

Efficient System Operation

CEER White Paper series (paper # IV) on the
European Commission's Clean Energy Proposals

16 June 2017

1. Introduction

This Regulatory White Paper provides the views of National Regulatory Authorities in the Council of European Energy Regulators (CEER) on efficient system operation, covering operational security, congestion management and non-frequency ancillary services. The aim of this White Paper is to deepen understanding and to assist the EU Institutions in assessing the proposals contained in the "Clean Energy for All Europeans" legislative package of 30 November 2016.¹

2. CEER's Key Recommendations

The ongoing integration of European wholesale electricity markets, combined with an increasing share of intermittent renewable energy as part of the decarbonisation agenda, requires a rethink of the system operation design in Europe beyond 2025. This includes the framework for a reinforced and more efficient coordination among TSOs. In this context, CEER recommends the following with respect to the Clean Energy package:

- CEER welcomes the regional coordination proposed for ROCs, noting that further discussion and investigation will be undertaken with the clear objective of developing a robust regulatory oversight framework and in particular establishing the optimal allocation of responsibilities between TSOs and ROCs at regional level. This review will be based on the experience gained from the implementation of RSCs, in order to establish appropriate principles on regional TSO coordination and on the precise allocation of different responsibilities.
- Full implementation of CACM is essential. CEER cautions that the creation of further harmonised European arrangements for managing cross-border congestion may not add value, but will instead risk creating enduring regulations that are not compatible with local needs.
- CEER supports a level playing field for delivery of non-frequency related ancillary services, fair compensation for its provision and appropriate coordination between DSOs and TSOs in accessing these services.
- CEER is of the view that, while market based procurement can be efficient for certain types of non-frequency related ancillary services, the local nature of the services and the inherent market power concerns calls for discretion on a case-by-case basis.
- Mapping current practices and sharing best practice, guided by a progressive convergence on the principles, is a more appropriate means of delivering efficient non-frequency related ancillary services than through a Network Code.

¹ For ease of reading, references to the Electricity Directive and its Annexes refer to the re-cast Electricity Directive COM/2016/0864 final/2 - 2016/0380 (COD) and its Annexes. References to specific Articles in the proposed recast legislation relate to the revised texts (corrigenda) published by the [European Commission](#) on 23-02-2017.

- A clearer distinction between assets owned by TSOs and DSOs (which are most efficiently provided as an integral part of the network equipment), and those services suited for market based provision, is needed, in order to preserve an efficient and reliable transmission and distribution service to customers.

3. Operational Security

The current System Operation Guideline aims at harmonising the rules for cross-border electricity system operation and enhancing cooperation between Transmission System Operators (TSOs), while keeping the logic of national TSO responsibility as regards security of supply (which is a national prerogative).

The large penetration of intermittent and distributed renewable generation will increase the complexity for TSOs in relation to intraday and close to real-time system operation, requiring the adaptation of system operation to fast changes in non-programmable generation and the utilisation of flexible resources including demand response. An increasing challenge for TSOs will therefore be to continuously assess the capability of the networks to transport electricity from cheap generation to high-value demand, in order to maximise economic efficiency from all (internal and cross-border) trades while preserving operational security.

Under the current Regional Security Coordinators (RSCs) approach, TSOs are supported by RSCs. RSCs perform coordinated security analyses and recommend the most efficient remedial actions to implement in order to increase the system security in a region. To this end, TSOs need to respect a number of principles, to prepare, activate and coordinate remedial actions.

CEER acknowledges that the concept of TSO coordination (a core premise of the 3rd Package of energy legislation and augmented by the System Operation Guideline) may have to be strengthened. This is in order to accommodate increased market integration and renewable penetration and to avoid burdensome and time-consuming coordination procedures (data collection, coordinated assessment and coordinated decision making, coordinated application of remedial actions).

CEER therefore supports the intention of the Commission to address this issue in the Clean Energy package. In a sensitive field like system operation, where major disruption should be avoided, CEER recommends that the deployment of Regional Operation Centres (ROCs), at least in the area of operational security, should take into account the time for implementation and experience from RSCs as laid down in the System Operation Guideline.

CEER welcomes the regional coordination proposed for ROCs, noting that further discussion and investigation will be undertaken with the clear objective of developing a robust regulatory oversight framework and in particular establishing the optimal allocation of responsibilities between TSOs and ROCs at regional level. This review will be based on the experience gained from the implementation of RSCs, in order to establish appropriate principles on regional TSO coordination and on the precise allocation of different responsibilities.

4. Congestion management

CEER supports the necessary implementation of the current legislative rules for electricity cross-border congestion management as described in the Capacity Allocation and Congestion Management (CACM) Guideline, to efficiently support the integration of large quantities of renewable generation. This approach combines, in heavily meshed areas, flow-based market coupling based on adequately defined bidding zones. This implementation is key to achieve more efficient dispatch for the day-ahead timeframe, lower re-dispatching costs and needs, and better operational security.

Furthermore, with the increase of distributed and self-generation, it is increasingly important that TSOs and Distribution System Operators (DSOs) coordinate with each other to ensure approaches to managing congestion deliver the best outcomes for the system as a whole. However, with the rapid deployment of new sources of flexibility, CEER cautions that the creation of further harmonised European arrangements for managing congestion may not add value, but will instead risk creating enduring regulations that are not compatible with local needs.

5. Approach to non-frequency related ancillary services

A variety of ancillary services is required in order to provide a reliable electricity transmission and distribution service to customers and to “keep the lights on”. The Clean Energy package defines the term “non-frequency related ancillary services” as a service used by TSOs or DSOs for steady-state voltage control, fast reactive current injections, inertia and black start capabilities. Currently, these services are mostly provided by generators but may also be provided by demand facilities, network operation and equipment, as well as energy storage facilities.

The Clean Energy package introduces provisions regarding:

- Transparent and non-discriminatory procurement of non-frequency related ancillary services;
- TSO ownership and control over assets providing non-frequency related ancillary services; and
- A mandate to provide further rules through Network Codes on the provision of non-frequency related ancillary services.

CEER supports a level playing field for the delivery of ancillary services. Market arrangements or market-based compensation², where appropriate, may allow for the most cost-efficient procurement and utilisation of existing and new technologies.

It is, however, important to keep in mind current technical limitations of non-frequency related ancillary services and their geographical limitations (e.g. the ability to supply and or absorb reactive power from distant sources). Due to the local nature of some of these services and therefore the inherent market power concerns, not all non-frequency related ancillary services are well suited for market-based approaches. The optimum design of products is also expected to differ according to the locality. Before being required to carry out a cost benefit analysis to justify non-market based approaches (as per the current Clean Energy package proposals), it would be preferable to assess whether the possibility for a well-functioning market exists for these services.

Therefore, given the existing technical and geographical limitations, rather than predefining a prescriptive requirement for market-based procurement for all non-frequency related ancillary services in European-wide legislation, a more suitable approach would be to allow for more local discretion on a case-by-case basis, taking into account different technical and local circumstances.

A more flexible and principles-based approach would also ensure that innovation in the provision of these services is not inhibited.³ With such an approach, CEER supports further work on a progressive convergence of the principles for the provision of non-frequency related ancillary services. This could be complemented by mapping current practices and sharing best practice among energy regulators in CEER. If this approach does not work and legislation is deemed necessary, and able to demonstrate that it would not have unintended consequences such as

² Including via connection arrangements.

³ We note that a range of innovation projects are currently looking at ways that access to non-frequency ancillary services can be facilitated, for instance through DSO voltage control techniques, or through local markets for reactive power which coordinate across DSO and TSO needs.

inhibiting innovation, CEER considers that a first step should be to build upon existing Network Codes and Guidelines.

CEER also agrees that TSOs and DSOs should coordinate to ensure approaches to accessing these services, which deliver the best outcomes for the system as a whole. In addition, requirements on connectees will remain an important (non-market based) and complementary route to ensuring secure operation of the system. As more activity occurs at local distribution level, and given the variety of local circumstances and large number of DSOs across Europe, regulatory authorities should retain discretion, applying European-wide principles appropriate with local circumstances.

In summary, CEER recommends the following with respect to these issues:

- While market based procurement can be efficient for certain types of non-frequency ancillary services, the local nature of the services and the inherent market power concerns calls for discretion on a case-by-case basis.
- CEER supports a level playing field for the delivery of ancillary services, fair compensation for its provision and appropriate coordination between DSOs and TSOs in accessing these services.
- Mapping current practices and sharing best practice, guided by a progressive convergence on the principles, is a more appropriate means of delivering efficient non-frequency related ancillary services than through a Network Code.

6. Clearer distinction between network assets and market-based service provision

TSOs and DSOs are responsible for the secure, safe, and efficient operation of the electricity system and thereby responsible for controlling voltage and managing reactive power. This can be carried out through a number of means such as tap changers on power transformers, switching of capacitors and shunt reactors, use of power-electronics-based voltage and reactive power management devices, etc. (cf. System Operation Guideline article 22(1c)). In doing so, the TSO/DSO may own and operate network equipment that provide non-frequency related ancillary services that improve system performance and efficiency of power transmission/distribution.⁴

It would therefore be useful for the Clean Energy package to make a clearer distinction between the services provided by the system/network operator (either TSO or DSO) as an integral part of the transmission and distribution systems, and the services suitable for procurement from the system users, in order to be able to provide a reliable service.

CEER considers it appropriate for a TSO or DSO to use network operation approaches, and investment in network equipment as an integral part of the transmission and or distribution grid, if the overall costs of ensuring the necessary properties in the system can be reduced. CEER recommends that further work be done in order to find an appropriate distinction on the category of assets the TSO or DSO may or may not own and operate. Such a distinction should take into account

⁴ A TSO may also switch out circuits or other ways of changing network configuration to provide voltage support rather than utilising dedicated assets or third parties. Another example is HVDC interconnectors and converter stations, which are owned and operated by TSOs and already do provide a variety of non-frequency related ancillary services as an integral part of the network equipment. Equally, SOs may make use of a parallel variety of approaches to support the distribution network and or wider grid.

unbundling principles and the potential conflicts between regulated and non-regulated market participants.

In summary, CEER recommends the following in respect to these issues:

- A clearer distinction between assets owned by TSOs and DSOs (which are most efficiently provided as an integral part of the network equipment), and those services suited for market based provision, is needed in order to preserve an efficient and reliable transmission and distribution service to customers.

Annex 1: Relevant ACER/CEER Papers

This White Paper builds on the “[European Energy Regulators’ Overview Paper - Initial Reactions to the European Commission’s Proposals on Clean Energy](#)”, published by ACER and CEER on 23 January 2017. It is part of a series of CEER Regulatory White Papers on key topics related to the Clean Energy package.

European Energy Regulators (ACER-CEER) White Paper #1 Renewables in the Wholesale Market , May 2017
European Energy Regulators (ACER-CEER) White Paper #2 Role of the DSO , May 2017
European Energy Regulators (ACER-CEER) White Paper #3 Facilitating Flexibility , May 2017
European Energy Regulators (ACER-CEER) White Paper #4 Efficient Wholesale Price Formation , May 2017
CEER White Paper (no. I) on Distribution and Transmission Network Tariffs and Incentives , May 2017
CEER White Paper (no. II) on Technology that Benefits Consumers , May 2017
CEER White Paper (no. III) on Consumer Empowerment , May 2017
CEER, The Future Role of DSOs – A CEER Conclusions Paper , July 2015
ACER-CEER, Joint ACER-CEER response to European Commission’s Consultation on a new Energy Market Design , October 2015
CEER, Position Paper on the Future DSO and TSO Relationship , September 2016
CEER, Consultation Paper on the use of flexibility at distribution level , March 2017
EG3, Smart Grid Task Force, Regulatory Recommendations for the Deployment of Flexibility , January 2015