Bundesnetzagentur

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Cost cascading: points of orientation

5 March 2026

AgNes determination proceedings

1. Introduction

The Bundesnetzagentur's Grand Ruling Chamber for Energy opened proceedings for the determination on the general electricity network tariff system (AgNes) for the period once the Electricity Network Tariffs Ordinance (StromNEV) has ceased to be in effect in accordance with section 29(1) in conjunction with sections 21 and 21a of the Energy Industry Act (EnWG) on 12 May 2025 [GBK-25-01-1#3].

Upon opening the proceedings, the Bundesnetzagentur published a discussion paper that presented the changes in the framework conditions brought about by the energy transition, a target vision, an analysis of the current situation, a comparison between the current situation and the target vision, and initial adaptation options based on this. The responses to the subsequent consultation on the paper and the contributions in the industry workshop held at the beginning of June 2025 helped to set out the various players' target visions and ideas and point to the advantages and disadvantages of different adaptation options. The Bundesnetzagentur published the responses to the consultation.

The Bundesnetzagentur is now condensing the options to be considered, taking into account the findings from the consultation and the workshop and in close dialogue with the experts commissioned to produce reports for the AgNes process. This status report contains specific proposals that indicate the direction in which the Ruling Chamber is tending at this stage. These proposals will now be discussed in detail and examined for their practicability in expert workshops.

The Bundesnetzagentur has also published a report that analyses the different approaches in Europe to designing network tariffs.

This paper presents the latest considerations on **cost cascading** and about a possible removal of transformation levels relevant to settlement.

Cost cascading refers to the process of passing on the costs of the different network levels within one network operator or between upstream and downstream network operators. It is an offsetting process in the sphere of the network operators, not a network tariff invoiced “externally”. Nevertheless, cost cascading does have a strong influence on the network tariffs of the actual network users since the higher the proportion of network costs that may or must be cascaded to a downstream network operator or to the downstream network level of the same network operator (and thus their customers), the lower the proportion of network costs that has to be borne by the network customers directly connected to the upstream network level or the upstream network operator.

Papers on the proposals for the basic network financing model, the (dynamic) network tariffs with an incentive function, the network tariffs for storage facilities and the network tariffs for producers have already been published. Providing clarity on the current situation here will help to structure the subsequent discussion, especially at the expert workshops.

2. Current status of discussions on cost cascading

Cost cascading reform

- The current system of cost cascading essentially treats downstream network operators as final consumers that are connected to a network. This basic approach is also used for dealing with the network levels of a network operator that operates multiple voltage levels.

- In the view of the Bundesnetzagentur, the current system of vertical cost cascading leads to large regional differences in the participation of consumers of downstream distribution networks in the costs of the upstream networks. In networks with a high proportion of distributed generation, there is comparatively little electricity withdrawn from the upstream network levels. Yet distributed generation leads to practically no cost savings in the upstream networks. On the contrary, it actually tends to cause significant additional costs as more electricity flows back into upstream networks.

- The disproportionately small share of the cost burden also leads to tariff anomalies. In particular, the introduction of the renewable energy compensation mechanism (BK8-24-001-A) can lead to a situation in which the nationwide distribution of network costs caused by renewable energy can make a downstream level cheaper than an upstream one, reinforcing tariff anomalies. A situation in which the use of more infrastructure is cheaper than the use of less infrastructure is difficult to reconcile with the principle of cost reflexivity. Unwanted incentives – for example in the choice of connection network level – also arise.

- In general terms, the current cascading mechanism could be described as an incentive for the financial optimisation of the downstream network levels over the transregional structures of the upstream network level. This does not seem right as the energy system is still securely operated starting from the transmission network, which bears the responsibility especially for balancing energy, frequency control and restoration. All upstream networks have the task of ensuring the secure supply of all consumers, increasingly with zero-carbon energy – the energy transition is causing the average transport distance from the point of generation to the customer to rise. The addition of many small and very small generation installations does nothing to change this situation.

- In the opinion of the Bundesnetzagentur, therefore, there is a need to reform the vertical cost cascading. Various options have been examined, including
    - adjusting the cost cascading to the proposed new network tariff structure;
    - introducing bidirectional cost cascading as repeatedly proposed in the past; and
    - decoupling the cost cascading from the network tariff structure.

- The Bundesnetzagentur is proposing to decouple the cost cascading from the network tariff structure by cascading according to the final consumption withdrawn from the network (“withdrawn final consumption”). Arguments in favour of this form of cost cascading are that
    - it can be seen as cost-reflective in light of the network operators’ task of supplying electricity. It is not, in the first place, the network operators that decide on the size of the network but rather the withdrawals made from it by network users. Therefore, as a distribution and safeguarding mechanism, the amount of energy withdrawn by network users is a justifiable basis for allocating the upstream network costs;
    - it is based on a clearly measurable variable that is independent of the development of distributed generation and thus allows for the allocation of costs in a way that is much more stable over time;
    - it can achieve an equal regional distribution of costs of upstream networks through a regionally similar, specific financing contribution (cents per kilowatt hour, ct/kWh);
    - tariff anomalies can be avoided, as can inappropriate design leeway and incentives.
- A further option under discussion could have been decoupling the cost cascading from the network tariff structure by cascading according to the connected capacity.
    - However, an objection to this solution is the fact that it is not really possible to firmly calculate the connected capacity at this time and securely identifying it would mean an avoidable additional burden of time and costs.
    - In addition, the calculation of the connection capacity between network operators is characterised by historical allocations and a high level of mixing (pooling). Reserves for an (N-1)-secure supply also mean that the network capacity between network levels cannot always be clearly calculated.

    - Moreover, coupling to the connection capacity would mean that a much higher proportion of the costs to be shared between consumers and producers would have to be shifted onto the producers, especially in networks with a large connected generating capacity.

- The cost-cascading methodology proposed here, using the withdrawn final consumption, would be a useful complement to the renewable energy compensation mechanism in place since 2025 since, although this mechanism compensates for disadvantages in network areas with high additional costs caused by renewable energy, it does not affect the results of the reduced downward cascading of costs of upstream network and transformation levels. The evaluation of the renewable energy compensation mechanism in 2028 remains unaffected and would have to be carried out in light of the AgNes determination.

Reform of the transformation levels relevant to settlement

- Network tariffs are currently calculated and settled for seven network and transformation levels. Delimiting and pricing the transformation levels raises a number of questions.

- Generally, neither upstream nor downstream network operators can operate their networks independently of the transformation level, since that is where connections to the upstream level are made and withdrawals are bundled and switched on the busbars.

- Other countries distinguish between far fewer levels, usually four: extra-high, high, medium and low voltage. There, transformation costs are integrated into the next downstream network level. At least for the transmission network level, this raises the question of how the requirement of the special unbundling regulations can be reflected. These require each transmission system operator (TSO) to be able to connect independently to the transmission system which, up to now, has included the extra-high to high-voltage transformation level. This is part of the transmission network.

- One possible means of simplifying the cascading system would be to reduce the number of network levels to four, doing away with separate transformation levels. This could reduce the complexity of the system, lessen unwanted incentives in the choice of location and network connection points (with effects on necessary connection lines) and increase the stability of network tariffs.

- The transformation costs could be allocated to the downstream network levels because the supply occurs there at the same voltage.

- At the same time, doing away with transformation levels leads to numerous questions of ownership. Depending on how these are answered, there are then questions regarding cost delimitations and compensation payments.

- Further, there are follow-up questions if network customers have made investments in longer connection lines for access to the transformation levels.

- These certainly complex issues to be addressed mean that, while the merging of network levels should be examined and discussed now, it can probably not be put into place by 1 January 2029 in the first phase of the AgNes determination.

3. Cost cascading between network and transformation levels

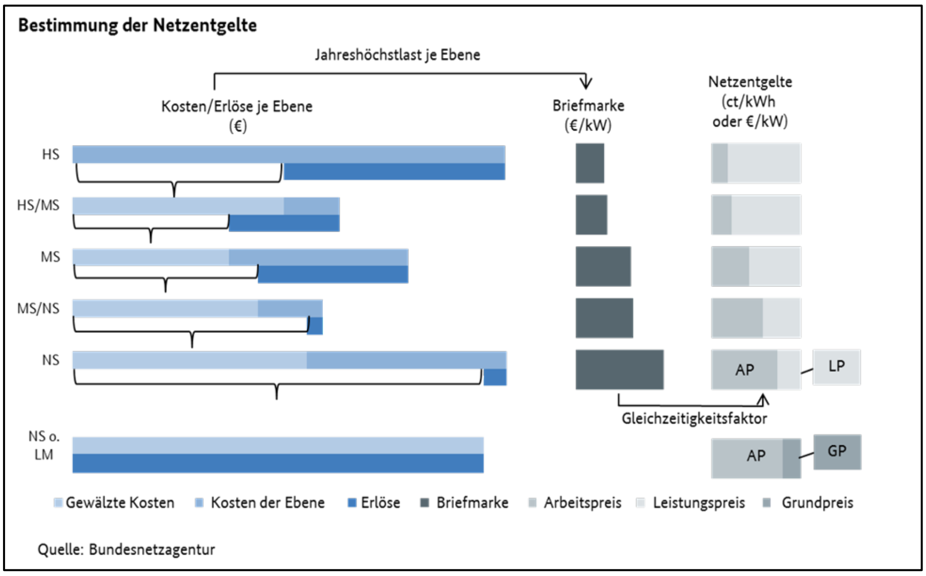
Up to now, the debate surrounding a greater participation in the financing of network costs has focused primarily on prosumers and industrial enterprises, which reduce their network tariff payments through self-consumption, and on the user groups that have hitherto been directly exempt from network tariffs, such as storage facilities and producers. However, a similar effect to the optimisation of network tariffs has been taking place at the level of the distribution networks via the mechanism of vertical cost cascading.

In distribution networks with a high proportion of distributed generation (mainly renewable energy installations), the electricity consumed from the upstream transmission or distribution network level is significantly reduced, both with regard to the energy withdrawn and the annual peak load. The latter depends on the correlation between the generation and consumption profile. In the cost cascading, the reduced withdrawal from the upstream level means that networks with a high level of generation penetration contribute to a disproportionately low extent to the costs of upstream networks, even though the costs of these networks are not significantly reduced. This restricts the cost reflexivity in the network tariff system. Network areas with a high level of penetration of distributed generation still access the transmission network to fulfil their supply task completely. Moreover, network areas with a low extent of distributed generation profit equally from the ancillary services provided by TSOs but contribute less and less to covering these costs. This not only leads to a less appropriate distribution of costs among network users but also increases the likelihood of the phenomenon known in the industry as “tariff anomalies”, in which there is a lower level of network tariffs in downstream network levels than in upstream ones in some network areas. Such anomalies then lead to unwanted incentives for network connection requests, which can give rise to an economically inefficient need for expansion in the lower network levels in addition to the already identified expansion requirement (especially in the higher network levels). In the view of the Bundesnetzagentur, these effects justify the need to change the cost cascading system.

The cost cascading mechanism in the existing network tariff system

In the current network tariff system, the costs of network and transformation levels are passed on proportionately according to a top-down principle, starting with the extra-high voltage level, to final consumers and the downstream network or transformation level. This vertical cost cascading is carried out in such a way that operators of downstream networks essentially pay the same tariff components to the operator of the upstream network as the final consumers directly connected to it (ie the power-based price for up to/more than 2,500 hours of usage and corresponding energy-based prices). For downstream network and transformation levels within the network of a network operator, these tariff payments do not happen explicitly but are taken into account in the internal cost allocation so they have the same effect as at the border between an upstream and a downstream network operator. The current tariff system contains a lot of special arrangements between upstream and downstream network operators, such as tariffs for operating resources used on a singular basis pursuant to section 19(3) StromNEV and pooling pursuant to section 17(2a) StromNEV and corresponding combinations. However, the Bundesnetzagentur's decision of 16 September 2025 (BK8-25-003-A) means that tariffs for operating resources used on a singular basis are no longer applied for network operators as of 1 January 2026.

The chart below illustrates the current top-down cascading principle using the example of a distribution system operator (DSO) with a network spanning the high to low-voltage levels. First the specific annual costs (known as the postage stamp) of the relevant level are calculated by dividing the costs of the highest network or transformation level operated by the network operator (medium blue cost bar in the graphic) by the simultaneous annual peak load of this network or transformation level. The costs of this level also include the tariff payments of the network operator in question to the operator of the network or transformation level directly above it (upstream network costs).



The level-specific postage stamp is then transferred by the relevant network operator to the corresponding energy-based and power-based prices. In the next step, it is calculated which revenues are to be expected on the basis of these tariffs and the forecast consumption volumes and power of the final consumers directly connected to the level and of downstream networks of other network operators. These revenues (dark blue bar for each level) are subtracted from the total costs per level. The remaining costs of the level are rolled over to the downstream network or transformation level. This sum is represented in the graphic by the light blue cost bar resulting from the curved bracket.

Together, the original costs of the level (medium blue) and the costs rolled over from the upstream network or transformation level (light blue) constitute the costs of the downstream network or transformation level. This process is repeated for each network and transformation level. At the lowest level (low voltage), it is not possible to pass on costs to downstream levels, so final consumers are divided into those with and without interval metering as different tariff structures are calculated for the two groups (energy-based and power-based price/energy-based price and standing charge).

The effect described above, that the regionally uneven addition of distributed generating installations leads to a distribution of costs from the transmission network that is not cost-reflective, is primarily due to the fact that the cost cascading – whether between upstream and downstream network operators or between levels operated by the same network operator – is based on the same tariff components that are also paid by final consumers. These tariff components are based on the actual, metered flows of electricity between the network and transformation levels. These flows, and thus also the costs passed on to a lower level, are reduced when generating installations are added to the lower level.

The renewable energy compensation mechanism established in 2025 helps to make the distribution of network costs caused by renewable energy more appropriate by sharing the additional costs of the integration of renewable energy evenly across the country especially for regions with an unusually high proportion of renewable energy and a comparatively low load. This mechanism only considers a network level's own costs and is calculated without upstream network costs. It therefore does nothing to change the fact that distribution network areas with a high level of generation penetration contribute to a disproportionately low extent to the costs of upstream network or transformation levels. This, in conjunction with the highly generalised nature of the mechanism, tends to relieve areas with a lot of distributed generation to a greater extent than is cost-reflective.

These and other features and consequences of the current vertical cost cascading system started a discussion about various options for change that has been ongoing for many years now.

The possible adjustments to the cost cascading system discussed below have arisen partly from considerations about the appropriateness of the cost allocation it brings about and partly from the options discussed in the AgNes process for the reform of the network tariff structure.

Bidirectional cost cascading

In the current network tariff system, inverted power flows are not taken into consideration in the cost allocation between network operators (or between network levels within a network area). Given there are now considerable inverted power flows in many network areas, some are arguing that network costs are not being passed on in a cost-reflective manner (any more) because the top-down cost cascading does not fully reflect the actual flows of electricity. Bidirectional cost cascading, by contrast, could take account of both downward and upward flows, allocating costs to network users in a more cost-reflective manner, it is maintained. This kind of cost cascading can be applied both within a network area and between network areas. There are various possibilities for its specific design, including:

a) bidirectional cost cascading in which the reverse cascading precedes the actual calculation of the tariffs; for example, the costs passed on to the upstream network level could be calculated before the pricing via the relationship between inverted power flows to the upstream network level and withdrawal by final consumers or withdrawal by the downstream network levels;[1]

b) bidirectional cost cascading in which inverted power flows are taken into account in the currently applicable tariff calculation so that inverted power flows are treated like downward flows.

The Ruling Chamber does not agree with the starting point of the argument in favour of bidirectional cost cascading – that there can only be a cost-reflective cost allocation if costs are distributed in line with the actual flows of electricity in the network – in this form. Network costs are not primarily caused by the direction of flows but by the need to keep transport capacity available and the structural demands on networks. It is not generally possible to assign the cause of network costs clearly to individual network users or user groups. The only exceptions to this are the (approximately) directly allocable marginal network costs, which, in the Bundesnetzagentur's proposal, are used as a basis for the design of the tariff components with an incentive function (eg congestion management costs). The question of which form of cost cascading is to be regarded as cost-reflective therefore also depends on other fundamental decisions such as the type and scope of participation of producers and storage facilities in the bearing of network costs. In a system in which the network costs are borne fully by consumers, as they are today, or in which producers and storage facilities participate but only to a limited extent compared to consumers, as is under discussion, a top-down vertical cost cascading system remains appropriate – not a bidirectional one. This is particularly true if combined with a tool like the renewable energy compensation mechanism. This mechanism ensures that the additional costs caused by renewable generation in individual network areas are borne by consumers in the whole country. By adjusting the cost cascading between upstream and downstream network operators, the aim is now additionally to ensure that the costs incurred for the electricity network as an overall system are also distributed appropriately. The Ruling Chamber considers that the tried and tested concept of top-down cost cascading is the best way to guarantee this.

Aside from this conceptual assessment, it should be noted that the methodologies hitherto proposed, and in some cases already examined, for bidirectional cost cascading are highly complex in their design and implementation and would entail a great deal of administrative effort. Moreover, the examinations undertaken so far have shown that bidirectional cost cascading can lead to questionable cost allocation, such as an accumulation of the costs to be borne in the high-voltage level in network areas with a high proportion of generation. The above-mentioned problem of increasing tariff anomalies would probably get even worse as a result. There are also no international empirical data from the application of bidirectional cost cascading. An ACER survey of 28

[1] Consentec/Fraunhofer presented this methodology in the network tariff report for the economics ministry (then BMWi) in 2018.

European countries plus Germany shows that top-down cost cascading is still the standard form.[2]

The Bundesnetzagentur therefore does not view bidirectional cost cascading as an option that can be implemented in the near future or as an appropriate alternative to the top-down approach in conjunction with the renewable energy compensation mechanism. Various approaches to the implementation of top-down cost cascading will be discussed below.

Capacity-based network tariff structure for cost cascading
In its points of orientation on the future structure of the standard network tariffs, the Bundesnetzagentur proposed replacing the current power-based tariff with a capacity-based tariff for which the individual network user would be free to choose their capacity, possibly within pre-defined limits. This proposal involves doing away with the current, flexibility-inhibiting power-based prices and the currently used model of the concurrency function and also dividing the energy-based tariff into shares for electricity consumption below and above the chosen capacity. Under the proposed new capacity-based system, there would be a higher energy-based price for consumption volumes above the selected capacity than for those below it.

It seems logical to base the vertical cost cascading, as well, on the tariff components imposed on final consumers. Network operators could then order capacity for each network or transformation level from the operator of the upstream level. For network operators to order from themselves to represent the internal cascading would make little sense, however. Within a network, this ordering would have to be replaced by objective criteria. The capacity ordered from the upstream network operator would only relate to top-down consumption. For inverted power flows, on the other hand, it could be considered whether to add an additional component to the cost cascading if it is decided in the course of the AgNes process to introduce network tariffs (especially those with a financing function) for producers and storage facilities.

Transferring the capacity-based/energy-based price system to the vertical cost cascading in this manner could probably be achieved with a reasonable amount of effort but would have various questionable consequences. For example, unlike final consumers, network operators would not have an incentive in terms of their income to order the economically optimum amount of capacity since upstream network costs are logically treated as permanently non-controllable under the incentive regulation system. At the same time, the need for operators to order capacity from themselves for the transitions between their own operated network and transformation levels could lead to leeway for objectively unjustified redistributions between the levels.

More important for the assessment of this concept is, however, that it would not systematically combat the above-mentioned distortions in cost allocation caused by

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[2] https://www.acer.europa.eu/sites/default/files/documents/Reports/2025-ACER-Electricity-Network-Tariff-Practices.pdf

regional differences in distributed generation. Even with a combined capacity-based/energy-based price system, the allocation of costs would ultimately be based on the flows of electricity between the network and transformation levels since the economically optimum choice of ordered capacity depends on the expected time profile of the electricity consumption.

Moreover, legal concerns related to unbundling arise if a system is established in which a network operator chooses its capacity freely and, in order to make this choice rational, then has to have the possibility to ensure that it keeps to its ordered capacity limit by influencing the energy consumed.

For these reasons and in light of the problems described, the Bundesnetzagentur does not consider this concept a sensible solution.

Decoupling the cost cascading from the structure of the standard network tariffs

The desired effect of spreading the costs of the transmission network across all network areas in line with the actual use of the network can be achieved by decoupling the cost cascading from the structure of the standard network tariffs. This decoupling would lead to network operators not paying each other network tariffs (or applying them on an imputed basis for their own levels). Rather, the amounts to be cascaded would be calculated on the basis of allocation principles to be determined in an independent step and allocated to the respective downstream network operators/levels as upstream network costs to be covered. This would leave open possibilities for other allocation principles more appropriate to this usage behaviour to be applied for the cost cascading between network operators or levels. Network operators, unlike final consumers, can hardly influence their own usage behaviour. The usage behaviour of network operators is determined by the usage behaviour of final consumers and producers. Network operators only "consume" very small amounts of electricity themselves (such as loss energy or self-consumption). Incentives affecting network usage behaviour would therefore be largely useless. In addition, upstream network costs are costs not subject to efficiency benchmarking and can be adjusted to their actual level each year by network operators as a cost item. For network operators, this cost item is continuous and has no effect on net income and therefore does not set any behavioural incentives either. From the unbundling perspective, this system is also absolutely right because network operators must be strictly neutral with regard to the behaviour of upstream and downstream stages of the value chain.

Up to now, Germany has synchronised its cost cascading and tariff structure but, as the situation in other countries shows, this is not mandatory. In Austria, for example, the transmission network costs are divided up using allocation keys that do not match the structure of the transmission network tariffs. There are other examples of regulatory systems that separate the cost cascading from the standard tariff structure. There is no direct cascading of costs between TSOs and DSOs in Denmark, where a classification of customer groups is used to impose a tariff for the use of the transmission network for withdrawal at all levels. The same goes for customers connected to the distribution network in Spain. There is no cost cascading between the TSO and DSOs in the UK either, but a classification of customers is also carried out in order to assign the costs of the transmission network.[3]

This decoupling of cost cascading from the structure of the standard network tariffs that presents itself here could be approached in a number of ways:

- **cost cascading by contractual network connection capacity**
  For various reasons, the Bundesnetzagentur considers that tariffs in the future network tariff structure that are based fully or largely on network connection capacity are not suitable. These tariffs would, among other things, cause allocation problems between connection owners and network users, place a disproportionate burden on network users with short durations of use and potentially trigger unwanted incentives regarding the use of flexibility by network users. These disadvantages would not arise from the use of network connection capacity as an allocation key for the cost cascading, so this can still be considered.

- **cost cascading by technical network connection capacity**
  The Bundesnetzagentur considers that technical connection properties are not suitable for the formation of network tariffs either. However, they can generally be taken into consideration for cost cascading.

When using capacity variables like the network connection capacity or technical capacity, however, consumers in network areas where the necessary capacity is affected by inverted power flows (originating from feed-in of generating installations and/or storage facilities) would contribute to a disproportionate extent to the costs. This is the case because in areas with significant inverted power flows, the capacity size is not defined by the withdrawal, but by the inverted power flows. The distribution of costs of upstream levels would not, therefore, be more cost-reflective. Rather, and contrary to the aim of the renewable energy compensation mechanism, areas with a high penetration of renewable energy would have inappropriately high shares of costs from upstream levels assigned to them because of the inverted power flows caused by producers. In this case, it would be necessary to introduce a very high injection tariff with a financing function so as to reflect the costs caused by producers as well and not to disproportionately burden consumers. The discussion around the pricing of producers is the subject of the points of orientation on injection tariffs.

In that paper, the Bundesnetzagentur took a very cautious position with regard to the level of injection tariffs. Initial responses from the sector show that even this careful, restrained introduction is still seen as a challenge.

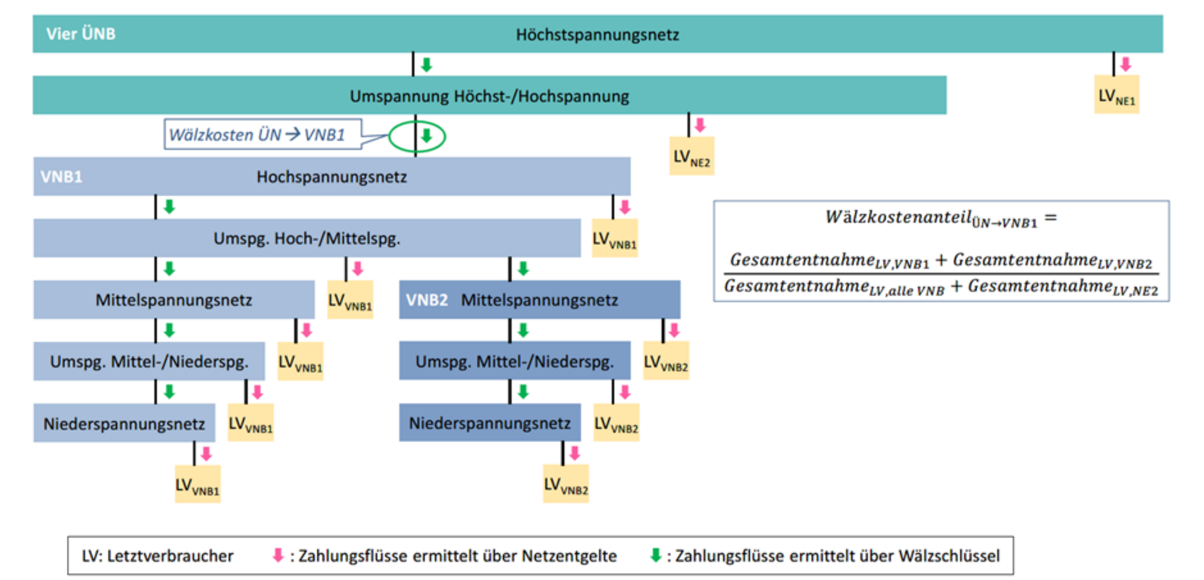
Moreover, to use the network connection capacity as an allocation criterion, it would be necessary to know the relevant reference value for levels within the sphere of a network operator as well. A uniform definition of technical connection capacity would also be

[3] https://bnetza.de/DE/Beschlusskammern/1_GZ/GBK-GZ/2025/GBK-25-01-1x3_AgNes/Downloads/Gutachten.pdf

needed, for example with regard to reserve equipment and the transmission capacity of network levels.

- **cost cascading by withdrawn final consumption of downstream final consumers**

  While the settlement of network tariffs is based on metered volumes, other criteria may be used for cost cascading. In particular, the withdrawn final consumption is a possible criterion. The withdrawn final consumption describes the total of all final consumer withdrawals from the relevant and all downstream network levels through to the low-voltage level. It does not matter whether the electricity is withdrawn from the operator's own network or the network of downstream network operators. The graphic below shows the calculation of the cascading key between the transmission network and a downstream distribution network.



Quelle: Consentec

Conversely, there are also designs of tariff components that are not suitable allocation keys for vertical cost cascading. These include dynamic network tariffs, as these are intended to set incentives that would not be effective for network operators because network operators do not generally have their own flexibility. They do not substantially actively influence their own consumption nor the consumption of their connection owners.

Of the criteria mentioned above and other possible criteria for a vertical cost cascading system that is decoupled from the tariff structure, the Bundesnetzagentur currently considers the withdrawn final consumption in particular to be a promising approach. There are various reasons for this:

- The withdrawn final consumption should generally be clearly definable, although it may be necessary in some cases to delimit subareas of downstream networks and allocate them accordingly.

- The withdrawn final consumption is independent of the scope of distributed generation and should thus provide a more balanced cost allocation. The nearly identical specific financing contribution (in ct/kWh) would mean that similar consumers, such as households anywhere in the country with a certain annual electricity consumption, would make about the same contribution in absolute terms to the financing of the transmission network.

- This approach would likely also largely exclude the possibility of tariff anomalies because the allocation of costs from upstream networks would no longer be influenced by the regionally different levels of distributed generation but would be based on actual final consumption, which tends to increase at the lower voltage levels.

- In comparison to criteria that (also) include the metered peak load in the cost cascading, cascading on the basis of final consumption volumes withdrawn from the network may be expected to have a very low sensitivity to rare load peaks and thus a generally high level of stability in the cost allocation.

- If withdrawn final consumption volumes are used, there is also no need for further considerations regarding pooling, which can have problematic effects if applied between upstream and downstream network levels. Under the current system, the question of whether and how pooling is allowed helps to decide which network concepts network operators implement for downstream levels. Thus decisions with cost relevance for the overall economy are made on the basis of concepts primarily causing redistributions. These potential unwanted incentives are avoided if the cost cascading is designed in such a way that pooling does not play a role. (The treatment of pooling for final consumers will be discussed in the points of orientation for industrial network tariffs.)

It may seem surprising to introduce cascading between network operators according to the withdrawn final consumption while the basic model of the newly proposed network tariff system envisages a capacity-based tariff for network users (based on a capacity that can be chosen by the user). In response to this, the following points should be noted.

For the assessment of the individual network users and their relative cost shares, their cost allocation can be related well to the network capacity to be kept available and the resulting maximum transport capacity . At the level of the network operators and for their relations to each other, on the other hand, costs are also driven strongly by structural properties such as the distribution of network connection points across the area or the resilience of structures connecting the upstream network or the network levels to each other. To this extent, using capacity as the criterion is no better than using energy alone.

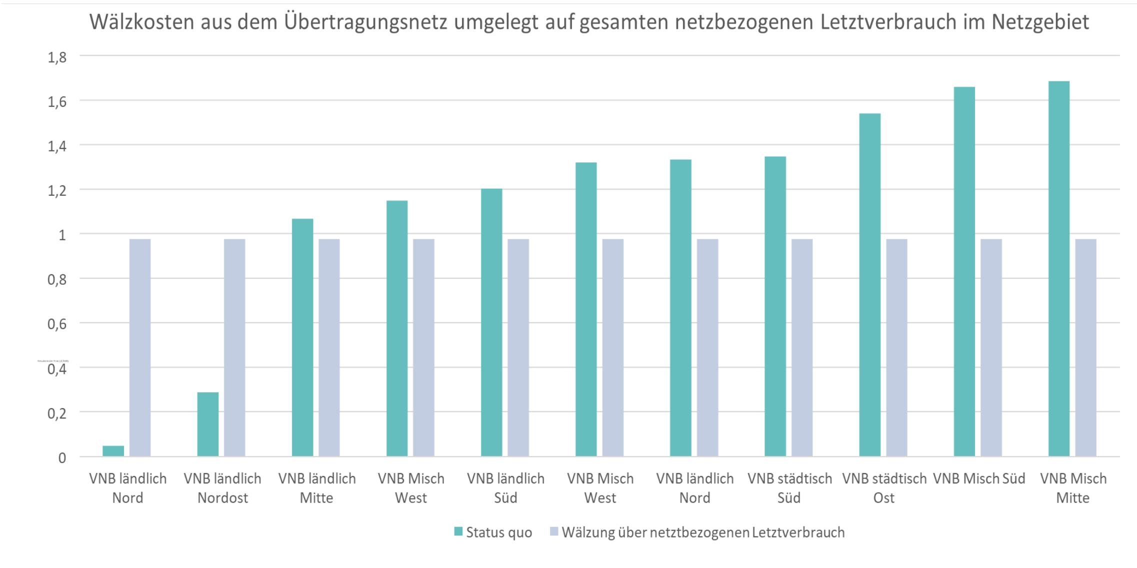
Moreover, cost cascading between network operators is about the proportion of network costs shared among downstream network levels and their customers, not about pricing individual final consumers. The task at hand is therefore also to allocate the costs of a functioning overall system appropriately. Merely asking what contribution the downstream network operator has made to causing the costs is not useful. In distributing the network costs among individual network areas or levels, the application of a pragmatic criterion such as energy seems preferable, in particular when looking at the above-mentioned advantages and simplifications (such as the more balanced cost allocation, lower risk of tariff anomalies, fewer definition/allocation problems, lower sensitivity) compared to the alternative allocation criteria.

The deviation from a cost cascading system strictly based on cost driver effects in the cost cascading by withdrawn final consumption may therefore be regarded as moderate and acceptable, especially as it avoids a complex definition and calculation of suitable power/capacity criteria.

In theory, it would also be possible to use several allocation criteria and combine them using a prescribed weighting. However, this would increase the effort and expense involved and would therefore have to be justified with relevant advantages in the cascading results. In any case, as explained above, the Bundesnetzagentur does not consider it absolutely necessary for the allocating of costs in the cost cascading to be the same as in the structure of the network tariff components. Rather, an appropriate distribution of the financing contributions that is as stable as possible should be achieved, based on a largely clear data basis that does not create inappropriate leeway for design or unwanted incentives.

To implement vertical cost cascading according to the withdrawn final consumption, downstream network operators – starting with the low-voltage level – would have to provide data on the electricity withdrawn by final consumers in their network levels. For consumers in the low-voltage network without interval metering, it would be necessary to turn to the accrual basis of accounting, which is already needed to calculate the network tariffs for the next calendar year, among other things. For special cases in which a network area on one network level is downstream to more than one network area at the upstream level, subareas would have to be suitably demarcated, as stated above.

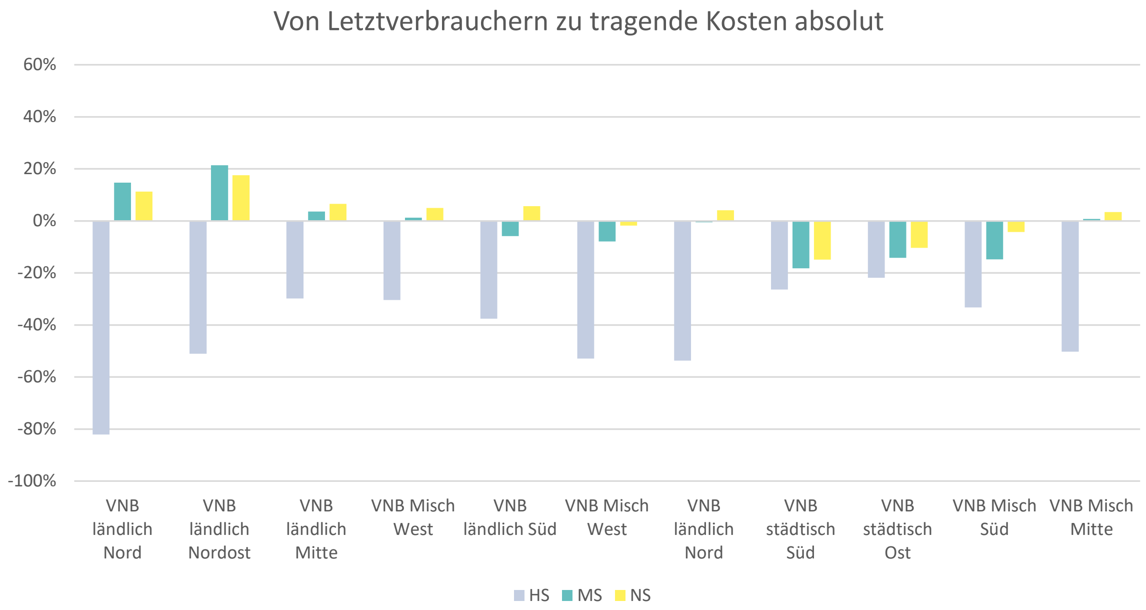
To roughly classify the effects of the proposed cost cascading system, the Bundesnetzagentur commissioned consultancy Consentec to carry out model-based calculations based on network tariff price lists for 2025. The chart below shows the level of costs cascaded down from the transmission network for 11 selected (larger) DSOs, each related to the withdrawn final consumption in the whole network area. For the status quo, there is an extremely wide range from well under 0.1 ct/kWh to more than 1.7 ct/kWh caused by the current cost cascading based on net flows of electricity (in line with today's network tariff components). With cost cascading by withdrawn final consumption, the financing contributions for the transmission network would, as expected, become uniform, here at a sum of just under 1 ct/kWh.



Source: Consentec

Using cost cascading by withdrawn final consumption across all network and transformation levels, the percentage changes from the status quo in the financing contributions to the network costs of all levels would occur as shown in the chart below. The considerable reduction across the board for the high-voltage level is due to the fact that the costs of this level, including the costs passed down from the transmission level, would be passed on to a greater extent to the lower distribution networks with cascading by withdrawn final consumption. At the lower levels, there would in some cases be additional burdens but, due to the larger group of final consumers, these would be much lower in percentage terms than the reductions in the high-voltage level. For the two DSOs at the far left of the chart, it is noticeable that there are large reductions for the high-voltage level although the cost cascading by withdrawn final consumption leads to a far higher passing on of transmission network costs in these network areas, as the chart above shows. This effect is more than compensated for by the stronger downwards cascading of costs from the high to the medium and low-voltage levels.

That these two DSOs would see additional burdens in the range of 10-20% in the lower network levels seems reasonable given that they are areas that benefit particularly strongly from the compensation mechanism for renewable energy costs. This shows that cost cascading by withdrawn final consumption would be a sensible complement to the compensation mechanism for renewable energy costs since the latter, although it does balance out disadvantages caused by additional costs of renewable energy, does nothing to change the (hard to justify) advantages caused by the reduced passing on of costs down from upstream network and transformation levels.



Source: Consentec

Questions

- Which model do you consider preferable?
- What requirements would have to be put in place for network operators to have all necessary information available to them, for example on withdrawn final consumption volumes, also from downstream network operators?
- Do you share the view of the Bundesnetzagentur that it is possible in most cases to clearly allocate the withdrawn final consumption in downstream levels to an upstream network area?
- How do you estimate the effort required to develop a clear methodology to demarcate withdrawn final consumption in cases with more than one upstream network operator? What could this demarcation methodology be?
- Would fixing the allocation keys (eg withdrawn final consumption) for longer than a year be a workable compromise to simplify the application of cost cascading in practice?
- What could pancaking (offsetting at the same voltage level) look like? Would it be possible to do without the offsetting of cascading amounts? Or are special arrangements still necessary?
- Is the technical network connection capacity in each of your own network levels uniformly defined and known? How are reserve transformers dealt with in the transformation levels and which other relevant configurations occur?

4. Transformation levels relevant to settlement

In accordance with Annex 2 StromNEV, the current network tariff system distinguishes between seven network and transformation levels, for each of which network tariffs are calculated separately. Final consumers are differentiated according to whether they are connected to a station of a network that contains substations to the next higher network level or to a station or connection point without such a connection to the upstream level.

This system creates an incentive for network users to select their location and set up a connection line (at their own expense) to get connected to a substation and thus benefit from the fact that network tariffs for a transformation level are usually lower than for the downstream network level. For network users, this incentive is offset by the added costs that may be associated with the location selection and setting up of the connection line.

From an economic point of view, this incentive is questionable, especially if it causes longer, more expensive connection lines to be built rather than using the nearest possible connection point even if it does not contain a substation to the upstream level.

Conversely, under the current system more tariff anomalies may arise, creating an incentive to seek a connection at a lower network level that may not be the best option technically. This, too, may lead to inefficient additional costs in the overall economy.

Option: do away with the transformation levels relevant to settlement
Network tariffs do not necessarily need to be divided into seven levels. Some other countries only distinguish between four levels – extra-high, high, medium and low voltage – and do not designate or apply separate tariffs for transformation levels. The Bundesnetzagentur takes the view that switching to this structure is worth considering as it would simplify the network tariff system and could combat the above-mentioned unwanted incentives related to the choice of connection network level and the construction of (unnecessarily long) connection lines.

That distinguishing between connections to network and transformation levels leads to a fairer distribution of costs is also essentially questionable. From the consumer's point of view, the proximity of a final consumer's location to the nearest substation arises coincidentally depending on the structural decisions made by the network operator.

A further advantage of reducing the number of levels relevant to settlement would arise if the vertical cost cascading were decoupled from the tariff structure, as discussed above, and the stability of the tariff level would then depend more on the size of the final consumer group for each network level. As there are often comparatively few consumers connected to the transformation levels, merging network and transformation levels could help to stabilise the amount of the tariffs.

As far as the specific allocation of costs is concerned, it would be possible to allocate the costs of the substations that are currently treated as independent cost categories to the costs of the respective downstream network level. It should be explored how much work would be involved in delimiting the costs and calculating any compensation payments with this kind of allocation due to the fact that the substations are often owned by the operator of the upstream network.

The reduction of settlement levels would constitute a major change to current practice. The consequence would initially be a shifting of numerous level boundaries that have often grown up for historical reasons. It would have to be carefully examined what kind of simplifications would result from this consolidation and whether these would outweigh the (unclear) possible disadvantages.

In this context, it must also be considered that busbars are particularly relevant to cost cascading. The busbar on the lower voltage side, for example, has so far been assigned to the transformation level and not to the downstream network level. If the network and transformation level were merged, a situation would arise in which the busbar was owned by one network operator but the downstream network operator connected to it would operate the same voltage level. This raises further questions related to the cost cascading between network operators and pricing of other network users at networks of the same voltage levels.

There is also a lack of clarity with respect to the busbar on the upper voltage side, where the current allocation to the network or transformation level is already questionable and a uniform practice across the whole of Germany cannot be clearly identified. Depending on where the busbar on the upper voltage side is located, more questions relating to customer allocations arise, especially in the transmission network. Unbundling rules require each TSO to be able to make a connection independently to the transmission system which, up to now, has included the extra-high to high-voltage transformation level.

Against this background, the merger of network levels should be examined and discussed at this stage of the proceedings. However, the Bundesnetzagentur does not consider it necessary to make arrangements concerning this at the same time as the initial AgNes determination for 1 January 2029. This can also be done later as required and following close examination.

If in future the number of levels differentiated in the network tariff system is reduced to four, it seems logical to assign the current users of the transformation levels to the users of the respective downstream network level as their supply occurs at the same voltage level. The levels of the network tariffs would then be harmonised to the technical network levels.

Questions

- Do you agree with the premise that doing away with the transformation levels would reduce unwanted incentives?

- Do you think that removing the transformation levels would lead to simplifications?

- What disadvantages do you see for existing customers?

- What ownership-related challenges or allocation problems do you think would have to be overcome if the network levels were reduced? What role would the busbars at the upper and lower voltage sides play?

- What other practical challenges do you see connected to a removal of the transformation levels relevant to settlement?

- Would you support arrangements to do away with the transformation levels relevant to settlement following on from the AgNes process (after 2029)?