IBERDROLA response to CEER Consultation on regulatory aspects of the integration of wind generation in European electricity markets

INTRODUCTION

IBERDROLA welcomes CEER consultation because now is the proper time to pay attention to the problems that large development of wind generation may impose in European electricity markets. Fulfilling the 2020 renewables objectives will require strong actions from many agents in the system and it is crucial to discover those necessities as soon as possible and take the appropriate decisions. In particular, completing the internal market as well as developing the necessary grid infrastructure are two vital elements to reach the objectives under a safe and reliable supply of electricity.

ANSWERS TO SPECIFIC QUESTIONS

Question 1:
How will the expected growth in wind generation affect the markets in which you operate?

In Spain the 2020 renewables objective is 20%, and is expected to be over 40% the participation of renewables in electricity production. Wind energy will contribute with a big share of this percentage. Therefore, we expect a big impact on the market in the following aspects:

- Impact on prices. The fact that there will be a great amount of intermittent energy with low variable costs, together with the need for having the necessary operating reserve in the system, will: 1) rise the volatility of the day ahead price; 2) will decrease in general terms the market price; 3) zero prices will be more frequent; and 4) probably the difference between peak and off-peak prices will increase
- Operating costs. Conventional thermal plants will operate less hours with more frequent start-ups; more operating reserve needed with thermal plants operating on minimum load with a lower efficiency and consequently higher costs.
- Generation investments. In the short and medium run, the generation mix will not be market driven, but it will have to incorporate a large amount of energy because of political/regulatory decisions. This will have a strong impact on the economics of existing plants, putting in a serious risk the recovery of previously decided investments. This economic risk, together with the higher volatility in prices will raise new difficulties to new investments. Market rules (as we will see in question 2) will have to be reconsidered in order to cover these risks and give proper incentives to future needed investments. In general we see the need for more flexible plants, either increasing flexibility of existing plants

or/and focusing new investments to a greater proportion of plants with a higher operating flexibility.

- The importance of intraday and balancing markets will increase because the predictability of wind is increased when getting closer to real time.
- Cross-border capacities will also be of great importance to allow more wind energy entering into the systems.

What are the key challenges you foresee?

- Integration of wholesale markets is a need to integrate the forecasted amount of wind and to mitigate fluctuations caused by wind patterns; but it is acknowledged that the differing market and regulatory arrangements between member states will be an important issue. It is also necessary to develop coordinated regional and EU-wide Intraday and Balancing markets in order to cope with increases and decreases of wind production.
- New wind farms will require investments in grid infrastructure. Furthermore, it is probable that big inter-area flows will change and reinforcements of existing networks will be also needed. ENTSO and ACER will have a key role to play in developing plans and fostering investments that will ease the introduction of wind energy.
- Predictability of wind energy has improved because of incentives to producers and SOs, through investment in forecasting tools, but further improvements will be necessary.
- Investment in investigation and improvements of technical features will also be a challenge to be able to produce higher levels of energy with higher levels of reliability.
- Any form of generation connecting to a network should be required to meet certain technical criteria for connection in order to ensure the operational security of the network. We therefore consider that NRAs should encourage the TSO/DSO to improve their operation rules regarding wind generation and to adequately enforce appropriately technical and fair performance rules for wind generation.
- The risks explained about existing generation will put a big challenge on the needed guarantee that there will be enough generation in the system for a general purpose: to supply the demand when there is less or no wind. This is known as the backup capacity. But also the speed of variation of wind will put a challenge on the type of generation, that is, there will be a need of flexible plants to follow wind variations.
- Wind characteristics have been shown before (mainly intermittent and less reliable and less predictable than thermal plants), and because of them, there are several developments that will favour its integration in the system, such as demand side management tools (by means of smart meters and smart grids) and storage facilities (being either pumping; batteries; compressed air; or other technologies).

Question 2:

What are the implications for market rules?

Existing market rules were designed under a completely different environment from the one it is being developed now. Markets were properly designed and functioning, giving the right prices for investing and consuming electricity. But, introducing a large amount of subsidized energy at very low variable costs is changing the outcomes of the market and we see the need for some changes in market rules. These rules are different in different countries; therefore, changes will also be different. For example, a big difference consist in if there exists a price cap or not; or if there is a suitable capacity payment or not; or if there is complete freedom to enter or to leave the market. Depending on these characteristics the need for a change will differ.

In Spain in the recent past years there has been a large development of thermal capacity as well as renewable capacity. Thermal capacity (mainly combined cycles) was necessary to satisfy the demand since the reserve margin had decreased so as to put in risk the supply (there is no room for unserved energy in the Spanish Market). Under those conditions the thermal capacity was planned to run for a number of hours and the economics of the investments were right. With the introduction of wind (and other) renewable capacity the thermal capacity is still needed (there is almost no capacity credit for wind capacity) but their performance is very much lower than forecasted. Therefore, if we need to keep these plants running, but present market design is not able to keep them in service, some change will be needed. Furthermore, when demand recovers a higher level, more capacity will be needed, but the market design will not give the right signal for these new investments. So, some changes will have to be introduced into the rules in order to avoid this risk, being either new reserve markets; new capacity payments; or other possible solutions starting from releasing price cap; letting demand to participate or any other change that may be proposed and prove to be efficient and effective.

Can you identify changes which would better facilitate integration of wind generation, including management of intermittency?

In general we think that wind energy should be given basically the same treatment as conventional energy in terms of: scheduling and balancing responsibilities; controllability from the OS; basic technical requirements (voltage control; voltage dips; etc.).

TSO/DSO should also adapt their operating procedures for keeping a stable and secure system to the new energy mix they are dealing with, in order to take the best out of each specific technology.

All the implications and challenges listed in the response to question 1 apply here, in particular the ones related to make markets closer to real time; promote cross-border markets, not only day ahead but also intraday and balancing markets.

Question 3:

Would moving the market's gate-closure closer to real-time facilitate the deployment of wind generation?

As it has been answered in previous questions, the response here is “Yes”. We think that this will reduce balancing costs since errors in wind forecasting are reduced when we get closer to real time. But also of great importance, as also has been said, is the developing of coordinated cross-border intraday and balancing markets. Continuous trade could be a good solution to cope with these elements.

Would this have any adverse consequences on the functioning of the electricity power system?
Complexity will grow in these developments but it will not be a real obstacle.

Question 4:

Are emerging cross-border congestion management models compatible with wind generation?

The development of explicit auctions has improved the use of interconnectors and the new market coupling initiatives can help to integrate the wind power in European energy market, increasing the amount of renewable production.
We should mention here that cross-border trade should be encouraged and restrictions should be kept at a minimum, only when there is congestion and when it is well proved that there is power market abuse. Imposing a ban on imports/exports of energy reduce the competition and the capability of the markets to integrate wind power.
Should further attention or priority be given to intraday capacity allocation mechanisms and markets, in light of the issues associated with forecasting wind generation?
Yes. As it has been said before, continuous intraday markets would be beneficial for wind integration, in a country-wide scope (in the case of Spain evolving from present intraday market arrangements) as well as in a cross border situation.

Question 5:
Should wind generation be subject to the same balancing obligations and the same types of charges as other types of generation?

YES, in principle. Nevertheless, given the nature of non-storability of wind (and other renewables resources), priority should be given in the access to the grid (provided the stability of power system is not at risk), regardless of the market arrangements in order to be sure that the resource is not lost.

All the generators should have the same requirements to connect to the grid (voltage control, voltage dips, frequency tripping), but each generator could offer different services to the system operator as a function of its own characteristics (flexibility, extra voltage control, frequency control, black start capability, balancing possibilities) and generators must receive a payment for these services.

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?

YES. The role of TSOs is very important to the development of wind energy and R&D will help to find better ways to incorporate wind energy into the system

If so , how should the regulatory framework require or support this?

We share EURELECTRIC position in this point, which is:
EURELECTRIC strongly believes in promoting R&D and supports schemes that incentivise both R&D as well as the transition from R&D to full implementation. We believe that the EU has a very important role to play by promoting and funding projects, such as the TENs funding.

The regulatory framework of each Member State can play an important role by introducing appropriate R&D incentives. For example, the recent Final Proposals from the GB Distribution Price Control Review introduced radical new incentive arrangements. In a European context, it will be important for any R&D initiatives to be monitored to share best practice and avoid potential duplication of work.

Question 7:
Should wind generators face the same types of network charges as other new generators, calculated using the same methodology?

Yes. All generators should act on a level playing field in terms of network access and connection rules. Nevertheless, it may prove reasonable to take into account the level of use of the network (may be in terms of coincident peak).

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?

Primary sources are located, sometimes, far from load centres, and generation should be located there. There are examples in the past related to this fact, such as large hydro reservoirs; coal plants located in the cost; nuclear plants far from large load centres, etc. In this case, wind mills should locate where wind resource exists and transmission lines should be built to transport energy to load centres.

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)?

Here we also agree with EURELECTRIC position since it is well known in advance the places where wind resource exists and, in some cases in connection with local authorities, where developers are planning to install wind plants. It is worth to add a point to reinforce the need for cross-border development of more interconnections, since it is clear that this will help to develop wind energy more quickly and integrate it into the systems more easily.

EURELECTRIC position is as follows:

TSOs should play a proactive role in planning and developing the network with a long term approach, considering that it takes much longer to build lines than wind farms. Planning of network expansion shall take into account existing scenarios of expected

installations both in RES and in conventional generation. Moreover investment and licensing timing of RES installations and grid development should be aligned. In order to minimise risks for investors and reduce inefficiencies, we cannot afford to have RES installations ready when there is no connection available yet (or vice versa).

Regulators and governments should limit uncertainty and investments risks as much as possible. First of all they should recognise the need to reinforce networks, authorising investments on a timely basis and allocating the appropriate remuneration (or authorizing the necessary grid tariffs) to TSOs and DSOs.

Regulators should make sure that transmission investments with positive socio economic welfare are made and decide on distribution of costs between TSOs. This could also mean that third country TSOs, not involved in the construction of the transmission line, but benefiting from it, could take part in financing it. A common incentive scheme needs to be put in place.

Should this be different for wind generation? Where is harmonisation required?

NO, in principle. However, a fact to be taken into account is that the simultaneous factor in wind installation makes a difference between capacity installed and capacity used, which differ from other (mainly thermal) plants situation.

.

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?

We in general agree with EURELECTRIC position also in this answer, but prior to show the position it may be worthwhile to raise a point on the need to separate off-shore plants that are located relatively near the cost with clear connection point on-shore, form off-shore projects that are suited to be connected to more than one country.

EURELECTRIC position is:

We are pleased that European regulators see the advantages of North Sea and Mediterranean grids. However given the expected complexity and high cost, we believe that they should be developed in a modular, phased approach to ensure that stranded costs are avoided and the application of new technologies, and improvements in existing technologies, can be maximized.

We believe that any "supergrid" must be seen from a pan-European point of view. Such an additional grid could also relieve the already constrained European transmission network by directly connecting RES generation and load centres and improving efficiency of RES development. Also developments in this part of the grid will be larger than national, and will raise the same questions, as who pays and who benefits, as the distorting effects from different support schemes, etc. We therefore agree that the development of a "blueprint" for the North Sea Grid, for example, is important in order to bring out particular issues associated with the development of this project.

Although we believe that the right issues are addressed in paragraph 5.1, we regret that section 5 only looks at the "external" part of the grid: nothing is said about the

needs also to invest in the continental grid in order to manage the intermittent injection.

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?

We think that all the relevant issues are taken into account in CEER considerations. The problems raised in off-shore projects are even larger than those in on-shore projects. It is inefficient to assign all the cost of connecting to the first developer since this would restrict projects. Assigning costs only to TSOs may also be inefficient, since it could end in underutilized assets. A compromise should be reached in which developers bear part of the costs in order to eliminate risk of over investments, though in the end, most costs, well undertaken, may be borne by the TSOs. In off-shore projects these risks may be bigger than in on-shore projects since availability of measured resource is more difficult and the real development of projects is more uncertain.

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?

Yes. In fact, regional projects may help to identify regulatory and coordination problems and propose solutions that allow advance in the development of installations that require solutions accepted by several countries. In order to achieve the final goal of a single market, a supervisory body should ensure that compatible solutions are being taken so that in the future all arrangements are compatible and may be substituted by a single arrangement. Even more, this body can support Regions in order to take the best known solution by means of spreading information about the developments, problems and solutions found by regions which take the first movements.

Question 12:

What other issues should European regulators consider in relation to the integration of wind generation?

We share EURELECTRIC view on authorisation procedures and distribution networks which are as follows:

Authorisation procedures

We agree that the challenging authorisations and permission processes in many MSs are a major issue and we fully support regulators in reiterating the call for governments to speed up the processes for building and construction authorisations. Although the construction phase of a major network reinforcement project will take around two to three years, construction cannot normally start until all authorizations are in place. Throughout Europe, the responsibility for providing authorizations lies with individual national governments. Unfortunately it is clear that obtaining authorizations for major network reinforcement projects can often be an inefficient and slow process where the

consideration of applications can take many years, and the process often involves lengthy discussions over the 'need' for a particular type of infrastructure, rather than focusing on the specifics of a proposed project. This results, in most countries, for the authorization process for major network reinforcement projects to take on average around 5 years but is often well over 10 years. If this continues, European energy policy targets will be seriously compromised.

Many countries now recognize that their planning systems need to be enhanced for nationally significant infrastructure by improving the strategic context (i.e. national policy) against which individual planning decisions should be made. We note that some countries distinguish between the decision to proceed with a project and detailed decisions on location, design etc. through a two stage decision-making process where the first decision is made at the national parliament, and once permission is granted in principle at this stage, the second stage would be conducted at the local level and be more concerned with design and routing etc. We therefore believe that an essential prerequisite for obtaining authorizations must be clear national criteria on which a decision must be made and should include a strategic framework and transparent guidelines for the process to reach a decision and for setting clear deadlines.

A 'National Policy Statement' agreed by the national government, could set out the criteria against which the body making a planning decision will judge applications for development consent. The use of such a statement would mean that applicants no longer have to demonstrate either the overall need for a project or for their particular proposal to be sited in a particular location, and would create a more efficient, transparent and accessible planning regime by establishing a clearer separation between policy-making and reaching decisions on individual applications. The benefit of such a statement would give applicants a clearer framework with a higher degree of predictability and a planning environment in which they can make investment decisions with more confidence. Individual planning decisions would be based on a transparent set of standards that set out the national interest. Both investors and the public would have a clearer view about what to expect from the planning process.

<u>Role of distribution networks</u>

Moving towards a low carbon electricity system will require radical changes on both the supply side (high penetration of variable renewable generation resources at all voltages) and the demand side (energy efficiency and the potential electrification of transport). As the network operator is the common link between these changing inputs/outputs there will need to be an evolutionary change in both network design and network operation from the largely passive (fit-and-forget) system of today.

Generally, electricity networks have been designed to deliver energy via high voltage and low voltage systems, with a 'top down' direction of power flows. Distribution networks that were originally designed as "passive" transport networks to accept electricity from the transmission system will need to become more "active" as more embedded renewable generation - from domestic micro-generation to larger scale commercial units - connects. Increasing levels of distributed generation (DG) in distribution networks will initially displace local demand but in certain locations will ultimately result in 'export' onto the transmission system, this in turn will have implications for the requirements for transmission infrastructure.

DG will also pose operational and control challenges for traditionally designed and operated distribution network and so the Distribution System Operators (DSOs) will have to become much more involved in real time distribution system operation, making use of innovative solutions such as smart metering, voltage control, power flow management, dynamic circuit ratings and energy storage technologies. The key technical issues will be power flow management, voltage control and fault level management.

This change will need to be managed by both by the transmission system operator and also by the DSOs. The move towards more active system management at distribution voltages will complement and support the transmission system operator (TSO). However, a pre-requisite of meeting this challenge will be to ensure that there continues to be effective, two-way communications between the DSOs and the TSO.

Other issues to be investigated

Although already mentioned somehow, it is worth to stress the following issues:

- Assess if current market rules provide the correct price signals to stimulate the necessary investments in flexible and back-up generation and if correctly rewards existing assets.
- Analyse possible undesired effects or distortions generated by frequent zero prices.
- Be prepared that there will be a change in generation mix and markets need to adapt accordingly
- Urgent need of short-term cross-border transmission capacity, and especially Intraday and balancing markets coordination.
- Development of electric vehicles and its implication on wind development
- Analysis of storage technologies
- The application of the latest technology through, for example, the development of "smart grids" to make better use of network infrastructure through active management of demand and generation is essential.
- The challenging authorisations / permission processes in many member states are a major issue and it is important therefore that regulators press member state`s governments to speed up their processes for building and construction authorisations.

Brussels, 18th of February 2010