Integrated Single Electricity Market (I-SEM)

Capacity Market

Capacity Requirement and De-rating Factor Calculation Preliminary Assumptions Document

January 2021 CY2024/25 T-4 Auction

May 2020

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Contents

1   INTRODUCTION

SEM Committee decision (SEM-16-082) and associated appendices set out the methodology to be used to calculate the Capacity Requirement and De-rating Factors for the capacity market auctions. This document outlines the assumptions that will be used for the calculations for the auction listed in Section 2.

2   ASSUMPTIONS FOR CALCULATION

This section details the assumptions to be used for the **January 2021 T-4 CY 2024/25 Capacity Market Auction**.

2.1   REGULATORY AUTHORITY PARAMETERS

Table 1 contains a list of some high level assumptions that will require input from the Regulatory Authorities.

Table 1: Regulatory Authority Parameters

Item	Descriptions	Value(s)
LOLE Standard	The SEM Loss of Load Expectation (LOLE) Adequacy standard to be used in the analysis	8.0 Hours
VoLL	Value of Lost Load used in the Least-Worst Regrets Analysis	€12,533.19/ MWh
Net-CONE	Net Cost of New Entrant used in the Least-Worst Regrets Analysis	€92.3 /kW/year
Capacity Year(s)	This is the Capacity Year for which the Capacity Requirement and De-rating Factors will apply to	2024/25
Demand Forecast Year	This is the demand forecast that will be used in the calculations	2024/25 (Oct 2024 – Sep 2025)
Reserve Assumption	The MW amount of a reserve requirement that should be included in the demand scenarios	0 MW
Interconnector Outage Statistics	The forced and scheduled outage statistics to be used to calculate marginal de-rating factors for the Interconnector Technology Class	Forced Outage Rate: 0.084 Scheduled Outage Rate: 0.053

2.2 DEMAND SCENARIOS

2.2.1 DEMAND FORECASTS

Demand forecasts will be based on **tables 2 and 3 below**. The low and high forecasts for Total Energy Requirement (TER) and TER peak are given in tables 2 and 3 below. The historical demand profiles for Ireland and Northern Ireland are grown separately and then added together to produce the All-Island demand profiles.

Table 2: Low TER and Peak Demand Forecast

Low	Calendar year TER (TWh)		TER Peak (GW)	
Year	Ireland	Northern Ireland	Ireland	Northern Ireland
2024	33.7	8.60	5.52	1.72
2025	34.2	8.60	5.55	1.71

Table 3: High TER and Peak Demand Forecast

High	Calendar year TER (TWh)		TER Peak (GW)	
Year	Ireland	Northern Ireland	Ireland	Northern Ireland
2024	39.1	9.20	6.32	1.84
2025	40.4	9.40	6.48	1.88

2.2.2 DEMAND FORECAST INTERPOLATION

The range between low and high forecasts of demand will be interpolated to give a total of **10** equally spaced forecasts ranging from the low to high demand.

2.2.3 HISTORICAL DEMAND PROFILES

Historical data for the years listed in Table 4 will be used to create a set of historic demand profiles. These profiles will be combined with the demand forecasts to develop the demand scenarios.

Table 4: Historical Demand Profiles Used

Historical Demand Profile	Year
Profile Year 1	2011
Profile Year 2	2012
Profile Year 3	2013
Profile Year 4	2014
Profile Year 5	2015
Profile Year 6	2016
Profile Year 7	2017
Profile Year 8	2018

2.2.4 NON-MARKET DEMAND

The TER demand will be adjusted to account for non-market generation. The estimated non-market adjustment for 2024/25 will be 265 MW, though this ultimately depends on the calculated wind capacity credit. This value may be reviewed before the auction. As per 3.4 of the "Methodology for the Calculation of the Capacity Requirement and De-rating Factors" document, this value only includes windfarms with a capacity smaller than 10MW.

2.3 CAPACITY PORTFOLIO

2.3.1 TECHNOLOGY CLASSES

The assumed Technology Classes are given in Table 5.

Table 5: Technology Classes and units included in the classes

Technology Class	Unit types included
Gas Turbine	CCGT, Gas and Distillate OCGT, Large CHP, Reciprocating Diesel
Hydro	Hydro
Steam Turbine	Oil, Coal and Peat fired boilers
Pumped Hydro Storage*	Pumped Hydro Storage
System Wide	All of the above
Other Storage	Battery Storage, CAES, Flywheel
DSU*	Demand Side Units
Wind	Wind
Solar	Solar
Interconnectors	Interconnectors

* For this auction, DSUs, run-hour limited DSUs and potential new storage units (that are not pumped hydro units) will be treated as new technology and assigned the system-wide outage statistics.

2.3.2 AVAILABILITY STATISTICS

The years that will be used to calculate availability statistics for the calculation of De-rating Factors are given in table 6. Data for all units that existed in these categories in the years listed below will be used to calculate the availability statistics.

Table 6: Years of historical data used for the availability Statistic analysis

Technology Class	Availability Statistics Used
Gas Turbine	2015-2019
Hydro	2015-2019
Steam Turbine	2015-2019
Pumped Hydro Storage	2010-2019
System Wide	2015-2019
Interconnectors	Values provided by RAs

2.3.3 CAPACITY PROVIDERS

The units listed in table 7 will be used for creating the reference portfolio used in the analysis.

Table 7: List of existing and planned units that will be included in the base portfolio for the calculations

Unit Name	Unit ID	Unit Capacity	Technology Class
Ardnacrusha	AA1	21	Hydro
	AA2	22	Hydro
	AA3	19	Hydro
	AA4	24	Hydro
Aghada	AD2	432	Gas Turbine
	AT12	90	Gas Turbine
	AT14	90	Gas Turbine
iPower AGU	AGU	76	Gas Turbine
Ballylumford	B10	101	Gas Turbine
	B31	246	Gas Turbine
	B32	246	Gas Turbine
	BGT1	58	Gas Turbine
	BGT2	58	Gas Turbine
Coolkeeragh	C30	408	Gas Turbine
	CGT8	53	Gas Turbine
Contour Global AGU	CGA	12	Gas Turbine
Dublin Bay	DB1	405	Gas Turbine
Dublin Waste	DW1	61	Steam Turbine
Edenderry	ED3	58	Gas Turbine
	ED5	58	Gas Turbine
Erne	ER1	10	Hydro
	ER2	10	Hydro
	ER3	23	Hydro

Unit Name	Unit ID	Unit Capacity	Technology Class
	ER4	23	Hydro
Great Island	GI4	431	Gas Turbine
Huntstown	HNC	342	Gas Turbine
	HN2	408	Gas Turbine
Indaver	IW1	17	Steam Turbine
Kilroot	K1	199	Steam Turbine
	K2	199	Steam Turbine
	KGT1	29	Gas Turbine
	KGT2	29	Gas Turbine
	KGT3	42	Gas Turbine
	KGT4	42	Gas Turbine
Lee	LE1	15	Hydro
	LE2	4	Hydro
	LE3	8	Hydro
Liffey	LI1	15	Hydro
	LI2	15	Hydro
	LI4	4	Hydro
	LI5	4	Hydro
Lisahally	LPS	18	Steam Turbine
Moneypoint	MP1	285	Steam Turbine
	MP2	285	Steam Turbine
	MP3	285	Steam Turbine
North Wall	NW5	104	Gas Turbine
Poolbeg	PBA	230	Gas Turbine
	PBB	230	Gas Turbine
Rhode	RP1	52	Gas Turbine
	RP2	52	Gas Turbine
Seal Rock	SK3	81	Gas Turbine
	SK4	81	Gas Turbine
Turlough Hill	TH1	73	Storage
	TH2	73	Storage
	TH3	73	Storage
	TH4	73	Storage
Tawnaghmore	TP1	52	Gas Turbine
	TP3	52	Gas Turbine
Tynagh	TYC	400	Gas Turbine
Whitegate	WG1	444	Gas Turbine
ESB North Wall 5 GT	GU_400311	118	Gas Turbine
ESB North Wall 4 GT	GU_403650	118	Gas Turbine
ESB Ringsend Gas Flexgen	GU_403610	70	Gas Turbine

Unit Name	Unit ID	Unit Capacity	Technology Class
ESB Poolbeg Gas Flexgen	GU_403620	70	Gas Turbine
ESB Corduff Gas Flexgen	GU_403680	70	Gas Turbine
DSU_401610	DSU_401610	32	DSU
DSU_401870	DSU_401870	25	DSU
DSU_402090	DSU_402090	9	DSU
DSU_402100	DSU_402100	8	DSU
DSU_402120	DSU_402120	10	DSU
DSU_403430	DSU_403430	17	DSU
DSU_403450	DSU_403450	9	DSU
DSU_403470	DSU_403470	9	DSU
DSU_501380	DSU_501380	7	DSU
DSU_501510	DSU_501510	6	DSU
DSU_501590	DSU_501590	5	DSU
DSU_501600	DSU_501600	5	DSU
Aggregated 2 hour run-hour limited DSUs	Aggregated 2 hour run-hour limited DSUs	270	Run-hour limited DSU