Bundesnetzagentur

- Ruling Chamber 7 -

Ref: BK7-24-01-014; BK7-24-01-015

3 July 2024

Initiation of multiple determination proceedings for the design of access to hydrogen networks

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On 3 July 2024, on the basis of section 28n(5) para 1 in conjunction with section 29(1) of the Energy Industry Act (EnWG), Ruling Chamber 7 opened the following determination proceedings:

BK7-24-01-014 (Determination on a hydrogen compensatory scheme and a basic balancing model, WasABi)

BK7-24-01-015 (Determination on a basic model for hydrogen capacity and managing network access, WaKandA)

The determination proceedings are directed at operators of hydrogen networks within the meaning of section 3(10b) EnWG where the provisions of sections 28k to 28o EnWG apply to them (see section 28j(1) EnWG).

The competence of the ruling chamber for the individual determination proceedings is derived from section 54(1) half-sentence 1(3) EnWG in conjunction with section 59(1) sentence 1 EnWG.

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A. **Background**

The two determination proceedings aim to further specify the details concerning access to hydrogen networks in Germany on the basis of the legal provisions of European and national law.

In what is referred to as the European Gas and Hydrogen Package (adopted on 21 May 2024), the European legislature created rules for access to hydrogen networks that need to be transposed into national law or applied directly.

Pursuant to Article 35(1) and (4) of the draft of the Directive (EU) of the European Parliament and of the Council on common rules for the internal markets in renewable gas, natural gas and hydrogen, amending Directive (EU) 2023/1791 and repealing Directive 2009/73/EC (2021/0425 (COD) (hereinafter referred to as Gas Directive) as from 1 January 2033 at the latest, the Member States must ensure the introduction of a system for regulated third-party access to hydrogen networks that is based on published tariffs and applied objectively and without discrimination between users of the hydrogen network. Until 31 December 2032, Member States may provide a system for third party access to hydrogen networks on a contractual basis according to objective, transparent and non-discriminatory criteria.

The draft of the Regulation (EU) of the European Parliament and of the Council on the internal markets for renewable gas, natural gas and hydrogen, amending Regulations (EU) No 1227/2011, (EU) 2017/1938, (EU) 2019/942 and (EU) 2022/869 and Decision (EU) 2017/684 and repealing Regulation (EC) No 715/2009 (2021/0424 (COD) (hereinafter referred to as Gas Regulation) contains further provisions on the design of the system for access to hydrogen networks. Article 3(b) of the Gas Regulation requires hydrogen network operators to cooperate in order to offer network users the ability to book entry and exit capacity independently from one another. Under Article 7(1) of the Gas Regulation, hydrogen network operators must offer their services to all network users on a non-discriminatory basis using equal contractual conditions for the same services. Under Article 7(2) of the Gas Regulation, they must make the maximum possible capacity of a hydrogen network available to market participants while ensuring system integrity as well as efficient and secure network operation. Beginning no later than 1 January 2033, the hydrogen networks are to be organised as an entry-exit system (see Article 7(6) Gas Regulation). The entry-exit system is defined in the Gas Directive as an access model for hydrogen, amongst others, where network users can independently book capacity rights at entry and exit points and which may include hydrogen networks or parts thereof (see Article 2(57) Gas Directive).

These European provisions basically introduce a capacity-based model for access to hydrogen networks, the design of which is based on the already-established system for access to gas supply networks. However, the model may also contain different access rules, which could result, for example, from the requirements for integration with the electricity market (sector coupling). National law also uses a capacity-based network access model. Article 1 of the Second Act amending the Energy Industry Act of 14 May 2024 (Federal Law Gazette 2024 I No 161) changed,

among other things, the provisions of section 28n EnWG. It requires hydrogen network operators to grant third parties connection and access to their hydrogen networks under appropriate and non-discriminatory conditions insofar as the connection or access is necessary for third parties (see section 28n(1) sentence 1 EnWG). When designing access to the hydrogen networks, operators of hydrogen networks must take into account the development of the hydrogen market and offer entry and exit capacity that generally allows access to the network without defining a transaction-dependent transport path and that can be used and traded independently (see section 28n(1), sentence 3 EnWG). They are generally required to design the rights to booked capacity in such a way that they entitle the shipper to provide hydrogen at each entry point for offtake at each exit point of their network or, if there is congestion on a lasting basis, a subnetwork (entry-exit hydrogen system), (see section 28n(1) sentence 4 EnWG). These requirements are aimed at operators of hydrogen networks where the provisions of sections 28k to 28o EnWG apply to them (see section 28j(1) EnWG).

These requirements establish an entry-exit system for access to hydrogen networks in Germany in line with European rules. The system is based on the requirements in section 20(1b) EnWG regarding access to the gas supply networks, but also takes into account the fact that, particularly in the ramp-up phase of the hydrogen market, not all the key characteristics of an entry-exit system (such as the market area-wide fixed free allocability of capacity) can be fully met (see Bundesrat Printed Paper 590/23, page 61).

In section 28n(5) para 1 EnWG in conjunction with section 29(1) EnWG, the legislature ultimately assigned the regulatory authority competence to issue determinations that, taking into account European and national rules, enable the regulatory authority to set requirements on the conditions for access to the hydrogen networks, including the rules for balancing the hydrogen network. Likewise, pursuant to section 28n(5) para 2 EnWG, the regulatory authority may, as part of determination proceedings, request hydrogen network operators to submit within a specific and reasonable time period common reference offers for terms and conditions for the contracts necessary for network access to hydrogen networks, in particular with respect to contract periods, the design of capacity products, capacity allocation procedures and balancing rules.

B. Ruling chamber's considerations regarding the determination proceedings that have been initiated

By initiating the two determination proceedings the ruling chamber is aiming to establish conditions for access to the hydrogen networks in Germany in compliance with the legal requirements of European and national law.

The ruling chamber believes it is conducive to design access to the hydrogen networks in Germany in greater detail at the beginning of the market ramp-up. The objective is to provide operators with clarity as early as possible on the conditions for access to hydrogen networks in Germany. The definition of specific access conditions should lead to more transparency and help to facilitate investment decisions. This should also help to achieve a uniform understanding of the access system among market participants and to ensure that legal regulatory provisions are being applied uniformly.

One important aim of the ruling chamber is to create a uniform framework for access to hydrogen networks in Germany from the outset. Particularly at the beginning of the hydrogen ramp-up it is to be expected that initially individual clusters will be put into operation and only over the course of time will they become connected and grow into a fully fledged market area with a nationwide entry-exit system. The determinations should thus help to ensure that key access conditions are applied uniformly across clusters beginning at the ramp-up phase. The ruling chamber therefore aims to introduce uniform rules across clusters on the handling of access to hydrogen networks, ie in particular on the metering and balancing of the inflows and outflows of hydrogen quantities as well as on key issues of a capacity-based network access model.

This should ensure a uniform and reliable access regime in Germany beginning with the ramp-up phase. At the same time it should facilitate the ramp-up of the hydrogen market itself. For example, a cluster merge should be easier over time if the same framework conditions already apply within the wider context in the individual clusters. However, the purpose of the determinations is not to regulate in detail all aspects related to access from the outset, particularly if requirements arise over the course of time that are not yet necessary at the beginning of the ramp-up. This could include introducing a congestion management mechanism or regulating the supplier switch process. The regulation of these aspects may take place when the time comes as part of future determinations.

The ruling chamber considers it important to bear in mind the objective of ramping up the hydrogen market, namely the implementation of the nationwide entry-exit system laid down in section 28n EnWG, within the framework of the determination proceedings. It therefore assumes a nationwide market area from the outset. Market area mergers like those in the natural gas market should be avoided. Appropriate account must be taken of the fact that not all the essential characteristics of a nationwide entry-exit system can be realised at the outset and during the ramp-up phase (for example the fixed free allocability of capacity beyond the individual clusters). Nevertheless the regulatory path to the implementation of a nationwide entry-exit system should already be sufficiently set out in the determinations.

The content and topics for which the ruling chamber believes determinations are necessary and useful are presented below for both proceedings. Generally, the requirements should apply uniformly in the market area (across all clusters). Insofar as the hydrogen network operators are granted leeway with regard to implementation, the requirements must be fulfilled uniformly (across all clusters) in the market area. The ruling chamber expressly reserves the right to make changes and/or additions to this content in the course of the proceedings.

1. BK7-24-01-014- Determination on a hydrogen compensation scheme and a basic balancing model, WasABi

When defining the balancing rules for the hydrogen market, the ruling chamber is considering establishing a basic model that differs fundamentally from the balancing system of the German natural gas market. The initially anticipated network-related technical restrictions in the hydrogen market require limited potential flexibility for network operation, and thus also for shippers, which also has an impact on the balancing system, ie on the balancing-related recording of input and offtake volumes.
The ruling chamber intends to define the basic aspects of a future hydrogen balancing system that will be applied throughout the market area during the ramp-up phase. The ruling chamber therefore considers it essential (both for the operational implementation of the balancing system and for the provision, processing and exchange of data) to establish a single body designated by the hydrogen network operators (like the market area manager in the gas market) and hereinafter referred to as the "body to be designated".
In the opinion of the ruling chamber, the following aspects represent the key points of the future basic model of hydrogen balancing and how it will be implemented operationally. The necessary aspects that supplement the actual balancing system (such as the collection and provision of measured data, the allocation rules to be applied and the establishment of a virtual trading point) are also to be included. As a result of the increased requirements for data transmission resulting from the network restrictions for the balancing system, the ruling chamber believes special consideration must also be given to data processing and communication between market participants.

The key elements of the future basic model of hydrogen balancing include the following:

1.1. Balancing groups

The ruling chamber plans to establish balancing groups in the entry-exit hydrogen system to balance the input and offtake volumes and to handle commercial transactions. If the clusters initially formed during the hydrogen ramp-up do not allow physical transport between clusters due to missing connections, then the balancing groups should at first be treated as individual clusters.

Multi-cluster netting of volumes in multi-cluster balancing groups should also be done no later than when multi-cluster transports are possible, . The ruling chamber considers it necessary for the balancing groups to also be designed uniformly so that even in different clusters the same IT interfaces etc. are used. The ruling chamber is also planning to stipulate that balancing group management and imbalance settlement should be done from the outset by a uniform body to be designated by the hydrogen network operators. Individual balancing responsibility should be assumed by a balancing group manager.

1.2. Balancing group status

In contrast to the natural gas market, the ruling chamber does not consider the introduction of a rigid balancing period that ends with balancing out to be necessary or feasible under the given framework of the hydrogen ramp-up.

Instead, the balancing group status should be continuously recorded and continually communicated as promptly as possible to the balancing group manager (see section on submitting data). The balancing group status is cumulated and continuously maintained without actually balancing out the balancing group. A time-defined balancing period is thus obsolete However, each balancing group manager remains responsible for the amount of hydrogen fed into or taken from the balancing group and must generally keep their balancing group balanced. Under certain conditions (see section 1.3) the balancing group manager must pay a penalty fee if they do not fulfil this requirement, but the ruling chamber considers it necessary for the balancing group manager to be granted a certain amount of tolerance within which deviations are under no circumstances penalised. Hydrogen network operators determine the amount of tolerance on the basis of technical conditions and the technical transport capacity available in the entry-exit system or (where relevant) in the respective cluster. The tolerance is granted as a percentage of the capacity entered into the balancing group. The tolerance can vary in the respective clusters but must cover at least potential measurement inaccuracies, whereby the ruling chamber currently assumes a minimum tolerance totalling around 10%, ie including leeway to compensate for measurement inaccuracies. Hydrogen network operators must make the tolerance in the market area or in the individual clusters transparent in a uniform manner and explain the chosen amount of tolerance to the ruling chamber.

If clusters are connected, a uniform tolerance must be granted so that a uniform tolerance is ultimately determined for the entire entry-exit system. Tolerance is to be granted equally for surplus supply and short supply. The TSO must provide the ruling chamber with a specific reason for not granting tolerance above the minimum limit in a cluster.

1.3. Overall system status

Beyond the ongoing submission of the individual balancing group status, the ruling chamber plans to require hydrogen network operators / the body to be designated to publish the overall physical system status in the same temporal granularity. This is the sum of the items of the individual balancing groups. If the balancing groups are initially managed only in individual clusters, the overall system status refers to the individual cluster. In this case the calculation of the overall system status and the publishing thereof must by necessity be done uniformly (eg with regard to its presentation and the platform where it is published, etc.).

There is an imbalance in the overall system whenever the overall system status is not zero. Hydrogen network operators must first divide the area of imbalance into zones. The zones are intended to provide the balancing group manager with information as to whether or not the existing imbalance in the overall network requires a compensatory measure. For example, the areas can be broken down into a traffic light system: a green zone means stable system status where no compensatory measures are required; a yellow zone means the system status is critical and requires compensatory measures; red zone means the system status is very critical and requires urgent compensatory measures; the hydrogen network operators may also be able to take measures such as reducing or switching off input.

The zones must be determined by the hydrogen network operators on the basis of the technical conditions in the respective clusters or in the entire entry-exit system. There may be strong interdependencies when determining the tolerance for the individual balancing groups and the zones for the overall status. Hydrogen network operators will need to strike a balance between the flexibility required for network control (size of the individual zones) and the flexibility needs of the individual shippers (amount of tolerance in the balancing groups).

1.4. Balancing period

The ruling chamber does not consider a fixed balancing period in the system of continuous balancing as depicted here to be necessary. The individual balancing groups could hence also be unbalanced for an undefined period of time without any financial consequences for the balancing group manager as long as the system status is moving within the green zone (see section 1.5). If the overall system status reaches the yellow or red zone, a financial incentive system should be triggered to incentivise the balancing group managers to take action that in that moment benefits the network and ultimately leads to bringing the overall system status back into the green zone.

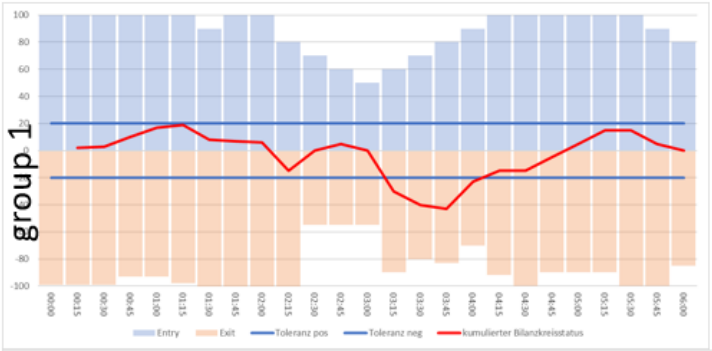
1.5. Financial incentive system

The ruling chamber assumes that, particularly in the early ramp-up phase, hydrogen network operators will have no or only very limited flexibility options outside the network buffer and external balancing energy for ensuring network integrity. For this reason the ruling chamber plans to

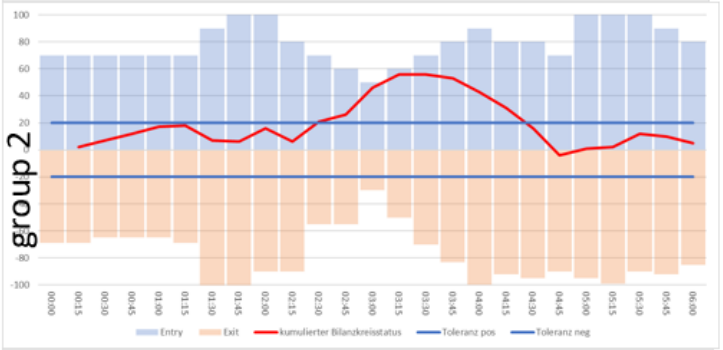
introduce a financial incentive system that (in conjunction with the elements of the continuous provision of the cumulative balancing group status and the overall system status described above) encourages the balancing group managers, where necessary in terms of network technology, to operate their balancing groups in a way that benefits the network. In this way the balancing group managers are encouraged to use the available flexibility in their portfolios to help ensure network integrity.

Under the incentive scheme balancing group managers can be classified as network-harmful (causer) or network-friendly (helper) depending on the overall system status. Conduct would be detrimental to the network if a balancing group manager exceeded the tolerance granted to their balancing group and at the same time the overall system status reached at least the critical zone (yellow), whereby the deviations must be in the same direction. In this case it would be helpful for a balancing group manager to do the exact opposite, ie to exceed the tolerance level in the opposite direction of the overall system status. Example:

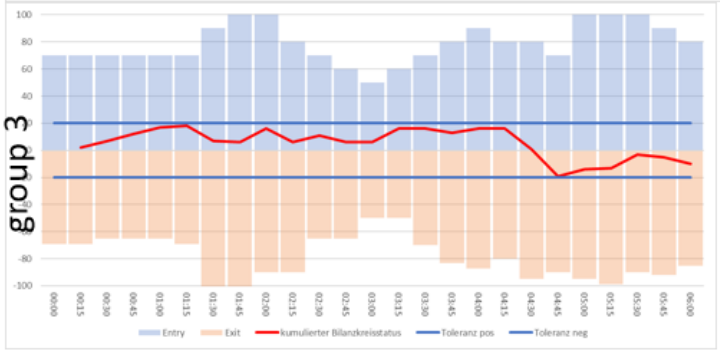
Balancing group 1



Balancing group 2

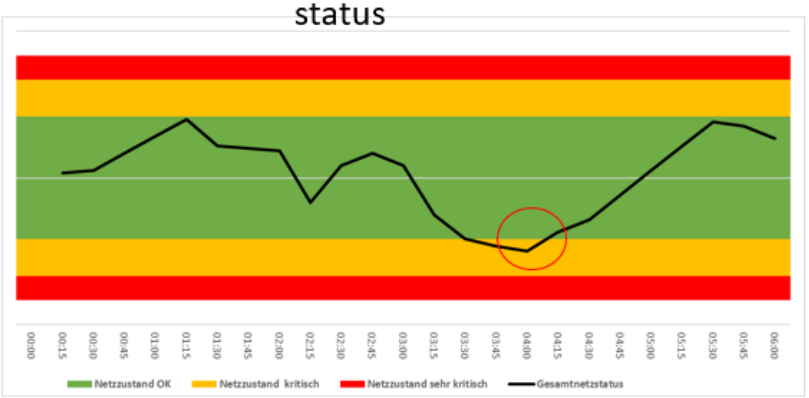


Balancing group 3



Overall system status falls short of the tolerance level in the critical area. Balancing groups conduct themselves in the network-harmful direction by falling short of the tolerance level (causers); balancing groups conduct themselves in the network-friendly direction by exceeding the tolerance level (helpers).

Overall system status



Balancing group 1: causer > pays penalty fee
Balancing group 2: helper > receives payment
Balancing group 3: neither helper nor causer > no penalty fee or payment

The causer must pay a penalty fee to the hydrogen network operator/body to be designated for the amount of tolerance exceeded by their balancing group. The network operator/body to be designated in turn disburses this money to the helper, who receives a financial reward for their network-friendly conduct in this case.

It would also be conceivable for the ruling chamber to extend the definition of helpers to include those balancing group managers whose balancing group status deviates in a network-friendly direction during the period in question but is still within the tolerance level granted.

If the overall system status reaches the red zone, hydrogen network operators should be able to implement measures (beyond the application of the financial incentive system) such as reductions or technical shutdowns to ensure network stability. The latter should be possible if the situation leading to a threat to network stability cannot be addressed or cannot be addressed in a timely manner through network or market-related measures taken by hydrogen network operators.

Regarding the amount of the penalty fees that the causers must pay to the hydrogen network operator/body to be designated, the ruling chamber could conceive of a calculation based on the network tariff. Where no derivation based on a liquid market is possible, orienting the penalty fee on the network tariff seems appropriate. A not-yet-defined percentage of the ramp-up fee would have to be multiplied by the relevant quantity (the amount the balancing group exceeded the tolerance level in the network-harmful direction). The amount collected would in turn be disbursed to the helpers in proportion to their network-friendly quantity (the amount the balancing group exceeded the tolerance level in the network-friendly direction). When the extended definition of a helper is applied, the network-friendly quantity increases accordingly.

1.6. Data provision

The hydrogen market area manager (the body to be designated) communicates the status of the respective balancing group to the balancing group managers every 15 minutes. The balancing group status at time t is the cumulative balance communicated by the balancing group at time t minus 15 minutes (t-15) plus the current measured data at time t. To enable the balancing group manager to make an additional assessment of how the balance of their balancing group will further develop, the ruling chamber also intends to provide for the transmission of a forecast value at the same time for the quarter hour following time t (t+15). To do this, the balancing group status recorded for time t, for example, could be extended by using the measured data collected at time t to derive a value for time t+15. The required measurement data must be continuously collected at the appropriate time intervals using interval metering or another adequate procedure.

The collection, processing and forwarding of the data relevant to balancing groups is to be done centrally by the body to be designated. This body performs the respective calculations and balances of the quantities entering and exiting a balancing group and informs the balancing group manager every 15 minutes of the balancing group balance and the forecast value. The quantities

that are definitively classed are to be corrected for missing or incorrect measured data and, where necessary, for settling to include corrected data for determining consistent energy content. In addition, the body to be designated will publish the system status of all balancing groups for each cluster every 15 minutes as the sum of all imbalances of the individual balancing groups in the respective cluster.

In its considerations on providing data, the ruling chamber assumes that the potential flexibility of the hydrogen network will be significantly less than what is currently the case with the natural gas system. For this reason longer data transfer phases than the chosen 15-minute phase do not seem appropriate to the ruling chamber, at least in the ramp-up phase, since longer periods would further limit the flexibility of the hydrogen network, which is already scarcely available, or, depending on to what extent the periods would be extended, would not be possible at all. The ruling chamber therefore considers it more conducive to make available the use of the limited potential flexibility to grant an individual tolerance for the balancing groups since the chamber assumes that with a short data transfer phase and the determination of the balancing group status that accompanies it, a proper balance between the interests of the individual shippers, ie the possibility of quantitative deviations within tolerance limits and the avoidance of critical system states, can be achieved. To the best of the ruling chamber's knowledge, a longer data transfer phase would not ensure compliance with these two requirements.

1.7. Data processing and data transmission

In addition to balancing group management and processing, the ruling chamber also intends to have the rest of the data and information processing and the associated correspondence done centrally by a body to be designated. This also applies specifically to the receiving, processing, forwarding and making available of measurement data in accordance with the requirements set out here for market participants.

The planned introduction of a data transfer frequency of 15 minutes means (taking into account the associated very short response times for the individual market participants and for the publication obligations with regard to the corresponding status information for the balancing groups and the system) placing significantly higher demands on data processing and communication between the actors involved than is currently the case in the natural gas sector. This applies equally to the fault tolerances when processing measured data, including the generation of substitute values, and to the transmission of measured data. An efficient data exchange model is therefore required to comply with these requirements. In the opinion of the ruling chamber the model should follow the basic approach of a central data exchange platform (data hub).

A data hub enables the market and communication processes to be made available and handled centrally without the need for each market participant to provide the hardware and software

themselves. The data hub's application programming interfaces, which will need to be standardised for this purpose, also ensure that demand-based information is provided and that the IT system of each company participating in the market can process the information. This applies not only to data processing and the exchange of data in balancing group and capacity management, but also to handling other market processes that will be introduced in the future.

The ruling chamber considers it expedient to initiate the establishment of a data hub at the earliest possible stage of the hydrogen market ramp-up before any data communication structures exist among the market participants in the hydrogen sector. Even if a data hub is not created immediately that takes into account the necessary development and implementation deadlines, the data processing and data transmission to be established on a transitional basis can be based on this future basic approach so that market participants can also avoid stranded investments in their IT infrastructure.

The ruling chamber therefore intends to require hydrogen network operators to develop a concept for the operation of a central data hub and subsequently to establish the data hub at the body to be designated.

1.8. Allocation methods

The ruling chamber is considering allowing nominated and measured quantities for balancing purposes. The quantities are allocated to the balancing groups using the "allocated as measured" method. When hydrogen network operators control entry and exit points on the basis of nominations by shippers, such as at cross-border interconnection points or storage facilities, the "allocated as nominated" method can likewise be applied. If the available capacity at such a network point is managed by more than one balancing group manager, hydrogen network operators must use an appropriate method to divide the quantity flow. One option would be to divide it by the share of booked capacity. Whichever method is chosen, it must be applied uniformly throughout all clusters. The ruling chamber is open to other allocation methods for entry and exit points. The same applies to (additional) quantity planning or nominations that may be useful for network control.

1.9. Portfolio and system balancing energy

In view of the plan to evaluate balancing group balances on a rolling basis (and the aim to get the balance back within the tolerance range if the tolerance limits are exceeded) there is no need for a commercial balancing of the balancing groups, including a separate provision of portfolio balancing energy. There is thus no need to make rules for a portfolio balancing energy system.
With regard to system balancing energy, the ruling chamber currently assumes that it will not be possible to procure market-based system balancing energy at the start of the ramp-up due to the lack of a trading market and the fact that there are no alternative product designs. However, the ruling chamber is aware that the conditions for market-based procurement of system balancing

energy must be re-examined once the individual clusters become increasingly interconnected and there are potentially more flexibility instruments.

1.10. Virtual trading point (VTP)

The ruling chamber also plans to have hydrogen network operators set up a virtual trading point for hydrogen that allows the economic trading of hydrogen volumes between balancing groups. For physically unconnected clusters, the transfer of quantities of hydrogen from the VTP to individual clusters may be limited. In these cases access to the virtual trading point must be ensured for each cluster. Hydrogen VTPs will be operated (including when trading points have been created for each cluster) by the central body that will be designated by the hydrogen network operators. During the ramp-up, access to the VTP can initially be linked to the booking of transport capacity.

The ruling chamber considers it conducive to establish a VTP early on that serves to transfer hydrogen quantities between balancing groups (particularly with regard to the planned market-wide and uniform handling of quantity and balancing group management). "Efficient" is when the establishment and operation of the virtual trading point is entrusted to the central body to be designated, which will also be assuming balancing group management and imbalance settlement. However, since in the ramp-up phase it is assumed that there will initially only be individual hydrogen subnetworks/clusters that are not interconnected, it is essential to ensure when setting up the hydrogen VTP that all clusters can be reached by this VTP and that an economic exchange can take place with each individual cluster in accordance with uniform rules applicable to all clusters. In designing the hydrogen VTP, the ruling chamber has for now deliberately left open the question as to whether and to what extent the market participants will be able to conduct purely commercial transactions at the virtual trading point or whether access to the hydrogen VTP will initially only be possible in conjunction with a booking of transport capacities (taking into account that in the ramp-up phase in the individual subnetworks, certain delivery processes of hydrogen quantities will be paramount).

2. BK7-24-01-015 - Determination on a basic model for hydrogen capacity and managing network access, WaKandA

The determination aims to design a basic model for managing network access in the capacity sector. A key cornerstone is access through a single market area, ie an entry-exit hydrogen system. However, particularly at the beginning of the hydrogen ramp-up it is to be expected that individual clusters will initially be put into operation and only over the course of time will they become connected and grow into a fully fledged market area. The determination hence outlines a basic model for the design of network access to create a level playing field across clusters beginning in the ramp-up phase. For the ruling chamber this includes the design of capacity

products, capacity duration and the allocation mechanism. Particular attention must also be paid to dealing with congestion between the individual clusters during the ramp-up phase.

The purpose of the determination is not to regulate in detail all aspects related to access from the outset as requirements may arise over the course of time that are not yet necessary at the beginning of the ramp-up. One such example here would be a mechanism for managing congestion, although the ruling chamber considers regulatory requirements on the topics listed below necessary from the outset and is putting forward its deliberations for consultation. In principle, the requirements should apply uniformly in the entry-exit system (across all clusters). Insofar as the hydrogen network operators are granted leeway with regard to implementation, the requirements must be fulfilled uniformly (across all clusters) in the hydrogen entry-exit system.

2.1. Design of capacity products

All arrangements in section 28n(1) EnWG specify that hydrogen network operators must offer separately bookable fixed entry and exit capacity, which normally allows unrestricted transport (freely assignable) within the hydrogen entry-exit system.

Where technically necessary, particularly where there is no physical connection or capacity to exchange between individual clusters, the ruling chamber considers hydrogen network operators to be entitled to initially offer fixed capacity with unrestricted transport only within individual clusters.

In the ramp-up phase the clusters that are initially separate will become more and more connected until there is a nationwide hydrogen entry-exit system. It will be necessary to deal with the fact that the ability to exchange between the individual clusters may only increase gradually and while multi-cluster transport may become possible on a firm basis, it may not be possible to the same extent as after completion of the ramp-up phase. The ruling chamber sees two conceivable options for dealing with potential congestion between the clusters during the ramp-up: the first option is based on an access system with only two products (firm capacity and interruptible capacity), whereas the second option would feature the introduction of several firm capacity products during the ramp-up.

<u>Option 1 (two-product world):</u>

a) From the beginning, the hydrogen network operators offer firm and interruptible capacity for Germany's entire entry-exit hydrogen system. During the ramp-up, however, the firm capacity contains interruptible elements for multi-cluster transports, which at first may even be 100%. For transport within a cluster, the firm capacity does not contain any interruptible capacity nor are there any allocation restrictions, ie the capacity is freely allocable.

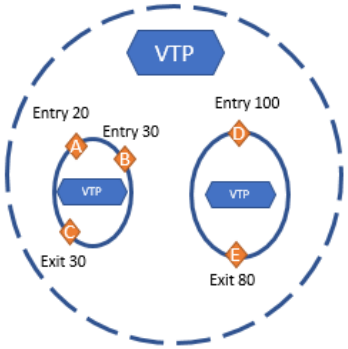
b) As the meshing of the clusters progresses and multi-cluster transports become possible, the interruptible element of the firm capacity will be continually reduced. This happens pro rata

throughout the entire available firm capacity. For example, if it is technically possible to transport 10% of the total firm capacity to multiple clusters on a firm basis, then every shipper has the opportunity to use 10% of their booked firm capacity on a firm basis for multi-cluster transport.

c) For shippers it must be clear which share of firm capacity makes multi-cluster transport on a firm basis possible. Hydrogen network operators must publish the necessary information. This does not mean that hydrogen network operators have to set out a binding timetable for reducing the interruptible element for multi-cluster transports when they offer firm capacity for the first time.

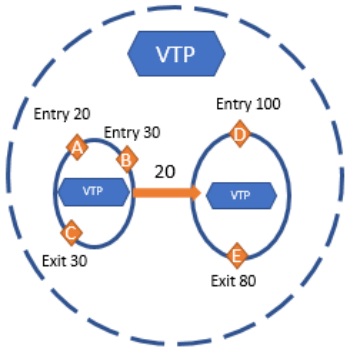
d) With the establishment of the nationwide entry-exit system, the interruptible element of the firm capacity product has fully decreased so that the capacity makes unrestricted transports possible on a firm basis within the entire entry-exit system.

Option 1 is schematically depicted below.



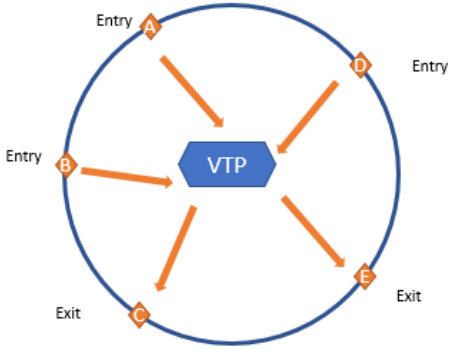
Beginning of the ramp-up:

- Individual network areas (clusters) are initially formed within the hydrogen market area.
- Physical transport between clusters is not possible because the clusters are not technically connected.
- Firm capacity is offered in each cluster. The capacity enables firm transport between the individual points of a cluster. Transport to the points of the other cluster is only possible on an interruptible basis. Thus the firm capacity contains an interruptible element.
- Trade and transport are processed through the "sub-VTP" of the clusters. The market area-wide VTP tends to be unusable.



During the ramp-up:

- A physical connection is put into operation in the ramp-up phase, allowing transport in the amount of 20 from cluster 1 into cluster 2. However, the connection does not yet allow merging of the clusters or comprehensive transport that can be freely allocated.
- The possible transport of 20 is allocated pro rata to the entry capacity of cluster 1. The interruptible element of the capacity decreases.
  - Entry A now allows a fixed multi-cluster transport of 8, entry B allows 12.
- Trade and transport are mostly processed in the "sub-VTP" of the clusters. The market area-wide VTP is partially usable.



Target model:

- Nationwide market area is established.
- The firm capacity enables transport between all points of the market area.
- All trade and transport can be handled through the market area-wide VTP.
- The sum of the firm capacity offered at each interconnection point in the clusters does not necessarily correspond to the amount offered at the beginning of the ramp-up.

Option 2 (multiple-product world):

a) The hydrogen network operators initially offer only firm capacity that guarantees firm transport within the respective cluster.

b) As the meshing of the clusters progresses and multi-cluster transports become possible, another firm capacity is offered that enables firm multi-cluster transport. This means different products will be offered: firm capacity whose free allocation is limited to the respective clusters and a firm capacity for multi-cluster transport.

c) Each possible multi-cluster firm transport would accordingly introduce an additional capacity product with "greater range" until a firm transport capacity is introduced at the end of the ramp-up for the entire hydrogen entry-exit system (total network capacity).

d) The ruling chamber believes that under this option it would make sense to introduce a requirement for hydrogen network operators to switch all capacity that only allows transport within a cluster to total network capacity as soon as it is available in order to reduce the number of available capacity products.

In the view of the ruling chamber both of the options above would be legally admissible and compatible with the rules of the tariff system formulated in principle in the WANDA determination (GBK-24-01-2#1). It is the opinion of the ruling chamber that the choice of the respective option must first and foremost strike a balance between a system that has only one firm capacity product, and which therefore appears easier to implement in operation but does not allow for a targeted booking of firm multi-cluster transport options in the ramp-up phase, instead it makes these available to all users equally, and a system that allows transport customers who need multi-cluster transports to book them in a targeted manner, but which conversely can lead to a potentially very high number of different firm capacity products and can thus require a large amount of effort to implement on the part of hydrogen network operators and shippers.

The choice of one of the variants outlined above can also have an influence on the amount of firm capacity that can be marketed at the beginning of the ramp-up. The ruling chamber is generally of the opinion that the requirement placed on hydrogen network operators to offer the maximum amount of available firm capacity also applies in the hydrogen sector. It is the view of the ruling chamber that the maximum firm capacity to be offered should first be limited by the projected total capacity of the core network (see 28q EnWG). According to the ruling chamber, however, the sum of the firm capacity that can be offered in the clusters at the start of the ramp-up (possible firm transport within the individual clusters) does not necessarily equate to the projected total firm capacity in the core network. The ruling chamber therefore believes that the firm capacity initially offered does not necessarily have to correspond to the total projected firm capacity of the core network.

The marketing of interruptible capacity should be given lower priority than firm capacity, ie after all the firm capacity at the respective point has been marketed.

2.2. Product duration and booking horizon

The ruling chamber believes it makes sense to offer both yearly and non-yearly capacity products to accommodate the different needs of the various market participants and hydrogen network operators. The ruling chamber is therefore considering requiring hydrogen network operators to offer firm capacities of different durations, with the yearly product being for the calendar year. By contrast the ruling chamber does not consider it expedient for the hydrogen market to follow the natural gas market's fiscal gas year (October to October of the following year). For one, the heating season and the overall heat-led demand in the hydrogen market should not play the key role as in the natural gas market. Secondly, following the calendar year would establish a synchronisation between the transport capacity and the corresponding network tariff, which is also to be determined on a calendar year basis in accordance with the WANDA determination (GBK-24-01-2#1).

To create planning certainty, the ruling chamber plans to enable a long-term booking horizon for yearly capacity. As is the case in the natural gas market, it would be possible to set 15 years as the maximum booking horizon. The current year would not be taken into account, so the total maximum booking horizon would be the current year plus the following 15 years.

In addition to the yearly product, the ruling chamber also believes that a daily capacity product makes sense, as it would likely lend itself well to meeting the market's need for flexibility. The day-ahead product should reflect the calendar day. Here, as well, the ruling chamber does not believe it makes sense or is necessary to use the natural gas market's gas day (6am on one day to 6am the following day).

Regardless of the design of any multipliers for non-yearly capacity products in the context of upcoming price determinations, the ruling chamber believes it may make sense to specify a minimum number of booking days per calendar year for day-ahead products. The ruling chamber is considering the requirement that whenever day-ahead capacity is booked, it must be booked on at least 30 days within a calendar year. If not, the hydrogen network operator must still be paid 30 days, with the payment being based on the highest capacity booking. While such a requirement would limit the flexibility of shippers, it could also balance out the main network costs that are incurred through keeping capacity available.

Since the ruling chamber considers the demand for day-ahead capacity to be rather short-term, it does not consider a long-term booking horizon for day-ahead capacity products to be reasonable. The ruling chamber is therefore considering stipulating that daily bookings, in particular, can be booked for the current month and the following month.

In addition to the yearly and day-ahead capacity products, the ruling chamber also considers it conceivable to introduce a monthly product. By offering monthly products, the ruling chamber can also envisage, unlike capacity marketing in the natural gas sector, longer-term marketing and thus

a longer-term booking horizon. This would mean that shippers could also acquire monthly capacity beyond the current year. For example, the months of January, February and March 2027 could be booked in 2025. It is the ruling chamber's opinion that such an option may provide potential suppliers with additional security in terms of capacity availability without the need for an annual booking. However, the ruling chamber is also aware that longer-term allocation of monthly capacity goes hand-in-hand with possible greater complexity and could require, for example, an additional reserve quota (see chapter on reserve quota).

2.3. Reserve quota

The ruling chamber considers it reasonable to introduce a reserve quota if shorter-term products are to be offered in addition to the yearly product.

As is the case in the natural gas market, when selling short-term products the ruling chamber sees the need to withhold some of the available capacity at cross-border interconnection points, at entry points of H2 terminals as well as at entry and exit points to and from storage facilities for short-term allocation. With regard to the level of the reserve quota, the ruling chamber considers various options conceivable. One option, as in the natural gas market, would be to set the level of the reserve quota for short-term products to withhold between 10% and 20% of the capacity for a short-term booking of day-ahead and/or monthly capacity.

In addition to the reserve quota, which ensures that the use of short-term products is not blocked by the long-term marketing of yearly capacity, it may make sense to have a second reserve quota. The ruling chamber is considering setting an additional reserve quota for the marketing of yearly products, particularly where there is a longer-term marketing option for monthly products. Such a reserve quota could ensure that the longer-term booking horizon of monthly capacity does not lead to a high level of booking of individual months that prevents or severely limits the booking of yearly capacity. With regard to the level of the reserve quota, one option would be that the amount of this second reserve quota inversely reflects the first reserve quota and thus withholds between 80% and 90% of the total capacity for the booking of yearly capacity.

2.4. Capacity marketing platform

The ruling chamber believes transport capacity should be booked using a single booking platform. For this reason the ruling chamber is considering requiring hydrogen network operators (taking into account a deadline for IT implementation) to implement a common platform for booking capacity. The single platform would also be used for marketing capacity in different clusters. The ruling chamber believes the need to implement a single marketing platform must also be seen independently from the chosen allocation mechanism.

2.5. Allocation mechanism

Transport capacity should be allocated using a non-discriminatory and transparent procedure. It is the view of the ruling chamber that allocation by means of auctions and the first come, first served (FCFS) principle would be possible in the ramp-up phase. The ruling chamber takes the view that the FCFS procedure is suitable as an allocation mechanism, in particular until signs of a capacity shortage appear. In scarcity situations the ruling chamber considers the auction to be the efficient allocation mechanism and by all means would be the allocation mechanism to switch to. In such a situation the auction would have to be introduced as an allocation mechanism in the entire entry-exit system or in all clusters, even if the scarcity only relates to individual points. To avoid having to go through any conversion process that becomes necessary, the ruling chamber also views allocation by auction as possible from the outset.

The ruling chamber believes that hydrogen network operators should also be given the opportunity to apply auctions to booking points where capacity is normally only requested by one customer (exit points to final customers as well as entry points from production facilities such as electrolysers). This could make sense in a situation where the overall technical capacity available in a competition zone does not meet the demand of the individual network points in the competition zone.

When allocating capacity to cross-border interconnection points the ruling chamber considers a bundled allocation to be practical in the long term. This has worked well in the natural gas market and may facilitate the cross-border transport of hydrogen and thus the connection of the German market to various hydrogen sources.

2.6. Nomination of capacity

The ruling chamber considers it reasonable to introduce a nomination system for the use of allocated capacity at cross-border interconnection points, at entry points of H2 terminals, at entry and exit points to and from storage facilities and at entry points from production facilities (eg electrolysers). A nomination system should significantly facilitate the allocation of quantities whenever there are several shippers using capacity at one point. Re-nominations, ie changing the quantities originally requested via the nominations, should also be possible. The lead times to be determined should make it possible to meet the requirements of the balancing system.

In addition, for network control the ruling chamber may also be open to suitable quantity planning/requests at exit points to final customers.

2.7. Handling existing contracts

The ruling chamber assumes that the hydrogen network operators will have concluded capacity agreements or will at least offer capacity before the determination's period of validity begins. The

agreements would not yet be based on the rules of the determination and key components could deviate from the determination. However, the ruling chamber believes a uniform contractual framework for access to hydrogen networks is conducive both to the operational management of network access and to transparency for potential market participants and thus to the hydrogen ramp-up overall.

For this reason the ruling chamber is considering imposing a requirement on hydrogen network operators to adjust existing contracts that were concluded before the start of the determination's period of validity. The requirement may be linked to an appropriate implementation period of 12 months, for example. This would ensure that all contracts comply with the same regulatory requirements from the date of implementation.

C. Next steps

The determination proceedings that have been initiated are conducted separately from each other under procedural law but in parallel as much as possible with regard to both time and process.

In addition to the first consultation that begins with the notification of proceedings (see D below), the ruling chamber plans to conduct a second consultation later in the course of the proceedings. The purpose of the second consultation is to give market participants the opportunity to comment on the draft operative parts in the individual determination proceedings. The final determination decisions should be applied while taking into account the implementation deadlines. Determination proceedings with the aim of creating reference offers will not take place until after the completion of these determination proceedings.

D. First consultation

The hydrogen network operators and all market participants are hereby invited to comment in detail on the determination subject matter of the determination and on the ruling chamber's deliberations. All consultation participants are asked to submit their comments no later than

30 August 2024

to the ruling chamber. Please submit responses separately if commenting on more than one determination proceeding.

Please use the form provided in Word format on the ruling chamber website to submit comments.

Comments are to be submitted

- for procedure BK7-24-01-014 to
  Wasserstoff.Bilanzierung@BNetzA.de

- for procedure BK7-24-01-015 to

  Wasserstoff.Kapazitaeten@BNetzA.de

or by post (be sure to include the reference number) to the following address:

Bundesnetzagentur
Ruling Chamber 7
Postfach 8001
53105 Bonn

The responses will be published on the Bundesnetzagentur's website.

In this connection, attention is drawn to the fact that consultation participants are required to indicate, upon submission, those parts of their responses that contain trade or business secrets or personal data (eg names, signatures, telephone numbers, email addresses containing names). Any trade and business secrets relating to third parties that are disclosed to Ruling Chamber 7 in the responses must also be indicated. If trade and business secrets are not indicated as such, Ruling Chamber 7 may assume, as provided for by section 71 sentence 3 EnWG, that consent is given to the information being made available to third parties. Attention is specifically drawn to the fact that if a response contains personal data, it is the responsibility of the participant submitting the response to obtain the data subject's consent to the personal data being published, or to redact the personal data in the version to be published as described below.

Further information about the protection of trade and business secrets is set out in the notice relating to Ruling Chamber 6 and 7 proceedings at

www.bundesnetzagentur.de/geheimnisschutz-enwg.

The Bundesnetzagentur has also published a notice "Scope and range of permissible redaction in the publication of the Bundesnetzagentur's decisions for the electricity and gas sectors" dated 22 March 2019, which is also available at the above internet address.

The reasons why information is being claimed as trade and business secrets must be specified in the confidential information template, together with the page, line and wording of the blacked-out information. The template is also available on the Bundesnetzagentur's website at:

www.bundesnetzagentur.de/geheimnisschutz-enwg.

It is not sufficient to state that there is a wish to keep the information confidential or that publication of the information would affect a company's economic position. Rather, further details must be provided on why, from the consultation participant's perspective, there is an interest in maintaining confidentiality. In particular, an explanation must be provided of why publication of

the information is expected to entail competitive and/or economic disadvantages. The explanation must be sufficiently detailed to objectively demonstrate the interest in maintaining confidentiality. The template must be sent to Ruling Chamber 7 in an electronic format suitable for processing with standard software.

If the responses submitted contain any confidential information as described above, participants must, without delay, also submit two copies of a redacted version (with the confidential information blacked out) that they consider can be made public without disclosing trade and business secrets or personal data. The methods used to redact the confidential information must be suitable to guarantee that the information is rendered unreadable and non-retrievable. It is not sufficient to mark the confidential information in a different colour in an electronic version, nor is it permitted to leave a blank space in place of the information to be redacted.