

Renewables - "Yes we can't"

Grattan Healy, Energy Adviser, 25th January 2012/final

Introduction

On the face of it, almost all observers are agreed that onshore wind is good for Ireland. We have a natural competitive advantage in wind, which makes the electricity we produce from it cheaper than in most other places, with the possible exception of Costa Rica. We have ambitious and binding renewable and carbon emission targets agreed with the EU, and have the potential to meet them and avoid the penalties and carbon costs that would arise if we don't. If we so wish, we could considerably exceed those targets, even make ourselves energy independent with wind energy. Indeed, net export of renewable energy is becoming a widely acceptable goal.

The wind industry currently provides jobs in development and construction, as well as rural incomes. A fast growing wind sector could create considerable employment in the supply of services and the production of equipment, possibly even wind turbine manufacture and assembly. Wind generation reduces our energy imports and helps our balance of payments. It is a sector that can help reflate our ailing economy, where jobs are so desperately needed right now.

So this author and most other industry participants find it very difficult to understand why the Government and the Regulators have in effect decided between them to collapse of the whole sector.

Sadly, this fits a pattern of Government encouraging development in the various renewable sectors, such as onshore wind, offshore wind, wave and tidal and biofuels, only to turn round sometime later and reverse the supports and collapse the sector. It is not clear how Government expects anyone to take them seriously when they point in the direction of a new activity, such as electric vehicles, smart grid, energy efficiency and so on. To twist a well-worn phrase, Government seems to be saying: "Yes, we can't".

Curtailement

Curtailement means reducing the output of wind-farms because the transmission system (in the widest sense) has not been properly developed to cater for the growth of the sector, despite our binding renewable targets and an admirable 2008 strategic plan for the grid, called Grid25. Under the rules agreed by the All-island Regulators, Eirgrid started to impose curtailement last year. While projects with so-called 'firm access' receive the wholesale market price (SMP) for such lost output, they do not receive the price support under the Government's so-called 'REFIT' scheme, which is vital for projects' development and survival. The decision not to pay the REFIT for either constraint¹ or curtailement² lies with the Department of Communications, Energy and Natural Resources (DCENR), the Minister for CENR, Pat Rabbitte, and ultimately the Government itself. Thus it is

¹ reduction in output due to local grid bottlenecks

² reduction in output for national system reasons (like too much generation), but not really 100% distinguishable from constraint

Government that is the author of the current hiatus in the renewables sector, contrary to its own advocated position.

A rough estimate would suggest that curtailment could have cost the sector up to €2m already in 2011. Going forward the impacts will grow in an uncertain way to maybe €20m or €30m per year, to the point where projects simply cannot build and the industry stops. The uncertainty itself is as bad as the loss from a banking point of view. If we are to meet our various targets in this situation, then a much more expensive solution will have to be implemented in due course. If we fail, we will have to pay whatever it would have cost to do the job correctly in the first place, but without any of the benefits, which defies all logic.

Regulatory uncertainty

Curtailment has been a *Sword of Damocles*, hanging over the wind industry since the CER's grid moratorium of December 2003. On the 11th of February 2008, soon after the creation of the Single Electricity Market on this island (in November 2007), the SEM Committee (which is formed by the two Regulators - CER in the South and The Utility Regulator in the North) started consulting on the treatment of wind. Ever since then, the threat of curtailment without compensation has existed, and has undermined the whole development of the wind sector.

After almost exactly 4 years of this uncertainty, the final straw came before Christmas. The SEM Committee (SEMC) decision on 'tie breaks'³ of Dec 21st last⁴ has now crystallized the problem of curtailment.

In essence, the SEMC has decided which projects will be made unviable and therefore unbankable by virtue of losses of output and revenue due to unquantified and uncompensated curtailment. Within the limitations imposed by the Department's policy, the SEMC had to choose between:

- a) sharing the pain equally among all wind projects, including those already built ('pro-rata'), which would have compromised existing projects and indeed new ones, because future increased levels of curtailment would have affected them later, or,
- b) an allocation system which would seek to protect existing projects and therefore load the losses onto new projects ('grandfathering'), which would stop the development and growth of the industry in its tracks.

To protect existing projects, the SEMC opted for b), though in truth, because of the manner of its implementation, many existing projects will be affected anyway. So we have the worst of both worlds, in that existing projects will be compromised and new projects simply can't build. So, while the regulatory uncertainty has now been removed, we are left with the uncertain levels of curtailment and how that will affect all projects, as we shall see.

It is worth noting that the Gate 3 grid deposits should be due towards the end of this year, and it is not clear how any project can finance such massive deposits in

³ sharing losses between nominally similar projects with some form of rule set

⁴ SEM-11-105, 21st December 2011,
http://www.allislandproject.org/en/renewable_current_consultations.aspx?article=baec321e-5542-44d9-8fb2-491ffab7972&mode=author

these circumstances, so we face the risk of having Gate 3 go over the cliff. Turning to Gate 4 as a solution, while these issues are not addressed, will not address the problem at all, and may be even worse, due to even greater uncertainty on planning and grid development after Gate 3.

Non-firm access as a proxy

Most projects face local bottlenecks in the grid, often due to unforeseen events like breakdowns, and are 'constrained' as a result. 'Firm access' is granted when the TSO believes that the grid has been suitably reinforced to cope with the output of their project under most contingencies. After projects achieve firm access, they are paid the market price (SMP) if they are scheduled to run but subsequently constrained. Projects can elect to connect before they are declared firm, but during that period, called 'non-firm', they receive no compensation of any kind and have to absorb all losses.

Curtailment is similar, but arises for system wide reasons, like having too much wind and not enough demand, or grid stability issues apparently limiting the amount of wind to 50% of demand at any time (as at present).

The Transmission System Operator (or TSO), Eirgrid, has many difficulties in implementing any rule for sharing of losses (tie-breaks) other than simple sharing equally between all projects (pro-rata). A crude and complex proxy has been designed for grandfathering constraint, in cooperation with the wind industry.

However, the choice of 'firm'/'non-firm' access as the proxy for grandfathering curtailment, without any proper consultation on the consequences, is extraordinary. That is especially so as curtailment and non-firm access generally have nothing to do with one another.

The result is that any non-firm project, whether existing or proposed is faced with huge uncompensated curtailment⁵. Existing non-firm projects are likely to go into default, while new projects will simply not build under non-firm. Consequently, new projects will only be able to build with firm access, which effectively removes the option of non-firm completely from now on⁶. This is a curious and rather unexpected result, which surely indicates that something was wrong in the consultation and decision process. With such serious implications, the decision truly required the preparation of a Regulatory Impact Analysis.

Furthermore, if so few non-firm projects will be around to absorb the losses, then most curtailment will fall on firm projects, on top of their constraints, making a mockery of the idea of being firm. In that case, almost all losses will be shared equally between firm projects; in other words it will trend towards a pro-rata allocation, which seems odd, since the aim was grandfathering.

SEM Decision undermines its own objectives

The decision states that it aims to protect existing projects. It most certainly does not, and will surely drive many, if not most, non-firm projects currently

⁵ Rory Mullan of IGS, Chair of the IWEA Grid Committee, estimates approx 15%, and 25% in 2020 for some classes of projects

⁶ curiously, the UK is going in the opposite direction by introduction non-firm access, but with the appropriate protections

connected into default with their banks. The decision states that it is designed to help in achieving national targets. By compromising existing projects and virtually halting any new development the decision, if it stands, actually copper fastens our failure to meet any future targets, either renewable or emissions. It leaves us in the arms of the fossil fuel industry, just as emerging conflict is about to play hell with oil prices, again.

Rationale?

In our current national receivership, it appears that official Ireland is overly focussed on short-term costs, regardless of the consequences, even if that actually causes dramatically increased costs. Apart from being hostages to the fossil fuel sector, no other explanation can go close to explaining the outright demolition of the wind sector.

The Public Service Obligation (PSO) for energy is used to channel funds from our electricity bills to targeted projects within the energy sector. The total is about €92m for 2011-12, including a correction for the previous year. This year, five fossil plants - three peat-fired plants and two gas-fired plants - will receive €71m between them, while renewables will receive round €35m. Curtailment means that this €35m figure will be reduced quite a bit, firstly through reduced wind output, secondly through increased market prices (because of less 'merit order effect' of wind, a point to be developed later) and thirdly because of delayed or cancelled projects. Curtailment will not compromise fossil plant at all, and may indeed cause an increase in their output and more supports to them (one of those hidden costs).

In addition, a further €180m per year is spent on what are mysteriously called 'imperfection charges'. These include the cost of dispatch changes due to prediction errors, constraint payments (mostly to fossil plant), reserve costs (for fossil standby plant to cope with fossil plant breakdowns) and various other costs. Of this total, only €11m can be laid at the door of wind, and only then because the time over which wind has to be predicted is too long (24 hours) in the SEM market design.

In summary then, some €300m a year of consumers' money is being spent on supports and imperfections, only some €46m of which goes to renewables. So the rest is obviously focused on fossil plant. How come supporting imported and filthy fuel is not a cost problem, while doing what is necessary to meet renewables targets using secure, indigenous, clean energy sources is?

One answer we often hear is that it is not possible to pay supports when generators don't run. Apparently, it needs to be pointed out to these commentators that fossil plants get paid not to run when they are scheduled to operate but there are bottlenecks in the grid (eg: the two brand new ESB and Bord Gáis gas-fired stations behind the Knockraha grid bottleneck in Cork). Apparently that isn't a problem.

As stated at the start, this author is unable to get this sorted out, but could be forgiven for thinking that a certain pattern is emerging.

Merit order effect

Yes, it gets worse. Since wind has high capital cost but no fuel cost, it has a very low operating cost (not quite zero). So it has a natural tendency to bring down

the wholesale market price when it runs. Simply put, it pushes out more expensive plant. This benefits consumers, and the effect is widely understood internationally and known as the 'merit order effect'.

SEAI and Eirgrid⁷ showed that the total PSO cost of wind was offset by these reductions in wholesale market prices. In other words, the bit in the PSO charge on the electricity bill for renewables is completely cancelled by a corresponding reduction in the cost of the electricity itself, but of course this is not shown to consumers on their bills.

IWEA asked Redpoint⁸ to model this effect out to 2020. That study showed a net benefit to consumers in Ireland of anywhere between €100m and €280m. In other words, the PSO charge for renewables would then be considerably less than the reduction in the cost of the energy on the bill (some €30-50 annually for each consumer). In fact the total cash benefit in 2020 would most likely exceed all possible costs, ignoring all other benefits like achieving renewable and emission targets (and avoiding costs otherwise), and security of energy supply, jobs, rural incomes and so on.

Solutions

Arguing over which windfarms should take the losses is a fruitless debate, imposed on the wind sector so as to avoid the real issue. Legal obligations under the EU's Renewables Directive require the grid to be developed to transmit renewable energy. Belatedly, this has been planned, but to date it has not been achieved. It may indeed be cheaper to compensate projects for the full value of their lost output instead of developing storage and other means to fully guarantee the transmission of renewable electricity. However, this trade off is not being undertaken. Renewables are simply being turned off and now put out of business.

Any realistic solution involves restoring the revenue stream of wind projects, because otherwise they cannot be financed and built. Three possible options suggest themselves:

- a) paying REFIT support on the output of projects as if they hadn't been turned off (ie: based on their 'availability', not their metered output);
- b) paying the same amount from SEM funds for 'services provided', or from Eirgrid's revenue (because they are supposed to have developed the grid);
- c) increasing the REFIT price by at least the same proportion as the maximum curtailment, and seeking a new state aids clearance from Bruxelles.

None of these options is easy or attractive.

- a) this is a proposal on the table in the Market Review in the UK (and therefore

⁷ SEAI and Eirgrid, February 2011,
http://www.seai.ie/Publications/Statistics_Publications/Energy_Modelling_Group/Impact_of_Wind_Generation_on_Wholesale_Elec_Costs/Impact_of_Wind_Generation_on_Wholesale_Electricity_Costs_in_2011.pdf

⁸ Irish Wind Energy Association, February 2011,
http://www.iwea.com/contentFiles/Documents%20for%20Download/Publications/News%20Items/Impact_of_Wind_on_Electricity_Prices.pdf?uid=1298912434703

Northern Ireland); it involves higher PSO costs to cover electricity not produced, which seems like a hard sell (though apparently it isn't for fossil fuels as discussed); importantly, it would only restore projects to what they were originally expected to receive, and what was approved by Bruxelles, and doesn't involve any extra payment as such; it reduces risk in the eyes of financiers, and therefore financing costs, a key point when considering the economic cost of support and the level of REFIT; it would preferably be associated with a pro-rata system of tie breaks to spread the cost and the compensation, so as to minimize the negative impressions caused by newer projects receiving much higher supports (apparently) not to generate; even those higher but foreseen costs are offset by the merit order effect, and increasingly so; this option could be handled under the existing REFIT terms and conditions and state aids clearance, by interpreting the quantity in the Power Purchase Agreement as available output, or by setting that quantity as a fixed amount of energy per year based on wind forecasting;

b) requires a very difficult All-island SEM Committee decision to allocate funds from the market, for example through so-called 'Ancillary Services' payments; or a CER decision to extract the funds from Eirgrid as a sort of penalty for not developing the grid; however, Eirgrid is not master of its own destiny, as CER controls its expenditure, so that could be a knotty problem; and since these decisions could be altered subsequently, it probably wouldn't provide the certainty that financiers are seeking, unless they are directly linked to curtailment losses (and maybe grid code compliance) and contractually committed to for 15 years;

c) it has taken 2 years to get the REFIT II scheme through Bruxelles, and there is no appetite for either increasing the price or making a new application and delaying Gate 3 as a result; however, if the current decision stands, Gate 3 is now delayed anyway, if not cancelled; while this would increase cover for banking purposes, the actual project revenue stream would still be uncertain and more expensive to finance.

Conclusions

1. Windpower provides serious benefits to our society, such as meeting binding renewable and emission targets, and avoiding the heavy cost of failing to do so, securing energy supplies in an increasingly unstable environment for fossil fuels (where there is in any case long term decline due to peak oil and gas), reducing costs to consumers, even after all costs are paid, in particular due to its low production cost in Ireland, provision of employment, rural incomes and economic stimulus, reduction in the balance of payments, and indeed potential to reverse the energy balance of payments to a large net export of energy (possible annual shift of €16bn); and yet all of this is at risk due to an unwillingness to secure project revenues at a cost of some €2-3m now, and €20-30m per year in 2020!

2. The SEM decision on tie-breaks is internally contradictory, counterproductive and was subject to a seriously flawed consultation process. It will need to be reopened, and should include a Regulatory Impact Analysis. Otherwise, as existing non-firm projects approach default, the existing decision will inevitably be challenged as retrospective revision of contractual terms, and a breach of the EU Renewables Directive. So it will not survive and must be withdrawn immediately.

3. Several solutions present themselves, none of which is easy or palatable. Our nearest neighbours had previously covered the cost of non-firm constraint under 'Connect and manage'; they are now proposing to simply pay the support on the

available output of wind projects, just as IWEA and MnaG have proposed here for years already. That is the cheapest way of reaching targets. It does have a negative side, in that projects would appear to be paid not to produce, whereas in fact they are being paid what they need to be financed with minimum uncertainty (to ensure financing and keep those financing costs down). In any case, their revenue stream is just being restored to where it should have been under the REFIT scheme and the state aids clearance. And in any case they provide far more in cash benefits than the total costs, never mind non-cash benefits.

4. The other options include either complex and difficult Regulatory decisions, most likely yielding an uncertain unbankable revenue stream, or a fresh state aids approval, causing REFIT to be less economically efficient, while leaving large scale uncertainty and higher financing costs.

5. However, by combining a) and b) we may have the essence of a workable solution. If 'Ancillary Service' payments from the SEM could be structured to guarantee cover of the curtailment losses for 15 years contractually, and only be reduced for lack of Ancillary Service performance (non-compliance with the agreed grid code), then we would avoid the painful and fruitless argument about consumers paying for output not produced. In the short term, until such an Ancillary Services type solution has been approved by the Regulators, the curtailment losses (currently €2-3m per year only) could be covered by payment of REFIT on availability as discussed.

6. However, a key point for the 'availability' solution is that it would preferably be associated with a pro-rata system of tie breaks, to spread the cost and the compensation, so as to minimize the negative impressions caused by newer projects apparently receiving much higher supports not to generate.

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