

# Summary:

## Gas Balancing Study Austria



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## Summary

Directive 2009/73/EC has established new requirements for Member States, with the objectives of creating liquid wholesale markets for natural gas, ensuring fair competition in retail markets, and providing a level playing field for all market participants. Free and efficient access to flexibility instruments represents an essential precondition in this respect, in order to enable shippers to balance their injection into and offtakes from the network when supplying natural gas to final consumers. The general requirements of 2009/73/EC are further detailed by the recently adopted ACER<sup>1</sup> Framework Guidelines on Gas Balancing, and the Network Code Gas Balancing, which is currently being developed by ENTSOG<sup>2</sup>.

The revision of the Austrian Natural Gas Act in late 2011 transposed the requirements of 2009/73/EC into national law. Whilst the Gas Act supplements the general framework of 2009/73/EC with more specific provisions, the detailed design of the future balancing arrangements has to be developed by the national regulatory authority, who has been granted the corresponding powers under the Gas Act. One key aspect in this respect is the duration of the balancing interval. Under the current market arrangements in Austria, shipper imbalances are settled on an hourly basis, whereas the Framework Guidelines mandate a transition towards daily balancing.

Based on this background, KEMA has been contracted by E-Control to prepare a study on the technical feasibility and the economic impacts of a potential transition to daily balancing in the Austrian gas market. Apart from the choice between daily and hourly balancing, this study also considers the need to provide sufficient within-day flexibility for daily network operations as well as the possible impacts and incentives on different types of market participants.

The following text summarizes the main findings of KEMA's analysis as well as our recommendations for the design of future balancing arrangements in the Austrian gas market.

### **Status quo and requirements on future balancing arrangements**

The current balancing model in the so-called control area East was in principle introduced with the complete liberalization of the Austrian gas market and therefore has existed for almost ten years. Experiences to date have been generally positive. We know of no instances

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<sup>1</sup> Agency for the Cooperation of Energy Regulators

<sup>2</sup> European Network of Transmission System Operators for Gas

where AGGM has been unable to control imbalances in the network. In addition, imbalance costs for shippers are estimated to be low in comparison to other European countries.

However, a more detailed analysis shows that the deemed advantage of lower costs results from the specific rules for the pricing of imbalances and a structural error in the standard load profiles. This allows at least some commercial balancing groups to profit from a structural deficit of the network. The current balancing arrangements are therefore clearly not cost reflective and can potentially disadvantage customers supplied under standard load profiles (SLP customers).

International comparison shows that Austria is the only country in this study<sup>3</sup> to use hourly balancing. With the exception of the Netherlands, the other countries all use daily balancing, although diurnal restrictions apply in Germany and for certain customers in France. In contrast, the market based and short term procurement of balancing gas in Austria is not unique. In fact the comparison shows that several countries have recently changed over to procuring balancing gas primarily or even exclusively through the wholesale market.

In this context it should be noted that the Framework Guidelines on Gas Balancing recently issued by ACER explicitly call for a transition to daily balancing as well as for the procurement of balancing services at the virtual point (VP). The model currently applied in the balancing zone East therefore does not comply with the requirements for the future design of balancing arrangements, at least at the transport level.

The Austrian Gas Act provides for a separation between the Market Area ("Marktgebiet") operated by the Market Area Manager ("Marktgebietsmanager", MGM), and the Distribution Area ("Verteilergbiet") operated by the Distribution Area Manager (Verteilergbetsmanager", VGM). As a consequence, different regulations for the Market Area and the Distribution Area are conceivable. Nevertheless, the Gas Act explicitly requires both the MGM and the VGM to procure balancing services at the VP wherever possible. In contrast, the continued use of the current balancing platform will remain principally possible, at least for the distribution area, but will be restricted to the demand for balancing services which cannot be procured at the VP.

Finally the Gas Act explicitly requires a harmonization of the balancing rules at the transport and distribution level and furthermore allows the functions of the VGM und MGM to be integrated. At least perspectively a uniform approach for the whole Market Area seems clearly to be the solution targeted by the Gas Act.

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<sup>3</sup> Germany, France, Italy, Netherlands, Slovakia, Slovenia, Czech Republic and Hungary.

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## **Costs of different balancing models and the supply of the diurnal profile for different customer groups**

The choice and design of the balancing model influence the costs arising for different customer groups from the settlement of imbalances. On the basis of typical load profiles, KEMA has investigated the effects of different balancing models on the costs for selected customer groups. For comparison KEMA additionally estimated the costs faced by different customer groups when having to create the diurnal supply profile in the current system of hourly balancing.

The calculations show that both the current model of hourly balancing and a system of 'pure' daily balancing result in low imbalance costs. Possible within-day restrictions in the context of daily balancing can lead to considerably increased costs if insufficient tolerances are allowed. Conversely, the positive evaluation of hourly balancing is strongly influenced by the specific structure of historic imbalance prices. A potential adjustment of the principles for imbalance pricing could thus result in increasing costs in the current context of hourly balancing.

Consideration of the structural costs shows that the supply of retail customers with a pronounced daily profile, such as SLP customers, would be considerably cheaper under daily balancing than in the current system of hourly balancing, which demonstrates a clear advantage. In contrast, for large industrial customers with a more constant demand, for example steel and chemical industries, the costs of supplying the diurnal profile are similar to the costs of imbalances. The use of within-day restrictions could result in substantial additional costs, and therefore daily balancing would bring considerable risks for this customer group.

Conversely, for large customers with a pronounced diurnal profile, such as power plants, the economic effects primarily depend on the detailed design of the balancing arrangements. Although this customer group would presumably benefit from pure daily balancing, within-day restrictions could lead to considerably higher costs than with hourly balancing.

### **Technical feasibility and costs of daily balancing**

In order to obtain a robust evaluation of the technical feasibility of daily balancing, KEMA has developed a detailed technical model of the Austrian gas network and used it to investigate the influence of possible changes in customer behavior on the transport network. The simulations show that the gas network in the control area East has in many cases a high degree of flexibility which could be used to enable daily balancing. Even fairly extreme scenarios could be securely controlled within the network without having to rely on the flexibility of underground storage or other external sources.

Although these results principally support the feasibility of daily balancing, the network simulations demonstrate potential limitations as well. For instance, extreme deviations in cross border exchanges in the gas network cannot be controlled. In addition, the gas network is operated in some cases directly at the permitted pressure limits, so that insufficient reserves remain for dealing with unplanned deviations such as large outages or the fluctuating demand of power plants.

A plausibility analysis based on historical data confirms these observations in principle. It shows that in many cases extensive linepack is available in the 'network level 1' and in particular in the transit pipelines. However, the availability of flexibility in the transit pipelines cannot be assumed to be guaranteed. An assessment of the demand for diurnal flexibility shows that the diurnal fluctuations to be expected when including all users in daily balancing may, in certain situations, (considerably) exceed the available flexibility in the network.

Thus, in order to assess the costs of daily balancing we have distinguished between different variants, in particular between a limitation of daily balancing to SLP customers or the limitation of daily balancing to all 'small consumers'<sup>4</sup>. In addition, we have differentiated between the use of different products for residual balancing, i.e. rest-of-day products traded at the virtual point and within-day products procured via a separate balancing platform. To assess the prices of both these products we have used historical prices from the within-day market on the EEX, the balancing platform of the current control area East and the balancing services procured by NCG in the German gas market.

The assessments show that the annual costs of daily balancing with an available linepack of 10 GWh even under unfavorable circumstances do not exceed 10 million € per year. With an available linepack of 5 GWh annual costs could increase to up to 10 million € per year if daily balancing was limited to SLP customers, or a maximum of 16 million € per year if daily balancing was extended to all small consumers. If additionally the costs for contracting extra 'market maker' products were taken into account, in order to guarantee a sufficient supply of balancing services particularly in winter months, these figures would increase only marginally to a maximum of approx. 20 million €/ per year.

Related to annual consumption these figures correspond to specific costs of approx. 0.2 – 0.4 €/MWh for daily balancing limited to SLP customers or 0.1 – 0.5 €/MWh for daily balancing extended to all small consumers. Both figures are considerably lower than the costs of providing the diurnal profile on an individual basis for the corresponding customer groups and below the analogue costs for the diurnal profile of the total demand in the current control area East. These results demonstrate that the introduction of daily balancing for SLP customers and if applicable also for all small consumers appears to be economically beneficial.

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<sup>4</sup> Defined as consumers with a maximum offtake of less than 100 MWh/h in Austria

In contrast, the costs of self-supplying the diurnal profile would likely be more favorable than the average costs of daily balancing for large industrial users with a more constant demand.

### **Possible effects of daily balancing on competition**

An additional analysis of the potential effects on competition in different market segments shows that in most cases these effects are positive, whether it is for the retail market, the wholesale market, the market for the procurement of balancing services or the storage market. Increasing liquidity and intensity of competition are particularly important on the wholesale market as these also indirectly have a positive influence on developments in the retail market and the balancing market.

This view is supported by the positive experiences gained after the introduction of the so-called 'On-the-Day Commodity Market' (OCM) in Great Britain or following the transition to daily balancing in Germany. In both cases the combination of daily balancing and the procurement of balancing services in the general wholesale market resulted in a tangible growth of liquidity in the wholesale market and, at least in Germany, a marked increase in competition on the retail market.

Simultaneously, the transition to daily balancing may create additional risks, in particular for large industrial consumers and power plants. Apart from the risk of higher costs of within-day restrictions, this also applies to the potential socialization of the costs caused by the need to supply the diurnal profile of final consumers supplied under daily balancing. In addition, the efficient and competitive procurement of the balancing services required to create the diurnal profile requires a sufficiently liquid market for such balancing services.

### **Recommendations for the potential design of daily balancing**

Based on the analysis and results presented in this study, KEMA proposes the following recommendations for the introduction of daily balancing to the Austrian gas market:

- **Uniform rules for the entire market area**

We recommend aiming for uniform rules and balancing arrangements for the entire market area and, as far possible, to create a single balancing zone. Among others this appears necessary to avoid the undesired arbitrage potential which might otherwise arise between two separate sets of balancing arrangements with potentially conflicting rules and prices.

- **Efficient use of the available linepack**

An efficient use of the available linepack is an essential precondition to enable daily balancing at reasonable costs. Besides the coordinated use of linepack and balancing services in general, this particularly relates to the coordinated use of available linepack at the transport and distribution level. This coordination should be supported by continuous monitoring of available linepack by a centralized entity, whilst the MGM, the VGM and the operators of transport pipelines should be obliged to provide all necessary data. Coordination should also be enhanced through appropriate contractual arrangements between the different network operators.

- **Market based procurement of balancing services**

KEMA recommends relying as far as possible on products that are commonly traded in the wholesale market for the purpose of residual balancing, in particular on the form of daily band deliveries of rest-of-day products. Only to the extent necessary and within the limits set by the Austrian Gas Act should network operators additionally use temporal products available on the daily balancing platform operated by AGGM or contracts for market maker products.

- **Settlement of imbalance**

To avoid undue risks for consumers that are subject to additional within-day restrictions, such consumers should be granted sufficient (cumulative) tolerances. Alternatively, E-Control may also consider the continuation of the current system of hourly balancing for corresponding consumers at distribution level.

The costs of creating the diurnal profile of consumers supplied under daily balancing should ideally be charged to customers benefitting from daily balancing, for instance in the form of a separate charge or tariff element. A second best solution might be the recovery of the corresponding costs via the general network tariffs.



