

IWEA Response to the “Wind generation in the SEM” consultation

SEM/08/002

12th March 2008

The consultation paper published by the Regulatory Authorities raises issues of fundamental importance to the electricity sector in Ireland.

The current market is strongly bedded in the principle that the fundamental technical and operating limitations of plant should be recognised in the Grid Code and the costs of operating within those limits managed by the system operator and recovered across all users as a cost inherent in the proper operation of a power system.

The option that the costs of any limitation on generation technology should be borne by the generator and the impacts of that option were fully explored and dealt with during the proposed MAE market. Reviving this as a principle and then applying it only to the renewable sector of the market would be highly inappropriate and discriminatory. It would also clearly be in contravention of the “equity” guiding principle listed in the consultation.

Assigning the costs of system operation issues driven by the characteristics of wind generation to the generator, while socialising the costs driven by thermal units would create inappropriate incentives. Yet throughout the discussion paper, the regulators appear to be searching for ways of allocating some of these perceived system costs to wind directly. If this were to happen, it would over incentivise the development of thermal rather than renewable generation and it will not properly encourage conventional plant to operate more efficiently. IWEA therefore feels that it should be clarified in the guiding principles that system operation costs are recovered equally across all of the users of the power system.

Flexibility of generation plant is a key market and operations enabler. The limited flexibility of most plant connected to the system is likely to create serious market and operational difficulties. The IWEA believes that market signals should encourage and not penalise flexible plant.

The concept of curtailment appears to be based on a view that wind has specific characteristics that require it to be operated in a specific manner. There is an open question in the consultation paper about whether wind should be compensated when scheduled downwards due to these characteristics. The IWEA notes that all generation technology has restrictive characteristics that impact on its mode of operation. In the event that wind is to be constrained down the consultation presumes that this may be attributed to the technical characteristics of wind. However, it is likely that the same issue could have been avoided were it not due to the technical characteristics of other plant (in particular the need to have a minimum stable load and a relatively slow ramp rate, compared to wind). It is also accepted that the system operator is charged with operating a secure power system and that this may require certain elements of risk management in certain operational circumstances.

The other specific characteristics of plants should be considered as part of this consultation. For example, the need to carry spinning reserve only arises due to the tendency of large thermal plants to drop their full output instantaneously. It is highly likely that the volumes of reserve provided freely to large thermal plants to facilitate their operation would be sufficient to facilitate the operation of renewable generation in the medium term.

The discussion paper seems to imply that the implementation of national targets is “outside of scope”. While there is not yet any 2020 target set for Northern Ireland, with a mandatory EU target of 20% of energy from all sources strongly supported, one would have to assume electricity will take a higher burden than transport. Additionally the UK Energy White Paper also noted that guidance would be taken from the All Island Grid Study. The authorities in the republic interpreted from the Study that 42% renewables would be economically optimum. In the light of the above, it doesn’t seem unreasonable to assume that Northern Ireland’s 2020 target when it is selected, would also be around the 33% mark, matching that in the south.

This equates to nearly 6000MW of installed capacity on the island of Ireland, in a system of around 9000MW installed capacity in 2020.

In paragraph 3.3, the RA’s note that they should not “hinder the achievement” of renewables targets. In our view, the discussion paper should start off with a statement noting this 6000MW figure, and then ask that all other proposals in the paper be considered in the

context of getting that amount of wind integrated into the SEM as efficiently and at as low a cost as possible. That is surely the primary goal of the next 18 years of SEM design and implementation with respect to renewables, and surely the RAs can do better than “not hinder”. As a matter of principle IWEA feel that ‘promotion of renewables in-line with all-island, national and EU targets’ be included in the list of guiding principles for this consultation.

To assist with providing focus for this consultation it is critical that both Government Authorities commit to an all-island target for renewable electricity, informed by the completed All-Island Grid Study.

The paper proposes to amend the TSC to ensure that generators, irrespective of their market classification, will not be compensated for non-firm constraints. Managing the risk of non-firm constraints will become a major factor in financing a large proportion of the renewable capacity required to meet Government targets. We believe that there is a need for industry debate on the treatment of generators with non-firm access. Exploring the options of allocating the risk, particularly the time period of non-firm constraint, is critical to ensuring the objectives of minimising the cost to the consumer and meeting renewable targets are achieved. As well as the compensation options for non-firm constraint, the option of applying a deemed firm date should be explored.

The IWEA welcomes the opportunity to debate the important issues raised in this paper. The integration of large volumes of wind raises many important market and system operation concerns. However the consultation should recognise the central role of wind as an integrated component of the power system and consider the full range of issues that create difficulty. A transparent and consistent set of principles should be uniformly applied to all technologies. We recommend that a detailed working group be convened to consider all these issues in detail.

The IWEA would welcome an opportunity to discuss these points in more detail with the Regulatory Authorities. The specific questions raised in the consultation paper are addressed in an annex to this response.

ANNEX Responses to specific questions in Consultation paper

- 1 *incentivisation of the System Operators regarding the management of constraints on an all island basis including suggested high level approaches to such incentivisation;***
- 2 *should the introduction of rolling dispatch scheduling and wind forecasting be considered in the context of increasing wind penetration;***
- 3 *guiding principles for decision making by the System Operators and factors to be taken account of in relation to constraining down of wind and other generation, specifically in the situations outlined above, and***
- 4 *the definition of ‘curtailment’ as provided by the System Operators.***

- 1) The System Operator should be incentivised to operate the system efficiently. However, if the SO has the option of curtailing wind at no cost to the SO this distorts the incentive for efficient operation. This will ultimately lead to more expensive energy for consumers as inefficient dispatch is encouraged. Faced with an issue that may be solved by reducing the output of a more expensive thermal plant or a wind unit, the SO would be incentivised to take the more expensive option in the event that “free curtailment” is allowed.

A similar principle also applies to the SO being incentivised to reduce non-firm constraint; if the entire risk is allocated to the developer this distorts the incentive for the efficient development and operation of the system.

The management of constraints is complex and vitally important. The SO should have visibility of the full costs of all constraints and be strongly incentivised to manage these efficiently.

- 2) This is a very important question that warrants further consideration. However, a significant amount of study would be required to understand the full impacts of the proposal.
- 3) The TSO should be guided by the principle of priority dispatch for renewables as well as their license obligations of operating a safe and secure system. There should be no discrimination between technologies. The TSO’s incentive to minimise cost is only effective if the target cost encompasses the full set of actual operating costs.

- 4) The definition is confusing in that it seeks to identify some system operations issues and deal with them separately to all other operational issues. Given the integrated nature of power systems this is difficult to understand. The specific technical characteristics of other technologies are not considered. This appears to unfairly discriminate against wind.

The questions asked on section 4.2.2 (Contingency Operational Reserve) were:

- 1 *the ability of wind generators to provide reserve***
- 2 *the possibility of alternative reserve products to manage the variability of wind generation***

- 1) Wind generation is fully capable of providing reserve on the same basis as all other plant and should be remunerated on the same basis. With all generation it is difficult to predict the exact response in advance of a given incident. It is likely that the performance of wind in this regard will be comparable to thermal plant.
- 2) Wind is the most flexible plant on the system and this benefit should be recognised in the overall operational framework. A comprehensive study of operational reserve requirements to meet system needs should be conducted. This should look at the actual requirements arising from the specific operational characteristics of all generation technologies. A tailored set of products that meets these concerns and recognises the delivery possibilities from generation and demand should then be developed. It would be suboptimal to design specific products for specific needs – while not recognising the overall system issues.

The questions asked on section 4.2.4 (Grid Code Compliance) were:

- 1 *is there benefit to examining the current requirements on conventional generators under the Grid Codes with a view to extending those requirements in light of increasing wind penetration on the all island system?***
- 2 *what specific attributes could be examined in this context?***

- 1) The technical limitations and characteristics of all generation technologies impose additional costs on system operation. It is essential that these limitations are kept to a minimum and that there are incentives on plant owners and operators to improve the flexibility and performance of their generation. It is worth noting that even a fully

grid code compliant thermal unit will impose costs on the system due to its technical limitations. These costs arise due to the fundamental technical limits of generation technology. It is accepted practise to recognise these costs as an inherent part of power system operation and to socialise them. However, there would be significant merit in reviewing the current accepted level of limitations.

The benefits of increasing the required standards may only be realised if those standards are met in actual operation. Efforts to improve performance and transparency in this area may be particularly useful.

2) The technical characteristics of most relevance are:

- Size and configuration of units e.g. 4 individual 100MW units offer better flexibility than a single 400 MW unit;
- Single shaft machines are less flexible than complex units;
- Minimum Stable Generation level;
- Ramp and loading Rates;
- Forbidden Zones;
- Minimum on and off times;
- Dwell/Soak times; and
- Block Loads.

Section 4.3.1

- 1 unconstrained schedule beyond demand requirements;**
- 2 the application of the market price floor in the context of increasing wind penetration going forward;**
- 3 tie-breaking rules for Price Takers as required within the unconstrained schedule.**

1) It would be inappropriate to restrict the ability of units to register as they desire and it is expected that as wind penetration levels increase there will be an incentive on many participants to act as price makers. It will clearly be necessary to develop tie breaking rules as suggested by question 3.

2) It would be inappropriate to expose renewable units to negative prices in circumstances where there is excess generation caused by inflexibility of other

generation (e.g. long minimum down times and high minimum stable generation levels)

- 3) A tie break process is required, but only between renewable generators, having already respected the principles of priority dispatch for renewables. It is important that any mechanism be fair and transparent and does not place repeated burdens on specific participants.

The question asked on section 4.3.2

the payment of constraint payments to wind generators for curtailment reasons as defined in Appendix A .

The concept of curtailment appears discriminatory. All generator technical restrictions impose an additional cost on the operation of the power system. The existence of minimum stable generation is a “non diverse” feature of thermal plant that imposes significant burden on the cost of system operation. If redispatch is required to address this; should this not equally be considered curtailment? The IWEA believes that all redispatch to meet technical limitations of generators should be treated consistently.

The questions asked on section 4.3.3 (Reflection of Cost of Wind Within the Market SMP) were:

- 1 the appropriateness of the continued treatment of wind generation in the unconstrained schedule as per the current TSC rules in the context of increasing wind penetration, and***
- 2 alternative approaches to the current treatment of wind generation in the unconstrained schedule.***

The current approach appears to be operating satisfactorily. If there is to be a fundamental review of SEM this issue should be explored in that context. Currently it is impossible for generators to finance projects on the basis of participation in SEM. It is necessary to introduce stability and transparency to the mechanisms used.

The questions asked on section 4.3.4 (Value of Wind within the Capacity Mechanism)

- 1 Does the capacity payment mechanism accurately reflect the value of wind capacity and will it continue to do so as wind penetration increases?***
- 2 How could the capacity payment be best revised to accurately value wind capacity going forward?***

- 1) Conventional capacity is rewarded on the basis of installed capacity, while wind is rewarded on the basis of actual output, wind therefore receives approx 30% of value per installed MW compared with conventional plant and is not over-renumerated. The current capacity mechanism fails to recognise the significant flexibility of wind compared to the inflexibility of other technologies.
- 2) Renewable technologies tend to be characterised by higher capital costs and lower operational costs. As renewable penetration levels increase it is expected that the total installed capacity on the system will also need to increase. This will be compensated for by a fall in energy prices. It would therefore be appropriate to reflect the rebalancing of total energy costs with increased levels of capacity payments. It is noted that the current framework for setting the annual capacity payment pot recognises this linkage.