



Redesigning the Austrian gas balancing framework

Conclusions document

The information, positions and proposals presented in this document in no way constitute a binding interpretation of the applicable provisions from the *Gas-Marktmmodell-Verordnung* (Gas Market Model Ordinance) 2012 or a binding commitment of the provisions that will be included in any future gas market model ordinance. Issuing and interpreting gas market model ordinances is the prerogative of the E-Control Executive Board, who will do so by handing down a corresponding decision and following a public consultation and consulting the Energy Advisory Council.



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1 Introduction

When Austria's current balancing regime was introduced on 1 January 2013, it was a major improvement over the previous situation. Even so, it is a complex two-system construct that means contractual and operational challenges for market participants in the eastern market area: ex-ante balancing by the market area manager, with mandatory exchange trading, co-exists with ex-post balancing, which is handled by the clearing and settlement agent. In addition, both ACER and market players have for some time criticised the Austrian balancing framework, arguing that it needed to be adjusted to fit with the Gas Balancing Network Code (Gas BAL NC). Overall, the balancing framework in Austria has been the object of much international criticism. ACER has explicitly voiced some of this criticism in the latest implementation monitoring reports on the Gas Balancing Network Code.¹ Also, section 41(4) Natural Gas Act 2011 requires that balancing rules at transmission and distribution level be harmonised.

In designing the balancing framework, we aim to ensure that it complies with all national and European legal provisions, addresses the points for improvement identified and unlocks efficiency potentials (simpler processes and streamlined roles and tasks, which translate to enhancements for stakeholders in the end). Only by overhauling the entire framework and creating an integrated balancing framework will we be able to accommodate all points.²

The need for redesigning the balancing framework arises from the situation in the eastern market area (MA). So, while we do address implications for the Tyrol and Vorarlberg market areas in the final chapter, the main body of this document focusses on the eastern market area.

In this, we dedicate chapter 2 to the thought process so far and the next steps; we summarise the main features of the revised balancing framework in chapter 3; we outline its benefits in chapter 4; we present more detail about each of the elements in chapter 5; and finally, we discuss Tyrol and Vorarlberg market areas in chapter 6.

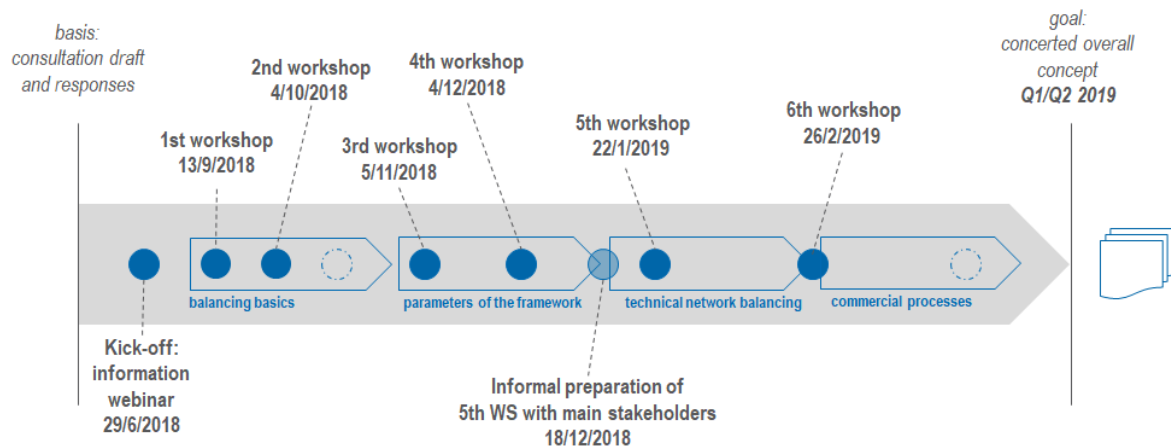
2 Process

We kicked off the redesign of our balancing framework with a public consultation of the first draft of this document in March 2018. To discuss the responses received and to delve into more detail on the different aspects of the revised framework, we initiated a stakeholder process in the second half of 2018. This included seven workshops that served as platforms to debate all elements with industry representatives (cf. Figure 1).

¹ [https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER%20Report%20on%20the%20implementation%20of%20the%20Balancing%20Network%20Code%20\(Second%20edition\)%20Volume%201.pdf](https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Publication/ACER%20Report%20on%20the%20implementation%20of%20the%20Balancing%20Network%20Code%20(Second%20edition)%20Volume%201.pdf)

² For more information, please consult the slides used at the first stakeholder workshop, available at https://www.e-control.at/documents/20903/388512/WS01+Grundsaeetze_der_Bilanzierung_180913.pdf/ae1a350d-e30c-10d5-6e7d-757f8462703a (German only)

Figure 1: Timeline of the stakeholder process



At each of the workshops, we tried to develop the ideas from the first draft into a concept that would attract everybody's support. The materials used at these workshops are available through our website, as is a comprehensive record of the stakeholder process.³

We have taken the conclusions drawn from this process and used them to firm up the design of the revised balancing framework; a recast of the *Gas-Marktmodell-Verordnung* (Gas Market Model Ordinance) 2012 will then be undertaken to formalise these arrangements.

The next steps in the process are planned as follows:

September 2019	We publish a first draft of the recast gas market model ordinance. <ul style="list-style-type: none"> > A two-month consultation period starts. > A public event could be held.
November/December 2019	The comments received during the consultation are evaluated and the consulted documents are updated.
early 2020	The recast gas market model ordinance is issued with entry into force on 1 October 2021.
early 2020	The tender procedure for nominating the single clearing entity from 1 October 2021 starts.
by mid-2020	A single clearing entity from 1 October 2021 is nominated.
by April 2021	The gas market code is drawn up, consulted and issued.
by April 2021	The general terms and conditions of the system agents are consulted and approved.
1 October 2021	The revised balancing framework comes into force.

³ Cf. <https://www.e-control.at/en/marktteilnehmer/gas/weiterentwicklung-bilanzierungsmodell/> (with some information in English)

3 Main elements

- > Integrated daily balancing for transmission and distribution, with the same rules for all entry/exit points and a single balancing system:
 - allocation of constant supply to consumers with connected capacities <300 MWh/h;
 - balancing energy pricing in line with the Gas BAL NC;
 - a Gas BAL NC small adjustment of 3%;
- > within-day obligations that complement the daily balancing regime:
 - tolerances for balance responsible parties' within-day balancing whose amount is derived from the quantities allocated to consumers and which are fed from the available linepack;
 - a cautious 4% tolerance level;
 - a WDO fee payable by balance responsible parties only for days during which opposing balancing actions had to be taken;
 - calculation of the daily imbalance quantity based on the net imbalances during a gas day beyond the balance responsible party's tolerance;
 - cost-reflective pricing of the WDO fee, i.e. the fee being set so that it covers the actual costs the single clearing entity has incurred for within-day balancing;
- > provision of comprehensive information about the position of each individual balance group and of the market area;
- > large consumer schedules, provided for system operation reasons, while without relevance for the balancing framework; no other consumer schedules;
- > curtailment of balance groups, adjusted to reflect that there are no consumer schedules anymore;
- > a new framework for technical network balancing with improved transparency, cost-reflective settlement and perspectives for further enhancements:
 - transitioning calorific values applicable for interconnection points between networks from default to actual calorific values, which can be metered, calculated or projected; preparations for transitioning consumed volumes from default to actual calorific values, so that the results of an ongoing OVGW process can be accommodated;
 - adjusting the allocation components to fit with the overall goal;
 - elimination of billing DSOs for linepack movements; calorific value differences (unless actual calorific values are used for consumed volumes) and other differences are billed to DSOs directly and are then passed on to consumers, i.e. elimination of the current residual load approach;
 - no technical network balancing by the single clearing entity for transmission level;
- > more efficient commercial processes:
 - application of most features of the current neutrality charge system in the distribution area under the integrated balancing framework;
 - calculation of the neutrality charge and the clearing fee from total entry and exit allocations;
 - an enhanced risk management that adequately addresses risks;
 - commercial transactions being handled by the single clearing entity;
 - a monthly clearing rhythm that maintains the current 2nd clearing mechanism.

The other elements of the current market model and balancing framework (e.g. membership of balance groups, entering capacity to balance groups, merit order list, etc.) will not be changed drastically; if anything, they will be adjusted slightly where necessary to fit with the revised balancing framework.

4 Benefits

Leaner institutional framework

For historical reasons, we currently rely on a multitude of system agents to run the gas market. Lately, first steps towards a leaner setup were taken: since mid-2017, the statutory tasks entrusted to the distribution area manager (DAM) and market area manager (MAM)⁴ have been carried out by a single entity.⁵ The revised balancing framework will further simplify: while ex-ante and ex-post balancing are currently handled by two different bodies (MAM and clearing and settlement agent, respectively), a single entity will take care of both in future. If possible, this single clearing entity should even be the same for all three market areas. This will result in the following advantages for market players:

- Simpler regulatory framework
- Leaner contractual relations with operators
- Single point of contact for all balancing issues
- Easier market entry for new players

More efficiency for market players

Bundling all balancing tasks in the single balancing entity simplifies not only the institutional setup but also operative balancing, thereby benefitting both system agents and market players. The single clearing entity can maximise synergies and eliminate any duplication of systems and processes for similar tasks. Simpler processes and less necessary messaging as part of the market model also reduce pressure on market players. In addition, market players cannot, under the new system, ever be exposed to the risk of having potentially opposing imbalances for the same day (due to the two different balancing regimes). An integrated balancing framework means the position of the market area can always be unequivocally expressed. To further capitalise on this advantage, market players receive much more comprehensive and better structured information to support their own portfolio balancing decisions. Red tape is further reduced as balance responsible parties (BRPs) no longer have to be members of the gas exchange. Given that the Austrian gas market is a competitive field, we assume that consumers will in the end reap some benefits from these efficiency improvements, too.

Future-proof framework

We are aware that changing the existing framework will require system agents and market players to change their systems and that this will mean some effort on their side. However, this is a one-off transition and we are setting up a framework that will remain stable in the long term. The revised balancing framework will be fully in line with the national and international legal situation, which is why we do not expect any further adjustments to be necessary in the foreseeable future. We thus provide regulatory stability for the market players. In addition, the new rules for the applicable calorific value already prepare the framework for increased shares of renewable gases in the system.

⁴ Please note that there is no market area manager in the market areas of Tyrol and Vorarlberg.

⁵ For further details, please consult https://www.e-control.at/presseaussendungen-2017/-/asset_publisher/UjGhJhn2d7X/content/e-control-unterstutzt-op-timierung-des-gasmarktmodells?inheritRedirect=false&redirect=https%3A%2F%2Fwww.e-control.at%2Fpresseaussendungen-2017%3Fp_p_id%3D101_IN-STANCE_UjGhJhn2d7X%26p_p_lifecycle%3D0%26p_p_state%3Dnormal%26p_p_mode%3Dview%26p_p_col_id%3Dcolumn-1%26p_p_col_count%3D1 (German only)

Attractive regional market

The Austrian gas market is the regional venue of choice for transit, storage and trade. We need an effective and efficient market model to secure and expand this position, and balancing is a crucial element in any market model. A simple, fair and efficient balancing framework will strengthen the Austrian gas market as a regional hub and help bolster utilisation rates of our gas infrastructure.

The first workshop held during the stakeholder process dealt with the benefits that the revised balancing framework will deliver for each market role.⁶

5 Elements

5.1 Institutional setup

The market area manager (in the eastern market area) and the distribution area manager (in all three market areas) will be merged into a single market area and distribution area manager (MADAM)⁷ for all Austrian market areas. The MADAM will undertake any and all necessary balancing actions, on behalf and for account of a single clearing entity. The MADAM will also be the main point of contact for registering balance groups (currently the MAM). In addition, it will handle scheduling at distribution-level cross-border interconnection points, storage points and production points (currently a DAM task).

The distinction between ex-ante balancing and clearing (through the MAM, at the gas exchange) and ex-post balancing and clearing (through the clearing and settlement agent) will be dropped. Instead, a single clearing entity will handle all clearing. If possible, this should be the same entity for all market areas. It will exercise the statutory balancing and clearing tasks of the clearing and settlement agent under section 14(1)(14) *Gaswirtschaftsgesetz* (Natural Gas Act) 2011 and of the clearing and settlement agent under section 87 Natural Gas Act 2011.

In line with section 85 Natural Gas Act 2011, we will conduct a transparent selection procedure that respects the principles of free and fair competition and of equal treatment of all applicants, and we will then appoint the single clearing entity (cf. the dates in chapter 2). While a single clearing entity must be appointed for each market area separately, synergies from the same body running clearing for all three market areas is in the interest of expediency and cost efficiency and will be positively considered. Independence and neutrality towards market players and a secure and modern clearing and settlement software will be decisive criteria as well.

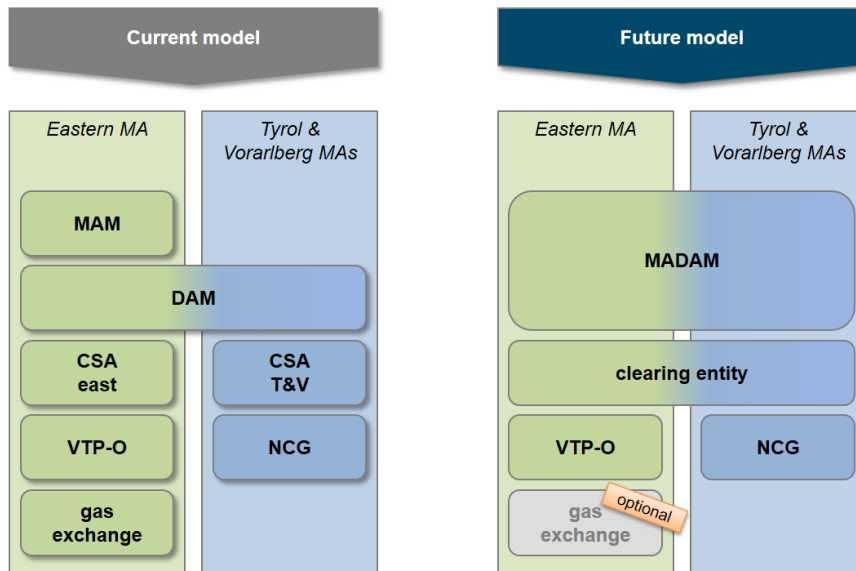
Mandatory gas exchange trading for market participants in the eastern market area will be abolished, but of course, the option to participate in exchange trading will remain. Even so, it will still be necessary for participants in the eastern MA to have a contract with the operator of the virtual trading point; likewise, contracts with the NCG market area manager remain necessary for the Tyrol and Vorarlberg market areas.

Balance responsible parties need to have several contracts in place to be able to operate. The revised balancing framework will bring some changes to this contractual construct:

⁶ https://www.e-control.at/documents/20903/388512/WS01+Grundsaeetze_der_Bilanzierung_180913.pdf/ae1a350d-e30c-10d5-6e7d-757f8462703a (German only)

⁷ In the eastern market area, the tasks of both the MAM and the DAM have been entrusted to the same entity since 1 June 2017, so the MADAM already exists in practice.

Figure 2: Contractual construct for BRPs under the current and revised balancing frameworks



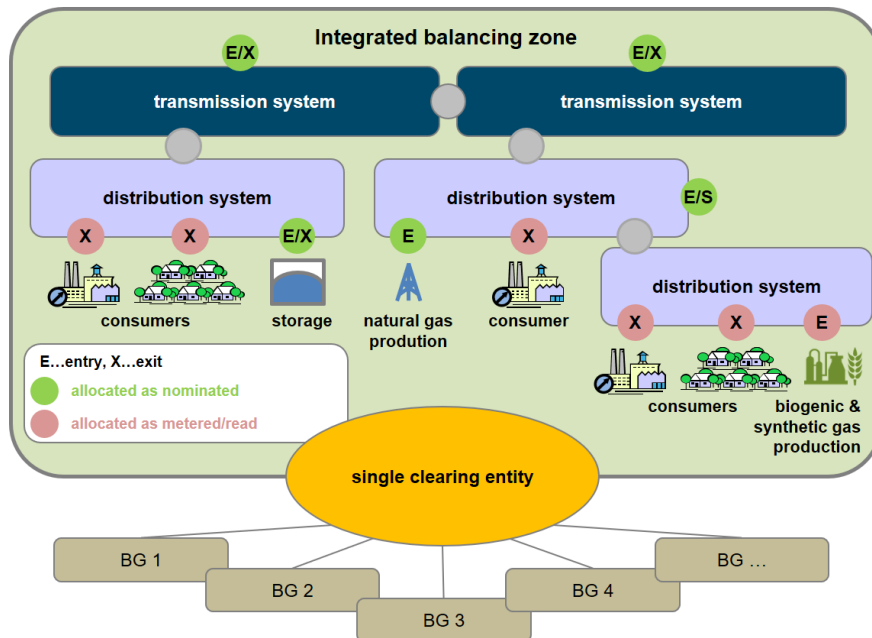
5.2 Integrated daily balancing

5.2.1 Principles

Consumer schedules (for daily and hourly balancing) play a pivotal role in the current Austrian balancing framework. They split the regime into transmission-level balancing and distribution-level balancing: the market area manager balances nominated and scheduled gas, while the clearing and settlement agent takes care of divergences between consumer schedules and actual consumption. This differentiation will be abolished in favour of integrated daily balancing. By “integrated daily balancing”, we mean a single balancing zone in which the same rules apply for all entry/exit points (across transmission and distribution) and a single operational balancing system. Consumer schedules will no longer be necessary for balancing purposes.⁸

⁸ Please note that this does not apply for large consumer schedules; they must be provided for system operation reasons (cf. chapter 5.4.3). For a record of the discussion that took place during the stakeholder process around this issue, please refer to https://www.e-control.at/documents/20903/388512/Kurzprotokoll_Stakeholderprozess+BAL_WS04+2018-12-04.pdf/c1e2c0c9-a363-3035-aec7-2cdca63d8bb6 (German only).

Figure 3: Market participants and system agents in the integrated balancing zone



Please note that

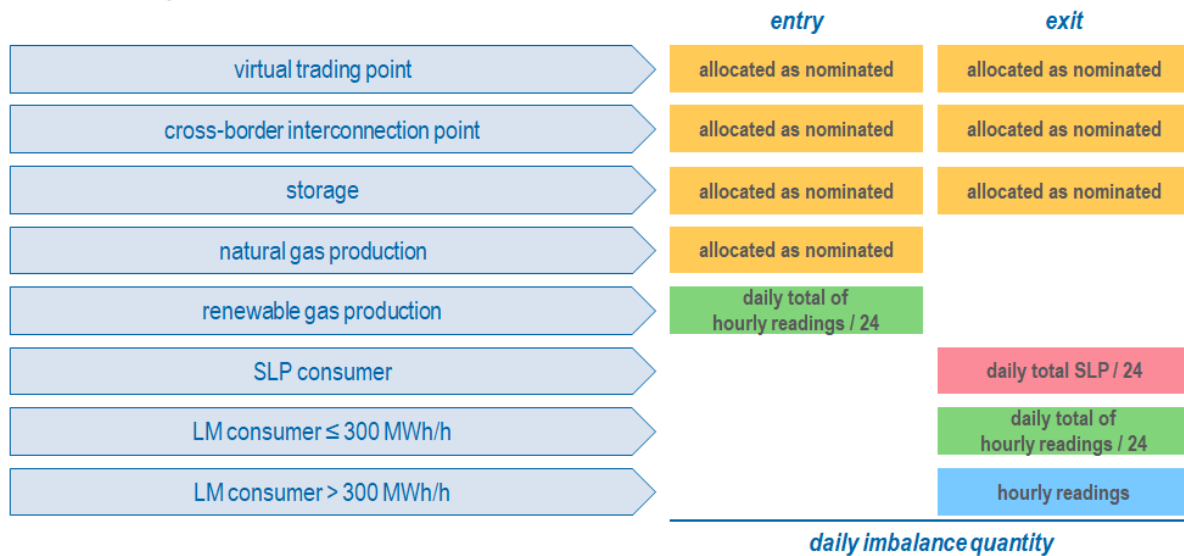
- the system will take care of all cross-border interconnection points, regardless of whether they are at transmission or at distribution level;
- system operators must design their interconnection point agreements so that they can accommodate the “allocated as nominated” rule. Any differences between nominated/allocated quantities and actual meter readings must be documented in operational balancing accounts (OBAs).

5.2.2 Daily balancing

The principle of daily balancing is a central tenet of the Gas BAL NC. It stipulates that a balance responsible party’s daily imbalance quantity corresponds to the difference between all its inputs and all its off-takes during a gas day. This applies to the entire balancing zone, i.e. across transmission and distribution. Our current hourly balancing regime is not compatible with this rule. However, the Gas BAL NC lays the basis for within-day obligations to complement the daily balancing regime, and we the revised balancing framework will feature this possibility (s. sub-chapter 5.3).

The integrated system will use a single daily imbalance quantity for each BG, and the figure below shows which quantities and readings will be used to calculate it.

Figure 4: Values and readings that will be used to calculate daily imbalance quantities



Please note that for LM consumers ≤ 300 MWh/h, there will be a possibility to switch to hourly meter readings; s. explanations below.

The framework will consider all supply to consumers to be a constant allocation.⁹ There are two exceptions from this rule: the first one concerns load-metered consumers with a contracted capacity > 300 MWh/h, whose allocations correspond to their actual hourly meter readings. The 300 MWh/h threshold has been set after comprehensive analyses and discussions that took part during the stakeholder process.¹⁰

The second exception from the constant allocation rule for supply to consumers applies to load-metered consumers with a contracted capacity ≤ 300 MWh/h. Their BRPs will be able to switch individual metering points to actual hourly meter readings instead of constant allocations. The single clearing entity will develop an efficient operational process to enable this.

Exits for consumers with standard load profiles (SLP consumers) will not be metered but calculated from the applicable load profile and the actual weather conditions.¹¹ This corresponds to the base case described in the Gas BAL NC.¹²

⁹ To be precise, these are 24 identical hourly allocations each day.

¹⁰ For further details and background information, please refer to chapter 5.4.3 in the conclusions document that was released following the stakeholder process. It is available here: https://www.e-control.at/documents/20903/443907/2019-04-15+Zusammenfassung_Stakeholderprozess+BAL_WS07_postWS-Version+190415_EN.pdf/987e1471-9787-1bae-9a00-419d92e89b82

¹¹ Any residual load error will be borne by the distribution system operator (s. sub-chapter 5.7.3).

¹² The Gas BAL NC provides that for the information models 'base case' and 'variant 1', all gas delivered to the distribution system be allocated.

5.2.3 *Balancing actions*

The market area and distribution area manager will undertake any and all necessary balancing actions (on behalf and for account of the single clearing entity). The portfolio of different actions at its disposal remains largely the same, as does the order in which they may be used:

- > trade in standardised products on the gas exchange at the virtual trading point;
- > procurement of standardised products from the merit order list (section 31(2)(1) Gas Market Model Ordinance);
- > procurement of flexibility products from the merit order list (currently section 31(2)(2) Gas Market Model Ordinance).

These actions are only admissible to the extent that the linepack available at transmission and distribution level is not sufficient to balance the network. Linepack must be used first, so that fewer balancing actions have to be taken and the WDO fee (cf. sub-chapter 5.3.3) and imbalance price (cf. sub-chapter 5.2.4) are reduced.

5.2.4 *Operational daily balancing and applicable price*

While the MADAM handles balancing actions operationally (cf. the previous sub-chapter), financial responsibility for any balancing actions that have been procured lies with the single clearing entity, which in turn settles any BG imbalances with the corresponding BRPs.¹³ BRPs assume financial responsibility for all daily imbalance quantities of their BGs. The daily imbalance quantity corresponds to the difference between all entries and all exits in the market area (cf. Figure 4). There will be no linepack flexibility service (cf. Article 21(2)(a) Gas BAL NC).

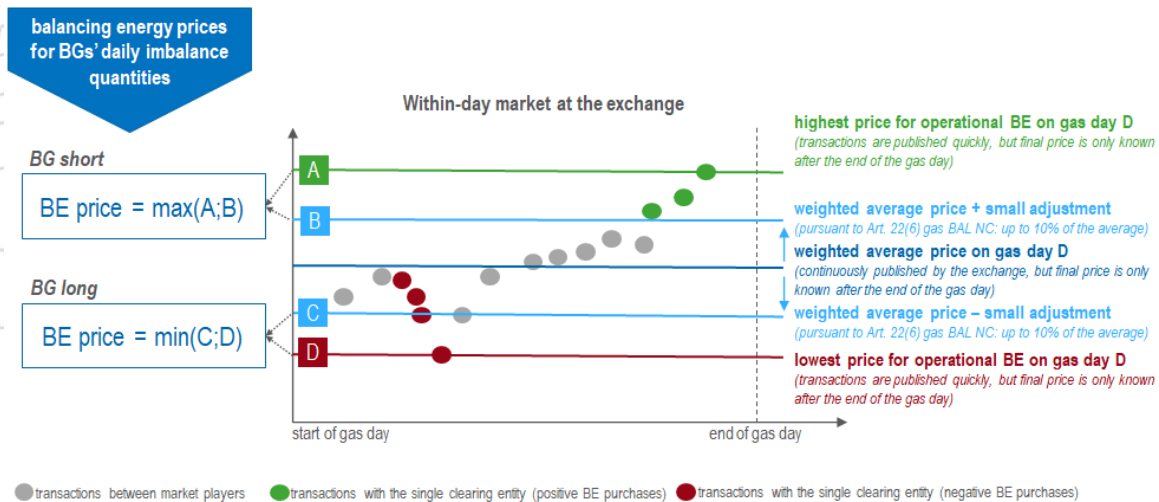
The applicable price for the daily imbalance charge will correspond to the rules in Articles 19 to 23 Gas BAL NC: either marginal sell price for positive balancing actions and marginal buy price for negative balancing actions that the MADAM must undertake on behalf and for account of the single clearing entity, or weighted average price of gas in the market area, including a small adjustment of 3% of the average gas price.¹⁴ We reserve the right to increase or decrease the small adjustment if practical experience suggests that this is appropriate.

Figure 5 visualises the financial settlement mechanism.

¹³ Balancing each BG's position during the day (on behalf and for account of the BRP) will not be necessary anymore.

¹⁴ The concept originally consulted provided for a helper/causer mechanism. This has been eliminated. For more information, please consult the summary of the third stakeholder workshop, available at https://www.e-control.at/documents/20903/388512/Stakeholderprozess+BAL_Sichtweise+E-Control+nach+WS03+2018-11-05.pdf/6bcffc15-c06e-da54-5f92-4aff928aa0b6 (Germany only)

Figure 5: Prices for daily imbalances



The current approach towards pricing any reconciliation between allocated and metered quantities that is identified as part of the 2nd clearing will be maintained: it will be priced at the same rate that applies for the 1st clearing, i.e. when BRPs are first billed for balancing energy. An adequate transitional arrangement will ensure that the second clearing continues to be exercised for times before the revised balancing framework comes into force.

5.3 Within-day obligations and incentives

The revised balancing framework will feature within-day obligations. They will reduce the need for balancing actions, and at the same time will ensure that opposing balancing actions are paid for by those who cause them, thereby adequately incentivising BRPs to reduce the overall costs of balancing and to contribute to the stability of the network.

5.3.1 The need for within-day obligations

Articles 26 through 28 of the Gas BAL NC prescribe the conditions and criteria for designing within-day obligations. Even before the stakeholder process, the TSOs and AGGM conducted a qualitative analysis to investigate whether there was a general need for within-day obligations in the eastern market area.¹⁵ They found that there was a definitive need for WDOs to ensure system integrity and to minimise the use of balancing energy. We agree with the results of the analysis, which fed into a debate about how to consolidate this need with the Gas BAL NC criteria.

Thus, in line with Article 25(2) gas BAL NC, we incentivise BRPs to undertake portfolio balancing to stay within a pre-defined range during the gas day. While daily balancing (cf. sub-chapter 5) achieves this effect for the entire day, the WDOs are designed to keep BRPs within range during each hour of the gas day. If balance groups move outside of this range and if all conditions are fulfilled, the single clearing entity charges a WDO fee to the BRP.

5.3.2 Defining the desired range

Following the responses to the consultation¹⁶ and the arguments presented in the stakeholder process, available linepack (including any available linepack at transmission level) will be equally distributed to all entry/exit forecasts,

¹⁵ https://www.e-control.at/documents/20903/388512/WS01+WDO_withinDayobligations_130918_fin.pdf/ab148774-727d-f6c2-ea67-f73c24e1a753 (German only)

¹⁶ https://www.e-control.at/documents/20903/0/2018-06-04+Stellungnahmen_Bilanzierungsmodell/7908b10c-4ce4-bcc3-e6ba-f0b9b5d8b6fd (German only)

i.e. all types of consumers will enjoy the same tolerance as far as their within-day obligations are concerned.¹⁷ For entries and exits that do not need to be forecast, we will maintain today's system: we expect BRPs to ensure that they are overall balanced, because in contrast to servicing consumers, there is no systemic imbalance risk for these entries and exits.

We conducted extensive technical and commercial analyses during the stakeholder process to find the right range that BRPs must respect, i.e. the tolerances that they are granted. Starting from the 300 MW/h threshold for daily/hourly balancing as a reference (cf. sub-chapter 5.2.2), and taking into account stakeholder concerns around disruptive system changes and risks connected with high tolerances, each BRP is assigned a tolerance of 4% of its exits to consumers for the day.

After some experience has been gained, we will analyse the situation, evaluate the impact to be expected of further changes and adjust the tolerance level in line with the results.

5.3.3 Pricing

Within-day obligations will incentivise players to maintain a balanced portfolio. WDO pricing must thus be based on a BG's total entries and exits.

Generally, the single balancing entity will determine quantities and prices ex-post, when it calculates the daily imbalance charge. However, information about a balance group's current position and the market area's overall position will be released to BRPs in the course of a gas day (cf. sub-chapter 5.3.5).

A WDO fee only applies

1. on days during which opposing balancing actions had to be taken. (We consider the lesser of the two directions to be necessary to balance within-day fluctuations.)¹⁸
2. for quantities beyond the BG's tolerance. This is calculated by totalling for each hour, the BG's hourly imbalances up until that point and subtracting the BG's tolerance (cf. sub-chapter 5.3.2).¹⁹

Considering the above, the WDO price is calculated as follows:

$$C_{spec.} = \max(C_{pos.BE} - R_{neg.BE}; 0)$$

$C_{pos. BE}$... the weighted average costs of positive balancing actions procured during the gas day

$R_{neg. BE}$... the weighted average revenues for negative balancing actions during the gas day

The BRP's WDO fee is calculated by multiplying this WDO rate by the quantities beyond its tolerances.

Also, the total fee paid by all BRPs for a gas day is capped with the total costs incurred by the single clearing entity in procuring opposing balancing actions for that gas day.

The above mechanism for calculating the WDO fee is simpler than in the consultation draft. In this format, it is easier for BRPs to estimate how high their fee will be and some of the costs for any opposing operational balancing actions in the other direction will be evened out through the neutrality charge for balancing.

¹⁷ The consultation draft already provided for within-day obligations. The need for WDOs was confirmed by the TSOs and AGGM during a workshop (cf. the chapter on within-day obligations).

¹⁸ There will be extensive public information about the balancing actions taken (cf. sub-chapter 5.4.1).

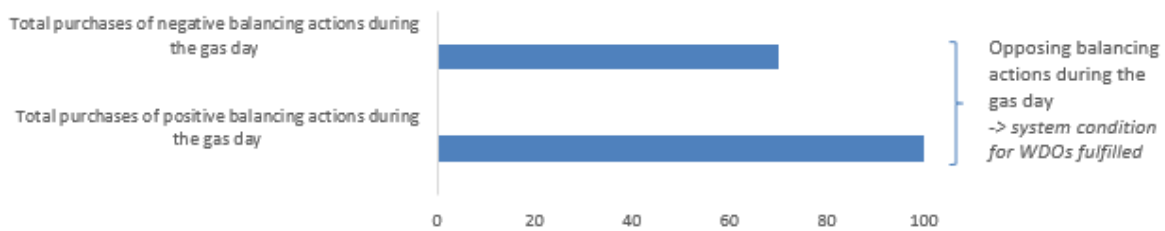
¹⁹ Following several discussions, we keep the principle of summing up all of a BG's previous hourly imbalances during that same gas day before applying the WDO fee. Experience with the GABI Gas 2.0 system in Germany have shown this to be the better approach. Also, it enables BRPs to offset their imbalances during the gas day against each other (within their tolerance) without immediate financial impacts.

There will be no within-day obligations at the level of technical network balancing (i.e. technical or systemic market-area-level imbalances).

5.3.4 Example

To further clarify how WDOs will work in the revised balancing framework, we provide an example and run it through all the steps.

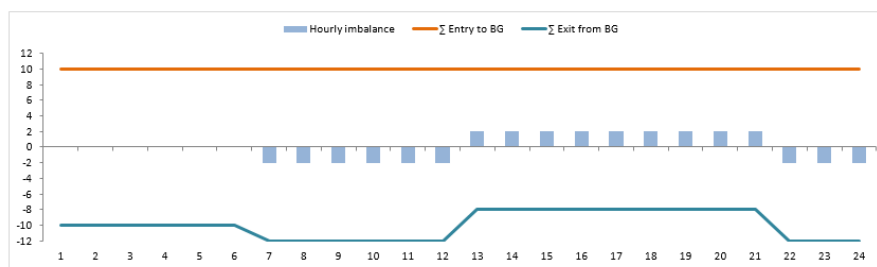
Step 1: Checking whether there were opposing balancing actions



In our example, opposing balancing actions were taken during the gas day. The system condition for WDOs is fulfilled. The next step thus involves looking at the entries and exits of each balance group.

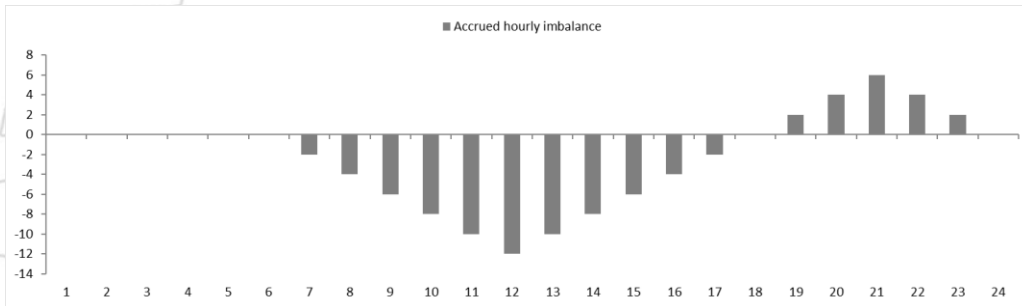
Step 2: Calculating each BG's tolerance level and hourly imbalances

Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Σ
Σ Entry to BG	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	240
Σ Exit from BG	-10	-10	-10	-10	-10	-10	-10	-12	-12	-12	-12	-12	-12	-8	-8	-8	-8	-8	-8	-8	-8	-12	-12	-12	-240
...out of these, to consumers	-3	-3	-1	-2	-3	-4	-4	-6	-4	-10	-10	-3	-2	-3	-2	-3	-4	-5	-4	-4	-4	-3	-3	-3	-100
Hourly imbalance: Σ entry - Σ exit	0	0	0	0	0	0	-2	-2	-2	-2	-2	-2	2	2	2	2	2	2	2	2	2	2	2	2	0
Tolerance (4% of daily exits towards consumers)	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4



The BG's tolerance level is 4% of its daily exits towards consumers. In our example, this is 4% times 100, i.e. 4. This is the range within which the BG should stay at all times, i.e. during each hour. To calculate the hourly imbalance, we net the BG's entries and exits for each hour.

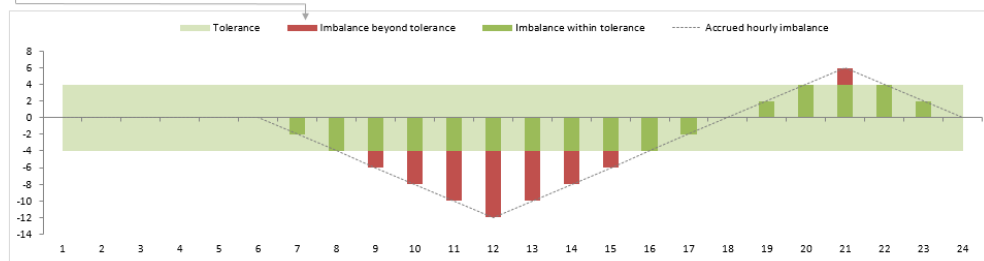
Step 3: Calculating each BG's accrued hourly imbalance



For each hour, the BG's hourly imbalances for this and all previous hours of the gas day are added up.

Step 4: Checking whether the BG's accrued hourly imbalance exceeds its tolerance

Hour	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	Σ	
Σ Entry to BG	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	240
Σ Exit from BG	-10	-10	-10	-10	-10	-10	-12	-12	-12	-12	-12	-12	-8	-8	-8	-8	-8	-8	-8	-8	-8	-8	-12	-12	-12	-240
...out of these, to consumers	-3	-3	-1	-2	-3	-4	-4	-6	-4	-10	-10	-3	-2	-3	-2	-3	-4	-5	-4	-4	-4	-3	-3	-3	-3	-100
Hourly imbalance: Σ entry - Σ exit	0	0	0	0	0	0	-2	-2	-2	-2	-2	-2	2	2	2	2	2	2	2	2	2	2	2	2	0	0
Tolerance (4% of daily exits towards consumers)	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4	±4
Accrued hourly imbalance	0	0	0	0	0	0	-2	-4	-6	-8	-10	-12	-10	-8	-6	-4	-2	0	2	4	6	4	2	0	0	0
Overhang → basis for WDO fee calculation	0	0	0	0	0	0	0	2	4	6	8	6	4	2	0	0	0	0	0	0	2	0	0	0	0	0



Now, we subtract the BG's tolerance (in our example, 4) from the accrued hourly imbalance. Any quantities beyond the tolerance (shown in red in the example) are subject to the WDO fee, payable by the group's BRP.

Step 5: Calculating the WDO price and fee

Our example BRP must pay a WDO fee for 34 hours (the total accrued imbalances beyond the tolerance, shown in red above). We assume

- > weighted average costs of positive balancing actions during the gas day of 26 EUR/MWh; and
- > weighted average revenues for negative balancing actions during the gas day of 22 EUR/MWh.

The spread, i.e. the WDO price, is 4 EUR/MWh. Multiplying the WDO price by the quantity means a WDO fee of 136 EUR for our example BRP.

5.3.5 Gas BAL NC requirements

WDOs are not a new feature of gas balancing in Austria.²⁰ However, their design in the revised balancing framework must correspond to the requirements from the Gas BAL NC. As a first step, the need for within-day obligations was identified by an analysis conducted by AGGM and the TSOs, was discussed during the stakeholder process, and was publicly consulted in line with Article 26(4) Gas BAL NC.²¹ These elements have led to the conclusion that the WDO design in the revised balancing framework complies with the requirements laid down in Article 26(2) Gas BAL NC. The below table provides more details and reference to the Gas BAL NC requirement.

	Requirement under Article 26(2) Gas BAL NC	Reference / response
(a)	no undue barriers on cross-border trade and new network users entering the market	We already have a comparable WDO system and this does not constitute an undue barrier.
(b)	adequate information provision to network users	addressed in sub-chapter 5.4.2
(c)	main costs shall relate to the network users' position at the end of the gas day	addressed by pricing mechanism design, cf. sub-chapter 5.2.4
(d)	charges shall be reflective of the costs	addressed in sub-chapter 5.3.3
(e)	no financial settlement to a position of zero during the gas day	addressed in sub-chapter 5.3.3
(f)	benefits of WDO outweigh any potential negative impacts	We already have a comparable WDO system and this does not have negative impacts.

In addition, the information required by Article 26(5) Gas BAL NC is contained in the present document and/or the materials referenced here. The below table provides more details and references the Gas BAL NC requirement.

	Requirement under Article 26(5) Gas BAL NC	Reference / response
(a)	the necessity for within-day obligations	cf. the analysis by AGGM and the TSOs ²²
(b)	adequate information provision to network users	addressed in sub-chapter 5.4.2
(c)	financial impact on network users	cf. sub-chapter 5.3.3 for a description of the methodology and sub-chapter 5.3.4 for an example
(d)	effect on new network users entering the market	We already have a comparable WDO system and this does not have negative impacts.
(e)	effect on cross-border trade, including on adjacent balancing zones	We already have a comparable WDO system and this does not have negative impacts.
(f)	impact on the short term wholesale market, including its liquidity	We already have a comparable WDO system and this does not have negative impacts.
(g)	non-discriminatory nature	ensured by mechanism design (cf. sub-chapter 5.3.3)

²⁰ Cf. section 26(6) Gas Market Model Ordinance.

²¹ https://www.e-control.at/documents/20903/388512/WS01+WDO_withinDayObligations_130918_fin.pdf/ab148774-727d-f6c2-ea67-f73c24e1a753 (German only)

²² https://www.e-control.at/documents/20903/388512/WS01+WDO_withinDayObligations_130918_fin.pdf/ab148774-727d-f6c2-ea67-f73c24e1a753 (German only)

We did not receive responses by regulatory authorities from neighbouring countries during the consultation of the original concept or during the stakeholder process. If we do receive any in response to the present document, we will take them into account in line with Article 27(2) Gas BAL NC. The motivated decision on within-day obligations in accordance with Article 27 Gas BAL NC will be handed down as part of the recast gas market model ordinance (cf. chapter 2).

5.4 Information provision

BRPs will need to balance their portfolios during each balancing period as best they can. The forecasting responsibility rests with them. (This is particularly relevant for balancing and the related balancing energy risks.) The MADAM, which will function as central data repository, will assist them in this task by providing market area information (cf. sub-chapter 5.4.1).²³

The single clearing entity has information about the status of each individual balance group, which it will make available to the BRPs. We explicitly encourage the MADAM and the single clearing entity to cooperate so as to provide information efficiently and in a user-friendly way.

5.4.1 The market area position

Figure 6: Features and purposes of market area position data

	<i>contents</i>	<i>purpose</i>	<i>frequency</i>
preliminary MA position	<i>total daily imbalance across all BGs</i>	<i>identify needed BRP activities</i>	<i>hourly</i>
operational balancing actions	<i>quantities, prices and details of these actions</i>	<i>transparency about marginal prices, supply situation etc. for BRPs</i>	<i>near real time</i>
MA consumption	<i>total consumption in the MA</i>	<i>transparency about current demand, market shares etc. for BRPs</i>	<i>hourly (preliminary data); monthly (for clearing and settlement)</i>
linepack and linepack use	<i>linepack limits defined by the MAM and linepack use</i>	<i>gauging the need for operational balancing actions</i>	<i>hourly</i>

This information should be available through a public portal, including interfaces and formats (e.g. XML) that enable automated data processing.

²³ In addition, the MADAM will continue to provide an SLP consumption forecast by 12 p.m. on D-1, which it will update in the course of D.

5.4.2 The balance group position

Figure 7: Features and purposes of balance group position information

	frequency	purpose	implementation DSOs
preliminary	each hour during gas day D	enable BRPs to balance their portfolios	current: X from 1/10/19: ✓
updated	D+1	preliminary information on actual daily imbalance quantity for day D	✓
for 1st clearing	in time for 1st clearing (monthly)	daily imbalance quantity for day D and basis for monthly clearing and settlement	✓
for 2nd clearing	in time for 2nd clearing (as in clearing calendar)	correction of monthly clearing and settlement, taking into account metered quantities for SLPs	✓

The system already disposes of information about entry/exit quantities that are allocated as nominated and of SLP consumption forecasts. In addition, BRPs should be informed about their BG's current position in the course of the gas day. Preliminary hourly readings for load-metered consumers >10 MW will be submitted from 1 October 2019, but the preliminary balance group position must also rely on information about load-metered consumers below this threshold. Instead of imposing an additional reporting requirement on DSOs to provide this information, the MADAM will calculate the balance group position.²⁴

Please note that this balance group position is the individual BG's position at a particular point of the day, i.e. it is not a projection of what the position will be at the end of the day, but rather a preliminary snapshot. To calculate it, the MADAM will rely on the following pieces of information:²⁵

- > nominations
- > SLP consumption forecasts
- > preliminary readings for LM consumers that submit data each hour
- > preliminary, calculated allocations for LM consumers that do not submit data each hour
- > preliminary allocations of quantities out of renewable gas production

It is crucial that BRPs can work with the information they receive out of this process. For this purpose, they must be aware that the data have different qualities (e.g. indicative intra-day reading vs. cleared reading for settlement) and rely on different parameters (e.g. the different calorific values).

In terms of the technological solution, we envisage a two-pronged approach: the default and mandatory solution will be a portal; if desired, information can also be provided to the BRPs directly, using established data formats and channels that enable automated data processing.

5.4.3 Large consumer schedules

BRPs will continue to submit large consumer schedules (for consumers with a contracted capacity >50 MWh/h). While they are not necessary for the revised balancing framework, i.e. will not be used for balancing or clearing

²⁴ This overall approach was agreed during the stakeholder process and a concrete process for this type of data exchange was developed along with it. For further information, please refer to: https://www.e-control.at/documents/20903/388512/2018-10-04_AGGM-LPZ-Prognose.pdf/44dc2c0b-0bac-ef58-7f45-8cc646f0284e (German only)

²⁵ We would like to underline that the consumption forecasts and BG position information, insofar as they are not determined ex-post for the purpose of clearing and settlement, are non-binding. Their main purpose is to assist BRPs with their own forecasts. They will not be used to calculate the daily imbalance quantities (this will be done during the 1st and 2nd clearings).

and settlement, the system agents need them to operate the system properly. To ensure that they are robust enough for system operation decisions, we will introduce an obligation for BRPs to submit large consumer schedules each hour in the MADAM's general terms and conditions.

5.5 BG curtailment

The eastern market area in Austria handles large transit volumes, which implies risks for Austrian consumers. To protect them, the revised balancing framework will feature a mechanism that allows for handling critical situations at times when market-based measures no longer work efficiently.

In doing so, we will largely maintain the current mechanism,²⁶ while accounting for the fact that there will be no more consumer schedules (cf. sub-chapter 5.2.1). Curtailing balance groups will continue to be a last resort option, and it is not linked to any system service interruptions that originate in the capacity model. As a matter of reference: since 1 January 2013, only 2-3 days saw balance groups being curtailed.

Currently a MAM task, it will be the MADAM that exercises curtailments under the revised balancing framework, and like today, it will primarily curtail the balance groups with the largest imbalance quantities (i.e. the largest contributors to the market area's overall imbalance). Given that we will no longer have consumer schedules, a balance group's position is not known ex ante for the entire gas day. Figure 8 displays how this will be approached under the revised balancing framework. In the end, the recast gas market model ordinance will provide a legal basis and the specifics will then be laid down in the MADAM's general terms and conditions.

Figure 8: BG curtailment mechanism

	current framework	revised framework
operational responsibility	MADAM	MADAM
decision which BGs to curtail	start with the BGs with the largest imbalance quantities (largest contributors)	start with the BGs with the largest imbalance quantities (largest contributors)
calculation of each BG's imbalance quantity	BG's position for the entire day, based on: <ul style="list-style-type: none"> entry/exit nominations VTP nominations storage/production schedules consumer schedules 	BG's position for the entire day, based on: <ul style="list-style-type: none"> imbalance quantity accrued up to that point in time* imbalance quantity for the entire gas day, forecast on the basis of large consumer schedules

* based on hourly information about the BG's daily imbalance quantity

5.6 Clearing and settlement

Clearing and settlement will be the core task of the single clearing entity.²⁷ It will be the BRPs' main contractual partner, and its mandate will roughly be based on that of the current clearing and settlement agent. The general

²⁶ The corresponding legal provision is section 26(7) Gas Market Model Ordinance, which is further detailed in the general terms and conditions for MAM, DAM and BRPs in the eastern market area.

²⁷ Our consultation draft offered the option of introducing a separate settlement agent to the financial side of the balancing process, but market players did not consider this necessary. We agreed to maintain the current approach.

principle of going through a 1st and then 2nd clearing before final settlement will be retained,²⁸ with one adjustment: if actual calorific values are to apply to consumed volumes (cf. sub-chapter 5.7.1), the system agents might have to engage in preparatory activities and the clearing process might have to be pushed back by a couple of days.

5.6.1 The neutrality charge for balancing

The revised balancing framework must ensure that the single clearing entity remains neutral in terms of both quantities and costs. This will be achieved by way of a neutrality charge for balancing. As prescribed in Article 29 Gas BAL NC, the neutrality charge for balancing will cover any and all revenues and expenditures from balancing actions, 1st clearing and the WDO fee.²⁹

A neutrality charge will only apply if the single clearing entity needs it to maintain its neutral position. By the same token, any overhang will promptly be reverted to the market players (while the single clearing entity will be allowed to retain an adequate liquidity reserve). As proposed by AGCS during the stakeholder process, the amount of the neutrality charge for balancing will be fixed every three months ex ante (generating planning security for market players). It will be calculated for each BRP separately and reflect the balance group's total entry and exit allocations.

The neutrality charge for balancing will be financially settled as part of the 1st clearing and will be corrected as part of the 2nd clearing if necessary.

5.6.2 The clearing fee

Like the neutrality charge for balancing, the clearing fee will be derived from each balance group's total entry and exit allocations.

5.6.3 Risk management

Under the current balancing framework, ex-ante risk management is achieved via the clearing house at the gas exchange: any imbalances are offset at the exchange on behalf and for account of the BRP. Additional ex-ante measures are not necessary. Ex post, explicit risk management takes place, based on historical data.

The revised balancing framework will provide for direct commercial transactions between BRP and the single clearing entity, and it will apply to all market players (from suppliers to transit shippers). In an integrated framework, the transaction sums might be higher than under the current framework, which is why the single clearing entity will need a more sophisticated risk management system. Such a risk management system must:

- > adequately respond to risks without going too far;
- > be able to react to recent developments and risks quickly (on a daily or even within-day scale);
- > leverage any cooperative synergies between the system agents and be easy to understand for market players.

In addition, we will lay down principles for the single clearing entity to evaluate alternative security approaches (e.g. earmarking gas in storage to avoid BRP curtailment) seen in best practices across Europe and to consider whether to integrate them. Details will be consulted with the market participants and then be laid down in the general terms and conditions.

²⁸ The consultation draft proposed that BRPs would be billed for balancing energy on a daily basis, i.e. would receive bills for each gas day just a couple of days later. Given that the market players did not see a need for such quick settlement, the revised balancing framework will stick with the current monthly rhythm, where BRPs are billed for all gas days of a month at once.

²⁹ Depending on the financial clearing regime, Article 31(3) Gas BAL NC provides that losses due to defaults by market players will also have to be recovered through the neutrality charge.

5.7 Technical network balancing

Transmission and distribution system operators will still be required to have a special balance group and to nominate a balance responsible party for it. When it comes to technical network balancing, i.e. handling technical or systemic market-area-level imbalances, our main goal is to establish a transparent, fair, future-proof system that enables efficient processes. While we preserve some elements of the current system that have proved their worth, we generally pursue a greenfield approach.

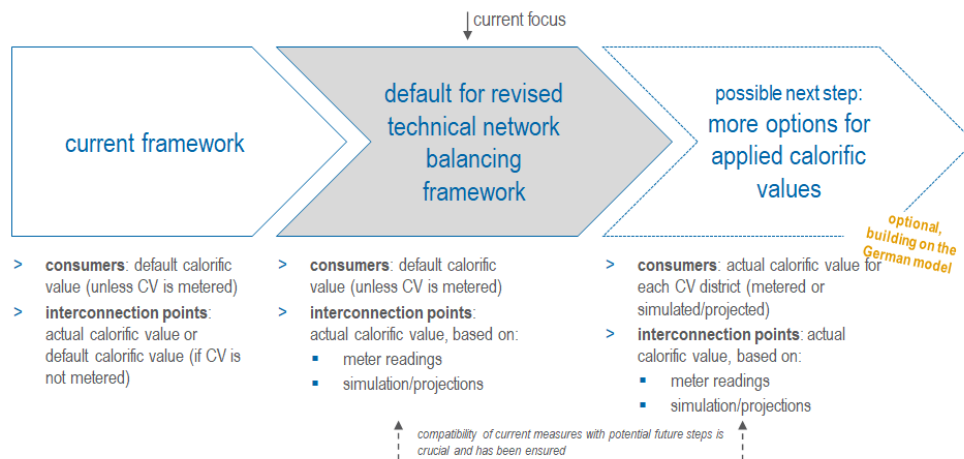
5.7.1 The calorific value

Technical network balancing is closely connected to the calorific value question. At the moment, the calorific value that is used to convert both consumed gas volumes and gas flows at interconnection points into energy units is the default calorific value (except in cases where the actual calorific value is metered on site).

As shown in Figure 9, this approach will gradually change. As a first step, we will apply calorific values at interconnection points between networks that better reflect the actual situation. These can be metered or calculated via simulations or projections. While the methods for calculating calorific values will need to be developed, there will be no need to considerably expand metering infrastructure.

A second step could involve a similar transition for consumed gas. This is currently being discussed as part of a process led by the Austrian Association for Gas and Water OVGW, and our revised balancing framework can accommodate the changes that might result.³⁰


Figure 9: Evolution of the default calorific value into the actual calorific value



5.7.2 Allocation components

The below table summarises all allocations that will be used for balancing and clearing, lists how they will be calculated and, if applicable, indicates the relevant calorific value. The system operators must submit these to the single clearing entity.

³⁰ Transitioning from default to actual calorific values for consumed volumes will require changes to the gas market model and gas system charges ordinances. The amendments must be agreed between E-Control and market players and the respective procedure be initiated well ahead of time. However, actual calorific values for consumed volumes can be introduced regardless of how far the rest of the revised balancing framework has progressed. It could be moved to the year after so as to ease pressure on market participants.



#	Allocation component	Calculation	Calorific value
1	allocated entries and exits at cross-border interconnection points (transmission and distribution level)	allocated as nominated	actual calorific value (deviations recorded in the OBA)
2	allocated entries from and exits to storage	allocated as nominated	actual calorific value (deviations recorded in the OBA)
3	allocated entries from and exits to natural gas production	allocated as nominated	actual calorific value (deviations recorded in the OBA)
4	entries from and exits to biogas and synthetic gas production	metered	actual calorific value
5	allocated exits to LM consumers	metered	default calorific value ³¹
6	allocated exits to SLP consumers	metered ³²	default calorific value
7	metered transfers at connection points between systems in the market area	metered	actual calorific value
8	metered own consumption	metered	actual calorific value ³³
9	non-metered own consumption	calculated	actual calorific value ³⁴

Nominations to cover own consumption are already part of other allocation components and must not be introduced to the calculation twice (but they are still necessary for commercial processes).

5.7.3 Clearing

The single clearing entity will use the actual calorific values calculated by the MADAM and the meter readings at market area entry and exit points and connection points (cf. sub-chapter 5.7.2) to calculate the below elements. It will then apply the weighted average price and settle the resulting sums with the system operators.

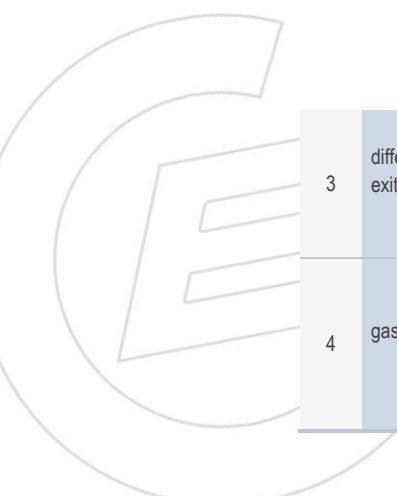
#	Element	Calculation	Relevant for clearing
1	OBA fluctuations	difference between allocated quantities and actual gas volume multiplied by the actual calorific value at points where quantities are "allocated as nominated"	no (basis for "allocated as nominated" allocations)
2	linepack fluctuations	difference between the available linepack at the beginning and at the end of the gas day, calculated by applying the system operator's weighted actual calorific value for the gas day	no (primarily serves to keep the system balanced and able to transport gas)

³¹ Section 126(3)(7) Natural Gas Act 2011 specifies that the default calorific value be used to calculate exits to consumers unless the actual calorific value is metered on site.

³² 1st clearing data are derived from the SLP; 2nd clearing data are metered and applied 14 months later.

³³ Allocation of metered own consumption relies on the actual calorific value, which is either metered or projected, or on the weighted actual calorific value.

³⁴ Allocation on non-metered own consumption relies on the weighted actual calorific value.



3	difference in calorific values for exits towards consumers	allocated exits towards LM and SLP consumers, multiplied by the difference between the weighted actual calorific value and the default calorific value	yes
4	gas unaccounted for	difference between allocated and metered quantities that cannot be accounted for by elements 1-3 (e.g. systemic errors from SLP application, metering errors etc.)	yes

Linepack fluctuations will no longer be relevant for clearing and settlement, because they are purely geared towards physical balancing and maintaining the network's ability to transport gas. The same applies for OBA fluctuations.

Any difference in calorific values for exits towards consumers and any gas unaccounted for will be taken into account when setting grid charges, i.e. any financial advantages or disadvantages that consumers might have due to these discrepancies will be offset by way of the grid charges. Any differences between the actual calorific value and the default calorific value that is applied for consumer exits and gas unaccounted for will be attributed to the system where these exits have taken place. They will then be multiplied by the weighted average price of gas and integrated into the system charges.

If the actual calorific value is used for consumed volumes, as is envisaged by OVGW, there will be no differences to be registered anymore; element 3 in the table above will no longer be necessary. In light of this, the DSOs and the single clearing entity should not have to adjust their systems now to accommodate an element (calculating the difference in the calorific values) that will soon become obsolete. A transitional provision will ensure that this would only become necessary from 1 January 2023 (by which time the OVGW process should be complete).

Also, there will be no more billing of residual load to suppliers. Any differences (arising from the calorific value question³⁵ or from other elements) will stay with the system operators and will then be socialised as part of the grid charges. It is thus in the interest of system operators to correctly differentiate between the elements of technical network balancing; this way, they can minimise the residual load and thus the commercial consequences for themselves and their customers.

5.7.4 Technical network balancing at transmission level

There are factual differences between technical network balancing at transmission level and at distribution level.³⁶ Transferring responsibility for technical network balancing of the transmission level to the single clearing entity would not unlock any advantages. Instead, the available linepack will simply be logged, assuming that gas will be compensated in kind without causing any commercial transactions. Such a log will also increase transparency. TSOs will thus be responsible for their own technical network balancing. The system agents have explicitly supported this approach.

The revised balancing framework will ensure that all distribution-side needs in terms of data provision, data granularity and data provision rhythm are addressed, i.e. that the single clearing entity receives the requisite data.

³⁵ In light of the transitional provisions envisaged until 1 January 2023.

³⁶ Cf. for instance: https://www.e-control.at/documents/20903/388512/2019-01-22_GCA_TAG_GmbH_Netzbilanzier-ung_FNB_190114.cleaned.pdf/bd515280-97a4-184a-52e0-ab3f37f0b2a1 (German only)

6 Rules for Tyrol and Vorarlberg

Tyrol and Vorarlberg will continue to be balanced through the VTP in the adjacent upstream market area in Germany. As is currently the case, consumption forecasts will serve to calculate how much gas will be needed to supply consumers in Tyrol and Vorarlberg, and this gas will be transferred to the MADAM (currently: the DAM) at the German VTP.

The single clearing entity clears the market areas following the same principles as above:

- it allocates quantities and uses the data described in sub-chapter 5.2.2;³⁷
- it calculates the daily imbalance quantities, as described in sub-chapter 5.2.4;
- it calculates the WDO quantities, as described in sub-chapter 5.3;
- it provides and receives the information described in sub-chapter 5.3.5;
- it clears and settles the BRPs as described in sub-chapter 5.6; and
- it undertakes technical network balancing as described in sub-chapter 5.7.

³⁷ If necessary, a detailed analysis could be undertaken to determine whether the thresholds for allocation methodologies in the Tyrol and Vorarlberg market areas should be different from those in the eastern market area.

7 Abbreviations

BG	balance group
BRP	balance responsible party
DAM	distribution area manager
DSO	distribution system operator
Gas BAL NC	Gas Balancing Network Code
LM	load metered
MA	market area
MADAM	market area and distribution area manager
MAM	market area manager
OBA	operational balancing accounts
SLP	standard load profile
TSO	transmission system operator
VTP	virtual trading point
WDO	within-day obligation