ECP 2-4 Constraints Forecast

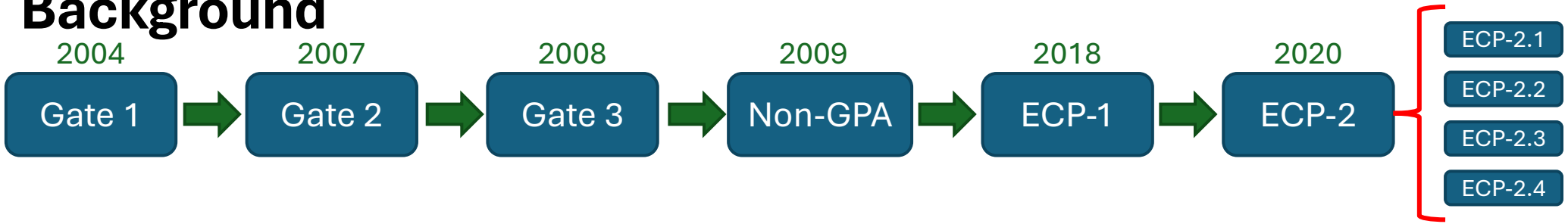
Draft Assumptions - Webinar

Constraints Analysis for Solar and Wind

Agenda

- Background
- Key Metric - Total Dispatch Down
- Analysis Process
- Assumptions
- Study Scenarios
- Timeline and Engagement Plan

Background



- The Enduring Connection Policy (ECP) 2-4 is the fourth of initially three, now four batches of connection offers for Renewable Energy Sources (RES) planned under ECP 2 by the Commission for Regulation of Utilities (CRU).
- The ECP 2-4 Constraints Analysis is carried out by EirGrid (as mandated by CRU/20/060 decision on ECP 2) to forecast dispatch down levels for ECP 2-4 wind and solar projects.
- EirGrid plans to publish 12 regional constraints reports that will provide ECP 2-4 developers with information on forecasted dispatch down levels in each region.
- Timeframe for completion of this work is Q4 2024.
- ECP 2-4 applicants include:

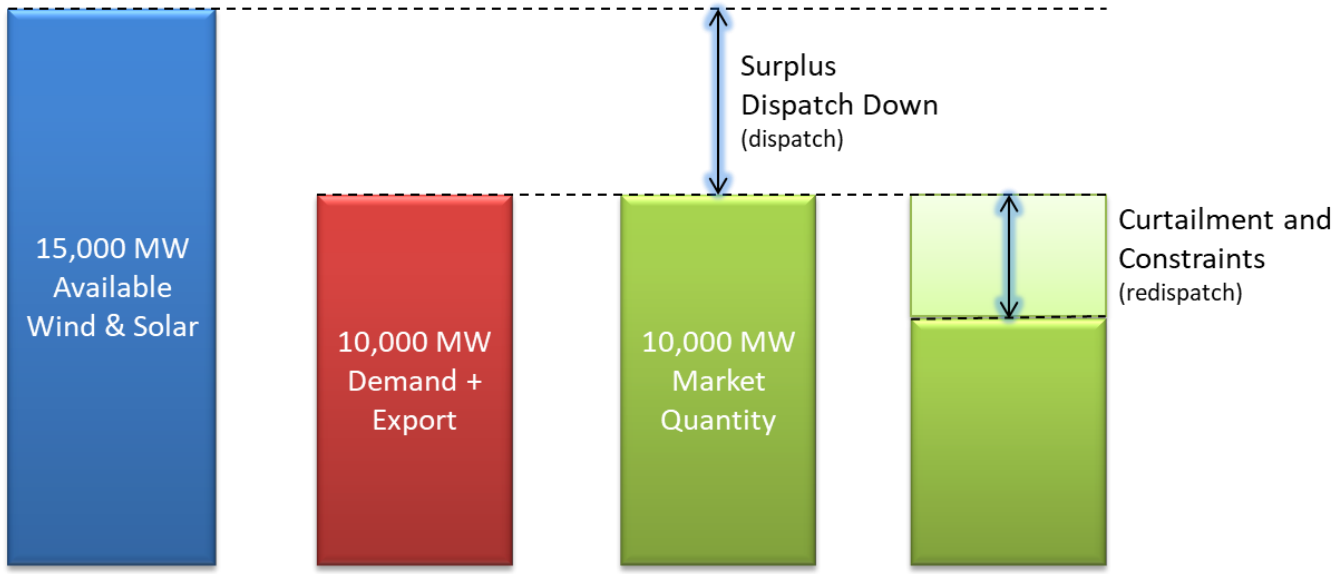
Wind	Solar	Battery
509 MW	1839 MW	1703 MW

Key Metric: Total Dispatch Down

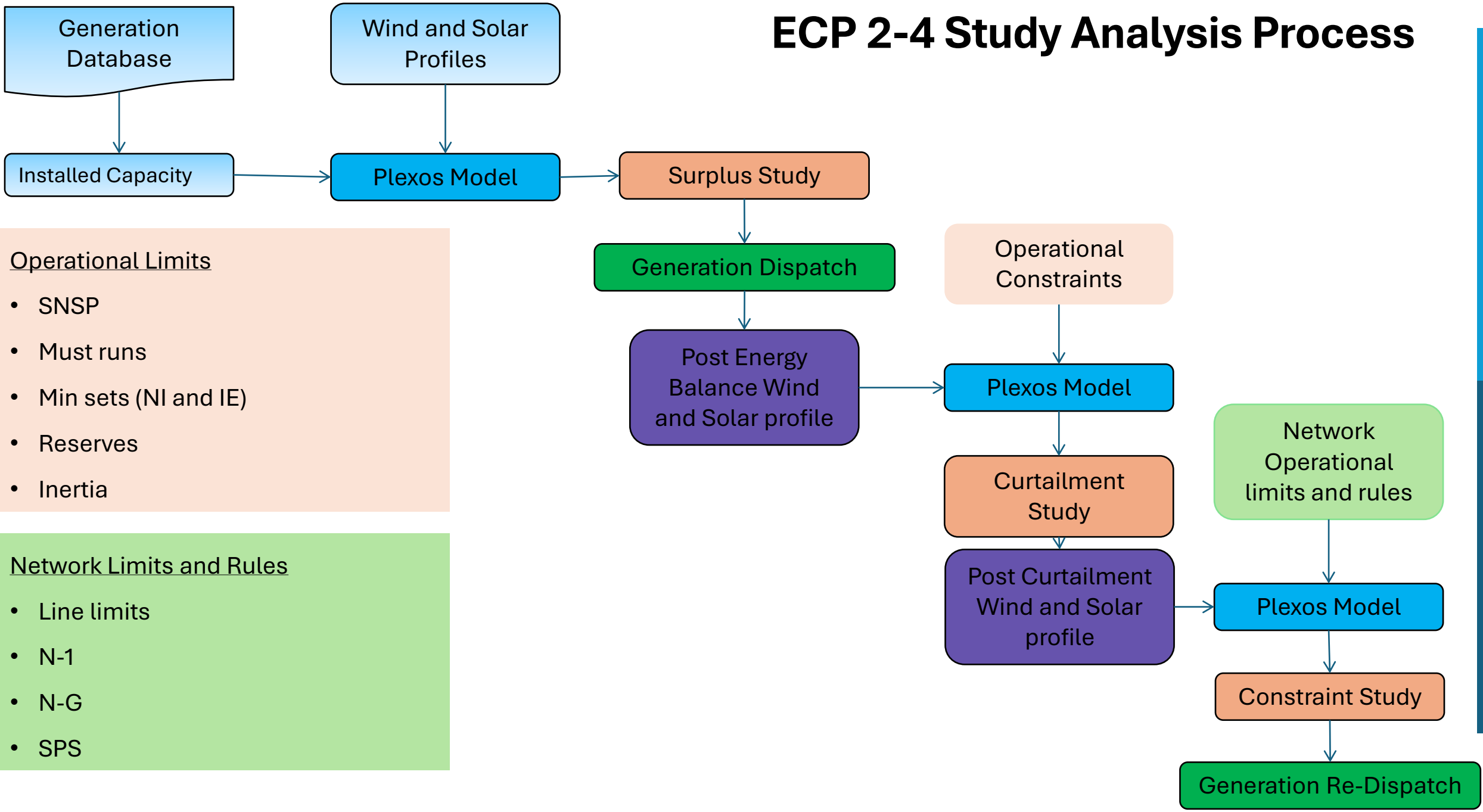
Total Dispatch Down

- Sum of Surplus, Curtailment & Constraint

Type of Dispatch Down	Definition
Surplus	Dispatch down applied for energy balancing when generation exceeds demand + interconnector export.
Curtailment	Dispatch Down applied to ensure operational limits are met.
Constraint	Dispatch Down applied to manage network constraints.



ECP 2-4 Study Analysis Process



Assumptions in ECP 2.4 compared to ECP 2.3

Assumption	ECP2.3	ECP 2.4
Demand	GCS 2023 – 32, shape based on 2022 profile	NRAA 2024-2033, shape based on 2022 data
Conventional Generation	GCS 2023 – 32	NRAA 2024-2033 and capacity auction
RES generation (Ireland)	Updated with ECP-2.3 list.	Updated with ECP 2.4 list
Onshore Wind Profile	Profiles from 2020. Each node using a representative profile from that area	Profiles from 2020. Each node using a representative profile from that area
Offshore Wind and solar Profile	Synthesised 2020 offshore profile (procured from an external vendor).	Synthesised 2020 offshore profile (procured from an external vendor).
Interconnector	2027 – EWIC, Greenlink, Moyle (Export 400MW). 2029 – EWIC, Greenlink, Moyle (Export 450MW), Celtic, North-South 2. Future Grid – EWIC, Greenlink, Moyle (Export 450MW), LirIC, Celtic, North-South 2, 2nd France*.	2027 – EWIC, Greenlink, Moyle (Export 400MW). 2029 – EWIC, Greenlink, Moyle (Export 450MW), Celtic, North-South 2. Future Grid – EWIC, Greenlink, Moyle (Export 450MW), LirIC, Celtic, North-South 2, 2nd France*.
Batteries	Based on current offers and applications. Used for maintaining reserve (POR, SOR, TOR1 & TOR2). 1 cycle per day limit. Portion of the long duration storage to provide energy arbitrage	Based on current offers and applications. Used for maintaining reserve (POR, SOR, TOR1 & TOR2). 1 cycle per day limit. Portion of the long duration storage to provide energy arbitrage
Outage assumptions (Transmission)	Consistent with ECP-2.2.	Consistent with ECP 2.3 and ECP 2.2
Reinforcement Assumptions	2026 and 2028 – Network Delivery Portfolio (NDP) Future Grid – SOEF 1.1 Roadmap.	2027 and 2029: Network Delivery Portfolio Future Grid: SOEF 1.1 Roadmap
Northern Ireland Assumptions	Northern Ireland Constraints Report.	Update with NI generation data and network data

Generation and Demand

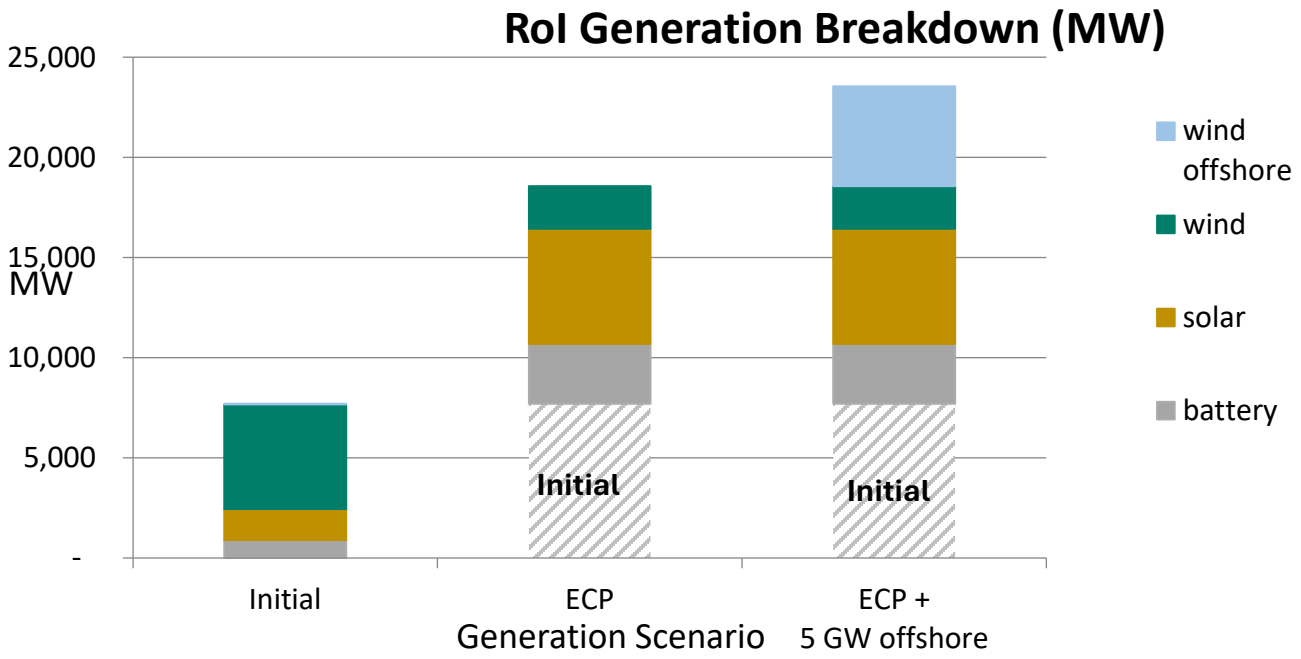
Demand

- Historical Year 2022 shape
- TER based NRAA
  - Median Demand
- LEU based on NRAA

Renewable Generation

- Data from Ireland Generation Database
- Offers from Non-GPA, Gate 3, Pre-Gate, ECP 1, ECP 2-1, ECP 2-2, ECP 2-3, ECP 2-4

ECP 2-4 Breakdown of IE Generation Capacity (MW)		
	Initial Study (expected to be in by 2027)	ECP All Study
Battery	896	3,883
Solar	1,550	7,307
Wind	5,227	7,357
Wind Offshore	25	25
Totals	**7,698**	**18,571**



ECP-2.4 applicant MW by Area			
Area	**wind**	**solar**	**battery**
A	31		
B		9	239
C	131	218	250
D		143	
E		176	270
F			
G		372	202
H1	155	173	265
H2	50	312	122
I		30	75
J	58	327	200
K	85	80	80
Total	**509**	**1,839**	**1,703**

Operational Constraints (Currently under review)

- Operational constraints
  - Based on operational roadmap policy

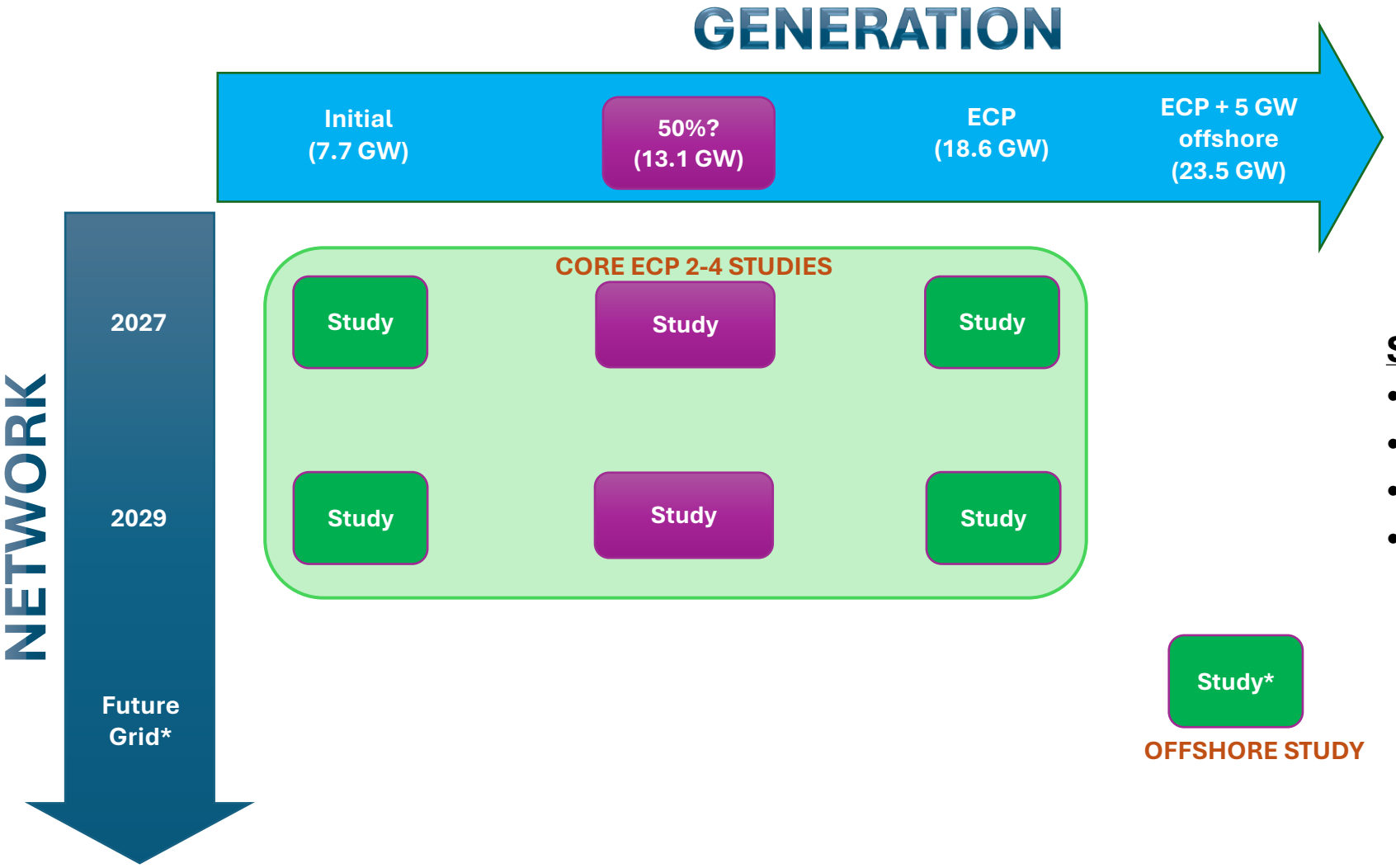
Active System Wide Constraints		Study Assumptions
Non-Synchronous Generation	There is a requirement to limit the instantaneous penetration of asynchronous generation connected to the All-Island system.	2027 – 85% 2029 – 90% Future Grid – 95%
Operational Limit for RoCoF	There is a requirement to limit the RoCoF on the All-Island system.	2027, 2029 & Future Grid – 1 Hz/sec
Operational Limit for Inertia	There is a requirement to have a minimum level of inertia on the All-Island system.	2027 – 23,000 MWs (Sync comp included) 2029 – 23,000 MWs (Sync comp included) Future Grid – 23,000 MWs (Sync comp included)
Minimum Sets (IE, NI)	There is a requirement to have a minimum number of conventional generators in Ireland and Northern Ireland.	2027 – 7 (4, 3) 2029 – 4, Future Grid – 3,
Reserve (IE, NI)	The amount of spare capacity in the system to manage any system disturbance.	POR, SOR, TOR I, and TOR II

Article 12 and Article 13 in ECP2-3 vs ECP 2-4

Under consideration - Potential implementation

	1. Surplus	2. Curtailment	3. Constraint
ECP 2-3 Approach	• Non-PD to reduce output on a pro-rata basis. • If **Surplus** is unresolved by non-PD reduction, PD reduce output on a pro-rata basis.	• Reduce PD and non-PD output where not already on zero output on a pro-rata basis.	**Proposed according to Enduring approach from SEM-22-009:** • Non-PD to reduce output on a pro-rata basis. • If **constraint** is unresolved by non-PD reduction, PD reduce output on a pro-rata basis.
Proposed ECP 2-4 Approach	• As per ECP 2-3.	• As per ECP 2-3.	**TBD**

Study Scenarios – Draft proposal for ECP 2.4



Scenarios / Study Selection criteria

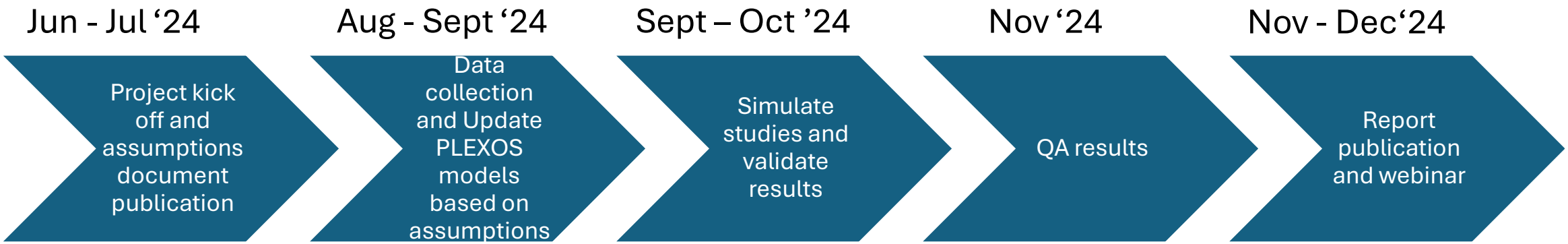
- Total – 13
- Confirmed scenarios – 5
- Flexible core scenarios – 2 to 4
- Flexible sensitivity – 4 to 6 (depending on number of core scenarios)

* SOEF 1.1 based network

Study - Confirmed Studies

Study - Options

Timeline



Engagement Plan

- First industry stakeholder engagement meeting – Mid July ‘24
- Second industry stakeholder engagement meeting – End of August ‘24
- Final assumptions webinar – Early September ‘24
- Draft Results – December ‘24
- Final area results webinars – January ‘25

Thank You
Questions?