ECP 2-4 Constraints Forecast

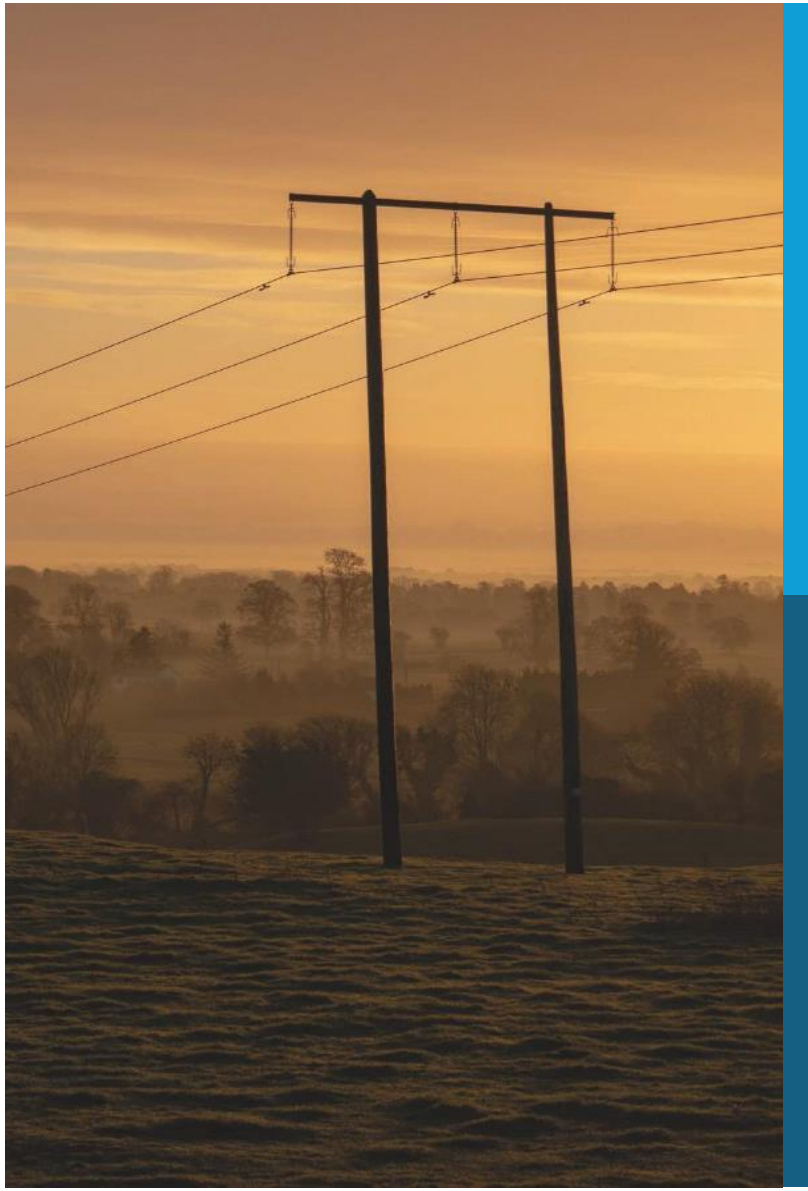
Constraints Analysis for Solar and Wind

Draft Results

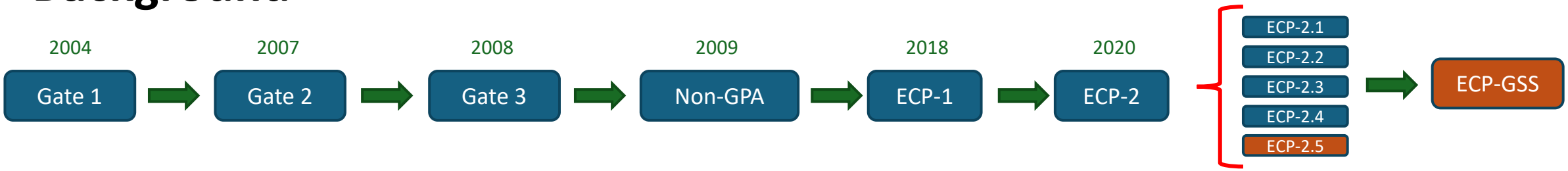
27/03/2025

Agenda

- Background
- Total Dispatch down
- Analysis Process
- Scenarios
- Assumptions
- Draft Results
- Key Messages



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.
- ECP 2-4 applicants include:

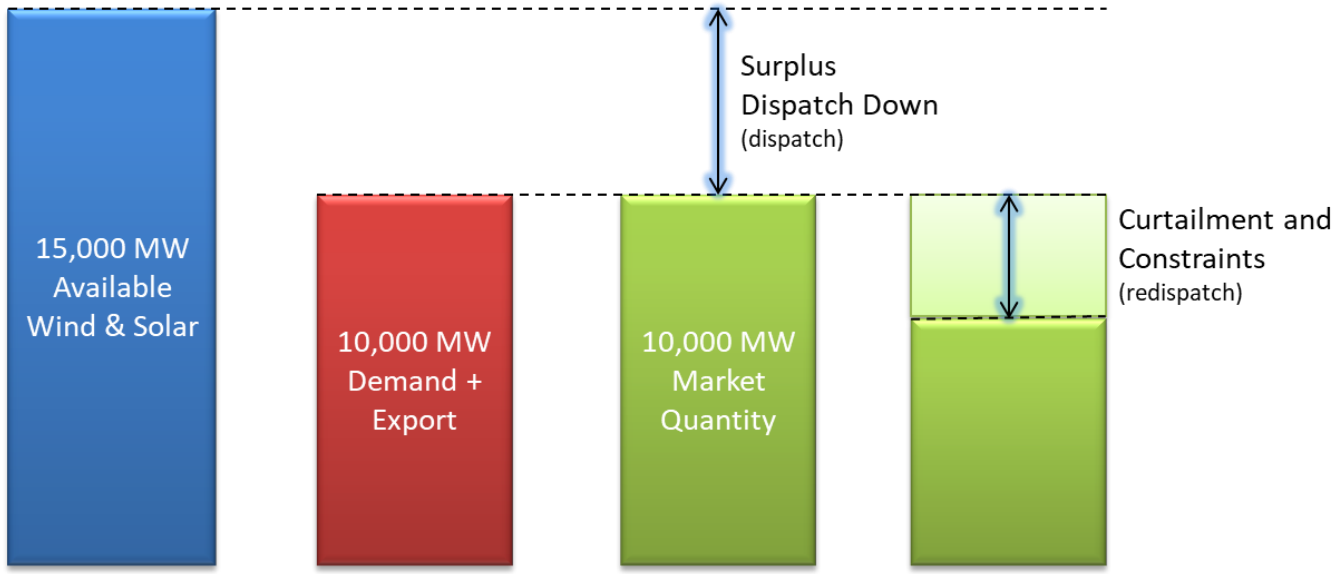
Wind	Solar	Battery
509 MW	1839 MW	1703 MW

Total Dispatch Down – constraint forecast

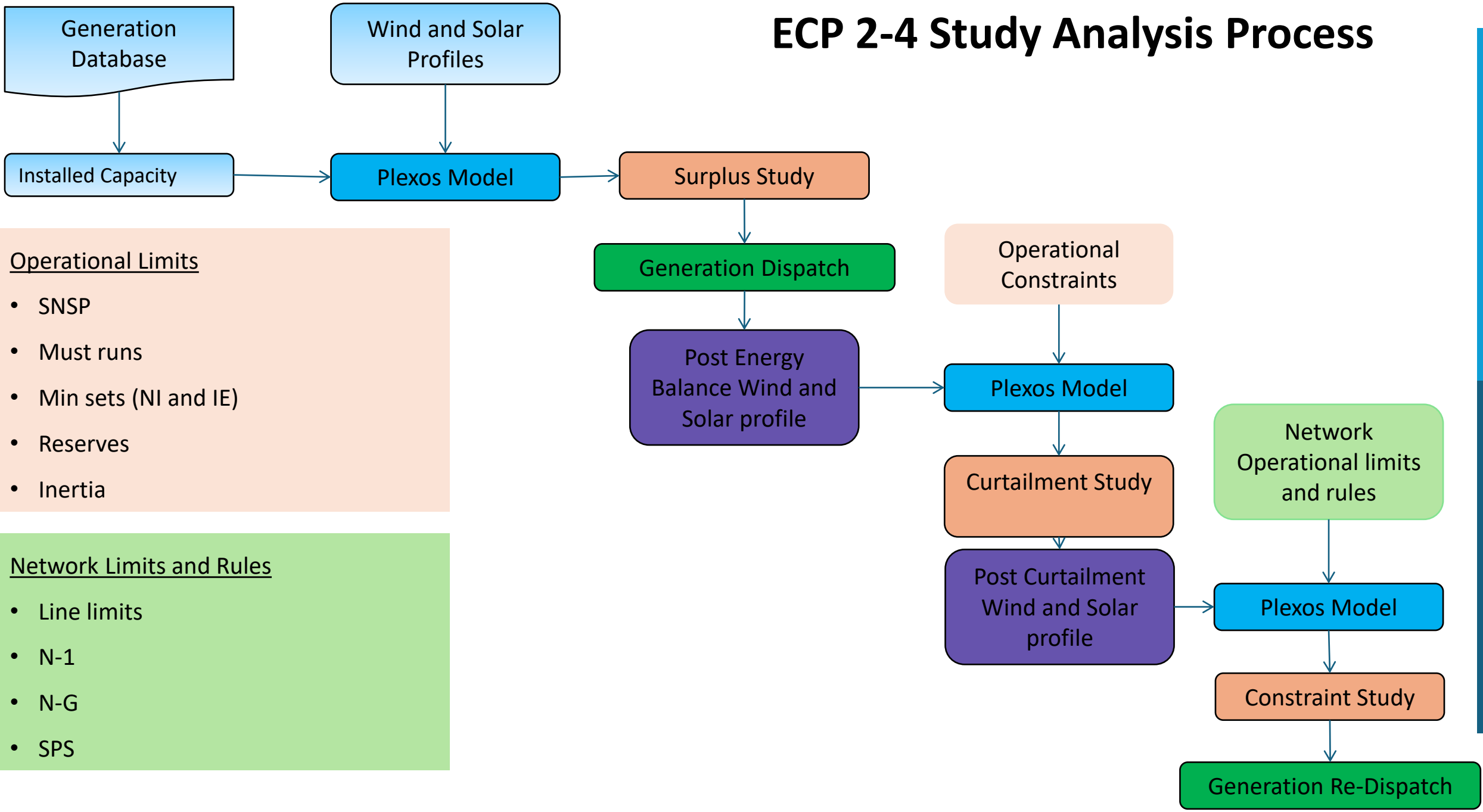
Total Dispatch Down

- Sum of Surplus, Curtailment & Constraint

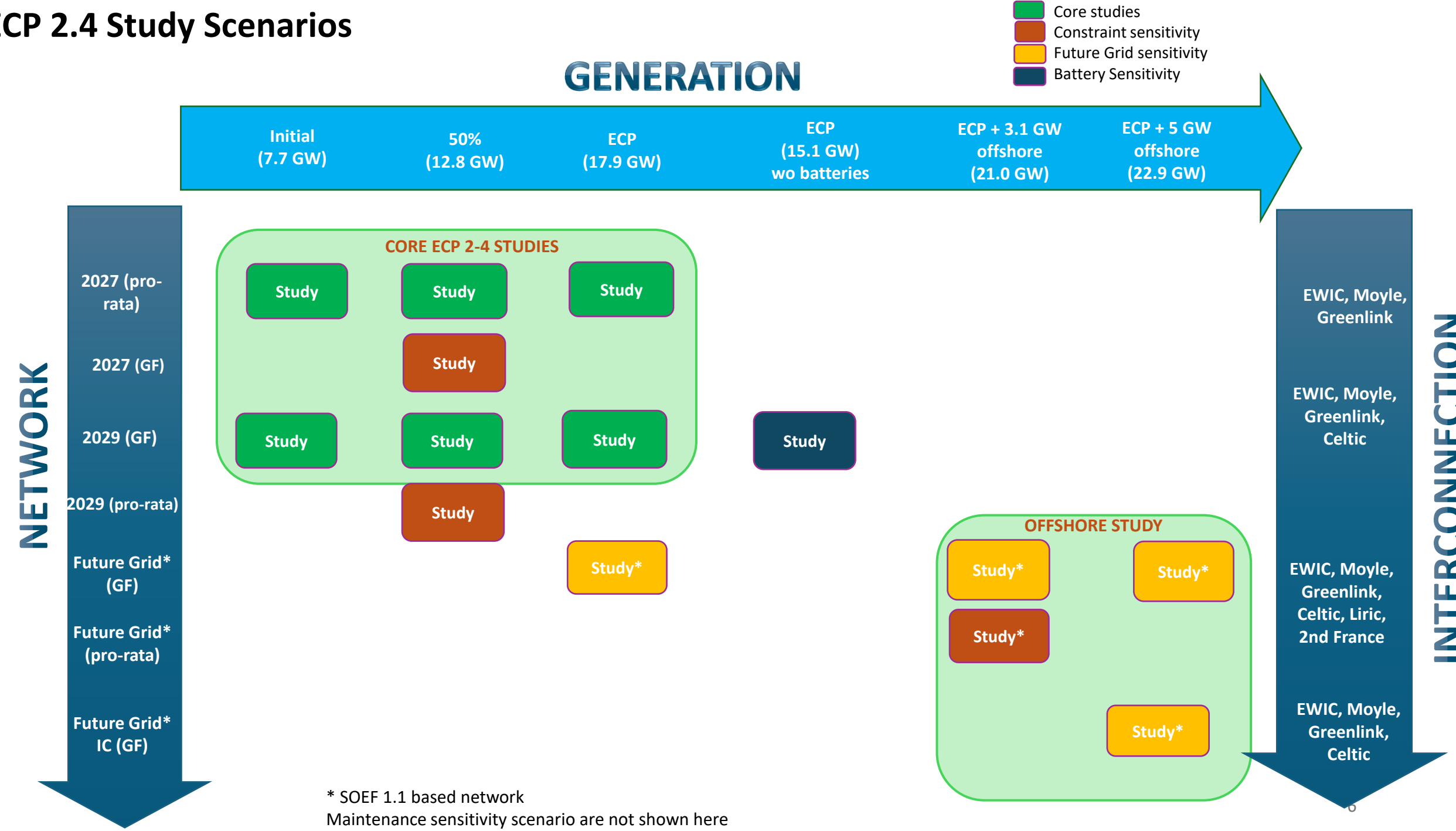
Type of Dispatch Down	Definition
Surplus	Dispatch down applied for energy balancing when generation exceeds demand + interconnector export.
Curtailment	Dispatch Down applied to ensure operational limits are met.
Constraint	Dispatch Down applied to manage network constraints.



ECP 2-4 Study Analysis Process



ECP 2.4 Study Scenarios



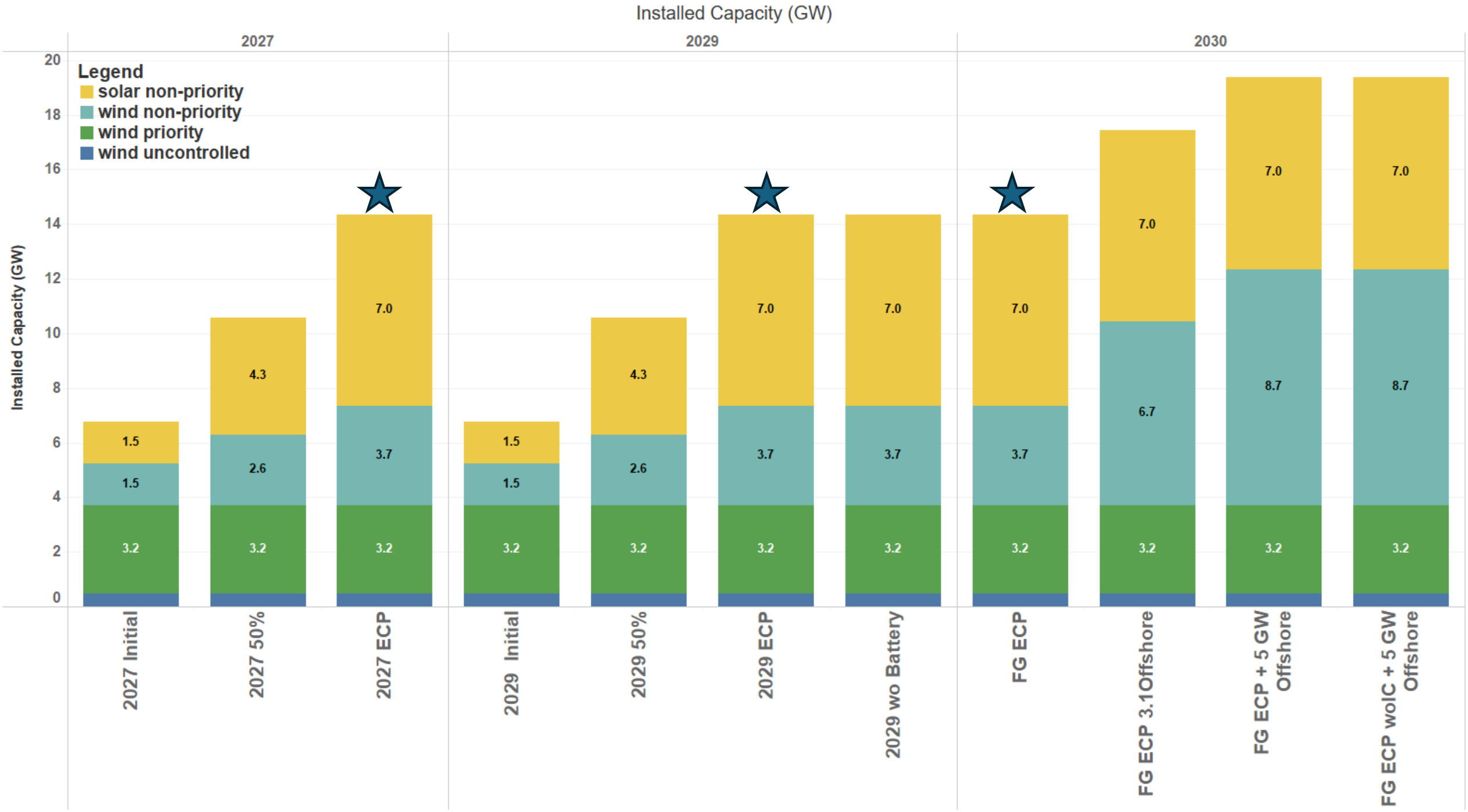
* SOEF 1.1 based network
Maintenance sensitivity scenario are not shown here

Assumptions in ECP 2.4

Assumption	ECP 2.4
Article 12/13 implementation (constraints)	Grandfathering method - Non priority generators are dispatched down ahead of priority generators Pro-rata method – all generators are dispatched down pro-rata 2027 – base scenario with pro-rata, sensitivity grandfathering 2029 and Future Grid – base scenario with grandfathering , sensitivity pro-rata
Article 12/13 implementation (Surplus)	Non priority generators are dispatched down ahead of priority generators
Demand	NRAA 2024-2033
RES generation (Ireland)	Updated with ECP 2.4 list
Onshore Wind Profile	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).
Operational Constraints	SNSP : 2027 – 85%, 2029 – 90%, FG – 95% Inertia : 23GWs for all years (Including Sync Comp) Min sets – 2027 – 7 (4,3), 2029 – 4 (2,2), FG – 3

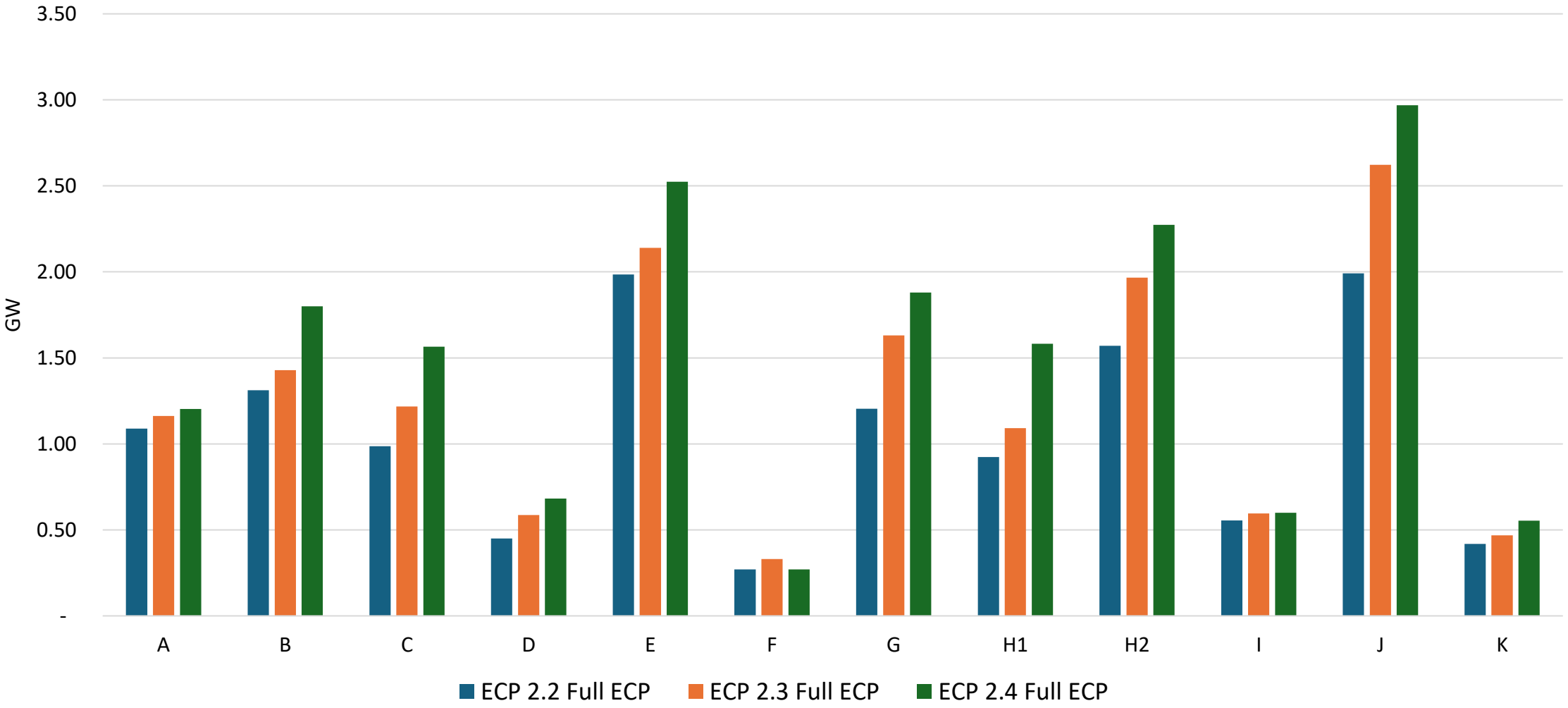
Assumption	ECP 2.4
Interconnector	2027 – EWIC, Greenlink, Moyle (Export 400MW). 2029 – EWIC, Greenlink, Moyle (Export 500MW), Celtic, North-South 2. Future Grid – EWIC, Greenlink, Moyle (Export 500MW), LirIC, Celtic, North-South 2, 2nd France*.
Batteries	Based on current offers and applications. Used for maintaining reserve (POR, SOR, TOR1 & TOR2). 2 cycle per day limit. Portion of the longer duration storage to provide energy arbitrage
Outage assumptions (Transmission)	Consistent with ECP 2.3 and ECP 2.2
Reinforcement Assumptions	2027 and 2029: Network Delivery Portfolio Future Grid: SOEF 1.1 Roadmap
Northern Ireland Assumptions	Update with NI generation data and network data
Conventional Generation	NRAA 2024-2033 and capacity auction
DLR	30% additional line rating based on the wind

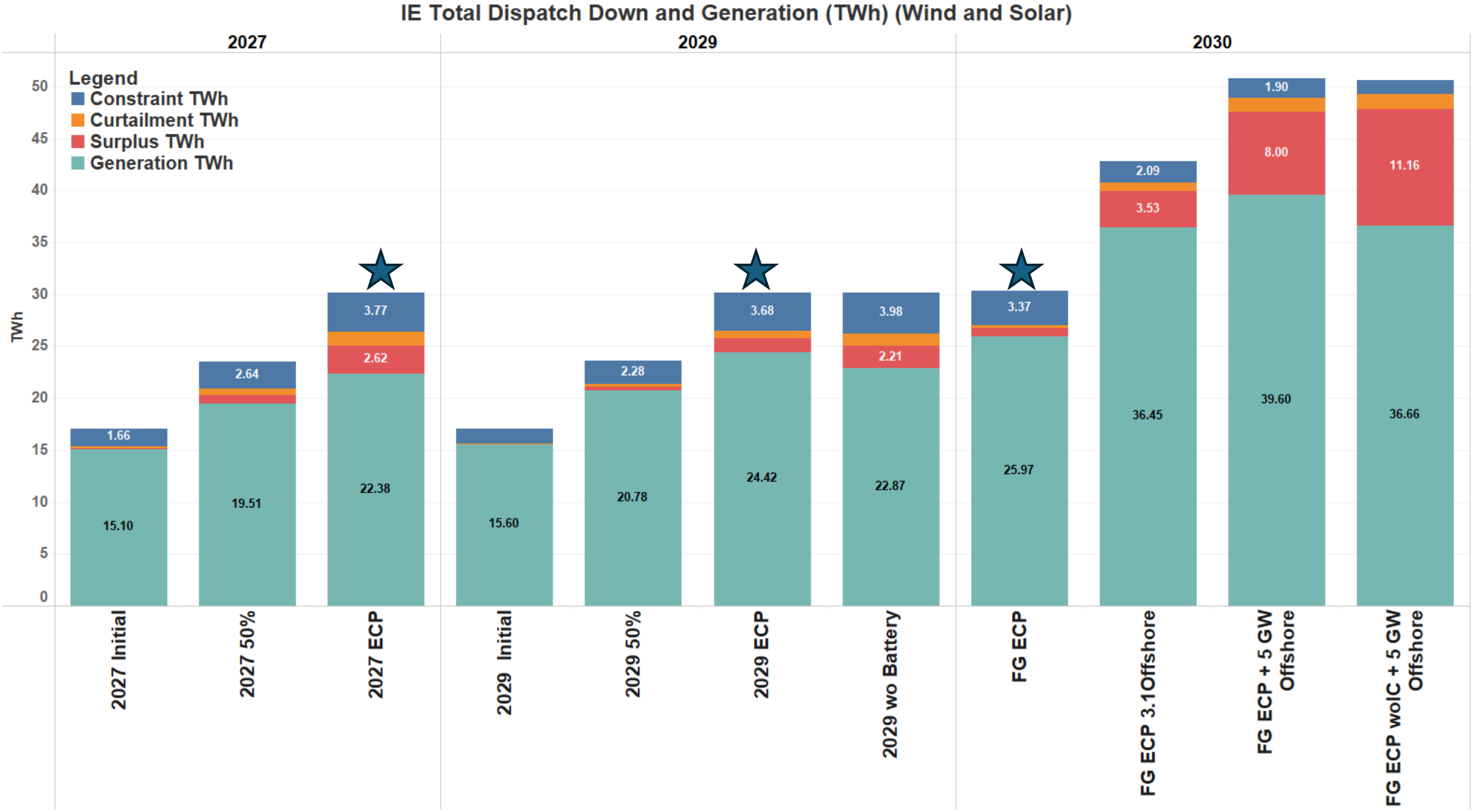
Draft Results

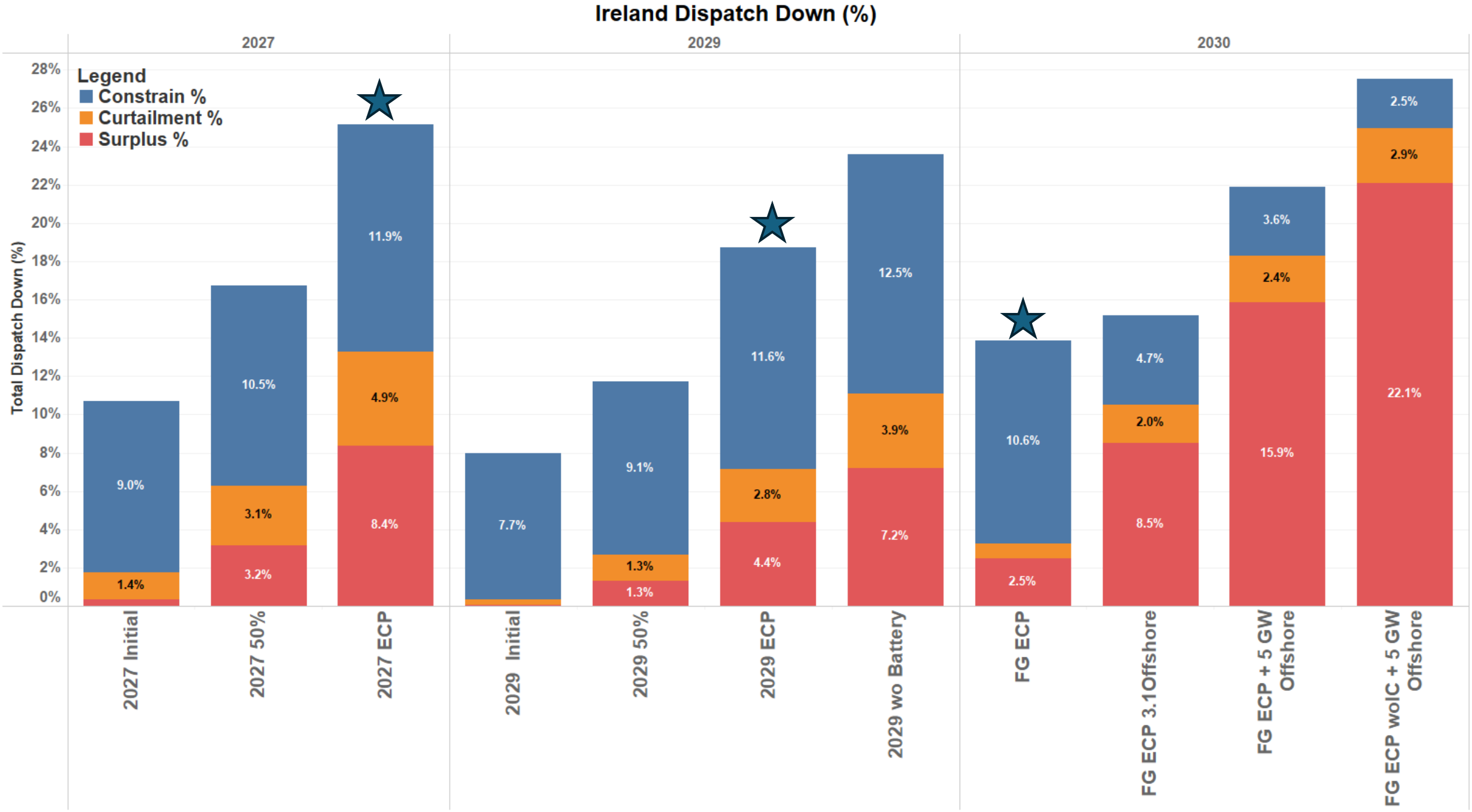

Installed Capacity (GW)
2027
2029
2030
Legend
solar non-priority
wind non-priority
wind priority
wind uncontrolled
Installed Capacity (GW)
0
2
4
6
8
10
12
14
16
18
20
1.5
1.5
3.2
4.3
2.6
3.2
7.0
3.7
3.2
1.5
1.5
3.2
4.3
2.6
3.2
7.0
3.7
3.2
7.0
3.7
3.2
7.0
3.7
3.2
7.0
6.7
3.2
7.0
8.7
3.2
7.0
8.7
3.2
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP woIC + 5 GW Offshore

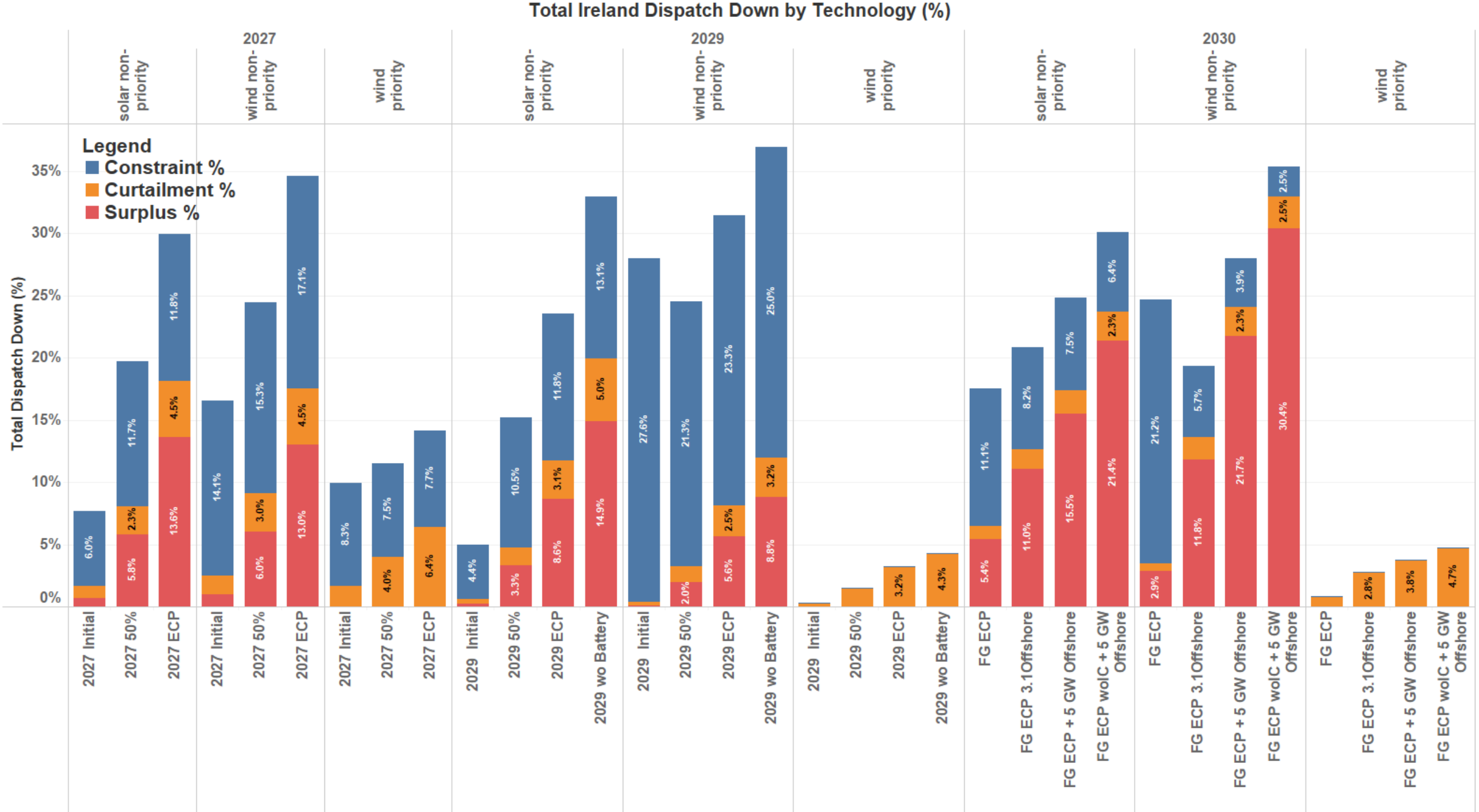
Comparison of Installed Capacity in ECP 2.2 - 2.4

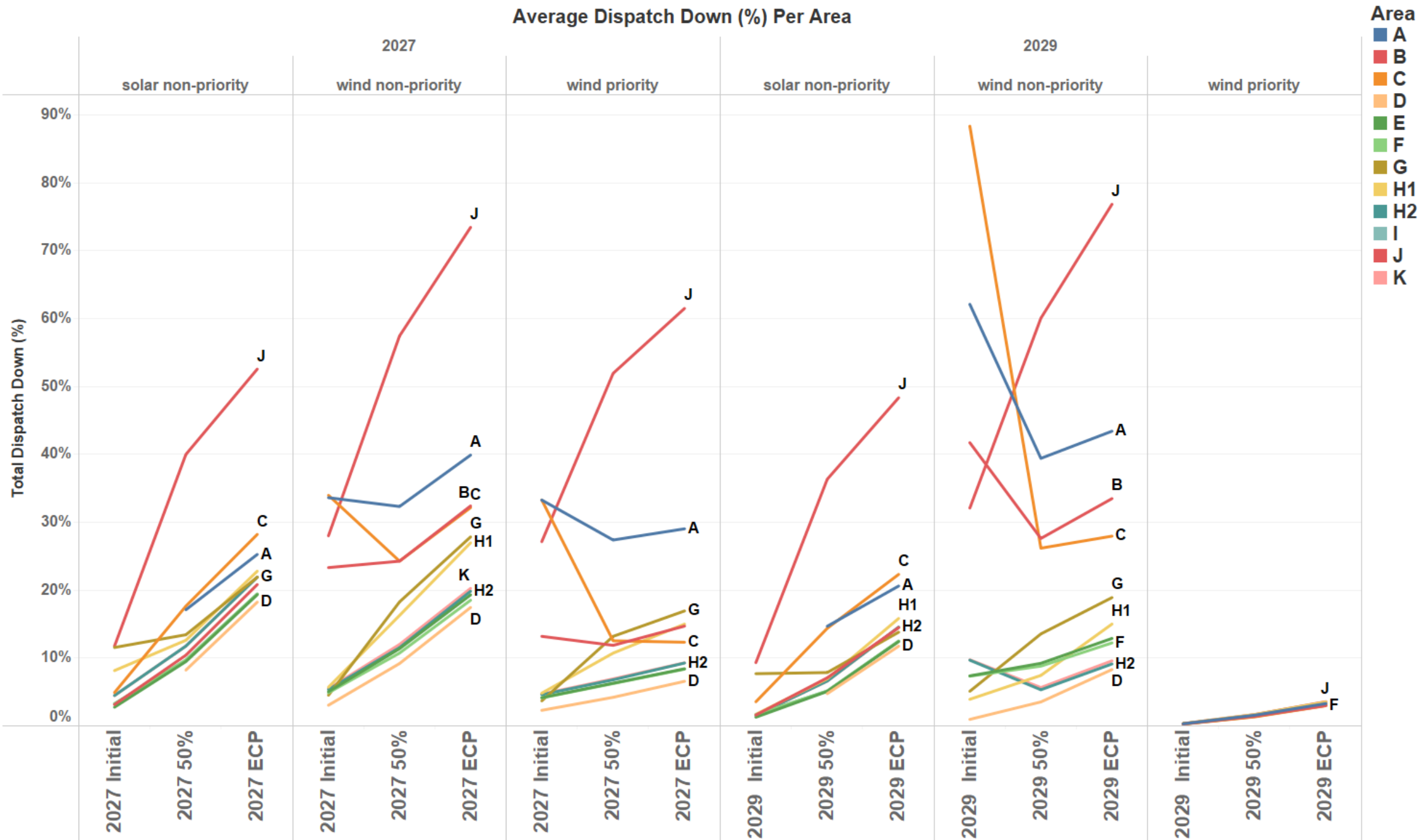
- Data taken from the final publications for respective ECP constraints analysis report.



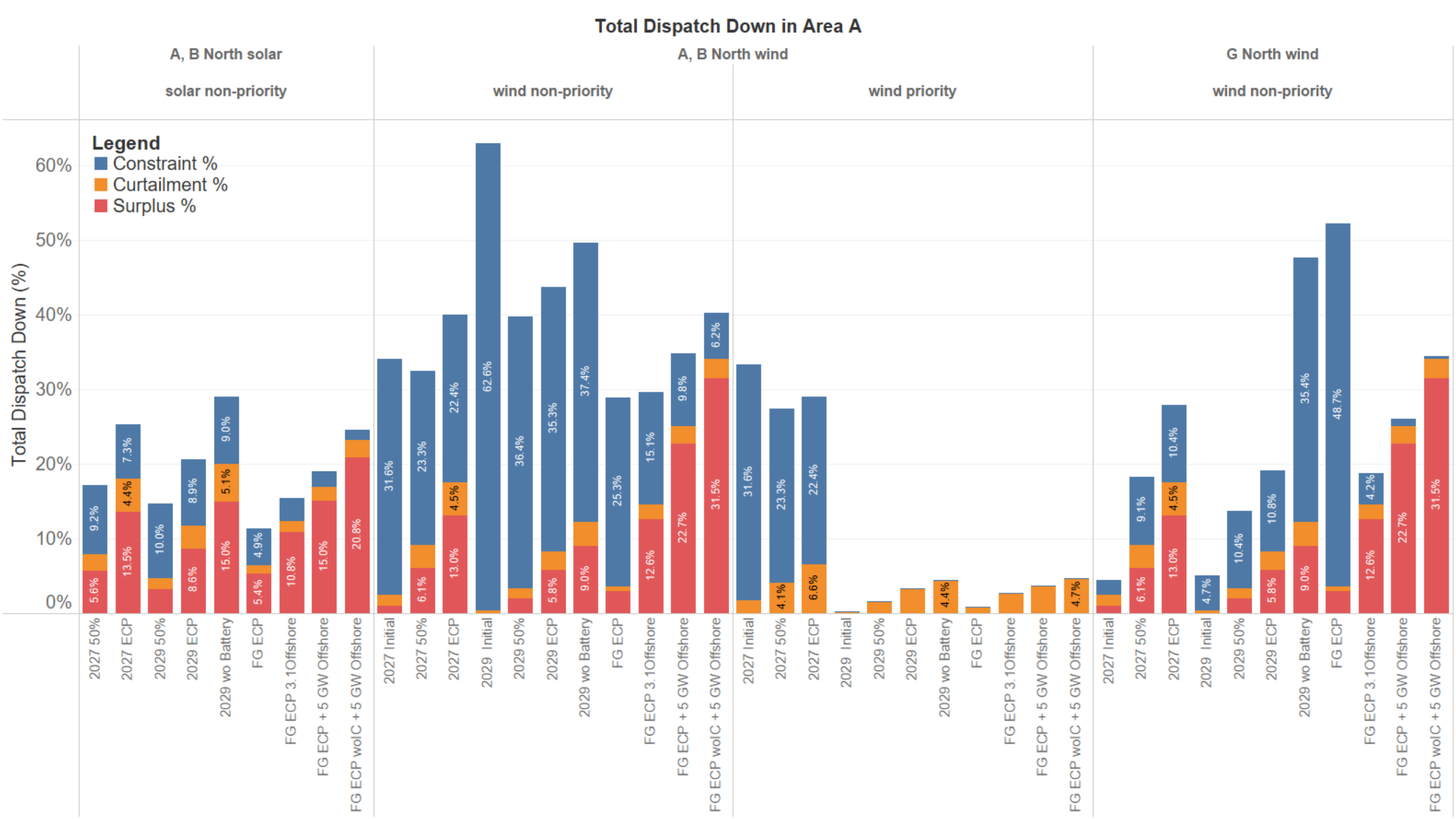

IE Total Dispatch Down and Generation (TWh) (Wind and Solar)
2027
2029
2030
Legend
Constraint TWh
Curtailment TWh
Surplus TWh
Generation TWh
TWh
0
5
10
15
20
25
30
35
40
45
50
1.66
15.10
2.64
19.51
3.77
2.62
22.38
2.28
15.60
20.78
3.68
24.42
3.98
2.21
22.87
3.37
25.97
2.09
3.53
36.45
1.90
8.00
39.60
11.16
36.66
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP woIC + 5 GW Offshore

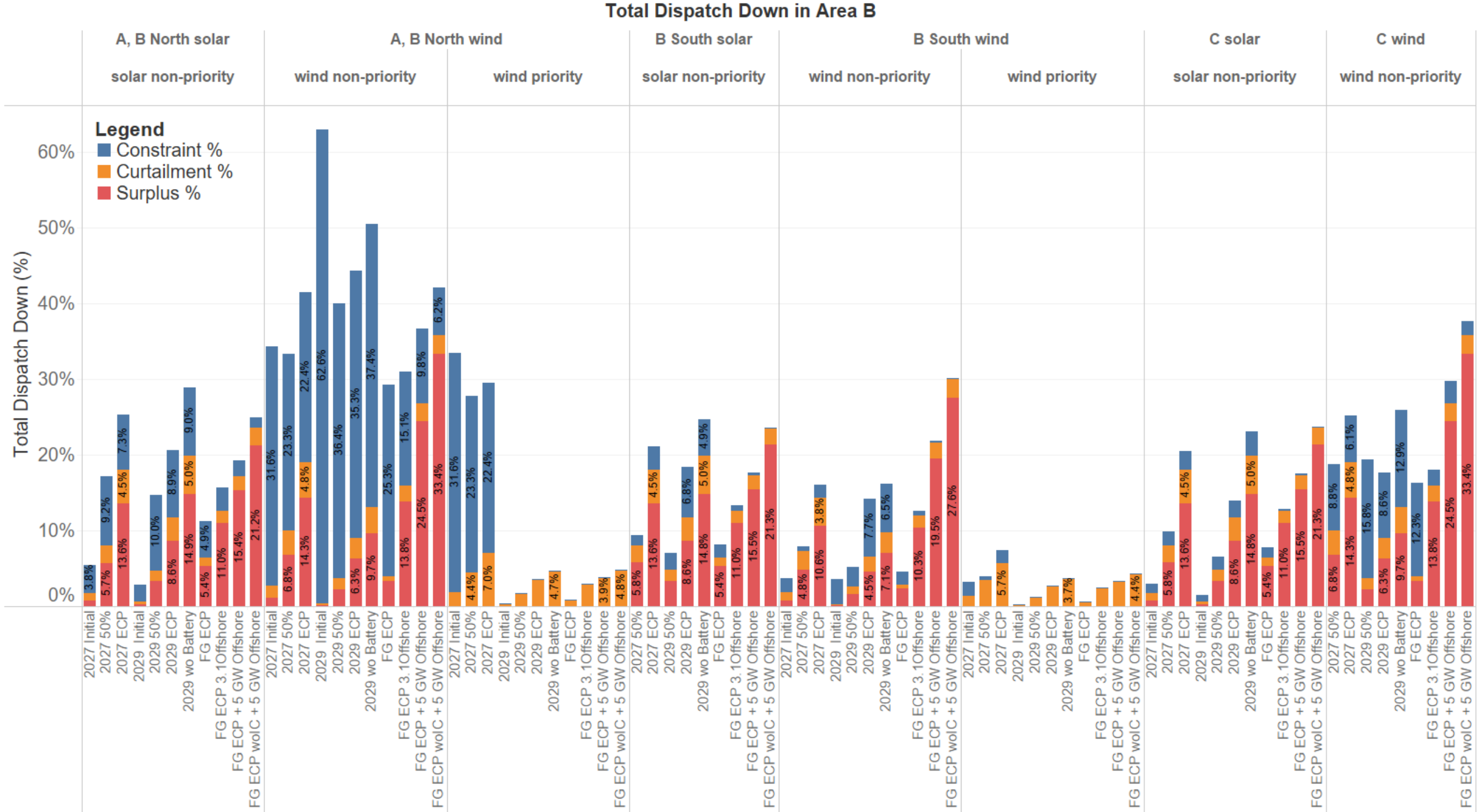

Ireland Dispatch Down (%)
2027
2029
2030
Legend
Constrain %
Curtailment %
Surplus %
Total Dispatch Down (%)
28%
26%
24%
22%
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
9.0%
1.4%
10.5%
3.1%
3.2%
11.9%
4.9%
8.4%
7.7%
9.1%
1.3%
1.3%
11.6%
2.8%
4.4%
12.5%
3.9%
7.2%
10.6%
2.5%
4.7%
2.0%
8.5%
3.6%
2.4%
15.9%
2.5%
2.9%
22.1%
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP woIC + 5 GW Offshore

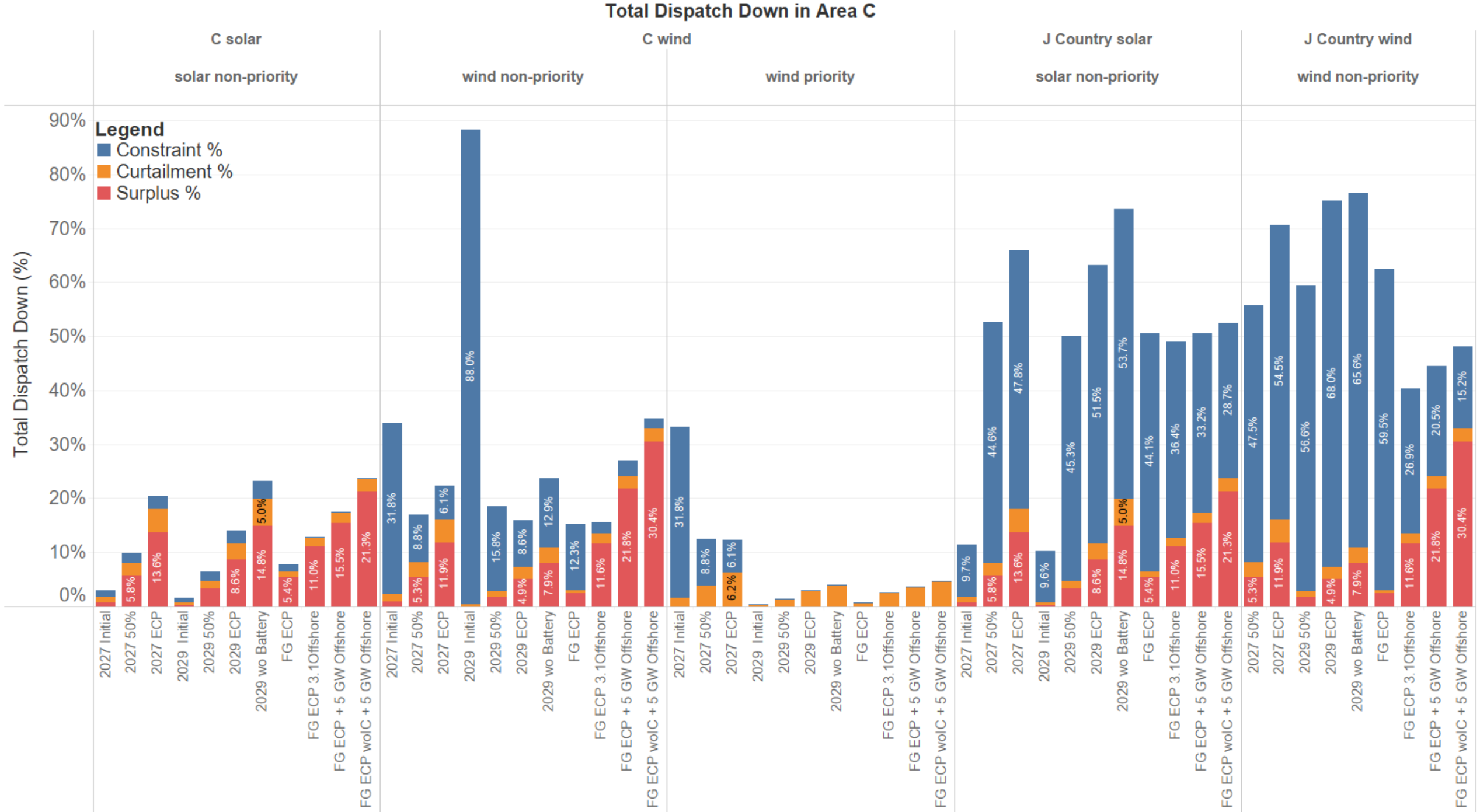

Total Ireland Dispatch Down by Technology (%)
2027
2029
2030
solar non-priority
wind non-priority
wind priority
Legend
Constraint %
Curtailment %
Surplus %
Total Dispatch Down (%)
0%
5%
10%
15%
20%
25%
30%
35%
6.0%
5.8%
2.3%
11.7%
13.6%
4.5%
11.8%
14.1%
6.0%
3.0%
15.3%
13.0%
4.5%
17.1%
8.3%
4.0%
7.5%
6.4%
7.7%
4.4%
3.3%
10.5%
8.6%
3.1%
11.8%
14.9%
5.0%
13.1%
27.6%
2.0%
21.3%
5.6%
2.5%
23.3%
8.8%
3.2%
25.0%
3.2%
4.3%
5.4%
11.1%
11.0%
8.2%
15.5%
7.5%
21.4%
2.3%
6.4%
2.9%
21.2%
11.8%
5.7%
21.7%
2.3%
3.9%
30.4%
2.5%
2.5%
2.8%
3.8%
4.7%
2027 Initial
2027 50%
2027 ECP
2027 Initial
2027 50%
2027 ECP
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP wolC + 5 GW Offshore
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP wolC + 5 GW Offshore
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP wolC + 5 GW Offshore

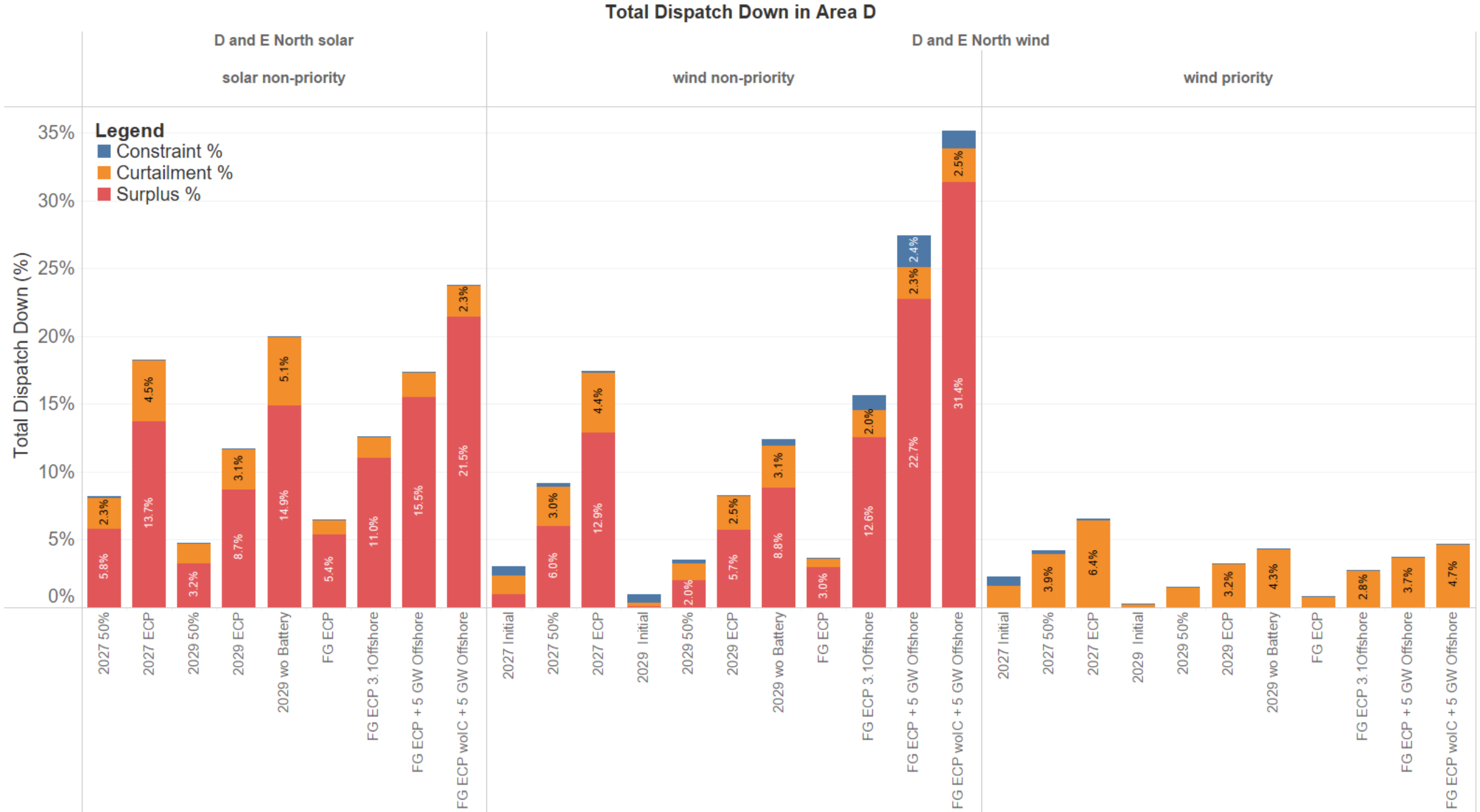

Average Dispatch Down (%) Per Area
2027
2029
solar non-priority
wind non-priority
wind priority
solar non-priority
wind non-priority
wind priority
Total Dispatch Down (%)
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
Area
A
B
C
D
E
F
G
H1
H2
I
J
K

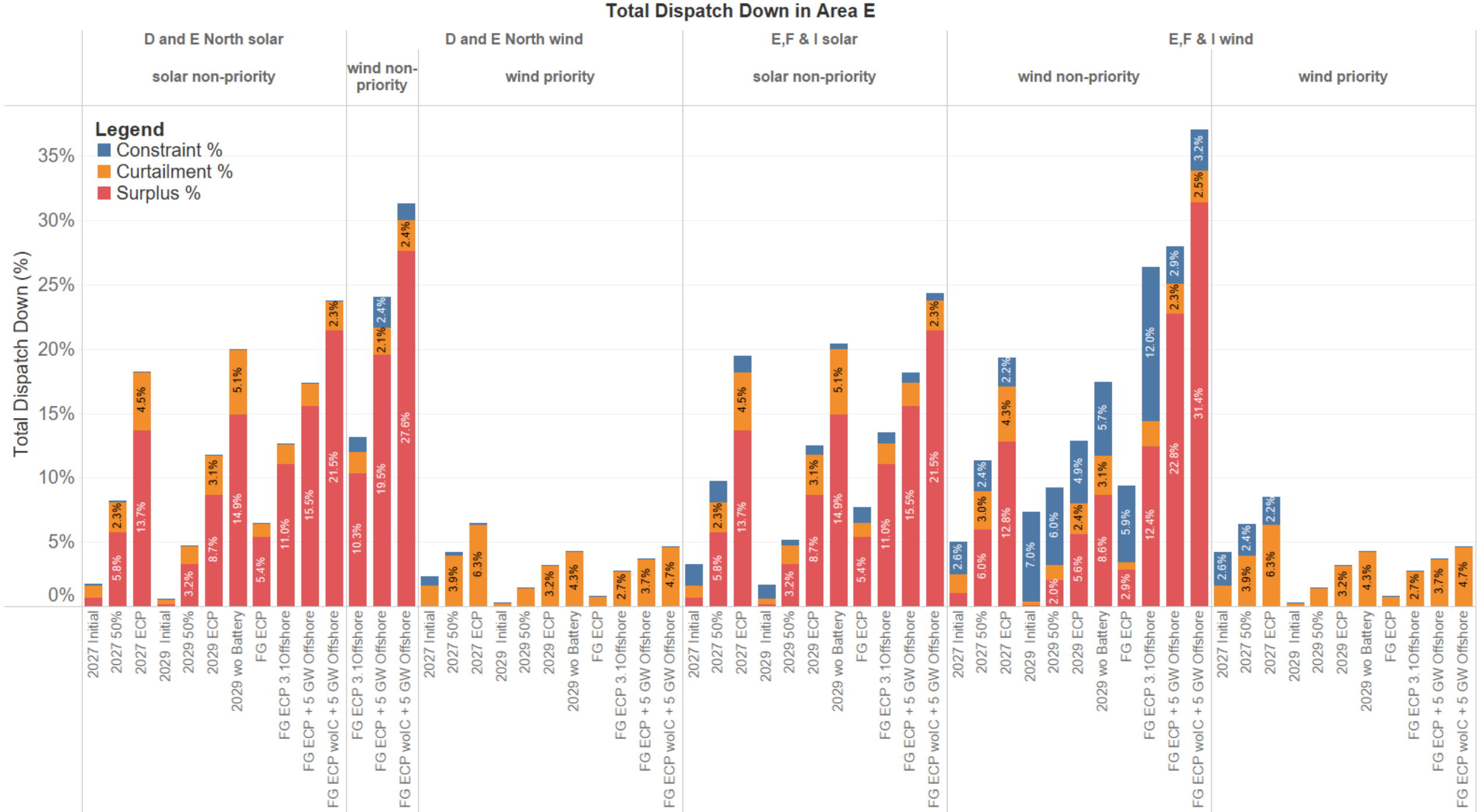
Area Results

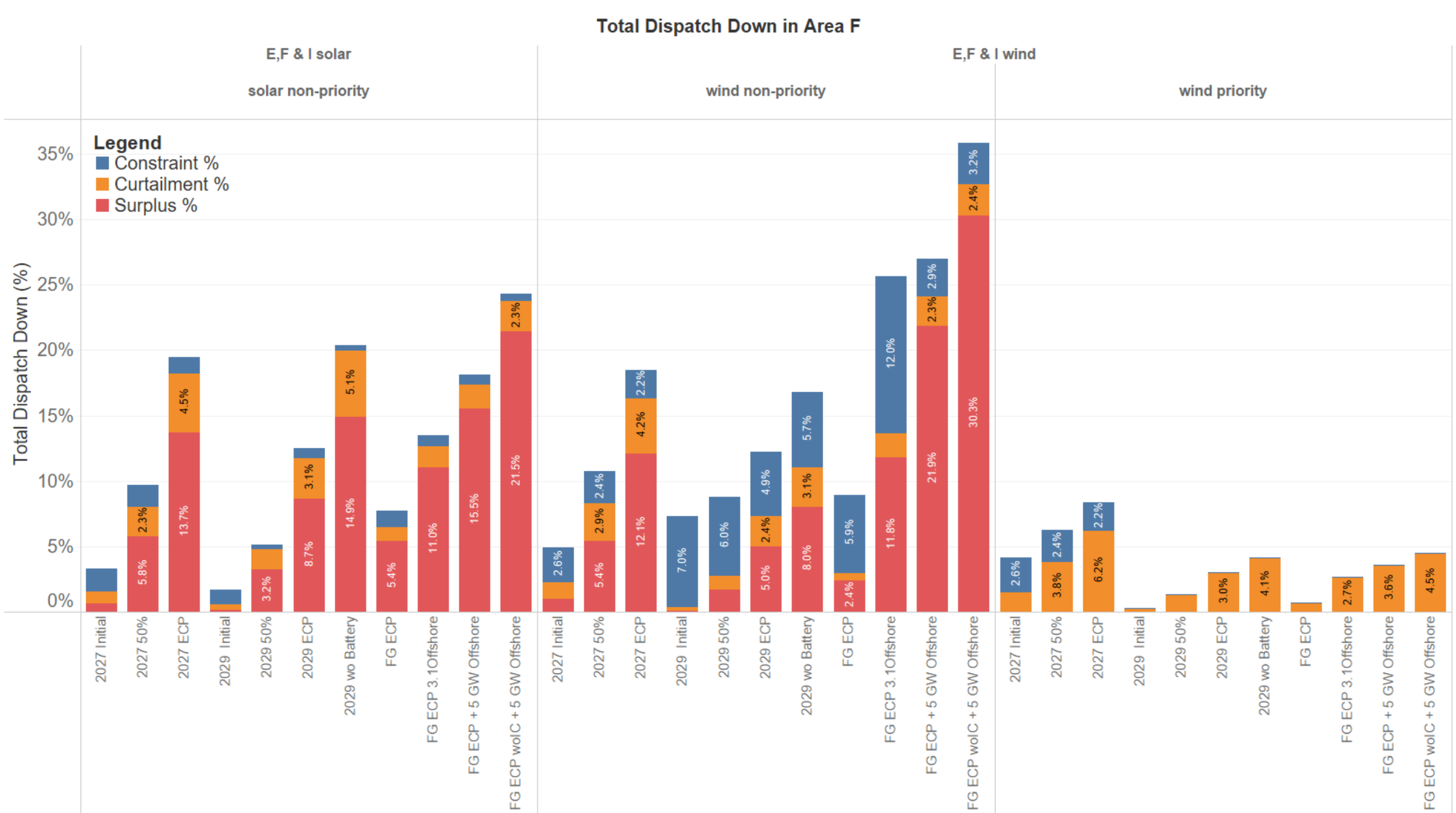

Total Dispatch Down in Area A
A, B North solar
solar non-priority
A, B North wind
wind non-priority
wind priority
G North wind
wind non-priority
Legend
Constraint %
Curtailment %
Surplus %
Total Dispatch Down (%)
0%
10%
20%
30%
40%
50%
60%
2027 50%
2027 ECP
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP woIC + 5 GW Offshore
2027 Initial
2029 Initial

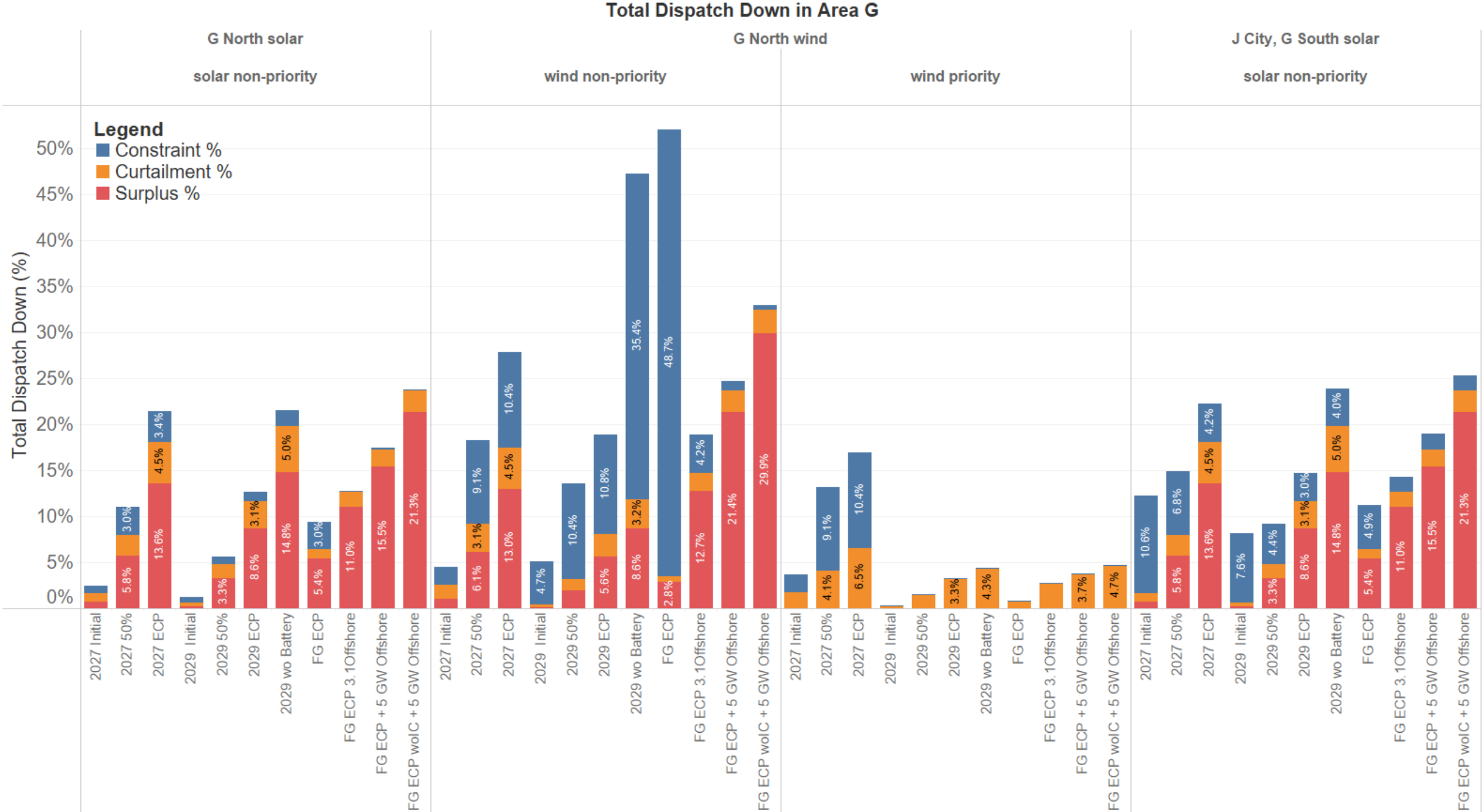

Total Dispatch Down in Area B
A, B North solar
solar non-priority
A, B North wind
wind non-priority
wind priority
B South solar
solar non-priority
B South wind
wind non-priority
wind priority
C solar
solar non-priority
C wind
wind non-priority
Legend
Constraint %
Curtailment %
Surplus %
Total Dispatch Down (%)
0%
10%
20%
30%
40%
50%
60%
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP wo!C + 5 GW Offshore

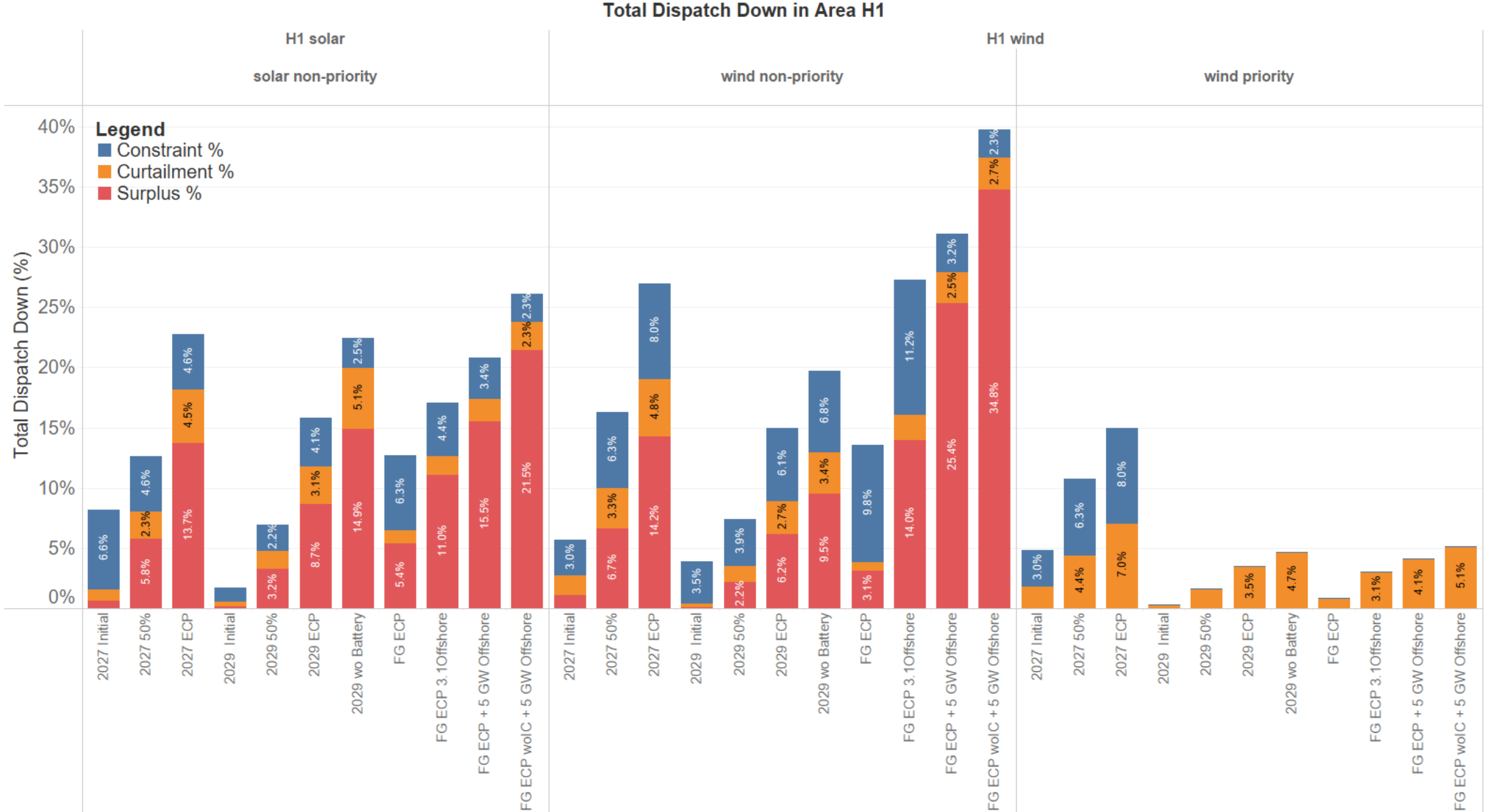

Total Dispatch Down in Area C
C solar
solar non-priority
C wind
wind non-priority
wind priority
J Country solar
solar non-priority
J Country wind
wind non-priority
Legend
Constraint %
Curtailment %
Surplus %
Total Dispatch Down (%)
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP wo/C + 5 GW Offshore
5.8%
13.6%
5.0%
5.4%
11.0%
15.5%
21.3%
31.8%
8.8%
5.3%
6.1%
11.9%
88.0%
15.8%
8.6%
4.9%
12.9%
7.9%
12.3%
11.6%
21.8%
30.4%
6.2%
9.7%
44.6%
47.8%
13.6%
9.6%
45.3%
51.5%
53.7%
14.8%
44.1%
36.4%
11.0%
33.2%
15.5%
28.7%
21.3%
47.5%
54.5%
11.9%
56.6%
68.0%
4.9%
65.6%
7.9%
59.5%
26.9%
11.6%
20.5%
21.8%
15.2%
30.4%

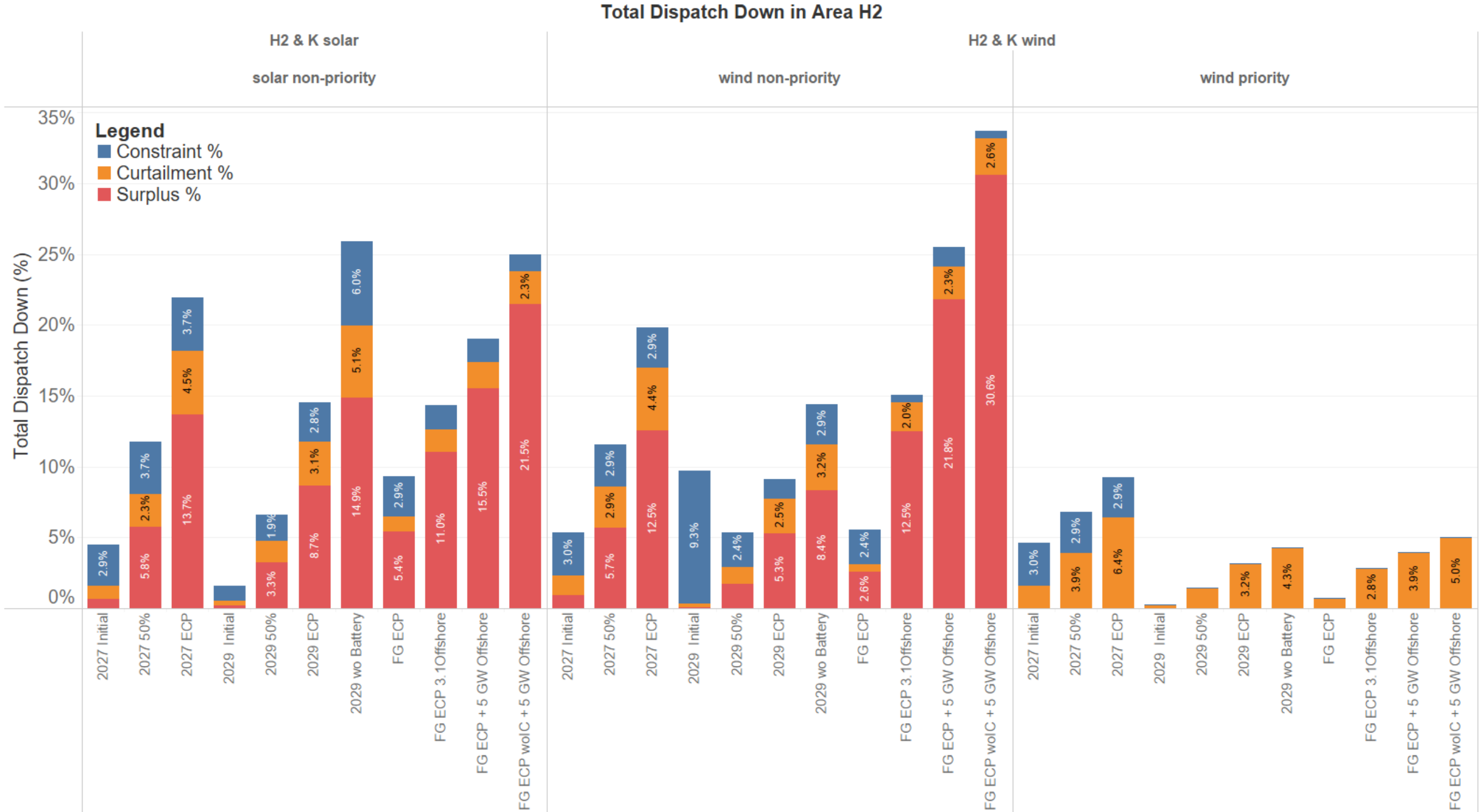

Total Dispatch Down in Area D
D and E North solar
solar non-priority
D and E North wind
wind non-priority
wind priority
Legend
Constraint %
Curtailment %
Surplus %
Total Dispatch Down (%)
35%
30%
25%
20%
15%
10%
5%
0%
2027 50%
2027 ECP
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP wo IC + 5 GW Offshore
2027 Initial
2029 Initial
5.8%
2.3%
13.7%
4.5%
3.2%
8.7%
3.1%
14.9%
5.1%
5.4%
11.0%
15.5%
21.5%
2.3%
6.0%
3.0%
12.9%
4.4%
2.0%
5.7%
2.5%
8.8%
3.1%
3.0%
12.6%
2.0%
22.7%
2.3%
2.4%
31.4%
2.5%
3.9%
6.4%
3.2%
4.3%
2.8%
3.7%
4.7%

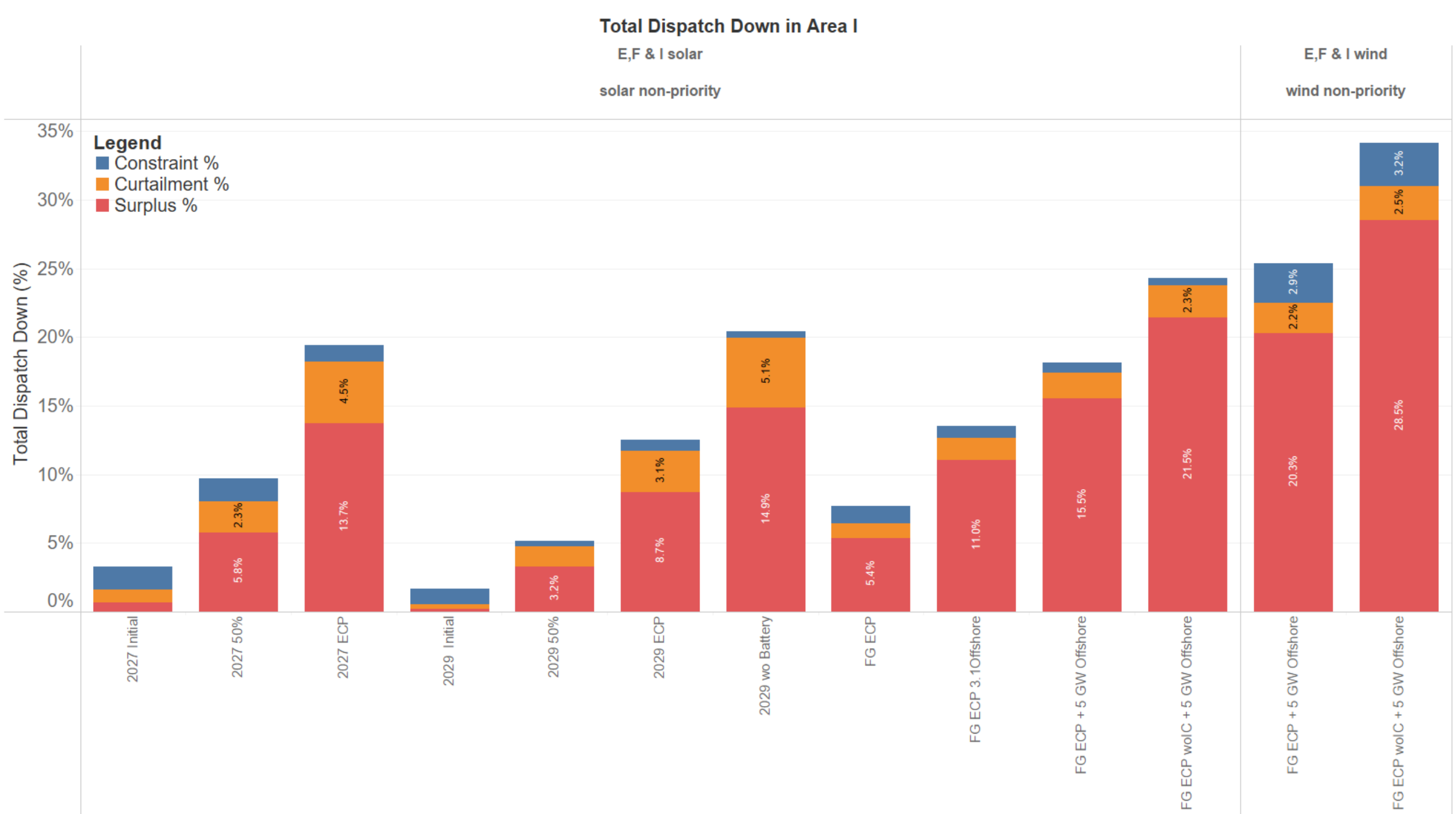

Total Dispatch Down in Area E
D and E North solar
solar non-priority
wind non-priority
D and E North wind
wind priority
E,F & I solar
solar non-priority
E,F & I wind
wind non-priority
wind priority
Legend
Constraint %
Curtailment %
Surplus %
Total Dispatch Down (%)
35%
30%
25%
20%
15%
10%
5%
0%
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP wolC + 5 GW Offshore

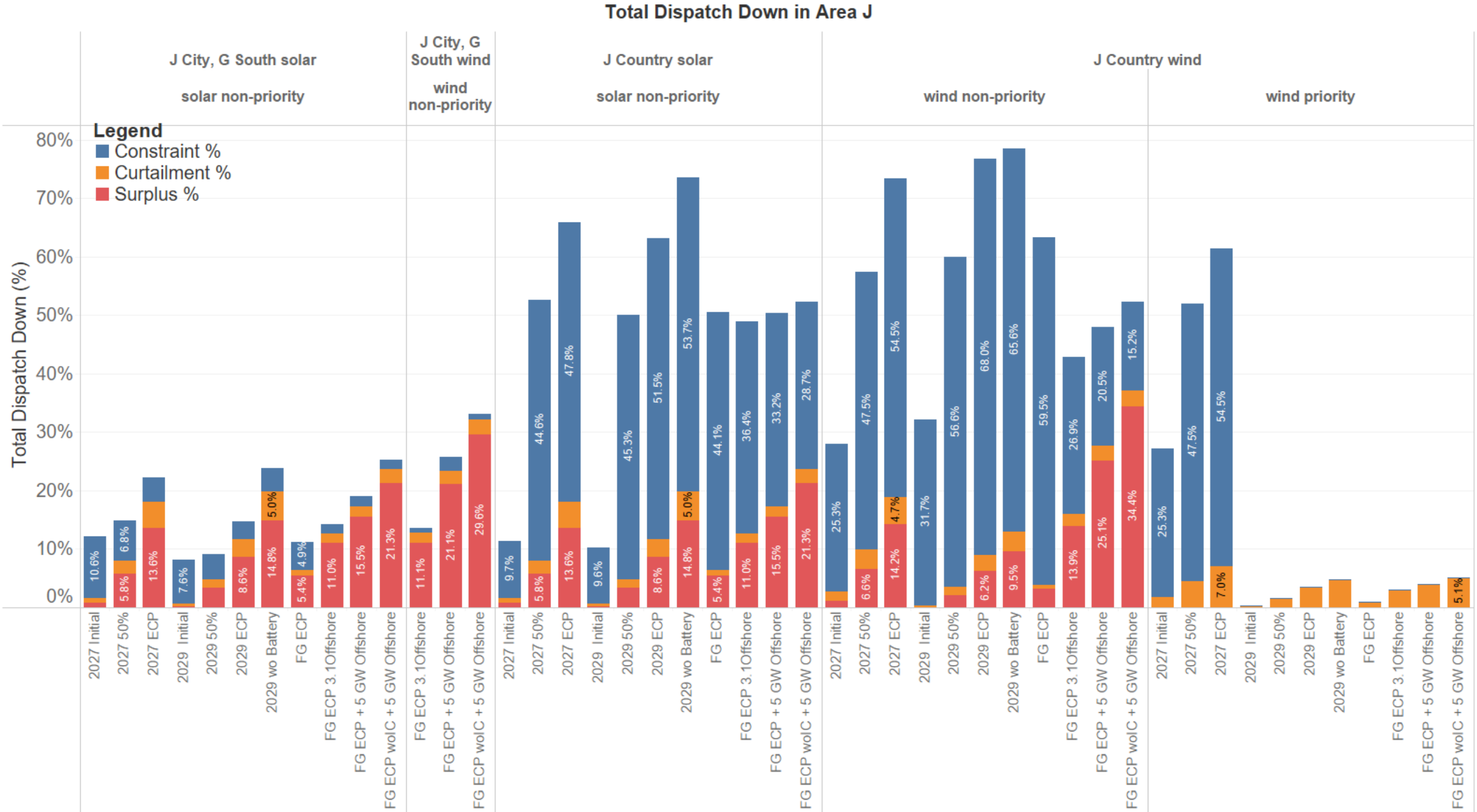

Total Dispatch Down in Area F
E,F & I solar
E,F & I wind
solar non-priority
wind non-priority
wind priority
Legend
Constraint %
Curtailment %
Surplus %
Total Dispatch Down (%)
35%
30%
25%
20%
15%
10%
5%
0%
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP woIC + 5 GW Offshore

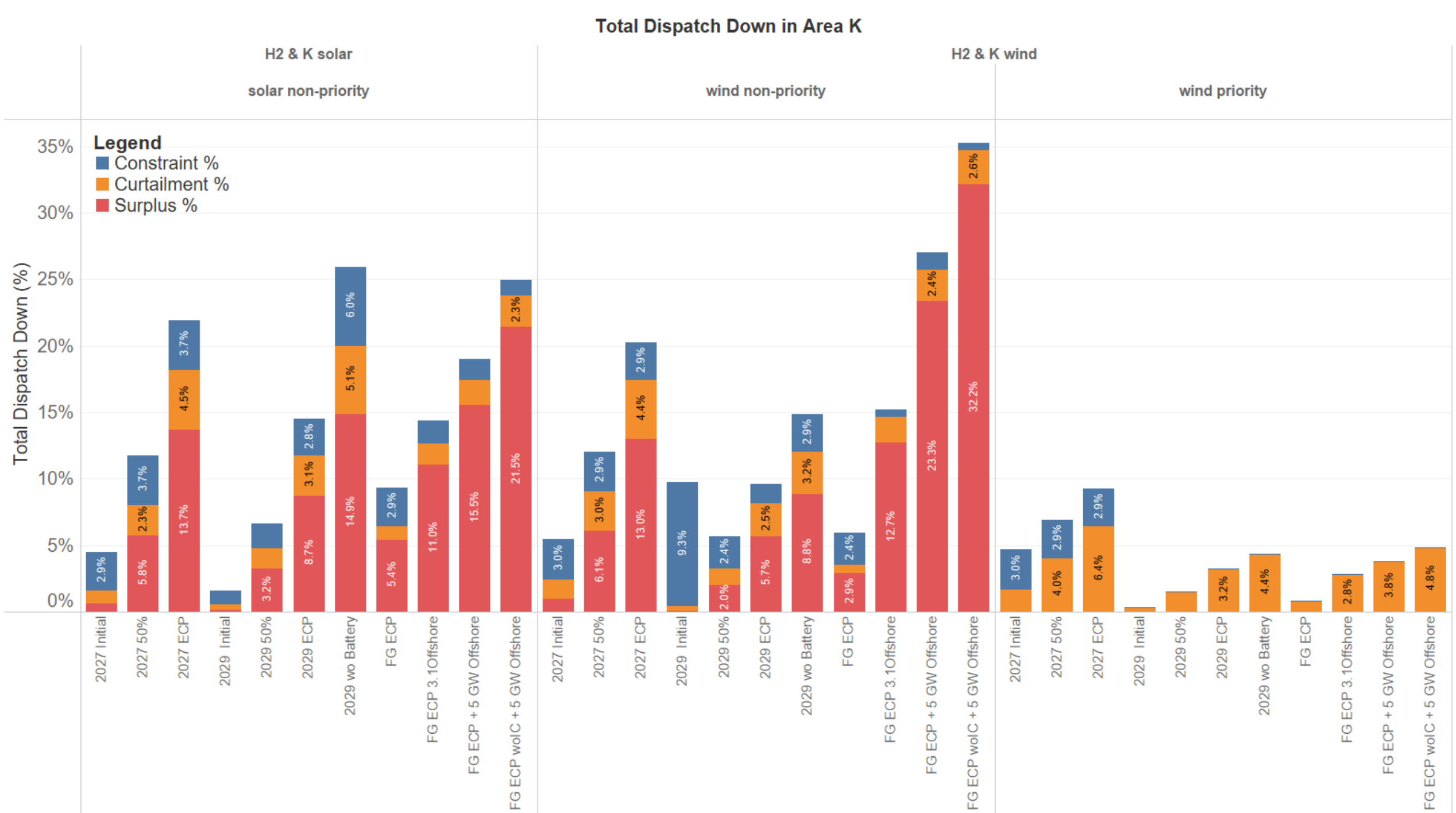

Total Dispatch Down in Area G
G North solar
solar non-priority
G North wind
wind non-priority
wind priority
J City, G South solar
solar non-priority
Legend
Constraint %
Curtailment %
Surplus %
Total Dispatch Down (%)
50%
45%
40%
35%
30%
25%
20%
15%
10%
5%
0%
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP woIC + 5 GW Offshore


Total Dispatch Down in Area H1
H1 solar
H1 wind
solar non-priority
wind non-priority
wind priority
Legend
Constraint %
Curtailment %
Surplus %
Total Dispatch Down (%)
40%
35%
30%
25%
20%
15%
10%
5%
0%
6.6%
5.8%
2.3%
4.6%
13.7%
4.5%
4.6%
3.2%
2.2%
8.7%
3.1%
4.1%
14.9%
5.1%
2.5%
5.4%
6.3%
11.0%
4.4%
15.5%
3.4%
21.5%
2.3%
2.3%
3.0%
6.7%
3.3%
6.3%
14.2%
4.8%
8.0%
3.5%
2.2%
3.9%
6.2%
2.7%
6.1%
9.5%
3.4%
6.8%
3.1%
9.8%
14.0%
11.2%
25.4%
2.5%
3.2%
34.8%
2.7%
2.3%
3.0%
4.4%
6.3%
7.0%
8.0%
3.5%
4.7%
3.1%
4.1%
5.1%
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP woIC + 5 GW Offshore


Total Dispatch Down in Area H2
H2 & K solar
H2 & K wind
solar non-priority
wind non-priority
wind priority
Legend
Constraint %
Curtailment %
Surplus %
Total Dispatch Down (%)
35%
30%
25%
20%
15%
10%
5%
0%
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP woIC + 5 GW Offshore


Total Dispatch Down in Area I
E,F & I solar
solar non-priority
E,F & I wind
wind non-priority
Legend
Constraint %
Curtailment %
Surplus %
Total Dispatch Down (%)
35%
30%
25%
20%
15%
10%
5%
0%
2.3%
5.8%
4.5%
13.7%
3.2%
3.1%
8.7%
5.1%
14.9%
5.4%
11.0%
15.5%
2.3%
21.5%
2.9%
2.2%
20.3%
3.2%
2.5%
28.5%
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP wo IC + 5 GW Offshore
FG ECP + 5 GW Offshore
FG ECP wo IC + 5 GW Offshore


Total Dispatch Down in Area J
J City, G South solar
solar non-priority
J City, G South wind
wind non-priority
J Country solar
solar non-priority
J Country wind
wind non-priority
wind priority
Legend
Constraint %
Curtailment %
Surplus %
Total Dispatch Down (%)
80%
70%
60%
50%
40%
30%
20%
10%
0%
10.6%
6.8%
5.8%
13.6%
7.6%
5.0%
14.8%
4.9%
5.4%
11.0%
15.5%
21.3%
11.1%
21.1%
29.6%
9.7%
44.6%
5.8%
47.8%
13.6%
9.6%
45.3%
51.5%
8.6%
53.7%
5.0%
14.8%
44.1%
5.4%
36.4%
11.0%
33.2%
15.5%
28.7%
21.3%
25.3%
47.5%
6.6%
54.5%
4.7%
14.2%
31.7%
56.6%
68.0%
6.2%
65.6%
9.5%
59.5%
26.9%
13.9%
20.5%
25.1%
15.2%
34.4%
25.3%
47.5%
54.5%
7.0%
5.1%
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP wolC + 5 GW Offshore


Total Dispatch Down in Area K
H2 & K solar
H2 & K wind
solar non-priority
wind non-priority
wind priority
Legend
Constraint %
Curtailment %
Surplus %
Total Dispatch Down (%)
35%
30%
25%
20%
15%
10%
5%
0%
2.9%
5.8%
2.3%
3.7%
13.7%
4.5%
3.7%
3.2%
3.2%
8.7%
3.1%
2.8%
14.9%
5.1%
6.0%
5.4%
2.9%
11.0%
15.5%
21.5%
2.3%
3.0%
6.1%
3.0%
2.9%
13.0%
4.4%
2.9%
9.3%
2.0%
2.4%
5.7%
2.5%
8.8%
3.2%
2.9%
2.9%
2.4%
12.7%
23.3%
2.4%
32.2%
2.6%
3.0%
4.0%
2.9%
6.4%
2.9%
3.2%
4.4%
2.8%
3.8%
4.8%
2027 Initial
2027 50%
2027 ECP
2029 Initial
2029 50%
2029 ECP
2029 wo Battery
FG ECP
FG ECP 3.1Offshore
FG ECP + 5 GW Offshore
FG ECP woIC + 5 GW Offshore

ECP-2.4 - Key Messages

- The general trend in the dispatch down is similar to ECP 2.3 constraint forecast results
- Grandfathering of surplus and constraints leads to significantly higher volumes of Total Dispatch Down(TDD) for non-priority generators.
- In the longer-term scenarios, surplus becomes a more significant component of TDD with increasing renewable capacity (with offshore).
- As study years progress the percentage of constraint decreases due to reinforcements to the network.
- Interconnection plays an important role in managing surplus and TDD assuming that the flows on the interconnectors are aligned with market dynamics.
- Batteries have a positive impact on reducing surplus and TDD.

Next Steps

- Industry webinar of draft results – 27th March
- Publication of 12 area reports – 31st March
- Area Webinar (TBC)

Thank You