



## GATE 3 FREQUENTLY ASKED QUESTIONS

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### Section 3 – Firm Access Quantities and Associated Transmission Reinforcements

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1. **What does the term Firm Access Quantity or 'FAQ' mean?**

The level of firm financial access available in the transmission network for a generator is that generator's Firm Access Quantity or 'FAQ'. Firm financial access means that if a generator is constrained on or off, it is eligible for compensation in the manner set out in the Trading & Settlement Code.

2. **I own or am planning to develop a wind farm – how does Firm Access relate to wind farms specifically?**

Firm Access is primarily related to receiving compensation payments when dispatched down. When your wind generation unit is dispatched down by the System Operator (EirGrid or SONI) you may be entitled to compensation for lost output by the Market Operator (SEM-O) but this depends on a number of factors such as the controllability of the unit and its Firm Access Quantity (FAQ). If the unit is eligible but has no firm access then you will receive no compensation for lost output. If the unit is eligible and fully firm then you will receive compensation for all of your lost output at the system marginal price. If your unit is eligible and has partial firm access you will be compensated up to the firm access level.

Developers who enter into Power Purchase Agreements instead of registering directly in SEM are usually paid by their supplier based on their output and do not normally receive payments from their supplier when constrained or curtailed down. For these developers the primary benefit of having Firm Access is that it may strengthen their negotiation power when entering into a PPA.

Under the [SEM-11-105 Decision on Treatment of Tie Breaks in Dispatch](#), Firm Access now has an impact beyond that of paying compensation. If there is a constraint on the system in one of the two specified constraint groups, the North West and South West, and the Transmission System Operator needs to dispatch units to resolve the constraint, units will be dispatched in the order of Non-Firm ahead of Firm. This means that non-firm units in these areas are likely to see higher levels of constraint than firm or partially firm units.

Under the [SEM Decision, Treatment of Curtailment in Tie Break Situations, \(SEM-13-010\)](#), there will be pro-rata treatment of all windfarms (firm and non-firm) in dispatch for the purposes of curtailment. On the market side, there will no longer be payments for curtailment in tie-break situations after 1 January 2018.

### **3. How are Firm Access Quantities calculated?**

EirGrid uses a computer program, called the ITC (Incremental Transfer Capability) Program, to calculate Firm Access Quantities. The ITC Program has been used for several years for the opportunity analysis for new demand and generation for the *Transmission Forecast Statement*.

Generators are tested by the ITC Program in chronologically ascending date order based on their application receipt date until firm access for the generator's full MEC (Maximum Export Capacity) is achieved. At the end of each year an agreed programme of up-grade works is added to the network models to reflect the on-going development of the transmission system. This takes account of the proposed developments outlined in Grid25 – EirGrid's strategy for the development of Ireland's electricity grid over the period to 2025.

The available firm capacity for a given year is calculated for each generator for three study seasons: maximum electricity demand in summer, maximum electricity demand in winter and minimum electricity demand in summer. For each of these study seasons, a number of credible dispatch scenarios are considered. For each calculation the ITC Program iteratively finds the point at which the generator causes a thermal overload on the transmission system. The output of the generator at the point of the thermal overload is the available firm capacity for a given scenario. The worst case available firm capacity for each season and dispatch scenario is taken as the available firm capacity for that year.

Connected and committed generation, both conventional and renewable, processed prior to the generator's relevant Gate are assumed to have rights to any firm transmission capacity on the network ahead of the generator and this is reflected in the network models used for the FAQ analysis. For example, Gate 1 and Gate 2 projects are already in the study case for Gate 3 generators' FAQ analysis.

### **4. Where are the Firm Access Quantities Results published?**

To date, EirGrid has carried out Firm Access analysis for Gate 1, Gate 2, Gate 3 and non-GPA projects as directed by the Commission for Energy Regulation. The most recent set of results available are located at the following links:

[Results from EirGrid FAQ Analysis for Gate 1 published 21st December 2012](#)

[Results from EirGrid FAQ Analysis for Gate 2 published 21st December 2012](#)

[Results from EirGrid FAQ Analysis for Gate 3 published 21st December 2012](#)

**5. Does the Transmission System Operator (TSO) allocate Firm Access to all Generators?**

Yes. Under the Connection Offer Process for Generators, Firm Access is provided by the Transmission System Operator (TSO) to each Generator that connects a Unit or Units directly to the Transmission System or indirectly connects through the Distribution System.

**6. Can I connect to the system without having Firm Access?**

Yes. A generator can connect without having firm access to the system provided the relevant control mechanisms are in place and the necessary shallow and short circuits works have been completed.

**7. How do I get Firm Access to the system?**

You get Firm Access to the system when your Associated Transmission Reinforcements (ATRs) are completed assuming all other shallow and short circuit works are completed and the relevant Grid Code tests, have been passed.

**8. What are Associated Transmission Reinforcements or ATRs?**

Associated Transmission Reinforcements (ATRs) are all of the transmission reinforcements that must be completed in order for you to be allocated FAQ. ATRs include reinforcements such as line and busbar upratings, new stations and new lines.

**9. Why are there so many ATRs associated with my generator which has a relatively early application receipt date?**

Whilst a generator's position (in terms of application receipt date) relative to other generators within a Gate is a key factor in determining the scale and extent of ATRs, other factors include the location of that generator and the scale of connected/contracted

generation with prior access rights which materially impact on the FAQ dates for that generator.

**10. What if some of my ATRs are finished ahead of others, can I get partial firm access when this happens?**

Correspondence from the System Operators will clearly define what ATRs need to be completed in order to release an associated FAQ. The FAQ may be broken down into sub quantities each associated with a set of ATRs or may be released in one block. In order for an FAQ to be released, all ATRs associated with it must be completed. Any changes to the FAQ of a unit or the ATRs associated with the FAQ for a generator unit will be communicated in writing by the relevant System Operator.

**11. How does EirGrid factor in the shallow connection delivery timeline in its FAQ analysis?**

All shallow connection assets are assumed to be in the analysis models for all seasons and for all years of study. This ensures that the shallow connection asset lead-times do not bias the firm access quantities offered to individual applications.

For the Gate 3 FAQ analysis the Bellacorrick (Mayo) node (which involves 400kV shallow works) is treated slightly differently. For this node the availability of firm access is assessed against the existing 110kV network for the earlier study years, recognising the relatively long lead-time involved in delivering extra high voltage infrastructure.

**12. What are constraint reports and how are they related to Firm Access?**

The constraint reports will provide you with an estimate of the amount of time your unit is expected to be dispatched down each year. For those times when your unit is dispatched down you will receive compensation from the market if you have firm access. If you do not have firm access then you will not receive any compensation from the market for the lost energy.

**13. What are the key differences between FAQ analysis and Constraints modelling?**

For the FAQ analysis EirGrid identifies the currently available and expected firm transmission capacity available for a generator for every year until firm access for the generator's full MEC (Maximum Export Capacity) is achieved based on the planned transmission network rollout. Connected and committed generation, both conventional and renewable, processed prior to the generator's relevant Gate are assumed to have rights to any firm transmission capacity on the network ahead of the generator and this is reflected in the network models used for the FAQ analysis. For example, Gate 1 and Gate 2 projects are already in the study case for Gate 3 generators' FAQ analysis. The FAQ analysis in any

given year involves the assessment of the transmission network's firm access capability during three distinct load scenarios, winter peak, summer peak and summer valley.

In contrast, the constraints model uses the methodology of production cost modelling to assess the 'physical' levels of curtailment and transmission constraint that generators might expect to experience. For every hour of each study year, the model uses optimisation algorithms to commit and dispatch generators with the objective of minimising the cost of generating power to meet demand while satisfying all operational and security constraints. The commitment and dispatch is governed by a set of operational rules to ensure power system security as well as a set of dispatch principles. Reductions in wind generation output relative to the theoretical unconstrained wind energy available are split into reductions due to curtailment and reductions due to transmission constraint by a post-processing calculation. However, there are times when generation reduction at a node can be due to both curtailment and constraint. In this case, our methodology allocates reductions to constraint. As a result, a low reported level of transmission constraint for a node does not always mean that there are no network limitations affecting it, as output reductions may be masked by curtailment.

Additionally, the FAQ analysis assumes all generator shallow connections are completed from the start of the study whereas the constraints analysis uses assumed build-out rates for generators which are influenced by a number of factors including the nature and extent of Shallow Works, planning permission status etc.

Under the FAQ analysis firm capacity calculated by the ITC Program is allocated to generators based on application date-order. In contrast the methodology used in the constraints analysis effectively means that tie-break constraints outside a Constraint Group can be smoothed out across a number of generators on a pro-rata basis. For example, four 25 MW MEC wind farms located outside a Constraint Group and connected via a radial circuit into a transmission node with 50MW of firm capacity will share constraints but only two of the generators (those with the earliest application dates) will receive any FAQ i.e. 25MW each.

**14. I am a wind unit with a registered capacity smaller than 5MW – does firm access apply to me?**

Yes, firm access applies to all units connecting to the distribution and transmission system. However, units under 5MW connected to the distribution system are not required under the Distribution or Grid Codes to be controllable. These units are only dispatched down (by opening circuit breakers at the network connection point) after all other dispatchable units that can resolve the problem have been dispatched. Hence the consequences of being non-firm are therefore lessened for units under 5MW.

**15. Can everyone see my ATRs?**

No. ATRs for individual wind projects are not published. Each generator receives a list of the ATRs specific to their wind project. Gate 3 ATRs are being issued to customers with their constraint report.

**16. I saw a list of ATRs on your website. Are these my ATRs?**

No. The document on our website is a list of all the transmission reinforcements (and their assumed completion year) included in the study models used for the FAQ and Constraints analysis. An individual generator's ATRs will be a sub-set of these.

**17. What happens if one of my ATRs is delayed?**

You cannot receive an FAQ allocation until all of the ATRs associated with that FAQ are completed hence if one of the reinforcements is delayed then your firm access is delayed.

**18. But you published a schedule of Firm Access Quantities. Is this not fixed?**

No. These are 'Scheduled Firm Access Quantities' and are based on assumed completion Dates for transmission reinforcements. Firm access is obtained upon the actual completion of your ATRs which may be before or after the assumed date.

**19. What happens when I receive an FAQ allocation or an increase in my FAQ allocation?**

When you receive an FAQ allocation or an increase in FAQ allocation you will be notified by the TSO or DSO depending on whether you have a Transmission or Distribution Connection Agreement. It is your responsibility to notify SEM-O of any FAQ change that affects a Unit under this Connection Agreement, in accordance with Clause 2.69 of the Trading & Settlement Code.

**20. Why did EirGrid re-study FAQ forecasts for Gate 3? I was happy with the forecasts published in 2010.**

FAQs are a key input to the Gate 3 Constraints Analysis due to be completed during 2013. Given that a number of the assumptions underpinning the original FAQ analysis have changed, it was considered appropriate to re-study these FAQ forecasts. The changes in assumptions include:

- the completion dates for some transmission reinforcements;
- future system demand levels;
- not all of the generation projects included in the original analysis remain in Gate 3; and

- EirGrid's network development plans have been further optimised.

In addition EirGrid has made a number of improvements to its FAQ and ATR analysis methodology.

## **21. What improvements have been made to the FAQ and ATR analysis methodology?**

The dispatch scenarios used to determine FAQs and ATRs were modified to better reflect our experience of the likely running regime of generators and the probability of particular units running together particularly following the publication by the SEM Committee of its decision in respect of the treatment of plant with Priority Dispatch (SEM-11-062). The dispatch scenario modifications aim to, as much as possible, identify meaningful network constraints associated with generators. This is achieved by reducing the level of conventional dispatchable plant required to meet system demand during high wind scenarios, reflecting the priority dispatch classification afforded to wind generation and the large volume of wind generation either connected, contracted to connect, or with live connection offers. More specifically, the generation dispatches used to assess wind generator FAQs during the summer valley demand scenario include dispatchable generators required for system integrity plus those deemed unlikely to be re-scheduled or de-committed in situations of network congestion operating at minimum load, while the dispatches used to assess wind generator FAQs during the summer and winter peak demand scenarios include dispatchable generators assumed to be reasonably in merit during high wind conditions operating at full load plus those required for system integrity operating at minimum load.

Improvements were also made to the approach used to determine whether an overload of a network element should be associated with a generation project when testing that project for firm access or ATRs. In the past if the overload of a network element increased with the addition of the generation project under test the overload was considered to be associated with that generation project (and hence would limit FAQ and/or result in an ATR). In an effort to ensure the association of overloads with generation projects are as binding as possible the approach was amended to include an assessment of the overload to ensure the change in overload is sufficiently attributable to the generator under test. This involves ensuring the relationship between the change in loading on the overloaded element and the change in exported power from the test generator is both continuous (larger export, larger overload) and exceeds a sensitivity threshold.

## **22. What will these improvements mean for the provision of FAQ and scale and extent of ATRs?**

The revised dispatches, together with the improvements to the process and approach to determining ATRs means that in general binding ATRs (i.e. those transmission reinforcements that actually affect the export from a generator) are identified up front, thereby providing more certainty to developers at a much earlier stage than would be achievable using the traditional processes. Furthermore the changes will, in general, result in more FAQ being available for wind generation projects ahead of the completion of



network reinforcement projects and that firm access for a number of generators will be dependent on lower risk profile transmission reinforcements when compared to those derived from the original analysis. Additionally most applicants will have fewer ATRs than was previously the case.

**23. When does EirGrid envisage undertaking the next FAQ re-study for Gate 3 projects?**

The FAQ/ATR studies for Gate 3 are quite a significant undertaking and therefore should only be done where there is real value to be gained. It is anticipated that the only real value in doing a further restudy for Gate 3 is if capacity is either released by some Gate 3 projects not accepting their connection offers or other generator connection agreement terminations. Therefore the next re-study of FAQs for Gate 3 projects is not expected to be undertaken until at least the latter part of 2014 and only then if it is felt that real value will be gained from doing so.

**24. Can you explain how is the East West Interconnector treated in the Firm Access Quantities Analysis?**

The dispatch scenarios used to allocate firm access are designed to create credible power flows along identified transmission network corridors. They are designed such that the main transmission corridors out of a group processing area are tested by generally increasing particular generation in particular group processing areas (the set-point areas) and reducing generation in others (the back-off areas) to maintain generation / demand balance. This approach is implemented via the ITC Program which is a piece of software designed to test the capability of the transmission system to transfer power between areas.

The East-West Interconnector (EWIC) is considered "connected" and subject to dispatch in the dispatch scenarios used for the testing of Gate 3 generation projects. EWIC will be dispatched "On" (importing onto Irish System) when it is included in the relevant set-point areas of the transfer test. When EWIC is included in the relevant back-off or remote area EWIC will be included in the list of generators available to be dispatched to maintain generation / demand balance. As a result, EWIC may be utilised to export power to Great Britain if the quantity of generation increased in the set-point area exceeds the generation permitted to be reduced in the back-off area and hence would contribute to creating the transfer test.

Due to the network location of EWIC it is not included in the set point areas for most generation projects in Gate 3 as a large portion of the projects are in the group processing areas along the west of the country. As a result EWIC will not be dispatched "On" (importing to Irish System) during the dispatch tests for these generators. It may be dispatched to export to Great Britain if the generation increased in the set-point area exceeds the generation permitted to be reduced in the back-off area. Only the group processing areas G, J and H2 include tests where EWIC is considered in the set point area.

