

GATE 3 FREQUENTLY ASKED QUESTIONS

Section 1 - EirGrid Gate 3 Constraint Reports, Constraints and Curtailment

1. What are constraints and curtailments?

The terms 'curtailment' and 'constraint' are sometimes used interchangeably to refer to changes in the output of generators in order to maintain the operation of a safe, secure and reliable power system. However, for the purposes of this report, these terms are used to refer to changes in generator output under different specific circumstances.

EirGrid must dispatch generators in such a way as to provide a range of system services in order to operate a safe and secure electricity system. The types of system services required include the following:

- Frequency control,
- Provision of reserve,
- Voltage control,
- Load following,
- Ability to withstand disturbances,
- Inertia.

As these factors are not accounted for in the SEM, the system operators must deviate from the market schedule and change the output of generators in order to ensure that sufficient quantities of the system services outlined above are made available at all times. The real-time dispatch can change from the market schedule also because of demand and wind forecast errors and unexpected trippings of plants.

Most system services, such as frequency control and reserve, can be located anywhere on the transmission system. Voltage control is location specific for example. For the purposes of this report, we classify the changes in generator output, which are required by EirGrid for system reasons, as 'curtailment'. This can arise at times when wind generation levels are a high percentage of system demand as it may be necessary to reduce output from wind powered generators in order to retain the necessary amount of conventional generation online to provide all the system services required. At very high wind generation levels, further reduction in the output of wind powered generators may be required if wind generation levels exceed system demand or if asynchronous generation limits are exceeded. This reduction is also classified as 'curtailment' in this report.

The output of generators may also need to be changed from the market schedule due to transmission network limitations, specifically the overloading of transmission lines, cables and transformers. This can happen for an intact network but typically occurs for network contingencies. In other words, a line may become overloaded if another line were to trip. In order to avoid this contingency overload, generation is dispatched so that if the tripping were to occur there would not be any contingency overloads. Changes in generator output for this reason are referred to in this report as 'constraint'. The constraining of generation is location-specific and can be significantly reduced by transmission network reinforcements.

Some transmission constraints might only exist temporarily due to transmission lines being taken out of service for maintenance or uprating. The model accounts for N-1 contingencies which is the usual security criteria used for dispatching the power system. In other words the transmission system will be dispatched in such a way that any single contingency will not cause overloads.

While this report separately lists estimates for curtailment and constraint, 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. This is line with the principles outlined in recent SEMC decisions. More information on this is contained in the appendices. As the focus of this report is on levels of output reduction, the costs associated with constraints and curtailment is not covered in this report.

2. What is the background to the Gate 3 Constraint Reports and what is the difference between the Gate 3 constraints Reports and the PGOR reports that were issued in 2011?

The Commission for Energy Regulation (CER) direction CER/08/260 'Criteria for Gate 3 Renewable Generator Offers and Related Matters' instructed EirGrid to "issue estimates, generally with the offers, of the likely incidence of constraining off of the recipients' generation output from the date of commissioning of the generator until all necessary transmission reinforcement works are expected to be completed".

In the period since publication of the CER direction CER/08/260, the Single Electricity Market (SEM) Committee has been consulting on Principles of Scheduling and Dispatch including rules around tie-break situations. Decisions taken by the SEM Committee (SEMC) arising from this consultation have implications for how constraints modeling is done and thus on the accuracy of the results. The final SEMC decision on these matters have been accounted for in the models used to produce the Gate 3 Constraint Reports.

PGOR Reports were issued to Gate 3 applicants by EirGrid in 2011 as directed by the CER as an interim measure to provide information to customers prior to the final decision by the SEM Committee on tie breaks as referred to above. These reports were based on a set of dispatch assumptions that were agreed with the CER at the time.

3. When can I expect to receive my constraint report?

The constraints reports will be published by area. The constraints reports will be issued on or before the end date by which the offers are to be issued for that area. The end dates for offer issuance are as follows:

Area	Estimated Date Range for Issue	Estimated Date Range for Expiry
K	24 Apr – 3 May	4 Jul - 15 Jul
D	8 May- 31 May	17 Jul – 12 Aug
H2	8 May- 31 May	17 Jul – 12 Aug
H1	8 May- 31 May	17 Jul – 12 Aug
B	4 Jun – 28 June	13 Aug – 6 Sep
F	4 Jun – 28 June	13 Aug – 6 Sep
J	4 Jun – 28 June	13 Aug – 6 Sep
E	10 Jun – 5 Jul	19 Aug – 13 Sep
A	17 Jun – 12 Jul	26 Aug – 20 Sep
G	24 Jun – 12 Jul	2 Sep – 20 Sep
C	24 Jun – 12 Jul	2 Sep – 20 Sep
I	24 Jun – 12 Jul	2 Sep – 20 Sep
Non-Wind	1 Jul – 19 Jul	9 Sep – 27 Sep

Note that applicants will receive information on their Associated Transmission Reinforcements (ATRs) for your project along with your constraint report. See section 2 of this document for further information on ATRs.

Note that the area that each Gate 3 project is assigned to is noted in the [Gate 3 Node Assignment List](#).

4. When does the validity period for the Gate 3 Connection Offers commence?

As per the CER directions [CER/08/260](#) CER Direction on Criteria for Gate 3 Renewable Generator Offers and [CER/09/191](#) Direction on Conventional Offer Issuance Criteria and Matters Related to Gate 3, the duration of the validity period for Gate 3 Connection Offers is 50 business days. This period commences on receipt of your Constraints Report. If Gate 3 applicants do not sign their Gate 3 Connection Offer before this 50bd period is up, the offer

will expire. It is important to note that although applicants will receive information on ATRs with their Constraint Report, the ATRs are not connected to the validity period of Gate 3 Connection Offers.

5. What information will be contained in the constraint reports?

The main body of the report contains the results of the constraints modeling for each node in the area. Each node has been analysed for all four scenarios and the results are presented in both tabular and graphical format. The levels of both constraint and curtailment are detailed for each year from 2013 to 2022.

In addition to the results section as described above, the report also contains background and supporting information associated with the constraints modeling.

6. Will the report contain any information on energy payments associated with constraint and curtailment?

The constraint reports assess the 'physical' levels of curtailment and transmission constraint that generators might expect to experience in the period from 2011 through 2022.

Whether a generator is compensated for the curtailment/constraint and the amount of any such compensation is not examined in the reports.

7. Can you explain the difference between Constraints Reports and Firm Access Quantities?

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 different factors including 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 (not REFIT). If your unit is eligible and has partial firm access you will be compensated up to the firm access level.

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.

8. Do the Firm Access Quantities (FAQs) that are listed for my project impact on my constraints or curtailments?

No account of 'firm access' was taken in the dispatch process as per current dispatch practices and as per the dispatch principles as provided by the CER to EirGrid. However, pending the decision on the current CER consultation paper 'Principles of Dispatch and the Design of the Market Schedule in the Trading and Settlement Code', your Firm Access Quantities may impact on whether you are compensated for constraints and curtailments.

9. How accurate are the Constraints Reports Analysis and what are the risks associated with the results?

The actual levels of curtailment and constraint may vary from those forecast in this report as the analysis is based on a set of input assumptions such as the level of uptake of Gate 3, roll-out of transmission reinforcements, treatment of interconnection with Great Britain, fuel prices, demand growth, treatment of Northern Ireland generation and transmission etc. Also, assumptions are made with regard to operational rules such as limits on the instantaneous wind penetration, operating reserve requirements and minimum conventional generation requirements necessary to operate the power system with a large amount of variable generation. The draft operational rules employed in the analysis (detailed in the appendices) may differ from those actually employed in the future with a resulting impact on curtailment and constraint levels.

EirGrid has used a modelling tool called PROMOD IV, which is supplied and supported by Ventyx. This tool is widely used across the industry for unit commitment and production cost modelling. While EirGrid strives to ensure that the data in the model reflects the power system attributes and performance characteristics, there could be some modelling inaccuracies or simplifications that potentially will not reflect how the real-time power system will operate.

In addition to these variations, a significant risk factor relates to the build-out rate methodology assumed. The analysis has been carried out on the basis of feedback from industry and also based on standard leadtimes for shallow connections. Any changes to the generators' connection or any deviation from the assumed connection timelines could potentially impact on the level of transmission constraints stated in this report.

One potential risk that could influence results is how constraint groups develop over time. The proposed constraint groups were devised based on an assumed grid delivery schedule and assumed uptake of grid connection offers. If either of these assumptions were to materially change, then the constraint groups could alter from the ones currently proposed. Another risk is how potential interconnector flows in reality will differ from those modelled. The model used for these reports assumed that wind would be exported to help avoid curtailment. Export flow figures have been provided in the report to allow readers to see how much energy has been exported on the interconnectors.

Scheduled transmission maintenance is not modelled and is not expected to materially affect results especially when considered over the entire horizon of the study period. It is possible though that extended outages of transmission plant could increase constraints in parts of the network for their duration.

Section 2 – Firm Access Quantities

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. 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 measures the amount of extra electricity that the transmission system is capable of transmitting from the generator under test to electricity users. It identifies available generation capacity and allocates it to generators on a date-order basis.

The available firm capacity 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 computer 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.

The ITC Program examines each generator for each year from the current year until the year that 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 Grid 25 – EirGrid's strategy for the development of Ireland's electricity grid over the period to 2025. The reinforcements that are required to connect renewable generation are prioritised as much as is practically possible in order to connect renewable generation as quickly as possible.

3. 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.

4. How are the timelines for transmission reinforcements that are included in the ITC Program determined?

The ITC Program's first study year includes those reinforcements that are actively being progressed. For the subsequent study years reinforcements are prioritised on the basis of attempting to relieve the largest "bottlenecks" first. This approach is designed to provide as much firm access as quickly as possible. The timelines used take account of certain practical

considerations such as ability to obtain outages and sustainable capital spend. The new-build reinforcements (i.e. new transmission circuits, transformers, reactive support devices, stations, etc.) that are actively being progressed are added to the ITC Program models according to their current expected completion dates, while the dates for those not yet actively being progressed are based on standard lead-times. Again, certain practical considerations are borne in mind, for example sustainable capital spend, in deriving these timelines.

5. I own or am planning to develop a wind farm - what does Firm Access mean to me?

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.

6. 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.

7. 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.

8. How do I get Firm Access to the system?

You get Firm Access to the system when your associated transmission reinforcements are completed assuming all other shallow and short circuit works are completed and the relevant Grid Code tests, have been passed.

9. What are Associated Transmission Reinforcements?

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.

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

It is generally not possible to disaggregate access and link it to the completion of individual transmission reinforcements. It may occur that when a group of reinforcements get completed, these taken together alleviate a bottleneck on the system and partial firm access can be released upon their completion. If this is the case, you will be able to see partial access assigned to your project in the FAQ publication on the EirGrid website. Furthermore, the TSO or DSO (depending on whether you have a Transmission or Distribution Connection Agreement) will issue you with a list of all ATRs required to give you firm access and this will show, if relevant, which specific reinforcements must be completed in order to get partial access.

11. 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.

12. 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.

Section 3 – Associated Transmission Reinforcements

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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.

2. 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.

3. I saw a list of ATRs on your website. Are these not my ATRs?

No. The list on our website is a list of all transmission reinforcements associated with Generator projects and their scheduled completion date. Each individual wind project will be associated with a sub-set of these.

4. What happens if one of my ATRs is delayed?

You cannot receive access until all of the ATRs required to give you access are completed hence if one of the reinforcements is delayed then your access is delayed.

5. 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. Access is obtained upon the actual completion of your ATRs which may be before or after the assumed date.

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

7.

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.

8. 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 is 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 analysis methodology.

9. Why can't I receive Firm Access if an ATR is delayed due to no fault of my own?

Given the scale of work involved unfortunately it is impractical to systematically assess the firm access impact for generators each and every time an ATR is delayed. EirGrid intends to re-study forecast FAQs on a periodic basis. The frequency of this will depend on a number of factors, including the scale of change in ATR forecast completion dates and whether capacity has been released back into the system by virtue of unaccepted connection offers or connection agreement terminations.

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

A further re-study of FAQs for Gate 3 projects is not expected to be undertaken until there is clarity on the final take-up of Gate 3 connection offers – which is currently expected to be end 2013.