

THE IMPLICATIONS OF RENEWABLES AND INTERMITTENT GENERATION

A major new Pöyry multi-client study

*'The wind flapped loose, the wind was still,
Shaken out dead from tree and hill:
I had walked on at the wind's will
I sat now, for the wind was still.'*

Dante Gabriel Rossetti, The Woodspurge

The levels of wind generation in GB and Ireland which are implied by the EU's proposed renewable targets for 2020 will challenge conventional wisdom. Pöyry's view is that if the renewables targets are to be met, the consequent level of uncertainty over market outcomes is greater than at any time since liberalisation of the electricity industry began.

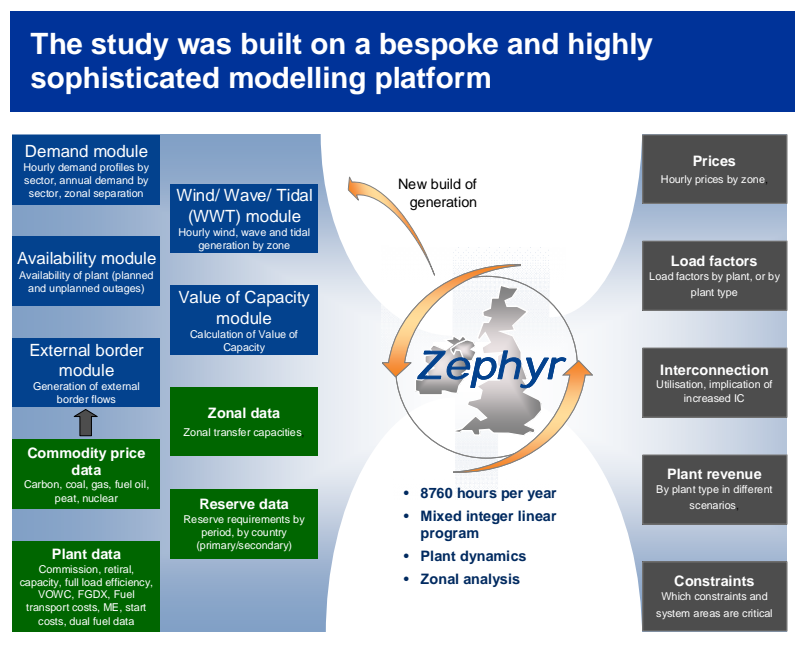
Pöyry Energy Consulting has launched a major multi-client study to examine the implications of the expected rapid growth in electricity generation from variable renewable sources. The ultimate aim of the study is to answer the question *'How will the impact of intermittent generation affect the wholesale energy markets in GB and Ireland?'*

The final report from the study, along with bespoke presentations, is available to new members. The study has already been joined by four major utilities (including three of the 'big six'), two grid companies, two regulatory bodies and two major wind developers. It has covered entirely new ground, and has given the first comprehensive analysis of the impact of wind on market players, along with commercial and strategic insights.

Overview

The variability of wind as the main renewable generation source, compounded by the relatively low levels of interconnection in the UK and Ireland and significant new build of baseload generation, has major implications for the operation of the system. This applies to patterns of price, operating profiles of existing generation and commercial implications on new build generation of different types, as well as the framework of market rules.

To understand these issues, Pöyry has built an unparalleled modelling platform backed by a wealth of historical data. The Zephyr model has been designed specifically to allow detailed examination of electricity markets with large amounts of intermittent generation. It examines hourly electricity prices for a series of 8 'mini-Monte Carlo' iterations which simulate differing patterns of demand, wind and plant availability. Pöyry has also worked with the Met Office to underpin the analysis with 2.8 million hourly wind speed records for 2000-2008 for 35 locations across the UK and the ROI.



Issues addressed by the study

Market prices	<ul style="list-style-type: none"> How will market prices change? How might price volatility change? How do different wind years affect prices?
Plant operation	<ul style="list-style-type: none"> How is thermal generation operation and revenue affected by intermittency? What impact will cycling have on plant emissions?
New thermal generation	<ul style="list-style-type: none"> How much new thermal generation might be required? What are returns on new thermal generation? How important could the LCPD and IED be?
Wind revenue	<ul style="list-style-type: none"> To what extent does wind cannibalise its own revenue? How much is wind output de-loaded?
Reserve and response	<ul style="list-style-type: none"> What is the effect of reserve and response constraints on plant load factors? How binding are frequency and inertia constraints? How does reserve and response change operation of plant? How important is wind forecasting to the 4-hour constraint? What are the implications for warming?
Interconnection and transmission	<ul style="list-style-type: none"> How important is interconnection between GB and Ireland? How are interconnector flows changed by transmission and reserve and response?
Market arrangements	<ul style="list-style-type: none"> Do capacity payments materially improve outcomes, compared to an energy-only market? What are the implications of day-ahead rather than within-day gate closure? Are existing market arrangements adequate to deal with large volumes of renewable generation?

Results from the study

The study began in December 2008 and the final report completed at the beginning of May 2009. However, the report and bespoke presentations are still available to new participants. The cost is £25,000.

Furthermore, Pöyry is planning to extend the study to investigate the impacts on the gas network, along with examining other European markets such as Iberia and North-West Europe.

Wind and thermal generation in January 2030 with the UK wind patterns from 2000

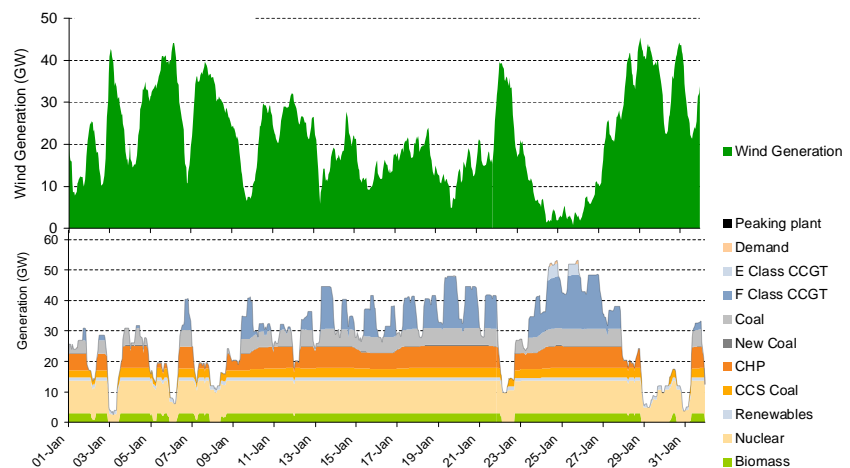


Diagram shows wind generation in 2030 with 43GW installed wind capacity, assuming wind patterns from across GB based on January 2000, and the effect on thermal generation

For further information on this study, please contact:
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