Connection Offer Policy and Process Paper (COPP)

Update on Installed Plant
13/08/2013

Introduction:

The Connection Offer Policy and Process (COPP) paper jointly proposed by the DSO and TSO (SOs), formed the basis of a 2010 CER consultation process (CER 10/237), in relation to same, setting out a number of connection application related rules to provide greater clarity, transparency and flexibility to the industry..The paper included a proposal that developers, typically of wind farms, could install capacity above MEC up to a set limit. The CER published its COPP decision paper (CER/11/093) in May 2011. The decision paper was accompanied by a covering note setting out specific decisions by the CER including the quantum of an installed capacity cap to be set at 5% over MEC along with a 'nearest value turbine' addition. Since the decision the SEM market rules applicable to wind generation have been amended.

It is on foot of these changes that the CER has requested EirGrid and ESB Networks to consider if the installed capacity cap could be increased and any system matters that should be considered.

For clarity this assessment pertains to the installed capacity cap for wind farms only. An installed capacity cap for conventional plant is not relevant as per the SO comments in the original CER Decision paper[1].

'Installed Plant' is the defined term in the Grid Code that relates to the installed capacity at a facility. For clarity the use of the term installed capacity in this document and the COPP paper should be read as having the same meaning as Installed Plant as defined in the Grid Code.

Background:

There is a generally understood principle that the energy output from, and the resultant capacity factor of, a wind farm project will vary depending on a number of factors. Each site is made up of a number of different characteristics that can impact - positively or negatively - on a wind farm's actual power production; such as –

- the wind profile of the site
- the wind turbine layout
- the wind farm's site classification
- the chosen turbine's power curve relative to the site's wind profile
- the aspect of the site relative to prevailing wind
- nearby topography, and
- the presence/absence of neighbouring forestry

For practical purposes, it is appropriate for the SOs to take an average position in relation to these factors. Thus, it is reasonable to assume that an increase in the installed capacity of a generation facility will result in an increase in both the total energy produced and the capacity factor. While such increases can be of benefit to a particular projects and perhaps the market overall it could also impact negatively on other parties.

[1] http://www.cer.ie/GetAttachment.aspx?id=7f8520ff-138d-418f-8ef5-12169927fd6d

A number of inputs are made in the planning and operation of any power system some of which are more variable than others. In the context of the previously consulted COPP paper, the SOs drew attention to one such input – installed capacity which can be easily verified and regulated. As such it is worthwhile considering whether unhindered installation of capacity above MEC should be allowed as it has the potential to negatively impact other customers.

Considerations:

There are a number of considerations that were deliberated on as part of the original consultation. It is not intended that these would be fully revisited again but rather are included here, in a summarized fashion, to provide context of a potential change in approach further on in the paper.

1. Planning the Power System.

EirGrid carries out transmission network development planning using MEC values to provide local access for each wind farm. However, when considering the planning needs of larger areas of the network, EirGrid takes a wider view of the power flows resulting from the aggregate production of all wind farms in an area with the objective that the optimum network is put in place to transport the output of all wind farms to end customers. If more wind generation capacity is installed than is planned for this, in theory, could result in sub-optimal development of the transmission network. This is turn could lead to an increase in the constraint quantities on the network, with associated impacts on constraint costs. The potential for sub optimal development to arise increases the later in a project's development that EirGrid are made aware of the intent to over install capacity.[2]

The SOs acknowledge and agree with the Industry comments that not all developers are likely to over-install and in some cases they may under-install. It is difficult to pick a level of over-installation which would not have a material impact on the design of the Transmission System in all cases. However, it is the SOs opinion that allowing up to 20% over-capacity should not require material additional grid investment, assuming there is strict adherence to the actual energy output, which at all times would be limited to the contracted MEC.

This assessment is, however, contingent on the basis that customers ensure that the information contained in the connection agreement/application accurately reflects the actual installed capacity and where a customer intends to add additional capacity at a site this would be subject to the connection agreement modification process i.e. customer confirm their intention to over install capacity at least a year prior to connection in accordance with the terms of their contract. The potential change in fault currents (short circuits) and other system impacts such as harmonic distortion due to different machines and/or installed capacity would also need to be assessed. Such assessments may identify unexpected additional works from those which were originally associated with a project In addition, fault current and harmonic distortion issues are not solely attributable to

[2] At present generator's are largely required to provide final plant details at a minimum 12 months in advance of energisation

any one applicant and as such other applicant in the same area as the party seeking to over install capacity may be impacted. It is expected that such works would only be associated with the applicants requesting the change and not other applicants in the same area that have already been processed.

2. Constraints/curtailment

As stated above the network is designed on the basis of MEC. If more capacity is installed than is planned for, this may result in an increase in constraint and/or curtailment quantities and an associated increase in constraint and/or curtailment costs. It is also worth noting that in accordance with the SEM committee decision on tie-breaks (decision post dated COPP) the units that will be constrained are not necessarily the ones that have over-installed. For example, a fully firm wind farm could install additional capacity yet it may be a neighboring partially firm wind farm that sees the additional increase in constraints.

The materiality of this issue has however changed somewhat with subsequent decisions on tie-break in dispatch. Curtailment is probably the most significant aspect to consider in terms of reductions in output. As there is a decision that curtailment will not be paid for by the market from 2018, over-installation should have no impact on the end user in terms of increased costs after that. So it falls back onto the generators themselves who, as part of the original COPP consultation, appeared to indicate that they have no difficulty with accepting potential increased levels of curtailment associated with over-installation. In considering any potential impact up to 2018 it is worth taking into account the anticipated build rate for Gate 3 projects and the number that are expected to be completed prior to 2018. Therefore,; a view could be taken that, based on these considerations, the likely cost of curtailment up to 2018 due to over-installation may not be material.

The levels of constraint that are associated with Gate 3 are very low (assuming that the required infrastructure is delivered in accordance with assumed lead-times). Furthermore it is expected that the increased constraint levels and costs for over installing to a 120% maximum would be low and not material. While overall levels of constraints are low, there are areas that may experience higher levels of constraint temporarily if generators connect before deep reinforcements e.g. in Constraint Groups. However, this is temporary until transmission reinforcements relieve congestions.

For clarity, the Incremental Transfer Capability model used by EirGrid in assessing scheduled firm access quantities was run on the basis of Maximum Export Capacity. Installed Plant was not an input for that model so changes made to Installed Plant will not change the scheduled firm access quantities derived from the model. This does not preclude that there may be changes as to how the model is run in the future.

3. **REFIT payments**

The potential implications on REFIT from a change in the policy on over installation of capacity for wind farms are matters for CER and the Department (DCENR). The SOs understand that the current policy is to install sufficient wind farms to meet the Government's 2020 40% Renewables target. There are Public

Service Obligation costs associated with installing capacity in excess of that which is required to meet these targets. Further it is the SOs understanding that entry into REFIT is based on MEC with a margin for associated over installation per the COPP ruleset and as such it should be considered (by the appropriate parties) if payout is based on energy whether there could be a mismatch between budgeted payout and actual payout under REFIT depending on the allowed installed capacity.

4. **Renewable Targets and Existing Queue**

The outcome of the decision on installed capacity could have an impact on the likely available capacity for the many applicants waiting for their applications to be processed the post Gate 3. We understand that the CER's decision of the size of Gate 3 was in a large part due to the 40% Government renewables target which comes from the output from renewable generation. If this was to be used to determine a future Gate size then allowing parties from existing gates to install increased capacity will perhaps reduce the available quantity for the next Gate

However allowing increased over installation of capacity should mean that renewable targets are reached quicker and may in some cases result in better utilisation of the transmission network by offsetting any reduced uptake of connection offers.

Categories of Connections

The SOs would request clarity as to what extent any over-installation should be allowed for different categories of applicants.

- *Contracted (not connected) and live connection offers:* The existing 105% rule applies and subject to the notes above it is assumed any new cap would be applied to these customers. This category equates to approximately 5000MW
- *Connected Generators:* There are approximately 1600MW of wind farm capacity connected which relates to MEC. Approximately 80-90% of this has not over installed to any appreciable amount. Therefore there could in theory be 250-280MW of additional capacity installed if these were also allowed to over-install by 20%. This is however only the case if everyone avails of the full over installation.
- *Applications in the Queue:* It is assumed that the any new cap would be considered as part of a future Gate process.
- *Repowering applicants:* There was less than 200MW installed by 2003. Assuming that the standard lifetime of a project is 20 years then it is not expected that there would be a large number of repowerings requested until post 2023.

It is worth noting that one of the main industry reasons for raising the cap appears to have been the mismatch between the timing of planning permissions and connection offers, and the turbine technology changes in the meantime. Therefore, if that is the primary concern, it is questionable whether over-installation should be available retrospectively to wind farms already connected.

Nearest Value Rule

In the current ruleset there is an allowance for generators to over install up to the 'nearest value' of wind turbine. If the overall limit is to be increased to 120% of MEC then it is questionable whether a 'nearest value' approach is required other than for smaller applicants e.g. less than 5MW.

Phases and Extensions

For phased connections or extensions to wind farms it is proposed that the allowable installed capacity shall be applied to the MEC that is contracted by an applicant at a specific point in time. An example being that if a customer has a contract to connect two phases of a project - 30MW in 2015 and an additional 40MW in 2017 (70MW total) the maximum installed plant that would be allowable based on a 120% rule would be 36MW in 2015 which could be increased up to 84MW in 2017

Conclusion:

There are two primary considerations for the SOs should customers seek to install plant capacity above a project's MEC.

The first one relates to the design and reinforcement of the transmission system. However, EirGrid would note that it is largely comfortable that an increase of up to 20% above MEC should not have a material impact on same due to the meshed and extensive nature of the transmission system. This of course assumes that the relevant notice period and process is followed.

The second consideration relates to the impact on the electricity end-user costs. However, given the clarification in market rules regarding compensation for curtailment from 2018 the end-user should not be affected to any material degree and as outlined above taking into account likely build out rates in Gate 3 and network roll out it would not be unreasonable to take a view curtailment costs up to 2018 would not be material.

There may be other considerations relating to connected or connecting parties, REFIT payments, etc however it is assumed the views of the relevant parties will be established as part of the consultation process.