FUTURE DISTRIBUTION NETWORK TARIFF STRUCTURES

Guidance

JUNE 2021

SYNOPSIS

- Distribution network tariff structures are one of the tools that DSOs have, within the regulatory framework, to address the challenges and realise the opportunities created by the profound changes to the energy system.
- Harmonisation of distribution network tariff structures across Europe is not a suitable solution to address the expectations emphasised in the EU Clean Energy Package. There is a wide variation in the context in which DSOs operate and different approaches may be appropriate in different regions.
- All distribution network tariff structures must prioritise and balance multiple objectives, although these may evolve over time and may differ from DSO to DSO.
- Distribution network tariff structures should provide economic signals to network users.
- Distribution network tariff structures should not be subjected to market objectives and signals.
- Distribution network tariff structures need to be resilient and anticipate future challenges (e.g. Renewables, Batteries, EV's, Electric Heating and Peer-to-Peer Exchange).
- The following **guiding principles** should be respected when developing tariff structures:
    - Cost reflectivity
    - Fairness
    - Incentives for efficient network use
    - Non-discriminatory
    - Transparency and understandability
    - Implementability
    - Limited complexity

- If new customer models (e.g. collective self-consumption, Peer-to-Peer (P2P)) do not decrease DSO's costs, regular network tariffs should be applied.
- Concerning tariffs, P2P only have significance when behind one single connection to the grid. In all other situations, without such a single connection, the regular tariffs have to be applied to each individually connected customer.
- Tariffs should be independent from suppliers, but also from the applications behind the meter. Special tariffs for special purposes do not make sense.
- Producers (renewable as well as conventional) should pay for the distribution network availability as well and be incentivised to efficient location and usage.
- When storage is applied, a solution needs to be considered for the problem of paying twice for the energy withdrawn and injected.
- Time-of-use tariffs (ToU) can be considered a tool for cost reflectivity, although there is a risk of peak load shift. Therefore, it should only be introduced carefully.

INTRODUCTION

Under the EU Clean Energy Package (CEP), the Distribution System Operators (DSOs) roles have been reinforced as essentially *two-fold*: on one hand the traditional and essential role of managing the network or *'keeping the lights on'* and on the other hand, the new role of neutral market facilitator.

Representing leading distribution system operators in Europe, E.DSO and its members are committed to rolling-out and maintaining a high-class infrastructure, guaranteeing reliability and quality of electricity supply while substantially contributing to the EU's climate agenda and decarbonisation objectives.

DSOs are the backbone of the energy transition while providing a high-quality service to all customers. They provide quality services and facilitate a level playing field by acting as neutral and efficient market facilitators. Further, DSOs guarantee distribution system stability, power quality, technical efficiency, and cost effectiveness in the future evolution of energy networks towards a smarter grid concept.

DSOs are natural monopolies, overseen by energy regulators to ensure that they deliver quality of service and value for money to customers. The costs of DSOs are remunerated through the network tariffs paid by customers. In most regulatory frameworks, incentives for cost-reductions are implemented, placing the focus on efficiency and short-term cost-reductions, featuring sanctions in case of non-compliance.

> **"The vision of an Energy Union with citizens at the centre, where citizens take ownership of the energy transition, benefit from new technologies to reduce their bills, participate actively in the market, and where vulnerable consumers are protected."**
>
> **Clean Energy Package**

CEP further stresses the incentivisation of network tariffs systems which activates flexibility and the improvement of efficient grid usage.

The Energy Transition is pressing on the power system in an unprecedented way. At the generation side of the system, renewables like solar and wind are feeding more power into the grid whereas, at the consumption side, electric vehicles (EV) and heat pumps will take more electricity out of it than ever before. The required grid capacity will increase which will drive a requirement for network reinforcements and increased maintenance, the costs of which will be included in networks tariffs. Further, the cost drivers are changing. If a customer decides to trade in their conventional combustion engine car for an EV, their annual electricity consumption can double but their peak demanded grid capacity could become five times higher. Increasing network costs and evolving cost drivers can trigger discussions about the tariff design and structure. These discussions have already started in several EU Members States.

E.DSO published a position paper in 2015 in which we spelled out several principles to be drawn by the National Regulatory Authorities (NRAs) and legislators when redesigning distribution network tariffs with the aim to align the interests of DSOs, owners of distributed generation, and society.

Considering the evolving role of DSOs in the energy transition and the European Union Agency for the Cooperation of Energy Regulators (ACER) ambition for tariffs to reflect long-term avoidable costs,* E.DSO is revisiting its previous position on electricity distribution tariff systems.

In this guidance we set out our approach about future distribution network tariff structures focusing on what we believe the future challenges to the grid will be and we propose a principle-based approach to follow when developing future tariff structures. We believe that there is certainly need for an evolution in tariff structures, while acknowledging that there is no ‘one size fits all’ solution.

Through this document we aim to set out key policy recommendations and guidance for future discussions with external stakeholders like ACER, the EC, and NRAs, considering that “network tariffs” has proved to be a complex and sometimes difficult topic. This paper does not endorse the “most appropriate” network tariff structure, and refrains from any “one size fits all” solution. **E.DSO’s position has always been to recognise that custom-made solutions have the potential to deliver more value than a common European model for distribution network tariffs, considering that national circumstances can differ significantly.**

The scope of this paper includes network tariff structures only and excludes any consideration of tariff levels or regulation schemes. Where network tariffs activate flexibility, e.g. the flexibility of a home battery, this flexibility is called implicit. This is to be distinguished from explicit flexibility, e.g., flexibility provided through specific products or through special contracts. In this paper we do not discuss explicit flexibility.

* ACER Report on Distribution Tariff Methodologies in Europe (February 2021) accessible here: https://www.acer.europa.eu/Media/News/Pages/ACER-reports-on-electricity-distribution-tariff-methodologies-in-Europe-and-recommends-how-to-improve-them.aspx

2. CURRENT SITUATION

On 10 February 2021, ACER published a report reviewing the methodologies for electricity distribution tariffs in EU Member States. The report provides detailed data across EU Member States on what costs are recovered via the distribution tariffs and how the tariffs are designed.

ACER considers several energy transition activities (e.g., Power-to-X facilities, Electric Vehicle, charging stations and energy communities) to be considered in the tariff methodologies. ACER stressed that distribution networks play a key role in the energy transition.

According to ACER, network tariffs have three key objectives: (a) they should recover costs, (b) they should incentivise DSOs to increase their efficiency and (c) they should support efficient usage of the network. All the above are important, but objective (a) and (b) are related to tariff levels and only objective (c) is related to tariff structures, which is the topic of this position paper. Objective (c) involves the incentivisation of network tariff structures, which means that they should provide economic signals to network users.

ACER also reveals that network tariff methodologies should be "*free from any political or commercial interest*". ACER's view is that this is the prerogative of NRAs. It equally means that the design of network tariff structures should be based on network related issues (like costs and efficient use) only and not be biased by market objectives or market prices. We will explore this point later in Chapter 4 below.

In most EU countries, network tariffs are based on a combination of energy (kWh), power (kW used or subscribed connection capacity) and lump sum. According to ACER's report, the EU palette is much more diverse. In most Member States, energy-based charges have a larger weighting than power-based charges. In six Member States power-based charges have a larger weight (CZ, ES, IT, NL, PT, SK).

Generally, there is a shift towards more power-based tariffs. Yet, the relevance of the power required by a network user depends not only on the amount of power required but also on the coincidence of this power requirement with the power requirements of other network users; this is important for the dimensioning of components of the grid. In some Member States (e.g. Germany) an energy component of the network tariffs reflects the energy-related costs (e.g. energy losses), and the costs of coincident network capacity (power) usage.

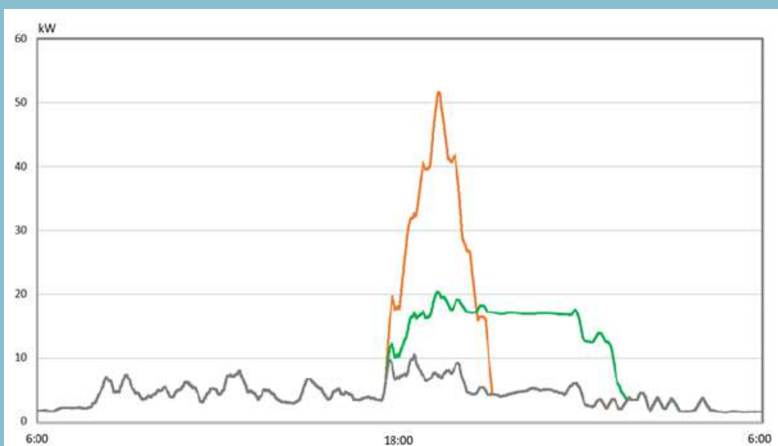
Moreover, the energy component offers an approximation for pricing the probability that the capacity of a network user coincides with the capacity needs of other network users: the more energy is used for a given capacity, the higher is that probability. To achieve this, the NRA/DSO need to estimate how the probabilities increase with energy use, which may need to be revised as new usage patterns develop with the energy transition, such as electric vehicle (EV)-charging, self-consumption, etc. The quality of the cost-reflection may decrease if customers become more different from each other.

An example of one of these new usage patterns is EV-charging: Imagine an individual customer, charging an EV during 2 hours with 10 kW. This customer extracts a 10kW load from the grid, while another customer, charging an EV with 5 kW for 4 hours uses the same amount of energy, but extracts half the load from the grid. It worth noting that, it is not the load of the individual customer that determines the tension on the grid, but the simultaneous load of a group of customers. Further, the probability that two 4-hour loads coincide is greater than that two 2-hour loads. Nevertheless, the probability of the latter is not insignificant, and should therefore be considered when calculating the required network capacity. This is important since a lot of EV-users arrive from work nearly at the same time and then start charging for a few hours.

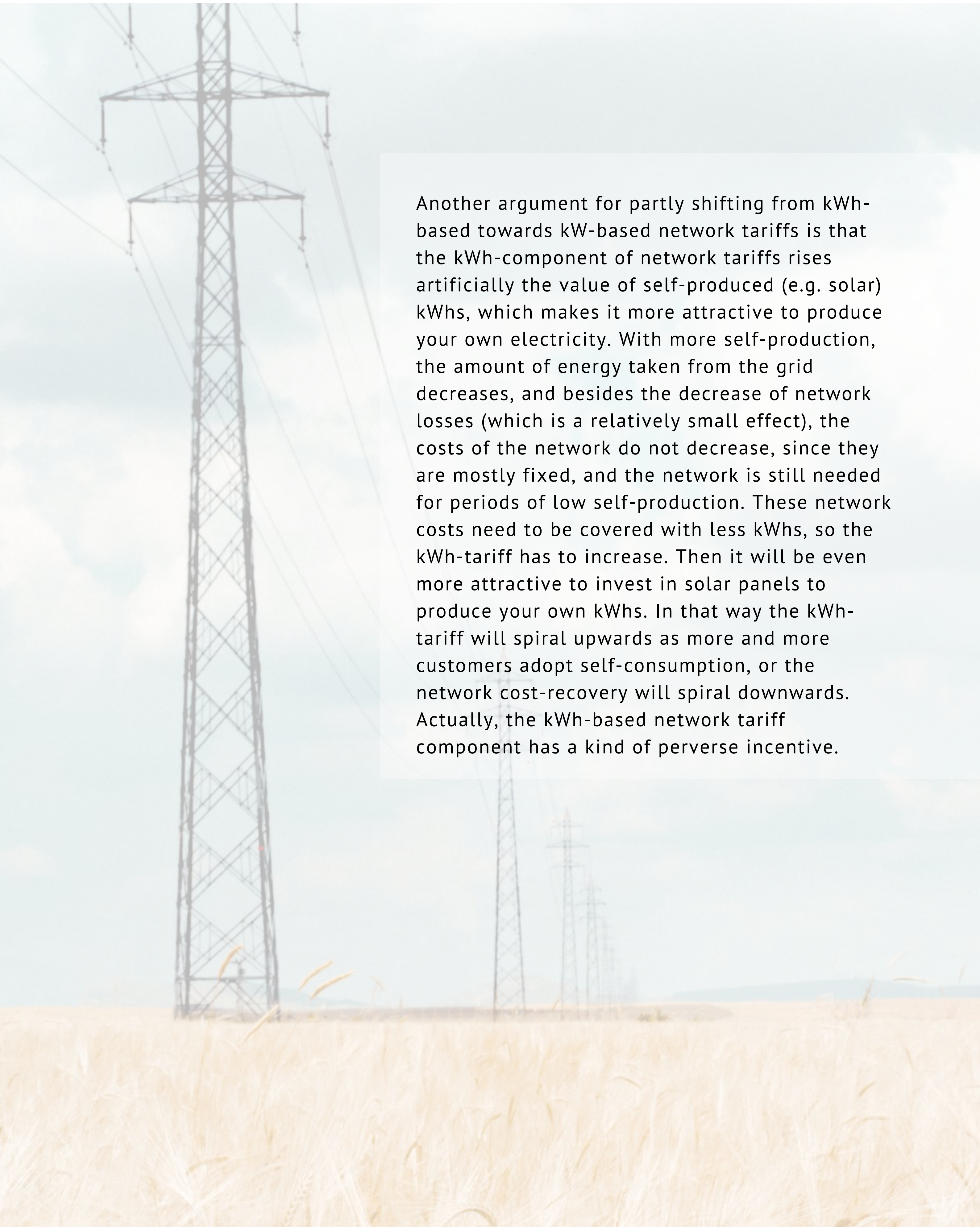
Consequently, the tendency towards more power-based network tariffs is at least based on the assessment that they better reflect network costs. Besides this, the tendency can also be understood because power-based network tariffs offer the possibility to introduce an incentive for customers to try to distribute consumption over time. See also the text box below for an example.

EXAMPLE

A network tariff that is (at least partly) power based can offer an incentive to spread the energy consumption over a longer time period, when possible, e.g, when charging an EV. Fig. 1 shows a somewhat constructed example, based on real measurements. All measuring points (every 10 seconds) represent the average power over the last 15 minutes. The black graph shows the sum of the simultaneous load of seven customers, without EVs, for 24 hours.



The orange line represents the situation if four of them would have an EV, and all EVs would charge 20 kWh, without any incentive at all. The first starts charging at 17:30, the others at 18:00, 18:30 and 19:00 respectively. The green one is exactly the same situation but now with an incentive for each customer to keep the individual total load (kW) low. Now each customer just takes more time to charge 20 kWh into the EV, resulting in a reduction of the total simultaneous load on the grid.



Another argument for partly shifting from kWh-based towards kW-based network tariffs is that the kWh-component of network tariffs rises artificially the value of self-produced (e.g. solar) kWhs, which makes it more attractive to produce your own electricity. With more self-production, the amount of energy taken from the grid decreases, and besides the decrease of network losses (which is a relatively small effect), the costs of the network do not decrease, since they are mostly fixed, and the network is still needed for periods of low self-production. These network costs need to be covered with less kWhs, so the kWh-tariff has to increase. Then it will be even more attractive to invest in solar panels to produce your own kWhs. In that way the kWh-tariff will spiral upwards as more and more customers adopt self-consumption, or the network cost-recovery will spiral downwards. Actually, the kWh-based network tariff component has a kind of perverse incentive.

3. MAIN CHALLENGES AND RELATION TO NETWORK TARIFFS

As already mentioned in Chapter 1, the energy transition in the context of decarbonisation is the main driver of discussions on new network tariff structures. Having this in mind, we elaborated some important challenges related to network tariffs. It is important to note that, the evolution of network tariff structures takes a few years and after their introduction, they must last for several years. Our intention is to focus on the challenges at least five years ahead.

According to E.DSO's viewpoint, the main tariff related challenges are Renewables, Batteries, EV's, Electric Heating and Peer-to-Peer Exchange.

3.1. RENEWABLES

Conventional production generally follows consumption very directly. Put differently: consumption is steering generation. This has often been one of the reasons to not (or hardly) apply injection tariffs (e.g., G-components). The network costs allocated to generators could just as well be compensated via consumer tariffs, since the withdrawal by consumers determine production. But as renewable production is increasing fast, this reasoning does not hold anymore. Renewable generators, by nature, follow the weather, in particular wind and sun and so production will not be steered by consumers anymore. Furthermore, there is more interconnection and use of electricity produced in other countries. That means that the logic that only consumers pay for the network (because they are steering production) is no longer valid. The new logic is producers should pay as well.

If a tariff is applied to generators, it should then incentivise efficient network utilisation. But then a question pops up: since RES is following wind and sun, is it possible for RES to steer its production? The answer is: yes of course, by combining it with batteries (storage for a few hours) or conversion (e.g. into hydrogen) and seasonal storage. Thus, distribution network tariffs for generators, when power based, can boost the application of flex and system integration.

3.2. BATTERIES

Batteries, in being flex-devices in the first place, can help to prevent network problems and can help to integrate more RES in our networks. But on the other hand, batteries can cause local system management problems when being used by customers and other market parties in balancing and trading. An aggregator can even make deals with customers allowing them to activate the charging or discharging of customer's batteries. In that case they can activate large loads on the network.

Network tariffs should incentivise the battery owner to utilise the network efficiently, for instance, by storing generator peaks. So, again: there is logic for injection tariffs. But if an injection tariff is applied with energy-based network tariffs, a solution needs to be found for the problem of paying twice (see also Paragraph 5.2).

3.3. ELECTRIC VEHICLES

The electrification of transport will be a game changer on the distribution system. The number of electric vehicles (EV) is expected to increase rapidly in this decade. In Norway and The Netherlands, supporting programs have led to a very successful introduction of EV's in these countries (currently the EV-number 1 and number 2 in Europe). In the Netherlands, the 2020 sales market share of EV's was 20.3%. In 2019 this figure was 13.7% and in 2030 it will be 100%, by law. Given the EU target of 55% CO_2-reduction in 2030, it is expected that most of the other EU countries will follow. Additionally, the EU targets setting for the car exhaust emissions are pushing the car manufacturers towards the introduction of more EV-models at moderate prices.

With an EV charged at home, the annual consumption can be doubled, but the effective capacity requirement can be multiplied by at least 4 or 5. In addition, the simultaneity of the individual peak loads can increase significantly, e.g., when customers arrive at home from work in the evening and start charging for a few hours. (See also fig. 1.) On the other hand, the EV-battery is a perfect flex provider when charged slowly (e.g., at night-hours). And, of course, batteries can be used for balancing and trading, as described in paragraph 3.2.

The electrification of transport will make network reinforcements unavoidable, but with smart charging investments and workload can be limited and spread. So cost reflective network tariff structures which incentivise smart charging could help.

3.4. ELECTRIC HEATING

Electric Heating is another important example of the electrification of society. The shift from gas and oil to electricity for heating (houses and buildings) has different reasons in different countries but can be seen as a general direction of travel. Most important is the application of heat pumps (HP), but we could add the electrical boiler as well. In particular, a boiler can convert self-produced solar peak-electricity into heat, and it can store that heat for hours.

A Dutch pilot also showed that a well-insulated house can buffer the heat for a few hours, making it possible to heat up the house during the afternoon instead of during peak hours. Again, when network tariffs offer the right incentives, it is possible to use the network more efficiently. In this case the effect is not as important as with EV, but it can play its role, especially where the EV battery will not be charged at home.

3.5. PEER-TO-PEER EXCHANGE

New customer models are arising, based on for instance collective self-consumption or peer-to-peer (P2P) energy exchange: what if one (A), on a sunny afternoon, charges an EV with the electricity from neighbour's (B) solar panels? Even when their individual flows from the grid (A) and into the grid (B) are large, they would argue that they are not burdening the grid. Nevertheless, DSOs must be prepared to serve and accommodate both customers, separately from one another. Customer (A) must be able to charge their car whenever they want, even when the solar panels of customer (B) are not producing anything. And customer (B) should be able to feed their solar production into the grid at any time, even when there is no EV to charge. Customers do not buy electricity from DSOs, what they purchase is capacity, or better, the assurance the capacity is always available. The P2P energy exchange is the exchange between market parties, in this example between two customers, one of them acting as a supplier. The DSO is not directly involved in this energy exchange.

Thinking ahead, imagine that we would take this P2P exchange into account, e.g. by applying a lower tariff only when both customers are connected behind the same transformer. Then what about customer (C) who is not connected to the same transformer but wants to buy electricity from (B) as well? If (C) does not get the lower tariff he could argue that he should be rerouted to be connected to this transformer. Bottom line is that when the network-layout could influence the network tariff, the customer could want to have a say in network design. This is principally conflicting with the role and responsibility of the DSO and therefore unacceptable. So the regular network tariffs should be applied to the peers.

Generally, the applied network tariffs depend on the individual characteristics of the customer, being the measured kWhs, the measured kWs or the connection capacity. It does therefore not and should not depend on which supplier or what kind of supplier of electricity. This implies that, from tariffs considerations, P2P only has significance when the peers are behind one single connection to the grid. And then, the applied tariff for the P2P group depends only on the capacity of that connection, and/or on the measured electricity through that connection point. In that situation the DSO-bill must be paid by the P2P-group and the P2P-group shall decide whether and how to split the network-bill into sub-bills for the individual members of the P2P. In other situations, e.g. if there is not a single connection point, the regular network tariffs should be applied to each individually connected customer.

4. NETWORK TARIFF STRUCTURES - PRINCIPLES

The first objective of network tariffs is to cover the costs of building and managing the network. These tariffs are regulated because the network is a natural local monopoly. Consequently, customers do not have the possibility to switch to another network provider. Therefore tariffs are regulated and not based on market mechanisms and network tariff structures should be based on a set of principles. E.DSO developed a set of principles that could be applied when developing new network tariff structures. An overview is presented in paragraph 4.1. In the second paragraph, 4.2., the relation with the main challenges from chapter 3 is given, while in 4.3. we will relate them to the ACER-report.

4.1. OVERVIEW: E.DSO'S PRINCIPLES FOR TARIFF STRUCTURES

4.1.1 COST REFLECTIVITY

The simplest form to explain this principle is: heavy users pay more than light users. Cost reflectiveness is, as discussed in chapter 2, the main driver behind the tendency towards more power-based network tariffs.

4.1.2 FAIRNESS

Fairness is very much related to cost reflectiveness. “Fair” as a principle for network tariff structures is only related to the network usage and the network costs that should be reflected. E.DSO considers network tariffs should not be a political instrument. Not for social policy, nor for environmental policy. Thus, when a customer has an EV which is charged at home, he probably pays more than another one who does not have an EV, but only because the EV is a heavy load.

4.1.3 INCENTIVES FOR EFFICIENT NETWORK USE

One could argue that when a tariff structure is cost reflective and fair, it already provides an incentive to use the network efficiently. Even ACER addresses the incentivisation of network tariffs. The energy transition and the electrification of society are expected to happen very quickly which means that the design of tariff structures should be forward-looking. There are also increasing possibilities for customers to steer the energy consumption by adapting their behaviour; digitalisation will enable this also. For example, an EV can be a considerable load, but the battery in it is an opportunity for flexibility at the same time.

4.1.4 NON-DISCRIMINATORY

Two different customers (A and B) in the same tariff zone (usually the DSO-area), with exactly the same load-profiles, pay the same amount of money. This does not depend on the locations of A and/or B, nor on the available network capacity on their locations. Customers would find it difficult to accept why A has to pay more than B because of the available network capacity. The design and capacity of that network was and is a DSO responsibility. Customers did not and should not have any direct say in network design. When applying network tariffs, DSOs will not discriminate customers on features, properties or characteristics that are not in the sphere of influence of the customer.

4.1.5. TRANSPARENCY AND UNDERSTANDABILITY

The customer must understand how their behaviour (e.g., load profile) effects their bill. Based on this understanding the customer must be able to “plan” their behaviour while knowing what the effect will be. They should be able to “predict” the effect of this behaviour. That means that the network tariffs they pay cannot depend on what other customers do or might do.

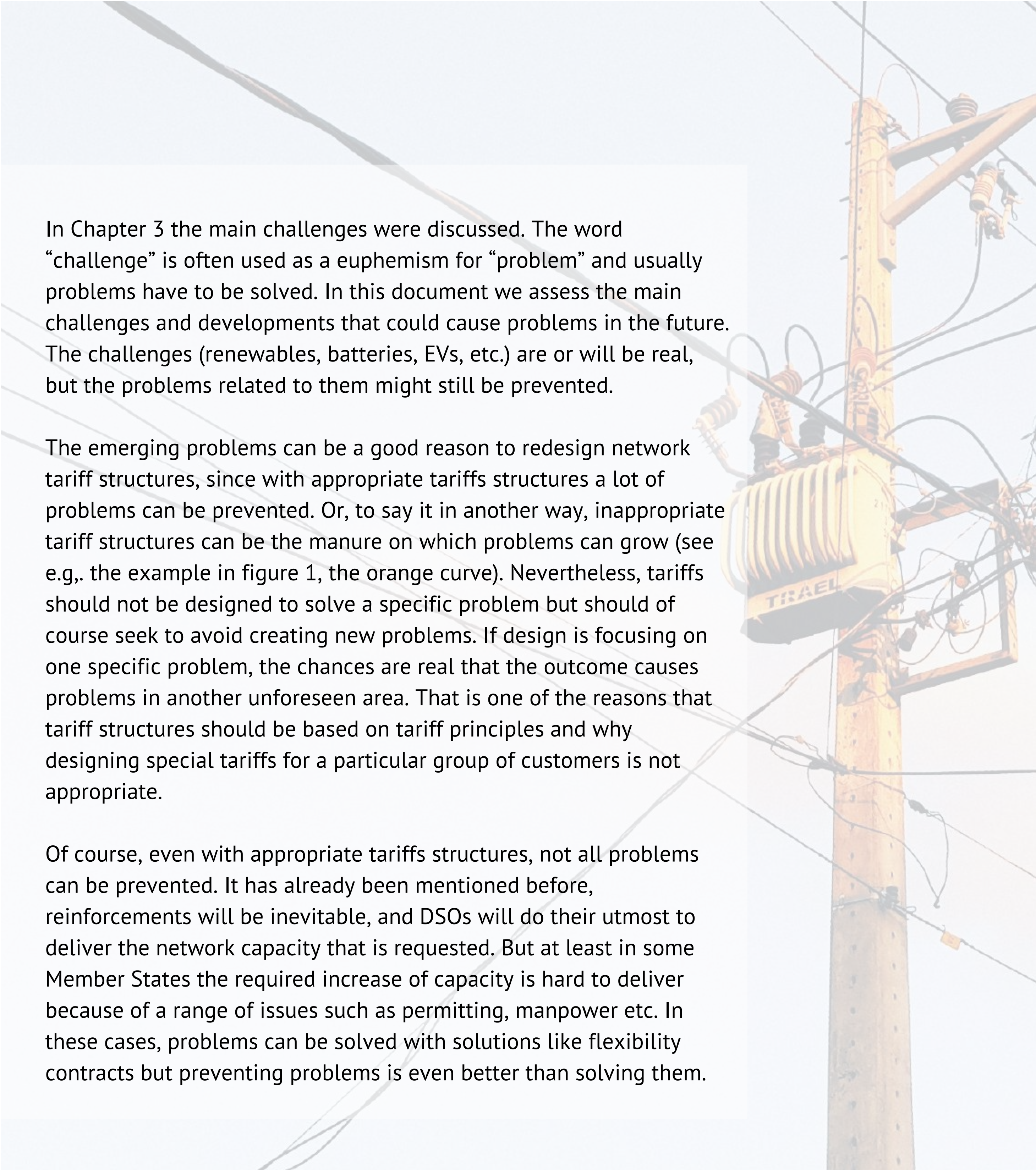
4.1.6. IMPLEMENTABILITY

When designing a new tariff structure, the implementability should be considered. E.g., a power-based tariff component needs metering devices that can measure power and for some structures smart meters are a prerequisite. Additionally, the administrative burden should be considered, adapting or even changing IT-systems can be very costly.

4.1.7 LIMITED COMPLEXITY

Complexity should be limited for both the customer as for operating organisation and systems. The first four principles mentioned above can of course increase complexity. So a balanced approach is very important. However, we have to accept that new tariff structures, being more complex than the current ones, could still be needed.

4.2. RELATION TO MAIN CHALLENGES



In Chapter 3 the main challenges were discussed. The word "challenge" is often used as a euphemism for "problem" and usually problems have to be solved. In this document we assess the main challenges and developments that could cause problems in the future. The challenges (renewables, batteries, EVs, etc.) are or will be real, but the problems related to them might still be prevented.

The emerging problems can be a good reason to redesign network tariff structures, since with appropriate tariffs structures a lot of problems can be prevented. Or, to say it in another way, inappropriate tariff structures can be the manure on which problems can grow (see e.g,. the example in figure 1, the orange curve). Nevertheless, tariffs should not be designed to solve a specific problem but should of course seek to avoid creating new problems. If design is focusing on one specific problem, the chances are real that the outcome causes problems in another unforeseen area. That is one of the reasons that tariff structures should be based on tariff principles and why designing special tariffs for a particular group of customers is not appropriate.

Of course, even with appropriate tariffs structures, not all problems can be prevented. It has already been mentioned before, reinforcements will be inevitable, and DSOs will do their utmost to deliver the network capacity that is requested. But at least in some Member States the required increase of capacity is hard to deliver because of a range of issues such as permitting, manpower etc. In these cases, problems can be solved with solutions like flexibility contracts but preventing problems is even better than solving them.

4.3. REFLECTION ON MATCH WITH ACER'S REPORT

ACER called the need for a common understanding of the term “distribution tariffs” by differentiating it from other regulated tariffs paid by users connected to the distribution network. ACER does not include connection charges in the definition of distribution tariffs. In this policy paper we follow more or less this definition of distribution tariffs. Connection charges are one off and hardly have possibilities to influence the daily efficiency in using the grid, unless they are linked to a flexibility or interruptibility contract, which may nonetheless not be suitable for all types of consumers or generators. But on the other hand, connection charges can offer the opportunity to apply local incentives. A new connection in an area where there is hardly any grid capacity could be charged with a higher connection tariff than in an area with excess capacity.

ACER states that distribution tariff structures should be “free from any political or commercial interest”. As already said in chapter 2, this supports the idea that network tariffs should not be biased by market objectives or market prices. DSOs are neutral market facilitators. Therefore, it might be possible that sometimes a power component in the distribution tariff could counteract to a price signal from the market. If that occurs, it does because it is necessary from the perspective of electricity transport/distribution. (As in any other market area, transport/distribution should be paid for and if the demand for transport is high, the price is (must be) high as well. Especially when the transport capacity cannot be adapted overnight.) This is also applicable if the electricity is coming from renewable sources and used to charge batteries of (CO2-free) EVs. The distribution tariffs should not be a tool for policy makers. Supporting programs for renewables, EV, etcetera to support political objectives, should not be financed through distribution tariffs. Tax measures would then be more appropriate.

The principles mentioned in paragraph 4.1 above, match very well with the principles ACER has mentioned in its report. ACER also stresses the difficulty “to meet all of the principles simultaneously and fully”. This is certainly true, but E.DSO believes it is possible to find a good balance with the set in this position paper.

5. SOME SPECIAL TOPICS

As has been said in the introduction, this position paper does not present one common model for network tariff structures, nor does it introduce a set of possibilities. It is just a guidance based on the main challenges and a set of principles. But two special topics are worth mentioning, because they will probably come back in discussions and because they implicitly give more context to the previous chapters.

5.1. TIME-OF-USE TARIFFS

Time-of-use tariffs (ToU tariffs) are designed to incentivize customers to use more energy at off-peak times, in order to decrease system load. It can be considered as a tool for cost reflectivity. With a ToU tariff scheme, customers can adjust their electricity consumption (either through automation or manually) to reduce their energy expenses. So ToU can be an interesting opportunity for customers but it should only be introduced carefully. Apart from network tariffs, suppliers or aggregators could use ToU pricing as well. This can lead to conflicting time signals, especially when one or both of them are dynamic. When static ToU network tariffs are applied there is a risk that the peak load shifts to the moment the low-price-period starts. Especially when the EV numbers increase and a lot of EVs start charging at the same moment, this can even be very counterproductive. There are of course ways to prevent this, but care should be given. The idea is to shift the individual loads to off-peak times, but this can also be achieved by using incentives to just spread the individual loads in time (see fig. 1 in chapter 2), e.g. with a subscription-based tariff model with which the customer wants to stay within the subscribed power range. Then a time-trigger is not needed, and the risk of peak load-shift does not occur.

5.2. STORAGE AND PAYING TWICE

In Chapter 2 batteries were addressed as one of the main challenges. A battery takes energy from the grid, stores it a few hours and delivers it back to the grid. Thus, it uses the grid twice, just like a ‘regular’ prosumer. In this position paper E.DSO considers a battery or any other storage device just as a ‘regular’ customer. The fact that a battery is not using energy is not very important because a DSO does not deliver energy. It provides capacity, the insurance that the power used to charge and the capacity to discharge is just available. If a power-based network tariff is applied one could just use for instance the maximum power as basis. Whether that maximum occurred during charging or discharging does not matter. But if the network tariff has a kWh-component, it would create potential difficulties and misunderstanding to price these kWhs twice (the charged kWh’s as well as the discharged kWhs). Then, something should be done to address this.

6. CONCLUSIONS AND RECOMMENDATIONS

- Challenges (see chapter 3) or problems can be a good reason to redesign network tariff structures, since with appropriate tariffs structures a lot of problems can be prevented. But, tariffs do not solve problems. They should not be designed to solve a specific problem. Tariff Structures should be based on Tariff Principles (see chapter 4).

- One size does not fit all. One common EU model will not help us, nor the customers. The national circumstances are too different.

- Although power is not the only cost driver (time, giving the probability for power to coincide with other powers, is too), the tendency towards more power-based network tariff structures can be understood from the assessment that they reflect network costs and from the possibility to introduce an incentive for customers to distribute consumption over time.

- Since power generation is shifting strongly towards renewables and renewables are following sun and wind, instead of demand, production will not be steered by customers anymore. So, the logic that only consumers pay for the network (because they are steering production) is no longer valid. The new logic is producers (renewable as well as conventional) should pay for the distribution network availability as well and be incentivised to efficient location and usage.

- Incentives for efficient network usage are important, not only to prevent unnecessary reinforcements, but also to buy time for the necessary reinforcements. Applying appropriate incentives can offer good opportunities for customers to keep their bill low.

- Network tariffs have no relation with market prices. Sometimes they can even be conflicting with each other. This should be assessed as a necessity, not as a problem.

- P2P energy exchange is between market parties, customers, of which one of them is acting as a supplier. The DSO is not involved. There is no reason to consider this P2P exchange as a special case when applying network tariffs.

- Concerning tariffs, P2P only have significance when behind one single connection to the grid. In all other situations, without such a single connection, the regular tariffs have to be applied to each individually connected customer.

- Tariffs should be independent from suppliers, but also from the applications behind the meter. Special tariffs for special purposes do not make sense.

E.DSO

E.DSO is a European association gathering leading electricity distribution system operators (DSOs) shaping smart grids for your future.

www.edsoforsmartgrids.eu