European Network of
Transmission System Operators
for Electricity

EC GREEN PAPER:

A 2030 FRAMEWORK FOR CLIMATE AND ENERGY POLICIES

AN ENTSO-E CONSULTATION RESPONSE PAPER

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EXECUTIVE SUMMARY

The role of electricity is increasing in importance in meeting the EU's climate and energy policy objectives. In all future policy scenarios the management of ever increasing large scale deployment of renewable sources of electricity and low carbon technologies on the pan European power system is the critical challenge. Integrating these in an economically efficient manner, while maintaining the reliability and resilience of the power system, is central to achieving the policy goals including affordable, reliable, secure and sustainable energy for all EU citizens and industry.

The Green Paper from the European Commission "A 2030 framework for climate and energy policies" is particularly clear on the importance of these issues, and depicts the difficulty of tackling these global problems. ENTSO-E and its member TSO's believe that our responsibilities as system operators, planners and developers, coupled to our focus to continuously challenge our technical capabilities aligned with our independent position in the industry place us at the heart of the solution to these problems and make us a key partner in successfully delivering on the climate and energy policy objectives.

In particular our role as network planners is central to the build out of the necessary grid, interconnection and network. In this regard, the Green Paper acknowledges the importance of the pan-European Transmission network. The roll out of the necessary network infrastructure in a timely manner is a core fundamental to underwriting the economic competitiveness of the EU and the security of supply of electricity for its citizens. But to reach this objective there needs to be a combined effort by policy makers, legislators, regulators and TSOs.

However, as important, is our role as system operators in understanding and mastering the technical challenges in operating the power system with a transformational level of renewable sources of energy and low carbon technologies. The scale of this should not be under estimated. It is only by understanding the aggregate impact of the large scale deployment of RES-E resources can the resilience and reliability of the pan European power system be maintained.

Intimately linked with system operation is the internal energy market. ENTSO-E strongly advocates the full and speedy implementation of the Target Model. This is a first necessary step in delivering for the end consumer on the efficiencies arising from trade that the pan-European power system offers. However the target model as designed may not be sufficient to economically deliver the range of policy objectives required, especially high RES-E. There is a clear need to examine what is required in addition to the internal market and this needs to pragmatically reflect these aggregate technical challenges. ENTSO-E's expertise is critical in this endeavor.

In conclusion, ENTSO-E has to continually challenge itself in understanding and mastering these evolving technical challenges. However these aggregate constraints are not only relevant to the technical issues but are at the heart of the efficacy of meeting the policy objective in the first place. In this regard ENTSO-E is already analysing, identifying and synthesizing solutions that reach the boundaries of power system capability that meeting the challenges that evolving energy policy requires. Already there is relevant information to be taken into consideration in formulating 2030 policy objectives.

ENTSO-E is open to active engagement with policy makers, in informing future policy, and as importantly regulators, in the design of appropriate market incentives to deliver on the policy objectives in an efficient, economical, sustainable and secure manner for all EU citizens.

1 INTRODUCTION AND POLICY OBJECTIVES

The EU Commission has published a public consultation on a European climate and energy policy framework for 2030. The consultation aims to establish an overarching framework for climate and energy policy in the EU that cuts across the electricity, transport and heating sectors and which is delivered through GHG emission reductions, renewable energy and energy efficiency measures. The consultation discusses the merit of applying individual targets in each sector of the economy (electricity, transport and heating) the need for policy coherence out to 2030 and methods to enhance energy security in the EU while acknowledging the various capacities to deliver meaningful change.

Electricity systems are increasingly playing a critical role in meeting the range of energy and climate policy objectives for the EU. From the EU 2050 energy Framework[1] paper electricity is predicted to double in size, from 19% in 2010 to 39% in 2050 of the overall European energy mix. In addition the use of renewable technologies is to rise from 18% in 2010 to at least 55% and up to 97% in the high renewables scenario by 2050. The consultation itself indicates that by 2030 the global energy mix will be expected to be around 30% of RES. This will require at least a minimum of 40% in RES-E in the European power system if this is to be achieved.

This transformation of the electricity system poses many technical, regulatory and financial challenges. However underwriting all these challenges is the requirement to maintain a reliable and secure electricity system as a basic need of citizens at an affordable, sustainable and competitive price. This technical challenge has many dimensions and ultimately contains the most binding constraints on efficiently reaching the policy objectives. Understanding these constraints and developing solutions to mitigate their impact has a direct impact on the efficacy of reaching the policy objectives.

To this end there is an onus on ENTSO-E, member TSOs and system operators across Europe to seek to understand the ever changing characteristics of the power system to meet these ambitious policy objectives. From this understanding there will be a need to develop and implement new operational practices, planning techniques, enhanced social acceptance engagement and ever evolving real time decision support tools to accommodate these changes. It is only by a strong focus on, and a single mindset to, continually challenge of ENTSO-Es' collective technical expertise and its member TSOs that successful solutions can be developed. In particular the technical challenges associated with the aggregate impact of the large scale deployment of new RES-E and low carbon technologies on the pan-European power system should not be underestimated. It is this obligation that policymakers and regulators should hold ENTSO-E and its member TSOs to account for.

However these technical challenges and the feasibility of their solution at times may need to inform policy. Indeed the boundaries of technical capability and know how may, at the extreme, need to shape policy too. Setting objectives that are not achievable or not compatible will lead to large scale inefficiencies. In addition it will divert the scarce technical expertise away from more relevant challenges. This will result in failures to meet the policy objective and a growing increase in operational and economical inefficiencies, ultimately at the expense of the EU electricity consumer.

Given electricity's increasing role in meeting the energy policy objectives the cost of this transformation has significant ramifications for the long term competitiveness of the EU. To achieve this transformation efficiently it is necessary to design incentives, markets and supports structures that pragmatically account for these technical

[1] EU Communication on "Energy Roadmap 2050", Dec 2011

challenges. Without this there can only be inefficient outcomes. In the current economic environment these inefficiencies are unacceptable. All stakeholders have a responsibility to ensure that this does not happen.

In particular the roll out of the necessary network infrastructure in a timely manner is a core fundamental to underwriting the economic competitiveness of the EU and the security of supply of electricity for its citizens. In this regard there needs to be a combined effort by policy makers, legislators, regulators and TSOs. In particular there needs to be a strong unwavering public political support for the need of the infrastructure, necessary changes to planning permit legislation to expedite this, innovative regulated incentivisation to construct the network and a relentless delivery of it by the TSOs.

From an ENTSO-E perspective the key mechanisms for informing policy makers and regulators on the technical challenges currently are found in the Ten Year Network Development Plan (TYNDP) and the Scenario Outlook and Adequacy Forecasts (SOAF). These, and the national member state TSOs equivalent reports, are the bedrocks on which European and national electricity policy and incentives should be built.

ENTSO-E is aware that development of these particular reports is necessary, particularly the SOAF, to identify the technical constraints emerging from high RES-E. These constraints include, but are not limited to, the increased need for flexibility and management of uncertainty. ENTSO-E is confident that the necessary and appropriate metrics can be developed to inform policy makers, and has started to work in that direction. Appropriately reflecting these technical constraints in incentive structures will lead to the efficient delivery of these ambitious policy objectives. Achieving this will underwrite the secure and sustainable long term EU energy system.

Finally the varying Member State capabilities including natural resources, geography, society and economic well-being are material considerations in ensuring realistic, achievable and equitable burden share in managing the transformation arising from energy and climate change objectives. These realities need to inform the allocation of the challenge under the 2030 horizon.

The rest of this response answers at a high level the 5 distinct consultation areas.

- General
- Targets
- Instruments
- Competitiveness and Security of Supply
- Capacity and distributional aspects

2 QUESTIONS

2.1 GENERAL: LESSONS LEARNED FROM THE ENERGY/CLIMATE POLICY FOR 2020

The most significant lesson from setting the 2020 targets is the importance of ensuring that the goals are technically realisable, compatible and within the extended capability of each specific Member State to achieve. In that regard ENTSO-E's technical expertise is an essential input into formulating new policy objectives to ensure technical feasibility a prior to policy setting. Some specific issues that have and are causing issues for TSOs and ultimately undermine the efficacy of the policy include the RES-E locating in remote and weak areas of network, and the characteristics of these new technologies being fundamentally different from traditional generation with associated resilience issues for power systems at higher and higher penetrations of these technologies. These issues are creating challenges in the short, medium and long term horizons for system security and should not be underestimated.

In addition experience indicates that there is clear interconnectivity between investments and signals in one area and the ramifications in separate areas of energy policy. For example the recent concerns expressed about the Emissions Trading Scheme (ETS) have increased investment uncertainty. This has implications for investments in both the traded and non traded ETS sectors. Separately there needs to be a consideration of other externalities to climate and energy policy that have direct impacts on the nature of investments within these sectors. These include factors that are external to the EU (e.g. international climate change conventions), some external to the energy industry (e.g. Member State fiscal policy) and some distinct and relevant to the energy sector (e.g. ETS, IEM design)

It is important to understand the limits and reach of climate and energy policy in solely shaping investments to meet the policy objectives. Knowing these limits creates additional pressure on policy makers to ensure that those elements that remain within energy and climate policy control are implemented in an appropriate manner to improve the efficacy and not than inadvertently hindering of the policy objectives. ENTSO-E remains available to assist policy makers in understanding the technical interactions on European power system with respect to developing new climate and energy policy objectives.

2.2 TARGETS

It is not appropriate for ENTSO-E to recommend the use or not of targets as this is a matter for policy makers. However long term stable energy policy, in whatever form it is implemented, is to be welcomed. This is particularly important to TSOs as it enables the allocation of the scarce technical expertise to solving the challenges which ultimately leads to more reliable efficient long term outcomes. ENTSO-E's studies dealing with the evolution of the power system and grid (Ten Year Network Development Plans, TYNDP) and associated resulting technical capacities are an example of this technical expertise and relevant to policy objective setting.

In addition ENTSO-E emphasises that all aspects of the Climate Change and Energy policy are interlinked. Nowhere is this more evident than in the combined impacts on the pan European electricity system. It is because of this interconnectivity that appropriate holistic consideration is required in determining objectives and instruments that are going to last to 2030 and beyond.

All Climate and Energy objective, mechanisms and frameworks should be subject to a careful assessment to ensure coherency. This assessment should target technical feasibility, realistic deliverability and sound economical design. As an example, the ambitious and challenging level of targets, particularly for RES-E and associated non financial support mechanisms including priority dispatch and access, has led to the need for increased infrastructure and is increasing operational complexity today in many power systems. In addition there are clear distortions emerging in the electricity energy markets across Europe. As a first step in this process the setting of targets or whatever manifestation of long term energy policy that policy makers choose, should be informed by the ENTSO-E's technical studies, expertise and capability with respect to the pan-European power system.

The tools chosen to implement policy objectives should pragmatically capture the technical challenges in achieving the goals, and make sure that the deployment of generation comes together with the requirements for maintaining the security of the power system. This has two major dimensions, the need for transmission network infrastructure and addressing the real operational challenges consistent with the policy objectives:

Concerning network infrastructure, ENTSO-E would welcome a stronger focus by Member States on delivering necessary transmission grid identified in the ENTSO-E Ten Year Network Plans (TYNDP). Some possible examples of this might include flexible permitting procedures for network infrastructure with special emphasis being place on nternational interconnections.

Concerning operational aspects, the development of more market-based mechanisms should evolve cognisant and reflecting the emerging technical challenges. In this regard ENTSO-E already publishes the System Outlook and Adequacy Forecast which highlights the ten year system need for adequacy. This should be the basis for the assessment of real adequacy issues and be the necessary precursor to any associated market changes. On top of this there is a need to augment this report to capture the emerging security challenges that the pan-European power system will experience in meeting the policy objectives. ENTSO-E is actively engaged in meeting this challenge.

Given the importance of the overall power system to energy and climate policy and the likelihood of increased embedded generation and demand side participation to achieve this there needs to be recognition that active control by distribution system operators can only be facilitated to the extent it does not undermine system security and lead to overall inefficiencies. In that regard obligations on DSO to co-ordinate with TSOs are essential and where safety and security of either the distribution and transmission systems are not at issue that these obligations reflect the requirement to deliver the greatest system wide benefit.

2.3 INSTRUMENTS

The question of policy coherence in the instruments used by Member State to achieve the energy and climate change targets out to 2030 is of considerable importance to ENTSO-E. While the consultation paper deals in overarching policy aims and the need for policy coherence in the energy sector in totality by breaking down the policy instruments (whether financial or operational) within each sector (electricity for example), it becomes clearer where some of incoherencies in policy aims emerge.

Of particular concern to ENTSO-E is the ambiguity and the discretionary rights of Member States in setting relative priority dispatch between RES-E technologies, high efficiency CHP, indigenously fuel priority dispatch units and interconnector flows. This has recently been reinforced in the Energy Efficiency directive. This alters

the effective merit order as determined in the market to one which is decided on by Member States. As the level and amount of these different priority dispatch technologies increases this will lead to further and further distortions on market outcomes.

To avoid these inconsistencies and to meet the ambitious policy objectives raised in the EU 2050 Energy Framework communication the use of absolute support structures like priority dispatch should be reviewed. The use of incentives that capture the technical challenges that large scale deployment of RES-E and low carbon technologies places on the power system is likely to be more efficient in achieving the desired policy outcomes. In addition the use of priority and guaranteed access for both CHP and RES resources has major implications for the planning and construction of the new and need network infrastructure. Without the regulatory support to TSOs to resource for this increased challenge there is no material benefit associated with these instruments. This should not be overlooked.

The implementation of the 2020 targets appeared to leave scope for improved efficiencies. In particular, the 3rd package provided a Cooperation mechanism which aimed at ensuring the most-cost-efficient solutions were chosen by Member States. However there was no significant use of these measures between regions and Member States. ENTSO-E believes such schemes should form a material part of member States to efficiently reach their goals. In this regard ENTSO-E would encourage appropriate developments in this area to promote cooperation between Member States on statistical trades, joint projects and cooperation mechanisms. In order to achieve an efficient functioning of co-operation mechanisms a transparent pan European wide disclosure mechanism is required.

Another element of importance is demand response. The removal of unnecessary administrative barriers coupled with the development of market based mechanisms that reveal the true value of system security including flexibility are necessary prerequisites in order for this latent potential to be released. There needs to be a coordinated focus on this by ACER and National Regulators. In addition support should be considered for ensuring the key technology enablers are in place to facilitate the large scale participation of demand side response in 2030.

From a research and development perspective, a significant amount of it to date has been focused on the development of low carbon and RES technologies. While this was appropriate, more attention needs to be paid to the challenges of integrating the large scale deployment of these emerging technologies into a coherent reliable power system, which have not been forecasted. In particular it is important that structured research programs enable the design and operation of the pan European power system for 2030, including integration of HVDC links in an AC system, frequency control with power electronics devices and the role of storage in the system.

Moreover, ENTSO-E believes that for the transmission infrastructure required to meet the EU policy goals to be developed in a timely manner, a framework recognising the particular financial needs of TSOs needs to be created. Such framework goes beyond the national regulatory framework and needs a European component. This European component should not be limited to improving debt financing options or grants, but also has to incentivise equity financing. Without extra incentives for equity financing, both the size and the pace of the investment challenge remain out of reach. The attractiveness of the electricity transmission sector and in particular the risk-reward balance of the prioritised projects necessary to meet the EU goals should improve in order to be competitive at global capital markets.

Finally, ENTSO-E believes that the coherence of different policy instruments should be guided by the principle of transparency. Transmission networks charges frequently include taxes and levies as well as support mechanisms to local or renewable production. This approach hides the real costs of the network to consumers and thwarts the comparison of support and administrative costs borne by market players. Therefore appropriate local transparency arrangements should be considered where transmission tariffs contain supports or other measures which lead to an association with high regulated TSO costs.

As a general recommendation, we believe that close dialogue between TSOs, regulators and policy makers must be promoted and reinforced in order to reach a common understanding about the real economic, environmental and technical needs for 2030. This would allow aligning priorities and strategies consistently with the implementation process of policy instruments such as Network Codes.

2.4 COMPETITIVENESS AND SECURITY OF SUPPLY

Competitiveness and Security of Supply are often seen as competing objectives with respect to Climate and Energy policy. Increased focus on one of these is generally at the expense of the other. However with respect to the pan-European electricity system there is a rare opportunity to reverse this trend. In particular investment in the necessary Member State network and interconnection, consistent with the TYNDP will significantly increase the security of supply of the electricity networks. This investment also provides the backbone to facilitate trade of sustainable and efficient forms of electricity production to end consumers. These factors, combined with the increasing role of electricity in meeting the EU energy policies, have multiplicative benefits for the future competitiveness of the EU and provide a stable footing for future economic growth and job development.

In order to achieve these outcomes there are two key areas to be addressed:

- Network Development and System Operation;
- Market Design and Incentivisation for Electricity production.

Network development requires a focus on planning the appropriate long term network to efficiently meet all policy objectives and getting that built as speedily and robustly as required. ENTSO-E and its members have a key role in this, both as network planners through the TYNDP and, in most Member States, as asset owners and builders of the network. However there are three other key success factors that require continual attention.

The first is in ensuring the appropriate political focus on obtaining and maintaining the necessary social acceptance for the need and benefits of electricity network infrastructure. National, regional and European policy makers and politicians have a leading role in this endeavor, in particular by simplifying the procedures to get authorization, whilst organizing the due consultations about the projects. An example of strong political leadership includes the support of the European council[2] gave to interconnection which should be at least 10% of a Member States electricity production capability.

[2] Presidency conclusions, European Council meeting, Barcelona, 15-16th March 2002.

Secondly the need to have sufficient funding to construct and maintain this network is required. National regulators and ACER need to continually strive for innovative regulated incentives to attract the necessary funding and link it to the policy objectives. A recent ENTSO-E position paper goes in depth into this subject.

Thirdly the development of transmission network has to be consistent in space and in time with new generation development, which implies sufficient anticipation on generation projects or a better coordination between network generation integration capacities and energy policies.

With regard to ensuring the ongoing security of supply in the power system it will be necessary to develop and innovate new tools for dispatching the necessary flexibility and managing the increased uncertainty that the policy objectives bring.. In this respect multilateral measures will become more common which will. improve the broader European wide understanding of the actual interactions in the grid especially arising from generation and consumption located remotely from each other. In addition national regulators should be aware of the increasing demand for such measures to be accepted as costs for enhancing the Internal Energy Market.

Concerning market design and incentivisation there is an emerging consensus that the target model as designed may not be sufficient to economically deliver the range of policy objectives required, especially high RES-E. This was the subject of several consultations from the Commission[3]. ENTSO-E strongly advocates the full and speedy implementation of the Target model. This is a necessary first step in delivering the benefits of increased trade that the pan-European power system offers to the end consumer. However there is a clear need to examine what is required in addition to this. Capacity Mechanisms are considered by some as a possible response to emerging issues, and a significant number of Member States have already implemented capacity instruments or are planning to do so. ENTSO-E notes the EU Commission's concerns about such an addition to the market design and shares some of these–related to badly designed mechanisms and the lack of coordination at a European level.

ENTSO-E's most important consideration on Capacity Mechanisms is that their impact should be targeted to address real and not perceived issues at hand. In this regard, the choice to implement such mechanisms, the design of products (e.g capacity, capability, flexibility) and markets should be driven by the technical needs of the system. TSOs are able to provide the relevant analysis and expertise which can be used as a basis for such decisions. To ensure coherency at the European level, the ENTSO-E System Outlook and Adequacy Forecast (SOAF) has a central role to play today and ENTSO-E is examining mechanisms to improve on this into to the future.

Any consideration of market redesign should go hand in hand with reviewing the nature and need for direct financial supports for given technologies, particularly RES-E. More elements on these topics can be found in ENTSO-E's answer to the EU public consultation on "Generation Adequacy, Capacity Mechanisms and the Internal Market for Electricity".

Finally ENTSO-E fully recognizes that the nature of the power systems and the technical limits it faces are fundamentally changing. It is these aggregate technical limits arising from the large scale deployment of RES-E and low carbon technologies that need to be pragmatically reflected in efficient market designs. It is only by doing this that the policy objectives can be achieved at efficient long term costs to the end consumer. ENTSO-E

[3] For instance: EC public consultation on "Renewable Energy Strategy", Dec 2011; EC public consultation on "Generation adequacy, capacity mechanisms and the internal market for electricity", Dec 2012.

has a clear need to mobilize the aggregate technical expertise of its member organizations to address these issues and develop metrics to measure them.

2.5 CAPACITY AND DISTRIBUTIONAL ASPECTS

For cost-efficient outcomes at an EU level, the policy framework should establish pan-European objectives taking into account global efficiency, but should also allow policy objectives to be met by each Member States in a way that exploits their national resources, capabilities and competitive advantages. In particular, variable energy and flexible service providers, including demand side and flexible storage, are complements in the development of a power system with a high share of renewable energy and corresponding lowered Green House Gas (GHG) emissions. Therefore, the policy framework should facilitate, if possible, the complementary need of the power system in meeting the policy objectives. A genuinely interconnected pan-European transmission network and well-designed internal Electricity Market are the key facilitators to exploit each country's capabilities in the best interests of Member States and the EU citizens.