European Energy Regulation:

A Bridge to 2025

Public Consultation Paper

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This consultation paper, issued by the Board of Regulators (BoR) and the Director of the Agency for the Cooperation of Energy Regulators (ACER or 'the Agency') with the support of the Council of European Energy Regulators (CEER), outlines the European regulators' common thinking on the energy sector challenges and possible policy and regulatory responses for the period 2014-2025. It draws upon the feedback we received to our November 2013 pre-consultation and seeks to involve all stakeholders in the continuing development of our policy bridge to 2025. Further feedback from stakeholders is invited by **16 June 2014** to **consultation2014O01@acer.europa.eu.** We shall finalise our formal proposals **by late September 2014**.

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1. Introduction

1.1 Delivering reliable, affordable and simple-to-use energy services for all European consumers (whatever their size) is at the very heart of creating the EU's Single Energy Market. The purpose of energy regulation is to deliver a level playing field in which competition can flourish and provide a sound investment climate that is based upon a stable and predictable regulatory framework. Independent regulators do, of course, play an essential role within this framework, their critical focus, enshrined in legislation, being to ensure that consumers are at the very centre of market design, with their needs and expectations understood and provided for, and the benefits of competitive markets being passed on to them.

1.2 The present paper is the second step in the process to define with greater precision our future priorities. It builds on the many helpful responses to the late 2013 pre-consultation (summarised briefly at the top of each section in Chapter 3). It considers anticipated market and relevant technological changes, and changing energy policy priorities. The vast array of possible future developments is challenging for any analysis, but the central issue we address is whether the framework of regulation as it is currently being developed will be sufficiently robust in this changing environment, and if not, where and how it may need to evolve.

1.3 Although not directly tackled as such, developments such as those linked with the implementation of the Regulation on Wholesale Energy Market Integrity and Transparency (REMIT) and the European Market Infrastructure Regulation (EMIR) will certainly impact significantly the energy markets, and the Agency for the Cooperation of Energy Regulators (ACER or the "Agency") and National Regulatory Authorities (NRAs) will need to be aware of those impacts and respond to them. Although the consequences of such developments are still emerging, and any new formal process will require time to implement, monitoring and enforcement mechanisms will also need to be examined to ensure their relevance throughout the period to 2025.

1.4 There will also be exogenous events and political factors that may impact on energy markets (for example, the recent events in Ukraine). Whilst there are some aspects that ACER and/or NRAs can influence and policies to which they can contribute, many aspects are beyond energy regulators' responsibilities. For instance, there are emerging concerns about the impact on certain regions in the European Union of future water shortages and, conversely, about increased risks of flooding. Although energy regulators need to fully recognise such issues in their dealings with system operators (Transmission System Operators (TSOs) and Distributions System Operators (DSOs)), the prime responsibility falls to other regulatory or governmental bodies. Thus such issues, whilst often critical, are excluded from our focus.

1.5 In selecting a time horizon of over a decade, we consider that we can have greater certainty in assessing the more significant influences that might occur before 2025. In this

"Bridge" from the date scheduled for the completion of the internal energy market until 2025, we are able to take full account of our current work (and that anticipated in the 2015 ACER Work Programme) and cover the completion and parallel implementation of the network codes that will provide the core rules supporting the EU's integrated Single Energy Market.

1.6 NRAs have contributed significantly to this assessment. Working through CEER, they have contributed to our assessment in the areas of consumers, retail markets and DSOs. Similarly, working with the specialist staff of the Agency, NRAs have also contributed to our thinking on the electricity and gas sectors.

1.7 This consultation paper is organised into an introduction and the following chapters: Chapter 2 explores the trends in a number of areas: electricity; gas; infrastructure; and consumers, retail markets and DSOs. Chapter 3 presents a summary of stakeholders' principal comments from the earlier pre-consultation and outlines some initial thinking on future actions for Europe's regulators. Chapter 4 considers the possible implications for future governance. A summary of our initial thinking on the proposed regulatory actions is annexed.

Stakeholder inputs

1.8 The paper identifies a number of areas that may benefit from greater regulatory focus. Without focusing on every area raised we **invite stakeholders: (i) to comment on those which might be prioritised** and to give their views on where the case for action is strongest, and **(ii) to identify any additional actions** that may be required in those areas or to identify areas which have not been highlighted. This information will feed into our **final proposals for publication** in late September 2014 and will permit ACER and CEER, within their ambit of responsibilities, to take forward their work programmes reflecting those conclusions. There will also be indicative allocation of tasks between ACER and CEER so that stakeholders will have clarity as to which body is leading in each topic area. In addition, we shall identify, in each area, the various work streams and deadlines for our work.

1.9 Our priority questions are as follows:

1. **Have we identified correctly the issues and trends within each area of the energy sector?**
2. **Have we identified an appropriate regulatory response?**
3. **Which regulatory actions are most important and should be prioritised?**
4. **Are there other areas where we should focus?**

We seek the **views of stakeholders by 16 June 2014**. Please send all comments to the following address: **consultation2014O01@acer.europa.eu**

2 Energy sector trends

2.1 Each of the following sections explores trends in one particular part of the energy sector and sets the scene for the possible priority actions regulators might take (as discussed in Chapter 3).

A ENERGY SECTOR TRENDS: Electricity Wholesale Markets

Electricity wholesale markets are undergoing fundamental changes. Whilst markets are becoming more pan-European as the realisation of the Target Model gets closer, policy interventions – which remain, in most cases, national, uncoordinated and non-market-based – are driving the generation portfolio towards smaller, more distributed, greener and less predictable generating plants. As a consequence, there are growing concerns about generation adequacy, flexibility and the provision of grid support services.

Integration of wholesale markets

2.2 Although challenging, the full and effective implementation of the current suite of electricity network codes is key to fostering the development of a harmonised and integrated European wholesale electricity market. Once achieved, the integrated European market will provide greater opportunities for cross-border trade and, as a consequence, enhanced competition resulting in a wide variety of benefits for system operators, market participants and, most importantly, consumers. The key developments of coordinated cross-zonal capacity calculation, forward-capacity allocation, day-ahead and intra-day market coupling, and integrated cross-border balancing will ensure that the existing assets and infrastructure are used in more efficient way to deliver electricity to consumers at the cheapest possible price.

2.3 National electricity markets will also be increasingly linked by greater levels of interconnection capacities. These should facilitate cross-border electricity flows that are determined by market forces, which will effectively create larger, harmonised and interconnected markets that will promote greater competition and, again, lower wholesale prices. Nevertheless, the establishment of integrated markets will require greater cooperation among TSOs in managing their systems and in ensuring the security of grid operation. TSOs will be increasingly able to source and share reserve capacity and balancing services from across national borders, which will maximise the efficiency of procurement of reserve capacity and balancing services and thereby reduce the overall costs for such services which are usually passed on to consumers.

Renewables growth driving changes in generation

2.4 National and European electricity policies have fostered the rapid growth of non-programmable renewable energy (NP RES) generation capacity, especially wind and photovoltaic, connected to both transmission and distribution networks. There are important characteristics associated with these technologies: their output is less

predictable and often less flexible than conventional generation and prone to rapid changes in output. Such characteristics can directly affect the operational security of electricity networks, for example due to the increased complexity of forecasting, the difficulty in maintaining frequency and voltage level, and the requirement for increased fast-reaction balancing services to accommodate rapid changes in NP RES output.

2.5 As the share of RES generation grows, so too will the requirement for additional flexibility to accommodate the less flexible, less-predictable, nature of NP RES generation. Consequently, greater emphasis will be placed on the appropriate tools for market participants and system operators to manage close-to-real-time changes in supply and demand (an important example may be greater emphasis on the provision of balancing or congestion management services by the users connected at distribution levels). These flexible tools will grow in importance with the increase in the share of NP RES generation.

2.6 A strong penetration of NP RES generation connected to different voltage levels may require greater coordination between TSOs and between TSOs and DSOs. There may also be consequences for gas markets as gas-fired electricity generation plants are likely to play a key role in many Member States in providing flexible, quick-response gas capacity for the electricity system. This is also an area that implies greater coordination.

Policy interventions to ensure adequacy

2.7 Governments and NRAs in several European countries have already voiced their concern that the level of electricity generation capacity delivered by the market may not be sufficient to meet demand at all times in the future. Such concerns are likely to deepen. For example, as the share of NP RES generation increases, the utilisation of conventional generation will be under pressure from the low marginal costs of RES technologies. In some countries, the investment challenges faced by conventional generators (and the continued operation of such existing plants) are already, or are planned to be, addressed by capacity remuneration mechanisms (CRMs). The implementation of CRMs (for this and other reasons) however needs to be done carefully, lest uncoordinated, national schemes may create distortions in the European wholesale market (highlighted by ACER's Opinion on Capacity Markets[1] and by the European Commission which has itself already expressed its concern).

[1] *ACER Opinion on Capacity Markets to the European Parliament's Industry, Research and Energy (ITRE) Committee*, 15 February 2013: http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER%20Opinion%2005-2013.pdf

2.8 Current concerns regarding the adequacy of generation capacity are compounded by the increasing need to manage greater and more sudden fluctuations in the generation and demand balance. Such adequacy and flexibility challenges are distinct, but related.

2.9 Further attention must be paid to market designs which enable the pricing of flexibility so that market forces can ensure that balancing can be undertaken in the most efficient way and that flexible assets, essential to any high-RES market, will enter or remain on the market. Such market design needs to support price discovery for products which can be activated quickly, and needs to provide efficient price signals for investment in new flexible capacity as required (on either the generation or the demand side). The Network Code on Electricity Balancing (along with other measures) lays some foundations in this respect, but European balancing arrangements will require further development to ensure that the signals for flexibility are sufficiently robust.

B ENERGY SECTOR TRENDS: Gas Wholesale Markets

Gas wholesale markets are also becoming more integrated as a consequence of the implementation of the provisions in the network codes and greater cross-border cooperation. However, the gas sector is dominated by uncertainties over the future patterns of demand and supply.

Integrating gas wholesale markets

2.10 The implementation of the networks codes will encourage further market integration across national borders. That integration will facilitate further competition through liquid and efficient wholesale markets, in combination with effective mechanisms for accessing networks. Deep and liquid gas markets will ensure fair price formation at all levels in the gas value chain so that European consumers secure the greatest benefits.

2.11 Although progress to date has been uneven across the EU, future implementation of the gas network codes should ensure that many of the necessary building blocks are in place to establish the Single Gas Market. These building blocks include: harmonised capacity allocation, gas flow nominations and tariff arrangements at interconnection points; common rules to ensure that TSOs operate their businesses and communicate with one another in a manner that does not pose a barrier to cross-border gas trade; measures to create efficient use of booked capacity by bringing unused capacity back to the market; common rules for cross-border balancing; and European-wide principles for running auctions and open season procedures that will facilitate cross-border market-based investment procedures for offering incremental and new capacity. Current work on the review of the Gas Target Model (adopted by European energy regulators in 2011) will help ensure that such developments are well focused, and that further necessary steps are taken to create well-functioning wholesale markets to the benefit of all gas customers.

Uncertain gas demand and supply

2.12 There is considerable uncertainty about the future gas needs of European consumers (including households, small and medium-sized companies, and energy intensive industry). In recent years, gas demand in the EU has decreased and, whilst some forecasters expect this trend to continue, others predict a revival in the near future. Several factors are relevant to future gas demand, including:

- European industries' use of gas (and their global competiveness) will be heavily influenced by the level of gas prices in Europe compared with other global regions, as well as by overall macroeconomic growth;
- gas use in the heating sector will be influenced by improvements in energy efficiency (e.g. insulation), the development of electric-heating (e.g. heat pumps) and the application of gas-fired combined heat and power systems;
- gas use in the power sector will be influenced by the increase in RES generation and the relative competitiveness of gas versus coal, also taking into account carbon prices; and
- developments in the transport sector, for example, the use of Liquefied Natural Gas (LNG) in maritime and inland waterways transport or of natural gas as an alternative fuel for oil-based road transportation.

2.13 It is difficult to predict exactly how, or indeed if and when, such developments will affect total gas demand. For example, should the role of gas-fired plants evolve to serve as back-up for NP RES generation, these plants may be called to produce at short notice and possibly only for a short time period; then the infrastructure to meet that peak demand will still need to be in place.

2.14 As a consequence of the recent decline in demand, in some Member States grid charges have increased for the remaining users, given that the grid infrastructure and operating costs still need to be recovered. This phenomenon risks setting off a reinforcing negative spiral where rising grid charges on the remaining grid users reduce the attractiveness of gas. This would lead to further consumers switching away from gas, and hence further increases in grid charges to be borne by those remaining.

2.15 The decline of indigenous production in Member States (especially in the UK and the Netherlands) is a major feature of the future development of the European gas market. In the absence of a compensating parallel reduction in demand, more imports will be needed. Greater reliance on imports could compound greater political uncertainty following recent geopolitical events. Moreover, where existing import capacity is insufficient, new investment in infrastructure will be required. A degree of uncertainty also exists on the supply side: new sources of domestic EU gas production may become viable in the medium term, for example, through greater unconventional gas production (including shale) in Europe and the advance of biogas and power-to-gas technologies.

2.16 These uncertainties on both the demand and supply sides have significant consequences. With greater reliance on imports, variances in global gas prices are already affecting the competitiveness of the European gas market vis-à-vis other global regions (this is particularly clear in the case of the global distribution of LNG cargos, which are currently increasingly shipped to Asia). The increasing share of imported gas to Europe reinforces concerns about the dependence on a limited number of import sources (or, in the case of some Member States, on a single source).

2.17 Uncertainty impacts on investment decisions thus hampering the development of market integration and competition. Whilst new investments may be vital to ensure that new sources of gas are brought to the European market and efficiently moved across the (EU), the possibility of declining demand for natural gas is also raising concerns about the risk of stranded assets.

The gas market's role in providing flexibility

2.18 Greater penetration of NP RES in electricity generation will increase the need for flexible tools with an ability to respond rapidly to ensure that system security is maintained during fluctuations in the generation and demand balance. Gas-fired plants are likely to be a major source of this flexibility in many Member States. Arrangements must be made in the gas market and in the supporting regulatory framework to facilitate gas-fired plants' ability to fulfil this role and to be appropriately rewarded (thus, gas-fired generators which run for a limited number of hours each day must be able to secure gas at those times whilst gas plants need to balance their own position when called on to provide such flexibility).

C ENERGY SECTOR TRENDS: Infrastructure investment

Infrastructure is the backbone of efficient European energy markets. A more pan-European approach to investment complements the current effort to reduce delays and ensure investments that deliver most value for consumers.

2.19 The timely delivery of infrastructure within, and between, Member States is critical to achieve the full benefits of an integrated European energy market.

2.20 Delays in delivering infrastructure projects have increased in recent years, and the European Commission's Energy Infrastructure Package (EIP)[2] therefore is seeking to

[2] Regulation (EU) No 347/2013 of April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009

address them. The Third Package[3] also created a more pan-European approach to infrastructure planning (notably through the Ten-Year Network Development Plans), but barriers to the timely delivery of investments remain. Infrastructure projects generally have long lead times and are frequently subject to significant opposition resulting in lengthy delays in obtaining planning consents. Several different administrative bodies can be involved, particularly for cross-border projects, which make coordination still more challenging and potentially leading to further delays in delivering consumer benefits. Such factors may increase the perception of risk for investors. Rigorous coordinated resilience planning will highlight considerations of national and regional security, economic operations, and public safety that rely on fully-functioning energy networks.

2.21 As projects increasingly span national borders, the need for compatible rules and regulatory coordination also increases. It is far from straightforward to allocate the investment costs of a cross-border project between individual countries. Similarly, the costs of operating more interconnected networks need to be appropriately targeted in order to promote efficient solutions. Not doing so can lead to suboptimal investment decisions or disincentives to invest.

2.22 Currently, the core focus of regulators is to create a regulatory framework that facilitates the delivery of efficient investment to safeguard the interests of consumers. That focus of regulators will remain, including at distribution levels where the changing role of DSOs and the move to more actively managed networks create further investment challenges. Sharing best practice between energy regulators has focused on the use of different regulatory approaches, including output-based regulation (ensuring companies deliver what consumers value) and on using appropriate incentives to align the interests of companies and consumers.

D ENERGY SECTOR TRENDS: Consumers, retail markets and the role of DSOs

The combination of technological developments and demand response-enabling services are facilitating active participation of consumers in energy markets and paving the way for the demand-side to contribute to system optimisation. This brings greater complexities which require user-friendly services to assist consumers in managing their consumption in the face of rising energy costs and a more active system management role is required of DSOs.

[3] The term “Third Package” refers to Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 (Gas Directive) and Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 (Electricity Directive), concerning common rules for the internal market in natural gas and electricity respectively.

Consumer concerns

2.23 Consumers of energy range from individual households, through small and medium-sized companies, to the largest companies operating in energy intensive industries. For all such consumers, the rise of energy prices remains a major concern: in household budgets and for companies' competitiveness. The European Commission has noted that energy prices have increased in recent years[4]. Significant increases in taxes/levies (including RES subsidies) and the anticipated growth in other costs will also impact on consumer prices. Policymakers will need to ensure that the impacts of their policy changes are applied as cost-effectively as possible. Households and industry can save energy and money by improving their energy efficiency, and potentially will increasingly be involved in demand response. Therefore, consumers should be encouraged and empowered to take full advantage of the new and emerging technologies that will allow them to respond.

2.24 Increased availability of energy efficiency and demand response services (for instance time-of-use contracts, dynamic pricing, including critical peak pricing) will offer consumers greater opportunities to manage their consumption and control their bills, provided that they are informed and empowered to do so. As the European Commission noted, information is needed to encourage consumers to take up innovative products and services, and to promote the financial instruments that enable consumers to increase their energy efficiency[5].

2.25 The challenge for energy companies to respond to such changes is considerable and, apparently, as yet unsuccessful. Across Europe, energy companies appear to be amongst the least trusted and least satisfactory service providers[6]. This is in itself worrying, particularly as the market is expected to become ever more complex, where demand participation is expected to grow with new actors progressively offering more innovative services. In these circumstances it will be important to strike a balance between ensuring consumers are protected and facilitating the development of new services that allow consumers to engage in the market with a greater level of confidence. This is an opportunity that cannot be missed.

Technological advances

2.26 A decade or so ago, few foresaw the development of internet-connected smart phones and their range of uses through applications. It is similarly difficult to forecast how technology will impact on energy consumers by 2025. Concepts such as 'the internet of things' and 'the connected consumer', together with other energy-specific developments such as smart grids and smart meters, suggest that consumers will increasingly be able to participate actively in the energy market.

[4] *Communication on energy prices and costs in Europe*, COM(2014) 21
[5] *A policy framework for climate and energy in the period from 2020 to 2030*, COM(2014) 15
[6] *8th Consumer Market Scoreboard*, DG SANCO, European Commission. December 2012

2.27 Technologies will make more detailed consumption information available to consumers, even though meter information alone has little potential to change consumption patterns. Greater home automation and innovative services will assist customers in managing their consumption and reduce the complexity of active participation in the market. Appliances will also increasingly help consumers to manage their energy consumption more efficiently.

2.28 The growth of a more active, smarter demand-side and smart grids depends critically on the availability of technologies that will help network users to contribute effectively to system operation, to use and produce power locally and to make more efficient use of energy.

2.29 We expect to see many technological changes; these can be grouped under a number of broad headings:

- **Smart grids** will assist network operators to meet consumer requirements more cost effectively and more quickly through better network management and to accommodate less predictable generation embedded in lower voltage networks. Although the (already-sophisticated) transmission network will become still smarter, it is at the electricity distribution network level where we consider that changes are likely to be most profound. Low voltage networks, originally designed for one-way flow, will require the measurement and control capability to accept input from distributed, small-scale renewable generation while at the same time supplying larger demands. More intelligent network monitoring and control will ensure the lowest cost means of providing the capability to meet these new demand and generation patterns.
- **Smart meters** could be a further important aspect of the transformation to smart grids. Compared with traditional meters, smart meters can measure and store more information about flows and can forward data to other parties and to appliances. This may enable the emergence of a range of new services. Permitting the accurate measurement of distributed electricity generation and allowing consumers to benefit from time-of-use pricing may enable those who are able to shift some of their demand away from peak times to be rewarded.
- **Smart load controls** enable consumers' end-use loads to be changed in response to particular events, for example, changes in electricity prices or conditions on the electricity network. Such developments raise the possibility of consumers' appliances being used to provide a range of ancillary services to network operators. The development of new technologies (including electric vehicles and energy storage) will provide further opportunities to utilise smart load control.
- **Micro-grids** will develop in specific areas as a consequence of the growth in embedded micro-generation and the developing need for greater service quality.

- **Gas developments**, such as the production and injection of biogas in the distribution system, may have adverse impacts on gas quality and may place greater risk on the normal operation of the grid and consumer safety. Costs of system access and compression also play an important role, especially for the injections from a DSO grid to a TSO grid. Biogas injections should be facilitated through the optimal sharing of these costs.

2.30 Developments such as those outlined above may have several consequential impacts on system operation, market activities and the role played by consumers, and the threats they face. Developments will support greater competition in ancillary services markets, helping to lower system operation costs. Network operators will require an improved communications infrastructure and greater management and better utilisation of data. We anticipate that there will be a more active role for DSOs in managing flows on distribution networks and, if so, there will certainly be a need for appropriate safeguards in respect of data security, including cyber-security.

Enabling demand response

2.31 In many Member States, larger consumers have provided load management services to system operators for many years. Smaller consumers are now increasingly equipped to offer these types of services (for example through aggregators), and, therefore, the relationship between consumers and system operators will change considerably. Rather than the traditional uni-directional relationship, many consumers – even at the level of the household – could be both consumers of energy from, and suppliers of energy to, the system. Consumer engagement will thus be increasingly important to ensure that these new relationships are understood and that the developments relating to demand response can be influenced from a consumer perspective. There will be significant differences in the way different types of consumers engage. For residential consumers, early adopters will engage differently from those who are less interested in any further interaction. Non-residential consumers are also likely to react differently depending on their size, their industry sector and the degree of energy-intensity of the business.

2.32 Demand response-enabling technologies and services will increasingly allow all types of consumers to contribute to system optimisation, thereby achieving the objective of secure, affordable, low-carbon electricity. Examples of such technologies and services include – but are not limited to – time-of-use pricing (static, dynamic and critical peak); demand-side response contracts; load limiters; demand reduction contracts (energy efficiency measures); and curtailment contracts. Aggregation is also likely to facilitate system operators' use of these services and could potentially be delivered by a range of players, including retailers, independent aggregators or energy services companies (ESCOs).

The future role of DSOs

2.33 The DSOs' traditional mission has been to operate, maintain and develop efficient distribution systems. However, many developments related to smart grids, demand response and distributed NP RES generation will require a new, more active (but market neutral) role for electricity DSOs. Similarly, the potential developments in the use of gas in the transportation sector (including liquefied or compressed natural gas, biogas and hydrogen) may also add new responsibilities for gas DSOs in response to the need for harmonised infrastructure. Given that DSOs are monopoly network operators, it is in the interest of all consumers that their influence on the operation of competitive markets will be appropriately minimised, leaving other actors (e.g. retailers, independent aggregators, ESCOs) to supply the new services including load control, usage monitoring and the provision of vehicle charging/refuelling, as well as non-energy services such as home security.

2.34 Access to metering data will be crucial for market actors who want to offer smart services to customers. Where DSOs manage this data flow, they have potentially a competitive edge through the advanced detailed knowledge of their customers. However, DSOs will increasingly need to undertake actions in the energy market in order actively to operate their networks. Whilst such actions could be at the request of the TSO (as for congestion management), they could also retain considerable discretion as to how to fulfil such requests and it will be important that any interventions are undertaken in a commercially-neutral manner.

3 Actions for Europe's regulators

A REGULATORY IMPACTS: Electricity Wholesale Markets

Stakeholders' feedback stressed the importance of simple, market-based approaches to tackle future challenges, such as remuneration for flexibility. In particular, there was a strong emphasis on the importance of developing transparent short-term markets through the full and effective implementation of the existing network codes. ACER and NRAs should focus on creating a level playing field for all parties; ensure that the rules for participation in markets are applicable and appropriate for demand, for renewables and for conventional generators; promote balance responsibility for all parties; and contribute to the debates on possible policy interventions.

An integrated electricity market across the continent

3.1 European-wide implementation of fully coordinated short-term trading, through liquid intraday and balancing markets, will create routes to signal the value that markets place on flexibility, as well as offering a greater range of balancing tools that can provide market-based solutions to the NP RES challenges. Thus there could be further refinements in many areas: on how existing assets and infrastructure are used; the detailed analysis of the optimal configuration of bidding zones to ensure that zones appropriately reflect network congestions; coordinated cross-zonal capacity calculation to optimise the use of available infrastructure; the development of efficient hedging tools for short-term price risks for market participants in all areas; and competitive short-term markets with implicit allocation of cross-zonal capacities.

3.2 The implementation of all aspects of the electricity Target Model across Europe will allow us more accurately and continuously to assess whether and how that model can be improved or refined in the years to 2025, and indeed beyond. The practical experience of a functioning European market will also permit us to identify other possible benefits, for example, from moving gate closure times in the day-ahead or intraday markets closer to real time; from shorter market time periods; or from enhanced designs of forward markets. ACER will therefore continuously monitor the implementation of the Target Model and will critically assess where improvements can be made, building on its fundamental design features.

3.3 Our initial thinking is that future regulatory emphasis must focus on the implementation of the cornerstones of the Target Model, building on the significant progress that has already been achieved in developing integrated wholesale electricity markets (particularly in day-ahead markets in the North West European region). Most immediately, greater emphasis should be placed on the need to rapidly implement the Target Model across all geographies and market timeframes. Additionally, we shall review (and report publicly on) whether additional changes are necessary.

Continued development of electricity wholesale markets

3.4 Non-discriminatory market arrangements must not create barriers to participation on the basis of size, location, connection voltage, technology and whether the participant is on the demand or generation side. It is imperative that markets promote participation for participants to compete and respond to price signals and, in the longer term, create a stable climate which supports investment. Greater consistency between Member States' approaches in their market arrangements and improved competition and liquidity in national and cross-border markets, continue to require further attention.

3.5 Our key priorities will be the following:

- Promoting a rapid transition to a system in which all parties are balance responsible, facing imbalance charges that reflect the cost of system balancing and where parties have appropriate incentives to manage their risk via well-functioning markets.
- Ensuring that all generation and demand compete on a non-discriminatory level playing field over the different time horizons of the wholesale markets. ACER and NRAs will play their part in ensuring that rules for participation in energy, balancing and reserves markets will apply and be appropriate for demand-side, distribution users, RES generation and conventional generation.
- Balancing markets are critical for sending market-based signals about the value of flexibility and in making the best use of available resources. However, cross-border European balancing markets need to be further developed. Further work is required to capitalise on the initial – yet vital – steps outlined in the Network Code on Electricity Balancing and the learning from the balancing pilot projects. A consistent and refined design for these markets will support liquid cross-border trading of balancing services that maximises the social welfare benefits for European consumers. We will undertake further analysis to develop and improve the common European balancing target model defined in the Network Code.
- Further optimisation and cross-regional co-ordination of the capacity calculation methodologies in order to establish a clear and transparent link between commercial congestions and physical congestions in the grid.
- By allowing markets to reveal the true value of electricity delivery, regulators will work to remove barriers and impediments which limit price formation. Regulated prices and bidding caps must not be allowed to distort efficient price discovery in the market. This is particularly important in the development of markets in flexible response, where robust price signals are clearly required to balance the demand and supply for these services.

Intervention in electricity markets

3.6 Wholesale electricity markets are increasingly supplemented with often national, non-market based support mechanisms. Although these interventions may seek to overcome market failures, foster innovation and technology deployment, and complement the market

in delivering appropriate investment signals, they may, depending on their design, also create distortions and significantly hinder market functioning.

- National RES subsidies targeted at specific technologies, although consistent with political EU objectives, are a major market distortion. Regulators (through CEER) have considered how national schemes can converge. This work will continue to ensure that investment policy complements the operation of the internal market in electricity and does not create disproportionate additional costs to customers. Similarly, non-direct financial support (including requirements for priority dispatch of renewable generation or giving particular technologies certain advantages under grid access rules) can also distort market signals. Regulators support the regular evaluation of arrangements, such as priority access and dispatch, with respect to the 2020 RES objectives, including consideration of whether non-financial support mechanisms could be replaced by market-based arrangements.
- In a well-functioning and efficient market, capacity remuneration mechanisms (CRMs) may or may not be needed to ensure generation adequacy. Every step towards developing CRMs needs to be clearly justified and carefully evaluated. This evaluation may include sufficiently coordinated adequacy assessments and whether rewarding flexibility is a more appropriate measure in a specific market. Where CRMs are considered necessary, a proper competitive environment for such mechanisms needs to be guaranteed to ensure that they are fit-for-purpose, open to new, existing and cross-border resources, and properly reflect the value of different generation, storage and demand response. Close monitoring, evaluation of the mechanisms' effectiveness, and, if possible, options for phase-outs also need to be envisaged.

3.7 The Guidance provided by the Commission on state intervention in electricity markets[7] and the Guidelines on state aid for environmental protection and energy[8] represent positive contributions that seek to avoid the integration and working of the Single Energy Market being undermined. Although the responsibility for the design and management of support mechanisms lies primarily with each Member State and the European Commission, NRAs and ACER are fully committed to provide support in the preparation and assessment phase and, where appropriate, the design of such mechanisms.

3.8 In contributing to the policy debate and supporting policy makers, the approach of ACER and NRAs is to promote cross-border solutions to address problems of generation adequacy and seek to ensure that all interventions minimise market distortions. We also support the reform of the European Emissions Trading System to meet carbon-related policy objectives. A well-functioning carbon market is the most appropriate tool to drive

[7] European Commission (2013), *Communication on Delivering the internal electricity market and making the most of public intervention*. C(2013) 7243 final

[8] European Commission (2014), *Communication on Guidelines on State aid for environmental protection and energy 2014-2020*, C(2014) 2322 final

investment in clean energy infrastructure. ACER and NRAs will offer advice on the design of interventions so that the goals of security of supply and competitive markets are met as far as possible[9].

Improved coordination

3.9 Improved coordination has perhaps been the defining feature of the developments seen in European electricity markets in recent years. That coordination will continue to drive future developments and should assist each actor most effectively to fulfil its relevant functions and ensure an efficient use of existing and future infrastructure. Improved coordination includes better cooperation and collaboration between NRAs so that day-to-day regulatory practices can be aligned to deliver as consistent an approach to regulating the Single Energy Market as possible. The requirement for greater regulatory coordination in Europe is addressed in Chapter 4.

3.10 The further integration of wholesale markets, along with the growth in NP RES generation, will require greater coordination between TSOs. Coordinated and optimised system operation across system borders is a key area to develop the internal market. Enhanced cooperation between TSOs has the potential to significantly improve operational security whilst providing additional economies of scale. Recent initiatives have demonstrated the benefits that cross-border cooperation can deliver and regulators will work with TSOs to build on these successes. We shall focus on measures including the creation of common functions to coordinate capacity calculation and allocation, the operation of the European transparency platform and further centralisation of system operation where improvements can be achieved and costs can be reduced. ACER and NRAs will also support the further development of Regional Security Coordination Centres (RSCC) and investigate the opportunities for these eventually to merge into one for each synchronous area or into a single European Security Coordination Centre. We consider these issues more fully in Chapter 4.

[9] Cf. also *CEER views on the Commission's Public Interventions Package: Delivering the internal electricity market and making the most of public intervention*, C13-EWG-95-05 of 12 Dec. 2013

B REGULATORY IMPACTS: Gas Wholesale Markets

Stakeholders noted the important contribution of the existing gas network codes and the priority of fully implementing these before any new rules are developed. However, stakeholders acknowledged an uneven implementation so far and the sizeable number of issues still to be tackled. These include barriers to competition, the uneven spread of liquidity across European hubs, and the need for some new infrastructure investments, whilst at the same time being conscious of the risk of stranded assets. Stakeholders also agreed on the need fully to ensure that gas market participants are able to fulfil their role of providing flexibility to accommodate the growing amount of NP RES generation.

A flexible framework for a liquid pan-European gas market

3.11 For both the electricity and gas sectors, our immediate regulatory priority is the full and effective implementation of the requirements of the Third Package's network codes and, in the case of the gas sector, to secure the continued development of deep and liquid wholesale gas markets. It is imperative that gas markets drive efficient outcomes and provide incentives for parties to participate, to respond to price signals and, in the longer term, create a stable climate which supports efficient investment. In particular, we will focus on the removal of barriers and impediments which limit or distort price discovery, (notably regulated prices) and continue to work towards greater consistency between Member States and improved competition in national and cross-border markets.

3.12 Other needed measures include further refinements of capacity calculation techniques; analysis of the optimal configuration of entry-exit zones to ensure that they appropriately reflect network congestions; effective risk management through reliable forward markets and capacity allocation (or comparable hedging tools); and coordinated capacity calculation to optimise the use of available infrastructure.

Achieving liquid gas markets

3.13 The integration of markets should contribute to liquidity by increasing the size of the market and therefore the potential number of counterparties. A more liquid market may also encourage entry, leading to more competition and further improvements in liquidity. In accordance with the provisions of the Third Energy Package, each consumer should have the right to benefit from the Single Gas Market. In some regions - beyond the implementation of the gas network codes - this could be reached by more closely integrating their national markets. We will, therefore, examine the possible tools of market integration as part of the Gas Target Model review. The form such market integration might take (trading region, implicit allocation, full entry-exit zone merger) will be considered on a case-by-case basis.

3.14 A key priority for ACER and NRAs will be to develop measures that are needed to ensure that all EU companies supplying gas to consumers, or buying gas directly on wholesale markets, can access liquidity sufficiently far ahead of delivery and can properly manage risk exposures at a fair price. Deep and liquid gas markets only at the day-ahead stage do not provide sufficient hedging tools for gas suppliers. However, traded volumes required to support forwards markets are likely to be considerably greater than those needed to support spot liquidity. The challenge will be to ensure sufficient liquidity in the forwards timeframe. A range of potential measures exist to meet this challenge and they include: minimising the barriers to the consolidation of gas hubs; developing capacity products that provide financial certainty for accessing neighbouring trading hubs (which have functioning forward markets); and hybrid merged gas trading zones, where the geographic area in which balancing occurs is different from the virtual trading hub (which may be much larger).

Uncertain gas supply and demand

3.15 Uncertainty about future European gas supply and demand requires a flexible framework that allows market participants and system operators to react efficiently in changing circumstances. Regulators need to strike a balance between, on the one hand, encouraging the necessary investments that will better integrate markets and transport gas across the EU, thus enhancing competition and reducing dependence of single sources of supply, whilst, on the other hand, also minimising the risk of stranded assets. We need to work to achieve greater consistency between Member States and improved competition and liquidity in national and cross-border markets.

3.16 Given the current uneven implementation of relevant EU legislation, and the corresponding highly divergent levels of gas market development across the EU, a flexible approach is also needed. Thus, a more targeted approach in certain regions could be more efficient than adding another layer of one-size-fits-all intervention at EU level. While the Gas Regional Initiative has shown itself to be a useful building block in advancing the internal market at a regional level, its voluntary character means there are demonstrable limits as to what can be achieved. To facilitate targeted interventions, criteria would need to be developed to indicate under which circumstances and at which level (regional and/or national) such interventions might be justified. Where intervention were to be justified at a regional level, optimising cooperation at regional level would be essential, along with developing satisfactory overall regional governance arrangements. Interventions will need to be directed at those areas where the welfare losses for citizens and their expected net benefits from action are the highest, without jeopardising the overall Single Energy Market framework.

3.17 Regulators must also develop – within their competence – a regulatory framework that takes into account the impacts on grid charges of the possible decline in gas demand in order to reduce stranded costs and ensure that the burden of any charges does not lead to a negative spiral which will impact heavily on consumers and prices. Work will be taken forward as part of the review of the Gas Target Model now underway in order to explore

the development of a flexible regulatory framework for gas wholesale markets that identifies the most appropriate measures for developing liquidity across all gas markets and in different timeframes. The review will also assess areas to identify any necessary improvements or updating of the approach.

3.18 Improved coordination through better cooperation and collaboration between NRAs (both at EU and regional level) is discussed in Chapter 4. It is needed to ensure day-to-day regulatory practices can be aligned, thereby ensuring a consistent approach to the regulation of the Single Energy Market.

Providing electricity flexibility through gas

3.19 The greater penetration of NP RES generation will need flexible tools to help electricity market participants and TSOs to manage close-to-real-time changes in electricity generation and demand. Gas-fired plants are well placed to fulfil this role given the speed with which they are able to ramp up and down (in addition to their low carbon emissions relative to other thermal generation plants). There are also ways in which the regulatory framework could facilitate gas generation further to fulfil this role and potentially to integrate gas and electricity market regimes as far as is appropriate, thereby avoiding unnecessary obstacles and ensuring efficient system balancing. For example, differences in the nomination periods between gas and electricity can result in a greater exposure to imbalance charges if a gas-fired generator changes output at short notice. Similarly, electricity TSOs could provide gas TSOs with more granular information to allow a more precise within-day forecast of the off-takes from gas power plants.

3.20 In some gas networks, reinforcement may be required to permit the fast response required by flexible electricity generators, including the potentially improved access to storage and linepack. The related issues of cost allocation and how best to incentivise TSOs to maximise the amount of system flexibility provided to market participants, will need to be further considered along with any changes to market arrangements that are required to ensure that gas markets meet the needs of the electricity market.

C REGULATORY IMPACTS: Infrastructure Development

Stakeholders offered a range of views with a clear priority being placed on the importance of market-based investment signals and the development of output-based regulatory frameworks which incentivise efficient investment decisions by system operators and appropriately reward those investments that provide the most benefits. Stakeholders were also keen to see regulation that drives cost reductions, but also takes account of R&D requirements and investment in necessary ICT. Transparent and cost-reflective network tariffs were identified as important aspects to facilitate appropriate network investments.

Investment driven by market signals

3.21 Maximising the benefits of Europe's Single Energy Market will be dependent on investing in sufficient levels of transmission infrastructure to allow for efficient cross-border flows of energy and to ensure the stability of the interconnected European system. Regardless of the specific type of infrastructure, market signals should drive the required investment decisions and investments should be coordinated on a regional and European level to ensure that cross-border considerations are fully taken into account. The EIP provides the basis for common criteria to assess the costs and benefits of potential projects of common interest (PCIs) and proposes measures to accelerate the deployment of these projects once accepted.

3.22 In electricity, in addition to the EIP, a new framework for the Inter-TSO Compensation mechanism (ITC[10]) and other developments in the methodology for TSO cost-sharing as a result of cross-border redispatching are being established. It will be important for regulators, the European Commission and TSOs themselves to ensure that these mechanisms remain effective and are consistently implemented.

3.23 Regulators clearly have a critical role to play in facilitating investment and we need to play our part to ensure that Member States' regulatory regimes operate is such a way that those projects with the greater economic benefits are favoured regardless of whether they are national or cross-border. While it is not clear whether cross-border investments are systemically more risky than any other investments, they do involve new and different challenges. Indeed, greater regulatory co-ordination – for example in approaches to assessing risk or cross-border cost allocation[11] – can enhance efficient decision-making

[10] ACER recommendation for a new regulatory framework for ITC: http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Recommendations/ACER%20Recommendation%2005-2013.pdf

[11] ACER recommendation on Cross-Border Cost Allocation Requests: http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Recommendations/ACER%20Recommendation%2007-2013.pdf

and therefore should be pursued. ACER and NRAs will assess the scope for greater co-ordination, including whether additional incentives to promote investments with significant economic benefits are needed and, if so, how relevant projects should be assessed and how any incentive should be funded.

3.24 Regulation itself must be "smart" so that it can respond to technological developments quickly whilst ensuring that such responses maintain a level playing field. Regulation should also support the early stages of technological development and the application of output-based evaluation once technologies reach maturity should also be considered. Such a move to an output-based approach must recognise and reward investments that contribute to a more efficient and cost-effective system. Regulators will explore how best to deploy incentive mechanisms, including output-based ones, to encourage efficient operations and investments by DSOs and TSOs.

D REGULATORY IMPACTS: Consumers, retail markets and the role of DSOs

Stakeholders strongly argued for protection and empowerment of consumers so that they remain at the heart of retail markets. They explained the need for greater transparency of consumption information whilst protecting and securely managing consumers' personal data and envisaged a role for suppliers to act as a single point of contact for consumers thereby facilitating easier, speedier switching.

A core role for DSOs is that of a 'neutral market facilitator' responsible for distribution networks' system and possibly data management. When considering unbundling, the importance of the full implementation of the Third Package rules was highlighted, arguing that regulators should define clearly the relationships between DSOs, other service providers and consumers and develop a clear framework that supports new market players, such as aggregators.

An appropriate framework for energy customers

3.25 The CEER-BEUC 2020 Vision[12] principles of Reliability, Affordability, Simplicity, Protection and Empowerment were developed in late 2012 to ensure that consumers remain at the heart of the energy market and the central concern of regulators. That Vision remains valid. Any regulatory framework must anchor itself to those principles. Indeed, it is even more important that the principles are acted upon in Europe's retail markets in an uncertain future. Regulators will therefore continue to translate the principles of the 2020 vision into practical actions within the future regulatory framework to protect energy customers in all Member States.

[12] CEER-BEUC (2012), *A 2020 Vision for Europe's Energy Customers A Joint Statement - 12 November 2012*

3.26 In this respect, the regulatory actions for domestic consumers that are already being considered include:

- Enhancing transparency through clear and trusted information. Companies should present price information so that consumers can effectively and readily evaluate competing offers between suppliers and other market participants (e.g. aggregators). Offers should easily be comparable (for example, by presenting all costs as a projected unit price).
- Facilitating consumers' engagement and switching. Regulators will require that suppliers are the main point of contact for each customer with regard to the majority of processes in the retail market (including for switching from one provider to another; and for billing).
- Improving consumer experience. The target we set is that, by 2025, the supplier switching period should fall from its present maximum of three weeks to within 24 hours. There should be no difference in timeframes between electricity and gas, in order to facilitate dual fuel switches.
- Building consumer trust and ensuring data privacy and security. Robust systems must be in place to protect customer metering data, while at the same time allowing customers to benefit from third-party services and efficient network operation. Regulators will work with stakeholders to develop minimum standards for contracts, so that customers have confidence when third parties are involved, and to provide for non-discriminatory access to customer metering data, where approval has been given.
- Protecting the most vulnerable consumers in all aspects of retail market development. Regulators will seek to ensure that vulnerable consumers are not mistreated, but, whenever possible, encouraged and empowered to participate in the energy market and not excluded from opportunities that are available to all other consumers.
- Deriving consumer benefits through smart meters. When and where smart meters are rolled out, consumers must be in a position to benefit from the possibility of accessing new or enhanced services and be given greater control of their energy use (for example, through time-of-use prices, rapid responsiveness and speedier access to network and consumption information).
- Addressing the needs of household "prosumers" as participants in the market for distributed (renewable) generation, either individually, or as a group.
- Guaranteeing high customer service levels through minimum standards. Connections, disconnections and maintenance are important and often the first interaction between consumers and the energy market. Guaranteed minimum quality standards (such as timeliness of services) along with compensation arrangements will protect consumers and help to improve their perception of the energy market.
- Understanding consumer behaviour. Regulators will improve their understanding of consumer behaviour by more actively seeking feedback from consumers (for

example focus groups or consumer surveys) in order to inform the future development of retail market arrangements. Regulators also need to recognise the major distinction between the needs and relative strengths of different consumers – for example, between the smallest companies whose concern may be to avoid being tied down for long periods on disadvantageous tariffs; household consumers whose level of knowledge and activity greatly vary; and the larger companies whose concern may be, *inter alia*, to enhance their energy efficiency and contribution to demand response.

Removing barriers in Europe's retail markets

3.27 A fully functioning single European energy market should allow for the benefits of cross-border trade to be passed on to retail markets and to consumers in all Member States. Whilst retail markets will continue to be founded on national jurisdictions, suppliers in one country should be able to compete in the retail market in another, in that way enhancing competition at retail level to the benefit of consumers. A useful step towards a pan-EU retail market framework would be to develop a common framework for authorising the activities of individual suppliers and other energy service providers in order to facilitate their entry into another Member States' retail market.

3.28 A true assessment of retail markets on the basis of the outcomes created for consumers must be secured. These outcomes should include the levels of consumer confidence in energy markets; the extent to which energy companies deliver value for money; and the ease with which consumers are able to understand and choose between different offers. However, the case for seeking to fully harmonise the design of retail markets (e.g. a Retail Target model) is far less strong than for wholesale markets. Regulators' focus is rather to ensure that there are no barriers to increasing competition in retail markets and no impediments to the benefits of competition reaching consumers. ACER and NRAs will, therefore, focus on identifying any barriers to the entry of suppliers in others' national retail markets and examine how best these can be removed.

Enabling the market in demand response

3.29 The introduction of new services and technologies which permit greater demand-side involvement in the energy market will need to be accompanied by a framework that covers commercial, regulatory and standardisation aspects. This framework will need to explore the new relationships between service providers and consumers and seek to facilitate consumer involvement wherever possible. Its preparation will build on the work of existing standards bodies by establishing guidelines to standardise business processes and equipment without hindering innovation. Regulators are also aware that cross-sectoral impacts have to be considered too (for instance, the sharing of communications infrastructure for smart meters across different sectors could be beneficial, as long as issues such as data separation and consumer protection are taken fully into account).

3.30 All elements of distributed energy resources need to be covered by the regulatory framework. These include distributed generation, demand response and flexibility services (such as load management and storage). There will need to be appropriate protection for participating consumers, requirements for information, data, cyber-security and monitoring – including an indication of who is responsible for the collection of the required data and its provision to other market actors. Moreover, areas where standardisation is required would need to be identified, for example as a prerequisite for the market to develop a common set of standards for the content, format and exchange of customer metering data (which is one of the important issues raised by the CEER draft advice on data management recently under public consultation[13]). Regulators will also focus on actions taken centrally for the market to function, including identifying interactions with wholesale markets and transmission and distribution operation and barriers to the development of flexibility services. Responses to the CEER consultation 'Regulatory and Market Aspects of Demand Side Flexibility'[14] are helping to inform our thinking.

Role of DSOs

3.31 DSOs will increasingly need to play a key role in the development of a more active, smarter demand-side and smart grids. Regulation should provide the framework for the efficient operation of DSOs and facilitate the development of new markets to the benefit of consumers.

3.32 Although the promotion of a market design for distributed energy resources may require some degree of economic and technical harmonisation at EU level, regulators believe that it is most useful to define a menu of (consistent) options as a way of describing the precise role DSOs might play in order to respect the different contexts of the distribution network across the EU. A guide of this sort would be based on a set of principles which would include: that DSOs should act as a neutral market facilitator; that (consistent with their responsibility to ensure system security) DSOs should not impede the development of the market in supply services including load control, energy usage monitoring or new activities (like electric vehicles recharge points in public places or vehicle-to-grid services); and that DSOs should not be able to use advance access to data to gain commercial advantage.

3.33 The most effective long-term model to deliver such an outcome is ownership unbundling. However, as many respondents to our pre-consultation suggested, a thorough assessment is necessary before introducing any new unbundling requirements into legislation. The full implementation of the Third Package – applied and enforced – remains the important first step, since our present regulatory framework already ensures neutrality and non-discrimination as long as DSOs only have a marginal role in dispatching. However, should the DSO role grow further, stronger unbundling would seem necessary, having

[13] C13-RMF-57-04 CEER *Draft Advice on Data Management for Better Retail Market Functioning*. 26 March 2014
[14] C13-SDE-38-03 CEER *Regulatory and Market Aspects of Demand-Side Flexibility*. 8 November 2013

regard to the market models chosen for the services provided and the existing differences in distribution activity across Europe.

3.34 Further analysis will focus on whether the services currently provided by DSOs could be better provided within competitive markets and whether additional safeguards (or boundaries) are required to ensure that any such competitive market could develop alongside the monopoly operations of DSOs. Regulators will further consider the future role of DSOs, including analysis of the appropriate degree of unbundling, taking into account the views of stakeholders.

3.35 The size of DSOs is of relevance given that many DSOs are at present exempted (in the Third Package) from unbundling (required only when integrated electricity or natural gas undertakings serve more than 100,000 connected customers). Thus, customers connected to small distribution networks may not benefit to the same extent as those connected to larger systems. Indeed, small DSOs often have limited (or zero) interactions with TSOs as they may only be connected to a larger DSO. Regulators will, therefore, consider whether to recommend to the European Commission the possible revision of the current *de minimis* limit (of 100,000 customers) and whether (and how) to encourage further consolidation of distribution systems.

Improved coordination

3.36 The remit of DSOs is perhaps changing faster than any other single actor in the energy sector. Some networks are beginning to require more active management as significant volumes of small-scale generation connect to distribution grids. The TSO-DSO interface therefore requires careful management, as does the need for efficient information exchange, coordinated congestion management and integrated planning (coordination requirements between TSOs and DSOs introduced, for example, by the Demand Connection Code provide a valuable starting point). NRAs and ACER will work with DSOs and TSOs to assist them in more clearly defining their respective roles and responsibilities so that DSOs may manage their evolving networks in a transparent and reliable way, whilst at the same time supplying system services to TSOs.

Encouraging efficiency through dynamic pricing

3.37 Time-of-use pricing in gas and electricity markets can be used to reflect more accurately the value of energy consumed at different times. Reductions in energy consumption during peak periods can reduce the need for additional infrastructure investment and thus reduce prices to consumers. Whilst the benefits of dynamic pricing can be identified, there are also costs which may result from different consumption patterns. These costs are harder to quantify because the effect of changing consumption patterns varies between consumers. Further, the costs and benefits will probably differ between electricity and gas as well as between different types of consumers. Regulators will therefore consider further the implications for consumers of time-of-use or locational distribution network tariffs.

Regulators will also consider ways in which efficiency in the use of the network for the operation of the competitive market may be encouraged, such as dynamic network tariffs or other dynamic pricing components such as levies, as well as the practical challenges that the implementation of such measures would pose given the very different structures that exist at DSO level across the EU.

4 Implications for governance

4.1 Robust and fit-for-purpose governance arrangements for the Single Energy Market should address the roles of all relevant actors with specific tasks under the Third Package and network codes[15] – including ACER and NRAs - and the interactions between ACER, NRAs and regulated entities. These interactions will be a critical feature of future energy sector rules.

4.2 Any lack of clear governance, institutional or cooperation arrangements hampers the decision-making process, as already experienced in the early implementation of the network codes. The next phase of implementation of the network codes may also reveal new governance gaps.

4.3 The challenges ahead suggest deepening further the cooperation and collaboration between NRAs (both at EU and regional level). This will maintain and enhance consistent approaches to regulation of the Single Energy Market as the growing integration of markets requires further concerted action and a robust and efficient decision making processes on EU wide regulatory issues. ACER will continue to play a central role in both respects as the support of NRAs and the coordination of their action at European level are already at the core of ACER's mission.

Fit-for-purpose processes for the implementation and enforcement of market rules

4.4 The gas and electricity network codes already adopted, or currently under development, need to be implemented quickly across the Union to become the cornerstone of the future European energy markets. Critical in fulfilling this fundamental role will be a robust, speedy and fit-for-purpose process for governing and monitoring the implementation process and enforcing the agreed network code provisions. This relates in particular (but not exclusively) to the processes for the terms and conditions and methodologies to be elaborated in a coordinated manner by TSOs under the umbrella of the ENTSOs and to the subsequent regulatory approval proceedings.

4.5 At the heart of such matters is the need for an effective process, respecting the different roles of the ENTSOs and ACER, TSOs, NRAs and the European Commission, and ensuring that there is an appropriate role for consumers and stakeholders. Since the Third Package was adopted, there have been clarifications of the scope of responsibilities which can be delegated to EU Agencies such as ACER. ACER's role could, therefore, be enhanced (subject to the necessary legislation) in a number of areas.

[15] For example, the relationships amongst TSOs, amongst PXs, amongst NRAs, but also between TSOs and PXs, between TSOs/PXs and NRAs, between NRAs and ACER, between NRAs and Member States, and between ACER and the ENTSOs

4.6 Modifications to network codes in the future must also be timely and well prepared. They should allow for the inevitable adaptation resulting from the gas and electricity Target Models as they evolve and to ensure that they are fully consistent. The extensive technological changes, new energy policy initiatives and behavioural changes will also require adaptations of market rules and procedures. It will also be essential that such changes remain coherent and consistent across the whole body of existing rules; that they take account of other developments and the longer term vision of the European market models. We therefore believe that it would be helpful to establish an agreed baseline (for example, consistency with the target models for electricity and gas) against which network codes (and code modification proposals) can be assessed. ACER itself will continue to develop the process for modifying network codes – a process that will be as effective and efficient as possible - taking full advantage of the experience of developing existing network codes. Whilst particularly timely with a view to the network code modification process, regulators will also review other processes to seek efficiency improvements.

4.7 Furthermore, it is also likely that we may need to review whether the present arrangements for the enforcement of codes are appropriate and sufficient and, if necessary, provide advice to the European Commission. Options for consideration include the role of all relevant actors including that of ACER.

4.8 While the further implementation of the target models will make cooperation increasingly pan-European, the scope of regional cooperation and coordination and its governance arrangements may need further development and reinforcement to respect and reflect regional specificities and to permit flexible and, where necessary, more targeted action, to overcome any obstacles to market integration.

The role of the ENTSOs

4.9 The European Network of Transmission System Operators for Electricity (ENTSO-E) and the European Network of Transmission System Operators for Gas (ENTSOG) have each played significant roles in the development of network codes and are an essential part of the European energy policy landscape. The role of both organisations will evolve and perhaps expand as more tasks currently performed nationally are centralised or coordinated. The two organisations will play a greater role in coordinating national TSOs' actions during the implementation of the network codes and in defining the detailed rules and procedures for the operation of European energy systems.

4.10 While ACER provides opinions on many ENTSOs' deliverables, including the network codes and the Ten-Year Network Development Plans, it is for consideration whether regulatory oversight of these organisations is adequate. ACER will, therefore, assess the current regulatory and governance arrangements. In particular, the ENTSOs' governance arrangements will be reviewed to ensure that the EU-dimension of their responsibilities prevails over the specific interests of their individual members, not least given their

commercial interests. ACER will publish its assessment and, where appropriate, advise the European Commission with regard to any improvements.

Appropriate regulatory oversight of new entities

4.11 Greater Europeanisation of tasks is clearly likely as the EU energy market becomes more integrated. NRAs and ACER must therefore ensure that the actions of the entities that perform specific tasks (such as coordinated capacity calculation) are appropriately monitored and that, where necessary, any regulatory action is taken. The implementation of the Target Models, particularly in electricity markets, will also see the creation of a number of new entities and changes in the roles of others. Such changes may, where appropriate, require NRAs and ACER to propose governance arrangements that strike a balance between the flexibility needed to reach efficient market-led solutions and the protection of the public interest, including the prevention of negative impacts on the functioning of gas and electricity markets.

4.12 In the electricity sector, the Capacity Allocation and Congestion Management (CACM) Network Code will require Member States to designate parties as Nominated Electricity Market Operators (NEMOs) which are required to perform the key function of Market Coupling Operator. However, at present in some Member States power exchanges, trading and capacity allocation platforms in both electricity and gas markets (for example, gas capacity booking platforms such as Prisma) are subject only to indirect regulatory oversight. In the interest of a robust framework, all market facilitators (TSOs, PX, hubs, balancing agents etc.) should be subject to a set of standard supervisory rules, executed by NRAs (for all actors with a national ambit) or ACER (for actors with a regional or EU scope). This could also include the regulatory oversight of the costs incurred by these bodies, particularly when these costs are to be borne by the TSOs which are regulated by NRAs. Given the central role of these bodies in delivering liquid and reliable markets, NRAs and ACER will assess the appropriate level of regulatory oversight for these entities and, if necessary, make recommendations to the European Commission.

4.13 Similar questions also arise in respect of Regional Security Coordination Centres (RSCIs). These voluntary bodies (such as Coreso and Transmission System Operator Security Cooperation (TSC)) undertake coordinated operational security analysis for the European grid. NRAs and ACER see RSCIs as a positive development which can enhance the efficiency of operational security analysis. However, given their present (and possible future) expansion, we shall assess the need for an appropriate regulatory framework for RSCIs. Appropriate governance arrangements should include all relevant market actors which are assigned responsibilities in the Single Energy Market, such as network operators, EU bodies like ENTSO-E, ENTSOG, power and gas trading exchanges, common service providers (such as Customer Advisory Committee (CAO) and Prisma) and other future institutions.

ACER's role in an expanding market

4.14 The integration of energy markets extends beyond the EU's borders, for example to include the Contracting Parties of the Energy Community Treaty (ECT) and the countries of the European Economic Area (EEA), as well as perhaps other countries in the future. Enlargement may provide benefits in terms of a complementary resource mix and enhanced security of supply, but will also mean that the Target Models and the provisions of the network codes will progressively be adopted by ECT and EEA countries. Other third countries may also decide voluntarily to do so. This raises the issue of the potential participation of third countries in the definition of these models and rules. The ACER Regulation sets the conditions for the participation of third countries in ACER. The European Commission is invited to assess the way in which these conditions can be met and the type of participation they trigger. A further option to be considered is the extension of the relevant region(s) within the Regional Initiatives to include NRAs from more advanced non-EU countries.

Regulatory capacity building

4.15 In earlier paragraphs, our concern has been to highlight the need for legal clarity with regard to the application of the Third Package, as well as the current Target Models and their evolution to address future challenges. There is also a more practical issue. The experience of NRAs and ACER in applying the legal provisions and their wider regulatory responsibilities raises the question of whether, and if so how, EU regulators might more effectively help other countries to develop their regulatory capacity. The "concentric rings" of possible support are clear: those of most immediate relevance and importance are the existing applicant countries for EU membership and those where agreements with the EU have entered into force (e.g. Energy Community) or where political considerations heighten interest (Ukraine, Moldova, the Eastern Mediterranean countries). NRAs separately and in CEER have the responsibility for exchanging experience and best practices internationally (both directly and through the International Confederation of Energy Regulators (ICER)), providing regulatory advice, assistance and possibly training, as well as raising awareness of the importance of independence and accountable regulatory practices at international level[16]. The political (and possibly financial) support from the Commission will clearly be a major factor in determining the extent of ambition that can be envisaged[17].

[16] For example, the European Bank of Reconstruction and Development (EBRD) has collaborated with ICER in a project to enhance the regulatory capacity of an energy regulator in eastern Russia.

[17] Especially where training modules to enhance regulatory knowledge and awareness based on NRAs' experience are envisaged.

Annex: Summary of possible regulatory actions

- We will place great emphasis on the need for the rapid implementation of the present electricity Target Model across all geographies and market timeframes and commit to review the need for any changes.
- We will undertake further analysis to develop and improve the common European balancing target model defined in the Network Code.
- We will proactively advise on the design of interventions so that the goals of security of supply and competitive markets are met as far as possible.
- We will support the development of Regional Security Coordination Centres and investigate the opportunities for these eventually to merge into a single European Security Coordination Centre, or one per synchronous area.
- We will review the Gas Target Model to ensure that it remains a flexible regulatory framework for gas wholesale markets, identifying the most appropriate measures to develop liquidity in all markets and timeframes including possible tools of market integration.
- We will further consider changes to market arrangements that are required to ensure gas markets meet the needs of the electricity market.
- We will map out a framework covering the required commercial, regulatory and standardisation aspects necessary to facilitate the market in demand response.
- We will consult on the future role of DSOs, including consideration of the appropriate degree of unbundling.
- We will consider whether the current *de minimis* limit applying to DSO networks should be revised.
- NRAs and ACER will work with DSOs and TSOs to allow them to more clearly define the respective roles and responsibilities that enable DSOs to manage their networks in a transparent and reliable way whilst also supplying system services to TSOs.
- We will assess whether additional incentives are needed to promote necessary (but higher risk) investments with significant social benefits and, if so, how such incentives should be funded.
- We will consider whether to develop and deploy output-based incentive mechanisms to encourage efficient operations and investments by DSOs and TSOs.
- We will continue to identify barriers to entry in national retail markets and examine how they can be removed.
- NRAs through CEER will further develop the CEER-BEUC 2020 Vision principles into practical actions as to how the future regulatory framework might evolve to enable market developments across Member States while continuing to protect and empower consumers.
- We will review the process for the development, modification and enforcement of network codes to ensure that it is effective and that the present governance arrangements are robust to the future pace of change.
- We will consider the appropriate governance arrangements for the ENTSOs.
- We will assess the appropriate level of regulatory oversight for power exchanges and other market coupling operators, and trading and capacity allocation platforms.
- We will assess whether bodies performing pan-European functions are regulated adequately and proportionately.
- We will, within the ambit of our responsibilities and resources, consider the participation of NRAs of relevant countries outside the Union willing to develop regulatory arrangements compatible with those applicable in the EU.
- We will consider offering training modules as part of its future collaboration with Third Countries subject to the availability of resources including financial support by the European Commission.