

Flexibility Use at Distribution Level

Public Consultation of the Council of European Energy Regulators (CEER), 25.05.2017

Berlin, 24. May 2017. We greatly appreciate CEER's initiative to consult on the use of flexibility services by Distributions System Operators (DSOs). Below are our responses to the consultation. bne members are committed to a modern and flexible electricity market design allowing for truly competitive solutions.

Link to CEER consultation paper:
<https://www.ceer.eu/flexibility-use-at-distribution-level>

Consultation questions and bne responses

1. What are, in your opinion, the main drivers for flexibility use by DSOs going to be in the coming years?

Enabled by smart meters, digitization and growing volatile price signals on the wholesale markets, many network users (= end consumers) will increasingly respond to market price signals at the same time and with similar consumption patterns. This change in electricity demand on low and medium voltage levels and the related increase of simultaneous consumption can lead to an increase in distribution network reinforcement needs, especially if load substantially includes new types of consumers, such as electric vehicles (EVs), electric heating, battery storage or smart home automation systems for example. Thus far, low voltage planning rules and operational principles do not account for integrating EVs and battery storage combined with different levels of distributed generation (DG) such as solar and wind. Albeit most of the new generators (both in number and capacity) are being connected to the distribution networks, which already constitutes a challenge itself. Furthermore, the spot market price may send a signal (e.g., low commodity prices) in opposite direction to the current local weather and DG situation in specific regions (i.e., peaks in the local distribution networks) which may aggravate the problem.

2. Please provide any alternative definitions for flexibility that you think capture the focus of this paper.

In our understanding, flexibility on the distribution level means the **ability of market parties** (energy supplier, service provider or independent aggregator) **to manage the customer's consumption and generation** (including the customer's participation in wholesale and balancing markets) while following **reasonable restriction requirements** set by the DSO **at the point of interconnection with the electric grid**. Those restriction requirements are based on congestion forecasts and should be defined very narrowly. For example, in the German case we suggest to allow DSOs the restriction of the customer's network capacity usage to a maximum of 12 quarter hours per day.

The restriction requirement limits the possibility to use the electric grid compared to the technically possible capacity at the point of interconnection with the local distribution grid, thereby reducing the degree of freedom for using the electric grid by the customer (= end consumer).

An extensive description of bne's model and its conceptual details can be found here: [*"Decentralized Flexibility Market 2.0"*](#).

3. Should DSOs be encouraged to use flexibility to manage the distribution network where this is more efficient than reinforcing the network? Please provide an explanation.

Yes, DSOs should definitely be encouraged to use flexibility to solve capacity constraints on the local distribution network and to avoid or defer reinforcement, if this is the most efficient option. At the same time, a clear framework which is setting the conditions and boundaries on how the DSO is allowed to use flexibility is needed in order to keep market mechanisms functioning. There are two important pre-conditions that need to be fulfilled for DSOs to be able to use flexibility: First, DSOs need to be fully unbundled and second, DSOs need to have a solid network structure at their disposal, including sufficient knowledge about the status of their network. This includes enhanced monitoring and control techniques to manage the network and provide data of network quality on the distribution level.

4. Should all sources of flexibility be treated equally in the market and by system operators?

Absolutely yes, all sources of flexibility (demand, generation and storage) should be treated equally and under cost-efficient aspects, competing against each other in the market on equal terms. However, today equal treatment is not given, as different incentive schemes and other measures and exemptions granted under national regulation (for example with respect to network charges and other fees and levies) often are contradictory to this principle and prevent a level-playing field between all market participants.

5. Are there any uses for flexibility that you think we have missed and should be considered? If yes, please provide an explanation.

The use of flexibility in CEER's paper is rather broad and from our point of view, has not missed any use case for flexibility.

6. Do you think it is important for Member States to establish standardised EU definitions of the various flexibility products, to facilitate market participation in flexibility use at distribution level?

Nationally, it will be of utmost importance to define a limited and clear set of valid flexibility products on the distribution level in order to keep transaction costs for market participants as low as possible while ensuring high transparency and market liquidity. As for standardized EU definitions of flexibility

products, we would suggest prudence with regard to the different situations in EU Member States. Guiding principles may be more useful on EU level. Clearly, the framework conditions for flexibility products should be similar in different Member States in order to prevent market distortions, but the situation of DSOs in different EU Member States vary extremely, which need to be accounted for.

7. **Should regulators seek a regulatory framework that can accommodate a range of models that would enable DSOs to access and use flexibility, while ensuring that competition and markets are not distorted?**

Any range of models needs to be kept as lean as possible. In a first stage of implementing market based procedures for flexibility use at the distribution level, bne strongly advocates for using a standard quota model on a national level where the DSO restricts energy producers and consumers based on the congestion forecast.

We envision two levels of participation: Network users (= final customers) that follow restriction requirements set by the DSO during certain time periods at the point of interconnection with the electric grid. In exchange for following those restriction requirements (= offering their flexibility to the DSO), they receive a specific reward. And on the other hand, network users that don't follow any restriction requirements. They can always use 100% of their technically available capacity at the point of interconnection and don't receive any kind of reward. It is important though, that participation by customers is voluntary, not obligatory.

Generally speaking, the terms "flexible network user" as well as "unrestricted" and "restricted grid usage" as well as the resulting financial implications of "restricted" or "unrestricted grid usage" need to be legally defined.


The parallel existence of different models or the combinations of models will lead to system inefficiencies, high transaction costs for market participants and limited market liquidity. Therefore, we strongly recommend the implementation of one coherent framework on a national level. Within the framework there should be variations available with regard to the conditions of restriction requirements which would suit the specific needs of each DSO.

8. **What do you consider to be the key benefits and key risks of particular models (rules-based, network tariffs, connection agreements, and market-based)?**

Rules-based approach: may make sense in very specific local situations (e.g., in relation to reactive power needs and other non-frequency ancillary services) since market based procedures may lead to a market with oligopolistic or even monopolistic structures and very high transaction costs. On the other hand, there is a risk of unequal treatment in different EU Member States and investments in flexibility may not be encouraged if no reward/compensation/remuneration is foreseen (which may lead to undermining the ability of competition).

Network tariff approach:

The general approach (= charging structures may be designed to encourage network users to alter their behaviour for a more efficient use of the distribution network) is supported by bne and also used in our model [*"Decentralized Flexibility Market 2.0"*](#).



However, the network tariff approach is often interpreted as “dynamic network tariffs” where DSOs send (close to) real-time price signals to network users, incentivizing them to modify how and when they use the network. This form of network tariff approach is opposed by bne for the following reasons: Dynamic network tariffs may quickly conflict with market price signals. A high effort on part of the DSO would be needed in order to implement, process and handle dynamic network tariffs (in particular challenging for smaller DSOs!). This approach would also result in high transaction costs for market players. In addition, customers would be confronted with high insecurity in terms of predictability & calculability of network tariffs. In addition, the parameter setting for dynamic network tariffs would be extremely difficult.

In contrast to this interpretation, we advocate for contractual arrangements (for example, the specific reward for accepting reasonable restriction requirements mentioned above could consist of granted network tariff reductions) that are based on regulated standard conditions (that are the same for all customers or at least customer groups).

Connection agreements approach: A reduced connection cost in exchange for following restriction requirements set by the DSO can be some form of reward analogically to the quota model introduced above. However, it should be stressed that the DSO never should be in charge of operating the customer’s flexibility. This should always be carried out by the customer’s energy service provider (e.g., his energy supplier or an independent aggregator) while following certain restriction requirements set by the DSO. Those restriction requirements are based on congestion forecasts and should be defined very narrowly. Furthermore, it is crucial that all customers are treated equally and in a non-discriminatory manner. In this respect, we would like to raise caution with this approach, as there is the danger of special contractual arrangements which could give an advantage to individual customers.

Market-based approach:

Generally speaking, bne is opposing bilateral contractual agreements between DSOs and customers (= end consumers). Such an approach is ALWAYS distorting competition and hindering other market participants in operating the customer’s flexibility. In addition, there is a quite a high potential for misuse on part of the DSO. Especially by smaller, not fully unbundled DSOs that could give a competitive advantage to affiliated business divisions. (Effective monitoring and enforcement control is problematic with a high number of DSOs, as is the case in Germany – 800 out of 900 DSOs are not fully unbundled and below the threshold of 100.000 connected customers.)

We clearly prefer the quota model as outlined above for implementing market-based procedures across the whole system and the different revenue streams (including from TSOs, suppliers or aggregators). This model would also be based on contractual arrangements, but would exclude unique and special bilateral contractual agreements between DSOs and end consumers.

In our view, competitive tendering or exchange / platform based procurement on the distribution level is a distant target model that cannot be implemented in the first stage of developing market-based procedures. There are too many obstacles at present that hamper an immediate implementation of tendering or platform based procurement. A huge problem right now for example is the very limited liquidi-

ty available and the need to activate many local flexibilities that have not been incorporated in the broader energy system yet, but are just used for self-optimization. Also, implementing smart meters on a broad scale and installing the required management and control software will need to happen first. In a second stage, we could envision transitioning from a quota model to a competitive tendering or exchange / platform based procurement.

9. What are the relative merits of a contracting strategy (competitive or otherwise) versus a real-time market approach to procurement of flexibility? Is the latter approach practicable?

bne is opposing bilateral contracting strategies between DSOs and end consumers. However, quota schemes of course would also be based on contractual arrangements. For the time being such an approach seems much more feasible.

A real-time market approach is desirable, but realistically may only be implemented in a distant future. Again, smart meter roll-out with a broad range of functionalities on a wide scale will be required first. Also, on part of the DSO there would be a need for monitoring and control techniques that have only been tested in very few pilots yet – a massive roll-out of those technologies in the local distribution networks will not happen any time soon.

10. Are there any models that would enable DSOs to improve system flexibility that you think we have missed and should be considered?

Yes, we at bne highly recommend looking into the quota approach for the first stage of implementing DSO's access to flexibility on the distribution network.

We suggest the implementation of: a) **Restricted use of capacity at the point of interconnection** along with b) **Unrestricted use of capacity at the point of interconnection**. The restricted use would receive some form of reward whereas the unrestricted use would not. DSOs should be allowed to set reasonable restriction requirements at the point of interconnection with the local distribution grid. These restriction requirements need to be embedded in clearly defined rules and appropriate boundaries (as for example outlined in bne's "[Decentralized Flexibility Market 2.0](#)"). However, participation in the restricted use of capacity needs to be voluntary.

11. Are there case study examples of approaches to improve flexibility on the system that you think should be considered in this work? If so, please provide a summary of the key information and findings.

- bne's suggestion for a market based solution for organizing access to flexibility on the local distribution network: "Decentralized Flexibility Market 2.0" (http://www.bne-online.de/en/system/files/files/attachment/20160704_bne_De-Flex-Market%202.0_final.pdf); German version available at:

[online.de/de/system/files/files/attachment/20160704_bne_Positionspapier%20Flexibilit%C3%A4t_sverordnung.pdf](https://www.bundesnetzagentur.de/system/files/files/attachment/20160704_bne_Positionspapier%20Flexibilit%C3%A4t_sverordnung.pdf)

- BNetzA-Paper: Flexibility in the electricity system:
https://www.bundesnetzagentur.de/SharedDocs/Downloads/DE/Sachgebiete/Energie/Unternehmen_Institutionen/NetzentwicklungUndSmartGrid/BNetzA_Flexibilitaetspapier.pdf;jsessionid=52EF3B79113A40EAFEE5A5E3C07A4215?__blob=publicationFile&v=1
- Agora study: Smart-Market-Design in German Distribution Grids (English Management Summary available and included in the document): https://www.agora-energiewende.de/fileadmin/Projekte/2016/Smart_Markets/Agora_Smart-Market-Design_WEB.pdf
- Dena Netzflexstudie (German Energy Agency's Study on Flexibility in the Electricity Grid; English Summary available and included in the document): https://shop.dena.de/fileadmin/denashop/media/Downloads_Dateien/esd/9191_dena_Netzflexstudie.pdf

12. Beyond impartial provision of data to market participants, do you consider that there any other tasks for DSOs to carry out to enable the competitive provision of and access to flexibility by others?

It is important to keep in mind that the metering operator is not necessarily the DSO. Competitive metering operators may also be possible in some EU Member States. Other forms of neutral data coordinators are possible, too. In order to allow for true competition, we deem it necessary to distinct between the market role of the metering operator and the market role of the DSO.

As for tasks of DSOs to enable the competitive provision of and access to flexibility by others, we strongly recommend the implementation and use of ICT-based standard electronic message formats for transferring the information regarding the restriction requirements at the point of interconnection to the end customer (or respectively his service provider /energy supplier /independent aggregator).

The following information needs to be transferred via standard electronic message formats: a) minimum thresholds for capacity usage and b) concerned time slices (= time intervals in which restriction requirements related to using the electric grid apply).

13. Do you think there are situations where DSOs should be allowed to provide flexibility beyond the distribution network component, where economically efficient to do so? Please provide an explanation.

Absolutely NO! This would enable market distortion and would violate basic rules and principles with respect to unbundling.

14. Are there other examples where the DSO could provide flexibility to help to reduce the overall costs of the system?

No, the DSO should never become a market participant providing flexibility products to the TSOs or any other use case. This would blur the line between market operations and network monopoly. Such a development would affect transparency and competition in a negative way.

15. In principle, can the regulatory tools listed be used by regulators to remove barriers and facilitate the use of flexibility at distribution level?

Yes, bne considers the regulatory tools listed as exhaustive. The challenge consists in changing the tools such as economic incentive schemes or revenue control effectively in order to allow for DSOs to use flexibility services as an alternative to traditional reinforcement where more efficient.

However, there is a severe problem which is not addressed by the regulatory tools listed: the missing data availability of network quality on the distribution level. Most DSOs have no data available for the majority of their networks with respect to active power, reactive power, voltage and temperature.

Though, the best regulatory toolbox will not help, if it is impossible to measure the output of DSO activities or even before measuring output being able to define what the benchmarks for DSO activities should be. In order to incentivize efficient behaviour, it is necessary to define what efficient behaviour means. Today, it is impossible to determine efficient behaviour in terms of network management and use of flexibility, because there is no data available which constitutes a solid basis for benchmark setting and comparison.

Regulatory obligations would be needed in order to implement distribution network specific monitoring and control on a broad basis. So far, there are mainly R&D projects which provide the needed data for very small and confined areas. Furthermore, smart meters will not bring about the solution to this problem as the data collected and provided by smart meters will not address reactive power, voltage or temperature and active power only in a very limited way.

16. Are there particular tools that you think would be the most effective in achieving flexibility use at distribution level? Please provide reasoning for your answer.

As described above, we deem the establishment of a broad data basis on distribution network quality a necessary pre-condition for setting up a regulatory framework that will be effective in achieving flexibility use at distribution level.

On the basis of available data on distribution network quality, there are different options and combinations of the listed regulatory tools that could be applied in order to achieve flexibility use at the distribution level. For example in Germany, two options would generally be possible: a) using appropriate comparison parameters as part of the efficiency benchmarking under the incentive regulation or b) a bonus-/malus-regime as part of the incentive regulation.

Both options could be incorporated in the current incentive regulation that has first been established in 2009. Both options have pros and cons. For determining which one would be more effective, a deeper analysis of the complex situation, possible interdependencies as well as implications and consequences of each instrument would be necessary.

17. Are there any other regulatory tools that have not been included and should be considered?

As described above, the establishment of a broad data basis on distribution network quality is missing. In addition, the regulatory framework discussion around curtailment of renewable energy should be included in the list of regulatory tools.

Another important aspect that is not considered systematically within the current CEER paper is the problem of exemptions and special treatments in the regulatory context. In Germany, there is a long list of examples for exemptions and special treatments which hinder generation, consumption and storage to participate on equal footing in the markets. Before setting up new market structures on the distribution level, those old and existing problems need to be addressed as well!

Examples include:

- §19 StromNEV (Section 19 of the German Ordinance on Electricity Network Fees – currently, network fees are designed to incentivise a flat consumption pattern, and hence penalise those who provide flexibility to the system): By receiving substantial reductions in their network tariffs, large industrial customers are encouraged to have a flat consumption pattern, or in other words they are incentivized to have their peak demand as much levelled as possible. As soon as their peak load increases, they risk a high increase of the capacity fee component of their network tariff. This increase can then counterbalance any cost advantages arising from flexible electricity demand. By implication, the industrial customer is maximizing his profit under the current system and has no interest in risking losing his reduction benefits by shifting his load, even if it would make sense from a macro-economic perspective.
- § 14a EnWG (Section 14a of the Energy Industry Act which already specifically provides for using flexibility on the low voltage distribution network): The current mechanism offers reduced network tariffs to energy-intensive domestic heating appliances (mostly electric storage-heaters) during the night hours. Most DSOs offer a so-called “Peak-Tariff (PT)” (Hochtarif, HT) which is used during the day and a so-called “Off-Peak Tariff (OPT)” (Niedertarif, NT) which is used during the night hours. The network fee reductions are applied to the “Off-Peak Tariff (OPT)”. The steering mechanism only works in relation to fixed restrictions given by the DSOs and appliances cannot be managed by market participants such as energy suppliers or independent aggregators. The current technical framework as well as the incentive scheme are both very inelastic and thus, are not sufficient to respond to the future system needs.

And there are many more (including the current support schemes for renewables and CHP).

18. Should the regulatory framework allow different solutions and combinations of tools to address the specific needs of the network?

As described above, we strongly recommend the implementation of one coherent framework on a national level and within that framework there should be variations available with regard to the conditions of restriction requirements which would suit the specific needs of each DSO.

The regulatory framework should use a holistic approach that is valid for all DSOs, but has some variation within the applied regulatory tools which allow a differentiation regarding specific network needs.

19. Is a principles-based approach (rather than one-size-fits-all) the correct one for national regulators developing a framework for facilitating flexibility use by DSOs at distribution level?

At present, yes – we deem a principles-based approach the correct one for national regulators developing a framework for facilitating flexibility use at distribution level.

20. Are the principles outlined appropriate? Are there any fundamental principles that you think are missing in order to deliver maximum benefit to customers?

Regulation should incentivise cost-efficiency and flexibility management. Those DSOs that are implementing the framework correctly and have an efficient operation should receive additional rewards. Whereas DSOs, that are not implementing the framework or have a bad implementation and inefficient operation, should be subject to a non-compliance mechanism. Any failures and infringements on part of the DSO need to be sanctioned by clearly defined penalties.

Who we are: Bundesverband Neue Energiewirtschaft e.V. (bne) / Association of Energy Market Innovators – a strong voice for independent energy companies

bne represents the interests of grid-independent energy suppliers and energy service companies in Germany. Unlike suppliers with a connected grid, bne-members are free of monopoly interests: They are committed to fair competition and a diverse energy market.

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