

FCR – Energy Management Strategy

Energy Management Strategy – Description of the asset

Description of the energy-limited asset:

- Battery type and characteristics
- Site description

Connection of the asset to the grid

- Single line diagram (clear indication of assets and measurement devices)

Description of the delivery point used for the prequalification :

- Back-up assets for energy management
- Frequency zones

Measurement and communication equipment:

- Delivered power (MW) per DP
- Available margin (MWh) per DP
- Power used for charging / discharging the battery (MW) per DP

A template for the description of EMS can be requested by e-mail to contracting_AS@elia.be

Energy Management Strategy – Description of the EMS (1/4)

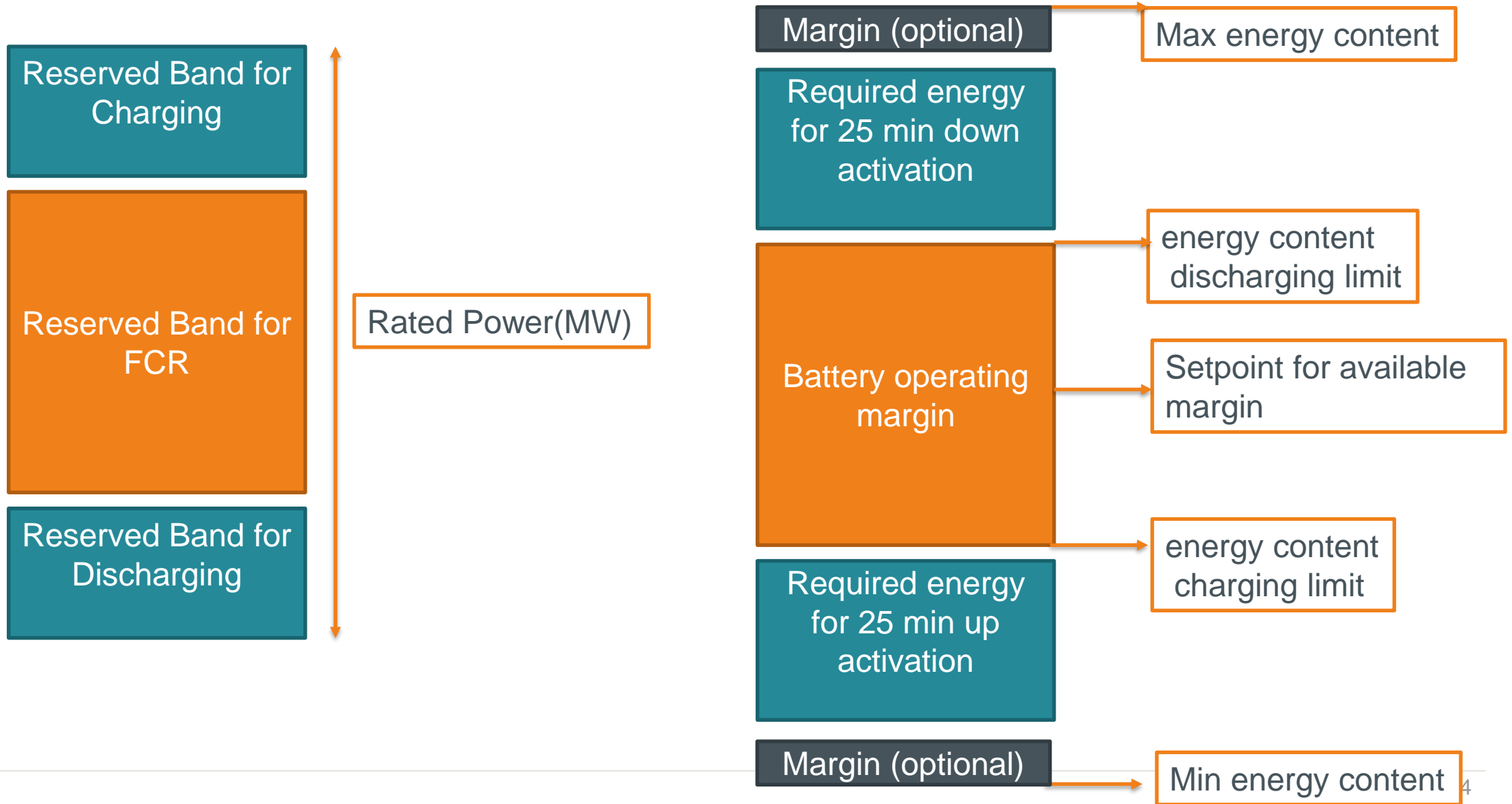
Technical information per DP

- Rated power
- Energy content
- Power bands
 - Reserved for FCR
 - Reserved for charging/discharging
 - If relevant: other purpose (reserve margin, operational use...)
- available margin:
 - Min/Max energy content (in MWh)
 - available margin - setpoint (in MWh)
 - Threshold for starting the charging/discharging strategy (in MWh)

Qualitative description

- Type of EMS
- Frequency rate for use of EMS (continuously ; each 5 min; 15 minutes ...)

Energy Management Strategy – Description of the EMS (2/4)



Energy Management Strategy – Description of the EMS (3/4)

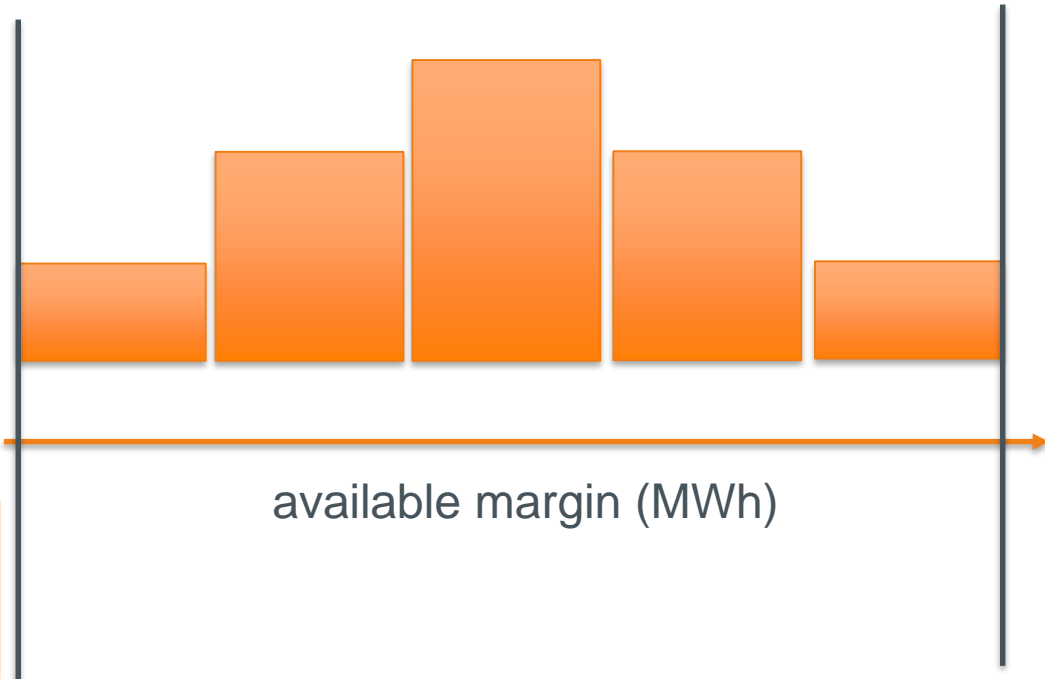
Simulation of the EMS efficiency and adequate charging/discharging bands

- Based on min 1 year of grid frequency measurement
- Simulation of:
 - The asset reaction to the frequency deviation (MW for FCR)
 - The use of the EMS as described in this document
 - available margin (MWh) of the asset at any time
- **Aim: prove that EMS and charging/discharging bands are designed to respect the 25 min energy requirement**

Expected results

- available margin (MWh) of the battery for the whole year (histogram)
- available margin (MWh) limits for the 25 min energy requirement
- available margin (MWh) is inside these limits
- Show the designed charging/discharging bands for a 100% availability of the required energy along the year to satisfy the 25 min energy requirement

available margin (MWh) histogram



Energy Management Strategy – Description of the EMS (4/4)

Simulation of the available margin (MWh) for two particular days in accordance with Elia

- Graphs showing the use of the EMS
 - available margin (MWh) evolution through the day with energy content (MWh) limit
 - MW output of the battery through the day with corresponding use of EMS

