

## **MAC REG Information Paper – Independent Market Operator - Project Scoping of Analysis of the Impacts Associated with Intermittent Generation Penetration within the Wholesale Electricity Market**

### **Background**

The introduction of the Government's Mandatory Renewable Energy Target (MRET) scheme will undoubtedly continue to increase the demand for investment in renewable energy generation in the South West Interconnected System (SWIS). This being the case, increased penetration of intermittent generation (such as wind farms) in the Whole Electricity Market (WEM) may create many technical and regulatory issues which must be investigated and analysed.

Wind farms have historically provided the highest growth in renewable energy fuelled generation accounting for approximately eighty percent of the new renewable energy generation facilities since 2001. This trend is set to continue with the expansion of targets of the MRET scheme to achieve a national target of twenty percent of energy generation to come from renewable energy by 2020.

The IMO in conjunction with the Office of Energy (OOE) and the power system operator System Management (SM) are currently in the process of seeking assistance, in the form of an external consultant, in developing a scope of works into the potential issues that may arise from increased penetration of intermittent generation such as wind farms in the WEM.

### **Desktop Study**

The successful tenderer for the Scope of Works will be required to undertake a desktop study to review the technical and regulatory practices used in other electricity jurisdictions of a similar size and composition.

The desktop study should consider how intermittent generation technologies are accounted for in terms of reliability and capacity frameworks and should also make an assessment of other technical issues (frequency control and others) that have arisen in jurisdictions with high levels of intermittent generation.

### **Scope of Work**

The project scoping will set to develop and propose a multi-staged review programme into potential impacts of increased intermittent generation in the WEM. Due to the small size of the SWIS and its geographic isolation from neighbouring jurisdictions, an increased proportion of intermittent generation will not only have significant power system operation impacts, but will also affect many aspects of the WEM.

The Scope of Work will broadly comprise of a three phase review which may include (but is not limited to):

- Phase 1  
The contribution, and potential for contribution, that wind farms make towards satisfying the requirements of the Reserve Capacity Mechanism, and the need to change the certification mechanism to properly account for that contribution.
- Phase 2A  
Technical issues associated with:
  - Impact of various levels of intermittent generation penetration on frequency keeping capability and requirements within a small isolated electrical system, and the need to change the cost recovery mechanisms to take into account that impact;
  - High levels of generation output coinciding with low system demand, particularly overnight, which may require output from high efficiency thermal plant to be curtailed and/or taken offline and operating regimes of existing base load plant rapidly changed.
- Phase 2B  
Development of appropriate costing mechanisms that should be associated with wind farm developments if, for example, additional load following or spinning reserve is required as a result of the development of wind farms within the SWIS.
- Phase 3  
Review of the likely impact that national and state policy will have on the incentives for developing wind farms within the SWIS, particularly given the operation of the RCM, and the extent to which transmission capacity limitations and any additional targeted costs are likely to impede the ability of intermittent technologies to locate in the SWIS.

Currently the IMO, OOE and System Management are in the processes of finalising the selection of the successful tenderer for the Scope of Works program and will come to a decision in the near future.

### **Possible Works Program**

At the present time no decision has been made in respect of the continuation of the second stage of the study, the Works Program. The Works Program would involve completing the necessary studies and analysis addressed in the Scope of Work in order to provide conclusions to the issue raised. The Works Program is envisioned to be a detailed and thorough discussion of the issues raised by the Scope of Works.

A decision into the continuation of the project past the development of the Scope of Work will be made after a review of the outcomes from the Scope of Works are assessed by the IMO, SM and OOE.