Firm Access 2024 Review Report

Final Technical Report

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EirGrid

The Oval, 160 Shelbourne Road, Ballsbridge, Dublin D04 FW28
Telephone: +353 1 677 1700 | www.eirgrid.ie

Contents

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Executive Summary

This report forms the basis of the CRU requested 2024 firm access review. Based on the CRU direction (CRU/2023114[1]), the 2024 firm access review considers all contracted non-firm generation that executed their connection agreements by 13 November 2023.

The committed non-firm generators were analysed in line with the approved methodology and three types of firmness outcomes were determined;

- Full/Partial firm access available immediately upon completion of connection works.
- Full/Partial firm access available following completion of a committed project(s) from the list in Network Delivery Portfolio (NDP)[2].
- No firm access available, project will remain non-firm and will be re-assessed in subsequent firm access runs.

A key assumption for the analysis is that generators with an existing firm access position will not be disadvantaged by the new review. For example, a generator which currently has firm access will not be changed to having non-firm status. Similarly, a generator which is currently allocated firm access at a specific future date will not be impacted by updated system assumptions.

Firm access is designed to reward generators that have developed in good locations. Good locations are defined as parts of the network that have capacity for new generation or have planned reinforcements that will deliver additional capacity in the area. A core feature of firm access has been the provision of locational signals for where generation should connect and providing an efficient investment signal to developers on that basis. The new methodology builds on the concepts introduced in CER/09/191 which emphasises the consideration of "the cost of alleviating transmission constraints (via transmission reinforcements) versus the cost of incurring the constraint costs". Thus recognising "the reality that when building the network, EirGrid, in keeping with its functions as licensed transmission system operator, develops the transmission system efficiently". The analysis completed as part of this review considers the interplay between three overarching features or lenses through which to view firm access:

End consumer:	Does the decision on generator firm access protect the end consumer from unreasonably high constraint payments?
Locational signals:	Does the decision on generator firm access provide an appropriate locational signal for where generation should connect?
System Development:	Is a specific constraint or group of constraints in an area sufficient justification for a specific reinforcement?

[1] CRU2023114_Firm_Access_detailed_methodology_decision.pdf (divio-media.com)

[2] Network Delivery Portfolio (NDP) | Grid Information | EirGrid

In attempting to answer these overarching questions, the firm access review must first identify the bottlenecks on the system which are becoming overloaded. It is then necessary to determine what generators are making a "material" contribution to these overloads. The firm access review must draw a distinction between "slight" and "material" contributions to an overload. This is done by considering the implications on the three overarching features of; end consumers, locational signals and system development.

In total this review considered the firm access status for over 200 separate generators compromising more than 6.1 GW of capacity. The results of the 2024 firm access review are presented in Figure 1.

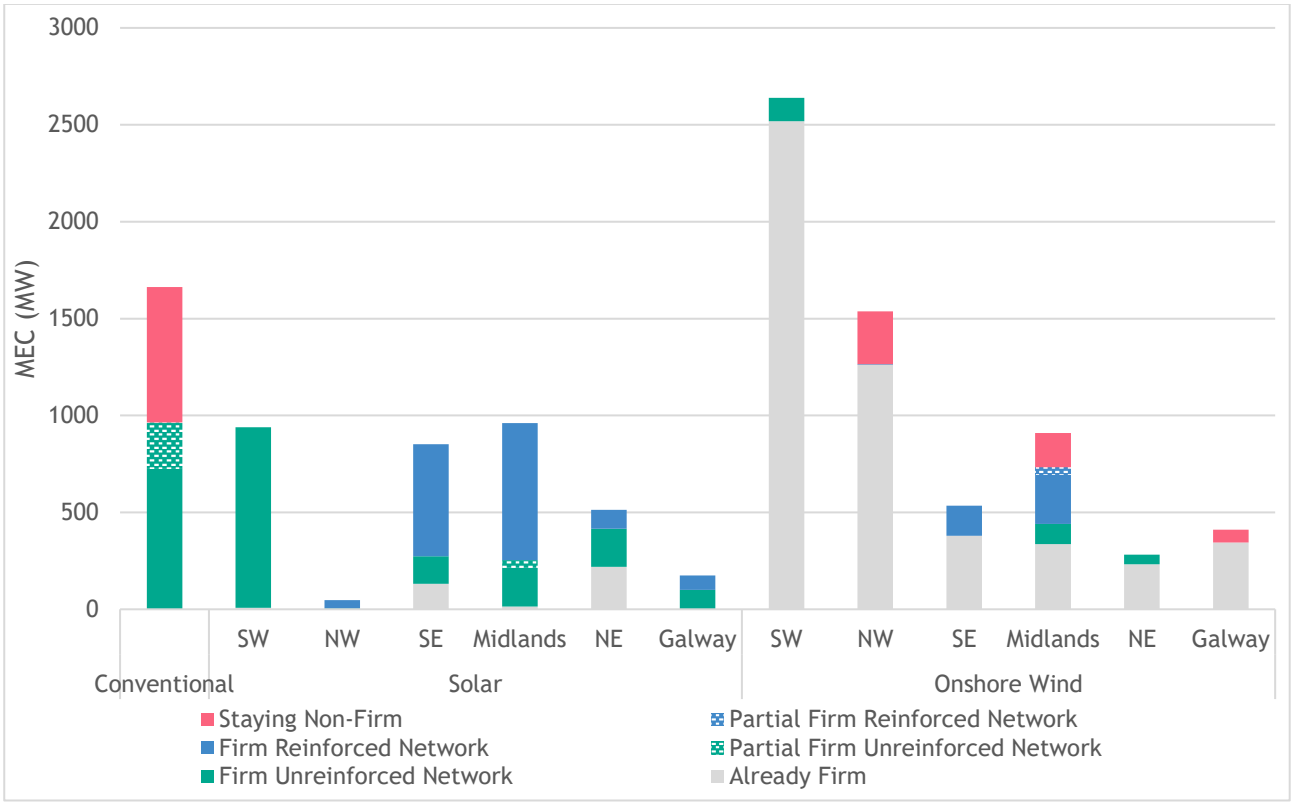

Figure 1: Summary of the 2024 firm access results.

The main conclusions of this firm access review are as follows:

- Firm access will be available for all committed solar projects.
- Over 1.6 GW of firm capacity will be available for new committed solar projects on the unreinforced system.
- In the reinforced system, firm access will become available for up to 1.5 GW of new committed solar projects.
- In total, including projects that are already firm, over 3.5 GW of solar generation will be receiving firm access.
- The main areas of the power system that experienced challenges accommodating solar capacity were in the midlands and the south-east. There are a range of planned reinforcements in these

areas which are critical to ensuring that the maximum utilisation can be achieved from this solar capacity.

- Almost 0.3 GW of firm capacity will be available for new committed wind projects on the unreinforced system.
- In the reinforced system, firm access will become available for over 400 MW of new committed wind projects.
- In total, including projects that are already firm, circa 5.8 GW of onshore wind generation will be receiving firm access.
- Firm access was not available on the reinforced system for over 500 MW of committed wind generation. These projects will remain non-firm and will be re-assessed in subsequent firm access runs.
- The main areas of the power system that experienced challenges accommodating wind capacity were in parts of the midlands and the west.
- Circa 1 GW of firm capacity will be available for new committed conventional generation on the unreinforced system.
- Firm access was not available on the reinforced system for circa 700 MW of committed conventional generation. These projects will remain non-firm and will be re-assessed in subsequent firm access runs.

1 Introduction

In December 2021, following CRU direction 20/060[3], EirGrid published the Firm Access Methodology Review paper[4]. In June 2022, following engagement with industry and the RAs, EirGrid submitted an updated Firm Access Methodology Review paper[5]. This led to a period of consultation[6] and the subsequent SEM Committee decision paper[7] on the Firm Access methodology. Following this decision, the CRU requested EirGrid to conduct an initial firm access run to consider existing connected non-firm generation and offshore phase 1 projects. This CRU request formed the basis of the "2023 firm access review" (the full results of this analysis are provided in Appendix 5.4 for completeness).

In June 2023, the CRU published a consultation paper on the Firm Access Detailed Methodology (CRU/202363)[8]. The consultation paper sought to develop and define more detail on how the firm access methodology will be implemented. In November 2023, the CRU published its decision paper (CRU/2023114[9]) and on 13 November 2023 the CRU wrote to EirGrid requesting the completion of a firm access run capturing all projects that have achieved committed status. The assessment was to be completed in advance of the next RESS auction.

This report forms the basis of the CRU requested 2024 firm access review. The report is structured as follows:

The Assumptions section describe the core assumptions that have been made as part of the setup and execution of the analysis. The Approach section describes the specific approach that has been taken in this analysis and lays out a detailed conceptual example of the process steps. This section will assist the reader in understanding the logic and concepts that have been applied in the studies. The main body of the report is contained in Section 4. This section describes the specific results and conclusions that were drawn from the analysis. This section is divided into subsections based on the specific areas of the network.

[3] CRU20060-ECP-2-Decision.pdf (divio-media.com)

[4] Firm-Access-Review-2021.pdf (eirgrid.ie)

[5] SEM-22-068a EirGrid Firm Access Methodology Proposal.pdf (semcommittee.com)

[6] SEM-22-068 SEMC Firm Access in Ireland consultation.pdf (semcommittee.com)

[7] SEM-23-004 SEMC Firm Access in Ireland decision.pdf (semcommittee.com)

[8] CRU202363 CRU Firm Access Detailed Methodology Consultation Paper

[9] CRU2023114_Firm_Access_detailed_methodology_decision.pdf (divio-media.com)

2 Assumptions

This section of the report describes the assumptions which has been applied to the firm access review.

2.1 Data Freeze

The Firm Access Run requires numerous sequential steps of data collection, data validation, model setup, simulation runs and results analysis. Once the detailed models are prepared, they are run through power flow studies which simulate all 8760 hours of the study year. These simulations include contingency analysis which disconnect each network element on the system, in turn, and repeats the power flow simulation without that element.

The entire computational process can take in the order of four weeks to complete. Any changes to the input data, at any step in the process, will require a full restart of the process. It is therefore important to have a clearly defined data freeze date for the analysis. For the Firm Access 2024 run, the data freeze date was 13th November 2023.

2.2 Non-Firm Committed Generators

For the 2024 firm access review, committed generators were defined as contracted generation that had executed their connection agreements by the data freeze date. These are summarised in Table 1 below. Section 5.1 of the Appendix to this report contains the full list of the committed generators that were considered as part of the 2024 firm access review.

Table 1: Summary of the non-firm generation being assessed as part of the 2024 Firm Access Review.

	Total Generation (MW)	Number of Units
Conventional	1663	10
Solar	3115	149
Wind	1240	37
Grand Total	**6018**	**196**

2.3 Generators Included in the Study

In addition to the non-firm generators being assessed, the models also included the existing generation that was contracted or connected to the system at the time of the data freeze. The total generation available in the study is outlined in Table 2. For avoidance of doubt, any generators that already had a firm access date from the 2023 run were not disadvantaged based on this run.

The offshore phase 1 projects previously received a firm access decision as part of the Firm Access 2023 Run and they have been included in the 2024 run. It should be noted that the offshore projects were only included in the reinforced network model and they therefore had no impact on the firm access awarded based on the unreinforced network model.

Table 2: Summary of the total generation included in the 2024 Firm Access Review Studies.

	Total Generation (GW)	Number of Units
Conventional	8	127
Hydro	0.2	78
Interconnector	1.7	3
Pumped Storage Hydro	0.3	4
Solar	3.8	172
Wind	6.6	383
Offshore Phase 1 *(Only included in the Reinforced Network)*	4.4	6
Total	**25**	**776**

2.4 PLEXOS Dispatch

The PLEXOS model from the ECP-2 constraint analysis formed the basis of the model used as part of the Firm Access 2024 run. PLEXOS was used to run a full simulation for every hour of a given year (8760). The PLEXOS simulation looks at the load for each hour and determines the optimum dispatch of the available generation for each hour. A surplus and curtailment simulation run was completed which determined the dispatch profiles of each unit based on market rules and considered:

- Assumed wind/solar profiles based on historical and industry data.
- Assumed interconnector profiles.
- Assumed generator prices based on technology types.
- Security Constraints; System non-synchronous penetration, inertia and min set rules are based upon the Operational Policy Roadmap 2023-2030[10].
- Demand based on the forecasted median scenario published in the Generation Capacity Statement (GCS) 2023 - 2032[11]. 2027 demand was used for the unreinforced system model and 2030 demand was used for the reinforced system model.

Sections 3.3 provided more details on how PLEXOS was used in the analysis.

2.5 PSSE Network Model

PSSE was used to study the power flows on the network in detail and attribute specific equipment overloads with specific generator outputs. Two main system models were considered as follows.

2.5.1 Unreinforced System

The firm access test for the committed generators was initially performed on an "unreinforced system" model. This test identifies if firm access is immediately available on the system. The unreinforced system model corresponds to a 2023 system. In order to minimise the volume of surplus renewable energy in the

[10] Operational Policy Roadmap 2023-2030 (eirgridgroup.com)

[11] Generation Capacity Statement 2023-2032

simulations, 2027 levels of demand and the two new interconnectors; Greenlink and Celtic were included in the model. This combination of assumptions in the unreinforced system model allows for the determination of the level of overloads that could be expected to occur on the system before planned reinforcements are complete.

2.5.2 Reinforced System

The firm access test for the committed generators was subsequently performed on the "reinforced system" model. This test identifies if firm access will be available on the system following the completion of planned reinforcements. The reinforced system model builds on the unreinforced system model and could be considered as corresponding to a 2030 network model. It includes, committed network reinforcements, 2030 expected demand levels and the Phase 1 Offshore connections. The NDP published on 31st October 2023 was used to determine the status of future grid development projects[12].

2.6 General Assumptions

The following general assumptions were applied throughout the analysis:

- The PSSE power flow simulations apply contingency analysis which disconnect each network element on the system, in turn, and repeats the power flow simulation without that element. Apart from these specific contingencies, it is assumed that no other overlapping outages are scheduled[13]. This is based on the TSSPS[14] criteria which determines that generation redispatch can be performed to reduce potential overloads during system maintenance conditions.
- Consistent with the principles of firm access, this review is attempting to estimate the overall level of constraint that could be required in a specific area, in order to prevent specific overloads. Areas where the majority of the generation volume can export from the area, without issues, would be considering as having firm access for that generation. For this reason, the firm access review assumes that constraints will be applied equally among all generators that contribute to an overload. Including existing firm and non-firm generators and priority/non-priority generators. This is done in order to stay true to the principles of the firm access concept and avoid the results being distorted by individual priority dispatch rules.
- Constraints are primarily only considered for generators that have a significant contribution to the issue.
- Constraints for certain regional or system wide area issues will be considered on a case-by-case basis in order to determine specific overload contributions.

[12] Network Deliver Portfolio Q3-2023.

[13] It should be noted that maintenance and development works on the system will result in several circuits being out-of-service at any given time during the outage season. As a result, the constraints calculated as part of the firm access review may not align with constraints identified in other studies or which materialise real-time operation of the power system.

[14] EirGrid-Transmission-System-Security-and-Planning-Standards-TSSPS-Final-May-2016-APPROVED.pdf

- It is assumed that in the event of a constraint involving a mixture of renewable and non-renewable sources, the non-renewable sources would be constrained first ahead of any constraint being applied to the renewable sources.
- Constraints are calculated and applied so that the transmission system meets the requirements specified in the TSSPS[15] and OSS[16].

[15] TSSPS – EirGrid-Transmission-System-Security-and-Planning-Standards-TSSPS-Final-May-2016-APPROVED.pdf

[16] OSS – Operating Security Standards (eirgrid.ie)

3 Approach

This section of the report describes the general approach which has been applied to the firm access review. This is an important section of the report to assist the reader in understanding some of the concepts used in the review.

3.1 High-level overview

This section describes the steps involved in the firm access review at a conceptual level. The starting point for the firm access review is a PLEXOS model to perform surplus and curtailment analysis. The output of this analysis is then further processed with PSSE-based power flow analysis for a full year (8760 hours). The limiting transmission network elements (circuits, busbars, or transformers) are identified from the power flow analysis. The main portion of the analysis focuses on these limiting elements. Nodal constraints are computed for the network elements and corresponding contingencies. The general steps are briefly described as:

Step 1: Compile the list of committed non-firm generators to be analysed. This is based on committed generator as of the data freeze date.

Step 2: Finalise the key assumptions for study years, demand data, interconnector data, RES profile, etc. Develop PSSE and PLEXOS models based on these assumptions.

Step 3: Compile the list of system reinforcements and their assumed completion years based on the Transmission Development Plan publications (Network Delivery Portfolio).

Step 4: Run a PLEXOS simulation to provide a full year of hourly profiles for interconnectors, demand and available generation (after surplus generation and curtailed generation have been removed).

Step 5: Run a PSSE power flow simulation for a full year using the PLEXOS hourly profiles from the previous step to set the dispatch.

Step 6: Identify the network elements that become overloaded (or could be overloaded if an N-1 contingency occurred) in the hourly PSSE analysis. Compute Shift Factors and other specific results to help identify the generators that are contributing to the overloading of specific network elements.

Step 7: Estimate the volume of generation that would need to be reduced at each node in order to prevent overloading specific network elements.

Step 8: The post processing phase of the analysis considered if generators can be granted firm access or a time bound firm access date.

3.2 Model Validation

To ensure consistency of assumptions and modelling set up, the ECP constraints model is used as a starting point with the firm access assumptions added on top.

Four PSSE power flow cases were used as a starting point for the analysis. They constitute Summer Peak, Winter Peak, Summer Night Valley and Winter Night Valley cases for the year 2023. These models were validated for November 2023 network and generators as follows.

- Connected firm
- Connected non-firm
- Contracted firm
- Contracted non-firm

3.3 PLEXOS Surplus and Curtailment run

PLEXOS models were simulated for the study year (rules in PLEXOS are based on the ECP 2 constraints analysis) without network considerations or operational rules. This provides information on the specific generation that would be utilised in an unconstrained market for each hourly demand. This step effectively matches the specific hourly electricity demand with the appropriate equivalent volume electricity supply. The reduction of available renewable generation for surplus reasons is necessary when the total available generation exceeds system demand plus interconnector export flows. In this review, generation reduction for surplus is applied prior to curtailment and constraint. This step is referred to as the ***surplus*** run in this report.

Using the surplus run as a starting point, PLEXOS models were also run to consider operational rulesets and system wide limitations (such as SNSP, minimum conventional generation, etc.). This is referred to as the ***curtailment*** run. The results from the PLEXOS curtailment run is used as a starting point for the generation, interconnectors, and demand hourly profiles in PSSE analysis. This includes the profiles for renewable generation dispatches which come from PLEXOS. A single PLEXOS run was used to capture both Surplus and Curtailment.

3.4 PSSE-based 8760 Analysis

As mentioned in the previous sections, PLEXOS is used to obtain the 8760 hour demand and corresponding generation dispatch following market and operational rules. The dispatch data is then utilised to perform power flow simulations in PSSE. The PSSE case includes all the relevant connected and contracted generators, and these are dispatched each hour according to the PLEXOS dispatch.

PSSE is used to perform the power flow analysis, for intact network (N) and single contingencies (N-1 and N-G) as per TSSPS[17], for every hour in the study year providing details of hourly overloading for the various network elements. Potential transmission overload issues, that could be solved by constraining generators, are identified from this analysis. As per the TSSPS, the loading on all circuits must be within the required emergency limits following an N-1 event. From the PSSE analysis, it is possible to determine all the network elements with violations and the extent of their violations with temporal granularity of hours. The hourly overload information is used in the following steps to distribute constraints at various nodes.

3.5 Post-processing

The main results provided from the PSSE analysis are post-processed to determine the constraints required at each node to alleviate any overloads. To help calculate the constraint required at each node, a **Shift Factor** is calculated. The Shift Factor (in MVA/MW) is defined as: *the resultant change in MVA flow on a circuit for a given change in MW at the node*. Shift factors are calculated for every node (that has a generation unit which can be constrained), for every hour of the study year and for the related contingencies. The changes are observed for a set of key network elements that are chosen by the user depending on the results from PSSE analysis.

The Shift Factor (SF) of a node is defined in equation (1):

$$SF_{i,j,h} = \frac{\Delta F_{j,h}}{\Delta P_{i,h}}, \quad (1)$$

where,

$i = 1, \dots, N$ is the node, and *N* is the total number of nodes,

$j = 1, \dots, Y$ is the network element, and *Y* is the total number of network elements,

$h = 1, \dots, 8760$ is the hour,

$\Delta F_{j,h}$ is the change in MVA power flow on the network element *j* during hour *h*,

$SF_{i,j,h}$ is the Shift Factor (SF) for the node *i* and network element *j* during hour *h*, and

$\Delta P_{i,h}$ is the change in generation at node *i* during hour *h*.

Smaller shift factors from nodes that are not material to circuit overloads are filtered out using a cut off value for the shift factors (SF_{cut}), then (1) changes to

[17] EirGrid-Transmission-System-Security-and-Planning-Standards-TSSPS-Final-May-2016-APPROVED.pdf

$$SF_{i,j,h} = \frac{\Delta F_{j,h}}{\Delta P_{i,h}}, \text{ if } \frac{\Delta F_{j,h}}{\Delta P_{i,h}} > SF_{cut} \text{ , else } SF_{i,j,h} = 0 \quad (2)$$

The level of constraints which must be shared/distributed across each node in order to eliminate an overload is based on a form of pro-rata calculation considering the shift factor and the volume of generation at the node. This is based on the following equations:

$$\Delta P_{i,j,h} = \left(\frac{SF_{i,j,h}\, P_{i,h}}{\sum_{k=1}^{N} SF_{k,j,h}\, P_{k,h}}\right)\left(\frac{OL_{j,h}}{SF_{i,j,h}}\right) \quad (3)$$

where,

$P_{i,h}$ is the generation at bus *i* and hour *h*, and

$OL_{j,h}$ is the overloading MVA (excess of the rated MVA) for the network element *j* during hour *h*.

Based on this analysis an assessment of the volume of constraint required at each node is determined. If this constraint is beyond the firm threshold, then it is concluded that the generator should not have firm access. Subsequent post processing steps are then required to determine if any planned reinforcements will address the issue or if any volume of partial firm access can be provided to a generator. The process is demonstrated with the following basic example.

3.6 Conceptual Example of Study Steps

The following example illustrates the core principles of the approach to firm access. The example is based on one specific hour (H) in the PSSE analysis for the study year. Assuming that the study year is a non-leap year, there would be 8760 PSSE cases corresponding to each hour of the study year. In this example, two overloads are identified on Circuits 1 and 2 within the system. Generation at Node A, Node B, Node C, and Node D are seen to be contributing to the overloads.

During the Post-Processing phase of the analysis, the studies reported that overloading would occur on the Circuit 1 and Circuit 2 in the event of N-1 contingencies. Note that overloading could occur on any network element (busbar section, transformer, circuit, etc.), this example assumes that only two circuits were overloaded, and four nodes were contributing to the overloads.

3.6.1 Basic Shift Factors

This step calculates the basic shift factor based on equation 1. This links the generation at each node to the impact it can have on the overloads on each circuit.

Nodes A, B, C and D have constrainable generation of 30 MW, 10 MW, 3 MW, and 40 MW, respectively. The limiting network elements are Circuit 1 with 5 MVA overloading (beyond its capability), and Circuit 2 with 10 MVA overloading (beyond its capability). The overloading MVA is the maximum which could occur within that hour, either during intact network or single contingencies.

The Shift Factors shown in Table 3 are based on Equation (1). In simple terms this means that a reduction in generation of 1 MW at Node A would cause a reduction in power flow of 0.55 MVA in Circuit 1 and 0.35 MVA in Circuit 2. Conversely, a reduction of 1 MW of generation at Node C will only reduce power flows on Circuit 1 by 0.15 MVA and Circuit 2 by 0.05 MVA.

The table illustrates how a high shift factor indicates that a generator is electrically quite close to a given circuit and therefore will have a large contribution to the power flows on that circuit.

Table 3: Example of raw shift factors for nodes and circuits.

Shift Factor for Hour "H"	Circuit 1 (5 MVA)	Circuit 2 (10 MVA)
Node A (30 MW)	0.55	0.35
Node B (10 MW)	0.25	0.35
Node C (3 MW)	0.15	0.05
Node D (40 MW)	0.25	0.30

3.6.2 Filtered Shift Factors

This step filters the shift factors to only focus on the nodes which are having a material contribution to the specific overloads. (This approach is explained in more detail in Section 3.7.1) For example, a shift factor cut-off value of 0.3 ($SF_{cut} = 0.3$) is chosen and applied the raw shift factors in Table 3. Any shift factor that is below the cut-off is set as 0. This focuses in on the generators that can be seen to be having a material contribution to the power flows on the overloaded circuits. These filtered shift factors are summarised in Table 4.

Table 4: Filtered shift factors (assuming a 0.3 cut-off)

Shift Factor for Hour "H"	Circuit 1 (5 MVA)	Circuit 2 (10 MVA)
Node A (30 MW)	0.55	0.35
Node B (10 MW)	0	0.35
Node C (3 MW)	0	0
Node D (40 MW)	0	0.30

3.6.3 Overload distribution

This step of the analysis determines how much of each specific circuit overload should be apportioned to each of the associated nodes. The shift factors combined with the volume of generation export is used to compute a ratio of how much each node is contributing to the overload. As stated already, higher shift factors correspond to nodes which are electrically closer or more relevant to the overloaded network element.

The approach taken to apportioning the volume of constraint amongst nodes with available generation is a ratio between the shift factor and the volume of generation. This is formulated in equations (2)-(3). In the example below it is determined that, of the 10 MVA of overload on the Circuit 1, 4.1 MVA of a reduction should be derived from the Node A, 1.3 MVA from the Node B and 4.6 MVA from the Node D. In this manner, the ratio of the generation export at a node, combined with the shift factor for that node determines what proportion of the reduction should come from each node.

Table 5: MVA overload distribution

MVA association for Hour "H"	Circuit 1 (5 MVA)	Circuit 2 (10 MVA)
Node A (30 MW)	5 MVA	$\left(\frac{0.35*30}{0.35*30+0.35*10+0.3*40}\right)*10 = 4.1\ \text{MVA}$
Node B (10 MW)	0	$\left(\frac{0.35*10}{0.35*30+0.35*10+0.3*40}\right)*10 = 1.3\ \text{MVA}$
Node C (3 MW)	0	0
Node D (40 MW)	0	$\left(\frac{0.3*40}{0.35*30+0.35*10+0.3*40}\right)*10 = 4.6\ \text{MVA}$

3.6.4 Nodal constraints

The combination of the shift factor and the overload distribution is used to compute the actual volume of generation constraint that will be required at each node, in order to deliver an overall reduction of 5 MVA on the Circuit 1 and 10 MVA on the Circuit 2. For Circuit 1 the analysis is very straight forward as Node A is determined to be the only node having a material contribution to the overload. In order to reduce the overload on the line by 5 MVA, a node with a shift factor of 0.55 would have to reduce its generation by 9 MW in order to create a resultant reduction of 5 MVA on Circuit 1.

For Circuit 2 this is more complex as the constraint has to be shared across Nodes A, B and D in order to create an overall reduction of 10 MVA on Circuit 2. For example, Node A is required to contribute a 4.1 MVA reduction. Given that it has a shift factor of 0.35 relative to Circuit 2, 12 MW of generation reduction would be required from Node A in order to create a resultant reduction of 4.1 MVA on Circuit 1.

Table 6: Nodal constraints (MWh) distribution

Constraints MW for Hour "H"	Circuit 1 (5 MVA)	Circuit 2 (10 MVA)
Node A (30 MW)	5 MVA/0.55 = 9MW	4.1 MVA/0.35=12 MW
Node B (10 MW)	0	1.3 MVA/0.35=3.7 MW
Node C (3 MW)	0	0
Node D (40 MW)	0	4.6 MVA/0.3=15.3 MW

Every PSSE case (corresponding to each hour) will have a volume of generation that must be constrained at specific nodes in order to alleviate overloads on specific network elements. These results are compiled into a matrix of nodes vs network elements for that hour. A results matrix is created (by adding up matrices corresponding to all the hours in the study year), to obtain the total MWh constraints for nodes and network elements for the year. This can be viewed as either a percentage constraint result or a GWh volume of constraint. The results matrix forms the core basis of the firm access review. From this matrix it is possible to tell:

- what circuits are overloaded?
- what nodes are contributing to the overload?
- how much generation would need to be constrained at each node in order to alleviate the overload?

The percentage constraints for a generator is defined as Constrained MWh (8760) / Total available MWh (8760). In the example above, if it was determined that due to the overload on Circuit 2 it was necessary to constrain Node A by over 15% throughout the entire year, then the generation at Node A would be considered non-firm. This node would then be considered for further post-processing to determine if there are any potential reinforcement solutions or if there is any partial firm access available at that node.

3.7 Firm Access Post-processing

This section of the report expands on the conceptual example described in Section 3.6 in order to further explain the main post-processing phase of the analysis. In this phase of the analysis the constraint results are processed in order to identify the “material” constraints and the “slight” constraints. Depending on the firm threshold selected, this phase of the analysis may identify that some generators are experiencing very little constraints and should be considered for being allocated firm access. Other generators may be seen to be having significant contributions to specific overloads and therefore require substantial constraint which would mean these generators would not be granted firm access.

3.7.1 Detailed consideration of Shift Factors and overload causation

This phase of the analysis concentrates on the generators with high constraint in order to understand their issues and make sure that they are credible. Decisions around granting firm access need to consider, inter alia, the following principles:

End consumer:	Does the decision on generator firm access protect the end consumer from high constraint payments?
Locational signals:	Does the decision on generator firm access provide an appropriate locational signal for where generation should connect?
System Development:	Is a specific constraint or group of constraints in an area sufficient justification for a specific reinforcement?

The Shift Factor used in the analysis is critical in identifying the primary generators which are contributing to specific regional overloads on the system. The analysis will typically apply a higher shift factor in order to identify the generators that are making material contributions to overloads. However, in some circumstances additional screening analysis will consider a lower shift factor in order to gain a full understanding of overload causation.

If a shift factor of 0.1 is used, this will result in "casting the net" very wide. With this approach a generator could also be associated with overloads far outside of its regional network, even with circuits on the other side of the country. This could result in the generator remaining non-firm. In these situations, it needs to be considered if this approach sends an appropriate locational signal, if it protects end consumers and if it aligns with system development principles.

A Shift Factor of 0.3 is consistent with the locational signal principles of firm access and, by extension, of linking generators to major regional bottlenecks. A generator with a Shift Factor above 0.3 will most likely be making a large contribution to an overload. It is reasonable to conclude that this generator must remain non-firm in order to protect the end consumer and send an appropriate locational signal regarding this area. In consideration of CER/09/031 it could generally be expected that for a generator with a Shift Factor above 0.3, the cost of incurring the constraints would be higher than the cost of alleviating constraints via transmission reinforcements (in addition to the economic considerations of a reinforcement, the technical, social acceptance and deliverability perspectives also need to be considered). The core principle here is that generators with a shift factor of 0.1 or below would generally not be a contributing factor in the justification for a system reinforcement and for that reason should not be directly linked to those issues. Conversely, a generator with a shift factor of 0.3 or above is making a material contribution to a system overload(s) and thereby is most likely contributing to a system reinforcement need.

The principle described above for shift factors holds true when dealing with unidirectional power flow issues. This is the case for much of the Irish power system where the network is not very meshed. Power from generators in a specific region will tend to always flow in the same direction on a limited number of circuits out of that region. This principle may not work for more complex meshed parts of the network where lots of different generators can impact on power flows. In these complex parts of the network, the magnitude and direction of power flows can vary significantly based on the prevailing generation and demand patterns. This tends to be a feature of some of the more central parts of the network. Attributing causation to overloads on these inter-regional network elements can become quite complex.

From a system development perspective, it is often quite clear that a reinforcement is justified for these network elements. However, it is often not clear if individual clusters of generators, in-and-of themselves, would be drivers for the reinforcement. For that reason, keeping projects non-firm for these issues may not be consistent with the overarching features of firm access (protecting end consumers, locational signals and system development).

In analysing overloads occurring on these meshed parts of the network it has been observed that a Shift Factor of 0.3 will isolate only the local generators which are closest to the overload. It has also been

noted, that only constraining these local generators may not be sufficient to fully alleviate the overload. In other words, an accumulation of generators with smaller Shift Factors are also contributing to the overload. It could therefore be considered unequitable and not in accordance with the general principles of firm access for only these local generators to be considered responsible for the overloads. In such circumstances, there is justification for using a lower Shift Factor of 0.1. This will cast the net wider in order to identify the broader spectrum of generators which are identified as contributing to a given overload.

Based on the list of generators identified as contributing to a complex inter-regional overload with a shift factor of greater than 0.1, the following factors will be considered:

1. With a shift factor of 0.1 the required volume of constraint will be shared across a larger number of generators. This may mean that the volume of constraint required by the local generators which are closest to the overload will drop below the firm threshold. In this case it is expected that all generators should be considered as firm.
2. In other situations, all generators will be identified as having constraints of greater than the firm threshold due to their total contribution to overloads on complex inter-regional parts of the network. In these cases, it will have to be determined if the generators can be allocated a time bound firm access date (based on expected reinforcement timelines) or if the generator will remain non-firm. This decision will have to be made cognisant of the implications on the three overarching features of firm access; end consumers, locational signals and system development.
3. In some instances, the review of generators contributing to an overload will suggest that there may be some anomalies in the dispatch profiles. This can be particularly noticeable if the dispatch profile suggests an unorthodox combination of conventional generation dispatches and interconnector power flows. In these cases, it will have to be determined if the scenario is reasonable and if keeping any associated generators non-firm would meet the overarching principles of firm access. In this case it is expected that all generators should be considered as firm.

3.8 Reinforcement Post-processing

For any generators that were determined to be non-firm, additional complementary studies will be completed to identify if any planned reinforcements would alleviate the constraints. This check involves focusing on worst case hours for the corresponding issue and implementing the reinforcement to check if it solves the issue. For reinforcements involving network uprates that may not completely solve the overloads, post-processing checks consider if the uprated network element reduces the constraints to below the Firm Threshold value.

The steps involved in this part of the analysis can be briefly summarized as follows:

- Based on the results from nodal constraints analysis, it is key to understand the reason for the high constraint.

- The dates for planned reinforcements that could possibly relieve the constraints were taken from the Network Delivery Portfolio[18]. If there are no reinforcements planned, then the generation is assumed to remain non-firm.
- If reinforcements are planned, depending on the overloading, network element type, and affected generators, more analysis is required. For example, where a 99 MVA rated circuit is experiencing a maximum overload of 150%. It is apparent that the issue will be solved with a planned uprate of the network element to 200 MVA. However, it is less apparent if a planned new circuit in the area will change the power flows sufficiently in order to alleviate the overload. In this case, if the worst case (hour) overload can be solved using any planned reinforcement, it is apparent that the corresponding reinforcement can solve the issue. If the planned reinforcement can only partially solve the issue, then a re-run of the firm access review (from steps corresponding to PSSE analysis) with new PSSE models will be required with planned reinforcements included.

3.9 Partial Firm Access Post-processing

For any generators deemed to be non-firm, there are additional studies to determine if partial firm access is available. These studies use the same tools, principles and methodologies of the original firm access assessment. The post processing step (outlined in Section 3.5) is re-run for each non-firm node and an amount of partial firm is assumed for each node. This process is done in blocks of 20 MW.

The output from this analysis then calculates the constraint on the assumed partially firm portion. If this calculated constraint is below the threshold, then the node has partial firm access available. If a node is found to have partial available, then the process is repeated with the next 20 MW block until the partial limit is reached.

[18] Network Delivery Portfolio (NDP) | Grid Information | EirGrid

3.10 Process Flow

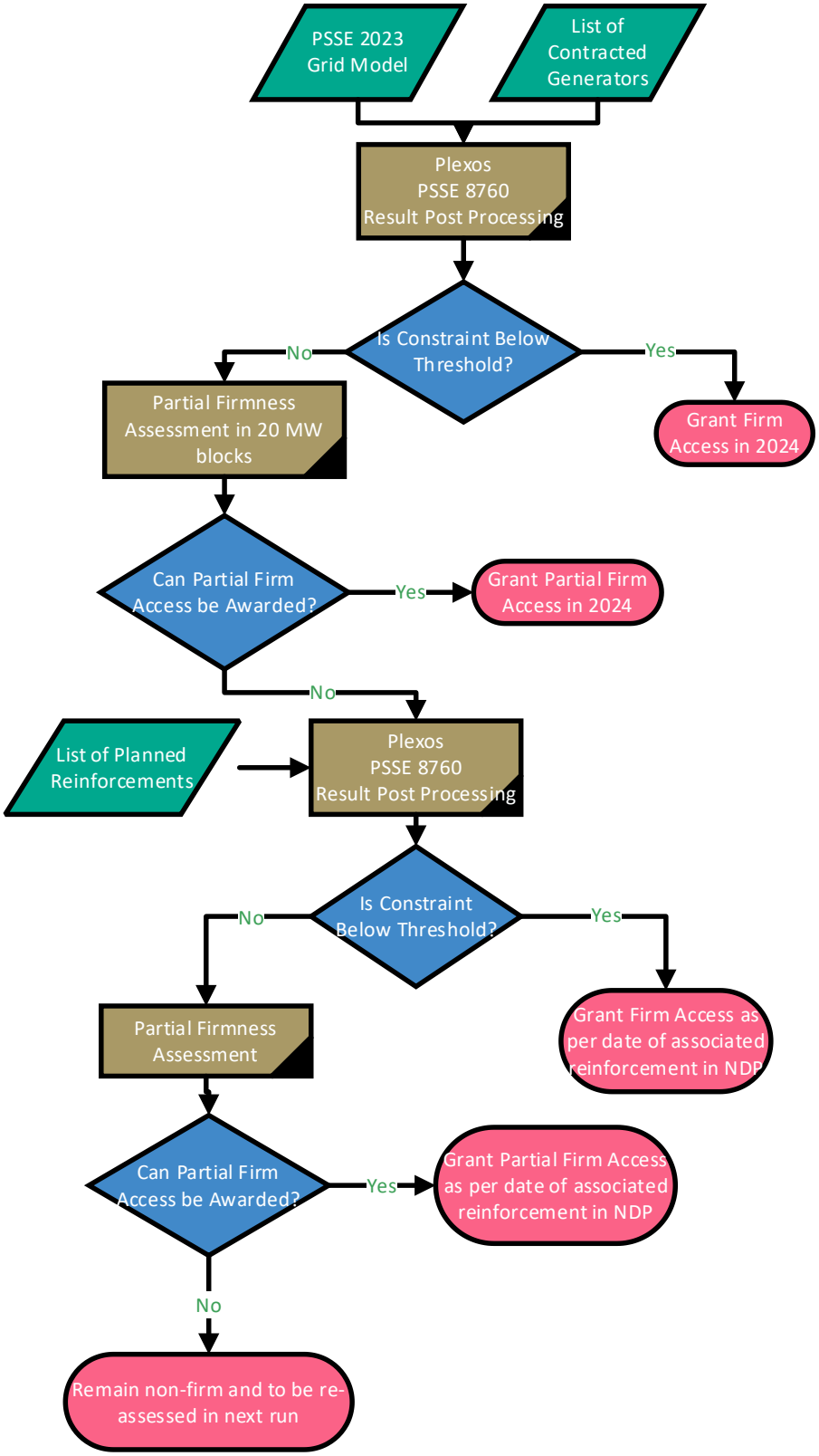

Figure 2: Outline of the sequence of steps of the firm access analysis.

4 2024 Firm Access Review Results

The PSSE 8760 analysis identified the transmission circuits that experienced overloads over the 8760 hour PSSE study. Further analysis was done to calculate the contribution from each generator node to the identified overloads. This phase of the analysis considers 37 non-firm wind firms, 149 non-firm solar farms and 10 non-firm conventional generation. In total, 6 GW of non-firm generation was assessed.

The post processing phase of the analysis considered the overloads in detail in order to determine which generators were making material contributions to the overloads. The non-firm wind and solar farms considered in this assessment were grouped into specific regional issues as described below.

As mentioned in Section 3, the PLEXOS Surplus and Curtailment runs were used as the input to the PSSE 8760 analysis. In the initial unreinforced system model a total of 18 TWh of wind energy and 3.8 TWh of solar energy was considered as available across the annual generation profile. This excludes 0.1 TWh of wind energy and 0.1 TWh of solar energy which is not allocated as a result of being surplus (generation in excess of demand) or due to curtailment (system-wide limitations).

The initial reinforced system model considers a total of 30.5 TWh of wind energy and 3.5 TWh of solar energy in the annual generation profile. This excludes 1.8 TWh of wind energy and 0.4 TWh of solar energy which is not allocated as a result of being surplus or due to curtailment.

During the post processing phase of the analysis, the impact of a particular generator on a given overload throughout the year is determined. When analysing the contribution from a generator to a specific overload, account is taken of the expected energy volume, the number of hours the contribution could occur for and if there is a logical rational for the contribution. Results from the simulations could be discounted for various reasons, for example:

- Imperfections in power flow and voltage solutions derived by the algorithm can suggest that the generator is having a material impact of power flows. This is particularly prevalent when testing small generators where it is challenging to discern if they are causing an impact. In many cases these changes are actually caused by cumulative computational noise from the various stages of the firm access analysis and can be ignored.
- In some cases, the dispatch combinations for generators and/or interconnectors from the PLEXOS solutions would be considered unlikely to occur on the actual system.
- Overloads driven by renewable generators which were based on a small number of hours or a low volume of energy were also not considered further.

The overloads were analysed in detail to attribute causation to the various non-firm generators. The following subsections of the report provide a breakdown of the analysis for renewables in specific areas and for the group of non-firm conventional units.

The analysis and results for each area are presented in the following format:

- A table of the specific network elements that could experience overloads.

- The specific nodes that are identified as contributing power to these overloads is then presented. (Only nodes with generation being tested in this review are listed in these tables. The volume of non-firm generation being tested is listed in the second column). Within these tables, individual nodes are listed separately to identify if an overload is related to wind or solar generation.
- These tables also list the network element that is causing the requirement for the highest constraint. (It is important to understand that there are likely a number of other circuits that will also result in constraint. Only the highest is shown in these tables. This is intended to give a general understanding of the issues in the area.)
- The calculated constraint for each generator was compared against the firm threshold. If the constraint was below the firm threshold, then firm access was awarded. If the constraint was above the firm threshold, then no firm access was awarded and the unit was analysed further to examine partial firm access and the impact of reinforcements. The firm threshold for wind and solar generators was 2% and the firm threshold for non-renewable generators was 0%.
- The final column of these tables lists the resultant conclusion as to whether the generation at the node should be firm.
- Any nodes which were not suitable for full firm access were then assessed to consider if it would be possible for some volume of generation at the node to receive partial firm access.
- Nodes which did not receive firm access are then considered in the reinforced system model. This will determine if these nodes can receive firm access at a future date.
- If full firm access is not available in the future, a further assessment considers if partial firm access could be available.

4.1 South-East

Figure 3 shows the network map of the South-East and the main nodes and circuits in this region.

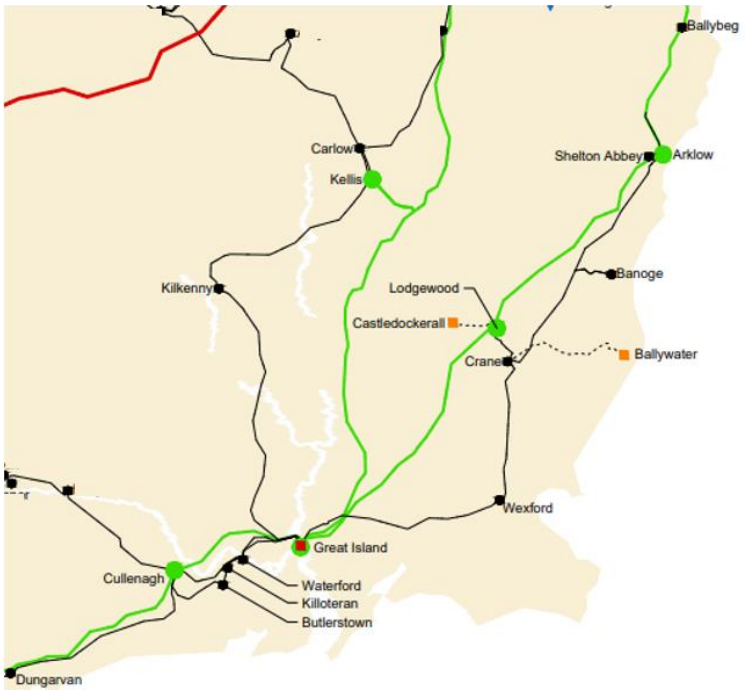

Figure 3: Network Map of the South-East

The following circuits experienced overloads in this area. These circuits were analysed in detail in order to determine which non-firm generators are making a material contribution to these overloads.

Table 7: The list of issues from PSSE power flow analysis in the South-East.

Line	Rating (MVA)	Number of Overloads (hours)	Highest Loading (%)
1121 ARKLOW 110.00 1301 BALLYBEG 110.00 1	99	5672	249
1301 BALLYBEG 110.00 17411 CKM_COUNTRY 110.00 1	136	1936	177
3082 INCHICORE 220.00 3122 IRISHTOWN 220.00 1	562	2656	164
3261 KILKENNY 110.00 3341 KELLIS 110.00 1	99	1671	182
1221 ATHY 110.00 1901 CARLOW 110.00 1	99	1433	166
1221 ATHY 110.00 4481 PORTLAOISE 110.00 1	99	1142	168
4472 POOLBEG SOUT220.00 17431 CKMN_PST 220.00 1	267	787	188
2202 DUNSTOWN 220.00 3342 KELLIS 220.00 1	393	556	133
1841 CRANE 110.00 5501 WEXFORD 110.00 1	136	635	149
3642 LODGEWOOD 220.00 11220 W_GLENART 220.00 1	434	338	124
1541 BANOGE 110.00 5291 TULLABEG 110.00 1	178	173	122
1122 ARKLOW 220.00 1742 CARRICKMINES220.00 1	434	300	130
1121 ARKLOW 110.00 1541 BANOGE 110.00 1	178	126	120

Unreinforced System Model – Full Firm Access Assessment

A large proportion of the non-firm generators in this area experience constraints in excess of the 2% firm threshold. As a result, there is no full firm access available to these generators in the unreinforced system. The predominant issue in this region is limitations on the main pathways for wind and solar to get to the large demand centre in Dublin.

There is firm access available for renewable generation at Dungarvan and Rathnaskilloge as it does not experience constraints above the 2% threshold. These nodes are located at the western side of the south-east region, and therefore are not a contributor to the issues.

Table 8: South-East Full Firm Access Results for unreinforced system.

Station	Non-firm (MW)	Highest Constraint *(Only the worst issue is shown, there may be other issues)*	Result
Arklow Solar	81.9	1121 ARKLOW 110.00 1301 BALLYBEG 110.00 1	Non-firm
Tullabeg Solar	50	1121 ARKLOW 110.00 1301 BALLYBEG 110.00 1	Non-firm
Banoge Solar	8	1121 ARKLOW 110.00 1301 BALLYBEG 110.00 1	Non-firm
Lodgewood Solar	20	1121 ARKLOW 110.00 1301 BALLYBEG 110.00 1	Non-firm
Effernoge Solar	50	1121 ARKLOW 110.00 1301 BALLYBEG 110.00 1	Non-firm
Crane Solar	9	1121 ARKLOW 110.00 1301 BALLYBEG 110.00 1	Non-firm
Wexford Solar	101.1	1121 ARKLOW 110.00 1301 BALLYBEG 110.00 1	Non-firm
Arklow Wind	39.99	1121 ARKLOW 110.00 1301 BALLYBEG 110.00 1	Non-firm
Butlerstown Solar	36.65	3261 KILKENNY 110.00 3341 KELLIS 110.00 1	Non-firm
Ballybeg Solar	8.5	1301 BALLYBEG 110.00 17411 CKM_COUNTRY 110.00 1	Non-firm
Great Island Solar	12	1121 ARKLOW 110.00 1301 BALLYBEG 110.00 1	Non-firm
Waterford Solar	6	3261 KILKENNY 110.00 3341 KELLIS 110.00 1	Non-firm
Rathnaskilloge Solar	95	N/A	Firm
Dungarvan Solar	46.94	N/A	Firm
Ballyragget Solar	39.99	3261 KILKENNY 110.00 3341 KELLIS 110.00 1	Non-firm
Kilkenny Solar	62	3261 KILKENNY 110.00 3341 KELLIS 110.00 1	Non-firm
Ballyragget Wind	45	1221 ATHY 110.00 1901 CARLOW 110.00 1	Non-firm
Kellis Solar	81	1221 ATHY 110.00 1901 CARLOW 110.00 1	Non-firm
Carlow Solar	13.3	1221 ATHY 110.00 1901 CARLOW 110.00 1	Non-firm
Carlow Wind	21	1221 ATHY 110.00 1901 CARLOW 110.00 1	Non-firm
Garrintaggart Wind	49.5	3261 KILKENNY 110.00 3341 KELLIS 110.00 1	Non-firm

Unreinforced System Model – Partial Firm Access Post-processing

Due to the level of constraint experienced and the existing level of awarded firm access in this area, there is no partial firm access available for wind and solar units in the South-East in the unreinforced system.

Reinforced System – Full Firm Access Assessment

In the reinforced system, firm access becomes available for all non-firm wind and solar generators in the Southeast. These projects will be awarded firm access on the scheduled completion date of the relevant reinforcements.

Reinforced System – Partial Firm Access Post-processing

As full firm access is granted for all non-firm generators, a partial firm access assessment is not required in this area.

Summary of South-East

Table 9: South-East summary of the firm access analysis.

Station	Non-firm (MW)	2024 Decision	2024 Partial Decision	Reinforced System Decision	Reinforced System Partial Decision
Arklow Solar	81.9	Non-firm	Non-firm	Firm	N/A
Banoge Solar	8	Non-firm	Non-firm	Firm	N/A
Tullabeg Solar	50	Non-firm	Non-firm	Firm	N/A
Effernoge Solar	50	Non-firm	Non-firm	Firm	N/A
Lodgewood Solar	20	Non-firm	Non-firm	Firm	N/A
Crane Solar	9	Non-firm	Non-firm	Firm	N/A
Wexford Solar	101.1	Non-firm	Non-firm	Firm	N/A
Arklow Wind	39.99	Non-firm	Non-firm	Firm	N/A
Ballybeg Solar	8.5	Non-firm	Non-firm	Firm	N/A
Great Island Solar	12	Non-firm	Non-firm	Firm	N/A
Waterford Solar	6	Non-firm	Non-firm	Firm	N/A
Ballyragget Solar	39.99	Non-firm	Non-firm	Firm	N/A
Kilkenny Solar	62	Non-firm	Non-firm	Firm	N/A
Carlow Solar	13.3	Non-firm	Non-firm	Firm	N/A
Kellis Solar	81	Non-firm	Non-firm	Firm	N/A
Ballyragget Wind	45	Non-firm	Non-firm	Firm	N/A
Carlow Wind	21	Non-firm	Non-firm	Firm	N/A
Butlerstown Solar	36.65	Non-firm	Non-firm	Firm	N/A
Rathnaskilloge Solar	95	Firm	N/A	N/A	N/A
Dungarvan Solar	46.94	Firm	N/A	N/A	N/A
Garrintaggart Wind	49.5	Non-firm	Non-firm	Firm	N/A

4.2 South-West

Figure 4 shows the network map of the South-West and the main nodes and circuits in this region.

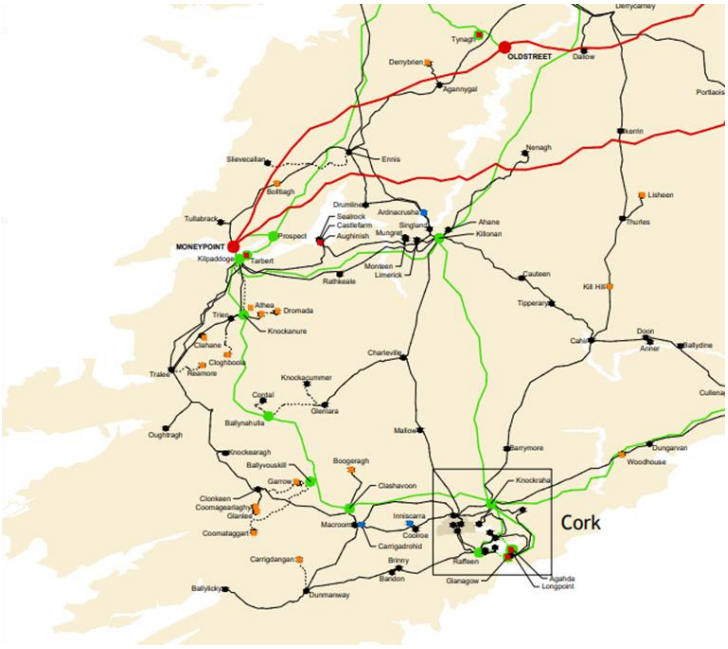

Figure 4: Network Map of the South-West

The following circuits experienced overloads in this area. These circuits were analysed in detail in order to determine which non-firm generators are making a material contribution to these overloads.

Table 10: The list of issues from PSSE power flow analysis in the South-West

Line	Rating (MVA)	Number of Overloads (hours)	Highest Loading (%)
1721 CAHIR 110.00 14619 BARRYM T 110.00 1	105	1497	163
1441 BANDON 110.00 47210 RAFFEENB 110.00 1	99	281	131
1721 CAHIR 110.00 2161 DOON 110.00 1	178	560	140
3462 KILPADDOGE 220.00 3940 MNYP B 220.00 1	660	672	148
3462 KILPADDOGE 220.00 3942 MONEYPOINT 220.00 2	660	672	148

Unreinforced System Model – Firm Access Analysis

Following in-depth analysis of the non-firm wind and solar in the region it was determined that these projects were not having a material contribution the overloads in the region. All non-firm generation in this region can be made firm in 2024 or upon completion of the connection works.

Table 11: South-West Full Firm Access Results for unreinforced system

Station	Non-firm (MW)	Highest Constraint *(Only the worst issue is shown, there may be other issues)*	Result
Ahane Solar	8	N/A	Firm
Ardnacrusha Solar	4	N/A	Firm
Ballinknockane Solar	50	N/A	Firm
Ballydine Solar	5.8	N/A	Firm
Ballyvouskil Wind	42	N/A	Firm
Ballyvouskil Solar	12.5	N/A	Firm
Bandon Solar	29.3	N/A	Firm
Barnahely Solar	9.95	N/A	Firm
Barrymore Solar	15	N/A	Firm
Boggeragh Wind	3	N/A	Firm
Booltiagh Wind	28.2	N/A	Firm
Cahir Solar	34.3	N/A	Firm
Charleville Solar	120	N/A	Firm
Clahane Solar	34	N/A	Firm
Coolroe Solar	9.99	N/A	Firm
Coolshamroge Solar	60	N/A	Firm
Coomagearlahy Solar	7	N/A	Firm
Cow Cross Solar	4.95	N/A	Firm
Doon Solar	8	N/A	Firm
Drombeg Wind	25.2	N/A	Firm
Drombeg Solar	50	N/A	Firm
Drumline Solar	12	N/A	Firm
Dunmanway Wind	21.75	N/A	Firm
Ennis Solar	18.3	N/A	Firm
Glenlara Solar	4.95	N/A	Firm
Kilbarry Solar	9.9	N/A	Firm
Knockearagh Solar	8.99	N/A	Firm
Knockraha Solar	42	N/A	Firm
Limerick Solar	8.95	N/A	Firm
Lysaghtstown Solar	87	N/A	Firm
Macroom Solar	13.8	N/A	Firm
Mallow Solar	4.95	N/A	Firm
Midleton Solar	10.95	N/A	Firm
Nenagh Solar	4	N/A	Firm
Oughtragh Solar	4	N/A	Firm
Raffeen Solar	55	N/A	Firm
Timoney Solar	156.56	N/A	Firm
Tipperary Solar	4	N/A	Firm
Trabeg Solar	4.95	N/A	Firm
Tralee Solar	13.9	N/A	Firm
Trien Solar	4	N/A	Firm

Unreinforced System Model – Partial Firm Access

As full firm access is granted for all non-firm generators in 2024, partial firm access is not required in this area.

Reinforced System – Firm Access

As full firm access is granted for all non-firm generators in 2024, no reinforced system analysis is required.

Reinforced System – Partial Firm Access

As full firm access is granted for all non-firm generators in 2024, partial firm access is not required in this area.

Summary of South-West

Table 12: South-West summary of the firm access analysis.

Station	Non-firm (MW)	2024 Decision	2024 Partial Decision	Reinforced System Decision	Reinforced System Partial Decision
Booltiagh Wind	28.2	Firm	N/A	N/A	N/A
Ardnacrusha Solar	4	Firm	N/A	N/A	N/A
Coolshamroge Solar	60	Firm	N/A	N/A	N/A
Ennis Solar	18.3	Firm	N/A	N/A	N/A
Drumline Solar	12	Firm	N/A	N/A	N/A
Boggeragh Wind	3	Firm	N/A	N/A	N/A
Ballyvouskil Wind	42	Firm	N/A	N/A	N/A
Drombeg Wind	25.2	Firm	N/A	N/A	N/A
Mallow Solar	4.95	Firm	N/A	N/A	N/A
Charleville Solar	120	Firm	N/A	N/A	N/A
Ballyvouskil Solar	12.5	Firm	N/A	N/A	N/A
Coomagearlahy Solar	7	Firm	N/A	N/A	N/A
Glenlara Solar	4.95	Firm	N/A	N/A	N/A
Drombeg Solar	50	Firm	N/A	N/A	N/A
Knockearagh Solar	8.99	Firm	N/A	N/A	N/A
Trien Solar	4	Firm	N/A	N/A	N/A
Clahane Solar	34	Firm	N/A	N/A	N/A
Tralee Solar	13.9	Firm	N/A	N/A	N/A
Oughtragh Solar	4	Firm	N/A	N/A	N/A
Ballinknockane Solar	50	Firm	N/A	N/A	N/A
Limerick Solar	8.95	Firm	N/A	N/A	N/A
Dunmanway Wind	21.75	Firm	N/A	N/A	N/A
Bandon Solar	29.3	Firm	N/A	N/A	N/A
Macroom Solar	13.8	Firm	N/A	N/A	N/A
Ballydine Solar	5.8	Firm	N/A	N/A	N/A
Barrymore Solar	15	Firm	N/A	N/A	N/A
Doon Solar	8	Firm	N/A	N/A	N/A
Cahir Solar	34.3	Firm	N/A	N/A	N/A
Tipperary Solar	4	Firm	N/A	N/A	N/A
Timoney Solar	156.56	Firm	N/A	N/A	N/A
Ahane Solar	8	Firm	N/A	N/A	N/A
Nenagh Solar	4	Firm	N/A	N/A	N/A
Knockraha Solar	42	Firm	N/A	N/A	N/A
Lysaghtstown Solar	87	Firm	N/A	N/A	N/A
Midleton Solar	10.95	Firm	N/A	N/A	N/A

Cow Cross Solar	4.95	Firm	N/A	N/A	N/A
Barnahely Solar	9.95	Firm	N/A	N/A	N/A
Raffeen Solar	55	Firm	N/A	N/A	N/A
Trabeg Solar	4.95	Firm	N/A	N/A	N/A
Kilbarry Solar	9.9	Firm	N/A	N/A	N/A
Coolroe Solar	9.99	Firm	N/A	N/A	N/A

4.3 North-West

Figure 5 shows the network map of the North-West and the main nodes and circuits in this region.

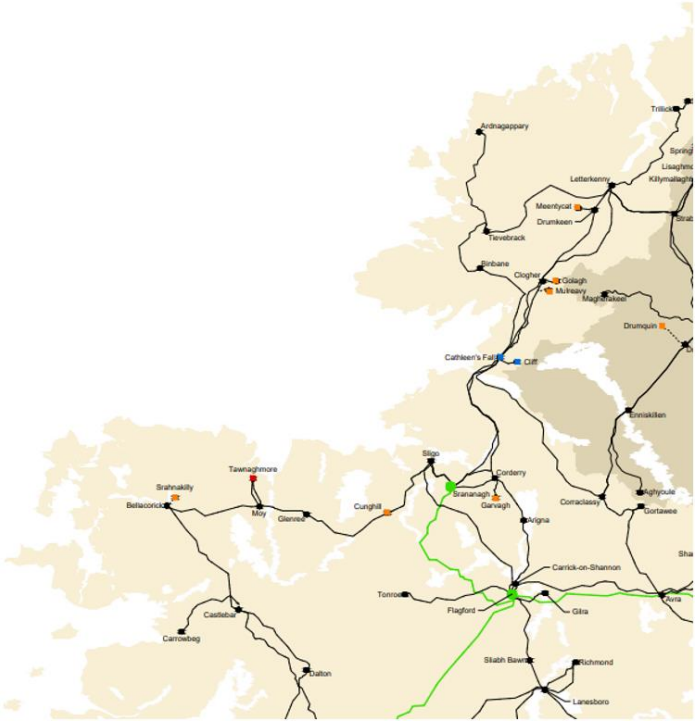

Figure 5: Network Map of the North-West

The following circuits experienced overloads in this area. These circuits were analysed in detail in order to determine which non-firm generators are making a material contribution to these overloads.

Table 13: The list of issues from PSSE power flow analysis in the North-West

Line	Rating (MVA)	Number of Overloads (hours)	Highest Loading (%)
2521 FLAGFORD 110.00 4981 SLIGO 110.00 1	99	2005	229
2281 DALTON_A 110.00 22811 DALTON_A 110.00 1	99	2156	224
1861 CARRICK ON S110.00 10619 ARIGNA_T 110.00 1	178	1452	180
1661 CASTLEBAR 110.00 1821 CLOON 110.00 1	99	2372	243
1401 BELLACORICK 110.00 1661 CASTLEBAR 110.00 1	195	2624	247
1631 CORDERRY 110.00 10619 ARIGNA_T 110.00 1	178	1382	182
1661 CASTLEBAR 110.00 2281 DALTON_A 110.00 1	99	1702	198
3581 LETTERKENNY 110.00 35891 LET-TIV 110.00 1	99	2220	228
2601 FIRLOUGH 110.00 4371 GLENREE 110.00 1	105	2560	250
1641 CASHLA 110.00 22811 DALTON_A 110.00 1	99	1781	216
35893 LET-T 110.00 35894 LET-DRM 110.00 1	99	2096	231
3581 LETTERKENNY 110.00 35893 LET-T 110.00 1	99	2215	223
1931 CUNGHILL 110.00 4981 SLIGO 110.00 1	178	1883	183
1931 CUNGHILL 110.00 4371 GLENREE 110.00 1	178	1882	191
5041 SRANANAGH 110.00 17010 CATH FALL 110.00 2	178	1663	223

1701 CATH_FALL 110.00 5041 SRANANAGH 110.00 1	191	1588	216
1181 ARVA 110.00 2821 GORTAWEE 110.00 1	178	311	124
1701 CATH_FALL 110.00 1981 CORRACLASSY 110.00 1	178	1215	156
2321 DRUMKEEN 110.00 28710 CLOGHER 110.00 1	103	1431	168
4981 SLIGO 110.00 5041 SRANANAGH 110.00 1	99	993	187
2601 FIRLOUGH 110.00 4041 MOY 110.00 1	105	1856	189
4981 SLIGO 110.00 5041 SRANANAGH 110.00 2	99	961	185
2870 CLOGHER 110.00 17010 CATH FALL 110.00 1	178	1256	163
1701 CATH_FALL 110.00 28712 CLOGHER 110.00 2	178	1235	161
1341 BINBANE 110.00 1701 CATH_FALL 110.00 1	99	591	198
5042 SRANANAGH 220.00 3WNDTR SRA2101 WND 1 1	250	1197	158
28019 GOLAGH T 110.00 35896 LET-GOL 110.00 1	99	909	157
35895 LET-T 110.00 35896 LET-GOL 110.00 1	99	909	157
3591 LENALEA 110.00 35891 LET-TIV 110.00 1	99	766	145
35894 LET-DRM 110.00 35895 LET-T 110.00 1	99	837	144

Unreinforced System Model – Full Firm Access

The majority of the non-firm generators in this area experience constraints in excess of the 2% firm threshold. As a result, there is no full firm access available to these generators in the unreinforced system. The predominant issue in this region is limitations on the main pathways for wind power to flow south onto the bulk transmission system.

There is firm access available for a small volume of solar generation that does not experience constraints above the 2% threshold.

Table 14: North-West Full Firm Access Results for unreinforced system.

Station	Non-firm (MW)	Highest Constraint *(Only the worst issue is shown, there may be other issues)*	Result
Corderry Wind	16.35	1181 ARVA 110.00 1861 CARRICK ON S110.00 1	Non-firm
Gortawee Wind	3.35	3521 LOUTHA 110.00 4781 RATRUSSAN 110.00 1	Non-firm
Garvagh Solar	40	1181 ARVA 110.00 1861 CARRICK ON S110.00 1	Non-firm
Lenalea Wind	30.1	3581 LETTERKENNY 110.00 35891 LET-TIV 110.00 1	Non-firm
Tievebrack Wind	29.9	3581 LETTERKENNY 110.00 35891 LET-TIV 110.00 1	Non-firm
Binbane Wind	7.8	3581 LETTERKENNY 110.00 35891 LET-TIV 110.00 1	Non-firm
C'Fall Wind	37.5	2521 FLAGFORD 110.00 4981 SLIGO 110.00 1	Non-firm
Clogher Wind	72	2521 FLAGFORD 110.00 4981 SLIGO 110.00 1	Non-firm
Bellacorick Wind	3.8	1401 BELLACORICK 110.00 1661 CASTLEBAR 110.00 1	Non-firm
Firlough Wind	75.6	1401 BELLACORICK 110.00 1661 CASTLEBAR 110.00 1	Non-firm
Dalton Solar	4	1661 CASTLEBAR 110.00 1821 CLOON 110.00 1	Non-firm
Carrick on S Solar	4	N/A	Firm

Unreinforced System Model – Partial Firm Access

Due to the level of constraint experienced and the existing level of awarded firm access in this area, there is no partial firm access available in the North-West in the unreinforced system.

Reinforced System – Full Firm Access

In the reinforced system, firm access will become available for an additional 47 MW at three nodes in the North-West.

Table 15: North-West reinforced system full firm access assessment results.

Station	Non-firm (MW)	Highest Constraint *(Only the worst issue is shown, there may be other issues)*	Result
Corderry Wind	16.35	2521 FLAGFORD 110.00 4981 SLIGO 110.00 1	Non-firm
Gortawee Wind	3.35	N/A	Firm
Garvagh Solar	40	N/A	Firm
Lenalea Wind	30.1	1701 CATH_FALL 110.00 5041 SRANANAGH 110.00 1	Non-firm
Tievebrack Wind	29.9	1701 CATH_FALL 110.00 5041 SRANANAGH 110.00 1	Non-firm
Binbane Wind	7.8	1701 CATH_FALL 110.00 5041 SRANANAGH 110.00 1	Non-firm
C'Fall Wind	37.5	1701 CATH_FALL 110.00 5041 SRANANAGH 110.00 1	Non-firm
Clogher Wind	72	1701 CATH_FALL 110.00 5041 SRANANAGH 110.00 1	Non-firm
Bellacorick	3.8	1931 CUNGHILL 110.00 4981 SLIGO 110.00 1	Non-firm
Firlough Wind	75.6	2521 FLAGFORD 110.00 4981 SLIGO 110.00 1	Non-firm
Dalton Solar	4	N/A	Firm

Reinforced System – Partial Firm Access

Due to the level of constraint and quantity of awarded firm access, there is no additional partial firm access available on the reinforced system. 273 MW of committed wind generation will remain non-firm and will be re-assessed in subsequent firm access runs.

Summary

Table 16: North-West summary of the firm access analysis.

Station	Non-firm (MW)	2024 Decision	2024 Partial Decision	Reinforced System Decision	Reinforced System Partial Decision
Corderry Wind	16.35	Non-firm	Non-firm	Non-firm	Non-firm
Gortawee Wind	3.35	Non-firm	Non-firm	Firm	N/A
Garvagh Solar	40	Non-firm	Non-firm	Firm	N/A
Lenalea Wind	30.1	Non-firm	Non-firm	Non-firm	Non-firm
Tievebrack Wind	29.9	Non-firm	Non-firm	Non-firm	Non-firm
Binbane Wind	7.8	Non-firm	Non-firm	Non-firm	Non-firm
C'Fall Wind	37.5	Non-firm	Non-firm	Non-firm	Non-firm
Clogher Wind	72	Non-firm	Non-firm	Non-firm	Non-firm
Bellacorick Wind	3.8	Non-firm	Non-firm	Non-firm	Non-firm
Firlough Wind	75.6	Non-firm	Non-firm	Non-firm	Non-firm
Dalton Solar	4	Non-firm	Non-firm	Firm	N/A
Carrick on S Solar	4	Firm	N/A	N/A	N/A

4.4 Galway

Figure 5 shows the network map of the Galway and the main nodes and circuits in this region.

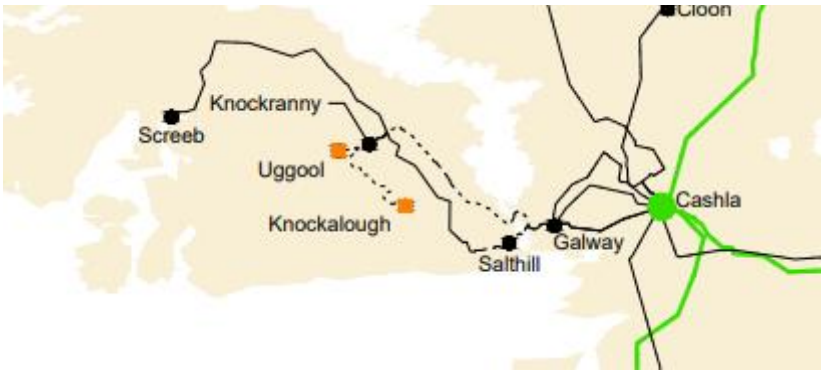

Figure 6: Network Map of the Galway area.

The following circuits experienced overloads in this area. These circuits were analysed in detail in order to determine which non-firm generators are making a material contribution to these overloads.

Table 17: The list of issues from PSSE power flow analysis in the Galway area.

Line	Rating (MVA)	Number of Overload (Hours)	Max. of Highest Loading
1641 CASHLA 110.00 4951 SALTHILL 110.00 1	97	1919	217
2781 GALWAY 110.00 4951 SALTHILL 110.00 1	99	1797	213
1821 CLOON 110.00 35011 LANESBORO_A 110.00 1	99	557	157

Unreinforced System Model - Full Firm Access Assessment

A number of the non-firm generators in this area experience constraints in excess of the 2% firm threshold. As a result, there is no full firm access available to these generators in the unreinforced system. The predominant issue in this region is limitations on the wind power flows through the Galway network.

Firm access is available for renewable generation at a number of nodes as they do not experience constraints above the 2% threshold.

Table 18: Galway Full Firm Access Results for unreinforced system

Station	Non-firm (MW)	Highest Constraint *(Only the worst issue is shown, there may be other issues)*	Result
Knockranny Wind	65.3	1641 CASHLA 110.00 4951 SALTHILL 110.00 1	Non-firm
Cloon Solar	74	1821 CLOON 110.00 35011 LANESBORO_A 110.00 1	Non-firm
Cashla Solar	100	N/A	Firm

Unreinforced System Model – Partial Firm Access Assessment

Due to the level of constraint and the existing level of firm generation on this area, there is no additional partial firm access available in the unreinforced system.

Reinforced System – Full Firm Access Assessment

In the reinforced system, firm access will become available for an additional 74 MW of solar at the Cloon node.

Table 19: Galway area reinforced system firm access assessment results.

Station	Non-firm (MW)	Highest Constraint *(Only the worst issue is shown, there may be other issues)*	Result
Knockranny Wind	65.3	2781 GALWAY 110.00 4951 SALTHILL 110.00 1	Non-firm
Cloon Solar	74	N/A	Firm

Reinforced System – Partial Firm Access Assessment

Due to the level of constraint and existing level of firm generation on this area, there is no additional partial firm access available on the reinforced system. 65.3 MW of committed wind generation will remain non-firm and will be re-assessed in subsequent firm access runs.

Summary

Table 20: Galway area summary of the firm access analysis.

Station	Non-firm (MW)	2024 Decision	2024 Partial Decision	Reinforced System Decision	Reinforced System Partial Decision
Knockranny Wind	65.3	Non-firm	Non-firm	Non-firm	Non-firm
Cloon Solar	74	Non-firm	Non-firm	Firm	N/A
Cashla Solar	100	Firm	Firm	Firm	N/A

4.5 Midlands and Dublin

Figure 5 shows the network map of this area and the main nodes and circuits in this region.

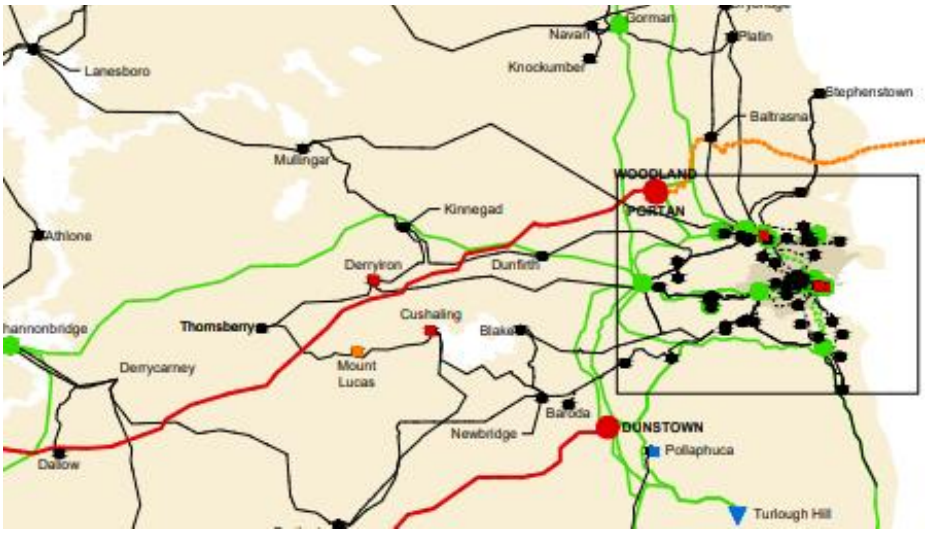

Figure 7: Network Map of midlands and Dublin.

The following circuits experienced overloads in this area. These circuits were analysed in detail in order to determine which non-firm generators are making a material contribution to these overloads.

Table 21: The list of issues from PSSE power flow analysis in the midlands and Dublin.

Line	Rating (MVA)	Number of Overloads (hours)	Highest Loading (%)
1941 CUSHALING 110.00 4201 NEWBRIDGE 110.00 1	134	5080	268
3841 MAYNOOTH A 110.00 5211 TIMAHOE NORT110.00 1	112	2971	261
3851 MAYNOOTH B 110.00 4741 RINAWADE 110.00 1	80	2343	293
4741 RINAWADE 110.00 23019 DUNFIR_T 110.00 1	99	2032	249
5321 THORNSBERRY 110.00 22614 DERRYIRON 110.00 1	99	2972	235
4121 MULGEETH 110.00 23019 DUNFIR_T 110.00 1	104	1241	221
3851 MAYNOOTH B 110.00 13219 BLAKE T 110.00 1	99	2026	198
5211 TIMAHOE NORT110.00 22613 DERRYIRON 110.00 1	104	1907	242
2401 MOUNT LUCAS 110.00 5321 THORNSBERRY 110.00 1	135	1958	186
2261 DERRYIRON 110.00 3381 KINNEGAD 110.00 1	99	2421	260
22613 DERRYIRON 110.00 22614 DERRYIRON 110.00 1	134	1688	224
35011 LANESBORO_A 110.00 66094 SLIABH BAWN 110.00 1	99	1370	171
1331 BLUNDELSTOWN110.00 2041 CORDUFF 110.00 1	130	679	156
1331 BLUNDELSTOWN110.00 4001 MULLINGAR 110.00 1	105	1139	169
4391 PHILIPSTOWN 110.00 4481 PORTLAOISE 110.00 1	136	1536	187
4201 NEWBRIDGE 110.00 13219 BLAKE T 110.00 1	136	1064	151
1941 CUSHALING 110.00 2401 MOUNT LUCAS 110.00 1	136	1126	229
3501 LANESBORO_A 110.00 35011 LANESBORO_A 110.00 1	134	969	171
3842 MAYNOOTH B 220.00 3WNDTR MAY2101 WND 1 1	125	500	183
1221 ATHY 110.00 4481 PORTLAOISE 110.00 1	99	1142	168

2921 HARRISTOWN 110.00 4121 MULGEETH 110.00 1	136	207	145
2521 FLAGFORD 110.00 66094 SLIABH BAWN 110.00 1	99	894	178
1351 BARODA 110.00 4081 MONREAD 110.00 1	99	1726	172
1351 BARODA 110.00 4201 NEWBRIDGE 110.00 1	122	1555	146
1941 CUSHALING 110.00 4391 PHILIPSTOWN 110.00 1	136	938	170
3241 KILTEEL 110.00 3841 MAYNOOTH A 110.00 1	99	286	147
2202 DUNSTOWN 220.00 3342 KELLIS 220.00 1	393	556	133
4711 RICHMOND 110.00 35011 LANESBORO_A 110.00 2	99	215	137
3241 KILTEEL 110.00 4081 MONREAD 110.00 1	134	110	124
1221 ATHY 110.00 1901 CARLOW 110.00 1	99	1433	166

Unreinforced System Model – Full Firm Access Assessment

The majority of the non-firm generators in this area experience constraints in excess of the 2% firm threshold. As a result, there is no full firm access available to these generators in the unreinforced system. The predominant issue in this region is the large volume of connections coupled with the poor ratings of the existing 110 kV circuits. These circuits have low ratings of between 80 MVA and 135 MVA and as they are the main paths for power flows in that area, they experience overloads at times of high renewables.

Firm access is available for renewable generation at a number of nodes as they do not experience constraints above the 2% threshold.

Table 22: Midlands and Dublin Full Firm Access Results for unreinforced system.

Station	Non-firm (MW)	Highest Constraint *(Only the worst issue is shown, there may be other issues)*	Result
Mulgeeth Wind	60	3851 MAYNOOTH B 110.00 4741 RINAWADE 110.00 1	Non-firm
Shanonagh Solar	58.6	3851 MAYNOOTH B 110.00 4741 RINAWADE 110.00 1	Non-firm
Mullingar Solar	28.85	1331 BLUNDELSTOWN110.00 4001 MULLINGAR 110.00 1	Non-firm
Mullingar Wind	97.5	1331 BLUNDELSTOWN110.00 4001 MULLINGAR 110.00 1	Non-firm
Lanesboro Wind	94.95	1331 BLUNDELSTOWN110.00 4001 MULLINGAR 110.00 1	Non-firm
Richmond Solar	12	1331 BLUNDELSTOWN110.00 4001 MULLINGAR 110.00 1	Non-firm
Lanesboro Solar	4	1331 BLUNDELSTOWN110.00 4001 MULLINGAR 110.00 1	Non-firm
Stonestown Wind	105	N/A	Firm
Athlone Solar	8	2521 FLAGFORD 110.00 66094 SLIABH BAWN 110.00 1	Non-firm
Mount Lucas	56.4	1941 CUSHALING 110.00 4201 NEWBRIDGE 110.00 1	Non-firm
Cushaling Wind	50	1941 CUSHALING 110.00 4201 NEWBRIDGE 110.00 1	Non-firm
Portlaoise Solar	4	1941 CUSHALING 110.00 4201 NEWBRIDGE 110.00 1	Non-firm
Derryiron Wind	110.2	3841 MAYNOOTH A 110.00 5211 TIMAHOE NORT110.00 1	Non-firm
Thornsberry Solar	23.8	1941 CUSHALING 110.00 4201 NEWBRIDGE 110.00 1	Non-firm
Dunfirth Solar	17.5	3851 MAYNOOTH B 110.00 4741 RINAWADE 110.00 1	Non-firm
Harristown Solar	42.3	3851 MAYNOOTH B 110.00 4741 RINAWADE 110.00 1	Non-firm
Timahoe North Solar	70	3841 MAYNOOTH A 110.00 5211 TIMAHOE NORT110.00 1	Non-firm
Derryiron Solar	132	3841 MAYNOOTH A 110.00 5211 TIMAHOE NORT110.00 1	Non-firm
Athy Solar	4.99	1941 CUSHALING 110.00 4201 NEWBRIDGE 110.00 1	Non-firm
Newbridge Solar	12	3851 MAYNOOTH B 110.00 13219 BLAKE T 110.00 1	Non-firm
Coolnabacky Solar	80	3261 KILKENNY 110.00 3341 KELLIS 110.00 1	Non-firm
Clonfad Solar	100	3841 MAYNOOTH A 110.00 5211 TIMAHOE NORT110.00 1	Non-firm
Blundelstown Solar	60	1331 BLUNDELSTOWN110.00 2041 CORDUFF 110.00 1	Non-firm

Kilteel Solar	15	3241 KILTEEL 110.00 3841 MAYNOOTH A 110.00 1	Non-firm
Griffinrath Solar	65.5	3842 MAYNOOTH B 220.00 3WNDTR MAY2101 WND 1 1	Non-firm
Monread Solar	8	3241 KILTEEL 110.00 3841 MAYNOOTH A 110.00 1	Non-firm
Shannonbridge Solar	65	N/A	Firm
Somerset Solar	8	N/A	Firm
Glasmore Solar	43.99	N/A	Firm
Finglas Solar	83.42	N/A	Firm

Unreinforced System Model – Partial Firm Access Assessment

20 MW of partial firm access is available for solar generation at Blundelstown and 20 MW of partial firm access is available for solar generation at Griffinrath. Due to level of constraints and existing firm access, there is no partial firm access available at other nodes in this area.

Reinforced System – Full Firm Access Assessment

In the reinforced system, firm access will become available for the majority of non-firm wind and solar generators. These projects will be awarded firm access on the scheduled completion date of the relevant reinforcements.

Table 23: Midlands and Dublin Full Firm Access Results for reinforced system.

Station	Non-firm (MW)	Highest Constraint *(Only the worst issue is shown, there may be other issues)*	Result
Mulgeeth Wind	60	N/A	Firm
Shanonagh Solar	58.6	N/A	Firm
Mullingar Solar	28.85	N/A	Firm
Mullingar Wind	97.5	N/A	Firm
Lanesboro Wind	94.95	N/A	Firm
Richmond Solar	12	N/A	Firm
Lanesboro Solar	4	N/A	Firm
Athlone Solar	8	N/A	Firm
Mount Lucas	56.4	1941 CUSHALING 110.00 4201 NEWBRIDGE 110.00 1	Non-firm
Cushaling Wind	50	1941 CUSHALING 110.00 4201 NEWBRIDGE 110.00 1	Non-firm
Portlaoise Solar	4	N/A	Firm
Derryiron Wind	110.2	1941 CUSHALING 110.00 4201 NEWBRIDGE 110.00 1	Non-firm
Thornsberry Solar	23.8	N/A	Firm
Dunfirth Solar	17.5	N/A	Firm
Harristown Solar	42.3	N/A	Firm
Timahoe North Solar	70	N/A	Firm
Derryiron Solar	132	N/A	Firm
Athy Solar	4.99	N/A	Firm
Newbridge Solar	12	N/A	Firm
Coolnabacky Solar	80	N/A	Firm
Clonfad Solar	100	N/A	Firm
Blundelstown Solar	60	N/A	Firm
Kilteel Solar	15	N/A	Firm
Griffinrath Solar	65.5	N/A	Firm
Monread Solar	8	N/A	Firm

Reinforced System – Partial Firm Access Assessment

There is 40 MW of partial firm access for wind generation at Mount Lucas.

Summary Midlands

Table 24: Midlands and Dublin area summary of the firm access analysis.

Station	Non-firm (MW)	2024 Decision	2024 Partial Decision	Reinforced System Decision	Reinforced System Partial Decision
Mulgeeth Wind	60	Non-firm	Non-firm	Firm	N/A
Shanonagh Solar	58.6	Non-firm	Non-firm	Firm	N/A
Mullingar Solar	28.85	Non-firm	Non-firm	Firm	N/A
Mullingar Wind	97.5	Non-firm	Non-firm	Firm	N/A
Lanesboro Wind	94.95	Non-firm	Non-firm	Firm	N/A
Richmond Solar	12	Non-firm	Non-firm	Firm	N/A
Lanesboro Solar	4	Non-firm	Non-firm	Firm	N/A
Stonestown Wind	105	Firm	N/A	N/A	N/A
Athlone Solar	8	Non-firm	Non-firm	Firm	N/A
Shannonbridge Solar	65	Firm	N/A	N/A	N/A
Somerset Solar	8	Firm	N/A	N/A	N/A
Mount Lucas Wind	56.4	Non-firm	Non-firm	Non-firm	Partial Firm
Cushaling Wind	50	Non-firm	Non-firm	Non-firm	Non-firm
Portlaoise Solar	4	Non-firm	Non-firm	Firm	N/A
Derryiron Wind	110.2	Non-firm	Non-firm	Non-firm	Non-firm
Thornsberry Solar	23.8	Non-firm	Non-firm	Firm	N/A
Dunfirth Solar	17.5	Non-firm	Non-firm	Firm	N/A
Harristown Solar	42.3	Non-firm	Non-firm	Firm	N/A
Timahoe North Solar	70	Non-firm	Non-firm	Firm	N/A
Derryiron Solar	132	Non-firm	Non-firm	Firm	N/A
Athy Solar	4.99	Non-firm	Non-firm	Firm	N/A
Newbridge Solar	12	Non-firm	Non-firm	Firm	N/A
Coolnabacky Solar	80	Non-firm	Non-firm	Firm	N/A
Clonfad Solar	100	Non-firm	Non-firm	Firm	N/A
Blundelstown Solar	60	Non-firm	Partial Firm	Firm	N/A
Kilteel Solar	15	Non-firm	Non-firm	Firm	N/A
Griffinrath Solar	65.5	Non-firm	Partial Firm	Firm	N/A
Monread Solar	8	Non-firm	Non-firm	Firm	N/A
Glasmore Solar	43.99	Firm	N/A	N/A	N/A
Finglas Solar	83.42	Firm	N/A	N/A	N/A

4.6 North-East

Figure 8 shows the network map of the North-East and the main nodes and circuits in this region.

Figure 8: Network Map of the North-East

The following circuits experienced overloads in this area. These circuits were analysed in detail in order to determine which non-firm generators are making a material contribution to these overloads.

Table 25: The list of issues from PSSE power flow analysis in the North-East.

Line	Rating (MVA)	Number of Overloads (hours)	Highest Loading (%)
3521 LOUTHA 110.00 4781 RATRUSSAN 110.00 1	95	1626	189
4501 PLATIN 110.00 4691 OLDBRIDGE 110.00 1	105	324	153

Unreinforced System Model – Network Firm Access

Following in-depth analysis of the non-firm wind and solar in the region it was determined that the majority of projects were not having a material contribution the overloads. Firm access is available for renewable generation at these nodes.

A number of the non-firm generators in this area experience constraints in excess of the 2% firm threshold. This is as a result of specific contingencies which would result in excessive power flows on circuits with low ratings. As a result, there is no full firm access available to these generators in the unreinforced system.

Table 26: North-East 2024 full firm access assessment results.

Station	Non-firm (MW)	Highest Constraint *(Only the worst issue is shown, there may be other issues)*	Result
Baltrasna Solar	17.14	N/A	Firm
Deenes Solar	85	N/A	Firm
Drybridge Solar	15.98	N/A	Firm
Dundalk Solar	4.99	N/A	Firm
Garballagh Solar	48	4501 PLATIN 110.00 4691 OLDBRIDGE 110.00 1	Non-Firm
Gallanstown Solar	50.5	4501 PLATIN 110.00 4691 OLDBRIDGE 110.00 1	Non-Firm
Lislea Wind	48.8	N/A	Firm
Louth Solar	50	N/A	Firm
Navan Solar	11.45	N/A	Firm
Shankill Solar	11	N/A	Firm

Unreinforced System Model – Partial Firm Access

There is no partial firm access available in the unreinforced system.

Reinforced System – Firm Access Assessment

In the reinforced system, firm access will become available for all non-firm generators in the North-East. These projects will be awarded firm access on the scheduled completion date of the relevant reinforcements.

Reinforced System – Partial Firm Access Assessment

As full firm access is granted for all non-firm generators, a partial firm access assessment is not required in this area.

Table 27: North-East summary of the firm access analysis.

Station	Non-firm (MW)	2024 Decision	2024 Partial Decision	Reinforced System Decision	Reinforced System Partial Decision
Lislea Wind	48.8	Firm	N/A	N/A	N/A
Shankill Solar	11	Firm	N/A	N/A	N/A
Garballagh Solar	48	Non-firm	Non-firm	Firm	N/A
Navan Solar	11.45	Firm	N/A	N/A	N/A
Louth Solar	50	Firm	N/A	N/A	N/A
Dundalk Solar	4.99	Firm	N/A	N/A	N/A
Drybridge Solar	15.98	Firm	N/A	N/A	N/A
Baltrasna Solar	17.14	Firm	N/A	N/A	N/A
Deenes Solar	85	Firm	N/A	N/A	N/A
Gallanstown Solar	50.5	Non-firm	Non-firm	Firm	N/A

4.7 Conventional Units (All areas)

Conventional units consist of dispatchable generation that operate by burning a fuel source. Unlike renewable generation, conventional units are not subject to a prevailing annual profile. Instead, these units are dispatched as determined by the market or as needed for system reasons. The following circuits experienced overloads attributed to non-firm conventional generation. These circuits were analysed in detail in order to determine which non-firm generators are making a material contribution to these overloads. Conventional units are only granted firm access if there are no constraints observed.

Table 28: The list of issues from PSSE power flow analysis associated with non-firm conventional generators.

Line	Rating (MVA)	Number of Overloads (hours)	Highest Loading (%)
1742 CARRICKMINES220.00 3122 IRISHTOWN 220.00 1	593	<100	136
3082 INCHICORE 220.00 3122 IRISHTOWN 220.00 1	562	2656	164
4472 POOLBEG SOUT220.00 17431 CKMN_PST 220.00 1	267	787	188
1392 CASTLELOST 220.00 4943 SHANNONBRIDG220.00 1	268	<100	113
1392 CASTLELOST 220.00 3852 MAYNOOTH A 220.00 1	268	<100	112
3463 GLANSILLAGH 220.00 34620 KILPADDOGE 220.00 1	645	<100	153
3463 GLANSILLAGH 220.00 5142 TARBERT 220.00 1	645	<100	103
3462 KILPADDOGE 220.00 5142 TARBERT 220.00 2	434	<100	212

Unreinforced System Model - Full Firm Access Assessment

Firm access is available for a number of generators in the unreinforced system. These generators tend to be located in areas of high demand or connected to high capacity 220 kV circuits (or both). A number of generators contribute to specific overloads in close proximity to their connections. As a result, there is no full firm access available to these generators in the unreinforced system.

Table 29: Conventional units 2024 firm access assessment results.

Station	Non-firm (MW)	Highest Constraint *(Only the worst issue is shown, there may be other issues)*	Results
Barnakyle Conventional	100	N/A	Firm
Poolbeg Conventional	63.5	N/A	Firm
Irishtown Conventional	63.5	3082 INCHICORE 220.00 3122 IRISHTOWN 220.00 1	Non-firm
Knockfinglas Conventional	600	3462 KILPADDOGE 220.00 5142 TARBERT 220.00 2	Non-firm
Castlelost Conventional	275	1392 CASTLELOST 220.00 4943 SHANNONBRIDG220.00 1	Non-firm
Cuileen Conventional	100	N/A	Firm
Corduff Conventional	63.5	N/A	Firm
Derrygreenagh Conventional	100	N/A	Firm
Kilshane Conventional	293	N/A	Firm
Castleview Conventional	4	N/A	Firm

Unreinforced System Model - Partial Firm Access Post-processing

240 MW of partial firm access is available for generation at Castlelost. Due to level of generation and existing firm access, there is no partial firm access available at other nodes.

Reinforced System – Firm Access Assessment

There are currently no committed projects in the NDP that alleviate the identified issues for the non-firm conventional generation. Therefore, there is no additional firm access available on the reinforced system.

Reinforced System – Partial Firm Access Assessment

There is no additional partial firm access available on the reinforced system.

Summary

Table 30: Conventional units summary of the firm access analysis.

Station	Non-firm (MW)	2024 Decision	2024 Partial Decision	Reinforced System Decision	Reinforced System Partial Decision
Castlelost Conventional	275	Non-firm	Partial Firm	No Additional Firm Access	No Additional Firm Access
Cuileen Conventional	100	Firm	N/A	N/A	N/A
Knockfinglas Conventional	600	Non-firm	Non-firm	Non-firm	Non-firm
Barnakyle Conventional	100	Firm	N/A	N/A	N/A
Corduff Conventional	63.5	Firm	N/A	N/A	N/A
Derrygreenagh Conventional	100	Firm	N/A	N/A	N/A
Irishtown Conventional	63.5	Non-firm	Non-firm	Non-firm	Non-firm
Kilshane Conventional	293	Firm	N/A	N/A	N/A
Poolbeg South Conventional	63.5	Firm	N/A	N/A	N/A
Castleview Conventional	4	Firm	N/A	N/A	N/A

4.8 2024 Firm Access Review Summary

The results are summarised in Table 31 and Figure 9 below. In total, 6 GW of non-firm generation was analysed as part of the firm access 2024 review. 2.6 GW can be made firm immediately (or upon completion of grid connection), 280 MW can be made partially firm immediately (or upon completion of grid connection), 2 GW can be made firm upon completion of specific reinforcements and 1.2 GW remains non-firm. The 1.2 GW of generation remaining non-firm will continue to be included in subsequent firm access runs.

Table 31: Summary of the Nodal Constraints

	Firm Unreinforced Network (MW)	Partial Firm Unreinforced Network (MW)	Firm Reinforced Network (MW)	Partial Firm Reinforced Network (MW)	Staying Non-Firm (MW)	Total Made Firm in 2024 Review (MW)
Solar SW	931	0	0	0	0	931
Solar NW	4	0	44	0	0	48
Solar SE	142	0	579	0	0	721
Solar Midland	200	40	707	0	0	947
Solar NE	196	0	99	0	0	294
Solar Galway	100	0	74	0	0	174
Solar Total	1573	40	1502	0	0	3115
Wind SW	120	0	0	0	0	120
Wind NW	0	0	3	0	273	3
Wind SE	0	0	155	0	0	155
Wind Midland	105	0	262	40	177	397
Wind NE	49	0	0	0	0	49
Wind Galway	0	0	0	0	65	0
Wind Total	274	0	411	40	515	725
Conventional	724	240	0	0	699	964
Grand Total	2571	280	1914	40	1213	4805

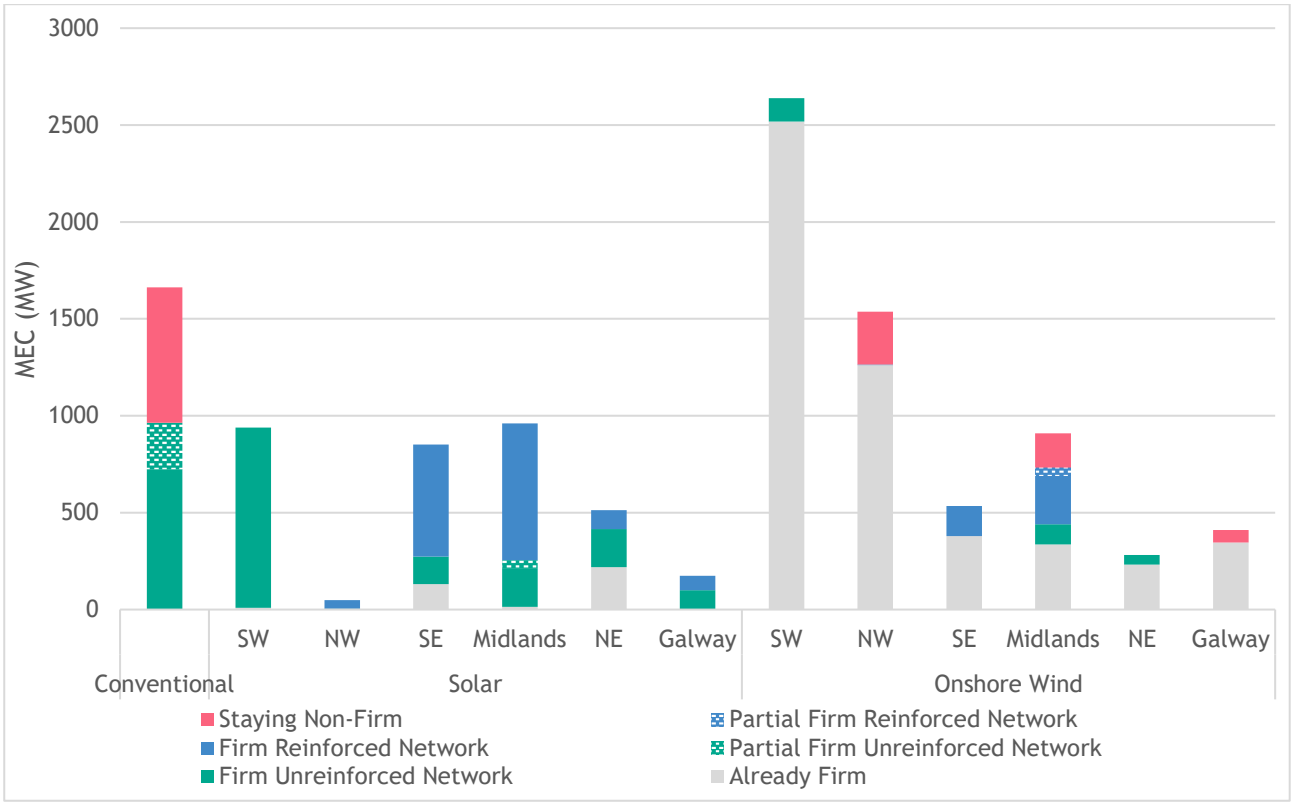

Figure 9: Summary of the firm access results for wind and solar by area.

5 Appendices

5.1 List of Generators assessed in the Firm Access 2024 Run

The following table details the generators that were assessed for firm access in this run. These are generators that are either fully or partially non-firm.

TSO / DSO	Contract Date	Code	Processing Type	Type	MW	Area	Station
DSO	15/09/2020	DG1495	ECP-1	Solar	15.5	J	Griffinrath
DSO	17/08/2020	DG1364	ECP-1	Solar	8.99	E	Knockearagh
DSO	08/03/2022	DG1630	ECP-2.1	Solar	35	H2	Ballyragget
DSO	17/01/2022	DG1608	ECP-2.1	Solar	1.35	G	Navan
DSO	21/03/2022	DG1591	ECP-2.1	Solar	17.5	J	Dunfirth
DSO	10/05/2022	DG1587	ECP-2.1	Solar	1.8	J	Thornsberry
DSO	03/02/2020	DG1584	ECP-1	Solar	3.99	G	Dundalk
DSO		DG1560	non GPA	Solar	10	G	Baltrasna
DSO	13/07/2023	DG1545	ECP-2.2	Solar	3.3	H1	Cahir
DSO	08/03/2022	DG1539	ECP-2.1	Solar	39.99	J	Glasmore
DSO	07/07/2022	DG1517	non GPA	Solar	7.14	G	Baltrasna
DSO	04/03/2022	DG1510	ECP-2.1	Solar	4.95	F	Bandon
DSO	23/03/2022	DG1664	ECP-2.1	Solar	4	D	Ardnacrusha
DSO	04/03/2019	DG1503	non GPA	Solar	4	H1	Ahane
DSO	27/08/2020	DG1673	ECP-1	Solar	20	B	Cloon
DSO	08/03/2023	DG1493	ECP-2.2	Solar	8.5	H2	Ballybeg
DSO	05/12/2022	DG1484	ECP-2.2	Solar	5	I	Barnahely
DSO	13/01/2021	DG1481	ECP-1	Solar	4	G	Drybridge
DSO	22/07/2021	DG1475	non GPA	Solar	4.95	I	Barnahely
DSO	13/01/2021	DG1468	ECP-1	Solar	3.99	G	Drybridge
DSO	07/03/2019	DG1453	non GPA	Solar	4	B	Dalton
DSO	23/09/2022	DG1447	non GPA	Solar	4	J	Glasmore
DSO	01/03/2017	DG1424	non GPA	Solar	4	J	Monread
DSO	09/01/2019	DG1405	non GPA	Solar	12	J	Newbridge
DSO	30/09/2016	DG1403	non GPA	Solar	4	C	Lanesboro
DSO		DG1385	non GPA	Solar	4.99	J	Athy
DSO	05/07/2023	DG1912	ECP-2.2	Solar	13.8	F	Macroom
DSO	17/08/2020	DG1508	non GPA	Solar	4	H1	Ahane
DSO	07/04/2022	DG1862	ECP-2.1	Wind	3	D	Booltiagh
DSO	17/05/2023	DG1909	ECP-2.2	Solar	19	K	Dungarvan
DSO	18/07/2023	DG1904	ECP-2.2	Solar	4.7	H2	Carlow
DSO	22/03/2023	DG1902	ECP-2.2	Solar	9.9	E	Tralee
DSO	22/02/2023	DG1896	ECP-2.2	Solar	7	I	Midleton
DSO	26/07/2023	DG1895	ECP-2.2	Solar	14	J	Thornsberry
DSO	24/01/2022	DG1892	ECP-2.1	Solar	20	H2	Lodgewood
DSO	20/04/2022	DG1886	ECP-2.1	Solar	4.6	H2	Carlow
DSO	16/03/2022	DG1882	ECP-2.1	Solar	4.99	H2	Ballyragget
DSO	03/03/2022	DG1878	ECP-2.1	Solar	6	H2	Kilkenny
DSO	16/03/2022	DG1875	ECP-2.1	Wind	3.6	A	Binbane

TSO / DSO	Contract Date	Code	Processing Type	Type	MW	Area	Station
DSO	18/01/2022	DG1868	ECP-2.1	Solar	1	G	Dundalk
DSO	10/06/2022	DG1867	ECP-2.1	Solar	15	H1	Barrymore
DSO	29/06/2023	DG1658	ECP-2.2	Solar	4	C	Somerset
DSO	30/05/2022	DG1864	ECP-2.1	Wind	25.2	E	Drombeg
DSO	06/01/2022	DG1361	ECP-2.1	Solar	2.1	G	Navan
DSO	15/03/2022	DG1856	ECP-2.1	Wind	16.35	A	Corderry
DSO	17/01/2022	DG1851	ECP-2.1	Wind	6	H2	Carlow
DSO	02/03/2022	DG1850	ECP-2.1	Solar	4	H1	Tipperary
DSO	09/03/2022	DG1840	ECP-2.1	Wind	3.35	A	Gortawee
DSO	10/02/2022	DG1836	ECP-2.1	Wind	1.3	B	Bellacorick
DSO	16/03/2022	DG1832	ECP-2.1	Wind	4.2	A	Binbane
DSO	17/08/2020	DG1808	ECP-1	Wind	4.95	C	Lanesboro
DSO	04/03/2020	DG1797	ECP-1	Wind	3	E	Boggeragh
DSO	06/01/2021	DG1790	ECP-1	Wind	2.5	B	Bellacorick
DSO	08/09/2020	DG1767	ECP-1	Solar	8	H1	Doon
DSO	25/03/2021	DG1715	non GPA	Solar	9.99	F	Coolroe
DSO	20/04/2022	DG1701	ECP-2.1	Solar	16.85	C	Mullingar
DSO	18/05/2022	DG1865	ECP-2.1	Wind	10.2	D	Booltiagh
DSO	17/06/2019	DG1128	non GPA	Solar	4	H1	Nenagh
DSO	18/05/2018	DG1373	non GPA	Solar	4	G	Drybridge
DSO	26/03/2018	DG1164	non GPA	Solar	4	H2	Kilkenny
DSO	01/09/2021	DG1162	non GPA	Solar	4	J	Monread
DSO	08/10/2020	DG1159	non GPA	Solar	5.8	H1	Ballydine
DSO	15/06/2016	DG1156	non GPA	Solar	4	J	Thornsberry
DSO	09/08/2016	DG1150	non GPA	Solar	4	J	Portlaoise
DSO	19/02/2019	DG1147	non GPA	Solar	4	H2	Banoge
DSO	25/07/2017	DG1146	non GPA	Solar	4	H2	Kilkenny
DSO	25/03/2021	DG1145	ECP-1	Solar	4	H2	Carlow
DSO	23/07/2020	DG1143	ECP-1	Solar	4.95	F	Bandon
DSO	02/06/2021	DG1142	non GPA	Solar	4.95	I	Kilbarry
DSO	15/07/2021	DG1141	non GPA	Solar	4.95	I	Trabeg
DSO	29/07/2020	DG1166	ECP-1	Solar	4	C	Mullingar
DSO	08/10/2020	DG1133	ECP-1	Solar	12	H2	Great Island
DSO	20/04/2022	DG1167	ECP-2.1	Solar	4	K	Dungarvan
DSO	09/09/2016	DG1127	non GPA	Solar	4	C	Mullingar
DSO	30/08/2019	DG1124	ECP-1	Solar	4	G	Navan
DSO	26/04/2017	DG1123	non GPA	Solar	4	C	Mullingar
DSO	22/04/2021	DG1119	non GPA	Solar	4.95	E	Mallow
DSO	23/07/2020	DG1117	ECP-1	Solar	4.95	I	Cow Cross
DSO	02/06/2021	DG1104	non GPA	Solar	4.95	I	Kilbarry
DSO	12/01/2021	DG1102	ECP-2.1	Solar	4.95	F	Bandon
DSO	02/06/2021	DG1101	non GPA	Solar	4.95	E	Glenlara
DSO	07/01/2022	DG1084	ECP-2.1	Wind	39.99	H2	Arklow
DSO	17/06/2021	DG1080	ECP-1	Solar	3.95	I	Midleton
DSO	10/06/2021	DG1079	ECP-1	Solar	3.95	K	Butlerstown
DSO	14/01/2021	DG1074	ECP-1	Solar	5.95	F	Bandon
DSO	08/09/2020	DG1138	ECP-1	Solar	8	H1	Cahir
DSO	03/02/2020	DG1275	non GPA	Solar	8.42	J	Finglas

TSO / DSO	Contract Date	Code	Processing Type	Type	MW	Area	Station
DSO	14/10/2020	DG1359	non GPA	Solar	3.99	G	Drybridge
DSO	17/08/2020	DG1358	non GPA	Solar	8	D	Drumline
DSO	14/12/2021	DG1353	non GPA	Solar	25	J	Griffinrath
DSO	07/10/2016	DG1315	non GPA	Solar	15	J	Kilteel
DSO	17/01/2017	DG1311	non GPA	Solar	4	E	Limerick
DSO	05/11/2019	DG1295	ECP-1	Solar	9	H2	Crane
DSO	23/07/2020	DG1294	ECP-1	Solar	4	D	Drumline
DSO	07/10/2016	DG1293	non GPA	Biogas / AD	4	I	Castleview
DSO	28/05/2021	DG1292	non GPA	Solar	4	E	Trien
DSO	11/12/2019	DG1290	ECP-1	Solar	4	H2	Banoge
DSO	26/09/2017	DG1288	non GPA	Solar	4	C	Somerset
DSO	19/02/2020	DG1287	ECP-1	Solar	4	C	Athlone
DSO	25/04/2016	DG1165	non GPA	Solar	4	C	Carrick on Shannon
DSO	28/09/2016	DG1278	non GPA	Solar	4	B	Cloon
DSO	17/01/2023	DG1919	ECP-2.2	Solar	8.5	F	Bandon
DSO	20/07/2021	DG1260	ECP-1	Solar	8	C	Richmond
DSO	22/12/2020	DG1250	ECP-1	Solar	3.99	K	Dungarvan
DSO	24/02/2017	DG1241	non GPA	Solar	4	C	Athlone
DSO	10/09/2020	DG1229	ECP-1	Solar	15	K	Dungarvan
DSO	07/11/2016	DG1220	non GPA	Solar	4	E	Oughtragh
DSO	03/12/2020	DG1208	ECP-1	Solar	4	E	Tralee
DSO	12/05/2017	DG1200	non GPA	Solar	4	G	Navan
DSO	10/07/2020	DG1188	ECP-1	Solar	4	H2	Arklow
DSO	15/12/2016	DG1186	non GPA	Solar	4	G	Shankill
DSO	22/04/2022	DG1175	ECP-2.1	Solar	4.95	K	Dungarvan
DSO	15/09/2020	DG1171	non GPA	Solar	4	H1	Cahir
DSO	01/07/2016	DG1168	non GPA	Solar	4	C	Richmond
DSO	28/05/2018	DG1281	non GPA	Solar	4	J	Thornsberry
TSO	18/02/2022	TG443	ECP-2.1	Wind	18	B	Knockranny
TSO	04/03/2022	TG435	ECP-2.1	Solar	50.5	G	Gallanstown
TSO	21/01/2022	TG434	ECP-2.1	Solar	47	J	Derryiron
TSO	18/01/2022	TG433	ECP-2.1	Solar	66.56	H1	Timoney
TSO	25/01/2022	TG432	ECP-2.1	solar	47.1	H2	Arklow
TSO	18/10/2021	TG431	ECP-2.1	Wind	88	C	Mullingar
TSO	09/09/2021	TG430	ECP-2.1	Wind	49.5	H2	Garrintaggart
TSO	13/10/2021	TG429	ECP-2.1	Wind	60	J	Mulgeeth
TSO	06/08/2021	TG428	ECP-2.1	Wind	56.4	J	Mount Lucas
TSO	18/10/2021	TG427	ECP-2.1	Wind	50	J	Cushaling
TSO	26/01/2022	TG423	ECP-2.1	Solar	58.6	C	Shanonagh
TSO	13/08/2020	TG328	ECP-1	Solar	85	G	Deenes
TSO	01/12/2021	TG418	ECP-2.1	Solar	87	I	Lysaghtstown
TSO	31/01/2022	TG445	ECP-2.1	wind	42	E	Ballyvouskil
TSO	07/03/2022	TG416	ECP-2.1	Solar	55	I	Raffeen
TSO	05/04/2022	TG410	ECP-2.1	Solar	101.1	H2	Wexford
TSO	25/04/2023	TG407	ECP-2.1	Gas	600	E	Kilpaddoge
TSO	14/01/2022	TG406	ECP-2.1	Wind	110.2	J	Derryiron
TSO	24/01/2022	TG401	ECP-2.1	Wind	47.3	B	Knockranny

TSO / DSO	Contract Date	Code	Processing Type	Type	MW	Area	Station
TSO	05/01/2022	TG400	ECP-2.1	Wind	48.8	G	Lislea
DSO	22/08/2023	DG1910	ECP-2.2	Solar	8.8	H2	Arklow
TSO	09/02/2022	TG392	ECP-2.1	wind	90	C	Lanesboro
DSO	07/07/2023	DG1928	ECP-2.2	Solar	22	H2	Arklow
TSO	06/05/2020	TG369	ECP-1	Wind	29.9	A	Tievebrack
TSO	21/05/2020	TG352	ECP-1	Wind	30.1	A	Lenalea
TSO	24/02/2022	TG422	ECP-2.1	Wind	27.3	B	Firlough
TSO	04/04/2023	TG488	ECP-2.2	Solar	50	B	Cloon
TSO	06/06/2023	TG509	ECP-2.3	Gas	100	J	Derrygreenagh
TSO	05/07/2022	TG501	T-3 2024/25	Gas	63.5	J	Poolbeg
TSO	05/07/2022	TG383	T-3 2024/25	Gas	63.5	J	Irishtown
TSO	16/06/2022	TG500	T-3 2024/25	Gas	63.5	J	Corduff
TSO	31/01/2023	TG498	T-3 2024/25	Gas	293	J	Cruiserath
TSO	06/07/2022	TG496	T-3 2024/25	Gas	275	G	Castlelost
TSO	02/09/2022	TG495	T-3 2024/25	Gas	100	C	Athlone
TSO	02/09/2022	TG494	T-3 2024/25	Gas	100	J	Barnakyle
TSO	27/01/2022	TG444	ECP-2.1	Solar	7	E	Coomagearlahy
TSO	09/04/2023	TG489	ECP-2.2	Solar	100	B	Cashla
TSO	31/01/2022	TG445	ECP-2.1	solar	12.5	E	Ballyvouskil
TSO	20/07/2023	TG484	ECP-2.2	Solar	48	G	Garballagh
TSO	23/08/2023	TG474	ECP-2.2	solar	85	J	Derryiron
TSO	06/06/2023	TG473	ECP-2.2	solar	50	G	Louth
TSO	06/01/2023	TG469	ECP-2.2	Solar	120	E	Charleville
TSO	03/10/2022	TG468	ECP-2.2	Solar	90	H1	Timoney
TSO	20/04/2023	TG466	ECP-2.2	Solar	81	H2	Kellis
TSO	14/03/2023	TG465	ECP-2.2	Wind	9.5	C	Mullingar
TSO	03/08/2023	TG461	ECP-2.2	Solar	25	J	Coolnabacky
TSO	28/02/2023	TG458	ECP-2.2	Solar	16.3	I	Knockraha
TSO	01/08/2023	TG448	ECP-2.2	Solar	75	J	Finglas
TSO	28/11/2022	TG446	ECP-2.2	Wind	105	C	Stonestown
TSO	10/08/2020	TG371	ECP-1	Wind	48.3	B	Firlough
TSO	05/04/2023	TG490	ECP-2.2	Solar	60	D	Coolshamroge
DSO	15/05/2023	DG1943	ECP-2.2	Solar	7	G	Shankill
TSO	13/11/2018	TG044	ECP-1	Wind	7.95	F	Dunmanway
DSO	17/06/2021	DG248	ECP-1	Solar	19	H1	Cahir
DSO	28/08/2023	DG1935	ECP-2.2	Wind	45	H2	Ballyragget
DSO	23/03/2021	DG821	ECP-1	Wind	15	H2	Carlow
DSO	22/12/2020	DG789	ECP-1	Wind	13.8	F	Dunmanway
DSO	09/01/2023	DG1938	ECP-2.2	Solar	6	H2	Waterford
TSO	11/12/2019	TG262	ECP-1	Wind	72	A	Clogher
DSO	17/07/2023	DG1942	ECP-2.2	Solar	18.3	D	Ennis

TSO / DSO	Contract Date	Code	Processing Type	Type	MW	Area	Station
DSO	07/06/2023	DG1934	ECP-2.2	Solar	25	J	Griffinrath
TSO	23/10/2018	TG322	non GPA	Solar	50	E	Drombeg
DSO	29/06/2023	DG1944	ECP-2.2	Solar	4	H2	Kilkenny
DSO	01/08/2023	DG1961	ECP-2.2	Solar	4.95	E	Limerick
DSO	15/05/2023	DG1970	ECP-2.2	Solar	44	H2	Kilkenny
DSO	24/05/2023	DG1971	ECP-2.2	Wind	37.5	A	Cathaleen's Fall
DSO	04/07/2023	DG1979	ECP-2.2	Solar	32.7	K	Butlerstown
DSO	31/01/2020	DG626	ECP-1	Wind	15	D	Booltiagh
TSO	07/09/2018	TG282	non GPA	Solar	55	J	Coolnabacky
TSO	21/12/2018	TG299	non GPA	Solar	50	E	Ballinknockane
TSO	03/09/2020	TG295	ECP-1	Solar	95	K	Rathnaskilloge
TSO	31/07/2020	TG289	ECP-1	Solar	65	C	Shannonbridge
TSO	21/12/2018	TG308	non GPA	Solar	50	H2	Tullabeg
TSO	11/08/2017	TG263	non GPA	Solar	60	J	Blundelstown
TSO	20/08/2018	TG307	non GPA	Solar	42.3	J	Harristown
TSO	20/08/2018	TG284	non GPA	Solar	25.7	I	Knockraha
TSO	09/05/2018	TG278	ECP-2.1	Solar	70	J	Timahoe North
TSO	20/06/2018	TG275	non GPA	Solar	34	E	Clahane
TSO	22/10/2020	TG270	ECP-1	Solar	40	A	Garvagh
TSO	15/10/2020	TG315	ECP-1	Solar	100	J	Kinnegad
TSO	15/09/2023	TG462	ECP-2.2	Solar	50	H2	Effernoge

5.2 Firm Access 2024 Review Generator Results Table

It is important to note that if a generation project is registered in the Integrated Single Electricity Market, the Participant is responsible for contacting the Single Electricity Market Operator (SEMO) at BalancingMarketRegistration@sem-o.com without delay, to confirm any changes to the market registration data. This applies to both fully firm and partially firm capacity.

Additionally, please note that as stated in the FAQ Change Request form, this change is dependent on successful validation by the Market Operator and the Transmission System Operator or Meter Data Provider as appropriate, which may take up to 28 days to implement.

For the avoidance of doubt, it is to be noted that the effective date for any changes to the market registration data will be agreed with SEMO as per the approved process.

Firm access shall only be granted once the permanent connection works are completed.

EirGrid Code	Name	Station	Type	Non-Firm MW	Firm Access 2024 Review Result
DG1495	Confey Solar Park	Griffinrath	Solar	15.5	15.5 MW Firm in 2024
DG1364	Madam's Hill Solar Park	Knockearagh	Solar	8.99	8.99 MW Firm in 2024
DG1630	Parksgrove Solar Farm	Ballyragget	Solar	35	35 MW Firm from 2030
DG1608	Kilkeelan Solar Farm Phase 2	Navan	Solar	1.35	1.35 MW Firm in 2024
DG1591	Dysart PV	Dunfirth	Solar	17.5	17.5 MW Firm from 2029
DG1587	Muiniagh Solar Farm Phase 2	Thornsberry	Solar	1.8	1.8 MW Firm from 2029
DG1584	Willville Solar Park	Dundalk	Solar	3.99	3.99 MW Firm in 2024
DG1560	Hilltown PV	Baltrasna	Solar	10	10 MW Firm in 2024
DG1545	Magherareagh Solar PV Farm	Cahir	Solar	3.3	3.3 MW Firm in 2024
DG1539	Mainscourt Solar	Glasmore	Solar	39.99	39.99 MW Firm in 2024
DG1517	Painestown Hill Solar Farm	Baltrasna	Solar	7.14	7.14 MW Firm in 2024
DG1510	Farrangalway Solar PV Farm	Bandon	Solar	4.95	4.95 MW Firm in 2024
DG1664	Dromsallagh Solar Farm	Ardnacrusha	Solar	4	4 MW Firm in 2024
DG1503	Laghtane Solar Farm	Ahane	Solar	4	4 MW Firm in 2024
DG1673	Cloonascragh Solar	Cloon	Solar	20	20 MW Firm from 2029
DG1493	Ballinaclough Solar	Ballybeg	Solar	8.5	8.5 MW Firm from 2030
DG1484	Leacht Cross Solar Phase 2	Barnahely	Solar	5	5 MW Firm in 2024
DG1481	Cluide Solar	Drybridge	Solar	4	4 MW Firm in 2024
DG1475	Leacht Cross Solar	Barnahely	Solar	4.95	4.95 MW Firm in 2024
DG1468	Stamullen Solar Park	Drybridge	Solar	3.99	3.99 MW Firm in 2024
DG1453	Lisduff Solar Park (Claremorris)	Dalton	Solar	4	4 MW Firm from 2029
DG1447	Featherbed Lane Solar	Glasmore	Solar	4	4 MW Firm in 2024
DG1424	Bodenstown Solar Farm	Monread	Solar	4	4 MW Firm from 2028
DG1405	Dunmurry Springs PV	Newbridge	Solar	12	12 MW Firm from 2028
DG1403	Creevy Solar	Lanesboro	Solar	4	4 MW Firm from 2029
DG1385	Woodstock North Solar Farm	Athy	Solar	4.99	4.99 MW Firm from 2030
DG1912	Berrings Solar Farm	Macroom	Solar	13.8	13.8 MW Firm in 2024
DG1508	Mulkear Solar (formerly Clyduff)	Ahane	Solar	4	4 MW Firm in 2024
DG1862	Gortaheera CM2 Wind Farm	Booltiagh	Wind	3	3 MW Firm in 2024
DG1909	Poulbautia Solar Farm	Dungarvan	Solar	19	19 MW Firm in 2024
DG1904	Coppenagh Solar Park Extension	Carlow	Solar	4.7	4.7 MW Firm from 2030
DG1902	Ballyenaghty Solar Park	Tralee	Solar	9.9	9.9 MW Firm in 2024
DG1896	Ballyduff PV	Midleton	Solar	7	7 MW Firm in 2024
DG1895	Ballyboughlin Solar Farm	Thornsberry	Solar	14	14 MW Firm from 2029
DG1892	The Dell	Lodgewood	Solar	20	20 MW Firm from 2030
DG1886	Coppenagh Solar Farm	Carlow	Solar	4.6	4.6 MW Firm from 2030
DG1882	Loan PV	Ballyragget	Solar	4.99	4.99 MW Firm from 2030

EirGrid Code	Name	Station	Type	Non-Firm MW	Firm Access 2024 Review Result
DG1878	Keatingstown Solar Farm	Kilkenny	Solar	6	6 MW Firm from 2030
DG1875	Cloghheravaddy Wind Farm	Binbane	Wind	3.6	3.6 MW staying non-firm
DG1868	Willville Solar Park Extension	Dundalk	Solar	1	1 MW Firm in 2024
DG1867	Farran South Solar	Barrymore	Solar	15	15 MW Firm in 2024
DG1658	Ardnadoman Solar Farm	Somerset	Solar	4	4 MW Firm in 2024
DG1864	Ballylongford Wind Farm	Drombeg	Wind	25.2	25.2 MW Firm in 2024
DG1361	Friarspark 2	Navan	Solar	2.1	2.1 MW Firm in 2024
DG1856	Tullynamoyle Wind Farm 5	Corderry	Wind	16.35	16.35 MW staying non-firm
DG1851	Bilboa Wind Farm Ext	Carlow	Wind	6	6 MW Firm from 2030
DG1850	Ballinalard Solar Farm	Tipperary	Solar	4	4 MW Firm in 2024
DG1840	Tullyhaw Community Wind Turbine	Gortawee	Wind	3.35	3.35 MW Firm from 2029
DG1836	Dooleg More Extension	Bellacorick	Wind	1.3	1.3 MW staying non-firm
DG1832	Bradan Community Wind Turbine	Binbane	Wind	4.2	4.2 MW staying non-firm
DG1808	Roxborough WF	Lanesboro	Wind	4.95	4.95 MW Firm from 2029
DG1797	Carrigcannon (2)	Boggeragh	Wind	3	3 MW Firm in 2024
DG1790	Dooleeg More Wind Farm	Bellacorick	Wind	2.5	2.5 MW staying non-firm
DG1767	Horsepasture Solar Farm (Grian PV)	Doon	Solar	8	8 MW Firm in 2024
DG1715	Garravagh 1 Solar Park	Coolroe	Solar	9.99	9.99 MW Firm in 2024
DG1701	Slanemore PV	Mullingar	Solar	16.85	16.85 MW Firm from 2029
DG1865	Crossmore Wind Farm Ext	Booltiagh	Wind	10.2	10.2 MW Firm in 2024
DG1128	Lisbrien Solar Farm	Nenagh	Solar	4	4 MW Firm in 2024
DG1373	Grangegeeth Solar	Drybridge	Solar	4	4 MW Firm in 2024
DG1164	Ballytobin Solar PV	Kilkenny	Solar	4	4 MW Firm from 2030
DG1162	Kerdiffstown PV	Monread	Solar	4	4 MW Firm from 2028
DG1159	Carrick Solar	Ballydine	Solar	5.8	5.8 MW Firm in 2024
DG1156	Muinagh Solar Farm	Thornsberry	Solar	4	4 MW Firm from 2029
DG1150	Shanderry Solar Farm	Portlaoise	Solar	4	4 MW Firm from 2029
DG1147	Courtown Solar Farm (previously Coolnastudd)	Banoge	Solar	4	4 MW Firm from 2030
DG1146	Castlekelly Solar PV Farm	Kilkenny	Solar	4	4 MW Firm from 2030
DG1145	Kilcarrig Solar PV Farm	Carlow	Solar	4	4 MW Firm from 2030
DG1143	Garryndruig	Bandon	Solar	4.95	4.95 MW Firm in 2024
DG1142	Drumgarriff South	Kilbarry	Solar	4.95	4.95 MW Firm in 2024
DG1141	Shanagraigue	Trabeg	Solar	4.95	4.95 MW Firm in 2024
DG1166	Tullynally Estate	Mullingar	Solar	4	4 MW Firm from 2029
DG1133	Ballyedock	Great Island	Solar	12	12 MW Firm from 2030
DG1167	Cooltubbrid West Solar Farm	Dungarvan	Solar	4	4 MW Firm in 2024
DG1127	Liss Solar Farm (prev Lands at Liss)	Mullingar	Solar	4	4 MW Firm from 2029
DG1124	Friarspark solar	Navan	Solar	4	4 MW Firm in 2024
DG1123	Marlinstown Solar Farm (prev Russellstown)	Mullingar	Solar	4	4 MW Firm from 2029
DG1119	Crossfield	Mallow	Solar	4.95	4.95 MW Firm in 2024
DG1117	Ballynacrusha	Cow Cross	Solar	4.95	4.95 MW Firm in 2024
DG1104	Coolyduff	Kilbarry	Solar	4.95	4.95 MW Firm in 2024
DG1102	Currabeha	Bandon	Solar	4.95	4.95 MW Firm in 2024
DG1101	Dromalour	Glenlara	Solar	4.95	4.95 MW Firm in 2024
DG1084	Ballymanus	Arklow	Wind	39.99	39.99 MW Firm from 2030
DG1080	Tead More Solar (Meelshane)	Midleton	Solar	3.95	3.95 MW Firm in 2024
DG1079	Keiloge Solar	Butlerstown	Solar	3.95	3.95 MW Firm from 2030
DG1074	Callatrim South Solar Farm (Kilcawha)	Bandon	Solar	5.95	5.95 MW Firm in 2024
DG1138	Monroe East Solar Farm	Cahir	Solar	8	8 MW Firm in 2024
DG1275	Bullstown Solar Farm	Finglas	Solar	8.42	8.42 MW Firm in 2024
DG1359	Beaulieu PV	Drybridge	Solar	3.99	3.99 MW Firm in 2024
DG1358	Clonloghan Solar Park	Drumline	Solar	8	8 MW Firm in 2024

EirGrid Code	Name	Station	Type	Non-Firm MW	Firm Access 2024 Review Result
DG1353	Taghadoe Solar Farm	Griffinrath	Solar	25	4.5 MW Firm in 2024, 25 MW Firm from 2028
DG1315	Threecastles Solar Farm	Kilteel	Solar	15	15 MW Firm from 2028
DG1311	Kilcolman Solar Farm	Limerick	Solar	4	4 MW Firm in 2024
DG1295	Macallian Solar	Crane	Solar	9	9 MW Firm from 2030
DG1294	Firgrove Solar Park	Drumline	Solar	4	4 MW Firm in 2024
DG1293	Hoffman Renewable Bioenery Plant	Castleview	Biogas / AD	4	4 MW Firm in 2024
DG1292	Shanacool (Trienearagh) Solar Park	Trien	Solar	4	4 MW Firm in 2024
DG1290	Gorey Solar	Banoge	Solar	4	4 MW Firm from 2030
DG1288	Ballycrissane Solar Farm	Somerset	Solar	4	4 MW Firm in 2024
DG1287	Rooaun Solar	Athlone	Solar	4	4 MW Firm from 2029
DG1165	Rathleg Solar Farm	Carrick on Shannon	Solar	4	4 MW Firm in 2024
DG1278	Barnderg Solar Farm	Cloon	Solar	4	4 MW Firm from 2029
DG1919	Finnis PV	Bandon	Solar	8.5	8.5 MW Firm in 2024
DG1260	Cleggill Solar Park	Richmond	Solar	8	8 MW Firm from 2029
DG1250	Foxhall PV	Dungarvan	Solar	3.99	3.99 MW Firm in 2024
DG1241	Shannagh Beg Solar Farm	Athlone	Solar	4	4 MW Firm from 2029
DG1229	Drumroe East Solar Farm	Dungarvan	Solar	15	15 MW Firm in 2024
DG1220	Maine Solar	Oughtragh	Solar	4	4 MW Firm in 2024
DG1208	Dromroe Solar	Tralee	Solar	4	4 MW Firm in 2024
DG1200	Kilkeelan Solar Farm	Navan	Solar	4	4 MW Firm in 2024
DG1188	Templerainey East Solar Farm	Arklow	Solar	4	4 MW Firm from 2030
DG1186	Carrickabane Solar Farm	Shankill	Solar	4	4 MW Firm in 2024
DG1175	Kilcannon	Dungarvan	Solar	4.95	4.95 MW Firm in 2024
DG1171	Farranlahassery Solar	Cahir	Solar	4	4 MW Firm in 2024
DG1168	Lisnageeragh Solar Farm	Richmond	Solar	4	4 MW Firm from 2029
DG1281	Lehinch Solar Farm	Thornsberry	Solar	4	4 MW Firm from 2029
TG443	Ardderroo Wind Farm Extension	Knockranny	Wind	18	18 MW staying non-firm
TG435	Harlockstown Solar	Gallanstown	Solar	50.5	50.5 MW Firm from 2025
TG434	Clonin North Solar Farm	Derryiron	Solar	47	47 MW Firm from 2029
TG433	Erkina Solar Park	Timoney	Solar	66.56	66.56 MW Firm in 2024
TG432	North Arklow Solar & Battery	Arklow	solar	47.1	47.1 MW Firm from 2030
TG431	Coole Wind Farm	Mullingar	Wind	88	88 MW Firm from 2029
TG430	Pinewoods Wind Farm	Garrintaggart	Wind	49.5	49.5 MW Firm from 2030
TG429	Drehid Wind Farm	Mulgeeth	Wind	60	60 MW Firm from 2029
TG428	Moanvane Wind Farm	Mount Lucas	Wind	56.4	40 MW Firm from 2030, 16.4 MW staying non-firm
TG427	Cushaling Wind Farm	Cushaling	Wind	50	50 MW staying non-firm
TG423	Clondardis Solar	Shanonagh	Solar	58.6	58.6 MW Firm from 2029
TG328	Gaskinstown Solar Farm	Deenes	Solar	85	85 MW Firm in 2024
TG418	Lysaghtstown Solar Park	Lysaghtstown	Solar	87	87 MW Firm in 2024
TG445	Knocknamork Wind & Solar Farm	Ballyvouskil	wind	42	42 MW Firm in 2024
TG416	Ballinrea Solar Park	Raffeen	Solar	55	55 MW Firm in 2024
TG410	Tracystown Solar Park	Wexford	Solar	101.1	101.1 MW Firm from 2030
TG407	Knockfinglas CHP	Kilpaddoge	Gas	600	600 MW staying non-firm
TG406	Yellow River Wind Farm	Derryiron	Wind	110.2	110.2 MW staying non-firm
TG401	Knockranny Wind Farm	Knockranny	Wind	47.3	47.3 MW staying non-firm
TG400	Drumlins Park Wind Farm	Lislea	Wind	48.8	48.8 MW Firm in 2024
DG1910	Coolboy Solar Farm	Arklow	Solar	8.8	8.8 MW Firm from 2030
TG392	Derryadd Wind Farm	Lanesboro	wind	90	90 MW Firm from 2029
DG1928	Johnstown North PV	Arklow	Solar	22	22 MW Firm from 2030

EirGrid Code	Name	Station	Type	Non-Firm MW	Firm Access 2024 Review Result
TG369	Mully Graffy Wind Farm (Formerly Kilgorman)	Tievebrack	Wind	29.9	29.9 MW staying non-firm
TG352	Lenalea Wind Farm	Lenalea	Wind	30.1	30.1 MW staying non-firm
TG422	Firlough Wind Farm Extension	Firlough	Wind	27.3	27.3 MW staying non-firm
TG488	Barnacurragh Solar Park	Cloon	Solar	50	50 MW Firm from 2029
TG509	Derrygreenagh OCGT 100 MW	Derrygreenagh	Gas	100	100 MW Firm in 2024
TG501	Poolbeg Flexgen	Poolbeg	Gas	63.5	63.5 MW Firm in 2024
TG383	Ringsend Flex Gen	Ringsend	Gas	63.5	63.5 MW staying non-firm
TG500	Corduff Flexgen	Corduff	Gas	63.5	63.5 MW Firm in 2024
TG498	Kilshane OCGT	Cruiserath	Gas	293	293 MW Firm in 2024
TG496	Castlelost FlexGen	Castlelost	Gas	275	240 MW Firm from 2024, 35 MW staying non-firm
TG495	Cuilleen Power - GI Athlone - T3	Athlone	Gas	100	100 MW Firm in 2024
TG494	Profile Park	Barnakyle	Gas	100	100 MW Firm in 2024
TG444	Coumaclovane Solar Extension	Coomagearlahy	Solar	7	7 MW Firm in 2024
TG489	Ballymoneen Solar Park	Cashla	Solar	100	100 MW Firm in 2024
TG445	Knocknamork Wind & Solar Farm	Ballyvouskil	solar	12.5	12.5 MW Firm in 2024
TG484	Garballagh2 Solar Farm	Garballagh	Solar	48	48 MW Firm from 2025
TG474	Garr Solar and Storage	Derryiron	solar	85	85 MW Firm from 2029
TG473	Monvallet Hybrid Solar and Battery Farm	Louth	solar	50	50 MW Firm in 2024
TG469	Ballyroe Solar	Charleville	Solar	120	120 MW Firm in 2024
TG468	Erkina Solar Park - Extension	Timoney	Solar	90	90 MW Firm in 2024
TG466	Garreenleen Solar Farm	Kellis	Solar	81	81 MW Firm from 2030
TG465	Coole Wind Farm Extension	Mullingar	Wind	9.5	9.5 MW Firm from 2029
TG461	East Laois Solar Extension	Coolnabacky	Solar	25	25 MW Firm from 2030
TG458	Ballyvatta Solar Extension	Knockraha	Solar	16.3	16.3 MW Firm in 2024
TG448	Fieldstown Solar	Finglas	Solar	75	75 MW Firm in 2024
TG446	Derrinlough Wind Farm	Stonestown	Wind	105	105 MW Firm in 2024
TG371	Firlough Wind Farm	Firlough	Wind	48.3	48.3 MW staying non-firm
TG490	Manusmore Solar Park	Coolshamroge	Solar	60	60 MW Firm in 2024
DG1943	Drumman Solar Farm	Shankill	Solar	7	7 MW Firm in 2024
TG044	Carrigdangan Wind Farm - Phase 2	Dunmanway	Wind	7.95	7.95 MW Firm in 2024
DG248	Ballymacadam Solar	Cahir	Solar	19	19 MW Firm in 2024
DG1935	Farranrory Wind Farm	Ballyragget	Wind	45	45 MW Firm from 2030
DG821	Bilboa (1)	Carlow	Wind	15	15 MW Firm from 2030
DG789	Knockeenbui (1)	Dunmanway	Wind	13.8	13.8 MW Firm in 2024
DG1938	Farranmacedmond Solar Farm	Waterford	Solar	6	6 MW Firm from 2030
TG262	Croaghonagh 1 Windfarm	Clogher	Wind	72	72 MW staying non-firm
DG1942	Lissane West Solar Farm	Ennis	Solar	18.3	18.3 MW Firm in 2024
DG1934	Smithstown	Griffinrath	Solar	25	25 MW Firm from 2028
TG322	Drombeg Solar Park	Drombeg	Solar	50	50 MW Firm in 2024
DG1944	Thomastown Road Solar	Kilkenny	Solar	4	4 MW Firm from 2030
DG1961	Islanduane Solar Farm	Limerick	Solar	4.95	4.95 MW Firm in 2024
DG1970	Clashwilliam Solar	Kilkenny	Solar	44	44 MW Firm from 2030
DG1971	Derrykillew Wind Farm	Cathaleen's Fall	Wind	37.5	37.5 MW staying non-firm
DG1979	Carriglong Solar Park	Butlerstown	Solar	32.7	32.7 MW Firm from 2030
DG626	Crossmore (1)	Booltiagh	Wind	15	15 MW Firm in 2024
TG282	East Laois Solar Farm (formerly Loughteague)	Coolnabacky	Solar	55	55 MW Firm from 2030
TG299	Ballinknockane Solar Farm	Ballinknockane	Solar	50	50 MW Firm in 2024
TG295	Rathnaskilloge	Rathnaskilloge	Solar	95	95 MW Firm in 2024
TG289	Blackwater Bog Solar 1	Shannonbridge	Solar	65	65 MW Firm in 2024

EirGrid Code	Name	Station	Type	Non-Firm MW	Firm Access 2024 Review Result
TG308	Tullabeg Solar Park	Tullabeg	Solar	50	50 MW Firm from 2030
TG263	Blundelstown	Blundelstown	Solar	60	20 MW Firm in 2024, 60 MW Firm From 2030
TG307	Harristown Solar PV	Harristown	Solar	42.3	42.3 MW Firm from 2029
TG284	Monatooreen Solar	Knockraha	Solar	25.7	25.7 MW Firm in 2024
TG278	Timahoe North	Timahoe North	Solar	70	70 MW Firm from 2029
TG275	Banemore Solar Farm	Clahane	Solar	34	34 MW Firm in 2024
TG270	Glen Solar	Garvagh	Solar	40	40 MW Firm from 2029
TG315	Clonfad Solar	Kinnegad	Solar	100	100 MW Firm from 2029
TG462	Tomsallagh Solar	Effernoge	Solar	50	50 MW Firm from 2030

5.3 Network Delivery Portfolio

https://cms.eirgrid.ie/sites/default/files/publications/NDP-Publication-Q4-2023_0.pdf

https://cms.eirgrid.ie/sites/default/files/publications/NDP-Publication-Q3-2023.pdf

Table 32: Breakdown of the NDP projects considered in the reinforced system study.

Project Code	Project Name	GW3 (CA)	GW6 (PA) 28/06/2024	Energisation (EI) 30/06/2027
CP0466	North South 400 kV Interconnector - RoI**	21/09/2016	28/06/2024	30/06/2027
CP0585	Laois Kilkenny (Coolnabacky) 400 kV Station - New Station & Associated Lines & Station Works	16/04/2008	17/06/2016	02/11/2026
CP0668	Corduff - Ryebrook 110 kV line uprate	29/04/2011	10/05/2013	02/06/2023
CP0724	Thornsberry 110KV Station Busbar uprate	01/03/2011	07/11/2012	30/11/2023
CP0808	Maynooth 220 kV Station Reconfiguration	16/03/2021	06/06/2024	08/03/2024
CP0816	North Connacht 110 kV Project	12/09/2018	20/12/2023	31/03/2028
CP0817	Flagford - Sliabh Bawn 110 kV circuit uprate	18/02/2021	02/06/2022	03/11/2025
CP0835	Coolnabacky - Portlaoise 110 kV line uprate	30/05/2018	26/09/2024	01/12/2025
CP0839	Moy 110 kV Station reconfiguration and busbar uprate	30/09/2014	07/10/2015	29/11/2024
CP0841	Arva - Carrick-on-Shannon 110 kV line uprate	21/05/2020	15/12/2021	30/11/2025
CP0848	Castlebar-Cloon 110 kV Line Uprate-Refurb	16/09/2020	20/12/2023	01/12/2025
CP0866	Great Island - Kellis 220 kV Line Uprate	16/11/2022	30/06/2025	30/11/2029
CP0869	Maynooth - Woodland 220 kV line uprate	15/08/2019	17/12/2020	30/11/2024
CP0905	Louth - Rathrussan 110 kV No 1 Line Uprate	25/05/2016	29/08/2022	30/09/2025
CP0907	Dalton 110 kV Busbar	01/10/2021	06/09/2023	24/11/2026
CP0919	Lanesboro 110 kV Station Redevelopment Project	28/12/2017	30/06/2020	30/11/2029
CP0966	Kildare Meath***	24/03/2021	29/11/2024	22/09/2028
CP0967	Moneypoint 400 kV Series Capacitor	31/08/2015	28/06/2024	31/12/2027
CP0968	Dunstown 400 kV Series Capacitor	15/06/2016	13/12/2023	01/07/2027
CP0969	Oldstreet-Woodland 400 kV Series Capacitor	15/06/2016	13/12/2023	09/08/2027
CP0970	Cross Shannon 400 kV Cable	21/09/2016	16/12/2021	22/05/2026
CP0984	Belcamp Shellybanks 220 kV Cable	01/07/2016	15/07/2020	
CP1000	Lanesboro - Mullingar 110 kV Thermal Uprate	29/01/2021	10/09/2024	30/11/2025
CP1002	Cushaling - Newbridge 110 kV Thermal Uprate	30/03/2023	19/12/2025	30/11/2029
CP1003	Cushaling - Portlaoise 110 kV line uprate	05/07/2023	05/12/2025	30/11/2029
CP1021	East Meath - North Dublin Reinforcement***	07/06/2022	30/06/2025	31/12/2029
CP1023	Letterkenny station redevelopment	17/06/2021	10/09/2024	28/09/2029
CP1078	Lanesboro – Sliabh Bawn 110 KV Line Uprate	18/02/2021	14/02/2024	30/11/2025
CP1079	Binbane - Cathleen's Fall 110 kV Line uprate	29/01/2021	07/06/2023	11/09/2024
CP1100	Finglas - North Wall Cable Replacement***	28/06/2022	19/12/2024	02/07/2029
CP1144	Kinnegad 110 kV station, Derryiron 110 kV bay conductor uprate	22/01/2021	01/12/2021	29/11/2025
CP1146	Carrickmines - Poolbeg 220 kV Cable Replacement***	16/12/2021	18/12/2025	20/06/2029
CP1149	Newbridge - Cushaling 110 kV line, Stations bay conductors and lead-in conductor uprate	22/01/2021	04/11/2021	10/11/2025
CP1150	Inchicore - Poolbeg 2 220 kV Cable Replacement***	16/12/2021	18/12/2025	28/09/2029
CP1155	Glenree - Moy 110 kV Line Uprate	15/04/2021	20/12/2023	30/06/2025
CP1156	Sligo 110 kV Station - Shrananagh 1 & 2 Bay uprates	18/06/2021	04/04/2022	30/11/2025

Project Code	Project Name	GW3 (CA)	GW6 (PA) 28/06/2024	Energisation (EI) 30/06/2027
CP1157	Inchicore - Poolbeg 1 220 kV Cable Replacement***	20/12/2021	18/12/2025	02/08/2029
CP1166	Gorman - Platin 110 kV line uprate	18/03/2021	18/04/2024	24/11/2025
CP1167	Drybridge - Oldbridge - Platin 110 kV line uprate	18/03/2021	27/10/2023	25/11/2025
CP1168	Cashla-Salthill 110 kV Thermal Uprate	18/03/2021	05/06/2024	30/11/2025
CP1170	Newbridge - Portlaoise 110 kV Line uprate	05/08/2021	22/02/2024	26/02/2026
CP1172	Crane - Wexford 110 kV Line uprate	17/06/2021	09/10/2023	30/11/2025
CP1190	Poolbeg 220 kV Station***	16/12/2021	30/10/2024	20/07/2027
CP1191	Cashla-Galway 110 kV cot 1 Line uprate	21/11/2022	30/12/2025	30/11/2029
CP1196	Arklow – Ballybeg – Carrickmines 110 kV Capacity Needs	28/06/2024	01/03/2026	01/12/2030
CP1199	Derryiron - Thornsberry 110 kV Line Uprate	19/11/2021	20/12/2023	25/10/2027
CP1211	Bandon Dunmanway 110 kV circuit thermal capacity	21/01/2022	30/09/2024	27/11/2026
CP1212	Bandon Raffeen 110 kV circuit thermal capacity	28/01/2022	31/12/2024	31/12/2027
CP1216	Poolbeg - North Wall 220 kV Cable Replacement***	31/05/2022	19/09/2024	01/12/2028
CP1223	Bandon 110 kV Busbar Rating Needs	03/05/2023	30/06/2025	03/12/2029
CP1232	Derryiron 110 kV Busbar Uprate	29/04/2022	05/07/2023	31/12/2025
CP1235	Louth - Woodland 220 kV Uprate	28/04/2022	02/06/2025	03/12/2029
CP1238	Arklow 220 kV Station Redevelopment*	20/04/2023	01/09/2025	01/09/2029
CP1242	Great Island 220-110 kV transformer upgrades	07/12/2022	20/12/2023	01/11/2028
CP1275	Cashla-Galway 110 kV 2 Uprating	21/11/2022	30/12/2025	31/12/2029
CP1276	Cashla-Galway 110 kV 3 Uprating	21/11/2022	30/12/2025	31/12/2029
CP1291	Carlow 110 kV Station Busbar Thermal Capacity Need	07/06/2023	20/12/2024	23/11/2029
CP1311	Athlone - Lanesboro 110 kV line uprate	16/02/2023	30/09/2025	30/11/2029
CP1320	Barrymore Cahir Knockraha 110kV Line Uprate	31/07/2022	30/12/2024	01/11/2028
CP1321	Cashla - Dalton 110 kV circuit 1 (DLR)	23/03/2023	20/12/2024	28/11/2025
CP1322	Cathaleens Fall - Coraclassy 110 kV circuit 1 (DLR)	05/04/2023	30/12/2024	28/11/2025
CP1390	Maynooth - Rinawade 110V line uprate	06/06/2023	07/03/2025	01/11/2029
CP1391	Maynooth-Derryiron-Timahoe 110 kV Line Uprate	05/04/2023	30/09/2025	08/11/2029
CP1403	Rinawade - Dunfirth 110 kV uprate	18/05/2023	30/05/2026	28/09/2029

5.4 2023 Firm Access Review

The following tables summarise the results of the 2023 firm access review.

Firm access was allocated to the following generators.

EirGrid Code	Name	Station	Type	Non-Firm MW	Firm Access 2023 Review Result
DG143	Bunnahowen (1)	Bellacorick	Wind	2.55	2.55 MW Firm in 2023
DG254	Carrowleagh (2)	Glenree	Wind	2.65	2.65 MW Firm in 2023
DG634	Lios na Carraige (1)	Meath Hill	Wind	0.017	0.017 MW Firm in 2023
DG240	Tullynamalra (1)	Meath Hill	Wind	2.0392	2.0392 MW Firm in 2023
DG989	Liffey Autoproduction Project	Shankill	Wind	1.6	1.6 MW Firm in 2023
DG1192	Liffey Autoproduction (extension)	Shankill	Wind	1.417	1.417 MW Firm in 2023
DG683	Shalveys Poultry Ltd. (1)	Shankill	Wind	0.017	0.017 MW Firm in 2023
DG195	Cooly (1)	Trillick	Wind	4	4 MW Firm in 2023
DG235	Corvin Wind Turbine	Sorne Hill	Wind	2.1	2.1 MW Firm in 2023
DG243	Meenkeeragh (2)	Sorne Hill	Wind	0.4	0.4 MW Firm in 2023
DG1017	Mossedge Wind Farm	Sorne Hill	Wind	0.5	0.5 MW Firm in 2023
DG864	Grady Joinery	Tonroe	Wind	2.5	2.5 MW Firm in 2023
DG223	Anarget (3)	Cathaleen's Fall	Wind	0.5	0.5 MW Firm in 2023
DG993	Michael Aylward	Waterford	Wind	0.5	0.5 MW Firm in 2023
DG887	Gortnahalla	Thurles	Wind	0.499	0.499 MW Firm in 2023
DG1047	Kilpatrick Wind	Bandon	Wind	0.499	0.499 MW Firm in 2023
DG270	Mounvaun (Mienvee) Wind Farm (2)	Ardnacrusha	Wind	0.19	0.19 MW Firm in 2023
DG324	Garracummer (2)	Cauteen	Wind	1	1 MW Firm in 2023
DG303	Kilberehert (1)	Charleville	Wind	4.5	4.5 MW Firm in 2023
DG1071	Ballon Wind	Carlow	Wind	0.499	0.499 MW Firm in 2023
DG1089	Ballynultagh Wind Farm	Carlow	Wind	0.499	0.499 MW Firm in 2023
DG1045	Moyvane Wind	Trien	Wind	0.499	0.499 MW Firm in 2023
DG870	Burtonstown AP 2	Drybridge	Wind	0.15	0.15 MW Firm in 2023
DG569	Country Crest (1)	Glasmore	Wind	0.5	0.5 MW Firm in 2023
DG1000	DePuy	Barnahely	Wind	2.5	2.5 MW Firm in 2023
DG481	Donaghmede Fr Collins Park	Grange	Wind	0.25	0.25 MW Firm in 2023
DG897	Meade Potato Company	Drybridge	Wind	0.3	0.3 MW Firm in 2023
DG739	Owenstown (1)	Griffinrath	Wind	0.018	0.018 MW Firm in 2023
DG1050	Patrick Costello Wind Turbine	Cahir	Wind	0.495	0.495 MW Firm in 2023
DG257	Rossaveel Wind	Screebe	Wind	3	3 MW Firm in 2023
DG842	St Patricks Missionary Society	Stratford	Wind	0.13	0.13 MW Firm in 2023
DG1066	Tesco Donabate	Glasmore	Wind	0.499	0.499 MW Firm in 2023
DG997	Wind Energy Project (Janssen)	Barnahely	Wind	2	2 MW Firm in 2023
DG233	Ballagh (1)	Trien	Wind	1.3	1.3 MW Firm in 2023
DG1817	Sorrell Island (Glenmore) WF Ext	Booltiagh	Wind	8	8 MW Firm in 2023
TG102	Boggeragh 2	Boggeragh	Wind	47.7	47.7 MW Firm in 2023
DG1798	Esk 2	Boggeragh	Wind	11.9	11.9 MW Firm in 2023
TG83	Clahane (2)	Clahane	Wind	13.8	13.8 MW Firm in 2023
DG321	Glanaruddery 2 (formerly Dromadda More 2)	Cloghboola	Wind	12	12 MW Firm in 2023
DG290	Cleanrath (1)	Coomataggart	Wind	42.64	42.64 MW Firm in 2023
TG34	Grousemount WF	Coomataggart	Wind	8	8 MW Firm in 2023
DG272	Cordal (2)	Cordal	Wind	54	54 MW Firm in 2023
DG261	Scartaglen (2)	Cordal	Wind	1.4	1.4 MW Firm in 2023
DG234a	Mauricetown (Glenduff) Wind Farm	Glenlara	Wind	7.8	7.8 MW Firm in 2023
DG282	Derreenacrinnig West	Ballylickey	Wind	5.82	5.82 MW Firm in 2023
DG405a	Cappagh White 2 & 3 & 4 Merge	Cauteen	Wind	49.08	49.08 MW Firm in 2023

EirGrid Code	Name	Station	Type	Non-Firm MW	Firm Access 2023 Review Result
DG90	Garracummer (1)	Cauteen	Wind	1	1 MW Firm in 2023
DG324	Garracummer (2)	Cauteen	Wind	1	1 MW Firm in 2023
TG84	Bruckana (1)	Lisheen	Wind	39.6	39.6 MW Firm in 2023
TG55a	Lisheen (1a)	Lisheen	Wind	1	1 MW Firm in 2023
TG370	Lisheen 3 WF	Lisheen	Wind	28.8	28.8 MW Firm in 2023
TG389	Cloghan Wind	Derrycarney	Wind	34	34 MW Firm in 2023
DG1035	Gortnacloghy	Trien	Wind	3.14	3.14 MW Firm in 2023
TG256	Kelwin	Coolnanoonagh	Wind	37.05	37.05 MW Firm in 2023
DG191	Knockalough (1)	Knockranny	Wind	29.1	29.1 MW Firm in 2023
TG58	Seecon (1)	Uggool	Wind	105	105 MW Firm in 2023
TG62	Arderoo	Knockranny	Wind	27	27 MW Firm in 2023
DG1012	Arderoo 2	Knockranny	Wind	64.2	64.2 MW Firm in 2023
DG94	Leitir Guingaid & Doire Chrith1 & 2 merge	Salthill	Wind	4.4	4.4 MW Firm in 2023
DG1161	Millvale North PV	Ballybeg	Solar	8	8 MW Firm in 2023
DG1561	Hortland PV	Dunfirth	Solar	14	14 MW Firm in 2023
TG285	Gallanstown Solar	Gallanstown	Solar	119	119 MW Firm in 2023
TG272	Rosspile Solar Farm	Rosspile	Solar	95	95 MW Firm in 2023
TG271	Gillinstown Solar	Garballagh	Solar	95	95 MW Firm in 2023
DG1087	Curraghmartin Solar Park	Waterford	Solar	3.99	3.99 MW Firm in 2023
DG1090	Blusheens Solar Park	Wexford	Solar	7.98	7.98 MW Firm in 2023
DG1172	Davidstown Solar	Wexford	Solar	4.95	4.95 MW Firm in 2023
DG1081	Ballycullane Solar	Great Island	Solar	4.99	4.99 MW Firm in 2023
DG1122	Lurrig Solar	Midleton	Solar	3.6	3.6 MW Firm in 2023
DG1136	Knockglass Solar	Macroom	Solar	4	4 MW Firm in 2023
DG175	Taghart Wind Farm (previously Cregg Road)	Meath Hill	Wind	23.06	23.06 MW Firm in 2023
TG94	Sliabh Bawn (1)	Sliabh Bawn	Wind	58	58 MW Firm in 2024
DG822	AMETS Belmullet (wave)	Bellacorick	Wave	10	10 MW Firm in 2026
DG825	Mayo Renewable Power Biomass CHP	Tawnaghmore	Conventional	49	49 MW Firm in 2026
TG26	Oweninny Power (2)	Srahnakilly	Wind	77	77 MW Firm in 2027
DG101	Faughary (1)	Sligo	Wind	3	3 MW Firm in 2027
TG59A	Killala Wind Farm (Phase 1)	Tawnaghmore	Wind	19.2	19.2 MW Firm in 2027
DG291	Magheramore (1)	Dalton	Wind	40.8	40.8 MW Firm in 2027
DG247	Corvoderry	Bellacorick	Wind	33.9	33.9 MW Firm in 2029
TG71	Oweninny 3	Bellacorick	Wind	50	50 MW Firm in 2029
TG33	Sheskin	Bellacorick	Wind	16.1	16.1 MW Firm in 2029
DG312	Black Lough (1)	Glenree	Wind	12.5	12.5 MW Firm in 2029
DG260	Cronalaght (2)	Ardnagappary	Wind	17.96	17.96 MW Firm in 2029
DG269B	Clogheravaddy (phase 1)	Binbane	Wind	10.8	10.8 MW Firm in 2029
DG269A	Clogheravaddy Wind Farm (Phase 1)	Binbane	Wind	9.2	9.2 MW Firm in 2029
DG407	Corkermore (2)	Binbane	Wind	4.4	4.4 MW Firm in 2029
DG244	Meenachullalan (2)	Binbane	Wind	1.9	1.9 MW Firm in 2029
TG197	Acres (prev. Spaddan (1))	Cathaleen's Fall	Wind	17.5	17.5 MW Firm in 2029
TG262	Croaghonagh (Gate 3)	Clogher	Wind	66.1	66.1 MW Firm in 2029
DG406	Tullynamoyle 3	Corderry	Wind	11.98	11.98 MW Firm in 2029
DG420	Derrysallagh (was Kilronan 2)	Garvagh	Wind	34	34 MW Firm in 2029
DG204	Lettergull	Letterkenny	Wind	20	20 MW Firm in 2029
DG308	Mulreavy Ext (Meenadreen South (2))	Mulreavy	Wind	5.4	5.4 MW Firm in 2029
DG284	Meenaward	Trillick	Wind	6.9	6.9 MW Firm in 2029
TG396	Sceirde Rocks	Moneypoint	Offshore	450	450 MW Firm in 2023
TG397	Oriel	Oriel	Offshore	375	375 MW Firm in 2023
TG398	Codling Wind Park	Poolbeg	Offshore	1450	535 MW Firm in 2023, 1450 MW Firm from 2030

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TG395	Arklow Banks Phase 2	Glenart	Offshore	800	400 MW Firm in 2023, 800 MW Firm from 2030
TG394	Dublin Array	Carrickmines	Offshore	824	412 MW Firm in 2023, 824 MW Firm from 2030
TG393	NISA	Belcamp	Offshore	500	150 MW Firm in 2023, 500 MW Firm from 2030