



ENTSO-E response to the CEER public consultation on the 'Regulatory aspects of the integration of wind generation in European electricity markets'

Brussels, 11 February 2010

1 GENERAL COMMENTS

ENTSO-E welcomes the opportunity to give feedback to the regulators on the CEER report "Regulatory aspects of the integration of wind generation in the European electricity markets".

The report addresses many important issues regarding integration of more wind generation now and in the future. The future challenges will be different from the historical ones as the 20-20-20 goals will lead to an increase in the share of wind power capacity. Meeting the challenges will require a holistic dynamic approach. To find the best solutions it is necessary to take into account all market players (renewable plants, conventional plants, consumers, power exchanges).

ENTSO-E is responsible for system security and shares the regulators objective of identifying challenges and proposing solutions for maximising the integration of wind generation, as well as all other fluctuating renewable energy sources, while taking into account that system security is preserved. TSOs are in favour of market based solutions. It is, however, necessary to also address technical/ operational challenges to be able to solve the market issues.

ENTSO-E is already engaged in various initiatives and projects such as e.g. EWIS. Furthermore ENTSO-E is at this moment working closely with regulators to provide a pilot network code on "Grid connection of generators with special focus on wind generation". This pilot network code will include many of the issues mentioned in this response.

We are currently in a process where increased requirements on wind power generators will be necessary in the long run and ENTSO-E therefore appreciates the already established communication with the wind associations. Furthermore ENTSO-E looks forward to the continued cooperation with regulators, governments and other stakeholders in developing solutions for the challenges based on the future wind power capacity development.

ENTSO-E is at the regulators disposal for further discussions.

2 QUESTIONS FOR PUBLIC CONSULTATION

Question 1	How will the expected growth in wind generation affect the markets in which you operate? What are the key challenges you foresee?
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The growing amount of wind generation is expected to have a substantial impact on the European power markets.

More wind power will result in more fluctuating electricity prices. This can already now be observed in markets with high wind penetration (hours with low (or even negative) prices due to large wind generation and hours with higher prices when there is no wind).

Due to the limited predictability of wind energy feed-in, wind volumes are traded mainly on day-ahead and intraday markets. Therefore continuing growth of wind energy will lead to increasing trading volumes in day-ahead and intraday markets, which will affect future markets as well.

Increasing wind generation causes larger imbalances in the control area corresponding to higher reserve demand as well as higher average balancing energy prices. Additionally the displacement of conventional generators lowers the available balancing reserves and leads to higher reserve prices. This possibility of lower conventional generation capacity combined with the fluctuating wind power will make efficient balancing a key TSO challenge. It will also be a key challenge for TSOs to facilitate the development of supplementary measures that will allow for the efficient integration of a fluctuating generation e.g. demand response. Finally a key challenge is the accuracy in forecasting wind power generation.

Higher flexibility as well as an adequate share of dispatchable capacity is required to balance the intermittency of wind energy generation. Further growth will require a more integrated view on wind generation as a part of the generation mix. Future market designs will have to integrate wind generation not as must-run units outside the market, but as low marginal cost units bidding into the market.

To avoid congestions especially on interconnections (which will hinder Europe-wide energy trading) there is a strong need for investments into transport capacity in order to connect areas with high wind generation (onshore and offshore) to areas with high consumption.

Well-functioning markets for congestion management, balancing energy and ancillary services are a prerequisite to integrate a higher amount of wind energy generation. ENTSO-E regards well-functioning markets as a necessary tool for the integration of more wind power into the system and for creating adequate investment incentives.

Continuous evolution of markets and support mechanisms are expected. A gradual harmonisation of the support systems at a European level would facilitate the convergence towards a European integrated electricity system (or a European internal market).

Question 2	What are the implications for market rules? Can you identify changes which would better facilitate integration of wind generation, including management of intermittency?
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ENTSO-E does not foresee the need for designing completely new market models, however, the expected large share of wind power calls for changes to the existing European market designs to take the fluctuating nature of wind generation into account. In general ENTSO-E finds it important to develop appropriate market mechanisms to incentivise consumers as well as all generators including wind power generators to interact with the electricity system in order to optimise the value of the fluctuating generation capacity.

In this perspective, ENTSO-E is of the opinion that the ongoing work on market design in the framework of the Florence Regulatory Forum offers a good starting point. The combination of coupled day ahead markets, followed by further developed and also coupled intraday markets and finally adequate balancing mechanisms, all comply with the basic principles of these developments.

Demand side management, storage facilities, and pooling solutions with different types of generation that combined will deliver marketable products could be some of the solutions to cope with the fluctuation of wind generation. Alternatively an adapted structure of energy products traded on power exchanges could improve the grid and market integration of wind generation. It should be further analysed if it is necessary to enhance the TSO's control capabilities of the storage facilities and of the different types of generation in order to maintain system security.

In the long run, wind generation should have to comply with the same requirements as conventional generation. Feed-in tariffs without any coupling to market requirements should therefore only be used for small wind energy generators. Larger windmills and in particular wind farms should adapt their feed-in according to market signals.

It is important that TSOs promote increased flexibility in generation, international trade and demand management. In this framework, it is necessary to further develop coordination between TSOs in order to maintain the high level of security of the European power system and to help TSOs manage the intermittency of wind generation. The service provided by this coordination will give an overview of the situation and of important modifications in the generation affecting more than one TSO's area. It is necessary that TSOs have data (both real time and forecast) about wind generation infeed level (both from transmission and distribution connected wind generation), and exchange these data. TSOs also need sufficient real-time control.

The flexibility of operation could e.g. be enhanced by promoting solutions that would extend the group of power plants providing reserve capacity and ancillary services (to include small power plants, wind generation, biomass power plants etc.). Especially large onshore and offshore wind farms could (given the right solutions) provide reserves to the system and thereby help balance the system.

Some Member States have introduced the concept of negative prices in order to stimulate the flexibility of the existing generation capacity. ENTSO-E will follow and analyse the experience obtained with negative prices, the impact it has on integrating wind power, its combination with different types of support schemes, and the impact on grid security.

Market coupling and the development of efficient markets of balancing energy and ancillary services would better facilitate integration of wind generation. Market coupling should allow for optimization of use of capacity in all time frames (harmonisation and integration of balancing markets and reserves as well).

A first step to increase the integration of balancing energy markets would be the implementation of the TSO-TSO model for exchanging balancing energy. This would allow the transfer of energy from areas with a surplus generation to areas that have a deficit, diminishing the need for curtailment.

Creating Europe-wide harmonised regional intraday markets that allow the trade of energy closer to real time would broaden the possible buyers/sellers of energy, increase liquidity of the market and would allow the international trade of energy.

Question 3	<p>Would moving the market's gate-closure closer to real-time facilitate the deployment of wind generation?</p> <p>Would this have any adverse consequences on the functioning of the electricity power system?</p>
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ENTSO-E agrees that the closer the GCT comes to real time - the higher the probability to accurately forecast the wind power - especially as the precision of the wind generation schedule is improved. Well developed intraday markets are an important market initiative that will supplement the possibilities of getting GCT closer to real time. In general market mechanisms should keep the incentive aimed at high quality load forecasts. A better wind generation forecast should lead to lower costs for the wind power generator and for the whole system by reducing the need for reserves.

However, allowing for a closer GCT will not remove the need for more flexibility, dispatchable capacity and demand response initiatives. There has to be an appropriate balance between the gate closure and giving the TSOs enough planning time to be able to analyse and use the information.

Another important subject when discussing GCT is harmonisation of gate closure time across Europe. ENTSO-E believes that such a harmonisation would be helpful to market integration.

Finally, it should be emphasized that harmonizing and bringing the GCT of intraday markets closer to real time, does not take away the importance of (preferably coupled) day ahead markets with harmonized day ahead market (DAM) GCT. The matching of day ahead markets based on wind forecast will remain the main starting point for the daily planning cycle of all involved operators, since it combines liquidity (obtained by the single DAM fixing) with larger opportunities for operational planning of generation and transmission, compared with close to real time intraday market closure.

Question 4	<p>Are emerging cross-border congestion management models compatible with wind generation?</p> <p>Should further attention or priority be given to intraday capacity allocation mechanisms and markets, in light of the issues associated with forecasting wind generation?</p>
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The use of market coupling between national and regional markets, day ahead implicit auctions and incorporating wind generation into the normal market mechanisms instead of treating it separately will enhance the integration of wind power into power markets. Efficient cross border trade provides the possibility for trading wind power in larger geographic areas.

The cross border models should where appropriate also include mechanisms for cross border trade of ancillary services.

Intraday markets may come to play an important role in trading electricity from wind power as it is closer to the operating hour. A main priority is therefore to develop continuous intraday market mechanisms aiming at creating a transnational liquid and simple to use market platform (comprising both platforms for energy trade and cross-border allocation mechanism). ENTSO-E is working in that direction.

Question 5	<p>Should wind generation be subject to the same balancing obligations and the same types of charges as other types of generation?</p>
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From a market perspective ENTSO-E is in favour of wind power being subject to the same balancing obligations as other types of generation. Whether or not wind generation is currently subject to the same balancing obligations and the same type of charges as conventional generation depends on the actual support scheme as well as compulsory defined integration mechanism. In the operational hour it is, however, necessary for the TSOs to have the required tools and the full responsibility to balance the system.

Imposing uniform balancing obligations on all generators is an essential component of a fair and transparent energy market. All participants should face the balancing costs that their actions impose on the system, meaning that wind generators, as all other generators, have to cover their own balancing costs. It is important not to undermine the Internal Electricity Market and to ensure an efficient interplay in the market between different kinds of market players (different technical characteristics). Exemption from balancing obligations could be viewed as an indirect subsidy.

Seen from a market perspective being exposed to these imbalance obligations/costs could incentivise all market players including wind generators to invest in more accurate forecast tools, increasing the usability of wind. The better the quality of day ahead and intraday wind forecasts, the better the marketability of wind on these markets. Finally it could be profitable for renewable generation to present together their offers to the markets, e.g. through the use of balance areas, in order to compensate as much as possible for individual errors in generation forecasts.

With regard to ancillary services, existing wind generation should participate according to their technical characteristics (full participation to voltage control, adapted participation to frequency control, curtailment possibility needed for system security). To ensure security of supply while allowing integration of more wind generation now and in the future, new wind generators should be encouraged to participate according to the possibilities given by the best technology available when the power plant is connected. This would benefit the system operation.

Question 6	Should TSOs engage in research and development (R&D) to address issues associated with a large share of wind generation included in the network? If so, how should the regulatory framework require or support this?
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It is very important that TSOs are involved in research and development provided that the costs of R&D are recovered. The involvement should include specification of R&D topics, analysis, validation of results and full scale demonstrations.

TSOs need to engage in R&D to understand the short and long term consequences of developing power systems with a significant share of intermittent generation. In order to help the integration of wind energy, innovative solutions are necessary.

The investments necessary for the realization of these R&D activities have to be fully covered by regulatory frameworks (tariffs, national and European research funding). TSO schemes for R&D activities need to deal with the natural time lag between the realisation/implementation of the benefits of the R&D activities and the years in which the associated costs have been made.

In this respect harmonization of regulatory frameworks regarding the facilitation of the collaboration of the pan-European R&D activities is an essential element in the realization of R&D efforts by TSOs.

On 11 January 2010 ENTSO-E launched a public consultation on its R&D Plan presenting the needed transmission network research themes for the coming years.

Question 7	Should wind generators face the same types of network charges as other new generators, calculated using the same methodology? What is needed to provide a sufficient incentive for generation in choosing where to locate? What is needed to provide an appropriate balance of risk among market players? When should this not be the case?
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Network charges

Wind power is usually located where the prevailing wind conditions are best and construction areas are available. These locations are very often far away from the consumption centers. Seen from a TSO point of view it is important that generators of wind power face the same types of network charging mechanism as other types of generation source in order to create a level playing field.

Charges need to reflect costs and need to be non-discriminatory.

Location

Sufficient incentive for generation location is a difficult task, particularly in light of the social and planning consents issue in many Member states, the strategic importance of the electricity infrastructure and the length of time it is likely to be in place compared to generator technologies.

Regarding the costs for the connection of offshore wind parks, there should be a pro-active handling by the National Regulatory Authorities, as there is a completely new infrastructure needed. Given the uncertainty of future development of offshore parks, a modular development of the offshore grid should be adopted in order to allow for high flexibility (see question 9). In several Member States positive experience has been obtained with the identification of priority connection zones by governmental entities. This can help TSOs carrying out timely investments, notwithstanding the time discrepancy between wind generation projects and new network development and reinforcement projects. TSOs should get the ability to build these connections and should be allowed to reimburse these costs in the tariff calculation.

Generally, ENTSO-E would prefer a solution where generators take account of the local market price, any need for grid reinforcements, and other locational signals when deciding on where to place their installations. Long-term security of supply is dependent on new capacity being placed where it is needed.

Balance of risk

To provide an appropriate balance of risk among market players there should be the same tariffs and market terms for all the market players. ENTSO-E believes that it is important to treat generators of wind (and RES-E in general) on equal terms with other generators regarding the costs of the system.

The costs that are induced on the system by the wind generation have to be transparent in order for the wind generation to contribute to efficient solutions. It is important that the large technical possibilities of wind generators are used for the benefit of the system, which must be reflected within appropriate network codes in the future.

Given the increasing number of connection applications for wind power generation, it is appropriate to provide for economic guarantees to TSOs in order to commit the applicants to actually carry out the investment projects in the same way as other generators.

It is also important that, in case of wind power generation connecting to distribution networks, the impact on the entire system operation is taken into due account by DSOs in cooperation with TSOs.

These issues will be taken into account by ENTSO-E when developing the network code for "grid connection of generators with special focus on wind generation".

Question 8	Broadly, what is the appropriate allocation of responsibilities, risk and cost among market players in developing new network infrastructure (e.g. ahead of or in response to new generation connections)? Should this be different for wind generation? Where is harmonization required?
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It is important that TSOs have the competence to develop new network infrastructure, and to develop technical standards and grid codes in an integrated approach for both onshore and offshore grids (These tasks are TSO core tasks and as such TSOs should have the authority). In this regard the incentives to develop the grid infrastructure given through the national regulation are of vital importance. It should not matter if this is related to wind generation or other types of generation.

Improvement of authorization procedures is an urgent task. It is therefore important to stress that member states in general need to dedicate effort to improve authorization procedures. The development of wind generation (and RES-E in general) will increase the need for stronger grids and interconnectors in the mid to long term. The authorization procedure

should be simplified and include a strict coordination of authorization for both the grid and the RES-E plant and should if possible be harmonized in Europe.

International alignment of authorization procedures for the location of offshore wind generation as well will improve the required approval process in order to realise an offshore grid (instead of many different offshore connections to offshore wind farms).

Harmonisation of responsibilities is required to obtain the same incentives for investments and operation for TSOs in all Member states.

It is important to allow for timely investments in network infrastructure. Therefore grid infrastructure developments are essential to anticipate ("strategic network").

The owners of wind parks, CHP units, power plants, RES-E installations etc. must be responsible for complying with the many rules that have to be met when connecting to the grid.

Question 9	Do you agree that the "supergrid" issues for regulators identified in 5.1 are relevant? Is there anything else European regulators should be considering?
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ENTSO-E agrees that these issues are relevant for regulators and supports the statement that the development of a "supergrid" and other projects (interconnectors) requires that regulatory uncertainty is minimized and that the experiences from "the ground" should play an important role in developing such regulatory certainty.

It is essential that the pan-European social and economic benefits associated with the development of a European "supergrid" must be proven before a final commitment is made to build. In addition it is necessary to address the issue of costs.

The European regulatory authorities should continue to focus on the proposed modular development of a European "supergrid" where investing in interconnectors has to have high priority.

In the context of trying to improve competitiveness, sustainability and security of supply through cross-border trade, a fully integrated European "supergrid" has a key role to play, thus a harmonised regulatory framework may be required. Regulators should work towards a regional/ European approach in order to stimulate the development of interconnector investments.

It is important to develop a common framework of technical and market rules for wind power connected to transnational grids. If a European "supergrid" is to be build then there is a need for common harmonized rules. At least, existing rules should be analysed in order to be sure that they are compatible with a European "supergrid", those being considered as barriers should be removed.

All the technical issues including reliability of a "supergrid" will be addressed by ENTSO-E, shared with all the stakeholders and approved by authorized bodies.

Question 10	Is the current ownership structure of the offshore lines or their regulatory framework a potential issue for the integration of offshore network? Are there other considerations affecting this ownership structure?
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There are several important issues that need to be addressed in order to stimulate the development of an offshore network. ENTSO-E finds it important to clarify the regulatory framework before addressing the ownership issue.

With the current ownership models and structures of offshore assets it is unclear who is responsible for building an offshore grid (responsibilities to build, own, operate and maintain offshore assets differ as well as grid codes differ). Policymakers and regulators need to facilitate the political wish to explore the renewable resources in the North and Baltic Sea.

The development of an offshore grid will benefit if the entire offshore infrastructure (on DC level) is owned and operated by onshore TSOs or alternatively by an entity that comply with all the requirements on TSOs.

Long term grid planning may lead to modular development of the offshore grid. Private companies chosen on least cost criteria to develop offshore connection may not chose technical solutions compatible with future modular developments. Therefore the TSOs grid planning responsibility should be extended to offshore grid planning as well. Environmental impact of connections will also be reduced if TSOs are in charge of clustering connections from several generators (avoiding radial connections only on a project by project basis).

It is also important to ensure that the offshore grid can be interconnected. Therefore coordination between onshore reinforcements and the offshore network is a requirement. This demands strong coordination between TSOs. An interconnected offshore grid as well as the relevant connection to the load centres will increase European electricity market integration.

As mentioned in the answer to question 8 the national (local) governments must clearly support faster permission and authorisation processes and ensure international coordination.

Long term development of offshore technologies will be hindered as a consequence of the uncertainties. Additionally the technological requirements and performance capabilities are not well understood. This knowledge is necessary for TSOs to be able to estimate the operation of the power systems and the potential operational benefit/cost these assets will bring.

Question 11	Do you agree that the Regional Initiatives should be used to address the issues associated with the development of the regional projects? What challenges does this present?
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As outlined in the ENTSO-E Draft response to the public consultation on the “ERGEG Draft Strategy for delivering a more integrated European energy market: The role of the Regional Initiatives”, ENTSO-E considers it necessary to utilize the Third Energy Package processes as driver for future policy determination and progress; with the Regional Initiatives delivering implementation. In effect, ENTSO-E considers it appropriate that the Regional Initiatives in future should act as a bottom-up implementation forum whilst guided by a top down vision and policy provided by the Framework Guideline and Network code development process envisaged in the Third Energy Package.

As described in the above-mentioned ENTSO-E response, it appears that the Regional Initiatives in many cases do not have the adequate geographical size (e.g. the North Sea offshore grid, which will not fit in CWE nor FUI initiatives or large scale wind penetration in some key markets (e.g. Germany) that affect many EU countries). In these situations a case by case approach is needed so that the regions are defined in function of the subject (e.g. the Pentalateral Forum (PLEF) and the extended PLEF). Currently there are efforts aimed at a better alignment of the activities of the extended PLEF and the activities of the involved TSOs within the ENTSO-E RG North Sea (under the System Development Committee).

These considerations have been factored in when developing regional cooperation structures within ENTSO-E, which ensures that developments at the regional level are compatible with network codes at Community level, as requested by the Third Energy Package.

Question 12	What other issues should European regulators consider in relation to the integration of wind generation?
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There should not be any special treatment for wind power, e.g. no special market rules, as this would hinder the market integration of wind power.

Operational and technical requirements for wind generators are essential to maximising wind power penetration while preserving system security.

TSOs face substantial investments in the development of the transmission grids, creating flexibility in generation and demand and intelligent control (SmarTGrids, electricity storage systems). Regulation must support this development and reinforce incentives for independent TSOs to act in accordance with socioeconomic welfare optimisation (e.g. investments in infrastructure and cross border congestion management).

Regulators should work towards creating a regulatory framework that promotes European solutions for interconnection of offshore windmill parks to several countries (e.g. Kriegers Flak).

Consideration is needed in the long term to the governance arrangements for generation becoming embedded into the distribution networks and the responsibility of the TSO with regard to these and overall system security. A significant increase in the distribution connected wind farms along with smart meters, and demand side systems creates challenges that should be addressed further.

The legislative requirement of priority dispatch may limit the capability of power systems to integrate more wind on average in the long term. This should be addressed to see if the intent of the legislation is to reach the highest level of renewables possible.

The CEER document emphasises that RES and market issues cannot be treated separately but in a broader context. The development of renewable energy generation should be harmonized with other areas (adequate generation mix, balancing, promotion of CHP generation etc.).