Template – general description of the EMS

This template must be used by the BSPs to submit an EMS to Elia. This template can be completed by any additional information if it is deemed necessary by the BSPs. Furthermore, bilateral meetings could be held between the BSP and Elia concerning the submission of any EMS and this template serves as a facilitator for a mutual understanding.

The BSPs can submit one or multiple different energy management strategies depending on the services they intend to offer. The information of Section 1, which relates to general information regarding the concerned DP(s) with LER, is common for all services and corresponding EMS the BSP would like to use. For each (combination of) contracted service the BSP intends to offer using the concerned DP(s) with LER, at least one description of the EMS and corresponding proof needs to be provided.

Sections 2 to 6 describe the different (combination of) services[1] for which the BSP could submit an EMS. It must be noted that a BSP can submit an EMS for one or more combinations. As such, the BSP is not obliged to provide an EMS for each of the different cases outlined in Sections 2 to 6.

1. Identification of the DP LER

The BSP must fill all relevant information concerning the DP with LER (or group of DP with LER). The BSP can add any other relevant information if needed.

Category	Data Name	Value
Identification	Name of the DP with LER (or group of DP with LER)	
	Code EAN	
	Location (if applicable)	
	Company Name	
	BSP Name	
	BRP Name	
Technical specifications	Nominal Power (injection and offtake)	
	Total energy available (including lower and upper limits)[2]	
	Description of any operational limits	

[1] Section 2: FCR only, Section 3: aFRR symmetric only, Section 4: aFRR in one direction only, Section 5: Combo FCR/aFRR symmetric, and section 6: any other case.

[2] Indicate the usable energy.

	Estimated yearly degradation of the usable energy[3]	
	Round-trip Efficiency	
	Other elements[4]	

[3] Only Indicative values

[4] Please describe any other relevant technical information for the EMS.

2. EMS 1 – FCR symmetrical

2.1. Key information

Category	Value
FCR maximal Power	*In MW*
Power attributed to state-of-charge management	*In MW*
Main techniques used in the EMS	☐ Back-up assets ☐ Intraday market ☐Other. *Insert any detail if needed*[5]
Non-contracted services[6] *Is the DP LER intended to be used for non-contracted services when FCR capacity will be contracted?*	☐ Yes[7] ☐ No
Replacement of an earlier EMS	*Does this EMS replace a previous EMS? If yes, which version?*

2.2. Description of the EMS

Explanation of the energy management strategy that would be applied to deliver the intended service. Among others, please clarify when state-of-charge supporting actions would be taken (at the latest) and the minimal required volumes corresponding to such state-of-charge supporting actions.

[5] For Back-up assets, please describe the information related to the back-up assets intended to be used in the description of the EMS.
For Other, please specify.

[6] For example, participation to DA/ID markets, offering of non-contracted aFRR or mFRR Energy bids, portfolio or system balancing.

[7] If yes, please describe in the description of the EMS, the maximum power that could be used for non-contracted services and the conditions related to the energy management strategy under which this power is considered not to be available and would hence not be used for offering non-contracted services.

2.3. Validation proof

For FCR, a simulation must be submitted by filling in the template available on the Elia website. Additional and optional explanations related to the proof can be provided in this section. The minimal information to be provided are listed below.

Category	Value
Version of the data used	Indicate the version of the data that has been used
Other source of info	Indicate any other source of information that would be used
Other relevant info	Describe other relevant info that might be necessary

3. EMS 2 – aFFR symmetrical

3.1. Key information

Category	Value
aFRR Upward maximal Power	*In MW*
aFRR Downward maximal Power	*In MW*
Power attributed to state-of-charge management	*In MW*
Main techniques used in the EMS	☐ Back-up assets ☐ Intraday market ☐Other. *Insert any detail if needed*[8]
Non-contracted services[9] *Is the DP LER intended to be used for non-contracted services when aFRR capacity will be contracted?*	☐ Yes[10] ☐ No
Replacement of an earlier EMS	*Does this EMS replace a previous EMS? If yes, which version?*

3.2. Description of the EMS

Explanation of the energy management strategy that would be applied to deliver the intended service. Among others, please clarify when state-of-charge supporting actions would be taken (at the latest) and the minimal required volumes corresponding to such state-of-charge supporting actions. In case asymmetric pricing would be used, please clarify the pricing strategy applied.

[8] For Back-up assets, please describe the information related to the back-up assets intended to be used in the description of the EMS.
For Other, please specify.
[9] For example, participation to DA/ID markets, offering of non-contracted aFRR or mFRR Energy bids, portfolio or system balancing.
[10] If yes, please describe in the description of the EMS, the maximum power that could be used for non-contracted services and the conditions related to the energy management strategy under which this power is considered not to be available and would hence not be used for offering non-contracted services.

3.3. Validation proof

The BSP must either submit a deterministic proof or a proof by simulation.

3.3.1. Proof by simulation

If the BSP submits proof by simulation, a simulation must be submitted by filling in the template available on the Elia website. Additional explanations regarding the proof can be provided in this section if required.

Category	Value
Version of the data used	Indicate the version of the data that has been used
Other source of info	Indicate the source of any other information
Other relevant info	Ant other relevant info that might be necessary

3.3.2. Deterministic proof

If the BSP submits a deterministic proof, an explanation should be provided here that demonstrates how the DP with LER will be able to deliver the service continuously.

4. EMS 3 – aFFR in one direction[11]

4.1. Key information

Category	Value
aFRR upward maximal Power (when aFRR downward = 0)	*In MW*
aFRR downward maximal Power (when aFRR upward = 0)	*In MW*
Power attributed to state-of-charge management	*In MW*
Main techniques used in the EMS	☐ Back-up assets ☐ Intraday market ☐Other. *Insert any detail if needed*[12]
Non-contracted services[13] *Is the DP LER intended to be used for non-contracted services when aFRR capacity will be contracted?*	☐ Yes[14] ☐ No
Replacement of an earlier EMS	*Does this EMS replace a previous EMS? If yes, which version?*

4.2. Description of the EMS

Explanation of the energy management strategy that would be applied to deliver the intended service. Among others, please clarify when state-of-charge supporting actions

[11] For more complex cases, such as cases with a different volume for aFRR upward and aFRR downward, the BSP must refer to the EMS 5. If the EMS for aFRR downward only differs from the aFRR upward only, two EMS should be submitted.

[12] For Back-up assets, please describe the information related to the back-up assets intended to be used in the description of the EMS.
For Other, please specify.

[13] For example, participation to DA/ID markets, offering of non-contracted aFRR or mFRR Energy bids, portfolio, or system balancing.

[14] If yes, please describe in the description of the EMS, the maximum power that could be used for non-contracted services and the conditions related to the energy management strategy under which this power is considered not to be available and would hence not be used for offering non-contracted services.

would be taken (at the latest) and the minimal required volumes corresponding to such state-of-charge supporting actions. In case asymmetric pricing would be used, please clarify the pricing strategy applied.

4.3. Validation proof

The BSP must either submit a deterministic proof or a proof by simulation.

4.3.1. Proof by simulation

If the BSP submits proof by simulation, a simulation must be submitted by filling in the template available on the Elia website. Additional explanations regarding the proof can be provided in this section if required.

Category	Value
Version of the data used	Indicate the version of the data that has been used
Other source of info	Indicate the source of any other information
Other relevant info	Ant other relevant info that might be necessary

4.3.2. Deterministic proof

If the BSP submits a deterministic proof, an explanation should be provided here that demonstrates how the DP with LER will be able to deliver the service continuously.

5. EMS 4 – combo's of FCR and aFRR

5.1. Key information

Category	Value
FCR maximal Power	*In MW*
aFRR upward maximal Power	*In MW*
aFRR downward maximal Power	*In MW*
Power attributed to state-of-charge management	*In MW*
Main techniques used in the EMS	☐ Back-up assets ☐ Intraday market ☐Other. *Insert any detail if needed*[15]
Non-contracted services[16] *Is the DP LER intended to be used for non-contracted services when FCR and aFRR capacity will be contracted?*	☐ Yes[17] ☐ No
Replacement of an earlier EMS	*Does this EMS replace a previous EMS? If yes, which version?*

5.2. Description of the EMS

Explanation of the energy management strategy that would be applied to deliver the intended service. Among others, please clarify when state-of-charge supporting actions would be taken (at the latest) and the minimal required volumes corresponding to such

[15] For Back-up assets, please describe the information related to the back-up assets intended to be used in the description of the EMS.
For Other, please specify.

[16] For example, participation to DA/ID markets, offering of non-contracted aFRR or mFRR Energy bids, portfolio or system balancing.

[17] If yes, please describe in the description of the EMS, the maximum power that could be used for non-contracted services and the conditions related to the energy management strategy under which this power is considered not to be available and would hence not be used for offering non-contracted services.

state-of-charge supporting actions. In case asymmetric pricing would be used, please clarify the pricing strategy applied.

5.3. Validation proof

The BSP must either submit a deterministic proof or a proof by simulation.

5.3.1. Proof by simulation

If the BSP submits proof by simulation, a simulation must be submitted by filling in the template available on the Elia website. Additional explanations regarding the proof can be provided in this section if required.

Category	Value
Version of the data used	Indicate the version of the data that has been used
Other source of info	Indicate the source of any other information
Other relevant info	Ant other relevant info that might be necessary

5.3.2. Deterministic proof

If the BSP submits a deterministic proof, an explanation should be provided here that demonstrates how the DP with LER will be able to deliver the service continuously.

6. EMS 5 – Any combination of FCR, aFRR Upward and aFRR Downward

This case is let open as the BSP might want to provide an EMS with non-symmetrical values for aFRR, with or without FCR capacity. The BSP is free to have multiple EMS in this category.

6.1. Key information

Category	Value
FCR maximal Power	*In MW*
aFRR Upward Maximal Power	*In MW*
aFRR Downward Maximal Power	*In MW*
Power attributed to state-of-charge management	*In MW*
Main techniques used in the EMS	☐ Back-up assets ☐ Intraday market ☐Other. *Insert any detail if needed*[18]
Non-contracted services[19] *Is the DP LER intended to be used for non-contracted services when FCR and aFRR capacity will be contracted?*	☐ Yes[20] ☐ No
Replacement of an earlier EMS	*Does this EMS replace a previous EMS? If yes, which version?*

[18] For Back-up assets, please describe the information related to the back-up assets intended to be used in the description of the EMS.
For Other, please specify.

[19] For example, participation to DA/ID markets, offering of non-contracted aFRR or mFRR Energy bids, portfolio or system balancing.

[20] If yes, please describe in the description of the EMS, the maximum power that could be used for non-contracted services and the conditions related to the energy management strategy under which this power is considered not to be available and would hence not be used for offering non-contracted services.

6.2. Description of the EMS

Explanation of the energy management strategy that would be applied to deliver the intended service. Among others, please clarify when state-of-charge supporting actions would be taken (at the latest) and the minimal required volumes corresponding to such state-of-charge supporting actions. In case asymmetric pricing would be used, please clarify the pricing strategy applied.

6.3. Validation proof

The BSP must either submit a deterministic proof or a proof by simulation.

6.3.1. Proof by simulation

If the BSP submits proof by simulation, a simulation must be submitted by filling in the template available on the Elia website. Additional explanations regarding the proof can be provided in this section if required.

Category	Value
Version of the data used	Indicate the version of the data that has been used
Other source of info	Indicate the source of any other information
Other relevant info	Ant other relevant info that might be necessary

6.3.2. Deterministic proof

If the BSP submits a deterministic proof, an explanation should be provided here that demonstrates how the DP with LER will be able to deliver the service continuously

Annex: template for the proof by simulation

The following table provides an overview of the information to be provided for the proof by simulation. An excel file will be available on the Elia website and should be used by the BSP to provide the requested data.

Category	Data name	Unit	Explanation
Date / Time	Date / Time	dd-mmm-yyyy hh:mm	One line is one minute
Contracted services	FCR	MW	The volume of contracted reserves for the corresponding period. In case the BSP intends to proof its ability to systematically offer a certain volume of contracted services, the provided values must be constant over the entire simulation.
	aFRR up	MW	
	aFRR down	MW	
Determination of FCR Requested	Frequency	Hz	Average frequency
	FCR Requested	MW	Average FCR Requested. A positive value reflects a need for upward regulation while a negative value reflects a need for downward regulation
	FCR energy band required	MWh	Energy band required for FCR (for both upward and downward direction)
Determination of aFRR Requested	Global Control Target for aFRR	MW	Average global control target. This is data made available by Elia that is to be used to determine the aFRR Requested. A positive value reflects a need for upward regulation while a negative value reflects a need for downward regulation
	Bid Price up	€/MWh	Bid price for upward regulation
	Bid Price down	€/MWh	Bid Price for downward regulation
	Cross-Border Marginal Price up	€/MWh	Average aFRR CBMP in the upward direction during the concerned minute. This is an additional information provided by Elia after the connection to PICASSO.

	Cross-Border Marginal Price down	€/MWh	Average aFRR CBMP in the downward direction during the concerned minute. This is an additional information provided by Elia after the connection to PICASSO.
	aFRR Requested	MW	Average aFRR Requested by Elia related to the contracted aFRR Energy Bids of the DP with LER. A positive value reflects a need for upward regulation while a negative value reflects a need for downward regulation
Information regarding the operation of the DP with LER and state-of-charge supporting actions	State of Charge	MWh	Average State-of-charge
	State of Charge	%	Average State-of-charge expressed as a relative value (relation to maximal available energy)
	Power output	MW	Output power (average for the minute). A positive value reflects an injection into the grid while a negative value reflects a withdrawal from the grid
	EMS Intraday	MW	Power related to intraday transactions related to EMS. A positive value reflects energy bought on the intraday market while a negative value reflects energy sold on the intraday market
	EMS back-up Power inside aFRR pool	MW	Average change of power activated on back-up assets related to EMS which are inside the aFRR pool. A positive value reflects an increase of the injection or a decrease of the consumption of the back-up asset, while a negative value reflects a decrease of the injection or an increase of the consumption of the back-up asset.
	EMS back-up Power outside aFRR pool		Average power activated on back-up assets related to EMS which are outside the aFRR pool. A positive value reflects an increase of the injection or a decrease of the consumption of the back-up asset, while a negative value reflects a decrease of the injection or

			an increase of the consumption of the back-up asset.
FCR delivery	FCR baseline	MW	Average FCR baseline. A positive value reflects injection into the grid while a negative value reflects withdrawal from the grid
	FCR Supplied by the DP with LER	MW	Average power provided for the minute
	Available energy band up	%	Calculated value based on maximal available energy, the current state of charge and the contracted FCR. Relative value.
	Available energy band down	%	Calculated value based on the minimum energy, the current state of charge and the contracted FCR. Relative value.
aFRR delivery	aFRR baseline	MW	Average aFRR baseline. A positive value reflects injection into the grid while a negative value reflects withdrawal from the grid
	aFRR Supplied by the DP with LER	MW	Average activated aFRR during the minute by the DP with LER
Delivery of non-contracted services	Power used for delivering non-contracted services	MW	Power that is delivered for other purposes than the contracted reserves and the EMS. A positive value reflects the increase of injection or decrease of consumption while a negative value reflects a decrease of injection or increase of consumption

The required granularity is per minute. All data with a higher granularity (e.g., frequency, FCR power, aFRR baseline) must be averaged over the minute.

The use of absolute and relative states of charge is applicable in the case of an aggregation of LER with varying availability.