Enduring Connection Policy 2.3

Solar and Wind Constraints Report: Results for Area F

Version 1.0

24/01/24

EirGrid

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

Revision History						
Revision	**Date**	**Description**	**Originator**	**Reviewer**	**Checker**	**Approver**

Disclaimer

EirGrid has followed accepted industry practice in the collection and analysis of data available. While all reasonable care has been taken in the preparation of this data, EirGrid is not responsible for any loss that may be attributed to the use of this information. Prior to taking business decisions, interested parties are advised to seek separate and independent opinion in relation to the matters covered by this report and should not rely solely upon data and information contained herein. Information in this document does not amount to a recommendation in respect of any possible investment. This document does not purport to contain all the information that a prospective investor or participant in the Single Electricity Market may need.

For queries relating to the document or to request a copy contact:

info@eirgrid.com

Copyright Notice

The Oval, 160 Shelbourne Road, Ballsbridge, Dublin 4, D04 FW28, Ireland

Table of Contents

Document Structure

This document is for customers wishing to see the estimated Total Dispatch Down for Area F. For information on the study assumptions, methodology, abbreviations and terms used for the Constraint Analysis reports, please see the area non-specific Assumptions and Methodology report found on the ECP-2.3 webpage[1].

This document contains two main sections:

Section 1: Results for Area F: outlines the area covered by this report. This section provides a network diagram of Area F and an overview of the results for Area F.

Section 2: Area F Node Results: provides a table of results for every node in the area. This table documents the installed capacity, available energy, surplus, curtailment and constraint for every node in Area F.

[1] https://www.eirgridgroup.com/customer-and-industry/general-customer-information/ecp-2.3-constraint-report/index.xml

Important Note

This ECP-2.3 constraints report presents an estimate of the reduction in available solar and wind generation based on the study assumptions described. The reduction in available generation has been split into three categories for the purposes of this study: surplus, curtailment and constraint.

The treatment of renewable generation under these three categories of generation reduction will be determined by the implementation of Articles 12 and 13 of the EU Regulation 2019/943[2].

The SEMC decision on the 22nd of March 2022[3] (SEM-22-009 Decision Paper on Dispatch, Redispatch and Compensation Pursuant to Regulation EU 2019/943) has been successfully challenged in the High Court ([2023] IEHC 629). Therefore, the detailed design of the implementation of Articles 12 and 13 has yet to be finalised, and may differ from the implementation for constraints used in this study. Therefore, an assumed interpretation has been included in this study, as detailed in this report.

This report uses the term "Total Dispatch Down" to refer to the total reduction in available solar and wind generation i.e. the sum of surplus, curtailment and constraint, and is considered the key indicator for the results. However, it is important to note that the term "dispatch down" is more correctly applicable only to TSO instructions to reduce generation output from a market position, as is the case for curtailment and constraint, and is not necessarily applicable to a generator reducing its own output from its availability to a market position so that supply and demand are balanced, as is the case for surplus.

The term "non-priority" and "not-priority" generators are used synonymously in the report.

The results presented in this report are based on the simulation and modelling assumptions described. The findings are indicative only and this report should in no way be read as a guarantee as to future levels of surplus, curtailment and constraint.

For wind and solar generation, values of Total Dispatch Down that are less than 5% are rounded up to 5% by adjusting the constraints for that generator. This is consistent with the approach used in the ECP-2.1 and ECP-2.2 constraints reports. However, in the ECP-2.3 constraints report, this adjustment to constraints is applied only to non-priority generation and not to priority generation.

[2] https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32019R0943&from=NL

[3] https://www.semcommittee.com/publications/sem-22-009-decision-paper-dispatch-redispatch-and-compensation-pursuant-regulation-eu

1 Results for Area F

1.1 Introduction

This section provides the surplus, curtailment and constraint results for Area F that are estimated by this analysis. There is a total of eight core ECP-2.3 studies and seven sensitivity studies (including without maintenance) presented in this report. The study scenarios and the associated assumptions can be found in the Assumptions and Methodology report. An overview and discussion of the results is provided in this Section. The surplus, curtailment and constraint results for each node in Area F are provided in Section 2 of this report.

1.2 Study Notes

A list of the major study assumptions is provided in the Assumptions and Methodology report. For Area F, there are a number of key assumptions which drive the results, including network outages and capacity factors. These are thus reiterated here. Similarly, it is worth highlighting again the differences between the various components of Total Dispatch Down.

1.2.1 Network Outages

The scenarios in this report are intended to give a view of average long-term levels of surplus, curtailment and constraint, subject to installed generation, demand, interconnection, operational constraints and reinforcement delivery.

The ECP-2.3 constraints forecast analysis applies a similar transmission outage schedule to the ECP-2.2 constraints analysis. This was kept consistent with last year's schedule following positive feedback from industry. This schedule allows a representation of outage impact in each geographical area to be included in the studies.

This representative transmission outage schedule is given in Appendix A of the Assumptions and Methodology report. However, at times, longer duration outages may be required for certain connections, reinforcement works or forced outages, these are not considered in this analysis and may result in higher wind and solar constraints.

1.2.2 Benefit of Capacity Factor

In practice, a specific windfarm may be located at a site with higher wind speeds or may have a better performing type of wind turbine; the result is a higher capacity factor than neighbouring windfarms. This report does not reflect this localised diversity between windfarm sites. In reality, a windfarm with a higher capacity factor may see lower percentage surplus, curtailment or constraint levels than an adjacent windfarm with a lower capacity factor. This is because at times of medium or low wind speed, the high-capacity factor windfarm can generate power when the low-capacity factor windfarm cannot.

1.2.3 Notes on Surplus, Curtailment and Constraint Modelling

1.2.3.1 Surplus

During generation reduction for surplus, a distinction is made between the treatment of priority and non-priority renewable generators, with non-priority generators being dispatched down ahead of priority generators. Within these two categories of generation, surplus is applied pro-rata across the all-island system for all renewable generators in the category.

For any hour of the study, the surplus level will depend on system demand and interconnector flow capacity. In general, surplus is expected to increase with increasing installed renewable capacity.

It is expected that the further interconnection of the all-Ireland network with mainland UK and Europe will decrease the frequency of surplus conditions occurring.

In general, increased interconnector capacity with mainland UK through the EWIC & LirIC projects will not necessarily eliminate surplus generation as solar and wind profiles in mainland UK will largely be in line with those in Ireland. In the Future Grid study year however, when both the Celtic and 2nd Ireland-France interconnectors are connected, there will be a greater export capacity during times of abundant renewable generation to mainland Europe where similar wind and solar generation in Ireland and mainland Europe is not expected.

Therefore, dispatch down due to surplus generation is not expected to occur as frequently once both the Celtic and 2nd Ireland-France interconnectors are connected.

1.2.3.2 Curtailment

In this report, for each hour of the study, the curtailment is shared pro-rata on a system-wide basis with no distinction made between priority and non-priority generators. This means that both curtailment reductions and curtailment increases are shared system wide.

Solar generation has different reported levels of curtailment compared to wind due to different capacity factors and annual profile shapes.

The applied curtailment is broadly constant across the system. However, due to differences in wind and solar profiles and capacity factors between areas, the percentage average curtailment differs between areas.

1.2.3.3 Constraints

During the constraint of renewable generation, a distinction is made between priority and non-priority generators, with non-priority generators being dispatched down ahead of priority generators across the relevant transmission nodes within the subgroup. More details on the approach assumed in this study for the application of constraints on priority and non-priority renewable generation can be found in the main ECP 2.3 Assumptions and Methodology report.

In general, there is a tendency for renewable bulk power to flow towards the demand in Dublin and the interconnectors. These flow patterns are relevant when seeking to understand constraint apportionment in the simulation.

When presented as percentage values, the constraint results look different for solar and wind, as they have a low correlation due to different profile shapes driven by weather patterns.

1.3 Generation Overview

A detailed system-level overview of the renewable generation scenarios used in these studies is given in Section 2 of the area non-specific Assumptions and Methodology report. The distribution of generation in each scenario based on technology, area and node is given in Appendix B of the Assumptions and Methodology report. The node-level installed wind and solar generation for Area F in the "ECP" scenario is given in Table 1-1.

Node	SO	Status	Solar	Wind
Ballylickey	DSO	due to connect		48
Ballylickey	DSO	connected		45
Ballylickey	DSO	connected		8
Bandon	DSO	due to connect	34	
Bandon	DSO	connected		9
Bandon	DSO	connected		4
Dunmanway	DSO	due to connect	5	
Dunmanway	DSO	due to connect		14
Dunmanway	TSO	connected		54
Dunmanway	TSO	due to connect		14
Dunmanway	DSO	connected		31
Dunmanway	DSO	connected		19
Dunmanway	DSO	due to connect		3
Macroom	DSO	due to connect	18	
Macroom	DSO	connected		24
Total			57	273

Table 1-1 Wind and Solar Generation Summary in Area F for Generation Scenario "ECP"

Table 1-2 and Table 1-3 show installed solar and wind generation for Ireland and Area F, and the available solar and wind generation for Area F for each generation scenario.

Solar	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Ireland (MW)	1563	3052	4542	6031	6031	6031
Installed Area F (MW)	27	37	47	57	57	57
Installed Controllable Area F (MW)	27	37	47	57	57	57
Available Controllable Area F (GWh)	32	44	55	67	67	67

Table 1-2- Installed MW and Available GWh for Area F - Solar

Wind	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Ireland (MW)	5104	5678	6253	6827	9901	11827
Installed Area F (MW)	215	235	254	274	274	274
Installed Controllable Area F (MW)	183	201	220	239	239	239
Available Controllable Area F (GWh)	596	656	716	772	772	772

Table 1-3 - Installed MW and Available GWh for Area F - Wind

1.4 Network Overview

Area F, in the south of the country includes a mix of wind and solar generation. A summary of this generation is given in Table 1.1.

The transmission network in Area F and the surrounding area is shown in Figure 1-1. The 220 kV circuits are shown in green and the 110 kV circuits in black. Possible future transmission stations and lines for the connection of new generation are also shown on the map below.

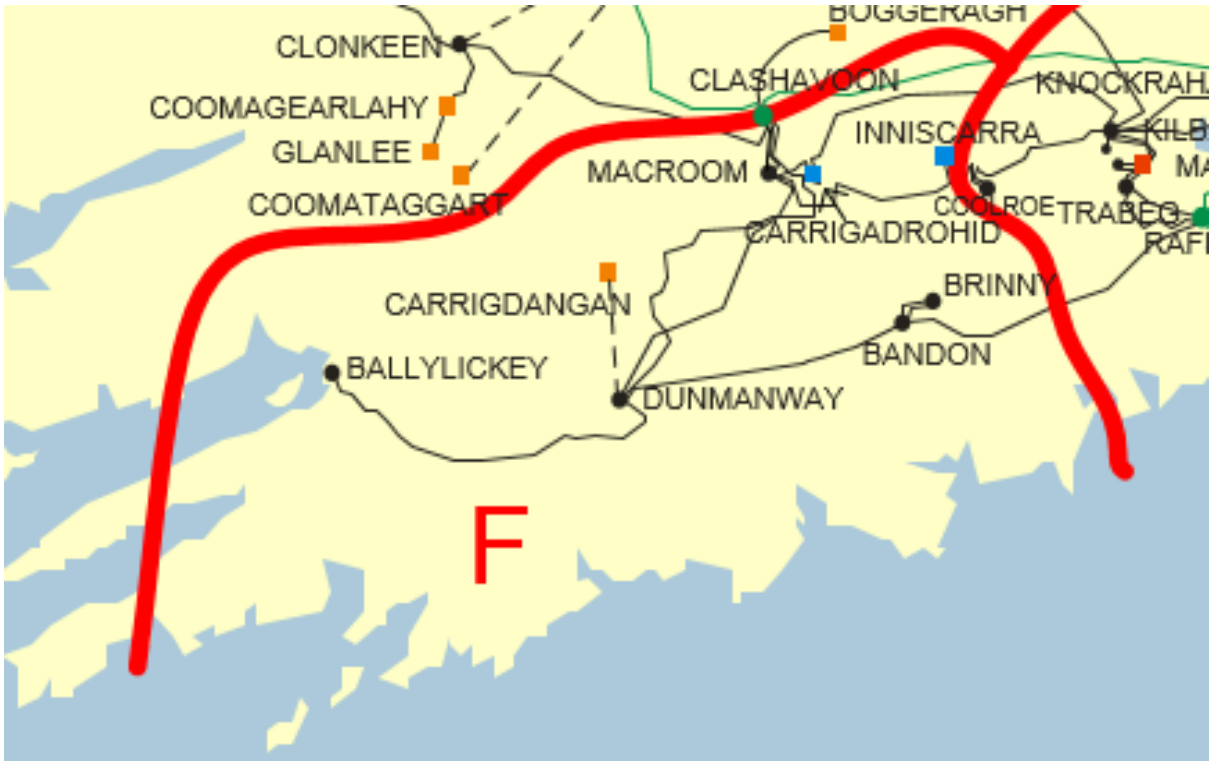

Figure 1-1 Network Map for Area F

At times of high renewable generation, there is a net export of power from Area F, and the dominant power flows tend to be from Area F towards the load centres on the east coast and the interconnectors. These flow patterns are relevant when seeking to understand constraint apportionment in the simulation.

Constraints in Area F can be caused both by local and wider system issues. Constraints in the model are optimised on a system-wide basis so, in theory, an increase in the installed generation in another area can increase constraints in Area F.

Also, the power flowing out of Area F meets and joins with power flows from other areas, as the power flows towards the demand centres and interconnectors. A transmission bottleneck between Area F and the east is shared with power flows coming from other areas.

1.5 Future Grid Sensitivity Scenario

In line with the ECP-2.1 and ECP-2.2 studies, and in response to feedback from industry, the Future Grid scenario is included in the analysis. All reasonable efforts have been made to align the network assumptions in the Future Grid scenario to the Shaping Our Electricity Future (SOEF) 1.1 Roadmap. The network projects included in the study are given in Appendix A of the Assumptions and Methodology report found on the ECP-2.3 webpage. Additionally, any project that has progressed to stage three of the six stage project planning process after the publication of the SOEF 1.1 Roadmap are also included in the Future Grid studies. Note however, that the wind and solar generation portfolio in the ECP-2.3 Future Grid scenario differs from the wind and solar portfolio considered in the SOEF 1.1 Roadmap. This is done to maintain alignment with the ECP-2.3 process. The ECP study scenario includes all wind and solar projects which have applied through connection processes, whereas the SOEF 1.1 study includes generators up to and including ECP-2.3

applicants and then scaled renewable generation capacity to achieve the capacity volumes stated in the Climate Action Plan 23.

The Future Grid study includes a base renewable generation scenario (ECP), along with three sensitivity generation scenarios (ECP + 3.1 GW offshore, ECP + 5 GW offshore and a maintenance sensitivity study). The scenarios with additional offshore wind have been included to show the potential impact of increasing offshore wind on Total Dispatch Down levels.

The demand modelled for the Future Grid scenario is based on the medium demand scenario for 2030 as published in the All-Island Generation Capacity Statement 2023-2032.

The purpose of the Future Grid scenario is to provide insights on the potential impact of the SOEF 1.1 Roadmap network reinforcement portfolio on the dispatch down of wind and solar generators. This study is not intended to be exhaustive; it is not intended to remove all transmission constraints and it does not give individual generators guarantee that their Total Dispatch Down will change to the estimated levels.

1.6 Area F – Average Results

The Total Dispatch Down results for Area F are provided below in Table 1-5 to Table 1-7 and Figure 1-3 to Figure 1-5. These include the breakdown between surplus, curtailment and constraint. The Total Dispatch Down percentages are based on the total available energy. The Total Dispatch Down is the sum of surplus, curtailment and constraint. The node level breakdown of surplus, curtailment and constraint are given in Section 2. The results show that the system level Total Dispatch Down increases with additional installed capacity due to a significant increase in surplus. However, the Total Dispatch Down reduces when the 2028 studies are compared with 2026 and there is a further reduction in the Future Grid scenario owing to increased demand, network reinforcement, interconnection and relaxed system level operational limits.

For each generation type in Area F (solar non-priority, wind non-priority and wind priority), the total installed capacity in MW and total available generation in GWh are given in Table 1-5, Table 1-6 and Table 1-7. The total generation in GWh after dispatch down and the corresponding percentage Total Dispatch Down are also included in the tables for each scenario. Details on the generation and network scenarios are given in Section 2 of the Assumptions and Methodology report.

1.6.1 Offshore Wind Sensitivity Studies

Results for the offshore wind-based sensitivity studies are included, along with results for the core scenarios. The general trend is that with increasing levels of offshore wind, Total Dispatch Down increases due to significant increases in the available wind energy, which in turn leads to increased levels of surplus.

1.6.2 Impact of Article 12 and 13

Higher Total Dispatch Down is observed for non-priority generators due to the impact of the implementation of Article 12 and 13 in the studies, which results in non-priority generators being reduced ahead of priority generators for surplus and constraint reasons. More detail on the Article 12 clause is available in Section 3.6 of the Assumptions and Methodology report.

Another factor that contributes to the higher total dispatch down for non-priority wind and solar units is the proportion of priority to non-priority units within a subgroup. If a subgroup has a high volume of priority wind/solar units to non-priority wind/solar units, this can result in the constraints that would usually be allocated to the priority units only allocated to the non-priority units (due to the grandfathering of constraints). This can result in high constraints for non-priority units within a subgroup.

1.6.3 Future Grid Sensitivity Study

The results of the Future Grid scenario show a notable reduction in Total Dispatch Down over the core study years (2026 and 2028) due to the impact of the SOEF 1.1 Roadmap network reinforcements, increased demand levels, increased interconnection, and the relaxation of operational constraints. However, increases

in installed wind and solar generation, as seen in the offshore wind scenarios, result in rising surplus levels, causing an increase in Total Dispatch Down levels. A detailed breakdown of the Total Dispatch Down components for Area F under the Future Grid scenarios and associated sensitivity case is given in Table 1-5 to Table 1-7. Further node level details can be viewed in Section 2.

1.6.4 Area Subgroups

The constraint forecast study, which is performed using PLEXOS software, applies mathematical optimisation to find the lowest cost generator dispatch schedule to meet demand, subject to a number of system and transmission level constraints. To ensure the model is impartial, the assumptions on the cost of renewable generators remain the same, irrespective of technology or location, and are always lower than that of conventional plants. This ensures renewable generators are given priority in the PLEXOS optimisation. However, due to network congestion caused by line limits and N-1 contingency security checks, the power flows in certain lines are limited, causing dispatch down in RES generators which may affect one generator or multiple generators chosen by PLEXOS' internal logic. During various initial studies, it was observed that PLEXOS may repeatedly choose the same generator(s) to dispatch down to manage an issue in a region shared by multiple generators.

There is often a post-processing step between the PLEXOS simulation and this report to ensure an appropriate allocation of constraints among generators sharing the bottlenecks. This is done by creating constraint subgroups within an area or spanning multiple different areas. The subgroups are selected based on an assessment of the raw PLEXOS results and based on TSO experience of dispatch down on the real system. The subgroups are chosen to group those generators into a constraint group that are expected to experience similar constraint levels. The subgroups are selected on the basis that they share a common transmission bottleneck, or they are electrically close to a congested area within the network.

Area F is adjacent to Area E, and the power from Area E tends to flow onto the 220 kV circuit running from Kilpaddoge towards Knockraha. Area F pulls its power onto the 220 kV nodes in Area E or I. Any issues with the 220 kV circuit or with parallel paths can limit the generation in this area. Additionally, the issues binding for the circuits in Area E can create additional stress on the Area F and Area I circuits, as they merge with rescue flows. The area also benefits from the Celtic interconnector in the 2028 and Future Grid study scenarios.

The contingencies and overloaded lines associated with the area are included in the Appendix C of the Assumptions and Methodology Report.

Analysis of Area F identified a constraint subgroup for solar and wind generation combining Area E, Area F and Area I. The subgroup nodes are given in Table 1-4. The constraints are shared on a pro-rata basis amongst the non-priority generators in the subgroup ahead of priority generators. The individual node level dispatch down is given in Section 2.

This subgroup arrangement is unchanged from ECP-2.2 studies.

Subgroup	Nodes
E, F & I	Ballylickey
	Bandon
	Dunmanway
	Macroom

Table 1-4 Area F generator nodes and their subgroups

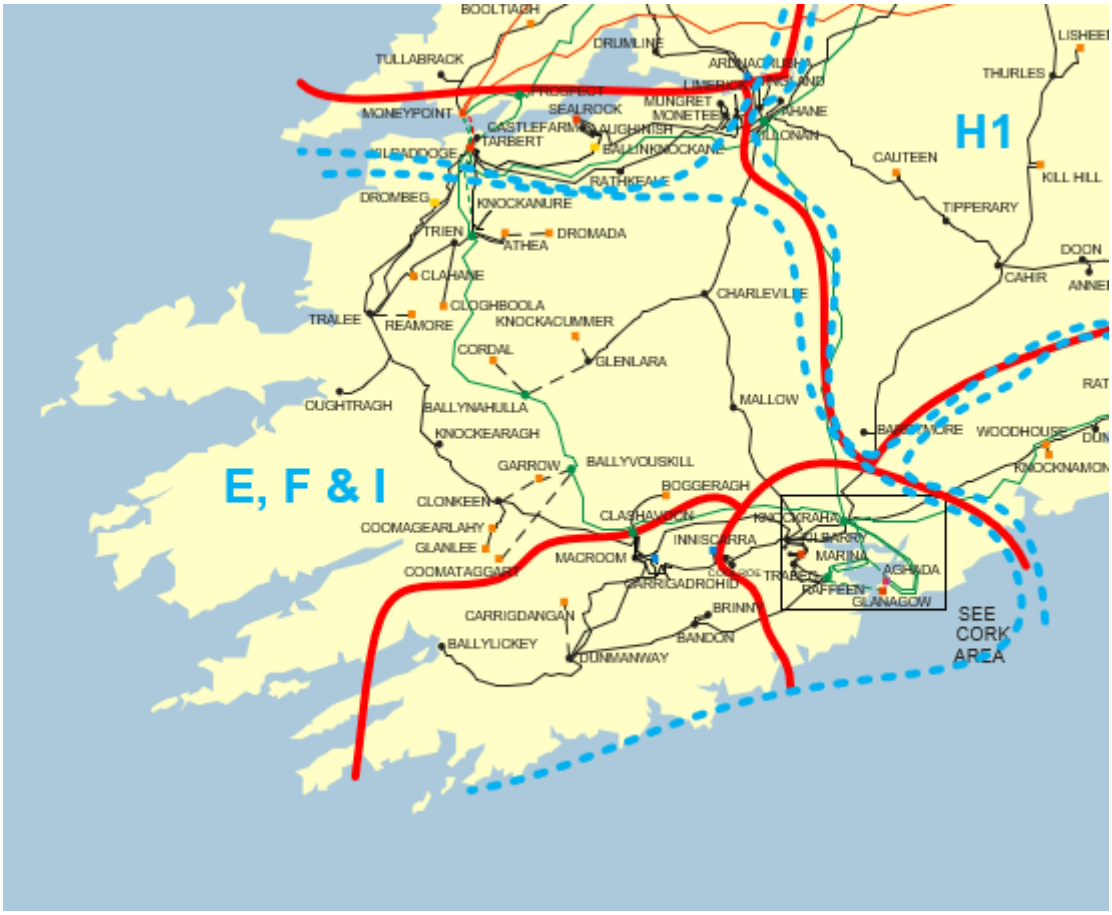

Figure 1-2 Subgroup E, F & I (subgroups outlined by blue dashed line)

The solar non-priority data is given in the following table.

Area F (E, F & I)	Year	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Capacity (MW)	2026	27	37	47	57		
Installed Capacity (MW)	2028	27	37	47	57	57	
Installed Capacity (MW)	2030				57	57	57
Available Energy (GWh)	2026	32	44	55	67		
Available Energy (GWh)	2028	32	44	55	67	67	
Available Energy (GWh)	2030				67	67	67
Generation (GWh)	2026	30	41	51	58		
Generation (GWh)	2028	30	42	53	62	57	
Generation (GWh)	2030				64	61	59
Surplus (%)	2026	1%	2%	5%	9%		
Surplus (%)	2028	<1%	<1%	2%	5%	11%	
Surplus (%)	2030				2%	6%	10%
Curtailment (%)	2026	1%	1%	2%	4%		
Curtailment (%)	2028	<1%	1%	1%	2%	3%	
Curtailment (%)	2030				1%	1%	1%
Constraint (%)	2026	4%	1%	1%	1%		
Constraint (%)	2028	5%	4%	2%	1%	1%	
Constraint (%)	2030				2%	1%	1%
Total Dispatch Down (%)	2026	5%	5%	8%	14%		
Total Dispatch Down (%)	2028	5%	5%	5%	8%	15%	
Total Dispatch Down (%)	2030				5%	8%	12%

Table 1-5 - Surplus, Curtailment and Constraint for Solar Non-priority in Area F (E, F & I)

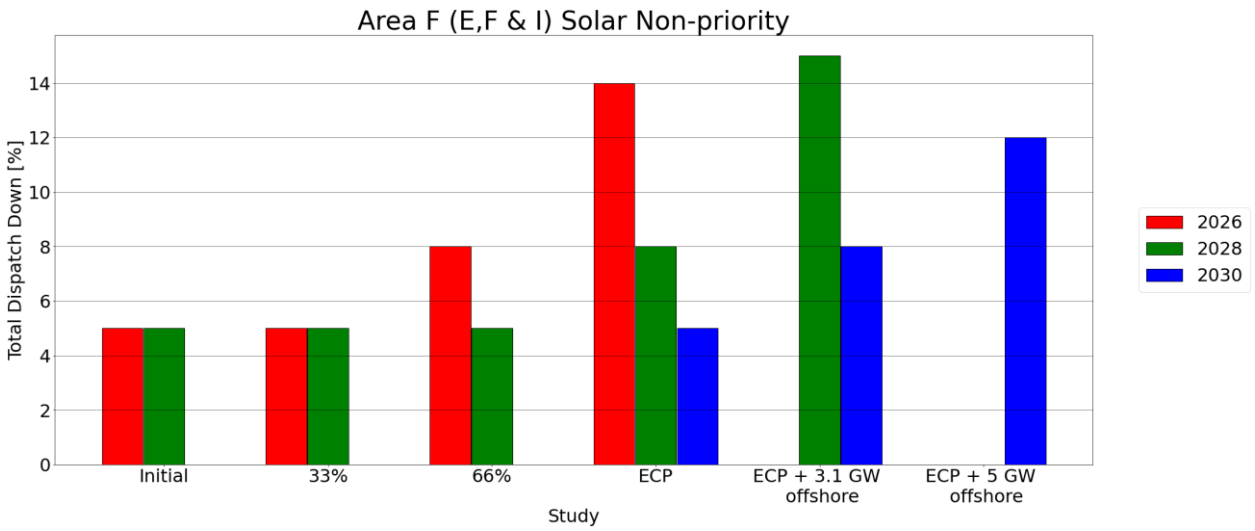

Figure 1-3 - Results Solar Non-priority Area F (E, F & I)

The wind non-priority data is given in the following table.

Area F (E, F & I)	Year	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Capacity (MW)	2026	74	92	111	130		
Installed Capacity (MW)	2028	74	92	111	130	130	
Installed Capacity (MW)	2030				130	130	130
Available Energy (GWh)	2026	239	299	359	419		
Available Energy (GWh)	2028	241	301	362	422	422	
Available Energy (GWh)	2030				419	419	419
Generation (GWh)	2026	196	240	277	307		
Generation (GWh)	2028	219	267	309	348	258	
Generation (GWh)	2030				379	301	308
Surplus (%)	2026	1%	4%	8%	12%		
Surplus (%)	2028	<1%	<1%	2%	4%	20%	
Surplus (%)	2030				1%	9%	20%
Curtailment (%)	2026	2%	3%	4%	4%		
Curtailment (%)	2028	<1%	1%	2%	3%	4%	
Curtailment (%)	2030				<1%	2%	2%
Constraint (%)	2026	15%	13%	12%	10%		
Constraint (%)	2028	9%	10%	11%	11%	15%	
Constraint (%)	2030				8%	17%	5%
Total Dispatch Down (%)	2026	18%	20%	23%	27%		
Total Dispatch Down (%)	2028	9%	11%	15%	18%	39%	
Total Dispatch Down (%)	2030				10%	28%	27%

Table 1-6 - Surplus, Curtailment and Constraint for Wind Non-priority in Area F (E, F & I)

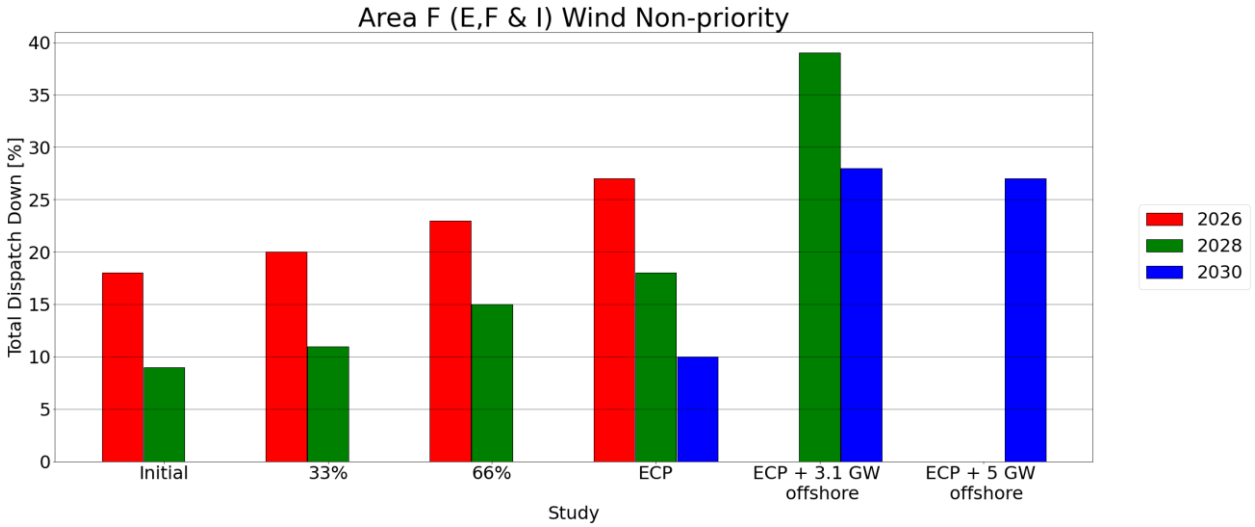

Figure 1-4 - Results Wind Non-priority Area F (E, F & I)

The wind priority data is given in the following table.

Area F (E, F & I)	Year	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Capacity (MW)	2026	109	109	109	109		
Installed Capacity (MW)	2028	109	109	109	109	109	
Installed Capacity (MW)	2030				109	109	109
Available Energy (GWh)	2026	353	353	353	353		
Available Energy (GWh)	2028	355	355	355	355	355	
Available Energy (GWh)	2030				353	353	353
Generation (GWh)	2026	346	341	336	331		
Generation (GWh)	2028	354	351	348	344	331	
Generation (GWh)	2030				351	335	341
Surplus (%)	2026	<1%	<1%	<1%	<1%		
Surplus (%)	2028	<1%	<1%	<1%	<1%	<1%	
Surplus (%)	2030				<1%	<1%	<1%
Curtailment (%)	2026	2%	3%	5%	6%		
Curtailment (%)	2028	<1%	1%	2%	3%	7%	
Curtailment (%)	2030				1%	5%	3%
Constraint (%)	2026	<1%	<1%	<1%	<1%		
Constraint (%)	2028	<1%	<1%	<1%	<1%	<1%	
Constraint (%)	2030				<1%	<1%	<1%
Total Dispatch Down (%)	2026	2%	3%	5%	6%		
Total Dispatch Down (%)	2028	<1%	1%	2%	3%	7%	
Total Dispatch Down (%)	2030				1%	5%	3%

Table 1-7 - Surplus, Curtailment and Constraint for Wind Priority in Area F (E, F & I)

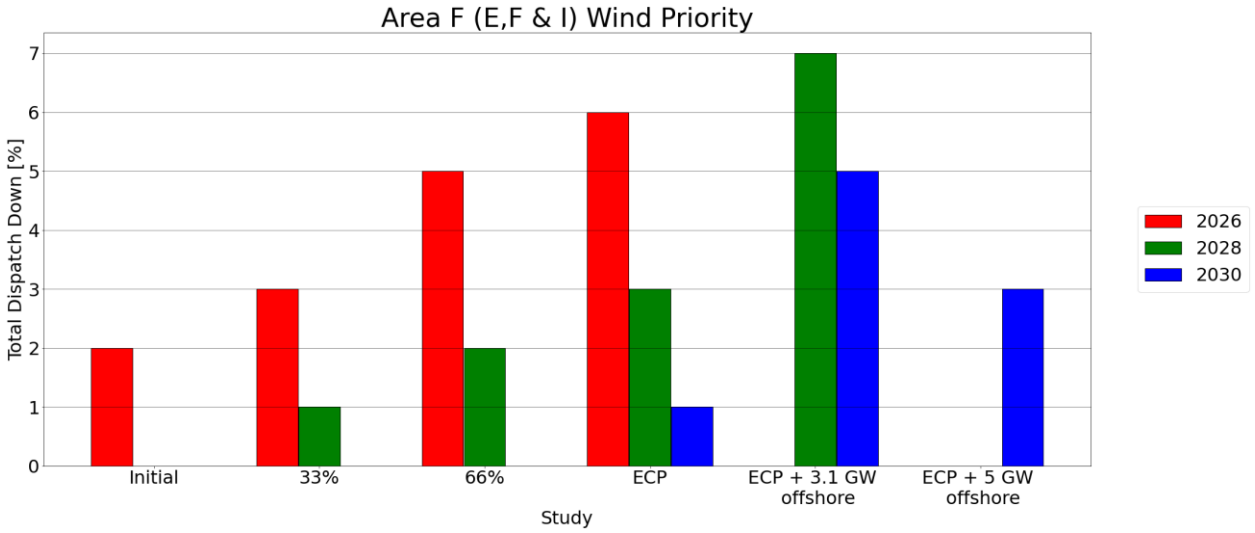

Figure 1-5 - Results Wind Priority Area F (E, F & I)

1.7 Conclusion – Results for Area F

This section provides an overview of the estimated surplus, curtailment and constraint values for Area F for a range of scenarios based on a number of installed generation assumptions (generation scenarios) and the study year (network and demand assumptions). The results highly depend on the study assumptions, which are described in the Assumptions and Methodology report.

Section 2 contains the detailed results consisting of available energy (GWh) and percentage surplus, curtailment, and constraint values for each node for both solar and wind in Area F.

2 Area F Node Results

This section presents the results of the modelling analysis for Area F. The levels of surplus, curtailment and constraint that controllable solar and wind generators in Area F might expect to experience are reported on a nodal basis for the study scenarios. Details on the generation capacity at each node are also provided along with the assumed amount of controllable generation.

This section also presents a list of the generators at each node that are included in the study.

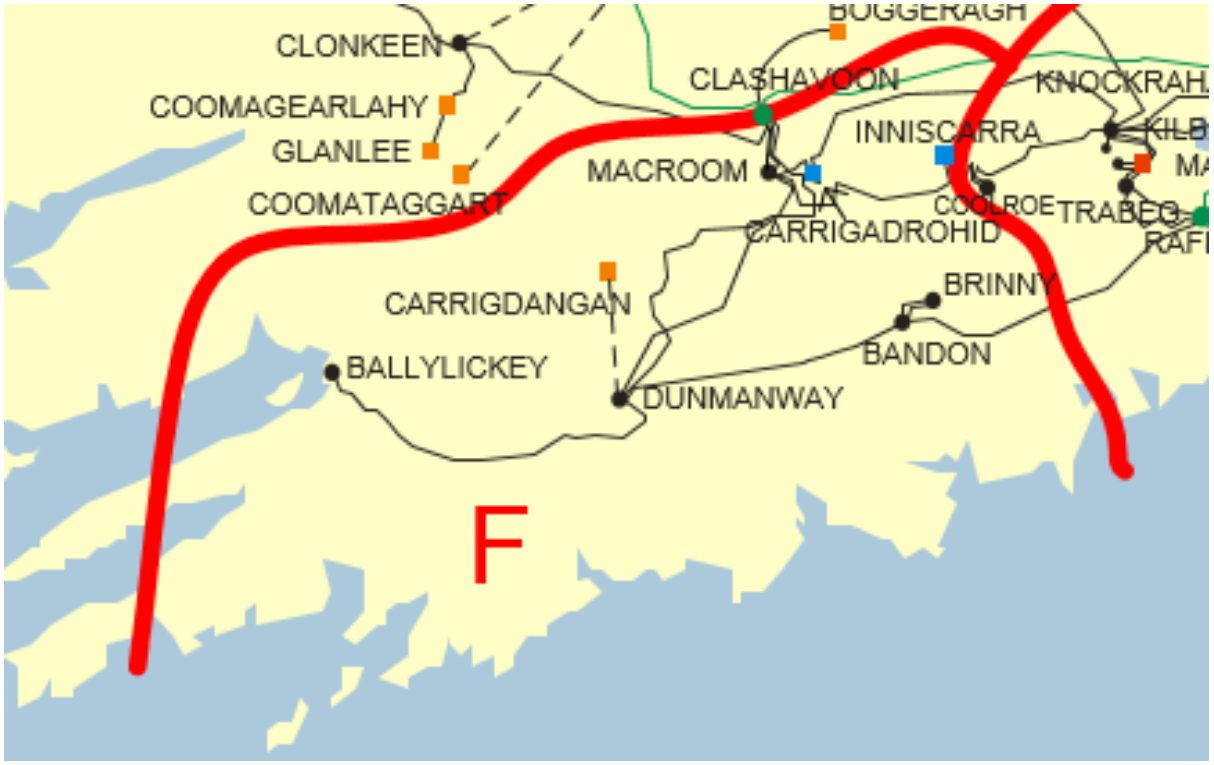

Figure 2-0 Area F

2.1 Ballylickey

Figure 2-1 - Location of node Ballylickey

Generator	SO	Capacity	Type	Status
Ballybane (Glanta Commons) Wind Farm	DSO	19.55	wind priority	connected
Ballybane 2 (Glanta Commons) Wind Farm	DSO	8.4	wind priority	connected
Ballybane 2A	DSO	11.5	wind priority	connected
Ballybane 2A (Glanta Commons) Wind Farm Extension	DSO	1.55	wind priority	connected
Ballybane 3 (Glanta Commons) Wind Farm	DSO	4.45	wind priority	connected
Derreenacrinnig West (prev Kilvinane 2 WF)	DSO	5.82	wind non-priority	due to connect
Kealkil (Curraglass) (1)	DSO	8.5	wind uncontrolled	connected
Curraglass Wind Farm	DSO	42.0	wind non-priority	due to connect

Table 2-1 - Generation Included in Study for Node Ballylickey

The wind non-priority data is given in the following table.

Area F	Year	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Capacity (MW)	2026	6	20	34	48		
Installed Capacity (MW)	2028	6	20	34	48	48	
Installed Capacity (MW)	2030				48	48	48
Available Energy (GWh)	2026	19	64	109	155		
Available Energy (GWh)	2028	19	65	110	156	156	
Available Energy (GWh)	2030				155	155	155
Generation (GWh)	2026	15	51	84	113		
Generation (GWh)	2028	17	57	94	128	95	
Generation (GWh)	2030				140	111	113
Surplus (%)	2026	1%	4%	8%	12%		
Surplus (%)	2028	<1%	<1%	2%	4%	20%	
Surplus (%)	2030				1%	9%	20%
Curtailment (%)	2026	2%	3%	4%	4%		
Curtailment (%)	2028	<1%	1%	2%	3%	4%	
Curtailment (%)	2030				<1%	2%	2%
Constraint (%)	2026	15%	13%	12%	10%		
Constraint (%)	2028	9%	10%	11%	11%	15%	
Constraint (%)	2030				8%	17%	5%
Total Dispatch Down (%)	2026	18%	20%	23%	27%		
Total Dispatch Down (%)	2028	9%	11%	15%	18%	39%	
Total Dispatch Down (%)	2030				10%	28%	27%

Table 2-2 - Surplus, Curtailment and Constraint for Wind non-priority in Area F

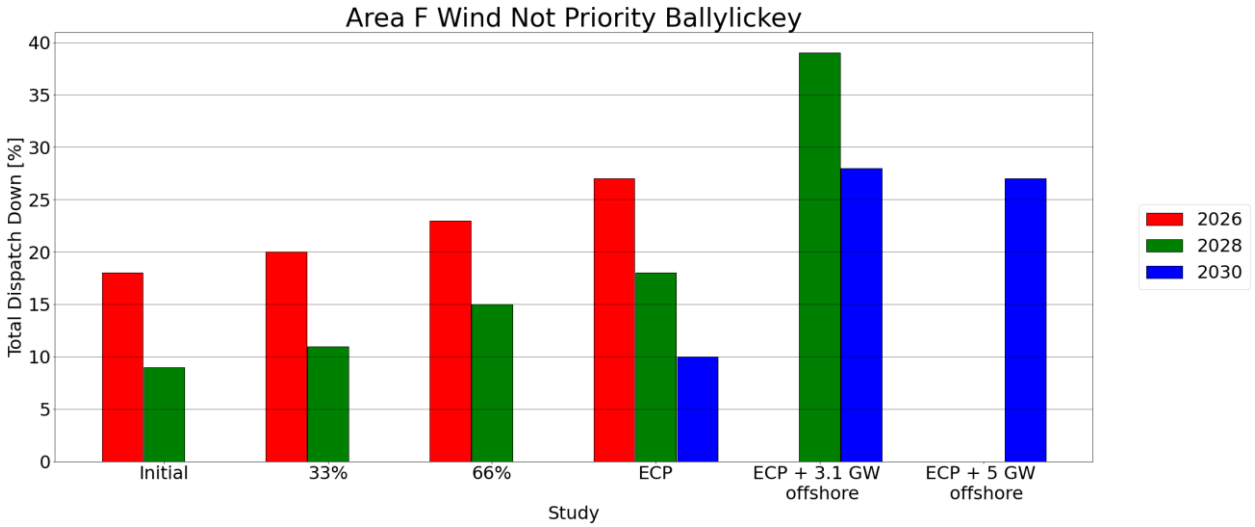

Figure 2-2 - Total Dispatch Down for Wind non-priority for Node Ballylickey

The wind priority data is given in the following table.

Area F	Year	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Capacity (MW)	2026	45	45	45	45		
Installed Capacity (MW)	2028	45	45	45	45	45	
Installed Capacity (MW)	2030				45	45	45
Available Energy (GWh)	2026	147	147	147	147		
Available Energy (GWh)	2028	148	148	148	148	148	
Available Energy (GWh)	2030				147	147	147
Generation (GWh)	2026	144	142	140	138		
Generation (GWh)	2028	148	147	145	143	138	
Generation (GWh)	2030				146	140	142
Surplus (%)	2026	<1%	<1%	<1%	<1%		
Surplus (%)	2028	<1%	<1%	<1%	<1%	<1%	
Surplus (%)	2030				<1%	<1%	<1%
Curtailment (%)	2026	2%	3%	5%	6%		
Curtailment (%)	2028	<1%	1%	2%	3%	7%	
Curtailment (%)	2030				1%	5%	3%
Constraint (%)	2026	<1%	<1%	<1%	<1%		
Constraint (%)	2028	<1%	<1%	<1%	<1%	<1%	
Constraint (%)	2030				<1%	<1%	<1%
Total Dispatch Down (%)	2026	2%	3%	5%	6%		
Total Dispatch Down (%)	2028	<1%	1%	2%	3%	7%	
Total Dispatch Down (%)	2030				1%	5%	3%

Table 2-3 - Surplus, Curtailment and Constraint for Wind priority in Area F

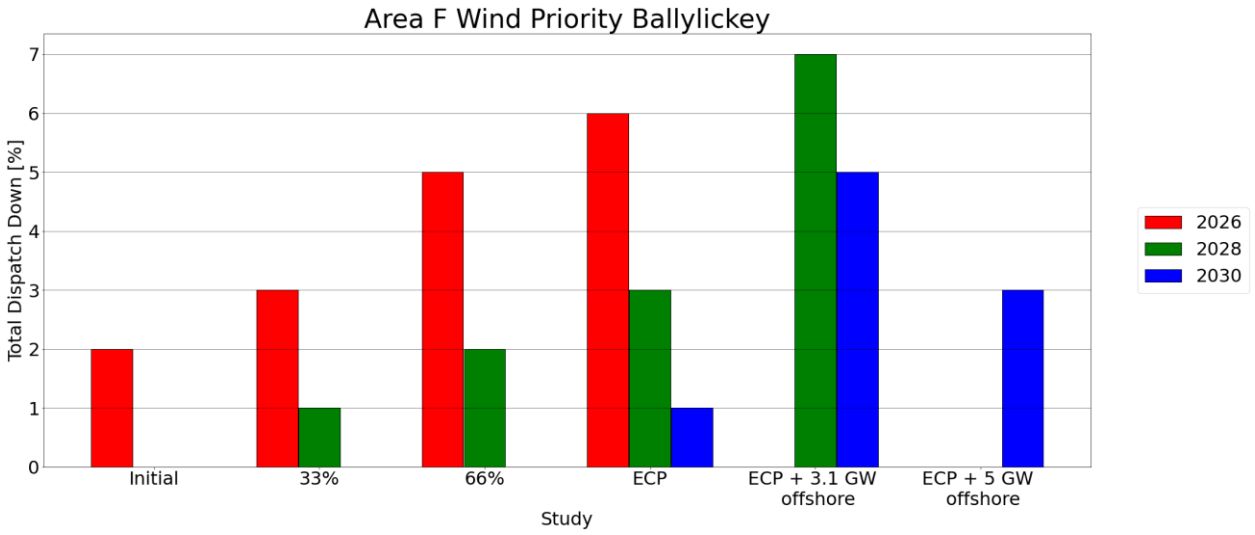

Figure 2-3 - Total Dispatch Down for Wind priority for Node Ballylickey

2.2 Bandon

Figure 2-4 - Location of node Bandon

Generator	SO	Capacity	Type	Status
Callatrim South Solar Farm (prev. Kilcawha)	DSO	6.0	solar non-priority	due to connect
Farrangalway Solar PV Farm	DSO	4.95	solar non-priority	due to connect
Finnis PV	DSO	8.5	solar non-priority	due to connect
Garranereagh (1)	DSO	8.75	wind priority	connected
Garryndruig	DSO	4.95	solar non-priority	due to connect
Kilvinane (1)	DSO	4.5	wind uncontrolled	connected
Currabeha	DSO	4.95	solar non-priority	due to connect
Cloghmacow Solar	DSO	5.0	solar non-priority	due to connect

Table 2-4 - Generation Included in Study for Node Bandon

The solar non-priority data is given in the following table.

Area F	Year	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Capacity (MW)	2026	23	27	31	34		
Installed Capacity (MW)	2028	23	27	31	34	34	
Installed Capacity (MW)	2030				34	34	34
Available Energy (GWh)	2026	27	32	36	40		
Available Energy (GWh)	2028	27	32	36	40	40	
Available Energy (GWh)	2030				40	40	40
Generation (GWh)	2026	26	30	33	35		
Generation (GWh)	2028	26	30	34	37	34	
Generation (GWh)	2030				38	37	35
Surplus (%)	2026	1%	2%	5%	9%		
Surplus (%)	2028	<1%	<1%	2%	5%	11%	
Surplus (%)	2030				2%	6%	10%
Curtailment (%)	2026	1%	1%	2%	4%		
Curtailment (%)	2028	<1%	1%	1%	2%	3%	
Curtailment (%)	2030				1%	1%	1%
Constraint (%)	2026	4%	1%	1%	1%		
Constraint (%)	2028	5%	4%	2%	1%	1%	
Constraint (%)	2030				2%	1%	1%
Total Dispatch Down (%)	2026	5%	5%	8%	14%		
Total Dispatch Down (%)	2028	5%	5%	5%	8%	15%	
Total Dispatch Down (%)	2030				5%	8%	12%

Table 2-5 - Surplus, Curtailment and Constraint for Solar non-priority in Area F

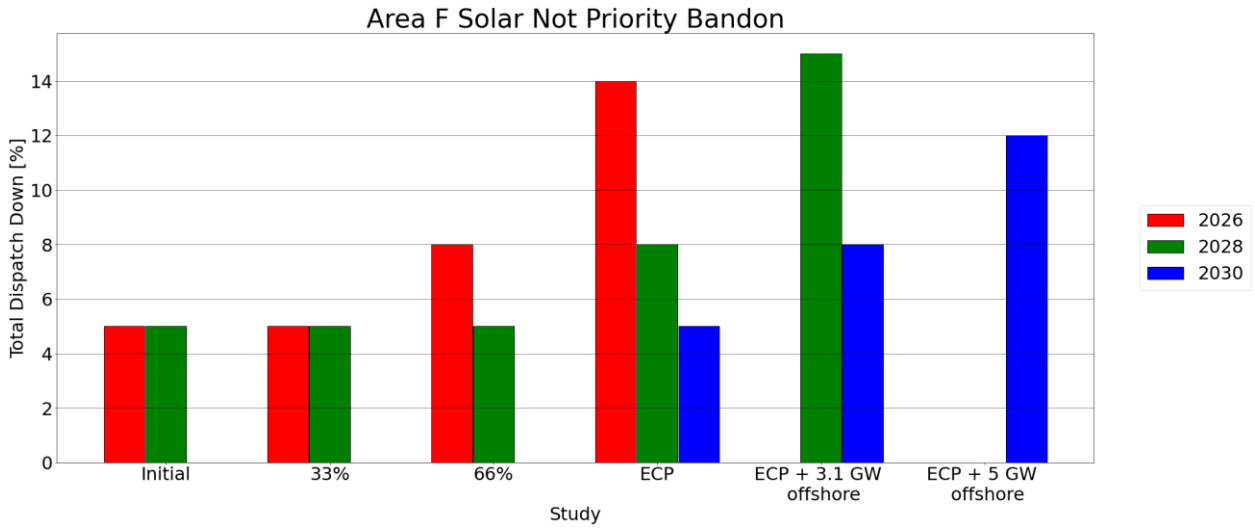

Figure 2-5 - Total Dispatch Down for Solar non-priority for Node Bandon

The wind priority data is given in the following table.

Area F	Year	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Capacity (MW)	2026	9	9	9	9		
Installed Capacity (MW)	2028	9	9	9	9	9	
Installed Capacity (MW)	2030				9	9	9
Available Energy (GWh)	2026	28	28	28	28		
Available Energy (GWh)	2028	28	28	28	28	28	
Available Energy (GWh)	2030				28	28	28
Generation (GWh)	2026	28	27	27	27		
Generation (GWh)	2028	28	28	28	28	27	
Generation (GWh)	2030				28	27	27
Surplus (%)	2026	<1%	<1%	<1%	<1%		
Surplus (%)	2028	<1%	<1%	<1%	<1%	<1%	
Surplus (%)	2030				<1%	<1%	<1%
Curtailment (%)	2026	2%	3%	5%	6%		
Curtailment (%)	2028	<1%	1%	2%	3%	7%	
Curtailment (%)	2030				1%	5%	3%
Constraint (%)	2026	<1%	<1%	<1%	<1%		
Constraint (%)	2028	<1%	<1%	<1%	<1%	<1%	
Constraint (%)	2030				<1%	<1%	<1%
Total Dispatch Down (%)	2026	2%	3%	5%	6%		
Total Dispatch Down (%)	2028	<1%	1%	2%	3%	7%	
Total Dispatch Down (%)	2030				1%	5%	3%

Table 2-6 - Surplus, Curtailment and Constraint for Wind priority in Area F

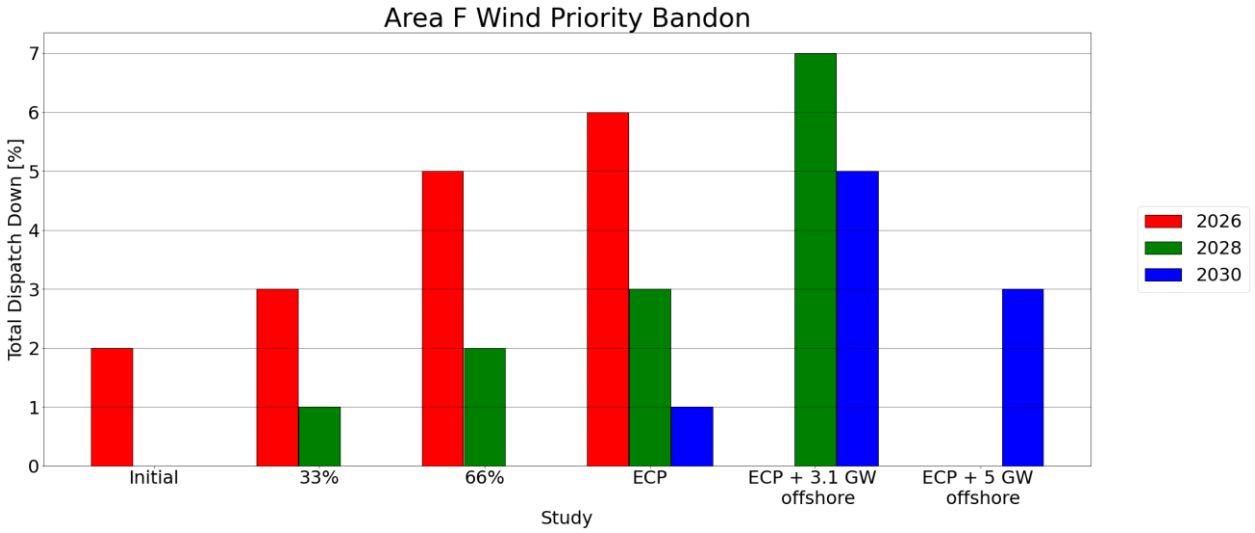

Figure 2-6 - Total Dispatch Down for Wind priority for Node Bandon

2.3 Dunmanway

Figure 2-7 - Location of node Dunmanway

Generator	SO	Capacity	Type	Status
Carrigdangan (formerly Barnadivine)	TSO	54.3	wind non-priority	connected
Carrigdangan Wind Farm - Phase 2	TSO	13.65	wind non-priority	due to connect
Coomatallin (1)	DSO	5.95	wind priority	connected
Coomatallin (2)	DSO	3.05	wind uncontrolled	due to connect
Currabwee (1)	DSO	4.62	wind uncontrolled	connected
Killaveenoge Windfarm (Derryvacorneen merge with Barrboy Windfarm)	DSO	17.0	wind priority	connected
Killaveenoge Windfarm (Derryvacorneen merge with Barrboy Windfarm)	DSO	7.8	wind priority	connected
Lahanaght Hill (1)	DSO	4.25	wind uncontrolled	connected
Milane Hill (1)	DSO	5.94	wind uncontrolled	connected
Reenascreena (1)	DSO	4.5	wind uncontrolled	connected
Beanhill South	DSO	4.95	solar non-priority	due to connect
Knockeenbui (1)	DSO	13.8	wind non-priority	due to connect

Table 2-7 - Generation Included in Study for Node Dunmanway

The solar non-priority data is given in the following table.

Area F	Year	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Capacity (MW)	2026		2	3	5		
Installed Capacity (MW)	2028		2	3	5	5	
Installed Capacity (MW)	2030				5	5	5
Available Energy (GWh)	2026		2	4	6		
Available Energy (GWh)	2028		2	4	6	6	
Available Energy (GWh)	2030				6	6	6
Generation (GWh)	2026		2	4	5		
Generation (GWh)	2028		2	4	5	5	
Generation (GWh)	2030				6	5	5
Surplus (%)	2026		2%	5%	9%		
Surplus (%)	2028		<1%	2%	5%	11%	
Surplus (%)	2030				2%	6%	10%
Curtailment (%)	2026		1%	2%	4%		
Curtailment (%)	2028		1%	1%	2%	3%	
Curtailment (%)	2030				1%	1%	1%
Constraint (%)	2026		1%	1%	1%		
Constraint (%)	2028		4%	2%	1%	1%	
Constraint (%)	2030				2%	1%	1%
Total Dispatch Down (%)	2026		5%	8%	14%		
Total Dispatch Down (%)	2028		5%	5%	8%	15%	
Total Dispatch Down (%)	2030				5%	8%	12%

Table 2-8 - Surplus, Curtailment and Constraint for Solar non-priority in Area F

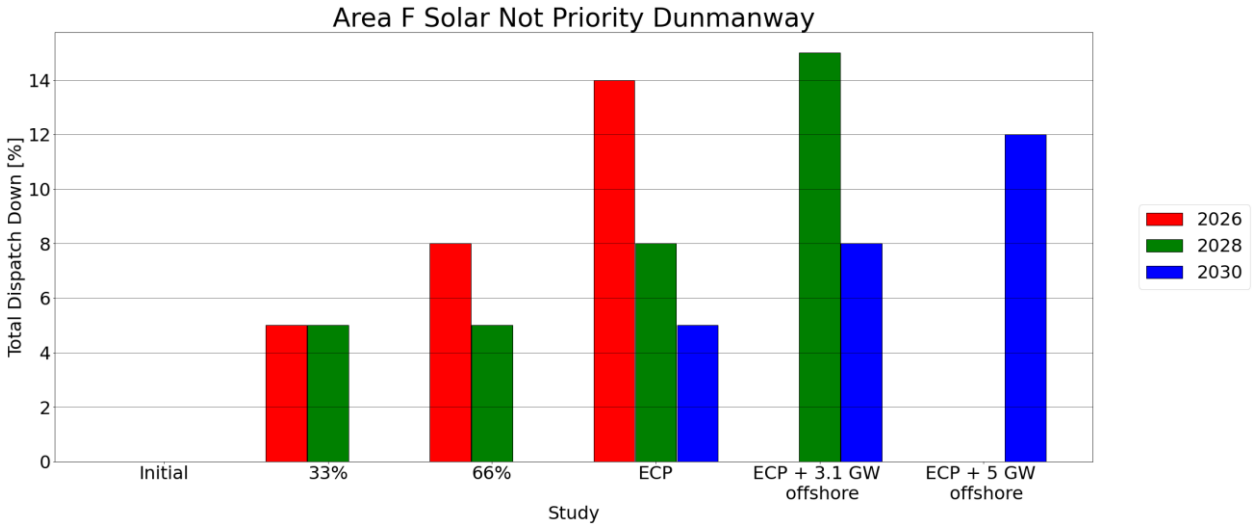

Figure 2-8 - Total Dispatch Down for Solar non-priority for Node Dunmanway

The wind non-priority data is given in the following table.

Area F	Year	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Capacity (MW)	2026	68	73	77	82		
Installed Capacity (MW)	2028	68	73	77	82	82	
Installed Capacity (MW)	2030				82	82	82
Available Energy (GWh)	2026	220	235	250	265		
Available Energy (GWh)	2028	222	237	251	266	266	
Available Energy (GWh)	2030				265	265	265
Generation (GWh)	2026	180	188	193	194		
Generation (GWh)	2028	202	210	215	219	163	
Generation (GWh)	2030				239	190	194
Surplus (%)	2026	1%	4%	8%	12%		
Surplus (%)	2028	<1%	<1%	2%	4%	20%	
Surplus (%)	2030				1%	9%	20%
Curtailment (%)	2026	2%	3%	4%	4%		
Curtailment (%)	2028	<1%	1%	2%	3%	4%	
Curtailment (%)	2030				<1%	2%	2%
Constraint (%)	2026	15%	13%	12%	10%		
Constraint (%)	2028	9%	10%	11%	11%	15%	
Constraint (%)	2030				8%	17%	5%
Total Dispatch Down (%)	2026	18%	20%	23%	27%		
Total Dispatch Down (%)	2028	9%	11%	15%	18%	39%	
Total Dispatch Down (%)	2030				10%	28%	27%

Table 2-9 - Surplus, Curtailment and Constraint for Wind non-priority in Area F

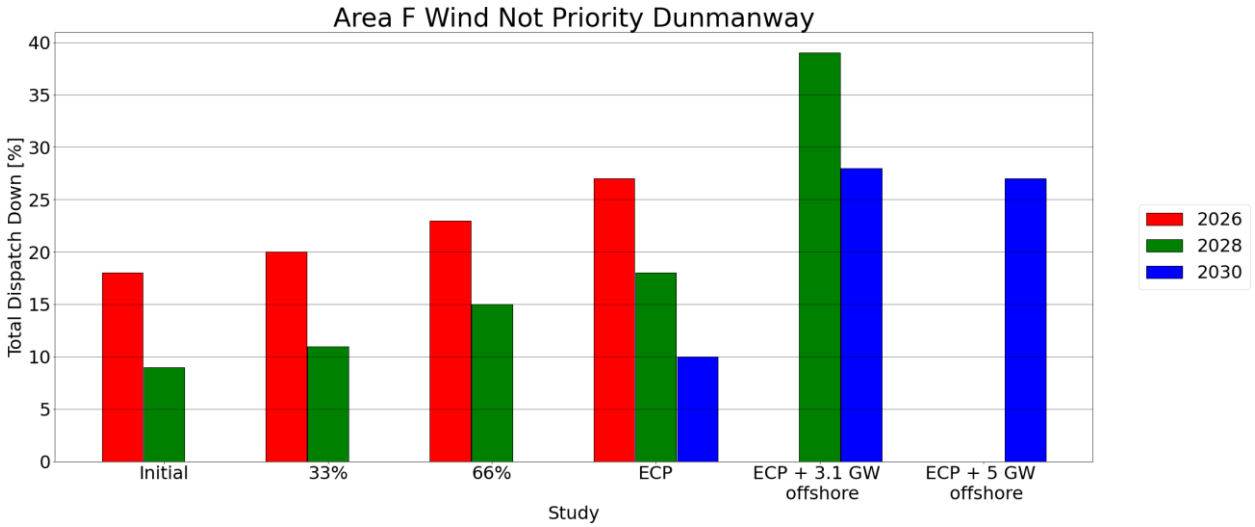

Figure 2-9 - Total Dispatch Down for Wind non-priority for Node Dunmanway

The wind priority data is given in the following table.

Area F	Year	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Capacity (MW)	2026	31	31	31	31		
Installed Capacity (MW)	2028	31	31	31	31	31	
Installed Capacity (MW)	2030				31	31	31
Available Energy (GWh)	2026	100	100	100	100		
Available Energy (GWh)	2028	100	100	100	100	100	
Available Energy (GWh)	2030				100	100	100
Generation (GWh)	2026	98	96	95	93		
Generation (GWh)	2028	100	99	98	97	93	
Generation (GWh)	2030				99	94	96
Surplus (%)	2026	<1%	<1%	<1%	<1%		
Surplus (%)	2028	<1%	<1%	<1%	<1%	<1%	
Surplus (%)	2030				<1%	<1%	<1%
Curtailment (%)	2026	2%	3%	5%	6%		
Curtailment (%)	2028	<1%	1%	2%	3%	7%	
Curtailment (%)	2030				1%	5%	3%
Constraint (%)	2026	<1%	<1%	<1%	<1%		
Constraint (%)	2028	<1%	<1%	<1%	<1%	<1%	
Constraint (%)	2030				<1%	<1%	<1%
Total Dispatch Down (%)	2026	2%	3%	5%	6%		
Total Dispatch Down (%)	2028	<1%	1%	2%	3%	7%	
Total Dispatch Down (%)	2030				1%	5%	3%

Table 2-10 - Surplus, Curtailment and Constraint for Wind priority in Area F

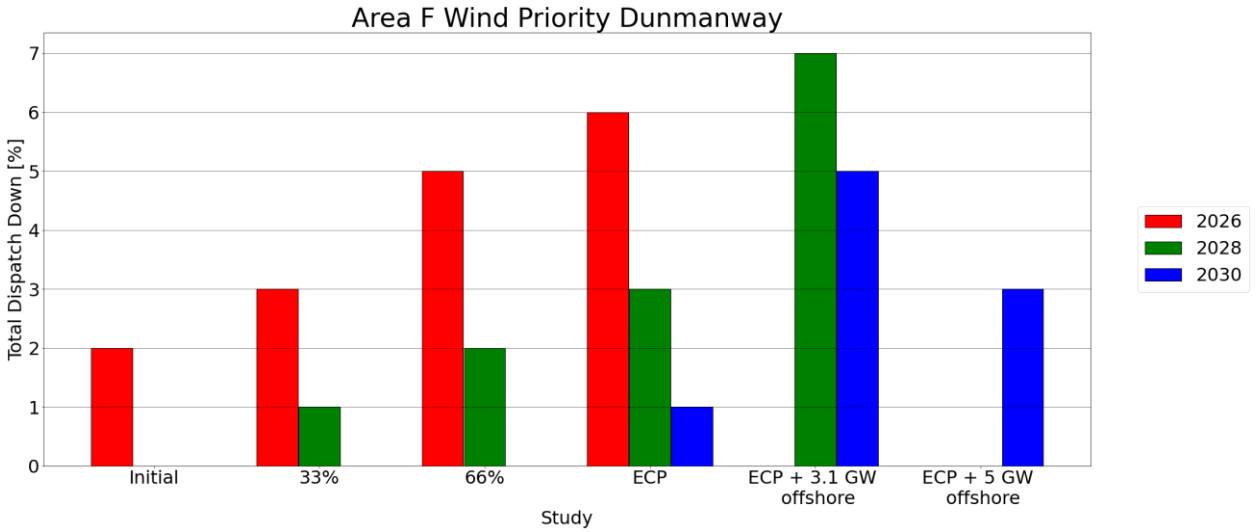

Figure 2-10 - Total Dispatch Down for Wind priority for Node Dunmanway

2.4 Macroom

Figure 2-11 - Location of node Macroom

Generator	SO	Capacity	Type	Status
Bawnmore (1) formerly Burren (Cork)	DSO	24.0	wind priority	connected
Berrings Solar Farm	DSO	13.8	solar non-priority	due to connect
Knockglass Solar Farm	DSO	4.0	solar non-priority	due to connect

Table 2-11 - Generation Included in Study for Node Macroom

The solar non-priority data is given in the following table.

Area F	Year	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Capacity (MW)	2026	4	9	13	18		
Installed Capacity (MW)	2028	4	9	13	18	18	
Installed Capacity (MW)	2030				18	18	18
Available Energy (GWh)	2026	5	10	15	21		
Available Energy (GWh)	2028	5	10	15	21	21	
Available Energy (GWh)	2030				21	21	21
Generation (GWh)	2026	4	10	14	18		
Generation (GWh)	2028	4	10	15	19	18	
Generation (GWh)	2030				20	19	18
Surplus (%)	2026	1%	2%	5%	9%		
Surplus (%)	2028	<1%	<1%	2%	5%	11%	
Surplus (%)	2030				2%	6%	10%
Curtailment (%)	2026	1%	1%	2%	4%		
Curtailment (%)	2028	<1%	1%	1%	2%	3%	
Curtailment (%)	2030				1%	1%	1%
Constraint (%)	2026	4%	1%	1%	1%		
Constraint (%)	2028	5%	4%	2%	1%	1%	
Constraint (%)	2030				2%	1%	1%
Total Dispatch Down (%)	2026	5%	5%	8%	14%		
Total Dispatch Down (%)	2028	5%	5%	5%	8%	15%	
Total Dispatch Down (%)	2030				5%	8%	12%

Table 2-12 - Surplus, Curtailment and Constraint for Solar non-priority in Area F

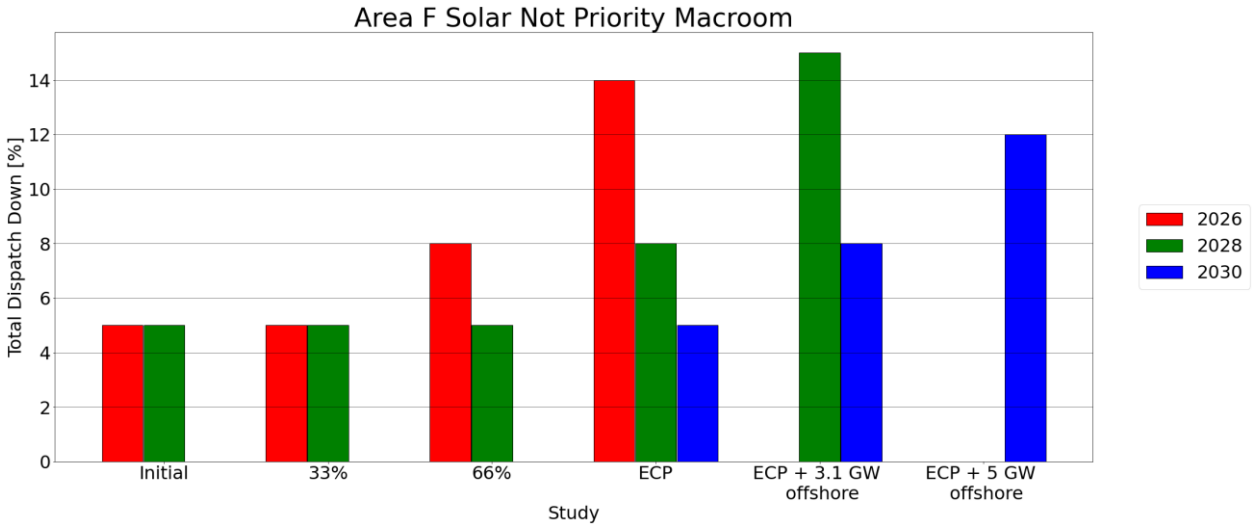

Figure 2-12 - Total Dispatch Down for Solar non-priority for Node Macroom

The wind priority data is given in the following table.

Area F	Year	Initial	33%	66%	ECP	ECP + 3.1 GW offshore	ECP + 5 GW offshore
Installed Capacity (MW)	2026	24	24	24	24		
Installed Capacity (MW)	2028	24	24	24	24	24	
Installed Capacity (MW)	2030				24	24	24
Available Energy (GWh)	2026	78	78	78	78		
Available Energy (GWh)	2028	78	78	78	78	78	
Available Energy (GWh)	2030				78	78	78
Generation (GWh)	2026	76	75	74	73		
Generation (GWh)	2028	78	77	77	76	73	
Generation (GWh)	2030				77	74	75
Surplus (%)	2026	<1%	<1%	<1%	<1%		
Surplus (%)	2028	<1%	<1%	<1%	<1%	<1%	
Surplus (%)	2030				<1%	<1%	<1%
Curtailment (%)	2026	2%	3%	5%	6%		
Curtailment (%)	2028	<1%	1%	2%	3%	7%	
Curtailment (%)	2030				1%	5%	3%
Constraint (%)	2026	<1%	<1%	<1%	<1%		
Constraint (%)	2028	<1%	<1%	<1%	<1%	<1%	
Constraint (%)	2030				<1%	<1%	<1%
Total Dispatch Down (%)	2026	2%	3%	5%	6%		
Total Dispatch Down (%)	2028	<1%	1%	2%	3%	7%	
Total Dispatch Down (%)	2030				1%	5%	3%

Table 2-13 - Surplus, Curtailment and Constraint for Wind priority in Area F

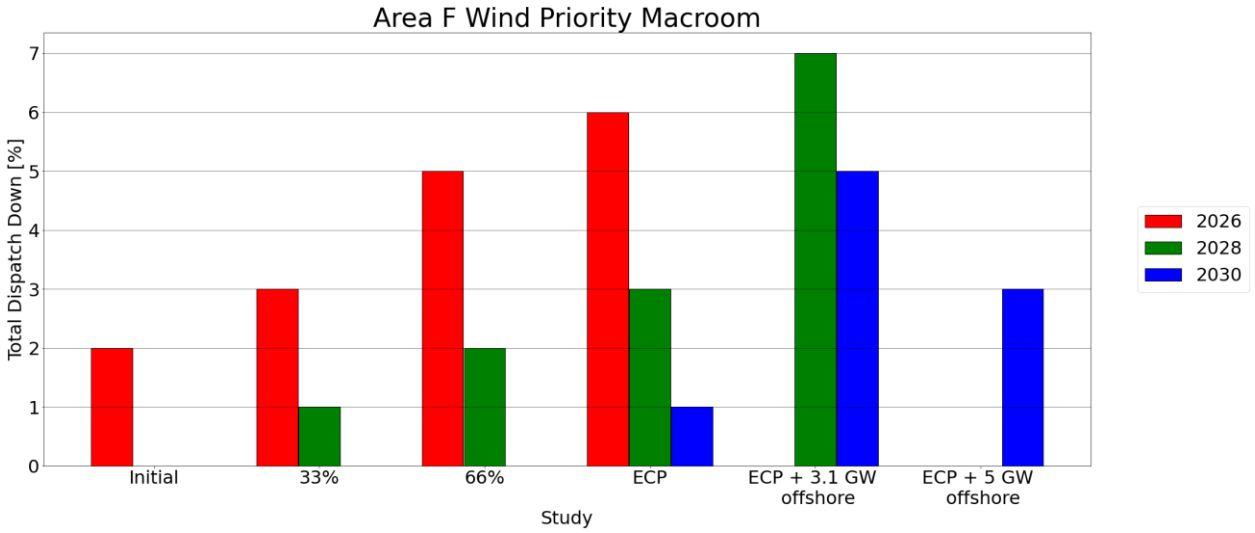

Figure 2-13 - Total Dispatch Down for Solar non-priority for Node Macroom