



Regulatory Aspects of Integration of Wind in European Electricity Markets

RES is a wind farm developer; we have a substantial development pipeline, including over 650MW of consented projects in Great Britain, Ireland, France and Sweden, ownership interests in more than 500MW and have a significant number of earlier projects at earlier stages in the development process. We also have significant interest outside Europe, primarily in the US. In the countries in which we operate we are amongst the leading independent developers. We are also active in the offshore market in the UK, Ireland and France and have consented 350MW of offshore wind projects in England and are supporting Centrica Renewable Energy Ltd in progressing the development of their UK Round 3 Irish Sea Zone which has a potential capacity of more than 4GW. Operating as independent developers and owners of wind capacity and providing project development and engineering support to utility clients, we have gained a wealth of experience and insight into how the various electricity markets operate.

The CEER consultation on regulatory aspects of integration of wind in European electricity markets is therefore of great importance to RES. The ability of wind to be smoothly integrated into the respective electricity markets in a clear and transparent manner is a major factor in whether it is economic for us to develop and establishing the investor confidence that will be essential to achieve the stretching European targets.

We firmly believe that wind can be integrated into the electricity market and that the regulatory regime plays an important role in ensuring that the benefits wind can bring to electricity markets such as low carbon and low marginal cost generation are maximised. It is also important in ensuring that the rest of the market is set up so it is best able to cope with the characteristics of wind generation, namely its intermittent nature. The regulatory regime can determine whether wind is able to fulfil its potential within a market or not.

There are some key principles that we believe are vital for the successful integration of wind in electricity markets:

- Regulatory regimes can have a major impact on the ability for wind to be successfully integrated into the electricity markets in Europe, it is important that regulators acknowledge their role in helping to enable this technology to thrive.
- Gate closure should be as near to real time as possible to minimise forecasting errors.
- The regulatory regime should incentivise a diverse generation mix, including highly flexible plant as well as baseload and intermittent capacity.
- Locational charges should be pursued where appropriate, providing that charges for individual generators do not become unduly high.
- We strongly support the development of the North Sea 'Supergrid' proposal and believe it can play an important role in meeting the EU 2020 targets, provided the regulatory complexities can be resolved.
- Wind should operate as part of the mainstream electricity market wherever possible but believe there is a case for wind to be dispatched by a central body once penetration levels are such the variations in output are more efficiently managed by a single body.
- Markets should be integrated as much as possible through the use of interconnectors.
- Competitive markets are very important to enable new entrants to join the market and to ensure that they are not penalised over incumbents.

Question 1: How will the expected growth in wind generation affect the markets in which you operate? What are the key challenges you foresee?

It is difficult to outline generic impacts of wind on the markets as the impacts are largely dependent on the market structure chosen by the government or regulator. Increased wind will not be the only factor influencing the choice of market structure, the need to increase other low carbon generating capacity, increasing distributed generation and increased levels of interconnection are all likely to play a part in the decision.

It can be expected that output will become more variable with high levels of wind connected to the system. This is likely to necessitate larger amounts of highly flexible plant such as open cycle gas turbines which can help balance wind's output. Similarly demand side measures such as active demand response and demand shifting could be used to help reduce price volatility. There is already a case for undertaking such measures as they reduce the amount of capacity needed in general, however, increased wind penetration increases the justification for them.

Increased correlation of wind output within individual markets is likely to reduce the wholesale price realised by our windfarms by depressing prices in periods of high wind output. High wind output could lead to periods of very low or potentially negative prices. The culmination of the two effects is that the wind weighted wholesale price is lower than the wholesale price realised by non-wind generators. We do not expect significantly differentiated wholesale prices to emerge until wind reaches significant levels, perhaps 20% of total installed capacity.

It is also not clear how much lower wind wholesale prices than non-wind sources will be. If other mechanisms are introduced to either curtail demand during low wind periods, or highly flexible generation which can operate at such times is built (or both), the variation in prices might not be very significant. There is also likely to be locational variations, as windfarms which are located further away from other windfarms (and so with less correlated output) will see less of an impact than those located closer to the majority of windfarms.

We believe that prices are likely to become more volatile due to both increased wind penetration leading to prices being more heavily impacted by wind output but also by input fuel prices being more volatile and the possibility of tighter capacity margins in the medium term in some markets.

The impact of increased wind generation on projects operating under feed in tariffs will not be felt until the end of the FIT period. The presence of the FIT in the early years of projects' lives will mean that investment decisions will not be impacted by any expectations of lower wind revenues or more volatile markets. There is, however, significant uncertainty over the effectiveness with which wind will be integrated into the existing market structures at that point.

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?

There are a number of ways in which market rules are likely to be tested by high levels of intermittent generation, but there is also significant opportunity for them to be altered to minimise the impact. For example a well functioning intra-day market will be very important in successfully integrating significant amounts of wind into the system. The European Wind Energy Association¹ estimates that savings of €1-2bn per year can be made through efficient intra-day rescheduling of cross boarder exchange. In addition to this savings of €250m can be achieved through improved capability for cross boarder balancing systems.

¹ <http://www.ewea.org>

Other market rules and structures which could maximise the potential for wind integration include more responsive demand and increased interconnection. Regulators should ensure companies are able to build new interconnections where price signals indicate it is economically efficient to do so. Capacity payments are another measure which could be used to help reduce price volatility and incentivise highly flexible plant to be built which would help minimise volatility with high amounts of intermittent generation.

Liberalised, competitive, flexible, open and transparent markets will help the deployment of wind as it will enable developers to enter those markets more easily and assess more easily the value and risk within each market. Similarly liquid markets will typically provide a better array of product offerings that will allow project operators to transfer some of the risk to market traders who are in a better position to aggregate and manage those risks. Competition at the retail as well as wholesale level will provide independent renewable generators will greater opportunity to sell their output at competitive prices.

The structure of market rules is ultimately a political decision, with the relative value attributed to price, security of supply and emissions reductions all playing a part in the structure. The GB regulator is currently considering fundamental changes to the market arrangements in GB. The review is primarily to ensure the market arrangements lead to sufficient new capacity being built to maintain security of supply and to reduce carbon emissions whilst minimising prices. Ensuring the market arrangements incentivise additional wind build as well as enabling the system to respond more efficiently to increased intermittent generation is another important factor.

Question 3: Would moving the market's gate-closure closer to real-time facilitate the deployment of wind generation? Would this have any adverse consequences on the functioning of the electricity power system?

Moving gate closure nearer to real time would help facilitate deployment of wind. Imbalance for wind can be reduced from 31% day ahead gate closure to 5% with 2 hours from real time gate closure². Setting up information flows to the grid operators to help them manage imbalance risks is an important aspect of this. Improvements in forecasting capability between grid operators should also provide grid operators with more information to assess imbalance risks as weather patterns develop across Europe.

Question 4: Are emerging cross-border congestion management models compatible with wind generation? Should further attention or priority be given to intraday capacity allocation mechanisms and markets, in light of the issues associated with forecasting wind generation?

Cross boarder congestion management systems must consider intra-day flows as well as day-ahead flows if they are to successfully manage variations in wind output. Most forecasting errors for wind output occur within day and reduce substantially the nearer real time forecasts are made. It is therefore vital that congestion management models are able to respond to conditions as near to real time as possible.

RES considers it important that much greater attention be paid to the issue to ensure that the congestion management models are up and running in time for the substantial expansion of wind capacity across Europe. It is anticipated that there will be a substantial increase in wind generation, and so in the medium term it will be necessary to achieve much closer to real time congestion management capabilities. Such compatibility should therefore be built into the models from the outset.

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

Wind generators should be incentivised to balance their output, but where imbalance charges would lead to unduly high charges, that the same scale of charges as is applied to other technologies would not be appropriate. There is a difference between incentivising to balance and imposing excessively high penalties for imbalance.

² Pyory, Value of GB Renewable Electricity, 2009

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?

TSOs should be allowed to engage in R&D to overcome the issues associated with substantial penetration of wind and other intermittent generation. Whilst some such R&D can be efficient to undertake on a European wide basis, many of the potential solutions will be specific to individual markets. Individual TSO should be able to undertake R&D for their own market. TSOs are often the most appropriate body to undertake such R&D. The regulatory structure should enable them to recover the costs of R&D through the charges they apply.

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?

Wind generators should face the same locational transportation charges as other generators but where they lead to unduly high charges, which would undermine the economic viability of a reasonably sited project, charges should be reconsidered. Any differentiation of charging provides an incentive to locate in a certain place. The balance between incentivising and dis-incentivising needs to be considered very carefully in the case of wind. The fact that some of Europe's best wind resources are located far from centres of demand cannot be ignored and charging arrangements should not preclude such resources from being exploited.

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 harmonisation required?

It is vital that sufficient network capacity is built to ensure the rapid connection of new wind capacity. Network owners should be encouraged to ensure there is sufficient capacity available on the network ahead of expected developments. In order to ensure that sufficient capacity exists and that generation projects are not delayed it will be necessary for network owners to take the lead and create capacity ahead of need. New generating projects should not be delayed or faced with added uncertainty due to slow or lacking development of the network. Regulators must ensure that the regulatory structures under which network owners operate enable proactive development of networks.

The cost of new network infrastructure should be socialised where possible. It is not possible to bring about stated political objectives, diversify the energy mix and improve fuel security without incurring some cost. Ultimately those companies delivering or enabling those objectives should not be penalised for doing so but rather should be incentivised to do so in as efficient manner as possible.

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?

RES considers that the 'supergrid' can play an important role in meeting the EU's 2020 target of 20% renewable energy. Such an ambitious project will require substantial coordination and cooperation of regulators. It will be necessary to ensure that the complexities of the various electricity markets, charging methodologies and connection arrangements covering the region can be overcome.

Regulators must be required to actively overcome the regulatory barriers to the development of the supergrid. Only with such a positive and proactive obligation on regulators will the project be able to overcome the regulatory hurdles which currently threaten its success.

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?

It is important that future development of offshore wind farms are not delayed, or subjected to added uncertainty or costs, due to the ownership structures of offshore lines. Costs and incentives should be made efficient for the long run as well as the short term.

The mechanism for development and ownership of offshore connections is currently under review within the UK (Ofgem Consultation on Offshore Electricity Transmission Enduring Regime). RES believe that further development of the arrangements offshore transmission will be required in order to ensure that the UK offshore wind resource can be efficiently deployed and broadly supports the BWEA consultation response. The principle issues are not related to the ultimate ownership of the assets but to the mechanism by which the assets are developed, built and commissioned and the timing of the transfer of ownership of the assets to long term ownership:

A developer led offshore wind industry will deliver the best economies of scale when given the scope and opportunity to deliver a pipeline of projects. The UK Round 3 presents this opportunity and is important that the arrangements for establishing offshore transmission owners (OFTOs) allow the developer flexibility in the development of the transmission infrastructure and the timing of transfer of assets to an OFTO. In some cases an early involvement of an OFTO in the development and delivery of the offshore transmission will be beneficial, in other circumstances the transfer of assets from the developer to an OFTO after construction and commissioning may bring the best economies of scale.

Arrangements for OFTOs should accommodate connection to and integration with interconnectors between member states (e.g. the supergrid) in order to ensure that the offshore network is optimised for transmission of power rather than purely for connection of individual projects to the existing onshore transmission system.

RES considers it important to ensure that total costs are minimised. However, a overly narrow and short term view of costs has often been taken in the GB offshore ownership structure. The regulator's attention has been focussed on minimising incremental cost, which could be argued has led to higher overall costs. Given the long term nature of such assets it is important that longer term is taken.

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?

Where appropriate regional initiatives should be used to progress regional development projects. However, there are a number of projects where the areas covered by regional initiatives do not match the areas covered by regional projects. The North Sea Supergrid is one such issue. For such projects it will be necessary to have a group which is constituted so as to be able to consider the whole geographic scope of the project.

Question 12: What other issues should European regulators consider in relation to the integration of wind generation?

The European regulators should consider more generally the ease with which new entrants can join existing markets. It is important for owners of wind farms, who are often independent companies, to be able to secure fair and equal access to the electricity market. The process of electricity market liberalisation can be used to provide a more level playing field for wind generators. RES believes that the internalisation of the many external costs of other forms of electricity generation will also help level the playing field by removing opaque and subtle distortions in the market. Full internalisation of all costs will greatly assist the integration of wind across Europe.

European regulators should consider establishing common definitions of certain terms such as 'priority access in the Renewables Directive.

We would welcome the opportunity to discuss further with you any of the points made in this response. Please do not hesitate to contact RES should you require any further clarification on the issues outlined.