

Regulatory aspects of the integration of wind generation in European electricity markets

A CEER Conclusions Paper

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INFORMATION PAGE

Abstract

On 10th December 2009, CEER launched a public consultation on the regulatory aspects of the integration of wind generation in European electricity markets (ref: C09-SDE-14-02a). It considered the regulatory regime for wind integration and, in particular, the barriers and distortion wind generation may face, with the expectation that these can be further explored with the input of stakeholders.

This document (ref: C10-SDE-16-03) is CEER's Conclusions Paper to this public consultation. It should be read in conjunction with CEER's Evaluation of Responses Paper (ref: C10-SDE-16-03a).

Target Audience

Energy suppliers, traders, electricity customers, gas/electricity industry, consumer representative groups, environmental groups, network operators, Member States (MSs), academics and other interested parties.

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Treatment of responses

All public responses are published on the CEER/ERGEG website: www.energy-regulators.eu.

Related Documents

CEER/ERGEG documents

- CEER Regulatory aspects of the integration of wind generation in European electricity markets: A CEER Public Consultation, 10th December 2009, Ref: C09-SDE-14-02a. http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/ELECTRICITY/Integration%20of%20Wind%20Generation
- ERGEG Draft Advice on the Community-wide Ten-year Electricity Network Development

Plan: A CEER Public Consultation, 10th December 2009, Ref: E09-ENM-16-03.

http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/ELECTRICITY/electricity%2010-year%20ntwk%20dev%20plan/CD/E09-ENM-16-03%20CW-Ten%20Year%20Plan_10%20Dec%202009.pdf

- ERGEG Position Paper on Smart Grids: An ERGEG Conclusions Paper, 10 June 2010, Ref: E10-EQS-38-05. http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/ELECTRICITY/Smart%20Grids/CD/E10-EQS-38-05_SmartGrids_Conclusions_10-Jun-2010.pdf.
- ERGEG Pilot Framework Guidelines on Electricity Grid Connection - Initial Impact Assessment, forthcoming, Ref: E09-ENM-18-03.
- ERGEG Pilot Framework Guidelines on Electricity Grid Connection, forthcoming, Ref: E10-ENM-18-04.

External documents

- Incorporation of wind power resources into the Californian energy market. Yuri Markarov et al. 2005. Available at: <http://www.caiso.com/docs/2005/04/05/2005040508370111356.pdf>
- ENTSO-E non-binding Community-wide ten-year network development plan – pilot plan. Draft for Consultation. 2010. Available at: http://www.entsoe.eu/fileadmin/user_upload/library/consultations/Closed_Consultations/TYNDP/100301_ENTSO-E_TYNDP_for_Consultation.pdf

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EXECUTIVE SUMMARY

European regulators recognise that, in the face of ambitious renewable energy targets, increasing proportions of wind generation gives rise to particular challenges and opportunities for the European electricity market. In response to this, in December 2009, CEER launched a Public Consultation to consider how, given the issues, CEER can continue to facilitate the deployment of wind generation whilst delivering increased market integration. CEER argued that it was no longer appropriate to consider wind generation in isolation from the rest of the market and that, in addressing the issues associated with the market and network arrangements, it is preferable for wind generation to be integrated into the rest of the market.

CEER had an encouraging reaction to the Public Consultation. CEER hosted a workshop with 100 stakeholders in February 2010 and received 43 formal responses to the Consultation. CEER have also met with a number of stakeholders on a bilateral basis. The purpose of this Conclusions Paper, therefore, is to address the responses received to the consultation, present the regulators' developed thinking and, where appropriate, to make a final position on the relevant issues. It should be read in conjunction with the Evaluation of Responses Paper (C10-SDE-16-03a).

In light of the response received, CEER returns to the three areas in particular where the integration of wind generation needs to be factored into policy decisions:

- Electricity market arrangements: Allowing wind generation to balance closer to real-time (where applicable) is good practice and CEER urges national regulatory authorities (NRAs) and market participants to consider shorter gate-closure times. Market arrangements must also facilitate, in an economic and efficient manner, intraday cross-border capacity allocation. Furthermore, CEER recognises the importance of balancing intermittent generation and the opportunity for innovative solutions;
- Network arrangements: CEER reiterates its support for a non-discriminatory approach to market arrangements and urge NRAs to consider whether the network arrangements in place deliver the appropriate signals in delivering the requisite investment. With respect to delays in the authorisation procedures, CEER suggests that the forthcoming 10-year network development plans could play an important role in identifying where there are particular issues. Furthermore, CEER appreciates that there is potential for the regulatory regime to serve an important role in incentivising TSOs to deliver anticipatory investment and suggests further consideration should be given here, in addition to building on recent work on smart grids; and
- The development of a supergrid: CEER reiterates that the issues associated with the building of a "supergrid" are challenging. CEER welcomes the establishment of the North Seas offshore grid initiative and the efforts taken by all stakeholders, such as the Commission, the Adamowitsch Working Group¹ and ENTSO-E. Regulators are keen to

¹ Working group for Offshore/onshore grid development, chaired by the European Coordinator Mr. Georg Wilhelm Adamowitsch, under appointment from the European Commission (12 September 2007).

contribute to the work being undertaken here to provide solutions to regulatory issues and to ensure that a joined-up approach can be taken.

CEER recognises that the 3rd Package² and its European network codes provide an invaluable opportunity to drive improvements in market and network arrangements to meet the challenges of the ever-evolving European energy sector. Indeed, European regulators and the forthcoming Agency for the Cooperation of Energy Regulators (“the Agency”) are leading and will lead the development of Framework Guidelines to shape the codes, many of which are pertinent to wind generation. As such, in progressing this work, CEER suggests that many of the issues are considered within the work on framework guidelines and network codes.³ For example:

- ERGEG’s work on the draft framework guideline on electricity grid connection is considering specific issues related to large scale intermittent generation and to distributed generation;
- ERGEG’s work on the draft framework guideline on electricity capacity allocation is already responding to the increased emphasis on the role of intraday cross-border capacity allocation, and needs to propose an approach that will enable trading in response to changes in wind output both in the near-term and as the proportion of wind generation increases;
- the envisaged framework guideline on electricity balancing should consider the case for shorter gate closure times, the appropriateness of the balancing regime for wind generation differing (if at all) from other forms of generation and the appropriate role of the transmission system operator (TSO) in wind forecasting, as well as the target model for cross-border balancing;
- the envisaged framework guideline on electricity grid access can assess the role of priority access for renewables, and how this can work as markets are integrated and, potentially, for transmission cables that are both interconnectors and wind farm connections;
- the national and European ten-year network development plans can indicate the investments needed to accommodate increasing wind generation, but may also play a role both in identifying specific issues regarding the authorisation procedure and in highlighting benefits to European citizens as a whole; and
- ERGEG’s current work to advise the Commission on a guideline on fundamental data transparency for electricity needs to consider how wind generation is treated, for example, in terms of updating output forecasts.

² The 3rd legislative Package proposals for the European Internal Market in Energy were finally adopted on 13 July 2009 and include 5 legislative acts, which can be viewed at: <http://eur-lex.europa.eu/JOHtml.do?uri=OJ:L:2009:211:SOM:EN:HTML>

³ At the 18th Florence Forum, the European Commission tabled a discussion paper on a three-year timeline for development of future framework guidelines and network codes. This can be accessed at http://ec.europa.eu/energy/gas_electricity/forum_electricity_florence_en.htm

More generally, CEER concludes that further work is needed: on the impact that intermittent generation has on investment prospects for conventional generation – for example, through more volatile wholesale prices; on the transmission investment ahead of generation connections and cross-border; on the implications of different national support schemes for renewables and on the development of a supergrid. Regulators understand that the European Commission is intending to fund a study of the first two of these issues during 2011 and that Eurelectric are also working on the first issue. Further, ERGEG has accepted an invitation from the North Seas Countries Offshore Grid Initiative to contribute to their work. CEER will consider as part of the European Energy Regulators' Work Programme for 2011, on which it intends to consult in the autumn, how else regulators can contribute to taking this work forward.

CEER has found this Public Consultation to be of real value, both for regulators' input to the framework guidelines and their work more generally. CEER thanks those who inputted into the Consultation and are confident that it has met the objective of assisting European regulators to understand better the appropriate response to wind generation.

Introduction

1.1. Background and purpose of this paper

In recognising the issues increasing amounts of wind generation may pose for the market and network arrangements in European electricity markets, CEER undertook a consultation to consider the regulatory arrangements associated with the integration of wind generation in December 2009.

As part of this consultation, CEER hosted a public workshop to discuss the issues raised in the consultation document on 11th February⁴. CEER also met with a number of stakeholders on a bilateral basis. The consultation document closed on 18th February, to which 43 responses were received (one being confidential)⁵. Please see CEER's Evaluation of Responses Paper for a summary of the issues raised by respondents.

The purpose of this Conclusions Paper is to address the responses received to the consultation, present CEER's developed thinking and, where appropriate, to make a final position on the relevant issues. It should be read in conjunction with the Evaluation of Responses Paper (C10-SDE-16-03a).

The paper is structured around the issues CEER focused on in the December consultation i.e. market arrangements, network arrangements and "supergrid issues". Chapter 5 briefly addresses "other" issues that were raised in the responses to the consultation document. Where appropriate, for each issue addressed, the proposition made in the Public Consultation is reiterated, the respondents' views are set out and then, where it is appropriate or possible to do so, CEER finalises its position and sets out how regulators intend to take the issue forward. The final chapter makes conclusions and reiterates the way forward for this project.

1.2. Recap of the Public Consultation

The Public Consultation on the integration of wind in the EU recognised that wind generation's unique characteristics, which distinguish it from other types of generation, gives rise to new issues relating to the design of the market and network arrangements. In addressing these issues, CEER held that it was no longer appropriate to consider wind generation in isolation from the rest of the market and that in considering how to address these issues, it is preferable for wind generation to have economic, efficient and non-discriminatory treatment compared with the rest of the market.

CEER considered three areas in particular where integration of wind generation needs to be factored into policy decisions:

⁴ See Annex 3 for a note on the Wind Integration Workshop.

⁵ All publically available consultation responses are available at: http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/ELECTRICITY/Integration%20of%20Wind%20Generation/RR

- electricity market arrangements, including the benefits for wind generation of allowing bids or declarations closer to real-time and the importance of within-day (intraday) markets and cross-border trade, as well as balancing by TSOs as a last resort to maintain balance between supply and demand;
- network access arrangements, such as the rationale for different forms of charging for connection and how decisions are made to extend the network to accommodate new generation, including in locations that may be remote from existing infrastructure. This includes regulatory issues as well as barriers such as difficulties in authorisation and permitting for new transmission lines; and
- the concept of an offshore supergrid, and the challenges in harmonising the range of differing policy and regulatory treatments, either on a broad scale or perhaps initially on regional projects.

CEER stated that these ideas did not represent CEER's definite position on the subject but rather sought to act as a first-step in engaging with stakeholders.

1.3. Responses received to the Public Consultation

CEER had a very positive response to the Public Consultation, receiving 43 responses (one being confidential).

Broadly, the respondents constitute 14 from those representing the interests of integrated companies (with production, network and supply interests), 6 representing the interests of network owners, 8 representing the interests of generation only (including wind generation) and 3 representing consumer interests. Other respondents include Greenpeace, the Scottish Highlands and Islands Enterprise and the Swiss NRA, Elcom. Of the 43 responses, 8 are from European or international organisation; the rest are from Member States (MSs). Annex 4 lists the publically available responses by category and country of respondent.

Of the responses received, the key messages from a significant number of respondents are that:

- European regulators have a role in considering the network and market issues relating to the integration of wind;
- Wind generation should be treated alongside the rest of the market and that it should be subject to a fair, economic, non-discriminatory and cost-reflective treatment;
- European regulators should consider the impact wind generation is having on other generation types, particularly with respect to the impact it has on the investment climate for conventional types of generation; and
- The idea of a European supergrid is one worth considering and European regulators

should continue to consider how to address the issues associated with this issue, as identified in the Public Consultation document.

1.4. Recent developments

There are some recent developments that are relevant to the issues raised in the Public Consultation document.

In March 2010, the European Transmission System Operators for Electricity (ENTSO-E) produced a pilot version of the 10-year network development plan. The final pilot document, following public consultation, was to be published on 30 June 2010. The plan aims to identify planned or envisaged European transmission investment projects in order to provide an outlook of the future conditions of the power system in Europe. Full versions of the plan should, in future, play an important role in the development of the network for both consumers and generation, including wind generation. ERGEG has produced advice on the 10-year network development plan.

There have also been some developments relating to the “supergrid” issues. Ten MSs⁶ have established a framework, entitled The North Seas Countries’ Offshore Grid Initiative, in which to develop a strategic and coordinated approach to the building of infrastructure projects in the North Seas. CEER, alongside the ENTSO-E and the Adamowitsch Working Group, shall act as a “key stakeholder” within the governance arrangements of the North Seas Initiative.

⁶ France, Belgium, Germany, Luxembourg, Denmark, Ireland, Norway, Sweden, the Netherlands and the UK.

2. Market arrangements

Wholesale market design refers to how generation is offered to the market and traded within it. As part of the Public Consultation, CEER considered issues such as the gate-closure times (GCTs), cross-border capacity allocation and balancing arrangements. Broadly, CEER argued that market arrangements should encourage wind generation to integrate into the market and should not distort the incentives wind generation has in integrating into the market. CEER also argued that these market arrangements should be non-discriminatory and cost-reflective where appropriate, and that, given that wind generation is more predictable closer to real-time, regulators should focus in particular on intraday and balancing markets.

The feedback received to the Public Consultation and from attendees at the Workshop recognised the growing importance of this area. Many respondents recognised that at least some change to the market arrangements are necessary as a result of increased wind generation. Indeed, broadly, most respondents focused more on the market arrangements over the other issues raised in the Public Consultation.

This section addresses again the issues of GCTs, cross-border capacity allocation and balancing.

2.1. Gate-closure times

2.1.1 Position in consultation paper

The GCT refers to the final moment in which market players are able to trade electricity or inform the balancing-responsible party (BRP) of their position before real-time delivery, without it affecting their balancing position (where this is relevant). This will therefore generally mean the intraday gate closure rather than the day-ahead gate closure where there is a difference between the two.

The time of gate closure is particularly important for wind generation, as it may be difficult to forecast it at the day-ahead or further out stages. The Public Consultation highlighted that the GCT varies between 24 hours ahead and 30 minutes ahead among MSs. CEER argued that it might be preferable to have a GCT in the intraday time frame closer to real-time, on the grounds that it may help to further encourage market participation by wind generation and reduce system-balancing costs.

2.1.2. Respondents' feedback

With respect to the feedback received on GCTs, a significant majority of respondents state that it should be nearer to real-time – reasons include more accurate wind forecasting, better production of a price reference and reduction of system costs. Regarding a specific GCT, many respondents state that one hour or less is best. There is also support for considering the level of information that is available in the market prior to gate-closure. Further out, some respondents state that they would support harmonising GCTs across Europe, with one arguing that different

GCTs, particularly among neighbouring countries, may act as a barrier to cross-border trading.

2.1.3. CEER's developed thinking

In light of the feedback received, CEER reiterates its support for shorter GCTs and argues that, in general, it is good practice for market designs to have shorter GCTs. Indeed, CEER urges NRAs and market participants to consider shorter GCTs in developing the design of national market arrangements, particularly where wind generation is or has the potential to play a significant role in the market's generation mix.

The benefits of shorter GCTs should, of course, be considered within the context of the overall market arrangements. Where generation is not subject to balancing rules, for example, having a shorter GCT is of minimal benefit for generation as there are no incentives for it to balance its generation in any case.

To consider further the role shorter GCTs could play in cross-border issues, the framework guidelines on network codes for electricity balancing, which European regulators expect to be developed by the end of 2011 and which they will play an important role in developing, shall evaluate the case for requiring reductions in GCTs and the case for moving towards harmonised GCTs across the EU. Furthermore, the appropriate level of information which should be available to the market prior to gate-closure is also worthy of further investigation – this will be addressed through ERGEG's Advice on the electricity fundamental data transparency guidelines which is due to be completed by the end of this year.

2.2. Cross-border capacity allocation

2.2.1. Position in consultation paper

The Public Consultation recognised that as the proportion of wind generation increases, physical cross-border trading will play an increasingly important role in meeting MS demand and in mitigating fluctuations caused by unpredictable wind patterns. As wind generation is less predictable at the day-ahead stage, CEER highlighted the importance of considering intraday markets, together with day-ahead markets, as part of ERGEG's input into the framework guidelines on electricity capacity allocation and congestion management.

2.2.2. Respondents' feedback

Nearly half of all respondents identify intraday capacity allocation as a priority for congestion management models. They argue that it helps provide a signal for the building of increased long-term cross-border capacities, it addresses wind's volume uncertainty and it is cost-efficient – one respondent, for example, estimates that it could save €1-2 billion a year compared with day-ahead scheduling. Indeed, many respondents state that developing liquid and integrated cross-border intraday markets should be a priority over shortening GCT.

With respect to the way in which capacity is allocated, several respondents support implicit allocation. There is also support for continuous allocation. With respect to reservation of

capacity, four respondents explicitly state this should not happen while one respondent argued that there should be reservation of capacity, so long as market participants or TSOs pay market value for it. There is also particular support for cross-border capacity for balancing and ancillary services.

2.2.3. CEER's developed thinking

ERGEG is currently developing a consultation on ERGEG's draft framework guidelines for capacity allocation and congestion management. That paper will consider the methods used to calculate and allocate existing interconnection capacity for the forward, day-ahead and intraday markets. The latter is of particular interest to wind generation given that it is increasingly predictable on the day.

Market participants need the intraday market to adjust their forecast, to overcome outages in production and consumption and to help reduce their balancing needs and those of the TSO. For the day-ahead stage, a single, centrally-coordinated price coupling solution, with capacity allocation via implicit auctions, is becoming accepted. The remaining transmission capacity, such as capacity left once prices are equalised or capacity in the un-economic direction from the day-ahead stage, would then be allocated at the intraday stage. The intraday capacity allocation is performed close to real-time so it needs to be based on a fast administrative procedure providing quick and reliable results, such as an implicit continuous mechanism. Nevertheless, simple continuous trading doesn't provide congestion pricing for the allocated capacities either to market participants or to the transmission system operators involved, which may be necessary as more and more trading activities – also in relation to higher wind penetration - are likely to occur close to real-time. A hybrid model can then be considered, mixing both continuous implicit trading and implicit auctions in order to combine both requirements into one single mechanism.

The advantage of this model is that it would facilitate the possibility of intraday trading in a relatively easy, transparent and Europe-wide manner. However, CEER recognises that in the absence of capacity reservation, there will be no guarantee that capacity will be available at the intraday stage in the economic direction as, if the economic direction has not changed since the day-ahead stage, then the day-ahead implicit allocation already enables the maximisation of cross-border trades in the economic direction, based on the information available at the time. On the other hand, if the economic direction does change after day-ahead allocation, then capacity will be available in the new direction. This issue is being taken into account in the work on framework guidelines on Capacity Allocation and Congestion Management, on which ERGEG will be consulting in the coming months. In any case, regulators will continue to monitor how forms of capacity allocation cope with increasing proportions of wind generation.

Furthermore, the benefits of cross-border intraday capacity need to be considered within the context of the overall market arrangements. Where there is a long GCT, the mechanisms for intraday capacity allocation may be severely limited. For example, in a market in which the GCT is 20 hours ahead of real-time delivery, intraday capacity on interconnectors will only be of use to the TSO in its balancing actions and to generation that has not participated in the day-ahead

pool⁷. As such, European regulators will continue to evaluate approaches to market arrangements as they develop regional and European arrangements.

2.3. Balancing obligations

2.3.1. Position in consultation paper

As electricity cannot be stored easily, TSOs have to balance in real-time. To promote competition, market participants are incentivised to balance their generation. In the consultation CEER suggested that balancing obligations should provide the same incentives for wind generation to balance as other types of generation. This, CEER held, may incentivise wind generation to invest in forecast tools in order to reduce their balancing costs and may encourage more innovation in addressing the problems associated with forecasting wind. Linked to the idea of shorter GCTs, it is also important that generation is given the means to ensure it can balance its generation and that all generation is subject to cost-reflective imbalance charges.

2.3.2. Respondents' feedback

Most respondents agreed that wind generation should be subject to the same balancing obligations as other types of generation. They state that allocating balancing costs to wind generation helps to solve congestion, limits the risk of gaming, improves forecasting and behaviour and increases the usability of wind. However, there was some concern among respondents about having the same balancing obligations on wind generation as other types of generation, arguing that it is not appropriate because of the envisaged increase in wind generation and that it damaged liquidity and trade.

2.3.3. CEER's developed thinking

Following engagement with stakeholders on the balancing issue, CEER sees some evidence that a cost-reflective balancing obligation on wind generation encourages the integration of wind generation. Otherwise, if wind generators are not responsible for their imbalances, they will not enhance their output forecasts which, at the end, hinders the large-scale deployment of wind generation in the system (the System Operator could not afford to dispatch a large share of highly imbalanced generators at the same time). In Spain, for example, wind generation is subject to the same incentives for balancing as other types of generation. This has contributed to the development of a competitive market for forecasting tools. Here, the market offers forecasting services by collecting weather forecasts for each wind farm and aggregating the data. As such, CEER supports and advocates the use of a financial incentive on wind generation to balance so long as it is cost-reflective and based on wind generation's net position and that there is a sufficiently short GCT in place to enable wind generation to properly balance its own generation.

⁷ This may become increasingly important as Ireland becomes more interconnected with GB and Continental Europe. The "East West Interconnector", a 500MW interconnector between Ireland and GB, is due to become operational by 2012 and a further 700MW interconnector "East West 1" and "East West 2" is also under discussion.

It may be also worthwhile to consider further whether there is benefit in placing additional requirements on wind generation compared with conventional forms of generation. For example, just as it is important for the TSO to ensure that its balancing charges regime is transparent for users, it is also important for wind generation to be as transparent as possible in providing its output schedule to the TSO⁸. Balancing incentives on wind generation could encourage wind generation to provide this. Similarly, wind generation could also be incentivised to exploit further their technical characteristics in providing system services such as grid control and voltage dips.

The views regulators have developed here will be taken forward as part of ERGEG's draft framework guidelines on balancing. These framework guidelines (and the subsequent network codes) will relate to cross-border flows and, as such, will focus on the appropriate balancing rules for interconnectors. This is an important area for wind generation as its proportion within the generation mix increases and as MSs increasingly rely on other markets in order to balance their generation. However, it is worth noting the possibility that the network codes on balancing could increasingly impact on national balancing rules in order to minimise distortions on trading.

2.4. The role of the TSO in balancing

2.4.1. Position in consultation paper

In the Public Consultation, CEER argued that it is helpful for NRAs to consider whether TSOs are sufficiently incentivised to procure and manage reserves over varying timescale in an efficient and innovative manner.

2.4.2. Respondents' feedback

In considering the appropriate responsibilities of TSOs in balancing, some respondents stated that they should provide adequate services, such as reserve capacity, and have in place operational rules that enable wind generation to integrate. The role of DSOs in balancing was also highlighted.

2.4.3. CEER's developed thinking

CEER continues to maintain that TSOs should be incentivised to manage reserves and to consider the use of more innovative ways in which to do this. Indeed, there is some evidence to

⁸ Indeed, experience of the balancing obligation on wind generation in the Californian energy market provides some interesting evidence of how increasing the informational requirements on wind generation can encourage its integration. Under this model, wind generation is subject to market incentives to balance but is required, in exchange for being able to balance its output on a monthly basis, to provide specific operating information about their performance. This includes meteorological data associated with the wind generation such as wind speed, wind direction and ambient temperature. The system operator then selects the most economic and reliable mix of resources to balance real-time energy needs. As a result, the system operator argues, the dispatch instructions are more accurate and achievable and avoid any last-minute "scramble" to find more costly replacement resources at the last minute. (Markarov et al, "Incorporation of wind power resources into the California energy market", 2005. Available at: <http://www.caiso.com/docs/2005/04/05/2005040508370111356.pdf>).

suggest that this can be done to increase efficiency in the system. In Italy, for example, the TSO is incentivised to assess both the total demand of the system and the output of wind generation (which is not required to balance its output) close to real-time. This measure is intended to minimise the system costs of wind generation imbalances by reducing both the reserve capacity required and the need for dispatching.

The development of cross-border balancing exchanges (TSO-TSO model) is also a way to improve competition and thus make balancing settlement prices more cost-reflective.

3. Network arrangements

Network issues associated with wind generation continue to be important in considering the issues for wind integration. Network arrangements vary considerably among MSs. In the Public Consultation, CEER argued that network arrangements, where possible, should not distort the incentives wind generation has in choosing where to locate and they should appropriately allocate risk among consumers and among industry.

In response to the network arrangements, most stakeholders broadly support a non-discriminatory approach to access arrangements, arguing that these minimise market distortions and help promote a level playing field. With respect to the development of the grid, many respondents state that there should be a strong, proactive TSO that is incentivised to manage the development of the network and to deliver transmission infrastructure where required.

CEER reiterates its support for a non-discriminatory approach to market arrangements and urges NRAs to consider whether the network arrangements in place deliver the appropriate signals for both network operators and generation in delivering the requisite investment. At the same time, CEER recognises that a pragmatic, stable approach is important for the regulatory regime and that consideration of changes to the network arrangements should be taken with the utmost care.

3.1. Authorisation procedures

3.1.1. Position in consultation

In the Public Consultation, CEER called on governments to speed up the process for consents for construction of electricity infrastructure. CEER argued for clear criteria, transparent guidelines, appropriate appeal mechanisms and consistent and transparent definitions of the role of various authorities.

3.1.2. Respondents' feedback

A number of respondents agreed that the complex and unpredictable timetable for building and construction consents is problematic. Indeed, some stated that having clear criteria against which projects are assessed is important. One respondent argued that this criterion should be based on long-term costs and wider benefits to the economy and to society.

3.1.3. CEER's developed thinking

CEER notes that there remains ample evidence that significant problems exist in gaining consents for the building of transmission infrastructure. A recent study from the EWEA on the time it takes to get a building consent for wind farms, for example, suggests that, according to the projects surveyed, average lead times for consents is nearly 5 years in Portugal and the

average number of authorities a developer must engage with is nearly 34 in Finland⁹. The situation for transmission infrastructure is often even slower than for wind farms. Given that this is an issue for governments to address, CEER once again urges them to speed up the process for authorisations.

In addressing this, CEER considers that there is potential for the TSOs' ten-year network development plans to play an important role in identifying where there are particular issues associated with the authorisation procedures for the construction of transmission lines. The potential of the TSO ten-year plan will increase further with the advent of the ENTSO-E's ten-year network development plan, as provided for under the 3rd Package. Indeed, CEER has evidence of TSOs working together in an innovative manner to address planning. Nordel, which used to coordinate the activities of the TSOs in Denmark, Finland, Sweden and Norway before the establishment of ENTSO-E, undertook planning for the entire Nordic market in order to develop a "Nordic Investment Plan". In this way, Nordel could consider the investment needs of the entire system in order to improve reliability and cross-border trade among the four countries. However, it is disappointing to note that the planning procedures did not consider the needs of the four countries together – rather, where the benefits of building cross-border infrastructure accrued to one country but not another, it was possible that the consent was denied in the latter country. In order for the forthcoming ENTSO-E ten-year network development plan to play a real role in improving the authorisations procedure, MSs should consider the benefits to European energy consumers as a whole rather than their national consumers.

CEER also notes that the situation differs considerably among MSs. As such, regulators welcome the Commission's efforts to address this at a pan-European level through its forthcoming Energy Infrastructure Package. Regulators are working closely with the Commission and with ENTSO-E (and ENTSO-G on gas-related issues) to ensure that any legislative proposal addresses this issue in a constructive way and builds on the 3rd Package, rather than duplicating the work of the players involved. Indeed, as noted above, the ten-year network development plan can provide a valuable input into the Energy Infrastructure Package. CEER recalls its preference for new infrastructure to be triggered and financed by the market and for it to be based on proven actual or potential physical needs.

3.2. Network connection criteria

3.2.1. Position in consultation

With respect to the technical requirements TSOs have in place for connecting and managing generation, including wind generation, CEER argued in the Public Consultation that consideration should be given to how necessary these requirements are within the context of the overall arrangements and whether it was reasonable to have certain distinctions for wind generation given that its technical characteristics differ from conventional generation.

⁹ For further information, see EWEA press release on the matter:
http://www.ewea.org/index.php?id=60&no_cache=1&tx_ttnews%5bttnews%5d=1834&tx_ttnews%5bbackPid%5d=259&cHash=9990ca46ca32bbe9a1bacb223fecbea4

3.2.2. Respondents' feedback

Given that the issue is largely being addressed as part of ERGEG's draft framework guidelines on electricity grid connection, respondents did not focus heavily on this issue. However, broadly, there were calls for adequate operational and technical requirements for wind generation in order to ensure the wind generation is maximised while, at the same time, ensuring that system security is preserved.

3.2.3. CEER's developed thinking

Much of the consideration here is taken up as part of the draft framework guidelines on electricity grid connection, which European regulators are currently developing and which the Agency will finalise in 2011. The issues being addressed here include the need to have harmonised minimum requirements for connection for all grid users (generation and demand), increased co-ordination and real-time data flows among TSOs and between TSOs and DSOs. In light of the specific technical characteristics of wind generation, ENTSO-E is working on a specific network code for wind generation, which sets out minimum requirements for wind generation in terms of connection, and contribution to system operation. It is anticipated that the work here will address the issues associated with grid connection for wind generation.

3.3. Network charges

3.3.1. Position in consultation

CEER held previously that charges for connecting to and using the system should, in principle, be transparent, cost-reflective and not dependent on the source of the electricity. In practice, however, CEER found that there were significant differences among MSs in how they charged generation, including wind generation, and that much of these differences related to the level of subsidy that were on offer for particular generation types. CEER argued that it was worth considering whether the design of the charges and the differences among MSs in the design of the charges created sub-optimal outcomes for the network and whether it distorted the incentives generation has in choosing where to locate.

3.3.2. Respondents' feedback

Most stakeholders supported non-discriminatory, cost-reflective access to the network on the grounds that it minimises market distortion, creates a level-playing field and helps the integration of wind generation. A few, however, argued that the answer to this depends on a range of issues, such as the goal of wind generation, and that the charging regime should take account of the peculiarities of wind generation.

Respondents were markedly mixed on the use of locational signals. Some argued that it ensures developers consider the cost implications when selecting a location, that it leads to more equal distribution of renewable generation and that it helps ensure the long-term security of the system in that generators take account of new where new capacity is needed. Others, in contrast, argued that wind generation should locate where the resources exist and that the transmission

lines should be built to transport it to the load centres.

3.3.3. CEER's developed thinking

Given the support for its preferred charging principles, CEER reiterates that the charging system should be transparent, cost-reflective and non-discriminatory charging system and CEER urges NRAs to consider their system against these principles. At the same time, however, CEER recognises that no one model is perfect and that the context of the overall arrangements should be taken account of in considering the charging model. Indeed, a stable, predictable and transparent system is also of utmost importance to the users of the system.

Further consideration on how the access regime should look will be addressed in the framework guidelines on electricity grid access, which the Agency is expected to produce in 2012. It will also be considered as part of the framework guidelines for tariffs, which the Agency is due to produce by 2012 and which European regulators will play an important role in developing.

3.4. Network development

3.4.1. Position in consultation

A further issue with the building of new generation, as addressed in the Public Consultation, is that the lead times for developing new infrastructure can be longer than the lead times for constructing the generation. This is likely to be a particular issue for wind generation, where it is often located in electrically remote areas. Indeed, CEER found a significant difference among MSs in the commitments TSOs require from generation, varying from requiring generation to pay the full upfront costs versus the TSO being responsible for the full cost. To address the issue of different lead times for transmission and infrastructure, CEER suggested that NRAs could serve an important role in encouraging the TSOs to take increased risk, with commensurate rewards, in fostering a more dynamic approach to the development of the network.

3.4.2. Respondents' feedback

There was general agreement among respondents that TSOs should take a more proactive approach to investment. This could involve considering the needs of the network on a short- and long-term basis, taking account of scenarios for renewable generation and identifying appropriate locations with existing infrastructure for new generation. The level of transparency provided by TSOs was also highlighted. It was argued that TSOs should provide information dedicated to renewable energy as part of their network development plans and that they should produce an annual report that details the causes of delays and the corrective action, including action taken to speed up the authorisation procedures.

In addition, respondents agreed that there was also a role for NRAs in network development: some stated that NRAs' role was to ensure risks are minimised while another argued that NRAs have been traditionally reluctant to allow TSOs to take more risky decisions which would need to change in the future.

3.4.3. CEER's developed thinking

CEER recognises the important role the national and Europe-wide ten-year network development plans can play in identifying future generation and demand needs and planning the network accordingly, and has recently published its final advice on the matter.¹⁰ Furthermore, there is potential for future guidelines on transparency to consider the appropriate informational requirements that TSOs should be subject to.

However, in light of the feedback, CEER recognises that the regulatory regime can also serve an important role in incentivising TSOs to deliver anticipatory investment. Indeed, for 2009/10 the NRA in Great Britain allowed TSOs to recover up to nearly €15m (£12.5m) for preconstruction works relating to specific grid reinforcement projects, with the intention that it will enable these companies to facilitate future market entrants to be connected as quickly as possible¹¹. It is also considering how to encourage identification of relevant information to make use of it in carrying out anticipatory investment in order to better understand what investment is appropriate. CEER will consider further how best European regulators can take this issue forward and would welcome feedback on the merit of further work in this area through its forthcoming Public Consultation on the draft Work Programme for 2011.

3.5. R&D for TSOs and DSOs

3.5.1. Position in consultation

R&D can also play a role in how the network should be developed. In the Public Consultation, CEER recognised that R&D in, for example, the development of smart grids could have significant potential to address the issues associated with the intermittency of wind generation. CEER found, however, that only five regimes provide for an incentive for TSOs to engage in R&D.

3.5.2. Feedback from respondents

CEER received a very strong response from stakeholders on the need for network R&D. Almost all respondents state it is necessary to address the network integration of wind generation. Of those in favour of R&D, there is very strong support for network-led R&D to address issues such as security of supply and achievement of the 2020 renewables and to help reduce costs and contribute to optimising the development of the network. Opinions on what form R&D should take varied among respondents and include analysis, full-scale demonstrations, delivering new technology and, from one respondent, projects which lead to harmonisation of support schemes. Furthermore, many respondents called for increased coordination among TSOs and between TSOs and industry, government and NRAs in order to lower overall costs, achieve benefits from benchmarking, avoid duplication and exchange best practice. The role of the distribution supply

¹⁰ See http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/CEER_ERGEG_PAPERS/Electricity/2010/E10-ENM-22-03_TYNDP%20advice_10-Jun-2010.pdf

¹¹ For further information, see <http://www.ofgem.gov.uk/Networks/rpix20/Pages/RPIX20.aspx>

operator (DSO) in R&D was also highlighted as being imperative by some respondents. With respect to the funding of R&D, some respondents support an incentive-based funding of R&D. Others propose that investment costs for R&D have to be fully covered by regulatory frameworks or provided through a cap on losses.

3.5.3. CEER's developed thinking

As established in the Conclusions Paper on Smart Grids¹², European regulators should support network operators' increasing efforts in R&D.

CEER recommends that NRAs should require network operators to disseminate the results of the R&D which is funded or incentivised by network tariffs and other public funds available at European or national level in order to minimise the risks of replicating the “mistakes” which may occur when carrying out research, development and demonstrating and the consequent stranded costs. This is particularly relevant to wind generation given that there is potential for TSOs to learn from each other in how they have or how they could address the issues of wind generation. However, TSO-led R&D should not be incentivised or supported to such an extent that it crowds out market-led R&D.

Furthermore, CEER recommends that NRAs continue their exchange of expertise at European level, such as the Strategic Energy Technology Plan, in order to learn as soon as possible from the (first) best regulatory practices.

¹² See http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/ELECTRICITY/Smart%20Grids/CD/E10-EQS-38-05_SmartGrids_Conclusions_10-Jun-2010.pdf

4. A European supergrid

The development of an offshore grid in the North and Baltic Sea, which could enable Europe to share and maximise its indigenous energy resources, is gaining increased attention. While the impetus and investment for such a project must come from the market, there is a role for European regulators, MSs, TSOs and other stakeholders involved in the authorisations of such projects to consider whether there are barriers that inhibit the market from undertaking this investment.

4.1.1. Position in consultation

In the Public Consultation, CEER stated that regulators have a responsibility to address the regulatory barriers associated with the building of a European supergrid and highlighted issues that CEER needed to consider further. These related to the problem of who should pay and who should benefit, the potential distortion created by different regimes, the potential incompatibility of interconnection and transmission and the current ownership arrangements for offshore transmission. Indeed, the impact of these issues have been illustrated in the decision by the Swedish TSO, Svenska Kraftnät, to pulled out of the Kriegers Flak project on the grounds that, because the Swedish support system does not give extra incentives for offshore wind and onshore generation is much cheaper to build, it did not expect wind farms in the Swedish sector of Kriegers Flak to be built in the foreseeable future.

4.1.2. Respondents' feedback

Among respondents, there was widespread support for the idea of a supergrid and many welcomed the attention that was being given to this issue. Similarly, there was widespread agreement that the issues CEER identified were the relevant ones for regulators to consider. The importance of considering who pays and who benefits from such a project was a particular issue raised by many, with respondents differing among whether the benefits should be strictly on a cost-effective basis or whether the social welfare and long-term benefits should also be included. Some respondents raised a concern over the impact of having several different national regimes, with some calls for harmonisation of arrangements for offshore. There was also some support for modular development of a supergrid, with respondents arguing that this ensures stranded costs are avoided and the benefits of applying new technologies can be maximised.

4.1.3. CEER's developed thinking

CEER reiterated that the issues associated with the building of a supergrid are challenging. However, in attempting to move this forward, CEER will continue to consider together how we can address these issues. A specific work stream within CEER has been formed to address further specific issues which could include consideration of the impact of different national support schemes on the deployment of renewables, for example. CEER will also continue to monitor the development of regional projects and, where necessary, consider any particular regulatory issues associated with them.

CEER also notes that the Regional Initiatives can play some role in facilitating consideration of these issues. Under this initiative, regions are increasingly working with each other to address particular issues and implementation solutions. However, CEER agrees with most respondents that the Regional Initiatives is not a “perfect fit” to consider all these issues and that focus instead should sit with European regulators working with other stakeholders.

With respect to the broader issue of a supergrid, CEER will continue to work closely with MSs, TSOs and other stakeholders in addressing the relevant issues. CEER warmly welcomes the establishment of the North Seas Grid Initiative, which is designed to provide a framework for regional cooperation among MSs in order to find common solutions to cross-country issues, and regulators look forward to playing an important role in assisting its work. regulators also continues to work with the many varied stakeholders of the Adamowitsch Working Group and, where it is possible and appropriate, with ENTSO-E’s European Wind Integration Study and with the OffshoreGrids Project in helping to consider the issues associated with the development of a supergrid. Indeed, the findings and feedback from such groups have been a valuable input into the development of CEER’s own thinking on these issues. Finally, CEER reiterates its commitment to assist the Commission in considering these issues under its future Energy Infrastructure Package.

5. Other issues

In addition to the issues identified in the Public Consultation, respondents brought attention to three specific issues which, they argued, CEER should also consider. Each of these is addressed below. CEER also sets out its proposed response to dealing with them.

5.1. Impact of wind generation on conventional generation

Over half of the respondents discuss the impact increased wind generation will have on the system's security of supply. Many respondents state that, as a result of increased wind generation (which is variable in supply), the price on the wholesale market is becoming more volatile. This, they argue, is having a fundamental impact on the incentives the market has to invest in conventional generation. This is a particular problem because it is flexible, conventional generation that is particularly necessary in the face of increased proportions of wind generation. In considering the necessary investment, many respondents state that considering investment in gas firing technology should be a particular priority as it is often called upon when wind supply falls. Respondents also discuss the impact increased wind generation is having on existing conventional generation – some state that its operating costs are rising as they have increasingly lower operating hours and more start-up costs.

CEER recognises that this issue could have an impact on the investment climate for conventional generation. To address the extent of this problem and to consider what European regulators can do, CEER proposes considering this as part of its work on generation adequacy, for which a “Call for Evidence”¹³ was held earlier this year.

5.2. Impact of wind generation on the distribution network

A number of respondents argue that further consideration needs to be given to the impact wind generation has on the distribution networks and the role distribution network owners can play in addressing the issues. Many respondents highlight the increasing need for distribution network owners to more actively manage their network and to become more involved in energy efficiency, smart grids and real-time distribution. Similarly, some respondents call for a framework in which distribution network owners are incentivised to undertake R&D to address these challenges.

CEER recognises that wind generation can have a significant impact on the distribution network and appreciate that the analysis in the Public Consultation focused primarily on the transmission network. In considering some of the specific issues associated with wind generation and the distribution network, such as demand response, CEER will endeavour to consider the impact of the distribution network, where it is relevant and appropriate. However, CEER notes that many

¹³ Generation Adequacy Treatment in Electricity - A CEER Call for Evidence (C09-ESS-05-03), http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/ELECTRICITY/Electricity%20Generation%20Adequacy/CD/C09-ESS-05-03_gen%20adequacy_CfEvidence_9-Dec-09.pdf

of these issues are addressed in its work on smart grids. In this work, regulators set out in detail the output measures (such as hosting capacity for distributed energy resources) and priorities distribution networks should consider in delivering both smart grids and in undertaking investment.

5.3. Renewables Directive implementation

A number of respondents also raise the issue of how the legislative requirements of priority dispatch may limit the capability of power systems to integrate wind generation. They argue that consideration should be given to the impact this is having on delivering renewable energy versus the intent of the legislation. One respondent suggests that European regulators establish a common definition of “priority access”.

MSs are responsible for the implementation of the Renewable Directive. Given that the market arrangements differ among MSs and that it MSs’ generation mix is unique to that country, it is preferable for each MS to develop the most appropriate means by which to implement this requirement.

CEER will also consider this further within ERGEG’s draft framework guidelines on third party access, which ACER is expected to develop by late 2011.

6. Conclusions and taking the work forward

CEER has made a number of recommendations with respect to what the appropriate market and network arrangements should look like. Broadly, these call for a more transparent, cost-reflective and efficient approach that encourages, rather than inhibits, the deployment of wind generation and increased market integration. This is essential if we are to meet the ambitious renewables targets faced for 2020 and beyond.

In progressing the issues raised in the Public Consultation, CEER considers that the future European network codes provide an invaluable opportunity to properly assess the cross-border arrangements with respect to a range of issues. As such, much of the work undertaken here will be progressed through the framework guidelines and other tools from the 3rd Package. Specifically:

- ERGEG's work on the draft framework guideline on electricity grid connection is considering specific issues related to large scale intermittent generation and to distributed generation;
- ERGEG's work on the draft framework guideline on electricity capacity allocation is already responding to the increased emphasis on the role of intraday cross-border capacity allocation, and needs to propose an approach that will enable trading in response to changes in wind output both in the near-term and as the proportion of wind generation increases;
- the envisaged framework guideline on electricity balancing should consider the case for shorter gate closure times, the appropriateness of the balancing regime for wind generation differing (if at all) from other forms of generation and the appropriate role of the transmission system operator (TSO) in wind forecasting, as well as the target model for cross-border balancing;
- the envisaged framework guideline on electricity grid access can assess the role of priority access for renewables, and how this can work as markets are integrated and, potentially, for transmission cables that are both interconnectors and wind farm connections;
- the national and European ten-year network development plans can indicate the investments needed to accommodate increasing wind generation, but may also play a role both in identifying specific issues regarding the authorisation procedure and in highlighting benefits to European citizens as a whole; and
- ERGEG's current work to advise the Commission on a guideline on fundamental data transparency for electricity needs to consider how wind generation is treated, for example, in terms of updating output forecasts.

More generally, CEER concludes that further work is needed: on the impact that intermittent generation has on investment prospects for conventional generation – for example, through

more volatile wholesale prices; on the transmission investment ahead of generation connections and cross-border; on the implications of different national support schemes for renewables and on the development of a supergrid. CEER understands that the European Commission is intending to fund a study of the first two of these issues next year and that Eurelectric are also working on the first issue. Further, ERGEG has accepted an invitation from the North Seas Countries Offshore Grid Initiative to contribute to their work. CEER will consider as part of the European Energy Regulators' Work Programme for 2011, on which it intends to consult in the autumn, how else regulators can contribute to taking this work forward.

CEER also intends to monitor, more generally, how well the arrangements meet the challenges associated with increased deployment of wind generation. More widely, regulators appreciate that renewables in general face particular issues in the face of market and network arrangements and, as such, they will continue to contribute, where possible, to this debate.

Finally, CEER recognises that the issues are not exclusive to Europe and, as such, it will continue to play a leading role in the assessment of best practice in accommodating renewables and distributed generation under the auspices of the International Confederation of Energy Regulators (ICER).

Annex 1 – CEER

In 2000, ten national energy regulatory authorities signed the "Memorandum of Understanding for the establishment of the Council of European Energy Regulators" (CEER). They had voluntarily formed the council to facilitate cooperation in their common interests for the promotion of the internal electricity and gas market. In order to cope with a growing number of issues and to improve cooperation at the operational level, the regulators decided in 2003 to formally establish themselves as a not-for-profit association under Belgian law and to set up a small secretariat in Brussels. The Statutes (English version, Statutes amendment) were published in the annex of the Belgian State Gazette on October 21st, 2003. The CEER now has 29 members - the energy regulators from the 27 EU-Member States plus Iceland and Norway. CEER and the European Regulators Group for Electricity and Gas (ERGEG) share similar objectives and the work and achievements of the CEER and ERGEG are intrinsically linked.

The work of the CEER and ERGEG is structured according to a number of working groups, composed of staff members of the national energy regulatory authorities. These working groups deal with different topics, according to their members' fields of expertise.

This report was prepared by the Sustainable Development Task Force of the Electricity Working Group.

Annex 2 – List of abbreviations

Term	Definition
CEER	Council of European Energy Regulators
BRP	Balancing Responsible Party
DSO	Distribution System Operator
ENTSO-E	European Network of Transmission System Operators for Electricity
ERGEG	European Regulators Group for Electricity and Gas
GCT	Gate-closure time
NRA	National Regulatory Authority
MS	Member State
R&D	Research and Development
SDE TF	(CEER) Sustainable Development Task Force
TSO	Transmission System Operator

Table 1 – List of Abbreviations

Annex 3 – Note on Wind integration workshop

1. Background

CEER hosted a workshop on the regulatory aspects of the integration of wind generation in European electricity markets on the 11th February 2010 at the Marriott Brussels Hotel. This note summarises the main issues/comments made by both presenters and attendees.

CEER published its consultation document on the Regulatory aspects of the integration of wind generation in European electricity markets on 3rd December 2009. The purpose of this workshop was for CEER to gain an initial understanding of the response to the consultation document and for the attendees to understand better CEER's position (and the position of others) before submitting a formal response, due on 18th February.

2. Format of the session

Mr Martin Crouch (Ofgem, co-Chair of CEER Sustainable Development Task Force) opened the session by setting out the legislative context of the integration of wind and outlining the relationship between, and impact of, the new Renewables Directive and the 3rd Package.

Presentations were then given by Ms Siobhán Carty (Ofgem, UK and member of the SDE-TF), Mr Niels Ladefoged, (Regulatory Policy and Promotion of renewable energies, DG TREN), Mr Christian Kjaer (CEO, EWEA), Mr Hans Erik Kristoffersen (Convenor, WG RES, ENTSO-E) and Mr Marcel Cailliau (Chairman of TF Integration of RES, Eurelectric). A panel discussion followed, chaired by Mr Martin Crouch. All presentations and a list of attendees are available at:

http://www.energy-regulators.eu/portal/page/portal/EER_HOME/EER_CONSULT/CLOSED%20PUBLIC%20CONSULTATIONS/ELECTRICITY/Integration%20of%20Wind%20Generation/Public%20Hearings

The issues highlighted below constitute the main ones identified by both the presenters and the attendees (following individual presentations and the panel discussion).

3. Overview

Broadly, there was support for the consultation document and agreement that the issues CEER highlighted were the correct ones.

Some stated that it was correct no longer to treat wind generation separately from other generation types.

Most of the presenters agreed that complete harmonisation of network and market arrangements was not necessary (for example, that harmonisation of support schemes would be a distraction) and that, in coordinating the arrangements, getting the right solution for wind and other generation types was important. Many suggested that account should be taken of the situation in each Member State (such as the typical size of generators) and that a regional

approach was important in doing this.

Some presenters and attendees also highlighted the importance of competitive, transparent, liquid markets and said that this can go a long way in addressing the issues associated with the integration of wind.

4. Legislative framework

The relationship between the new Renewables Directive and the 3rd Package was discussed. It was highlighted that the 3rd Package requires NRAs to grant “appropriate incentives” for TSOs/DSOs to foster market integration while the Renewables Directive obliges MSs to develop infrastructure for renewable energy sources and guarantee transmission and distribution of renewable energy. It was suggested that the legislative framework should be used as “guiding principles” and the future role of the European Agency and the ENTSO-E would play an important role.

5. Market arrangements

With respect to gate-closure times (GCTs), two presenters agreed that this was an issue to be addressed. It was stated that shorter and more harmonised GCTs were important for the integration of wind and reducing GCTs would also be important in encouraging balancing incentives. It was also stated that moving towards shorter GCTs was already happening and that, while it was an important issue to consider, it would “not solve everything”.

Regarding incentives for balancing generation, there was agreement that wind generators should be subject to balancing incentives, provided that the market does not pose a barrier (e.g. shorter GCTs). The importance of not having overly punitive balancing incentives if the GCTs are high was discussed as was the importance of having improved accuracy as a prerequisite for integration of wind. There was some discussion on the merits of TSO forecasting versus Generator forecasting – within this context, the importance of allowing a number of wind generators to pool their generation was raised.

Regarding capacity allocation on interconnectors, it was agreed that intraday markets are important. It was argued that capacity allocation on interconnectors was not transparent, that it was difficult to determine prices and that increased liquidity was required. It was also argued that the market needed to “hurry up” in implementing the target models proposed under the Project Coordination Group (PCG) as it represented the right approach.

On the issue of priority dispatch/access, it was suggested that, in the absence of competitive, liberal markets, it was necessary to make priority dispatch mandatory (and that the opposite was also true). The impact this can have on market arrangements was discussed and it was argued that negative prices can put investment in conventional generation at higher risks. The approach which Ireland is taking towards priority dispatch (in turning down conventional generation as wind generation increases) was discussed. It was suggested that this was not cost efficient for consumers and questioned how regulators could balance the objective of economic efficiency

against the literal interpretation of the Renewables Directive 2009/28/EC and the objective of sustainability.

With respect to the impact on conventional generation, the role of gas as a source of “back-up” generation was discussed. Within this context, the importance of having flexible generation that can meet supply (when wind supply falls or demand increases) and how the market can encourage this was discussed. The problem of negative prices was raised and it was argued that wind generators should be able to recover their costs. It was also argued that it was not appropriate for smaller generators to be exposed to negative wholesale prices. The idea of capacity payments was discussed as a way to address this, with a suggestion that consumers should pay for the security of supply this could provide.

The importance of demand-side response and increased interconnection was also noted.

6. Network arrangements

The importance of addressing the authorisations for wind infrastructure projects was discussed. It was argued that it was important to have proactive coordination regarding network development.

It was suggested that regulators should consider how to encourage anticipatory investments by TSOs.

Regarding the ownership of offshore transmission lines and the impact of the 3rd Package, it was argued that this needed discussion and consideration, that it was a complicated issue and that the owners of offshore transmission lines should be “entities with TSO qualities”.

With respect to TSO R&D on the integration of wind, it was agreed that this was important. The requirement under the 3rd Package for regulators, in setting tariff methodologies, to “support the related research activities” (Electricity Directive 2009/72/EC, Article 37) was highlighted.

7. Support schemes

It was argued that harmonisation of support schemes was not necessary and that it was demonstrated, during negotiations on the Renewables Directive, that there was no appetite for this and that there was little value in further discussion at this stage.

It was suggested that subsidies for mature technologies should be removed and moved to more immature ones.

Annex 4 – Respondents

Public responses were received from the following organisations:

No.	Respondent	Member State	Short description
1.	Association of Electricity Producers (AEP)	UK	Represents large, medium and small generators, including coal, gas, nuclear and the range of renewable energies.
2.	Associazione Produttori Energia da Fonit Rinnovabili (APER)	Italy	Represents electricity producers from renewable sources.
3.	Bundesverband Neuer Energieanbieter (BNE)	Germany	Represents the interests of producers and suppliers which predominately use third parties' networks to supply their customers with electricity or gas
4.	BDEW	Germany	Represents the interests of gas, electricity and water industries in Germany.
5.	European Chemical Industry Council (CEFIC)	European	Represents the chemical industry at European level.
6.	Centrica	UK	Generation and supply interests in GB and Europe. It has interests in wind generation.
7.	CEZ	Czech republic	Producer of (mainly coal-sourced) electricity and supplier.
8.	Dong	Denmark	Integrated electricity company. It has interests in wind generation.
9.	EDF (UK)	UK	Integrated energy company. It has interests in wind generation.
10.	EDF (FR)	France	It has interests in wind generation.
11.	Edison	Italy	Electricity producer. It has interests in wind generation.
12.	EDP	Portugal/Spain	Generator. It has interests in wind generation.
13.	European Federation of Energy Traders (EFET)	European	Represents over 90 trading companies in more than 20 countries.
14.	Eirgrid	Ireland	The electricity TSO in Ireland and the market operator for the SEM in Ireland.
15.	ELCOM	Switzerland	NRA for electricity in Switzerland.

16.	EnBW	Germany	Integrated energy company. It has interests in wind generation.
17.	Energy Norway	Norway	Represents about 260 generators, distributors, contractors and suppliers in Norway.
18.	Electricity Network Transmission System Operators for Electricity (ENTSO-E)	European	Represents electricity TSOs in Europe.
19.	E.ON	Germany	Integrated energy company. It has interests in wind generation.
20.	ERDF	France	French DSO.
21.	Eurelectric	European	Represents the common interests of the electricity industry at European level.
22.	European Wind Energy Association (EWEA)	European	Represents the wind industry at European level.
23.	GABE	Belgium	Represents industries and large electricity consumers, including those equipped with local cogeneration units.
24.	GEODE	European	Represents the interests of energy distribution companies at European level.
25.	Greenpeace	International	International environmental activist network.
26.	Highlands and Islands Enterprise	UK	Scottish Government's agency responsible for economic and community development across the northern half of Scotland.
27.	Iberdrola	Spain	Electricity generator, network owner and supplier in Spain and rest of Europe. It has gas network and supply interests. It also has interests in wind generation.
28.I	International Federation of Industrial Energy Consumers (IFIIEC)	International	Represents companies in energy intensive industries at a European level.
29.	Irish Wind Energy Association (IWEA)	Ireland	Irish wind energy association.
30.	Netbeheer Nederland (NBNIS)	The Netherlands	Represents the interests of national (TSO) and regional electricity and gas network operators in the Netherlands.
31.	PSE Operator	Poland	TSO in Poland.
32.	Renewable Energy Systems (RES) LTD	UK	Wind farm developer in GB, Ireland, France and Sweden. Also has interests outside of Europe, mainly in the US.
33.	RWE	Germany	Generator, trading, network owner and supplier in many MSs in Europe.

34.	Scottish and Southern Energy (SSE)	UK	Generator, network owner and supplier interests in GB, Ireland, Sweden, Portugal and the Netherlands. It has interests in wind generation.
35.	Statoil	Norway	Has electricity generation and supply interests in Norway and Denmark. Has gas production interests in Europe.
36.	Swedenergy	Sweden	Represents companies involved in the production, distribution and trading of electricity in Sweden.
37.	Swissgrid	Switzerland	The electricity TSO in Switzerland.
38.	Vattenfall	Germany	Integrated energy company. Has interests in wind generation.
39.	Verband der Elektrizitätsunternehmen Österreichs (VEO)	Austria	Represents the interests of Austrian electricity companies.
40.	Verbund	Austria	Electricity producer and network owner.
41.	VIK	Germany	Represents the interests of energy intensive consumers in Germany.
42.	Yellow Wood Energy	UK	Consultancy specialising in electricity and carbon capture.

Annex 5 - Evaluation of Responses

The Evaluation of Responses Paper (ref: C10-SDE-TF-16-03a) is available in a separate document.