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# The Future Role of DSOs

# A CEER Conclusions Paper

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**INFORMATION PAGE**

## Abstract

This document (C15-DSO-16-03) presents CEER's conclusions arising from our consultation on the future role of Distribution System Operators as well as our reflections on the 108 consultation responses and helpful input received at the CEER DSO workshop on the 30 March 2015. The document also includes discussion on areas whether further regulatory work is required.

## Target Audience

European Commission, energy suppliers, traders, gas/electricity customers, gas/electricity industry, consumer representative groups, network operators, Member States, academics and other interested parties.

## Keywords

Distribution System Operators, Network Regulation, Energy Innovation and convergence with ICT, Network Tariffs, 3rd Package implementation

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## Related Documents

CEER/ERGEG documents

- CEER advice on customer data management for better retail market functioning, Ref: C14-RMF-68-03, 19 March 2015
- CEER public consultation on the future role of DSOs, Ref: C14-DSO-09-03, 16 December 2014
- CEER advice on the quality of electricity and gas distribution services, Ref: C14-RMF-62-04, 21 October 2014
- Ensuring market and regulatory arrangements help deliver demand-side flexibility, Ref: C14-SDE-40-03, 26 June 2014
- CEER draft advice on data management for better retail market functioning, Ref: C13-RMF-57-04, 3 December 2013
- Status Review of Regulatory Aspects of Smart Metering, Ref: C13-RMF-54-05, 12 September 2013
- CEER status review on the transposition of unbundling requirements for DSOs and closed distribution system operators, Ref: C12-UR-47-03, 16 April 2013
- GGP on Retail Market Design, with a focus on supplier switching and billing, Ref: C11-RMF-39-03, 24 January 2012
- CEER advice on the take-off of a demand response electricity market with smart meters, Ref: C11-RMF-36-03, 1 December 2011
- GGP on Regulatory Aspects of Smart Metering for Electricity and Gas, Ref: E10-RMF-29-05, 8 February 2011
- ERGEG position paper on smart grids, Ref: E10-EQS-38-05, 10 June 2010

ACER documents

- Energy Regulation: a Bridge to 2025, Conclusions Paper, 19 September 2014

External documents

- EG3 Report, Smart Grid Task Force, Regulatory Recommendations for the Deployment of Flexibility, January 2015
- THINK Final Report Topic 11: Shift, Not Drift: Towards Active Demand Response and Beyond, June 2013
- THINK Final Report Topic 12: From Distribution Networks to Smart Distribution Systems: Rethinking the Regulation of European Electricity DSOs, June 2013

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# EXECUTIVE SUMMARY

## Background

In December 2014, CEER published a consultation document on the future role of the Distribution System Operators (DSOs). The consultation document recognised the significant changes happening at distribution level in both electricity and gas across Europe and the influence DSOs could have on the development of new markets and business models. Challenges in the power sector are considered to be higher than in gas due to the penetration of renewables and decentralised generation. This timely analysis grew out of regulators' holistic energy market proposals in the ACER conclusions paper: "Energy Regulation: A Bridge to 2025".[1]

The consultation closed on 28 February 2015. There were 108 responses. CEER held a Public Hearing on 30 March 2015 to discuss the key themes from the responses and around 120 people attended. We are pleased that our work has stimulated such interest amongst our stakeholders. This paper presents CEER's conclusions on the future role of the DSOs. Annex 2 provides an evaluation of the responses received from stakeholders.

## Objectives and Contents of the Document

Our conclusions demonstrate how European energy regulators will approach the issues facing DSOs, the expectations we have of DSOs, and the future work we plan to carry out. The present document follows the structure of the consultation document and presents CEER's conclusions in three chapters - (a) the role of the DSO and the need for regulatory oversight (b) the DSO-TSO relationship, and (c) economic signals and contractual arrangements. We also describe the next steps and how our work relates to the European Commission's plans.

## Brief Summary of the Conclusions

*The role of the DSO and the need for regulatory oversight*

As a starting point, we recognise that there are differences among European countries in the number, size and activity profile of DSOs, as well as in the technical characteristics of distribution systems and the challenges facing each network operator (especially variable RES electricity generation connected to distribution networks). This means that there is no single model for the role of the DSO.

In view of this, CEER has concluded that we need four overriding principles for DSOs and a framework that we believe is a useful tool to determine what DSOs should and should not do. These are: (1) DSOs must run their businesses in a way which reflects the reasonable expectations of network users and other stakeholders, including new entrants and new business models; (2) DSOs must act as neutral market facilitators in undertaking core functions; (3) DSOs must act in the public interest, taking account of the costs and benefits of different activities; and (4) Consumers own their data and that this should be safeguarded by DSOs when handling data.

[1] ACER Recommendation 5/2015, "Energy Regulation: a Bridge to 2025 conclusion paper", 19 September 2014

We propose to use a regulatory toolbox for NRAs to address a number of non-core activities, or "grey areas", where DSOs may participate in activities but where there are concerns. These grey areas include energy efficiency advice, the extent of involvement in flexibility and storage, and engagement with end consumers[2]. The more that DSOs are involved in non-core activities, the greater the need for regulatory control or unbundling. Moreover, the more the market is developed, the less DSOs are likely to be directly involved in carrying out the new activity.

Data management is a key area for the operation of existing and new markets. Consumers have the legal right to own their own data[3]. However, DSOs, who in most cases have access to data directly from smart meters, have a special responsibility to act impartially and to make available necessary data to other parties, while respecting data privacy legislation. CEER believes that DSOs should remain as neutral market facilitators but that this does not automatically confer the status of data management coordinator to a DSO.

There is also a need to differentiate between data which is required for technical purposes and data which has only commercial use and to have greater standardisation. We take the 3rd Package unbundling requirements as the minimum necessary noting that only 189 of the 2400 DSOs operating in Europe have been unbundled. Further consideration of the de minimis 100,000 consumer level may be necessary in the future because involvement in new activities could mean that there is greater impact on consumers and other markets than there would be when the DSO is just carrying out its core activities.

*The DSO-TSO relationship*

The relationship between the DSO and the TSO is a key area for change, particularly in the electricity sector. Higher levels of distribution-connected generation and the deployment of smart technologies will require DSOs to be responsive and innovative to ensure efficient network development and operation and to cooperate with TSOs.

This report identifies some of the key issues in the DSO-TSO relationship and establishes additional principles. There should be a general principle of subsidiarity, with decisions taken at the right time by the most appropriate entity. That entity must have the information it needs to make the decision. Changes could be made now to ensure adequate communication and information exchange between TSOs and DSOs, real time exchange of data, more co-ordinated planning and decision making, and greater transparency and communication with stakeholders.

*Economic signals and contractual arrangements*

CEER draws conclusions in a number of different areas - the incentives on DSOs to foster innovation, the form of regulation, the treatment of expenditure on flexible and smart solutions, the extent to which network tariffs may need to change to reflect demand side response at retail level, and contractual arrangements involving DSOs.

[2] Engagement with end consumers related to network operational issues such as connection agreements, interruption in delivery and safety could be regarded as core DSO activities depending on the specific situation in MS.

[3] see CEER paper: Data management for better retail market functioning, January 2015

We have concluded that DSOs need to be increasingly innovative and to explore smart and flexible solutions to running the grids of the future. Regulatory incentives should enable this behaviour and could encourage, where efficient and effective, controlled experimentation in pursuing benefits and value for money for current and future consumers. There are numerous examples of how innovation in energy networks has been stimulated. CEER will review such methods and their effectiveness with the aim of developing a toolbox of regulatory approaches to stimulate and facilitate innovation for whole system improvement and societal benefit.

The extent to which network tariffs should change and achieving fair network cost allocation in the light of Time of Use (ToU) offers in the retail market are complex issues. CEER will carry out more analysis on the potential benefits of different approaches including time of use charges, service related tariffs, capacity and consumption based charges, and discounts, together with any other options.

There are a number of contractual relationships the DSO will have, including connection agreements, contracts with 'prosumers' generating their own electricity, and contracts with flexibility providers. CEER is concerned about DSOs engaging with consumers directly given their monopoly power and the need to allow retail markets and new business models, including aggregators to offer their services to consumers. This concern was echoed in the "Bridge to 2025" conclusions paper, which highlighted the need to avoid incumbent players (notably DSOs) operating in ways which foreclose or distort the potentially competitive market in flexibility services.

This concern may, however, be less in some countries, particularly where DSOs do not operate metering and data management activities or where DSOs ownership unbundling is mandated by law. It is vital, however, that as new markets services develop and consumers understand more about their energy needs and become more active, energy regulators oversee arrangements to ensure there is a level playing field, that consumers are protected, and that new entrants can participate in the market.

CEER looks forward to cooperating with the European Commission and maintaining an open dialogue with energy stakeholders on these and related issues concerning the regulation of DSOs.

# 1 Introduction

There are important challenges facing electricity and gas markets as the Internal Energy Market (IEM) transitions in order to meet the needs of large shares of low carbon energy production and arrangements for the provision and procurement of flexible response. Distribution System Operators (DSOs) play an important role in a well-functioning IEM and as such can expect their role to change in the future.

The core role of the DSO has traditionally been well understood and defined. DSOs have been, and continue to be, responsible for the safe and secure operation and management of the distribution system. They are also responsible for network planning and development and in most Member States for investment decisions. DSOs have also had a core responsibility for data management (in most Member States) associated with the use of, and the management of losses on, the distribution system.

As such, the traditional role of the DSO has been broadly passive, with the only interactions being with suppliers as users of the distribution system, the Transmission System Operator (TSO) in terms of the interface with the transmission system and in some cases with consumers for safety or supply interruption reasons.

In addition, DSOs have an important role to play in ensuring system operation is secure and as a neutral market facilitator. In the coming years, there will be new opportunities for DSOs to deliver benefits to energy consumers and the energy sector in general. Retail liberalisation, demand-side response arrangements, new technology, and distributed electricity generation as well as gas distributed injection have meant that the role and culture of DSOs has changed over the last decade and will continue to change in the future.

While the basic functional model is broadly the same, there are significant differences between DSOs across Europe. In particular, their activity profile can vary significantly and there are still important differences in the degree to which different DSOs have been unbundled across Europe. There are also a number of structural and more specific differences such as size, voltage and pressure levels, degree of network automation and of penetration of distributed resources (distributed generation and storage, controllable loads, EV recharging stations).

As such, there is no ‘one size fits all’ model for the regulation of DSOs. In December 2014 CEER published a consultation paper addressing this and considering the different regulatory tools able to reflect the current differences in DSOs’ activity profiles, unbundling and structure and technical issues.

This document contains CEER’s conclusions on the role of the DSO from the perspective of European regulators. We explain our approach and the further work we intend to do.

# 2 The role of the DSO and the need for regulatory oversight

## 2.1 Principles, activities of the DSO and framework

*Principles*

There are differences in the number, size and activity profiles of DSOs as well as in the technical nature of distribution networks in Member States. In view of this, CEER has concluded that there should be four overriding principles for DSOs. These were largely supported by respondents to the consultation. CEER members will apply these principles in regulating DSOs:

1. DSOs must run their businesses in a way which reflects the reasonable expectations (e.g. firm security, high quality of supply, easy and non-discriminatory access to network, quick response to increases in demand, and transparent access to information – all efficiently) of network users and other stakeholders, including new entrants and new business models, now and in the future

2. DSOs must act as neutral market facilitators in undertaking core functions

3. DSOs must act in the public interest, taking account of the costs and benefits of different activities

4. Consumers own their data and that this should be safeguarded by DSOs when handling data

*Activities of the DSO*

CEER has developed a conceptual tool ('logical framework') that can be used by regulators and policy makers to analyse and determine the tasks a DSO might carry out in the future (both for electricity and for gas), given the country-specific situation. This was one of the recommendations listed in the 'Bridge to 2025' conclusions paper.

Existing European legislation, national legislation and indeed regulatory decisions may need to change to reflect the evolving role of the DSO or to enable new markets to develop. When there is the potential for competition to develop new activity areas, the default is either to prevent[4] DSOs from undertaking the activity completely, or allow the DSO to undertake the activity under special conditions imposed by the regulator. The reasoning behind this is twofold: firstly, competition is considered the best means of meeting customer demands in the most cost efficient way; secondly, the DSO has a low-risk profile due to its core monopoly activity and the fact its costs are normally covered by regulated tariffs.

DSOs may be allowed to perform activities even if there is a potential for competition under certain conditions or regulatory controls, if there is a clear, specific justification, possibly based on a cost/benefit analysis. Examples of these conditions include limiting the level of engagement by the DSO, limiting the period of involvement in the new activity and introducing transparency requirements.

[4] In this paper, when we use words such as "not allowed" this is from a regulatory perspective and does not necessarily reflect the current legislative position.

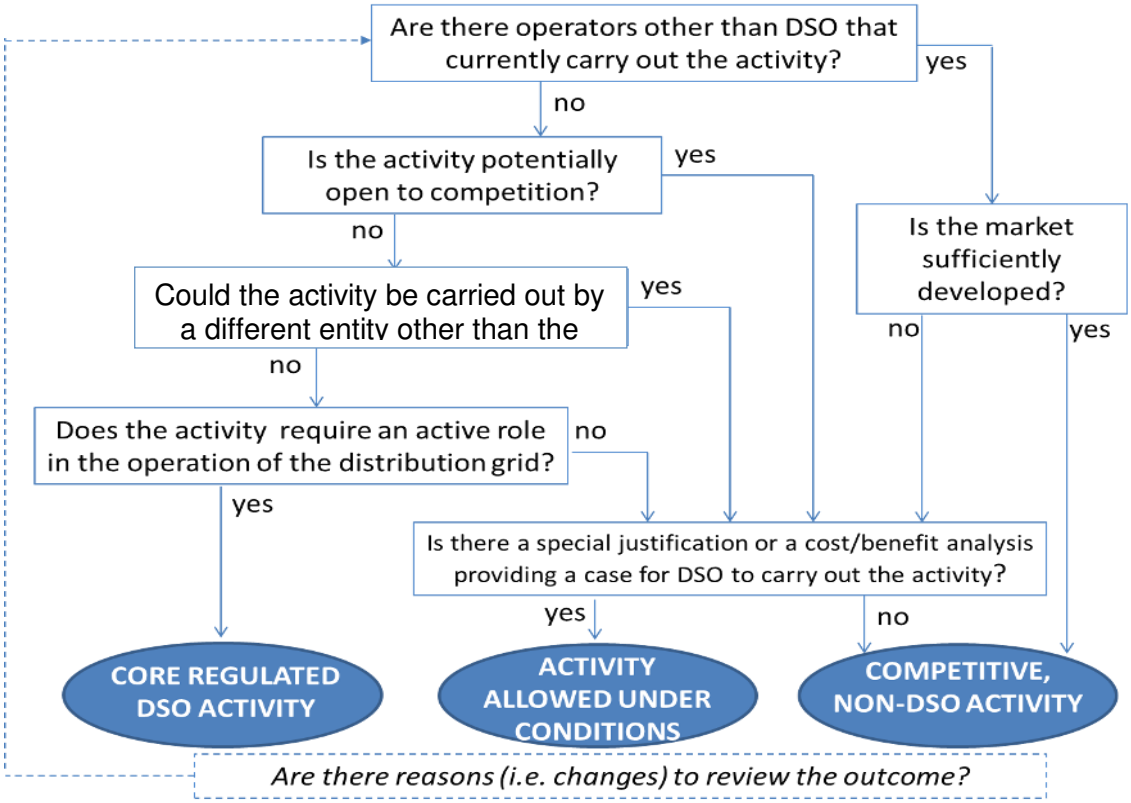
Participation of DSOs may also be beneficial in cases where a new market with potential benefits for consumers is relatively under-developed due to market failure and limited participation by the DSO might help "kick start" the development of that market e.g. by creating an economy of scale for new products related to that market.

This results in three main categories of DSO activities:

i. Core regulated activity
ii. Activity allowed under conditions and with justification
iii. Not allowed, competitive non-DSO activity

Categorising the range of DSO activities, from core to not allowed, helps provide some clarity about what DSOs should and shouldn't do.[5] CEER notes that for certain activities the answer depends upon the specific conditions within each Member State. In these instances, further assessment by the NRA would be required to determine under which conditions a DSO might be allowed to undertake the activity. Conditions set by NRAs should ensure that DSOs will not foreclose competition.

CEER also notes that different conditions exist in different Member States. Some countries have hundreds of DSOs; some only have one or two. Some DSOs have separate ownership to retail suppliers; some are part of the same group. In most countries, DSOs operate metering and roll out smart meters, in others they do not. In some countries, DSOs control data, in others they do not.




[5] Active role means any activity having a clear influence on the network rather than just being peripheral

However, even when activities are not carried out by the DSO, there could be still the possibility for the DSO to have some role related to its core activities providing it is non-discriminatory and does not impede competition i.e. a supervision role to avoid any negative impact on network operations.

This means that there is no single model for what a DSO can and cannot do, but rather a number of grey areas.

NRAs propose to use this logical framework as a conceptual tool to address grey areas where DSOs may participate in activities but where there are concerns. These grey areas include energy efficiency advice, the extent of involvement in flexibility and storage, and engagement with end consumers[6]. The more that DSOs are involved in non-core activities, the greater the need for regulatory control or unbundling. Moreover, the more the market is developed, the less DSOs are likely to be directly involved in carrying the new activity.

*What has changed as a result of the consultation*

Based on the input collected from the public consultation, CEER has adjusted, updated and clarified the application of the logical framework pictured above.

One of the main conclusions from the public consultation is that there is great support for using a logical framework to create more clarity about the activities of DSOs. However, there were two main concerns about the logical framework as displayed in the consultation document. First, the use of the wording 'new activity' in the first version (as published in the consultation paper) was not sufficiently clear. The application of the framework was alleged to create confusion in a situation where a DSO is already undertaking an activity, which is not defined as a core activity. This could imply that a new activity could never be allocated among core activities.

Second, respondents stated that it was unclear whether the application of the logical framework allows for the re-evaluation of activities through time. In response, CEER has revised the logical framework and considers it applicable through time, according to the evolution of normative and technological changes. This means that a certain activity could be categorised as a 'core DSO' or 'allowed under conditions' activity now but can be revaluated at a later point in time when the market is sufficiently developed and the results may evolve in 'competitive, non-DSO activity'[7]. This may be triggered by a change in circumstances or available information, meaning the activity can be categorised differently when applying the framework.

The updated framework reflects the idea that where competition in the market is able to result in an efficient outcome, there should be no DSO activity given the fact that the DSO is a regulated monopoly. This means that an activity potentially open for competition can only be considered a (regulated) core DSO activity when a number of conditions are fulfilled. Also, the core activity implies that it is strictly related to the operation of the grid, as suggested by

[6] Engagement with end consumers related to network operational issues such as connection agreements, interruption in delivery and safety could be regarded as core DSO activities depending on the specific situation in MS.

[7] It should be noted that it is more difficult for core DSO activities to evolve to competitive activities. It is however important to test the justification for natural monopolies, as some academic studies do, especially in the electricity sector, due to the emergence of new technologies.

some inputs collected during consultation. In all other cases – except under actual developed market competition – a cost/benefit analysis has to be carried out and/or special conditions have to apply in order to decide who the appropriate actor for the new activity is. If a DSO is allowed to perform the activity in a grey area, stricter regulatory control is required. For instance this could be a provisional mandate, until the market develops to actual competition.

The updated framework avoids using the term 'new activity', as this wording was not clear according to most consulted stakeholders. Another important modification made to the updated framework is the addition of a dynamic loop. This allows the activity to be re-evaluated. This has been signalled as necessary in some responses.

*Next Steps*

CEER considers that providing clarity on the activities performed by DSOs is of ongoing interest for all actors within the energy sector. As such, we plan to perform case studies on activities in areas are currently difficult to categorise and to share best practices among NRAs. We also invite stakeholders to identify and describe the new services and activities that DSOs are planning or are asked to do.

## 2.2 Data management

Data management is a key area for the operation of existing and new markets. Consumers have the legal right to control their own data. However, DSOs, who in most cases have data directly from smart meters, have a special responsibility to act impartially and to make available necessary data to other parties, while respecting data protection legislation and the fact that consumers own their own data

In our consultation paper, we explained the need to differentiate between technical data and commercial data and the need for a neutral body to act as data provider. CEER also said that there should be clear rules established for the collection, processing, storage and transmission of data and appropriate privacy security and protection measures in place.

The consultation responses explained that trying to define data as either commercial or technical is not useful because in some cases the same data might have both technical and commercial applications. Respondents noted that it would be more useful to categorise data based on who is using it and for what purpose. The CEER Advice paper on Customer Data Management for Better Retail Functioning[8] published in March 2015 outlines a useful distinction between data types[9] from a retail perspective, considering domestic and business consumers. It is important to note that the Customer Data Management Advice does not consider other distribution network users like generation or storage units and EV recharging stations. The paper notes the standardisation of data formats and systems for data exchange can be beneficial, essential for transparency, but may be subject to cost benefit analysis. The paper recognises the need to have as a minimum standardised interfaces and information exchange at DSO boundaries between customer and market participants.

[8] CEER Advice on Customer Data Management for Better Retail Market Functioning

[9] Different data types considered in the CEER advice are: Point of delivery identification data; User and contract data; Consumption data (C14-RMF-68-03, paragraph 1.2)

*What has changed as a result of the consultation*

CEER recognises the need for greater standardisation of data, and strong data protection measures. We will work with other relevant EU bodies to advance this, taking into consideration existing CEN and CENELEC smart meter data standards[10], and data protection requirements (including those of the European Data Protection Supervisor[11]) and the ongoing work of Expert Group 2 of the EU Smart Grid Task Force[12]). The definition of commercial and technical data continues to remain problematic. CEER will review this further, with reference to the principles for DSOs, the previous work we have carried out in relation to final domestic and industrial customers and with additional consideration given to generation and storage customers.

CEER remains of the view that there is a need for a neutral data coordinator or data hub to manage and provide access to data, and that this role can be provided by a number of different parties as is already the case in some EU countries. Some responses to our consultation suggested that a role could exist for the DSO to act as this neutral data coordinator. CEER believes that DSOs should remain as neutral market facilitators but that this does not automatically confer the status of data management coordinator to a DSO.

The scale and structures of DSOs in different Member States continue to dictate that the role of the DSO in data management may be different from country to country. There is, however, a need for the development of a set of guiding principles. These would inform the decisions of the relevant national authorities in overseeing or determining the extent to which DSOs can manage data, and the appropriate mechanisms for making decisions on availability of this data. The development of such guiding principles should involve NRAs and DSOs at a European level but such principles should not hinder the implementation of national requirements in relation to customer data protection.

*Next steps*

CEER will review further and collaborate with relevant parties to develop greater guidance on data and data reporting standardisation. CEER will also provide further guidance and information on the types of data and parties responsible for coordination of such data as well as the range of neutral market facilitator models. Finally, CEER will review further the ability of DSOs to engage in work relevant to data management and wider issues concerning DSO operational roles. We note the recent work of Expert Group 3 of the European Commission's Smart Grid Task Force in this area.

[10] CENELEC –Smart metering; CEN – Gas smart meter recommendations

[11] https://secure.edps.europa.eu/EDPSWEB/edps/EDPS/Dataprotection

[12] In October 2014, the Commission adopted a Recommendation on the Data Protection Impact Assessment Template (DPIA Template), which is in line with the forthcoming General Data Protection Regulation, anticipating the legal obligations arising therein. A two year test phase for the application of the template started at the beginning of March 2015 and the Template could be further fine-tuned to enhance its efficiency and user-friendliness at the end of 2016. The template is complemented by identification of Best Available Techniques (BAT) to mitigate security and privacy risks inherent to each of the smart meter functionalities in Recommendation 2012/148 on the roll-out of smart meters. This work is expected to generate a fully-fledged authoritative BAT Reference document by 2016 identifying the most suitable techniques for security in smart grids metering.

## 2.3 Unbundling rules and the *de minimis* threshold

In the changing energy sector with new markets and services, the consultation document stated that there might be a need for further regulatory and legal requirements on DSOs with a vertically integrated undertaking (VIU) in addition to the current unbundling rules. If the DSO takes on new roles, sufficient controls and structural prerequisites will be required to ensure that DSOs do not use access to data to gain commercial advantage or create market distortion.

In our consultation paper, full ownership unbundling is considered to be the strongest model for the independence of the DSO. But other models can also ensure transparent and independent decision making and equal treatment of all DSO stakeholders, as long as sufficient ring-fencing, regulatory monitoring and oversight are in place.

Current unbundling rules are applied with a *de minimis* threshold of 100,000 consumers for DSOs. CEER stated in the consultation document that a consideration of this threshold might be necessary in the future.

*What has changed as a result of the consultation*

We note that a number of consultation responses (mainly from DSOs) stated that the current unbundling requirements of the 3rd Package, in particular "debranding" (brand separation between DSO and commercial activities within the same VIU), were appropriate to ensure DSOs were sufficiently independent from a VIU. These responses made it clear that no further unbundling was required to ensure transparent and independent decision making and equal treatment of all DSO stakeholders.

However, from the regulators' point of view, these requirements need to be seen as a minimum standard for unbundling rules across Europe. We note that only 189 of the 2400 DSOs operating in Europe have been unbundled.

In order to achieve this, the minimum level of standard must be implemented in every Member State equally for those DSOs with activities in the grey area. Member States should be able to decide themselves on how to implement ownership unbundling for DSOs (as in the Netherlands). This should allow unbundling requirements to correspond with the breadth of the future role of the DSO.

*Next steps*

For the future, we believe DSOs should be included to a greater extent in the legal and management unbundling regime (Art. 26 para. 1-3 EC 2009/72 and /73) to get a high common standard of independence from VIUs in operating the distribution network. It is also necessary to adopt a proportionate approach when considering the *de minimis* threshold to ensure that no DSOs operating in marginal situations (such as off-grid islands) face unreasonable expenses to operate economically. We suggest adapting the *de minimis* threshold in order to have, as a maximum, a very small fraction of the total number of customers in each Member State connected to distribution systems operated by DSOs below the *de minimis* threshold. We consider that this approach would provide more flexibility in examining 'special cases'. We recognise that adjusting the *de minimis* threshold is a matter for each Member State and the European Commission, but from a regulatory perspective we

believe that a more economic approach is required.

In recognition of the different commercial capabilities of differently sized DSOs, only very small DSOs should have the possibility of being a *de minimis* DSO. A possible new approach to consider would be to recognise only those DSOs with a balance sheet total and net turnover of less than an agreed amount for distribution system operation as *de minimis* DSOs. Care would need to be taken to avoid providing an incentive to split larger entities into smaller ones to come within the threshold. Adapting the *de minimis* rule to the specific structural conditions existing in each Member State could help in ensuring that only truly marginal situations are covered by this rule.

# 3 DSO-TSO Relationship and responsibilities

The relationship between the DSO and the TSO is a key area for change in many Member States. Higher levels of distribution-connected generation and the deployment of smart technologies will require DSOs to be responsive and innovative to ensure efficient network development and operation and to cooperate with TSOs.

Traditionally, the TSO has been responsible for making system decisions. These include planning and development, balancing and significant decisions on constraints. Increasing amounts of distributed generation mean that DSOs are likely to experience potential problems. Furthermore, the potential offered by flexibility and electricity storage could result in the evolution of a local system balancing role (but not to be confused with TSO load-frequency control) for DSOs. This has already started to happen in some Member States where the DSO is taking more responsibility.

In our consultation paper, we identified some of the key issues in the DSO-TSO relationship and established additional principles -

i. **A whole system approach** has to be taken in all areas to avoid inefficiencies, especially in network planning and investment, integration of demand side response and distributed generation, and regulation. This will help to foster TSO and DSO innovation.

ii. **Greater coordination** is needed between DSO and TSO in relation to procurement of system services, operational and network planning/development/ investment decisions and also in developing greater whole system security including cyber security.

iii. **Exchange of data** between network operators to help coordination and optimisation seems helpful, in proven cases in real time or close to real time (especially for security issues that arise when the level of variable RES penetration in distributed generation is very high).

iv. **Use of flexibility** (in markets like balancing and directly) of decentralised demand and generation resources.

v. **Fairer cost sharing** should prevent the risk of creating perverse incentives for DSOs to avoid reinforcement, resulting in higher costs (ultimately for customers), and vice versa.

*What has changed as a result of the consultation*

The consultation responses emphasised that more general guidelines and principles should be defined at European level, while more detailed regulation should be developed at a national level. In our consultation, we noted that existing circumstances in each Member State differ and, therefore, no one size fits all model exists. Having reviewed the consultation responses, we still consider that national specificity must be taken into account. For example, in some countries DSOs are already actively managing their grid, providing forecasts for the TSOs, differences in operated voltage levels, communication systems, etc. CEER therefore

considers that detailed regulations should be set at a national level, taking into account national circumstances, while high level principles should be set at the European level. One of the key points made by those responding to our consultation was the need to look at the DSO-TSO relationship from a system perspective. We agree with this and have incorporated this in our future work plan.

Given the changing relationship between DSOs and TSOs, we think it is important that there is effective communication and engagement between the organisations representing these parties. The ongoing Energy Union process initiated by the European Commission will address governance issues and the DSO input to processes could be an element there. We note that in recent months DSOs and TSOs have been communicating through an informal platform. We will give consideration to any timely outcomes of this process in finalising our regulatory proposals in this area.

Despite national differences, we also consider that DSOs should be required to develop and publish long term plans for their networks, engaging effectively with their customers and wider stakeholders including new entrants and new business models in this process. This would inform the Ten Year Network Development Plans, and better system planning, with NRAs overseeing the development and publication of these plans, building on the existing requirements on DSOs in Article 25(7) of the Electricity Directive. There may also be a need to review existing governance of DSOs and TSOs.

CEER notes that such a requirement would need to be proportionate and avoid placing onerous requirements on those small DSOs that do not have a direct link to the TSO.

*Next steps*

CEER considers the relationship between the DSO and TSO an important area and will continue work in this area by exploring and analysing:

- The responsibilities which fall between the DSO and TSO on a European level in the context of flexibility. This includes considering respective responsibilities with regard to operational security and ensuring the proper functioning of the energy market (e.g. treatment of distributed generation).
- Whether there is a need to achieve a clear cost separation between the DSO and TSO considering whole system issues such as congestion management and avoided reinforcement.
- The role of the DSO in balancing and other ancillary services (voltage stability), including what information provisions should be mandated to DSOs by TSOs (e.g. real time data).
- The need for an established platform for optimised exchange and cooperation between DSOs and TSOs.

We intend to publish our conclusions on this during 2016. We will look at both electricity and gas systems, and the potential need for a holistic view encompassing electricity, gas and heat. We will also discuss with the European Commission how to strike the best balance between action by NRAs and European-wide measures.

# 4 Economic signals for DSOs and Customers

## 4.1 Regulatory incentives and innovation

Energy distribution activity faces new challenges, particularly (but not exclusively) in the electricity sector. The complexity of flows and relations between stakeholders are increasing and new activities may have to be performed by DSOs. For example, the emergence of 'prosumers' (consumers with their own generation units, even at small scale) changes the direction of financial and physical flows. This will increase considerably the complexity of the flows and will be a challenge in terms of the distribution grid management.

The new challenges can be addressed, at least in part, by flexible solutions both in the demand and in the supply side that have to be implemented without harming competitive processes. The DSO also needs to use available technologies and procedures capable to manage the direct interaction and communication among all grid users, i.e. to deploy smart grids.

The current regulatory frameworks applied in many countries may not fully address these new challenges. This concern was raised in the conclusion paper "The Bridge to 2025" published by ACER and reinforced during our public consultation on the role of the DSO. There are different ways in which regulators are likely to approach the issues depending on the context and the nature of the industry in each Member State.

Innovative investment related to smart girds is mostly in services and technology. This means with operating expenditure rather than capital expenditure. The investment in smart grids can avoid new investments in conventional assets, i.e. "copper and iron" investments. So, smart grid investments may increase the weight of Opex in the cost structure of the distribution activity.

This raises two issues; first, there is often a rate of return on capital expenditure but not on operating expenditure. Second, the payback period for 'smart' or 'innovative' investment may be different.

This type of investment is still characterised as having a shorter term lifespan than traditional investments (e.g. in lines). This does not fit with traditional regulatory payback periods, and can lead to a serious time lag between the investment costs and its recovery through tariffs.

It is necessary to develop regulatory schemes specifically tuned to foster innovation and to support the changing role of the DSO. We seek to encourage DSOs to include innovative options when assessing the optimal development of the system. We also seek to encourage DSOs to explore the latest innovations to increase the options being considered as part of developments. Several measures to promote smart grids and innovation have been referred to during the public consultation. These include: i) reducing the cost recovery period, and more specifically to take into consideration a shorter depreciation period; ii) taking into account the degree of risk in innovative investments, due to new technology or other factors; and iii) creating specific funds or incentives where necessary to promote the development of innovative investments which have the potential to deliver benefits for current of future consumers. The regulatory regime should not favour any particular type of technology but should focus on the potential benefits for consumers.

We also draw a distinction between experimentation of innovative projects which may bring benefits to consumers now and in the future and the roll-out of innovation which has already been tested.

Nevertheless, it is also important to remember that more innovation-focused regulation should not harm other regulatory objectives and the innovation risk cannot be wholly transferred to the system. Regulators generally want to reduce risk, but that does not mean that there will be no risk for the industry.

In the case of the natural gas sector, some of the innovative and organisational challenges that appear in the electricity sector are still not priorities. In that case, the introduction of more innovative approaches may have to be done more carefully, as emphasised by some stakeholders during our consultation.

Any specific measures should be based on a cost benefit analysis to prevent inefficient economic decisions in the short and in the long term. Innovation should sit alongside more conventional investment in order to ensure high quality and reliability of service.

Within this new organisational and technological framework, regulatory schemes that do not differentiate between Capex and Opex, i.e. "Totex"[13] approaches, may be more effective. A Totex approach allows the DSO to adjust investment strategies to the targets specified by the regulators in terms of cost efficiency and outputs. However, it is important that this type of approach does not jeopardise economic efficiency, for example, through the creation of monopoly rents, due to an excessive return on assets. It is important for network companies to have good regulatory accounting systems to be able to track expenditure across different cost categories, activities and businesses.

Outside the traditional type of regulation, the implementation of output-based regulation can also be seen as an effective way to promote efficient investment and innovation to the benefit of consumers and to tackle the challenges of the DSO, particularly in a more flexible and competitive environment. We note, however, that it can be difficult to set output targets accurately and this needs to be carefully assessed.

The choice of the best regulatory approach will depend on the characteristics of the DSO, such as the size and structure of the company, the maturity of the distribution business, the cost efficiency already achieved by the company and characteristics of the distribution networks (level of technology/automation, topology of the network, overhead or underground lines, and DG penetration).

As far as smart grid incentives are concerned, CEER has concluded[14] that the way forward is to develop guidelines of good practice on incentives schemes, which can for instance include output-based mechanisms. The main objective of these guidelines will be to share the knowledge of NRAs in the promotion of regulatory environments that allows the DSOs to

[13] Some NRAs simply define a Totex approach as a system which does not treat cost categories (Opex and Capex) differently. The system usually accounts for an adequate rate of return on a regulated asset base (RAB) and depreciation (the sum of both accounting for Opex and Capex). A regulatory formula is then applied on the total sum of the components (and not just on one of the sub-items). Such a system avoids costs that can be shifted between the Opex and Capex blocks. Other approaches may involve providing the network operator with a budget and let it decide its' optimal spend on Opex and Capex by rewarding the most efficient solution.

[14] "Position paper on Smart Grids (E10-EQS-38-05)" and "The Bridge to 2025"

weigh up the risks and rewards related to innovative investment and properly decide whether to invest in "system intelligence" and not only in "copper and iron".

With respect to the application of an output-oriented approach to drive innovation and smart grid investments, the pros and cons should be carefully considered. Factors to consider include (i) the requirements needed for an effective application of the methodology; (ii) the difficulty in the selection and measurement of outputs related with "innovation and intelligence", as well as in the calibration of the regulatory formula; (iii) the relevant time horizon needed between the investment decision and the achievement of the targets; and (iv) the need to avoid overlapping of other economic signals that are present due to existing regulatory mechanisms or wider incentives.

*What has changed as a result of the consultation*

With this consultation, it was possible to get a greater perspective about how stakeholders felt about the type of risks attached to innovative investments. Some claim these are uncontrollable such as regulatory and technological risks. These incremental risks were stressed especially in those countries where the regulatory framework does not imply the sharing of this risk between DSOs and end consumers.

Despite the development of different types of mechanisms used by NRAs, there is still a high level of risk associated with smart grid investment perceived by DSOs. CEER wishes to reduce risk where it can ultimately disadvantage consumers. We recognise that regulation should allow a reasonable return for the risk that a DSO has in performing its tasks. NRAs will consider this aspect in the design of any regulatory incentives to promote innovation in distribution systems. CEER considers that regulation in general aims to create a balance between the interests of future and current consumers.

CEER notes that in many countries, with a range of different regulatory approaches (including output-based incentives for quality of supply), DSOs are already actively undertaking innovative and non-conventional investments. Examples include remote recovery and automated network management.

These responses allowed CEER to consolidate its original view that regulation needs to facilitate and foster investments in smart distribution systems. Responses also mentioned number of additional problems, namely the time lag between investment cost and its recovery through tariffs.

Contrary to what was expected, stakeholders seem to be less in favour of output-based regulation. This may be because it can be hard to find meaningful, measurable and controllable outputs. There are other measurements that can have a greater impact when it comes to incentivising smart grids investments from DSOs as there are a number of problems that will still remain with the implementation of output-based regulation. We have recognised this in our conclusions.

*Next steps*

Keeping in mind their main objectives related to the interests of consumers and the promotion of economic efficiency, individual NRAs will seek to avoid undue bias towards capital investment over operating expenditure, building on existing requirements in the 3rd Package and the Energy Efficiency Directive. They will ensure that regulatory frameworks

promote innovation and flexible solutions where they benefit current and future consumers and not overlap with other economic signals already present. CEER will consider the need for further guidance in any of these areas.

## 4.2 Network tariffs

In our consultation, we discussed the relevant factors to take into account when considering the appropriate structure of network tariffs. We discussed the extent to which network tariffs should incentivise more efficient use of the network and the fact that they might need to change to reflect demand side response at retail level. We noted that the falling electricity consumption of some customers (as energy efficiency improves and levels of self-consumption increase) could mean that some DSOs are unable to recover the allowed revenues set by regulators.

Although existing tariff structures vary across Member States, a majority of Member States use consumption based tariffs to allow DSOs to recover 50% or more of their allowed revenues. Some DSOs are concerned that this consumption element of the network tariff may be disproportionately high (compared with the capacity element).

Network charges should be cost reflective, and as network costs are mainly capacity driven a future DSO tariff structure may be used to encourage customers to reduce consumption at local peak times, in order to increase an efficient and economic use of the network. However, we also need to ensure that the tariff structure does not contradict the aim of efficient price signals at retail level to encourage customers to reduce their consumption at peak times. This would encourage efficient and economic use of the network and of energy generally.

Certain tariff structures are better in that they provide a strong economic signal to the customer to reduce their consumption at peak times. However, certain tariff structures may also increase the risk to DSOs of recovering their costs, as customers' consumption patterns change. This could mean that the basis for setting DSO tariffs needs to be updated regularly or that the tariff structures themselves need to be flexible enough to take changes in consumption patterns into account.

As well as providing an economic signal to customers and enabling DSOs to recover their costs, DSO tariffs also need to be compatible with retail competition and may need to change to reflect demand side response at retail level. We consider that, where distribution network ToU tariffs are introduced (as they already have been in some Member States), regulators need to ensure that they are implemented in a simple and effective way. In particular, regulators will need to consider further how these tariffs interact with system energy prices and affect price stability, as well as how such tariffs should be regulated and updated in order to adapt to change.

*What has changed as a result of the consultation*

There was a wide range of views on tariff structures in the consultation responses.

The strength of the economic signal to customers and certainty of cost recovery for DSOs were considered relevant by the majority of respondents. However, a number of respondents noted that allowing consumption assumptions in the tariff model to be updated to provide DSOs with greater certainty of cost recovery would make prices less stable. Other

respondents pointed out that simplicity for customers should also be taken into consideration, particular with regard to conflicting network and system energy price signals. Some pointed out that there was a difference between peak periods at network level and at market and local level.

The responses reinforced our view that there are trade-offs between a number of factors, such as cost-reflectivity, simplicity and predictability. The wide range of views expressed, highlighted the need for further work and detailed analysis of the different options for network tariff structures. It is also clear there is no consensus on the extent to which network tariffs should reflect time of use retail prices. Respondents largely emphasised that the two are separate price signals, influenced by different (and potentially conflicting) factors. We will take into account any analysis carried out by the industry, academia or other parties.

*Next steps*

We have reflected on the consultation responses carefully and it is clear that this is a complex area. We also need to distinguish clearly between price signals at retail level and network tariffs. CEER therefore intends to carry out more work to analyse the benefits of different approaches to both use of system and connection charges (regulated access tariffs) and to ensure that network tariffs are not a barrier to demand side response.

This will include analysis of (a) whether there should be a time of use element in distribution network tariffs and how this can be coordinated with the other parts of the final price for consumers; (b) whether charges should be based more on consumption or capacity and whether charges should reflect different services offered by distribution networks; (c) whether the special behaviour of some network users could be incentivised by financial signals, for example where suppliers or aggregators reduce the demand on the network; and (d) any other options.

A consideration in all this should be the need for a coherent system-wide approach and the benefit versus the cost of changing or administering the charging structure, together with the need for simplicity in any consumer facing signals. We will take into account any relevant research into consumer behaviour. We expect this work to take some time but we will start in 2015.

### 4.3 Contractual arrangements and relationships between DSOs and consumers

In our consultation document, we sought to clarify the role and responsibilities of the DSO in procuring flexibility or demand side response. The principles and the logical framework from Chapter 1 should be applied, acknowledging the value of flexibility to DSOs as well as the need to ensure a level playing field for all parties.

It is not possible to describe regulatory details for each contract or situation because of the many different forms of flexibility contracts and situations. Nevertheless, in Table 2 in the consultation document, we sought to give a preliminary indication of a potential regulatory view on the contractual relationships for each type of DSR contract, in relation with the logical framework possible outcomes.

This is an area where much depends on the particular circumstances of each Member State. Therefore, activities which may be allowed under conditions in some Member States would not be allowed in others. We are concerned about DSOs engaging directly with consumers directly given their monopoly power and the need to allow retail markets and new business models (including aggregators) to offer services to customers. We note, however, that this concern may not be as great in some countries, particularly where DSOs do not operate metering and data management activities or where DSOs ownership unbundling is mandated by law.

The arguments for direct contracts might include a consumer who generates their own electricity to the extent that they do not need a retail supplier, or a consumer who wishes to procure their own energy on the wholesale market without using a third party intermediary.

As we stated in the consultation, different conditions exist in current activity profiles and unbundling structures of DSOs in different Member States. As a result, the application of the logical framework (in Chapter 1) for each potential DSO activity may lead to different results in different Member States.

In some Member States, circumstances may be such that DSO contracts with domestic customers would not be deemed appropriate by the NRA (according to the framework) and would therefore be classified as a competitive, non-DSO activity. In other Member States, particularly those where the DSOs do not have a role in the smart meter roll-out or data management or where there are other arrangements, these contracts may be allowed under appropriate regulatory conditions. These conditions would need to take account of the risk of consumers being confused by offers from the DSO, which could affect how they engage in the retail market.

We do not yet know how the markets for flexibility will develop. It is vital, however, that as new market services develop, and as customers understand more about their energy needs and become more active, regulators oversee arrangements and ensure there is a level playing field and that consumers are protected and new entrants can participate in the market.

*What has changed as a result of the consultation*

We note that a number of stakeholders thought the view presented in Table 2 of the consultation paper was unclear. This was because a number of contractual relationships were categorised as *either* allowed under conditions (categories II and III) *or* not allowed (categories IV and V).

Table 2 in the consultation paper was intended to give a preliminary indication of the regulatory view of the types of DSR contract a DSO may be able to have with different customers, in accordance with the principles and logical framework described in Chapter 1. We still consider that these principles apply.

As the table was related to the logical framework, the categorisation of each relationship was not intended to be definitive. As with the logical framework, we have tuned and improved the table following the public consultation and include it below. Again, it is important to note that differences in circumstances in each Member State will inevitably lead to differences in the regulatory arrangements for contracts involving the DSO as a buyer of flexibility, at least in the shorter term.

We have developed a new table that should give a clear view on the link between the type of contractual relationship and framework categories.

| Contractual relationship | Customer type | Category | Notes |
|---|---|---|---|
| Implicit via Connection Agreement DSO-Customer or grid tariff | Domestic Customer | Core Activity *or* Activity allowed under conditions | (1) |
| | Commercial and Industrial Customer | Core activity *or* Activity allowed under conditions | |
| | Distributed Generation Customer | Core activity *or* Activity allowed under conditions | (1) |
| Explicit additional and commercial DSR contract DSO-Customer[15] | Domestic Customer | Activity allowed under conditions *or* Competitive, non DSO activity | (2) |
| | Commercial and Industrial Customer | Activity allowed under conditions *or* Competitive, non DSO activity | (2) |
| | Distributed Generation Customer | Activity allowed under conditions | |
| Explicit Additional and commercial contract with customer via aggregator | All Customers | Activity allowed under conditions | |
| Explicit Additional and commercial DSR contract with customer via supplier | All Customers | Activity allowed under conditions | |

Notes:
(1) Static time of use tariffs would be categorised as 'core activity'
(2) This would be 'allowed under conditions' particularly in Members States where DSOs do not carry out data management activities

*Next steps*

TSOs and DSOs should be allowed in certain circumstances to have bilateral flexibility contracts with customers in a geographical area, where it is efficient to do so and as long as this does not prevent a flexibility market in the future to develop, which is able to deliver flexibility services in that area.

[15] The conditions for DSO-customer contracts should not hinder the maximum competitiveness in providing services.

CEER will carry out work to develop a toolbox for regulating flexibility contracts involving DSOs. We consider that flexibility should be procured in a non-discriminatory, market-based, transparent and efficient way.

### 4.4 Innovation and ICT

Through the CEER Public Hearing on the Future Role of the DSO and from several of the responses received to the consultation paper, we have noted that the area of information communication technology (ICT) and new and innovative methods of providing enhanced services to both energy customers and network operators are becoming important aspects to consider in the development of regulation of energy networks and markets. Cyber security was also identified as an important area to consider further in addition to the data management and protection issues discussed in Chapters 1 (as for data management) and 2 (as for data exchange with TSOs).

CEER commits to working further with other stakeholders such as DG CNECT, DG ENER, BEREC and ENISA on this to ensure that ICT developments that could enhance DSO operations and services are enabled.

As the importance of information communication technology (ICT) and telecommunications infrastructure in our energy systems increases, new interdependencies and vulnerabilities are emerging and overall complexity is rising. Previous standalone systems with proprietary protocols and isolated operations are transformed into interconnected, computerised networks with an increasing number of entry-points. In light of these developments, the traditional notion of security through isolation (“air gap approach”) seems ever more difficult to ensure and the risk to falling prey to sophisticated and complex cyber-attacks becomes more prevalent. CEER commits to working further with stakeholders on both a European and national level by driving initiatives to tackle systemic cyber-risks and to augment the protection of safety-critical control and processing systems by enabling effective collaboration processes.

The main role which requires further consideration by CEER is to what extent DSOs should be facilitated in their ability to innovate and integrate new services and facilitate new services by third parties. Also of consideration is how regulators should help facilitate such innovation. There are numerous examples of how innovation in energy networks has been stimulated and as requested by respondents to the consultation paper, CEER commits to reviewing such methods and their effectiveness with the aim of developing a toolbox of regulatory approaches to stimulate and facilitate innovation for whole system improvement and societal benefit.

# 5 Overall conclusions and road map for CEER work on DSOs and related issues

## 5.1 Actions and timetable

The role of the DSO is clearly changing and this document shows how we as regulators will respond to this. However, the pace and precise nature of this change is unclear. Technological change is happening rapidly and new markets and business models are starting to develop. Many consumers will soon have smart meters. The roadmap for DSOs will therefore need to continue to evolve. As regulators, we will monitor developments and engage with a wide range of stakeholders, including those outside the traditional energy sector, to ensure we continue to set the right regulatory framework for electricity and gas. We will apply the principles, framework and general policy in these conclusions.

Our conclusions contain some immediate actions we propose to take to develop our thinking on key issues for electricity and gas. We will:

i. conduct case studies of difficult grey areas of DSO activity and share best practice amongst regulators

ii. carry out further work and produce guidance on standardisation of data reporting

iii. provide further guidance and information on the types of data and data co-ordinator and the range of neutral market facilitator models

iv. review DSO roles in relation to data

v. carry out further work and analysis on the key aspects of the future DSO-TSO relationship for electricity and gas, including the advantages of taking an integrated approach to electricity, gas and heating sources

vi. develop guidelines of good practice on incentive schemes

vii. analyse the benefits of different types of distribution use of system and connection charges in the context of time of use retail tariffs

viii. develop a regulatory toolbox for flexibility contracts

This work will probably span 2015-2017. We plan to start work as soon as we can, given the importance of addressing these issues in the interests of current and future consumers.

## 5.2 Relationship with other CEER work

There are already references in these conclusions to other work we have conducted in relevant areas. We worked very closely with ACER on its Bridge to 2025 publication last year and our conclusions on the role of the DSO address some of the conclusions in that document.

Our conclusions also reflect previous work on smart grids, flexibility and unbundling. More recently, early in 2015 CEER published a paper on data management for better retail market functioning and this fed into our thinking in the present paper.

In terms of the future, we are working with ACER on how we are collectively addressing the significant potential of increasing flexibility across the energy value chain. In Q3 2015, we will publish a position paper on well-functioning retail markets. For 2016, we have included work referred to in our consultation on the CEER 2016 work programme. We look forward to hearing stakeholder views on this programme.

### 5.3 Relationship with the European Commission's Electricity Market Design and Retail Market Communications and its Smart Grid Task Force work

The European Commission is expected to publish a package of energy market documents in July 2015. CEER has been engaging with the European Commission on DSO-related issues, including those analysed in this present work. Regulators have also actively participated in the European Commission's Smart Grids Task Force (involving regulators, consumer groups and industry) which has been working on similar issues over the last year or so.

There is clear read across from CEER's work on DSOs and future market design (deriving from the "Bridge to 2025" proposals) to that of the European Commission. Our conclusions in this document will, we hope, help the European Commission in its thinking on the European energy market framework. Regulators remain committed to following up the issues identified in this conclusions paper and to engaging with the European Commission in its next steps as regards the future role of DSOs, flexibility and other issues. CEER looks forward to contributing to the Commission's consultation and to further developing regulators' thinking on these questions.

## Annex 1 – List of abbreviations

| Term | Definition |
|---|---|
| ACER | Agency for Cooperation of Energy Regulators |
| AFID | Alternative Fuels Infrastructure Directive |
| CAPEX | Capital Expenditure |
| CEER | Council of European Energy Regulators |
| DER | Distributed Energy Resource |
| DG | Distributed Generation |
| DSO | Distribution System Operator |
| DSR | Demand-side response |
| ESCO | Energy Service Company |
| EV | Electric Vehicle |
| GGP | Guidelines of Good Practice |
| HV | High Voltage |
| IEM | Internal Energy Market |
| LV | Low Voltage |
| MV | Medium Voltage |
| NC | Network Code |
| NRA | National Regulatory Authority |
| OPEX | Operational Expenditure |
| PV | Photovoltaic |
| RES | Renewable Energy Source |
| SME | Small-Medium Enterprise |
| TOTEX | Total Expenditure |
| ToU | Time of Use |
| TSO | Transmission System Operator |
| VIU | Vertically Integrated Undertakings |

## Annex 2 – Evaluation of responses to the CEER Public Consultation on the Future Role of the DSO

### CHAPTER 1

| Public consultation question | Summary of responses | CEER Position |
|---|---|---|
| **Question 1: Do you agree with these three core principles?** | Almost all respondents agree with the core principles as presented in the consultation document. Some of the views expressed provided the following input:<br>• The first (headline) principle should be that DSOs should at all times act to improve consumer welfare.<br>• Quality and security of supply should be in the core principles<br>• The needs of future users and stakeholders should be recognised<br>• DSOs responding to the public consultation agree in general with the principles, but with the addition that often DSOs see an active role for themselves in promoting the energy transition in a broad range of activities ('DSO should whatever is asked for by customers and market parties'). Neutral is not passive.<br>• DSO should have clear separation between core/monopoly and competitive activities<br>• Guidance by the NRA is needed in overlapping situations with commercial activities (for example, ICT for system security while it can be applied to telecommunication grids).<br>• There should be no 'one size fits all' model, special circumstances should be taken into account.<br>• Several respondents mention that it is up to the NRAs to arbitrate between requirements of all (heterogeneous) network users, as their interests can conflict.<br>• Full implementation of the 3rd Package must be enforced where it has not yet been implemented. | We have maintained the three principles, while adding in a reference to the future and new entrants and business models. A fourth principle has been added specifying that the consumer owns their data and that this should be safeguarded by DSOs when handling data. |

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| **Question 2: What Challenges would new forms of stakeholders (e.g. community or municipal energy schemes and ESCOs) bring to DSOs and to existing approaches?** | There is **wide agreement** among respondents that there is a need for the emerging role of the DSO and of other players in the energy system to be clearly established and defined by regulators.<br>The majority of DSOs responding to this question felt that these were the main challenges:<br><br>• **Increase in stakeholder pluralism** – This is both with respect to typology and size.<br><br>• **Increase in information exchange** – The level of information being shared will increase and this increases operational costs.<br><br>• **Conflicting targets** – Respondents indicated the need for transparent rules in case of conflicting targets (e.g. between two different municipalities).<br><br>• **New Players** – New players mean new contracts, products, services and technologies<br><br>The majority of suppliers who responded to this question indicated that neutrality would be a key challenge for DSOs.<br><br>The majority of other respondents indicated that the role of the DSO was moving towards that of an active grid manager and facilitator. The majority indicated that the range of new activities required of DSOs - smart metering, intense data handling, DSR, active grid management and storage, EV infrastructure and energy efficiency - would bring the challenges of reconciling market-based demand side management with grid security and constraints, and addressing investment needs to satisfy the information needs of existing and new actors. | We agree that DSOs will need to adapt to the needs of different stakeholders. We recognise this in the principles. They must find the most effective and efficient way of doing this. We do not believe that this will necessarily lead to increased costs. |
| **Question 3: Do you agree with the proposed logical framework? Are there other important questions which should be included in the framework?** | There is a general agreement among respondents with the proposed logical framework and with the principle that “not one size fits all”. The national and local situation should help determine what activities are allowed for DSOs.<br><br>The main concern expressed by respondents who do not agree with the proposed framework concern, among others, the definition of “new activity”. Furthermore, the majority of suppliers who have provided an answer to this question highlighted the fact that when there is a need to kick-start a market, priority should be given to market players. Only when they decline, a DSO should be allowed to perform the activity. In the absence of competition, the DSO should be allowed automatically to carry out the activity; | We have retained the framework but, in light of the comments, we have made some adjustments to make it more consistent.<br><br>For example, we do not agree that DSOs should be allowed automatically to carry out additional activities in the absence of competition – each case should be considered in the context of our framework. |

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| | other market players would be possible as well.<br><br>Respondents also noted that the framework proposed three possible "outcomes" (core, grey areas, not allowed) but had five categories. Responses also stated that it was unclear whether the application of the logical framework allows for the re-evaluation of activities through time. | We also consider the framework to be applicable through time, according to the evolution of normative and technological changes. |
| **Question 4: Do you agree with the proposed assessment of activities and are there any additional grey areas for DSOs other than those considered?** | Views were split relatively evenly between agree and disagree for the proposed assessment of activities. Some of the specific points raised were:<br>**A) Existing and evolving core activities**<br>- Some stakeholders felt Annex 4 (DSO activities) should be intended as a non-exhaustive list, because further activities could develop in the future. Hence, what is important is to set out the principles at this point.<br>- Some additional activities should be added to the core activities, including: compliance checks of generators (according to RfG Network Code); and Voltage control and reactive power management as an activity.<br>- System security - Some DSOs highlighted that future users will help the DSO in this regard, particularly voltage regulation. Some TSOs maintain the division of responsibility between TSO and DSO on system security to be clarified.<br>- Technical data management – Many stakeholders underline the overlap of responsibilities with C4 "Activities for commercial data handling" – Some suggestions that a more clear cut differences is required.<br>**B) Activities where DSOs should not be involved**<br>- Exception to the disallowance of contracting local temporary generation for the sake of continuity of supply – Some DSOs and Industry participants consider this activity as core to DSOs.<br>- Exception to the disallowance of supplying energy being the supplier of last resort – Many DSOs and some energy industry respondents consider this outside of the DSOs activities, and is an activity for market operators.<br>**C) Activities related to retail liberalisation**<br>- Relationship with retail suppliers - DSOs confirm that this is a core activity.<br>- Final customers for revenue protection – DSOs consider this is more appropriate as a core activity today, and there isn't much potential for competition.<br>- Commercial data handling – Some respondents retain that this activity is unclear and has overlap | We note the different views expressed. There will inevitably be some disagreement about which different services are in which category, particularly from DSOs. We have adjusted the framework to try to make the position clearer, while maintaining our position on issues such as data management.<br><br>Overall, we consider that our framework allows sufficient discretion for NRAs to make decisions based on the context in their country. |

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| | with the technical data handling.<br>**D) Activities related to renewables penetration and new flexibility needs**<br>- Local dispatch for local resources – Some respondents suggest that this activity should be allowed in all cases, and that it should be a core activity. Some TSOs supported the need for appropriate separation of DSOs where they have responsibility for dispatching generation.<br>- Energy storage – Some stakeholders note the overlap with this and the "beyond the meter activities" under category G. There were mixed responses, with some DSOs highlighting that DSO ownership and operation of storage should be an option.<br>**E) Activities related to infrastructure provision of electric/gas vehicles**<br>- DSOs, aggregators and other stakeholders maintain that DSOs should cooperate on a non-discriminatory basis.<br>- DSOs think they could act as kick-starter, in some countries, to help reaching EV targets and solve the lack of market initiative.<br>**F) Ownership & management of meter**<br>- Some stakeholders highlight that the activities should be related to metering system (included central system, communication), not only on metering devices.<br>**G) Activities reaching beyond-the-meter**<br>- Some aggregators, retailers, suppliers, TSOs and other stakeholders agree with CEER's view (leaving to the market players).<br>- Some customer organisations suggest a guideline that DSOs should only engage in activities beyond-the-meter where a convincing business case can be made that there is a consumer benefit that no other party is placed to provide as efficiently.<br>**H) Other activities out of the electricity/gas supply chain**<br>- Offering services to telecom companies - Some DSOs suggest that other grey areas can be added, such as rental of regulated assets (buildings, columns, corridors, optical networks, etc.).<br>- Some service providers underline the added value of combining infrastructure development in different areas.<br>- Regarding sharing of communication infrastructure, some operators added that it was of utmost importance for the network operation to avoid unauthorised access of third parties and prevent cyber-attacks.<br>**I) Data Handling** | |

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| | - Some DSOs think there should not be restrictions to use information from the smart meters | |

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| **Question 5: For activities falling in category II and III, under which regulatory conditions could DSO intervention be allowed?** | Some local utilities retain the 3 core principles as a good reference for the behaviour framework of DSOs. Most stakeholders suggest applying the provisions of the 3rd Package, and in particular the controls already in place to set the right regulatory conditions to ensure that activities falling under categories II and III are carried out in a transparent and non-discriminatory way (acting as a neutral market facilitator). Some stakeholders suggest considering DSOs as a pioneer to kick start the market; in this sense a further condition could be the temporariness of the activity. | See comments in Question 3 and Question 4 (Framework and Activities). |
| **Question 6: Do you agree with the assessment of DSO access to data and data management?** | From the responses, it is difficult to point out whether stakeholders clearly agree or disagree with the CEER position on DSO access to data and data management, as respondents agreed with some aspects and disagreed with others. There were a number of key themes in the responses:<br>- Some DSOs noted that data management should be organised by one party and not one responsible for technical data and another one for commercial data.<br>- Most of the stakeholders remarked that DSOs should have access to metering data, and that consumers should have to agree actively to the use of their data.<br>- All stakeholders agreed that a data hub should be a neutral body.<br>- For the management of data, some German DSOs recommended having standardised data formats. | We will look at the potential for further standardisation of data. We remain of the view that an independent data co-ordinator is the best approach to facilitating competition. |

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| **Question 7: Risks of DSOs participating in "grey areas": Do you agree that the risk of DSOs participating in some of the 'grey areas' (particularly flexibility and DSR) decreases the more separated a DSO's operational activities** | A strong majority of respondents disagreed with the question. General comments in the responses included:<br>- Some DSOs and some local utilities highlight that robust regulatory monitoring and oversight by NRAs can help.<br>- Some think that DSOs should leave flexibility and DSR products to the market. DSOs should safeguard these markets inter alia by running the "traffic-light-concept". DSOs could also be customers of such flexibility products.<br>- Regulatory changes also increase the risk of a lack of investments in a sector which requires substantial investment in order to meet the decarbonisation targets. | We note the responses, many of which were DSOs or vertically integrated groups.<br><br>We maintain our view that the 3rd Package unbundling requirements should be seen as the minimum necessary to ensure competitive markets develop.<br><br>We also consider that for the future it is necessary to include more DSOs into the legal and management unbundling regime |

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| **are from other competitive activities carried out by other companies within the same vertically integrated group?** | | (Art. 26 para. 1-3 EC 2009/72 and /73) to get a high common standard of independence from VIUs in operating the distribution network. |
| **Question 8: Do you agree with first considerations on the de-minimis threshold?** | The majority of responses agreed with the question in this case. Some themes from the responses were:<br>- There isn't a common approach to the type of revision that should be done on the thresholds<br>- Important to note that the Austrian responses stated the de-minimis threshold of 100,000 customers seems adequate. They represent almost 25% of answers that show their agreement with this question.<br>- Most respondents agree that a regulatory framework is needed to ensure that DSOs treat all market actors in a non-discriminatory way. However, some of them argue that to achieve this there is no need for stricter unbundling rules than those of the Second and Third Energy Packages, if they are fully implemented.<br>- According to some respondents, the de-minimis approach is not sufficient regarding flexibility activities, as the role of some DSOs develop into an active grid manager. They state that separation should also be enforced in between DSO's own activities.<br>- One of the respondents points out that the current ruling could have the effect that larger companies are splitting up, to fit under the de-minimis ruling. | We have retained the position in our consultation document. We have, however, adjusted our approach to the de minimis threshold to reflect our overall thinking and to allow for further analysis. |

## CHAPTER 2

| Public consultation question | Summary of responses | CEER Position |
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| **Question 9a: Do you consider all the activities and topics described in this Chapter 2 as relevant to further defining a regulatory framework for DSO-TSO relationship and responsibilities?** | A strong majority agreed with the question.<br>- Many respondents stated that regulation of DSO/TSO relationships is best achieved by national regulation, and stated that EU regulation should focus on cross border issues only.<br>- Many respondents also stated that regulatory intervention should not be developed until the new EU network codes are implemented and analysed in terms of their effectiveness.<br>- Network operators (regardless of whether they are TSOs or DSOs) should coordinate with each other only where their grids are directly coupled. A framework respecting this principle needs to focus on directly-coupled network operators whether DSO /DSO or TSO/DSO<br>- Services, Coordination, and Optimisation as described in 2.1 need further consideration with predicted large scale integration of RES, V2G, static storage, etc. where TSO/DSO/DSO interactions could become potentially critical.<br>- Many respondents noted that the area of congestion management and balancing is complex and incentives and regulation needs to reflect whole system cost, and take account of societal benefit.<br>- TSOs and representative organisations are strongly opposed to greater DSO activity in balancing and congestion management at DSO level. | We note these comments. We recognise that the right balance needs to be struck between action at European and national level. However, we also see great benefit in working together at European level to discuss and agree on potential solutions to common issues. Decisions on which activities fall to the DSO or TSO should in or view be based on which entity is best placed to make that decision and on ensuring that there are common principles and a greater exchange of information. |
| **Question 9 b: Are any activities or topics missing in the DSO-TSO relationship discussion?** | The majority of respondents do not think there were any missing topics. Where there were suggested topics that needed to be included, these were:<br>- Much greater focus is needed on analysing and regulating the energy system as one system.<br>- A whole system approach must incorporate the system users and give consideration to the impact of their actions on the system.<br>- Regulation should ensure that forecasting, network planning and development are undertaken by both the DSO and TSO in a manner that is macro-economically optimal.<br>- The model of a disaggregated supply chain can discourage the optimal whole system solutions from being used. | We agree that there needs to be a focus on the overall system and have included this in our conclusions. |

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| **Question 10: Do you agree with the description of the activities and topics in this Chapter? If not, what is your view on your specific activity or topic that is relevant for the DSO-TSO relationship?** | There was strong agreement from participants. Where there was disagreement, the few key themes were:<br>- Some activities don't reflect the current situation in some European countries, e.g. DSOs are already actively managing the grid in some places.<br>- No one size fits all model exists, and that needs to be reflected.<br>- There is less need for real time data exchange between the DSO and TSO in the gas sector due to the fact there is more internal flexibility e.g. through the use of linepack. | We recognise that the position varies from country to country, but we think the principles we provide can be applied to different situations. |
| **Question 11: Do you agree with the statement that further regulatory guidelines may be required (in addition to current Network Codes) and if so, which regulatory guidelines do you consider necessary?** | A slight majority of the responses stated that no further regulatory guidelines are required over and above the network codes. Key themes were:<br>• There were many comments suggesting further refinements may be necessary in the future once the network codes are fully implemented.<br>• Majority of DSO respondents disagreed and that additional regulation may be required and developed at a national level.<br>• Consumer organisations consider the code not well suited for application to domestic customers, and that major re-thinking is required to protect households with generation. | We plan to carry out further analysis of the issues and to publish our conclusions from a regulatory perspective on the future DSO-TSO relationship.<br><br>We recognise that much of the consultation paper was focused on electricity issues and that greater focus on gas specific issues will need to be take place, and also possible advantages of integrating the energy sources (electricity, gas and heating). |

## CHAPTER 3

| Public consultation question | Summary of responses | CEER Position |
|---|---|---|
| **Question 12 a: What, if any, are the particular or incremental risks attached to innovative and non-conventional investments? Do these warrant special recognition by NRAs?** | Technological and Regulatory risks were the types of risks most often identified in responses. In this case, technological risks are uncertainties on the investment viability. A regulatory risk is the uncertainty of schemes or methodologies for unconventional investments.<br>Among the identified risks, the main aspects mentioned by the respondents are for regulatory risk:<br>• Rate of return (doesn't reflect the risk)<br>• Micromanagement<br>• Inappropriate depreciation times<br>• Increase of % OPEX in the TOTEX<br>In the case of technological risks, the main aspects referred are:<br>• Stranded costs<br>• Reliability (failure of unproven technology)<br>• Life time of the asset | We note the responses with interest. Our general aim as regulators is to minimise risk but not to eliminate it, taking into account the fact that risk is included in WACC formula and, if correctly determined, eventually produces increases in tariffs paid by customers.<br><br>This means DSOs assuming a degree of risk and we recognise that trials of genuinely innovative ideas can bring a higher degree of risk.<br><br>The natural monopoly regulation is focused on the asymmetric information issue. Therefore, it tries to emulate a competitive environment where risk is natural.<br><br>Without any risk, and the due compensation for overtaking it, the incentive to the natural monopoly company to better perform is reduced. |

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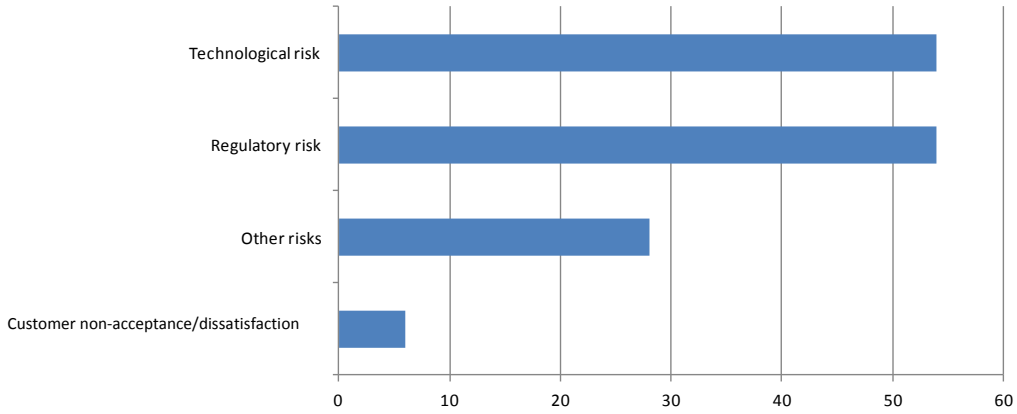
| |  <br>**Figure 1 – Main risks reported** | |
| **Question 12 b: to which extent, if any, is this incremental risk borne by DSOs?** | The majority of responses stated that incremental risks are mostly borne by DSOs. Only one DSO stated that incremental risk was not borne by DSO. Consumer organisations emphasised that in the end risk may be mostly born by consumers (see answers to question 12a) | We note the responses.<br><br>However, it has to be highlighted that the majority of answers have been provided by DSOs and other utilities. |
| **Question 13 a: Does NRAs' conventional focus on rate of return regulation on capital expenditure, and in some cases limited pass through of OPEX, have the effect of discouraging certain smart grid investments?** | The majority of answers clearly answered yes – that the conventional focus discourages smart grid investments,<br>DSOs considered that what differentiates those investments from the conventional is mainly the short term period of life expectancy, the higher OPEX, the lower impact on the RAB increase. Therefore the main reasons that justify a view that the conventional regulatory approach discourages smart grid investments are:<br><br>• Cost efficiency on OPEX.<br>• Inadequacy between regulatory period and smart grid investment implementation phase.<br>• Too long depreciation period. | We recognise the potential disincentive to pursuing flexibility or smart solutions instead of infrastructure investment and include some proposals in our conclusions. |

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| | • Time lag between investment cost and its recovery through tariffs.<br>• Positive externalities of the SG investment are not considered. | |
| **Question 13 b: What alternative approaches help incentivize DSOs to adopt smart grids?** | Respondents referred to several alternatives to incentivise DSOs to adopt smart grids, and, typically, each respondent pointed more than one alternative. When looking for the complete set of answers, none of the alternatives is clearly dominant, as shown in the figure below. By decreasing order, the most referred alternatives are:<br><br>• Increase the rate of return for smart grid assets, to mitigate the higher risk involved;<br>• Shorter depreciation period, due to the type of equipment used in the smart grids;<br>• Introduce funds or incentives to promote the development of innovation in the distribution grids;<br>• TOTEX approach.<br><br>The group "Others" include alternatives like benchmark for efficiency in smart grid solutions, guarantee to recover smart grid investments in case of phase-out or sunk costs, evaluate SG benefits in a societal perspective.<br><br>Answers to this question were very much dependent on the type of respondent. For instance, the answer 'appropriate/higher rate of return' was most common amongst DSOs. | We note the wide range of potential solutions in consultation responses. |

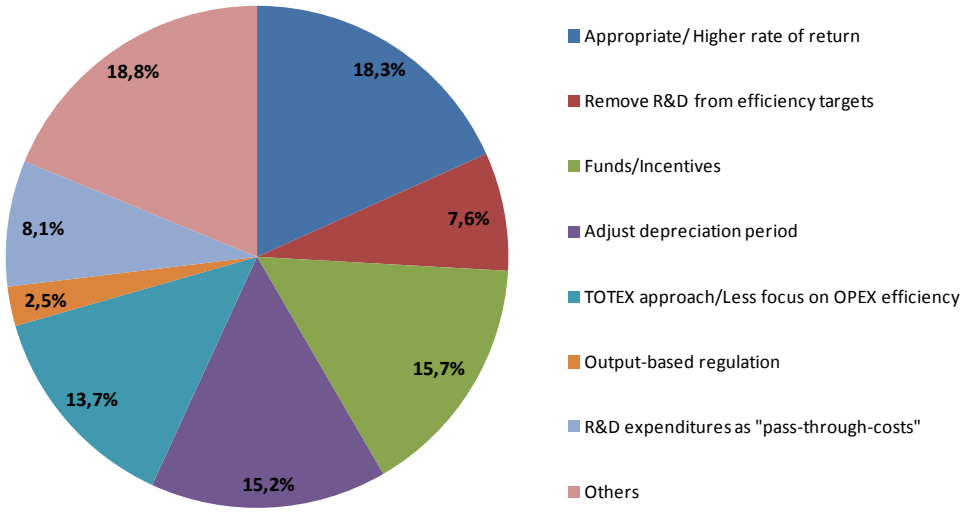


**Figure 2 – Alternatives to incentivise investments on SG mentioned by respondents**

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| **Question 14: CEER would welcome views from stakeholders on the pros and cons of output based incentives. Please also define for which regulatory incentives they might be appropriate.** | Most stakeholders seem to agree that output-based incentives as a regulatory tool are beneficial in general to customer satisfaction, competitive non-discriminating investments and long term value for money if all aspects mentioned on p. 31 are taken into consideration. Many are in favour of a combination of output and input based incentives.<br><br>There is contention about whether output-based incentives should be used for R&D and/or innovation. There is a strong response from DSOs and DSO associations that output based incentives are not appropriate to drive innovation (33 of 52 DSO respondents; 63%).<br><br>Some stakeholders claim though that output-based incentives would lead to innovation given enough room for the company to maneuver. | We note the differing views on the merits of output-based regulation, depending on the type of respondents. We conclude that output-based regulation can nevertheless deliver real benefits, if correctly designed. We recognise however that there are alternative ways of achieving these depending on the maturity of the sector and the quality of the data available to define outputs/parameters.<br><br>We think that the way forward is to develop guidelines of good practice on incentives schemes, which can for instance include output-based mechanisms. |
| **Question 15: Do you agree that to allow timely recovery of DSO revenues, assumptions on consumption patterns in tariff models could be updated within price control periods?** | A strong majority of respondents agree that assumptions should be updated within price control periods. This agreement is across the stakeholder groups of DSO, TSO, suppliers and others. This is because actual consumption is outside the control of DSOs. Whereas consumer organisations and metering operators disagree, arguing that the consumers have an interest in stable and predictable pricing. | We note these differing responses. In our view, this is about striking the right balance between certainty and cash flow. |
| **Question 16: How can ToU network tariffs be coordinated with system energy prices?** | The DSOs largely agree that a network ToU and system energy prices are two separate economic signals. It is generally agreed that the first would be driven by local network conditions, while the second would be driven by system-level supply and demand. However, there is some disagreement as to the extent to which these signals can or should be coordinated.<br><br>Very few of the responses directly address the question of *how* coordination could be achieved.<br><br>DSO respondents were mixed in whether it was possible to coordinate tariffs. Some note that this coincidence of peaks would negate the need to coordinate the tariffs. Others | We note the disagreement on the extent to which price signals should be co-ordinated. We consider this supports our conclusion of carrying out further analysis of different options. |

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| | argue that there is limited coincidence between the two prices, and that they will increasingly conflict with one another, making it harder to coordinate the two signals.<br><br>One TSO and some customers highlight some risk related to too much complexity or improper signals to the customer. | |
| **Question 17a: Are there circumstances under which suppliers should be required to pass through the distribution tariff signal to customers?** | The majority of responses answered yes, there are circumstances under which suppliers should be required to pass through the distribution tariff signal directly to customers. Some key themes from the responses were:<br><br>• It is only appropriate if carried out in a transparent manner, via suppliers.<br>• In most cases, suppliers decide how much to pass through. And this doesn't necessarily have to change. Suppliers retain that they should always be free to not pass a network tariff through to customers.<br>• There are some potential advantages of this, with the management of local constraints for example.<br>• A number of respondents strongly support requiring suppliers to pass through distribution price signals on the basis that transparent price signals to customers are necessary for enabling peak demand reduction and avoiding network costs.<br>• Intervention in the retail market shouldn't happen unless necessary | As we note above, we will consider these issues further. However, our current view is that we should avoid undue intervention in retail markets, while ensuring that network tariffs do not serve as a disincentive to time of use retail tariffs. |
| **Question 17b: If you answered yes to 17a, should there be regulation to ensure that suppliers are required to pass through the distribution price signal to customers?** | The majority of respondents answered yes, there should be regulation. The majority of answers referred back to their previous answer in 17a.<br>• A number of the responses agree that where it is deemed that there are benefits to consumers of passing distribution price signals to customers, regulation may be required to ensure that suppliers do not socialise the signal.<br>• Consumer organisations believed regulation should be non-discriminatory, while tariff should fairly reward customers whose usage supports network operation.<br>• Other responses support regulation where transparency is promoted | We note these responses. Our view may depend on the extent to which there is a strong price signal in network tariffs and the nature of the retail market in each country. We will consider this further in our analysis of the extent to which distribution network tariffs should change. |

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| **Question 18: Do you agree with the above assessment (in Table 2) of different cases when DSOs or other parties should have contracts or agreements with consumers and distributed generators?** | The majority of responses disagreed with the assessment.<br><br>• In general, many DSOs thought that the table was too vague and restrictive. It was not understood what column two meant (additional and commercial DSR contract DSO- consumer) as the DSO only uses DSR for grid purposes.<br>• There was also some confusion over columns 3 and 4 (additional and commercial DSR contract with customer via aggregator/supplier) which the DSOs argued should be part of DSO core activities and classed as category 1.<br>• Some DSOs agreed with the table as it leaves as many options open as possible, however, they noted that the text in section 3.5 doesn't align with the table as the text makes a clearer distinction between new and existing customers.<br>• Suppliers felt that DSOs should never directly contact the consumer as it could cause confusion and DSR is a competitive market where actors already offer these services. Suppliers also expressed concern about the level of neutrality of DSOs in some countries.<br>• Respondents from the energy industry argued that suppliers should be the only point of contact. Connection agreements between DSO and customer should only happen where there are technical issues or emergency issues or where there are only a small amount of specific customers.<br>• Other respondents have argued that they are not convinced that the role of the DSO as a data manager is in conflict with additional contracts between the DSO and consumer.<br>• Consumer organisations felt DSR for domestic customers shouldn't be a core role of the DSO. | We understand that respondents found the table unclear. This is a complex issue given the different roles and degrees of separation of DSOs in each country. We have explained our position in a different way in our conclusions and hope that stakeholders will find this clearer. |
| **Question 19: Which type of regulatory controls should be adopted by NRAs for DSOs, in cases of contractual arrangements falling** | Responses to this question were varied, as it is an open question. Some main suggestions raised were:<br><br>• DSOs want regulations to be very light as the consumer is free to decide whether or not to enter into a contractual arrangement. As the market is just developing, it is better to have a wait and see approach and avoid over regulation which could stifle innovation. | We note the range of responses. Our conclusions include a range of regulatory options for dealing with different scenarios and regulators will consider issues against this framework. |

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| **under categories II and III?** | • Consumer organisations want regulators to ensure that contractual arrangements are transparent and non-discriminatory for all parties involved.<br>• Energy industry respondents answered that connection agreements between the DSO and the customers should be limited to technical issues. Any commercial arrangement for the procurement of DSR should always be enacted by a third party, there should be no direct contact between a DSO and a consumer, with the exception of emergency situations or situations where there is a specific amount of consumers. | |

## Annex 3 - List of consultation respondents

In total, CEER received 108 responses to this public consultation. The table below contains the names of those respondents who did not indicate their responses as confidential.

| Respondent | Type of organisation |
|---|---|
| Nissan Europe | Automotive industry |
| PWR Consultants Limited | Consultancy |
| National Energy Action | Customer organisation |
| IFIEC Europe | Customer organisation |
| Citizens Advice | Customer organisation |
| CATHODE | Demand Response Association |
| Enexis BV | DSO |
| Netbeheer Nederland | DSO |
| EWE NETZ GmbH (germany) | DSO |
| Netz Niederösterreich GmbH | DSO |
| Rheinische NETZGesellschaft mbH | DSO |
| Electricity North West | DSO |
| Caruna | DSO |
| SRD | DSO |
| ENEA Operator Sp. z o.o. | DSO |
| RWE Stoen Operator Sp. z o.o. | DSO |
| ENA | DSO |
| PGE Dystrybucja S.A | DSO |
| Polish Power Transmission and Distribution Association | DSO |
| GrDF | DSO |
| ERDF | DSO |
| Thüga AG | DSO |
| ENERGA OPERATOR SA | DSO |
| ADEeF Association des Distributeurs d'Electricité en France | DSO |
| Wiener Netze GmbH | DSO |
| Netz Oberösterreich GmbH | DSO |
| Elektrizitätswerke Reutte AG | DSO |
| TAURON Dystrybucja S.A. | DSO |
| Fortum Distribution AB | DSO |
| Alliander | DSO |
| TINETZ-Stromnetz Tirol AG | DSO |
| E.ON Distribuce, a.s. | DSO |
| GEODE | DSO |
| Kraftrinen Nät AB | DSO |
| Energienetze Steiermark GmbH | DSO |
| GEODE German Section | DSO |
| Netz Burgenland Strom GmbH | DSO |

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| Schwaben Netz gmbh | DSO |
| EDSO for Smart Grids | DSO |
| Vattenfall Eldistribution | DSO |
| Stromnetz Berlin GmbH | DSO |
| Eandis | DSO |
| UK Power Networks | DSO |
| Wels Strom GmbH | DSO |
| Agder Energi | DSO |
| EnBW Energie Baden-Württemberg AG | Energy corporation |
| Defo | Energy industry |
| RWE Deutschland AG | Energy industry |
| KS Enterprises | Energy industry |
| Finnish Energy Industries | Energy industry |
| Fortum Markets | Energy industry |
| Svensk Energi - Swedenergy | Energy industry |
| Enel SpA | Energy industry |
| EDF Energy | Energy industry |
| ČSRES | Energy industry |
| Energy Norway | Energy industry |
| Association of Austrian Electricity Companies (Oesterreichs Energie) | Energy industry |
| Eurogas | Energy industry |
| E.ON SE | Energy industry |

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| GDF SUEZ | Energy industry |
| EURELECTRIC | Energy industry |
| CEZ, a. s. | Energy industry |
| Enel Spa | Energy industry |
| Energie Nederland | Energy industry |
| AIGET | Energy industry |
| Svenska Energigruppen | ESCO - business based on smart meter data |
| UPRIGAZ | Gas Energy industry |
| Czech Gas Association | Gas Energy industry |
| Swedish Gas Association | Gas Energy industry |
| Sedigas | Gas Energy industry |
| Association française du gaz | Gas Energy industry |
| Bundesverband Neue Energiewirtschaft e.V. (bne) | Independent suppliers |
| Independent electricity retailers in Sweden | Independent suppliers |
| Glen Dimplex Heating | Industry |
| The Electricity Storage Network | Industry |
| Sofrecom | Integrator |
| BDEW | Local utilities |
| Finnish Local Power Association (Paikallisvoima ry) | Local utilities |
| CEDEC | Local utilities |
| Verband kommunaler Unternehmen Ã– sterreichs | Local utilities |

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| Stadtwerke München GmbH | Local utilities |
| INNAX energiemanagement | Metering operator |
| Regulatory Assistance Project | NGO / International best practice |
| Lokalkraft Sverige ekonomisk förening | NGO for local Swedish DSOs |
| NEON | Ombudsman |
| CEEP (European Centre of Employers and Enterprises providing Public Services) | Public service providers |
| European Photovoltyaic Industry Association | RES industry association |
| Groningen Centre of Energy Law, University of Groningen | Research |
| The Institution of Engineering and Technology | Research |
| Austrian Institute of Technology | Research |
| EDF SA | Supplier |
| Edison SpA | Supplier |
| Vattenfall AB | Supplier |
| National Grid Electricity Transmission | TSO |
| REN | TSO |
| ENTSO-E | TSO |
| ENAGAS | TSO |
| REN | TSO |

## Annex 4 – About CEER

The Council of European Energy Regulators (CEER) is the voice of Europe's national regulators of electricity and gas at EU and international level. CEER's members and observers (from 33 European countries) are the statutory bodies responsible for energy regulation at national level.

One of CEER's key objectives is to facilitate the creation of a single, competitive, efficient and sustainable EU internal energy market that works in the public interest. CEER actively promotes an investment-friendly and harmonised regulatory environment, and consistent application of existing EU legislation. Moreover, CEER champions consumer issues in our belief that a competitive and secure EU single energy market is not a goal in itself, but should deliver benefits for energy consumers.

CEER, based in Brussels, deals with a broad range of energy issues including retail markets and consumers; distribution networks; smart grids; flexibility; sustainability; and international cooperation. European energy regulators are committed to a holistic approach to energy regulation in Europe. Through CEER, NRAs cooperate and develop common position papers, advice and forward-thinking recommendations to improve the electricity and gas markets for the benefit of consumers and businesses.

The work of CEER is structured according to a number of working groups and task forces, composed of staff members of the national energy regulatory authorities, and supported by the CEER Secretariat. This report was prepared by the CEER's DSO Working Group.

CEER wishes to thank the many regulatory experts involved in developing this project and in particular the following for their work in preparing this report: Matthew Berry, Daniel Bongart Andy Burgess, Vitor Marques, Antonio Ocaña, Luca Lo Schiavo, Luuk Spee and Stefan Voegel.

More information at www.ceer.eu.