Regulatory aspects of the integration of wind generation

in European electricity markets,

C09-SDE-14-02a, 10 December 2009

Comments from Yellow Wood Energy, 18 February 2010

Introduction

Yellow Wood Energy (YWE) is a small consultancy specialising in electricity and carbon capture. Its consultants have had central roles in a number of high profile electricity market reform projects in the UK, Ireland and the US, over more than decade.

The Council of European Energy Regulators' consultation paper, “Regulatory aspects of the integration of wind generation in European electricity markets”, Ref: C09-SDE-14-02a, dated 10 December 2009, and the workshop held in Brussels on 11 February 2010, raised a wide range of issues. YWE does not intend this to be a comprehensive response to all of the points raised and questions asked. Nevertheless, based on its own experience, YWE has a number of comments regarding issues that were discussed at the workshop, in particular:

(i) gate closure times;

(ii) priority dispatch; and

(iii) harmonisation.

Gate Closure Times

If it is the case that prices charged on energy imbalances reflect high-cost, short-term balancing actions, long gate closure times which require market players to cease trading and to finalise their contractual positions well in advance of real time will be particularly burdensome for wind generation. Despite improvements in forecasting techniques, wind generation will be more exposed than other generation to balancing charges which, depending on the particulars of the market design, may be overly severe. As such, trading closer to real-time will be to the benefit of wind generation, although the systems and processes necessary to take advantage of shorter gate closure can themselves be costly to implement and operate.

It has been argued that such balancing costs reflect the costs that uncertainty imposes on the system. However, YWE believes that there is a tendency to conflate the costs arising from:

(a) contractual imbalances, i.e. deviations between the quantities generated (or consumed) and the quantities that have been bought or sold under bilateral contract; and

(b) informational imbalances, i.e. deviations between the quantities generated (or consumed) and the physical intentions to generate (or consume) that have been declared to the relevant system operator.

System operators should need only to be concerned with informational imbalances. It is (or should be) of little interest to the system operator whether a generator has chosen to cover its output under bilateral contract with another party or whether it is content to accept the prevailing imbalance price. In contrast, where the output of generators is different to that expected by the system operator, particularly in short time-scales, then the system operator may be forced into taking more expensive balancing actions than otherwise might have been necessary. Note that it is a separate matter whether imbalance prices on contractual imbalances are designed to provide incentives for parties to contract bilaterally.

Consequently, it is necessary that system operators are provided, ahead of real-time, with information concerning the intended outputs of generators (and the intended demands of customers) and the availability and cost of balancing actions. In order that market players can provide the most relevant information, there may be a case for reducing the period before real-time before which this information must be provided. Conversely system operators may prefer longer notice such that a greater range of balancing options can be considered.

Nevertheless, the timely provision of intended generation and the availability and cost of balancing actions does not necessarily preclude continued trading. YWE understands the concerns that system operators may have that further trades might influence the behaviour of generators and cause them to want to deviate from previously declared intended outputs. However, this is not likely to be true with wind generation, which is likely to operate at maximum possible output irrespective of the trades made. In any case, it would be an issue for the levying of charges on information imbalances, not contractual imbalances. In principle, if contractual imbalance charges are cost-reflective, it should be irrelevant when bilateral trading ceases. However, unless there is some other reason why it is important that contracts are struck ex-ante, there is no reason why market players should not trade their contractual imbalances after the event, i.e. ex-post trading. Such an approach clearly would allow wind generation to trade after its physical position is known, and would also allow imbalances to be traded in less onerous time-scales than close-to-real-time trading entails[1]. Whilst when imbalance prices become known it is likely that these will largely

1 Note that the consultation paper shows the time between closure of the forward market and real-time delivery for the market in Ireland as twenty hours. However, the Single Electricity Market in Ireland and Northern Ireland is a mandatory gross pool, and whilst bid prices (for those generators that are required to submit them) must be submitted well in advance of the the trading period to which they relate, the pool is an ex-post pool, in which availabilities and market prices are established after the event. Furthermore, there is nothing to prevent financial contracts being traded at any time.

determine the prices at which ex-post trades are made, to the extent that there are contractual imbalances which can be avoided, there will still be reason for market players to make such trades.

Priority Dispatch

Discussion at the workshop suggested that, provided that a Member State has a well-functioning market, it may not be necessary to make explicit provision for priority dispatch. However, it is a matter for consideration as to how stringent the test of a "well-functioning market" is applied.

Consider an overnight trough in demand which requires either a thermal generator to be de-synchronised and re-synchronised or, alternatively, wind generation to be curtailed. If a thermal plant's start-up costs are sufficiently high (say as a result of the effect of additional start-ups on shortening the life of the plant) then the cheaper solution may be to curtail the wind generation. Under such circumstances, a "well-functioning market" might set prices to be negative[2] in which case, the wind generation would prefer to be curtailed (as market price is lower than avoidable cost of production) whilst the thermal plant would prefer to keep generating (to avoid the cost of start-up).

Nevertheless, even in competitive markets, prices may not be set in this way. Non value-reflective pricing which results in a positive overnight price may result in both the thermal generator and wind generation wishing to generate, leaving the system operator to discriminate between them. The system operator can continue to schedule at least cost which will, of course, provide the same solution as would the hypothetical optimal pricing algorithm. However, with pricing algorithms as may have been implemented, dispatching down the wind generation will generally cause it to lose revenue, whilst the cost to the thermal generator of forcing a stop and a start will typically be made good through additional payments. Thus, the appropriate dispatch decision here is perhaps less clear, albeit stopping and starting the thermal generator would result in greater cost to the consumer.

Harmonisation

Harmonising arrangements or "levelling the playing field" is desirable to the extent that it improves the allocation of resources and hence promotes efficiency. This will apply to harmonisation in a wide number of areas which may include connection arrangements, ancillary services payments or, even, approaches to transmission system development and construction. In practice, however, there will be many factors that are outside the scope of electricity regulation, e.g. local planning processes or local taxes. The drive to harmonise should recognise that such external factors will be present and hence the gains from some harmonisation measures may be limited.

2 If demand can respond to price it may be unnecessary either de-synchronise and re-synchronise the thermal plant or curtail the wind generation.

Other

Notwithstanding the comments above, aspects of market design which have the potential to affect greatly the cost of integrating high levels of wind generation in European electricity markets are: the arrangements for transmission access; and the provision of adequate levels of other generation in order to ensure security of supply.

Transmission Access

Increasing levels of wind generation will require, in some if not all Member States, considerable expansion of existing transmission infrastructure. The rate at which such infrastructure can be constructed will often be a limiting factor to the rate at which wind generation can contribute to meeting customer demand. The arrangements by which access to market is afforded to generation can affect whether or not there are incentives to construct generation ahead of the this transmission infrastructure.

YWE recognises that work has already been done on arrangements for cross-border congestion management. Nevertheless, congestion management arrangements within Member States can also have a major influence. If new generation is able to participate in the market, in advance of the necessary transmission infrastructure being available, market prices may be suppressed which thus may distort trade between Member States. Furthermore, to the extent that there are capacity constraints on the construction of wind generation, then providing incentives to install wind generation that cannot run due to congestion will reduce the amount (or raise the costs) of wind generation that can be constructed elsewhere in potentially less congested areas.

Generation Adequacy and Security of Supply

Increasing levels of wind generation will place increasing emphasis on the provision of capacity and reserve in order to maintain adequate security of supply. It would thus be desirable to review how capacity and reserve are valued in different systems (which could include also a consideration of the value of fuel diversity). In order that wind generation can be integrated lowest possible cost, it will be desirable to consider the value of capacity and reserves on EU-wide, or at least Regional Markets, basis. It will be necessary, too, to review the extent to which generation in one Member State can be considered to provide security of supply for customers in another. In contrast, existing arrangements may, at times of system stress, retain generation in one Member State to provide security of supply solely or primarily for customers in that same Member State.

Yellow Wood Energy
www.yellowwoodenergy.com
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