

**LONG TERM CC AND
NUCS PROJECT**

23.JAN.2025

AGENDA

- Value Framework for LTCC/NUCS Project
- CGM/A process for Y-1/M-1
- High level business process for LTCC & NUCS
- Mockup of End Result



VALUE FRAMEWORK FOR LTCC & NUCS

LONG-TERM CAPACITY CALCULATION PROJECT – FLOW-BASED METHODOLOGY FOR THE NORDIC MARKETS

Situation

- The Nordic power system is facing increasing complexity due to:
 - Rapid growth in wind and solar power generation.
 - Rising large-scale electricity consumption.
- The existing Net Transfer Capacity (NTC) method struggles to handle grid congestion and ensure efficient grid utilization.
- Flow-Based (FB) methodology, recognized in European legislation, offers better grid utilization and market transparency.

Complication

- Increasing grid congestion and operational challenges are leading to inefficiencies in power flow and significant price differences across the Nordic region.
- The outdated NTC approach limits electricity transmission, particularly from lower-priced northern regions to higher-priced southern regions.
- Regulatory pressure to implement Flow-Based (FB) long-term capacity calculation within one year after Nordic Day Ahead FB go-live.

Resolution

- Implement the Long-Term Capacity Calculation (LTCC) project using the Flow-Based (FB) methodology to:
 - Calculate long-term capacities for Y-1, M-1 and provide insights for market participants, allowing them to do longer-term forecasting
 - Ensure compliance with the Nordic CCR LTCC Methodology and Transparency Regulation.
 - Integrate the Nordic Unavailability Collection System (NUCS) to provide accurate outage forecasts, further improving market transparency.

How we do it today with NUCS and UMM

An outage will shift supply and demand and therefore spot-prices

Must be updated in case of changes.

No reference to timeframe

Transmission unavailability	COBRACable	DK1 > NL NL > DK1	28.10.2024 06:00 01.11.2024 20:00	0 0	700 700	06.08.2024 13:53	Energinet	<input type="checkbox"/>
Bidding Zone	Interval start (CET)	Interval Stop (CET)	Installed Capacity [MW]	Available Capacity [MW]	Unavailable Capacity [MW]			
NL > DK1	28.10.2024 06:00	01.11.2024 20:00	700	0	700			
DK1 > NL	28.10.2024 06:00	01.11.2024 20:00	700	0	700			

UMM published on NUCS in the NTC methodology providing key knowledge on supply and demand.



URGENT MARKET MESSAGES (UMM) ARE NOT BASED ON FB METHODOLOGY

Inaccuracies in the UMM Lead to the following problems

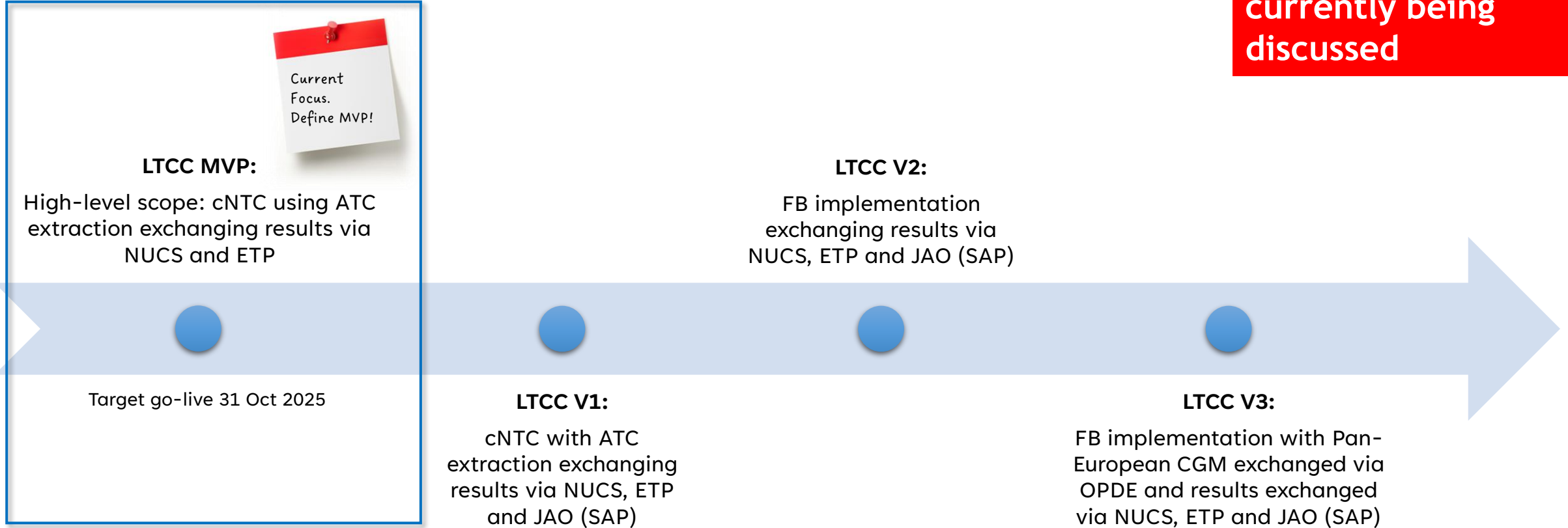
- Poor decision making
- Increased risk in long term price forecasting

How LTCC & NUCS Project Create Value

- Better Hedging and Forecast Options
- Accurate NUCS Messages
- Better bidding strategies

STEPWISE APPROACH TO PROCESS VERSIONING OF THE LTCC PROCESS

**Proposal -
currently being
discussed**



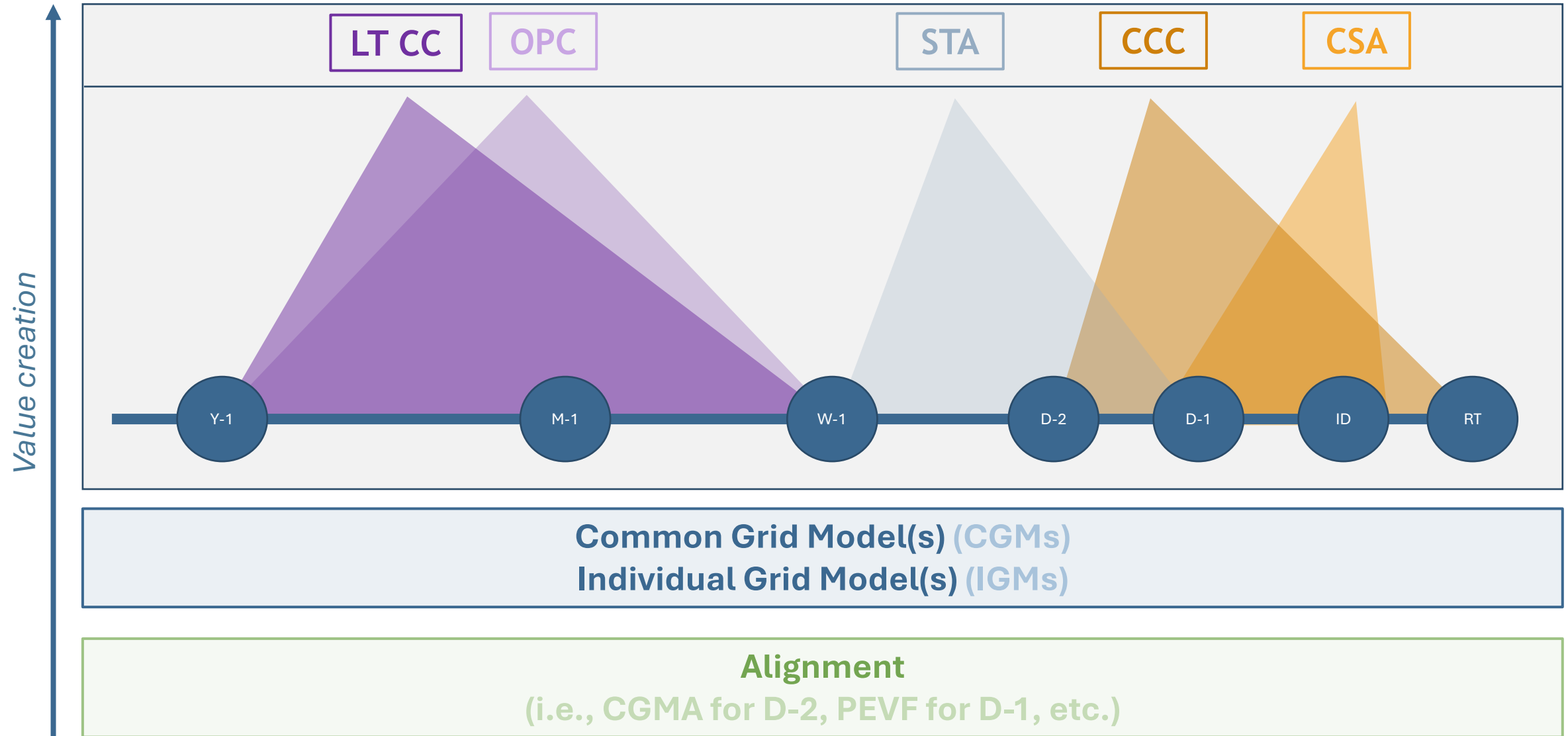
Goal of stepwise process implementation approach:

Enhance efficiency of prioritization, increased transparency for risk assessment and decision making.



**CGM/A PROCESS FOR
Y-1 AND M-1**

GRID MODELLING AND ALIGNMENT (GMA) – TIMELINES



Y-1 PROCESS - OVERVIEW

Why?

- Mandated task [1]
- Model and assess the future state of the transmission grid

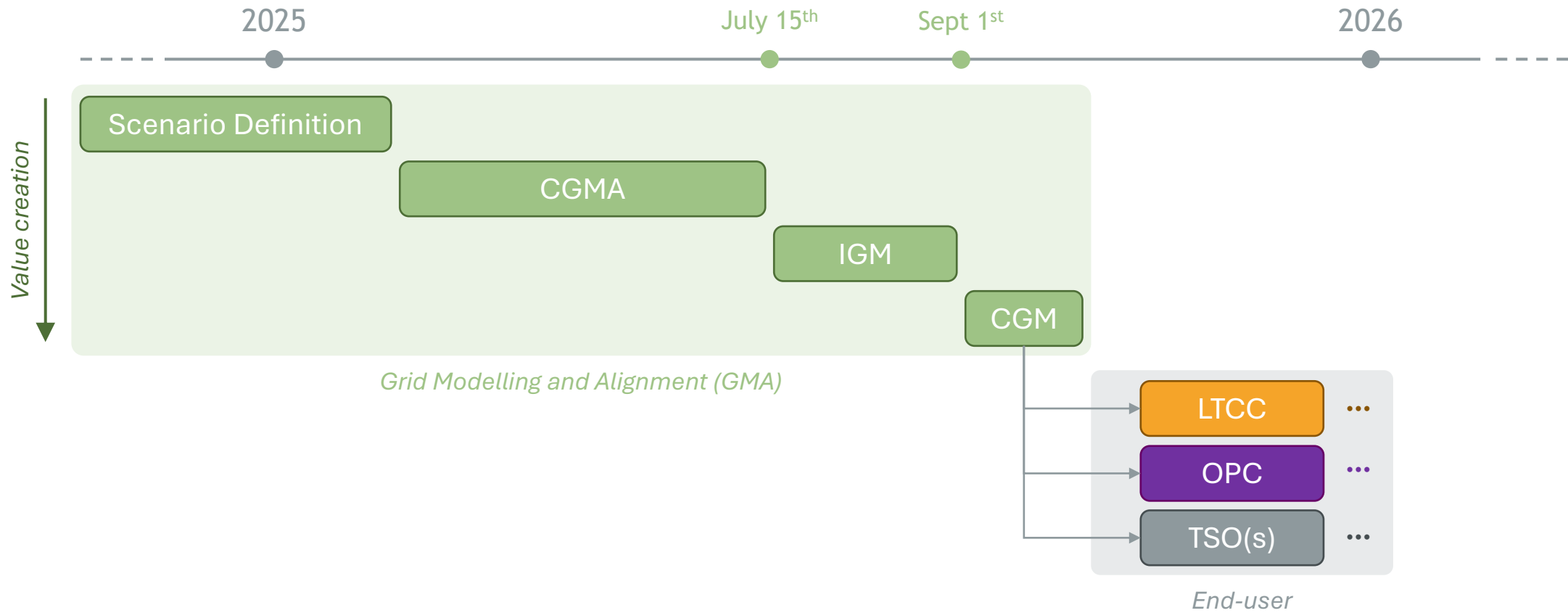
Use cases

- Outage Planning Coordination (OPC)
 - Plan Outages (Nordic and Pan-European level)
- Long-term Capacity Calculation (LT CC)
 - Forward Capacity Allocation
- Others
 - ENDK Observability Area (contingency analysis)



[1] All TSOs' proposal for a common grid model methodology in accordance with Article 18 of Commission Regulation (EU) 2016/1719 of 26 September 2016 establishing a guideline on forward capacity allocation

Y-1 PROCESS - TIMELINE



M-1 CGM/A BUSINESS PROCESS (MANUAL)

Monthly Schedule

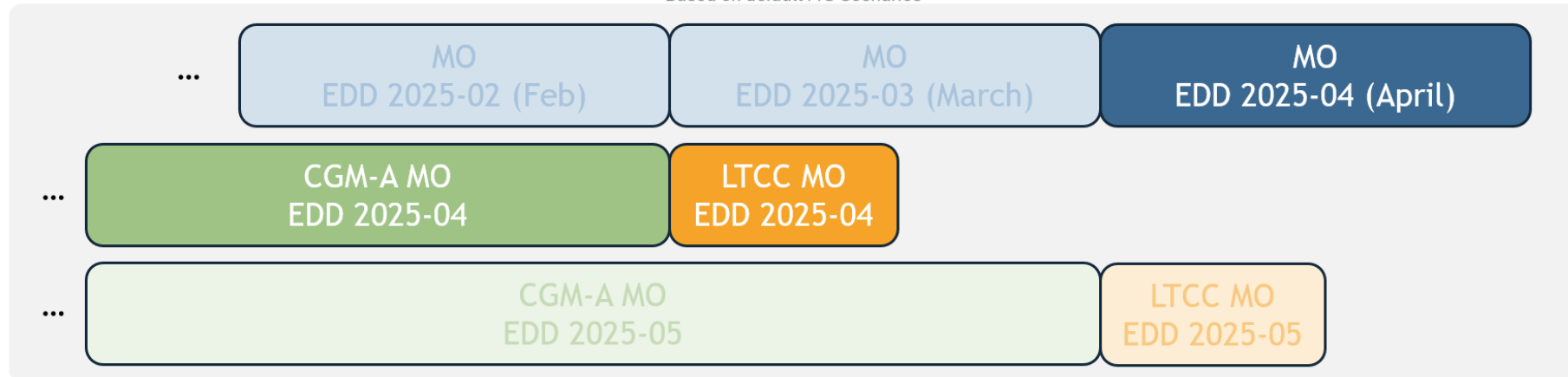
- Expected Scenarios (2025-04)
 - Valley (Sun, 12/04/2025 at 03:30h CET)
 - IGM as 20250412T0130Z_MO_...
 - Peak (Wed, 16/04/2025 at 10:30h CET)
 - IGM as 20250416T0830Z_MO_...
- Suggested Deadlines on the right-hand side
 - New deadlines
 - Already described deadlines on *Monthly Schedule*

- Deadlines

- ADD MO (?)
- CGMA TSO Input (?)
- CGMA TSO > NRCC
- CGMA NRCC > TSO
- IGM TSO > NRCC
- IGM INC
- CGM NRCC > LTCC/TSO
- LTCC NRCC > SAP/TSO

Month-Ahead Process for EDD 2025-04

Based on default MO Scenarios





**BUSINESS
PROCESSES FOR
LTCC & GRID
UNAVAILABILITY**

High-level business process illustration for LTCC

*The Y-1 process is executed once a year for the upcoming year
The M-1 process is executed once a month for the upcoming month*



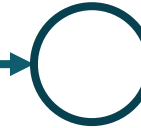
Y-1 and M-1
CGM merging
process

Y-1 and M-1
CCC data

Y-1 and M-1
CCC process

Result
validation

Result
publication



FB calculation
process

ATCE process

- FB parameters computation
- Additional quantities calculation

During transitional period

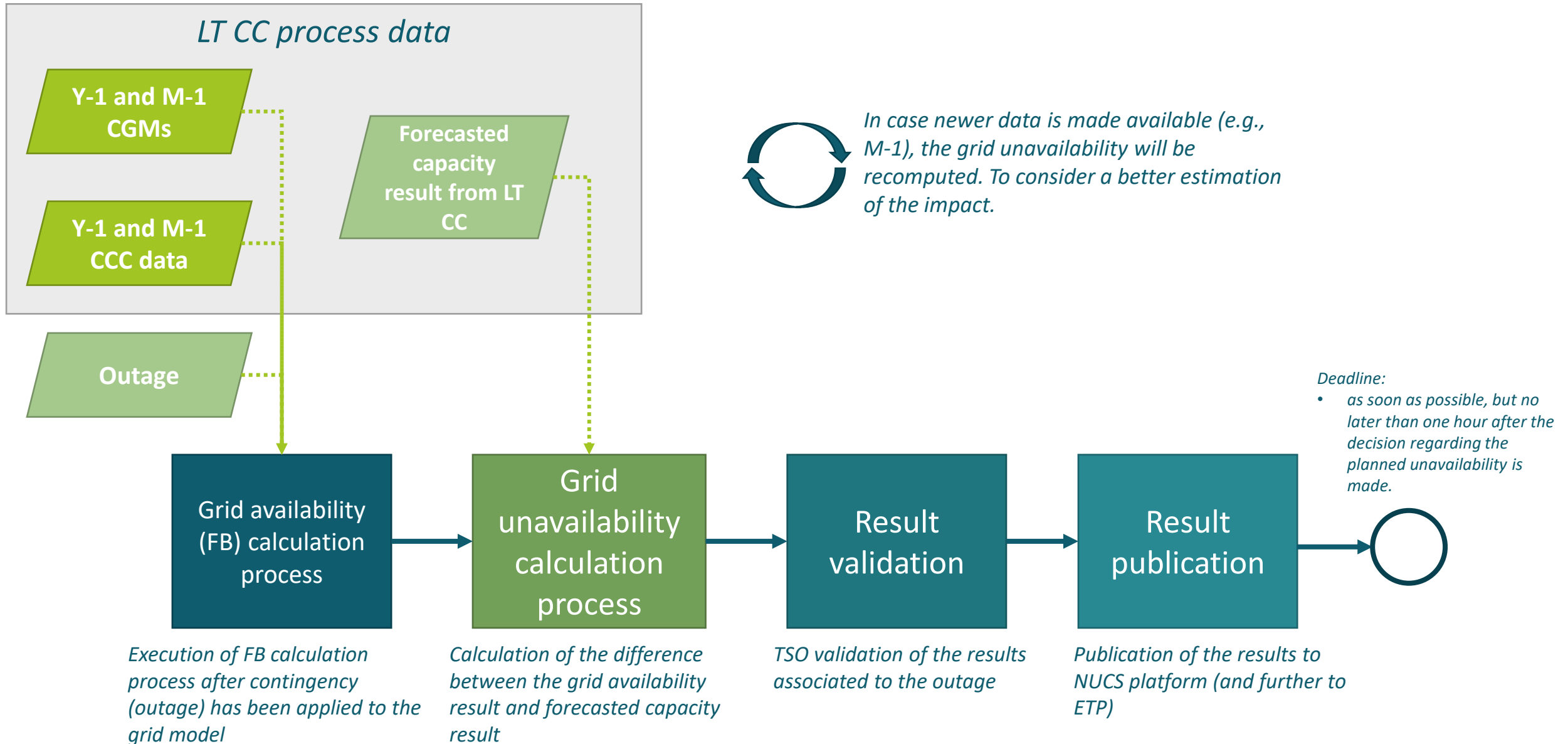
TSO validation

*Publication of the results to JAO and ETP
Containing the information defined in LT CCM Article 23 (similar as Article 25 in DA CCM)*

Deadline:

- In Y-1 process: one week before the yearly allocation process or 15 December, for all months of the following year;*
- In M-1 process: two working days before the monthly allocation process for all days of the following month*

High-level business process illustration for Grid Unavailability



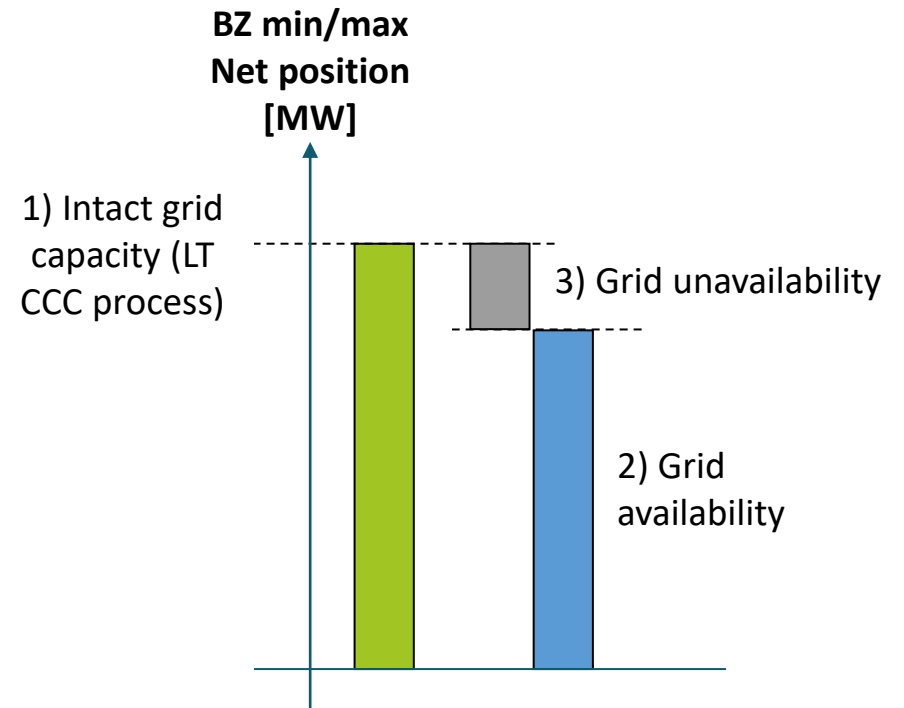
PRESENTING THE GRID UNAVAILABILITY DUE TO AN OUTAGE WITH FB METHODOLOGY

- To compute the **grid unavailability** due to an outage, the results from following processes are expected:

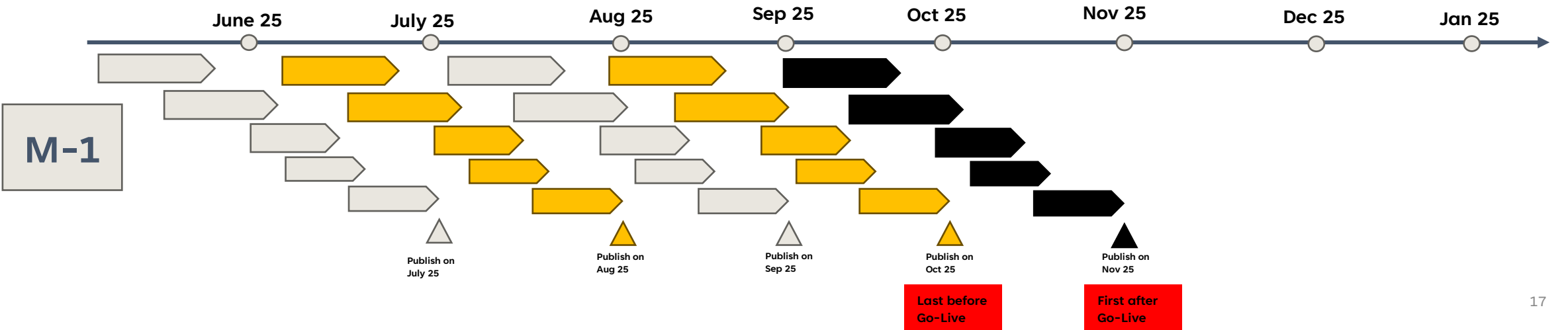
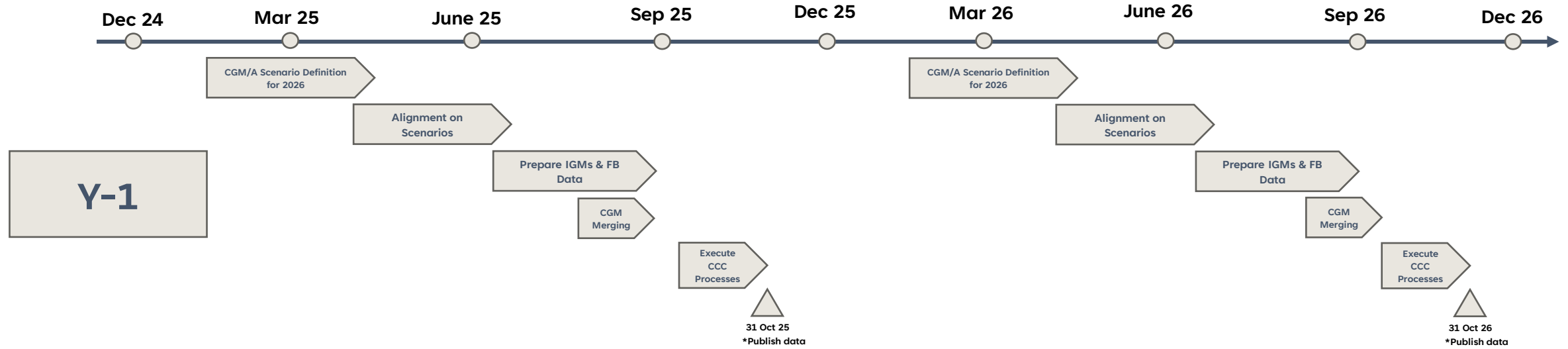
- 1) Result from **LT CCC** process (*intact grid capacity*)
- 2) Result from the **grid availability** (after outage) process


- The publication of results per outage (to NUCS platform) would therefore contain the following information:

- 1) *Intact grid capacity (LT CCC process)*
- 2) *Grid availability (per BZ impacted)*
- 3) *Grid unavailability (per BZ impacted)*
- 4) *FB parameters associated to grid availability calc.*



TIMELINE OVERVIEW FOR LTCC Y-1 & M-1 IN 2025







MOCKUP OF THE
END RESULT
(UNDER
DISCUSSION)

The new UMM

Disclaimer: This is our best estimate of the new UMM; however, it is still uncertain whether this is the exact implementation.

Type of Event	Affected Asset or Unit	Fuel Type	Bidding Zone	Event Start (CET) ▲ ▼	Event Stop (CET) ▲ ▼	Available net position [MW]	Unavailable net position [MW]	Publication Date/Time (CET) ▲ ▼	Publisher ▲ ▼	
Transmission unavailability	S 300 Mauranger-Samnanger		NO5 export	28.06.2023 08:00	28.06.2023 16:00	2500	400	22.12.2022 09:27	Statnett	^
			NO2 export			1500	500			
			...							
Bidding Zone	Interval start (CET)		Interval Stop (CET)			Maximum net position [MW]		Available net position [MW]		Unavailable net position [MW]
NO5 export	28.06.2023 08:00 (CET)		28.06.2023 16:00 (CET)			2900		2500		400
NO2 export	28.06.2023 08:00 (CET)		28.06.2023 16:00 (CET)			2000		1500		500
		
Event Start	Event Stop		Event Status		Message ID					
28.06.2023 08:00	28.06.2023 16:00		Active		NU_fHLg69-Okvj58f4_idxi9Q_001					
Affected Assets or Unit	Affected Assets or Unit EIC Code		Market Participant		Market Participant Code					
S 300 Mauranger-Samnanger	50TL00000001062S		Statnett		10X1001A1001A38Y					
Type of Unavailability	Reason Code		Version		Unit of measurement					
Planned	Foreseen Maintenance		1		MW					
Reason for The Unavailability					Remarks					
					Planned work on 300kV line Mauranger-Samnanger					

[Download FB Parameters](#)
Actions ▼




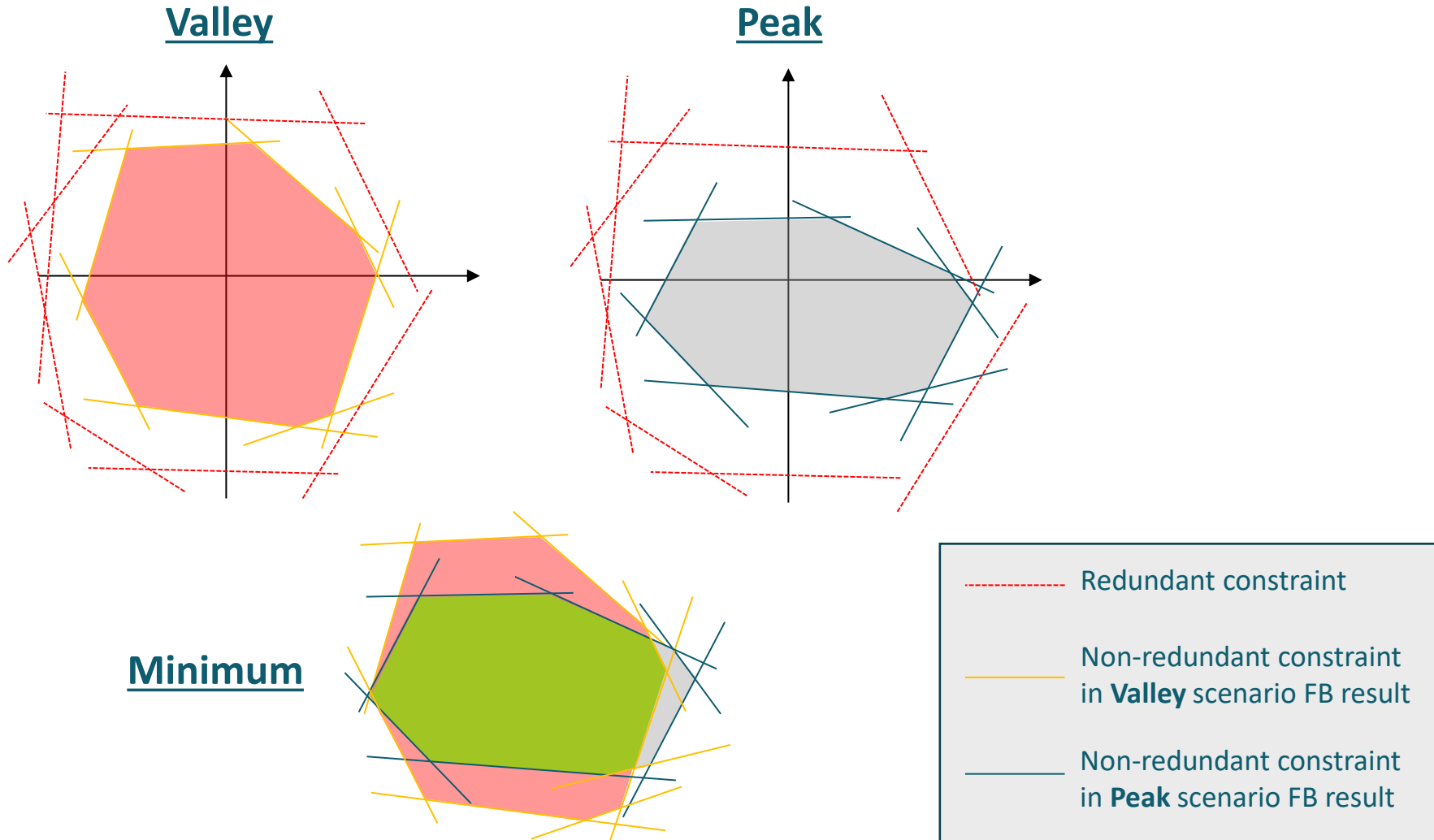
APPENDIX

Scenario-based FB calculation process

- As the CGMM defines the Y-1 and M-1 CGMs to be scenario-based, the FB calculation process will need to consider this aspect as well
- In the **CGM merging process** context:
 - There will be a *Peak and Valley* scenario merging corresponding to a specific season/month (Y-1/M-1)
- In the **FB calculation process** context:
 - There will be a *Peak and Valley* scenario calculation to a specific month/day (Y-1/M-1)
 - There will be a *Minimum* scenario calculation that considers the result from the *Peak and Valley* scenario to a specific month/day
 - In total there will therefore be:
 - 36 CCC results for a Y-1 CCC process (12 months, 2 scenario types + min. calculation)
 - 84-93 CCC results for a M-1 CCC process (28-31 days, 2 scenario types + min. calculation)
- In the next slide, the minimum calculation process is illustrated in more detail

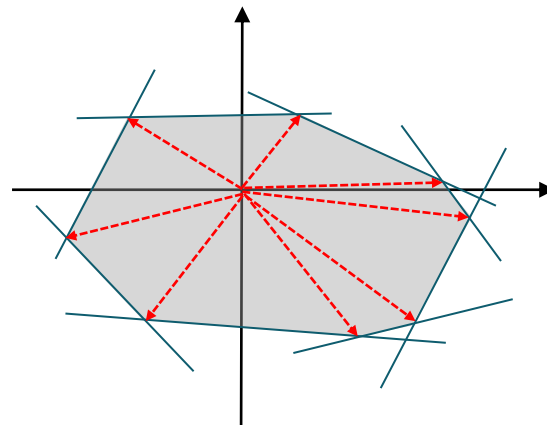
Calculation of the minimum FBdomain from the Peak and Valley result

1. Extract all the constraints (incl. PTDFs and RAM and its subcomponents) resulted from the Peak and Valley calculations
2. Perform an additional quantities computation (defining the non-redundant constraints) with all the extracted constraints
3. Obtain the new *minimum* FBDomain formed by the new non-redundant constraints



Calculation of the reduction in cross-zonal capacity due to unavailability of transmission infrastructure with FB methodology

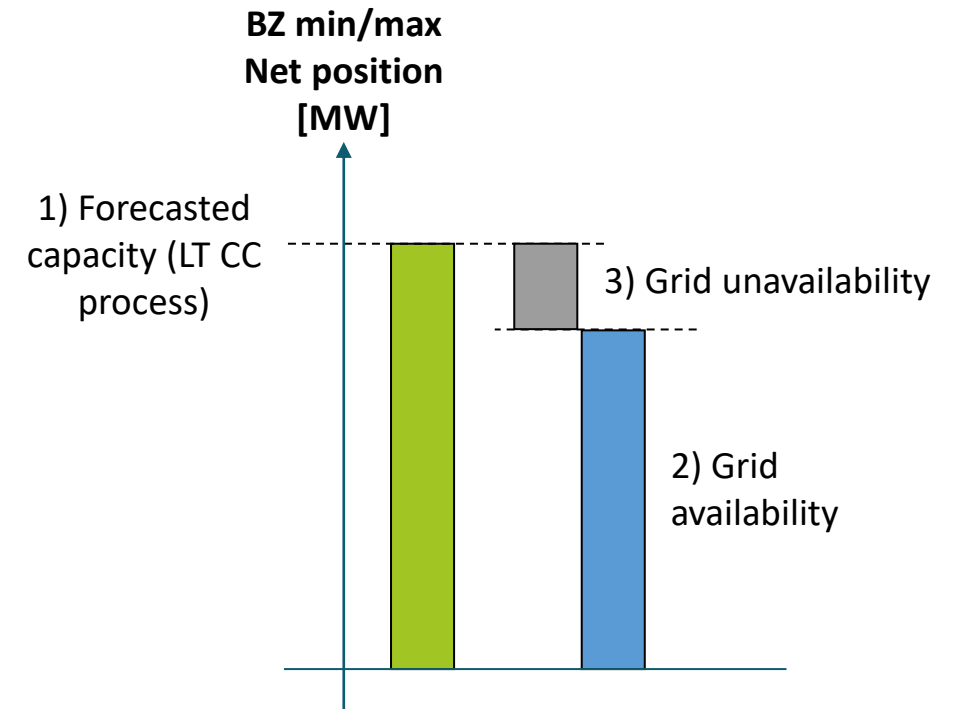
- As the FB methodology defines capacities in a form of a FB Domain, calculating a *reduction in cross-zonal capacity* due to an outage with FB methodology is not “well fitting”
- Therefore, the Nordic CCR has considered an alternative parameter to reflect the outage impact on the cross-zonal exchange:
 - The impact of the outage on the *minimum* and *maximum* net positions for each Bidding Zone associated to the FB Domain formed by the constraints
 - In which the *minimum net position* defines the *maximum import* capability (within the FBDomain constraints) of each BZ
 - And the *maximum net position* defines the *maximum export* capability (within the FBDomain constraints) of each BZ
 - The needed reference would be the LT CCC process result
- In the next slide the illustration for calculating the unavailability due to an outage with above-mentioned parameter is shown



The corner points of the formed FBDomain contain the minimum and maximum net positions for each BZ

Presenting the grid unavailability due to an outage with FB methodology

- In order to compute the **grid unavailability** due to an outage, the results from following processes are expected:
 - 1) Result from LT CC process (*forecasted capacity*)
 - 2) Result from the **grid availability** (after outage) process
- The result, the **grid unavailability** for each BZ impacted by the outage, is the “delta” between these two results
- In addition, the FB parameters (PTDFs and RAMs) of the non-redundant constraints associated to the results could also be published to NUCS platform
- The publication of results per outage would therefore contain the following information:
 - 1) *Forecasted capacity (LT CC process)*
 - 2) *Grid availability (per BZ impacted)*
 - 3) *Grid unavailability (per BZ impacted)*
 - 4) *FB parameters associated to grid availability calc.*



NUCS Platform impact

- As the presentation of the unavailability is expected to change with FB methodology, changes to NUCS platform are also expected
- The detailed design, how the expected data will be visualized in NUCS platform, is a work in progress
- No detailed design has yet been made on NUCS platform side, but initial discussions have begun