



European Union Agency for the Cooperation
of Energy Regulators

Wholesale Electricity Market Monitoring 2021

Prequalification processes for the provision of balancing services (as of 31 December 2021)

Report in PowerPoint format

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- To keep the electricity system in balance, Transmission System Operators (TSOs) procure balancing services from Balancing Service Providers (BSPs). EU rules require TSOs to develop prequalification processes for potential BSPs. This allows potential BSPs (such as generators or consumers) to provide proof that they fulfil the requirements for rendering one or more types of balancing services necessary to guarantee the grid frequency.
- The **2020 ACER MMR¹** identified **some design features of the prequalification processes for the provision of electricity balancing services** (originally designed in a context of centralised production) that may currently represent a **barrier to market entry of new and small market participants** (including consumers or **demand-side response, decentralised production and energy storage**).
- This overview examines product prequalification in more detail, and the requirements for groups in particular. It identifies some practices that could be considered by TSOs to **improve and simplify the processes for new and small market participants**, including demand response.



ACER's findings:

- There is considerable **room for TSOs to simplify the product prequalification processes to overcome potential market barriers to new and small market participants, including demand response, in providing balancing services.**
- Electricity balancing prequalification **approaches differ significantly across Member States (MSs)** and across balancing products.
- **Only a few TSOs apply simplified approaches to product prequalification** as a rule for some less demanding balancing products.
- **Prequalification of groups of units is still not possible in some MSs.** Where it is possible, **some TSOs do not allow generation units and consumer/demand units to be aggregated in the same group.** This may represent an entry barrier for new market participants that aggregate multiple types of units (e.g. solar PV panels, household consumers, etc.).
- In the first-time prequalification of groups comprising small units (e.g. EVs, PV panels, household consumers, etc.), a few TSOs still require each individual unit to prequalify separately. On the contrary, some TSOs make simplifications or exceptions to simplify and speed-up the prequalification for these groups.
- There is considerable **room to simplify the re-prequalification for groups when they are subject to changes** in units such as add-ons or removals. Some TSOs limit the need for this re-prequalification to only significant changes.
- ACER identifies **friendly practices that may facilitate market entry for new and small participants**, and **non-friendly practices that may constitute a barrier to their market entry².**
- Some friendly practices include setting a product prequalification for **groups aggregating any type of technology**; setting thresholds for **re-prequalification only after significant changes**; using **type-approval small units** and **verifying the compliance to product requirements during service delivery** instead of before delivery.
- ACER invites TSOs to consider these and other friendly practices identified in this overview, including when setting prequalification processes of products for solving physical congestions or for voltage control, if these processes are to be defined.

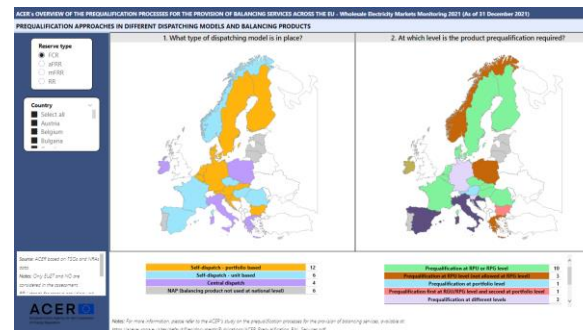
Notes:

¹ Chapter 7 of 2020 ACER Market Monitoring Report - Electricity Wholesale Market Volume available at: <https://extranet.acer.europa.eu/en/Electricity/Market%20monitoring/Pages/Current-Edition.aspx>

² See disclaimer in Annex III.

- **Purpose of this ACER overview:** To provide an overview of selected design features of the prequalification processes in balancing markets across the EU. In addition, ACER identifies  friendly practices that may facilitate market entry to new and small participants, and  non-friendly practices that may constitute a barrier to their market entry (see disclaimer in Annex III). These practices should be considered to remove barriers to new and small market participants, as identified in the 2020 ACER MMR¹.
- **The prequalification process:** It consists of: i) where applicable, a grid prequalification to verify that the delivery of a service can be technically supported by the connecting grid and any intermediate grids and ii) a product prequalification to verify the compliance of the assets of the BSP to the technical requirements set by the TSO. On some occasions, some TSOs require potential BSPs to pass an activation test² as part of the product prequalification.
- **Scope:** This overview is focused on product prequalification only and mainly focuses on the prequalification of groups. It covers different scenarios, such as a first-time prequalification, re-prequalification after add ons, removals, switching of reserve providing units (RPU) or reserve providing groups (RPGs) between BSPs, etc. Other aspects are out of the scope of this overview including what the prequalification processes encompass in terms of steps and tests, how TSOs execute these processes in practice and how cumbersome and complex these processes may become for some market players.

- Check out the interactive charts [here](#):



Notes:

¹ Chapter 7 of 2020 ACER Market Monitoring Report - Electricity Wholesale Market Volume available at: <https://extranet.acer.europa.eu/en/Electricity/Market%20monitoring/Pages/Current-Edition.aspx>

² In an activation test the SO sends an activation signal to the BSP's assets during normal operating conditions to ensure that in case of need (and favourable market clearing) the resources can actually be activated, their capabilities meet the product requirements and the relevant data can be exchanged. Testing IT and communication requirements are out of the scope of the activation test.

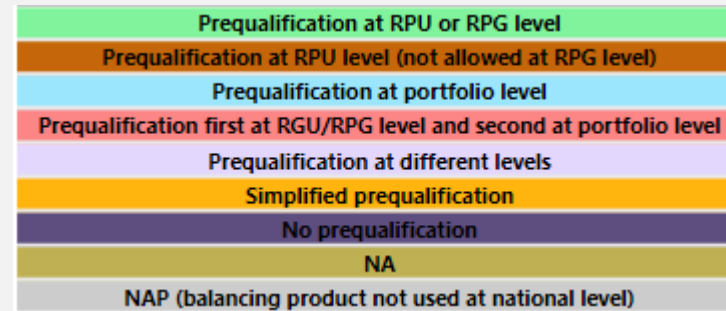
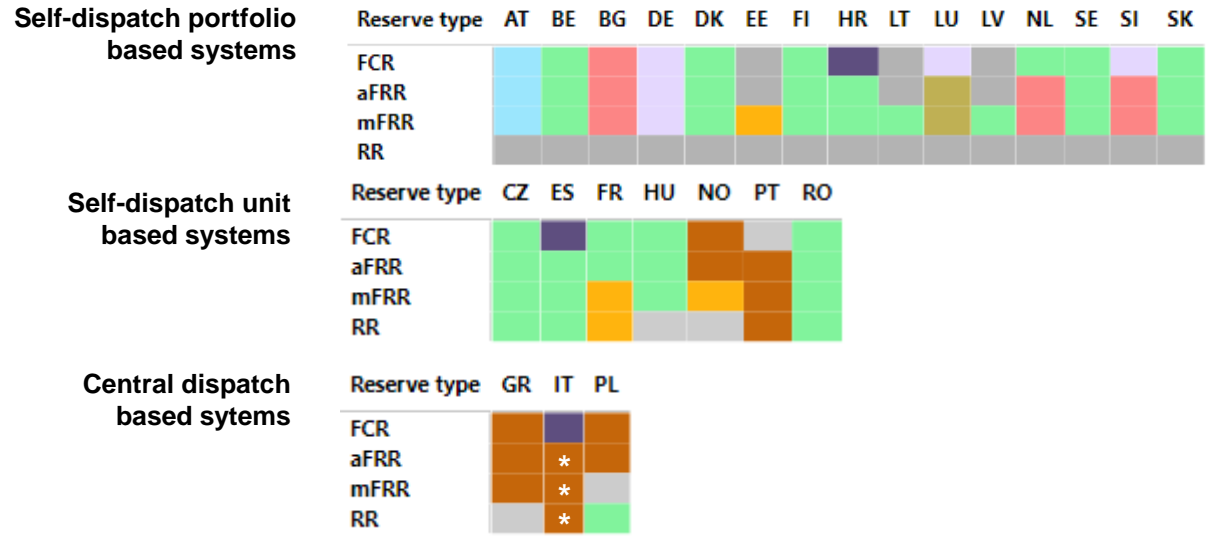
³ This overview is based on the replies to a questionnaire as provided by TSOs and/or national regulatory authorities (NRAs). See Annex II for more information.

Prequalification approaches in different dispatching models and balancing products

TSOs require to pass the product prequalification (PQ) at different levels depending on the dispatching model or the balancing product. Three main categories can be identified, including i) prequalification at RPU or RPG level¹, ii) prequalification at portfolio level or iii) first prequalification at RPU or RPG level and second prequalification at portfolio level. Other types of approaches (i.e., prequalification at different levels² and simplified prequalification) only apply in specific cases.

- Most TSOs in Europe require a **prequalification at RPU or RPG level**, i.e., each RPU/RPG is required to meet the technical requirements set by the TSO for the provision of the balancing product. On some occasions, the RPU/RPG is required to pass an activation test.
- In **self-dispatch portfolio-based systems**, only AT performs the **prequalification process and tests at portfolio level** (i.e., the set of RPUs or RPGs of the BSP are required to meet the technical requirements set by the TSO for the provision of the balancing product).
- NL, PL, SI use **different approaches depending on the type of balancing reserve**.
- FR, EE and NO have a **simplified prequalification** for mFRR and/or RR.
- In IT, ES and HR where providing FCR is mandatory for some transmission connected units, **TSOs do not have any official prequalification process nor test** but the units usually need to pass some inspections and verification processes.

Prequalification approaches per type of dispatching model and balancing product across the EU



* In IT the prequalification of RPGs is only allowed within the framework of the pilot project UVAM.

Notes:

No data available on the prequalification process for IE.

¹ As shown in the figure, in some MSs, this prequalification is only required at RPU level because the prequalification of RPGs is not allowed.

² Prequalification at different levels refers to cases where different formal requirements and functional tests are required at technical unit, RPU/RPG or portfolio level. For further information on this and other approaches, please refer to Annex I.

For mFRR and RR, a few TSOs have simplified the product prequalification processes. In FR (only mFRR and RR), EE (mFRR) and NO (only mFRR) the TSOs do not require to pass a formal ex-ante prequalification process nor activation test. Instead, they perform a kind of ex-ante administrative validation where the BSP confirms that its RPU/RPG meets the requirements at RGU/RPG level (or at portfolio level in EE). It is a kind of one-and-done situation based on trust.

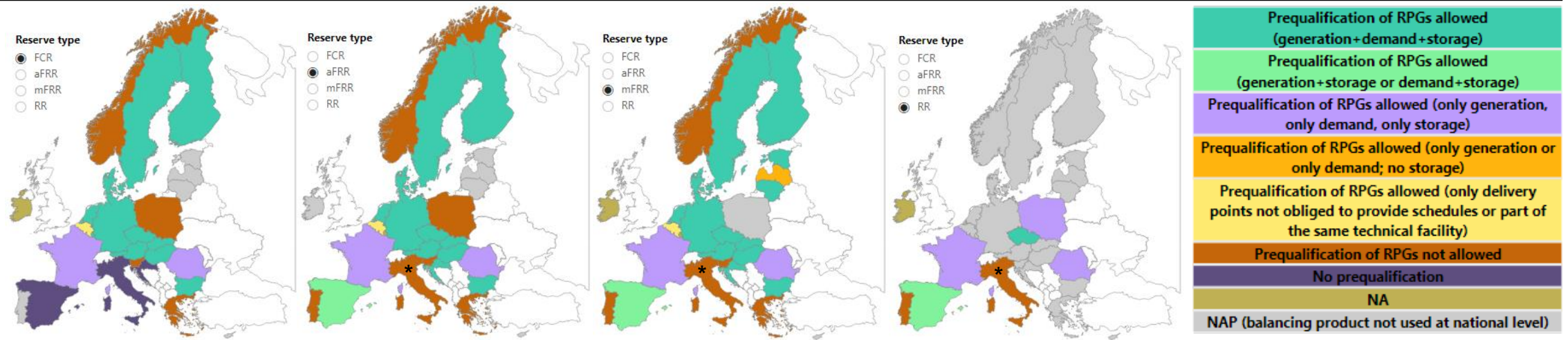
- The TSOs perform an ex-post verification during the activation phase based on the service delivery. Thus, the first time the BSP is required to activate the RPU/RPG to provide mFRR/RR, the TSOs verify the technical capabilities of the RPUs/RPGs to deliver the balancing product.
- The TSOs verify and test ex-ante whether the BSP has procured the right IT infrastructure for activation and whether the communication TSO-BSP works through the BSP's endpoint. This process includes testing the real-time data flow to the TSO control room concerning the active power change.
- If changes in the “prequalified” RPU/RPG, the BSP communicates such changes to the TSO and confirms that the requirements needed are still met.
- If the BSP cannot provide mFRR/RR in accordance with the balancing agreement, the TSOs put the agreement on hold until the BSP can prove performance or is terminated.

Verification or testing of different requirements according to different approaches in product prequalification

	Simplified prequalification	Prequalification
Requirements	EE (mFRR), FR (mFRR, RR), NO (mFRR)	Remaining countries and balancing products
Settlement account and financial liabilities of the BSP, compliance of the BSP with the legal provisions, etc.	ex-ante ¹	ex-ante
IT and communication requirements between the BSP and the TSO	ex-ante	ex-ante
Real-time data flows	ex-ante	ex-ante
Technical capabilities of RPUs/RPGs to deliver the balancing product (e.g. compliance with ramping rate specifications)	ex-post ¹	ex-ante

¹ Ex-ante refers to requirements verified or tested during the prequalification phase while ex-post refers to requirements verified or tested during the market phase.

First-time prequalification of reserve providing groups



* In IT the prequalification of RPGs is allowed for units < 10MW within the framework of the pilot project UVAM. Under UVAM, these RPGs can aggregate generation, demand and storage units.

Most MSs allow prequalifying RPGs, however:

- **ES and LV** do not allow prequalifying generation and demand under the same RPG¹. LV does not have a regulatory framework on storage units yet.
- **FR, RO and PL (the latter one only RR)** do not allow aggregating different technologies². In FR it is due to IT limitations to be removed in the upcoming years.
- **SE** allows prequalifying all technologies under the same RPG but there are IT limitations to bid RPGs aggregating all technologies.
- **BE** has 2 types of Technical Units: DP_{su} (units > 25MW with obligation to provide schedules to Elia) and DP_{pg} (units < 25MW with possibility of not providing schedules). Aggregation under RPGs is only allowed for DP_{pg} and for DP_{su}, the latter under the condition to be part of the same technical facility. Different technologies can be aggregated under the same RPG.

⊗ **Still GR, IT* (only aFRR, mFRR and RR), NO, PL (only FCR and aFRR), PT, SI do not allow prequalifying RPGs⁴.**

- **NO³**: There is no formal PQ of RPGs. Nevertheless, the TSO usually gathers RPU in “station groups” (generation and storage or demand and storage) to streamline the PQ process, especially when units are small.
- **SI**: Regulation groups include prequalified units. Only the combination of regulation groups at portfolio level needs to meet all the PQ requirements.

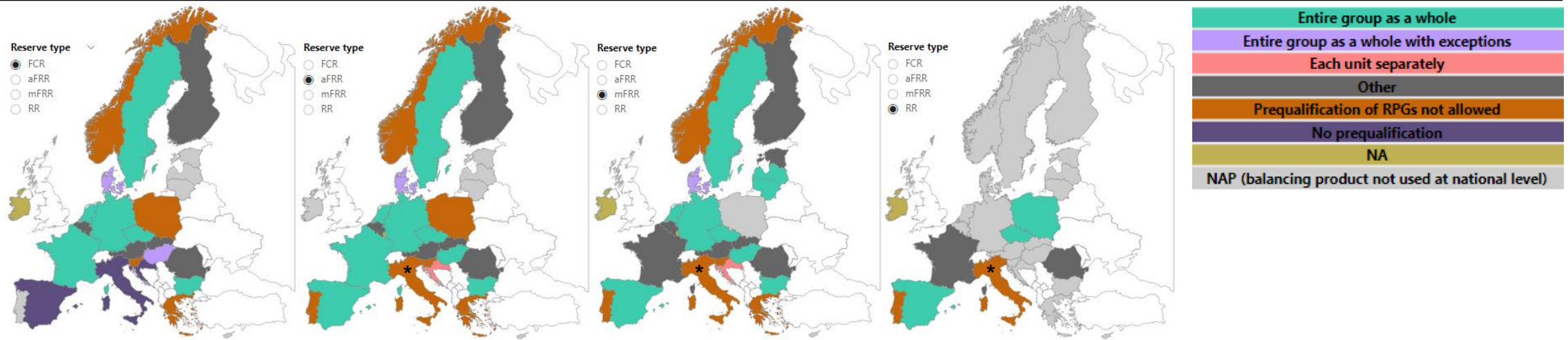
Notes:

¹ ES allows aggregating all technologies in aFRR since April 2022.

² In 2023, RO and PL plan to allow aggregating generation, demand and storage under the same RPG.

³ The Norwegian TSO is in the process of preparing a proposal for new prequalification requirements for FCR that are expected to deviate from current practice. These new requirements will be subject to approval of NVE-RME.

⁴ According to ACER's interpretation, it follows from the SO Regulation, in particular Articles 3(9), 154, 155, 158, 159, 161 and 162 thereof, that a reserve provider can be supplying from one or more units (RPU), one or more groups (RPG), or from both RPU(s) and RPG(s), and that the TSOs' RPU/RPG prequalification process needs to cover all these options.



* In IT the prequalification of RPGs is allowed for units < 10MW within the framework of the pilot project UVAM. In a first prequalification of a RPG under UVAM, the TSO prequalifies the entire group as a whole.

12 MSs allow prequalifying the entire group as a whole:

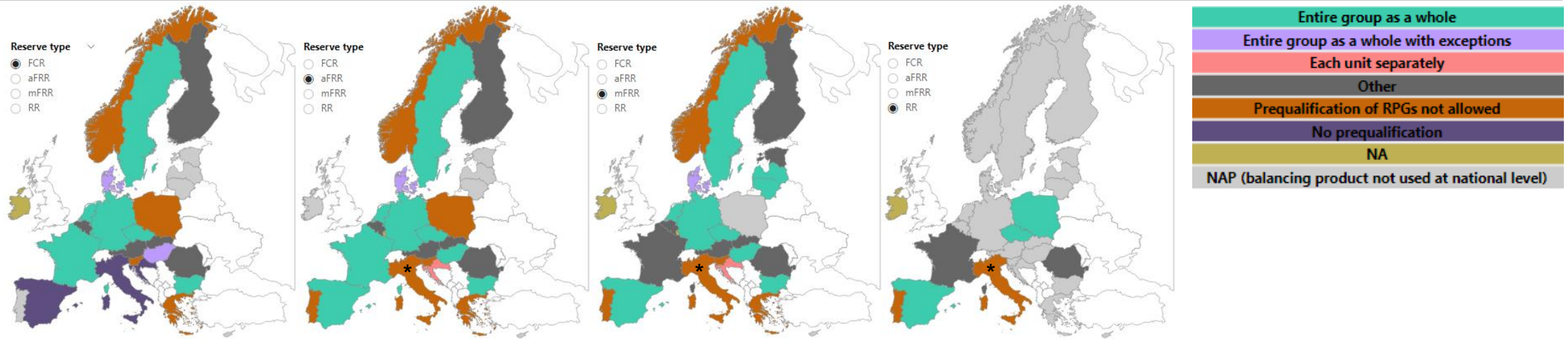
- ✓ • **ES:** If units <1MW, mandatory PQ of the RPG as a whole; if units >1MW, optional PQ of the RPG as a whole
- ✓ • **CZ:** The TSO aims to change the terms and conditions or methodology (TCMs) for BSPs from 2023 not to require PQ for new RPGs if the underlying units have a PQ certificate provided by an original equipment manufacturer (OEM).
 - **DE¹ (and LU only for FCR):** Different formal requirements and functional tests at technical unit, RPU/RPG and portfolio level.

In DK and HU, they make a PQ of the entire group as a whole although with some exceptions:

- **DK:** In FCR, units above 3MW and in aFRR and mFRR, units above 10 MW need to be prequalified individually
- ✗ • **HU (only FCR):** The TSO requires unit-based PQ tests in addition to the PQ of the entire RPG as a whole

✗ Only HR (only aFRR and mFRR) requires prequalifying each unit of the RPG separately

Notes: ¹ At technical unit level, the German TSOs request formal confirmations from the supplier and balance responsible party (BRP) if the reserves are provided by a third-party BSP, from the connecting DSO regarding Article 182 of SO Regulation and time series as part of the RPU/RPG standardised ramping up/down test. They also perform storage capacity tests for limited energy reservoir (LER) units where applicable. At RPU/RPG level, the German TSOs perform standardised ramping up/down tests to check the RPG's capabilities and the reserve power based on a digital time series file. In a RPG, these standardised tests are performed in each unit and in the entire RPG in addition to tests to check the operational concept of the RPG (especially in RPGs with a heterogeneous structure in terms of types of technologies and size of the individual units). At portfolio level, the German TSOs perform functional pool tests. They are repeated only when specific conditions and changes apply, e.g., change to a new third-party pool SCADA service provider, migration of large number of assets from one BSP to another BSP, etc.

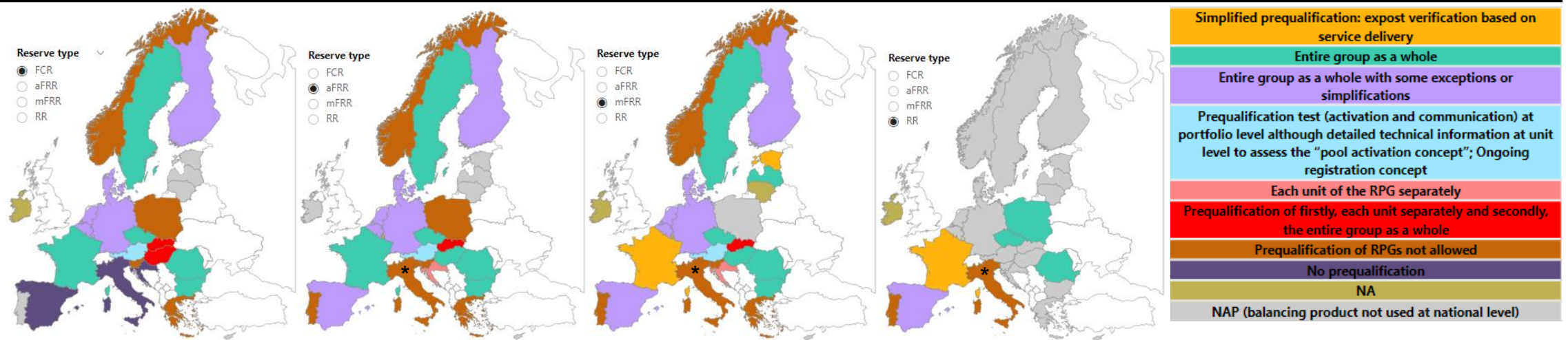


* In IT the prequalification of RPGs is allowed for units < 10MW within the framework of the pilot project UVAM. In a first prequalification of a RPG under UVAM, the TSO prequalifies the entire group as a whole.

Some MSs use “other” approach for the first-time PQ of RPGs:

- **AT:** PQ test (activation and communication) at BSP-portfolio level although detailed technical information (technology, specifications, etc.) at unit level to assess the “pool activation concept”.
- ✓ **EE:** Simplified prequalification at portfolio level. Ex-post verification based on the service delivery.
- ✓ **FI:** As a general rule, PQ of the entire RPG as a whole. Alternatively, the BSP can choose to prequalify the units of the RPG separately and verify the operation of the RPG by testing a subset.
- ✓ **FR (only mFRR and RR):** Simplified prequalification at RPU/RPG level. Ex-post verification based on the service delivery.
- ✗ **SK¹:** First, PQ of each unit of the RPG and second, PQ of the RPG as a whole.
- **RO:** PQ of the entire RPG as a whole or grouping prequalified RPUs.
- ✓ **BE:** If the technical units are Dpsu (units > 25MW), PQ test of each unit for each operation mode of the technical unit; if the technical units are DPpg (units < 25MW), the BSP can choose to prequalify the entire RPG as a whole or the individual units separately.

First-time prequalification of RPGs comprising of small units¹



* In IT the prequalification of RPGs is allowed for units < 10MW within the framework of the pilot project UVAM. In a first prequalification of a RPG under UVAM, the TSO prequalifies the entire group as a whole.

✓ Some MSs prequalify the RPG as a whole with some exceptions or simplifications:

- **ES:** If units <1MW, mandatory PQ of the RPG as a whole; if units >1MW, optional PQ of the RPG as a whole
- **FI:** BSP can choose to prequalify either a) the entire RPG as a whole or b) the individual units separately and a random subset to demonstrate the operation of the group
- **DK:** In FCR, units above 3MW and in aFRR and mFRR, units above 10 MW need to be prequalified individually
- **BE²:** BSP can choose to prequalify the entire RPG as a whole or the individual units separately
- **NL²:** If many units/connection points, TSO may select and prequalify a subset of the RPG
- **DE² (and LU only for FCR³):** Standardised ramping up/down test at unit level are omitted when units <100kW and exemptions of time series per unit are applied in standardised ramping up/down test at group level

Notes:

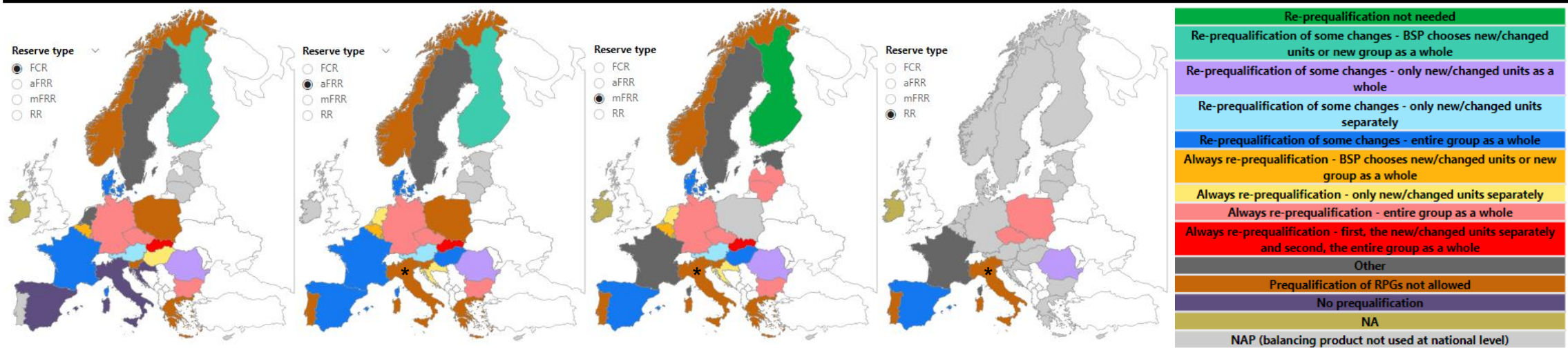
¹ Some examples of small units are distributed generation, household consumers, non-household consumers connected to the distribution grid or storage units other than pumped-hydro storage.

² In BE, NL, DE/LU, these practices only apply when RPGs comprise small units.

³ In LU, no unit connected to the Creos network can participate in the aFRR nor mFRR German market. For more information, please see slide 32.

Changes in reserve providing groups already prequalified

Adding units or connection points or increasing capacity of the existing units of a prequalified RPG (1/2)



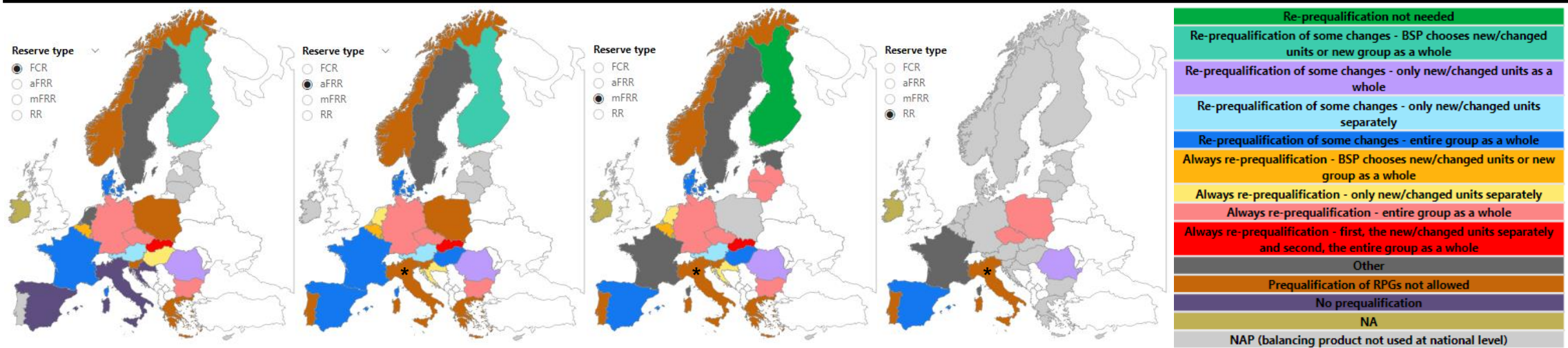
* In IT the prequalification of RPGs is allowed for units < 10MW within the framework of the pilot project UVAM. Only if more than 30% of the minimum/maximum prequalified active capacity of a RPG is changed, the prequalified RPG is required to pass a new PQ process of the entire group as a whole.

✓ In 7 MSs only some add-ons require to pass a new PQ process:

- **AT:** If the new units require an adaptation of the “operational pool concept” (e.g., because of another technology) or remarkable additional power (no absolute limits); TSO decides in case of doubt. Ongoing concepts to add small units of already prequalified types/technologies in a qualified BSP by mere registration.
- **DK:** In FCR, if more than 3 MW are added to the RPG; in aFRR and mFRR if more than 10 MW are added.
- **ES:** In aFRR, when the ratio (non-prequalified power/prequalified power) > 10% or the increased power > 30 MW; in mFRR and RR, it depends on a dynamic ratio based on the size of the RPU. However, if the increased power > 30 MW, a new PQ process is needed regardless of the ratio.
- **FI (only FCR and aFRR):** If the BSP increases the capacity that can bid to the market.
- **FR (only FCR and aFRR):** If > 10% of the units of the RPG are changed (added/increased capacity).
- **HU (only aFRR and mFRR):** If the increase of the reserve capacity > 1 MW.
- **RO:** Only if the control loops are modified or when the ratio (non-prequalified power/active power of the BSP) > 10%.

Notes: Even though the German TSOs always require a new PQ after add-ons, they apply some simplifications and shortcuts in the new PQ process after add-ons such as synthesising units' standardised ramping up/down test with different timestamps to a virtual group's time series, the standardised ramping up/down tests may be used for different products (negative/positive, FRR/FCR) and may be combined with the test of the storage capacity, etc.

Adding units or connection points or increasing capacity of the existing units of a prequalified RPG (2/2)



* In IT the prequalification of RPGs is allowed for units < 10MW within the framework of the pilot project UVAM. Only if more than 30% of the minimum/maximum prequalified active capacity of a RPG is changed, the prequalified RPG is required to pass a new PQ process of the entire group as a whole.

Some MSs use “other” approach:

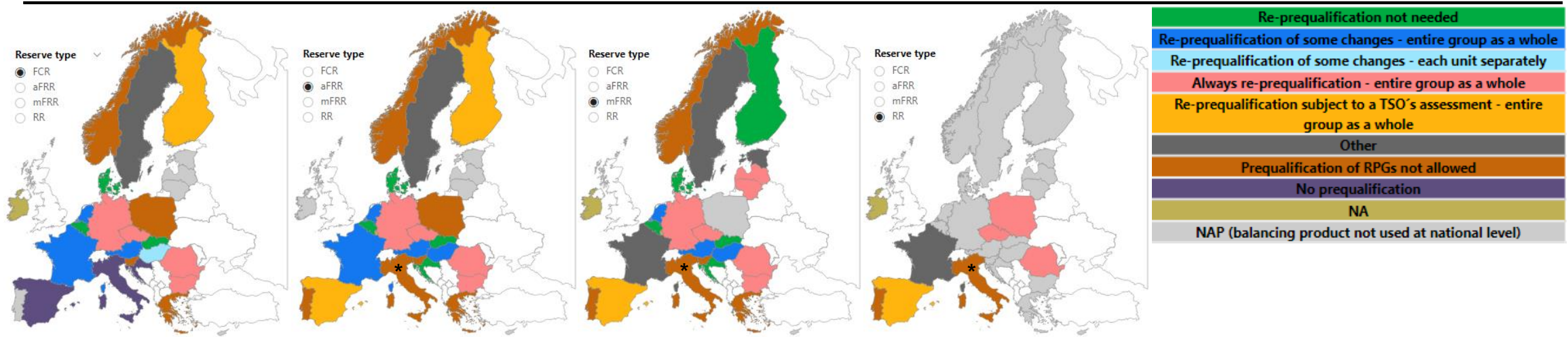
- **SE:** Units with maximum capacity < 0.1 MW can be type-qualified and added to a prequalified RPG in steps of 0.1 MW up to a maximum of 1 MW, without performing a new PQ. To increase the capacity with type-qualified units beyond 1MW or with non-qualified type units, a new PQ is needed. Alternatively, the BSP can freely expand a RPG without a new PQ as long as its maximum prequalified volume does not change.
- **NL (only FCR):** Units with rated power of < 1.5 MW can be type-approved if same control behaviour as technical units that are part of the prequalified RPG.
- **EE and FR (only mFRR and RR):** No PQ but administrative validation. The BSP just informs the TSO about the changes and confirms the requirements are still met.

When RPGs consist of **distributed generation, household and non-household consumers or storage units (other than pumped-hydro storage)** same procedures apply as shown in the maps with the exception of LV and DE:

- **LV:** BSPs with RPGs of load can add units without performing a new PQ
- **DE¹:** PQ tests are repeated once in a while (e.g., when a significant number of small units is added), there are exemptions of time series per unit as part of the RPG's standardised ramping up/down test and the standard test at unit level is usually omitted when the RPG consists of small units (<100kW).

Notes: ¹ Even though the German TSOs always require a new PQ after addons, they apply some simplifications and shortcuts in the new PQ process after addons such as synthesising units' standardised ramping up/down test with different timestamps to a virtual group's time series, the standardised ramping up/down tests may be used for different products (negative/positive, FRR/FCR) and may be combined with the test of the storage capacity, etc.

Removing units or connection points from a prequalified RPG



* In IT the prequalification of RPGs is allowed for units < 10MW within the framework of the pilot project UVAM. Only if more than 30% of the minimum/ maximum prequalified active capacity of a RPG is changed, the prequalified RPG is required to pass a new PQ process of the entire group as a whole.

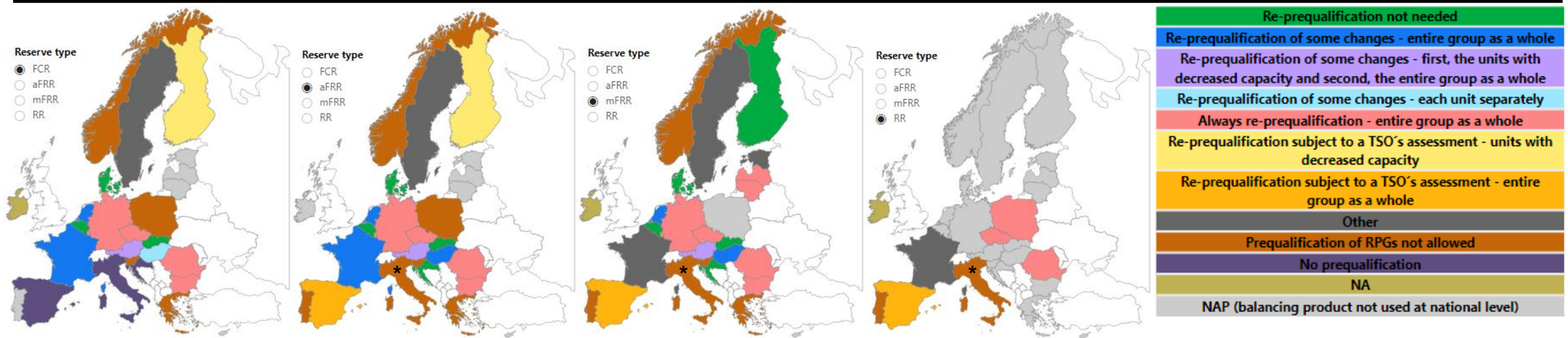
- ✓ In 5 MSs only some removals require to pass a new PQ process:
 - **AT**: Changes that not only reduce the power but also require a change in the “pool concept”.
 - **FR (only FCR and aFRR)**: If > 10% of the units of the RPG are changed (removed/decreased capacity).
 - **HU**: If the prequalified reserve capacity decreases.
 - **NL**: Only when the capacity decreases. The PQ process may require a PQ test or not.
- ✓ Some MSs use “Other” approaches:
 - **EE and FR (only mFRR and RR)**: Simplified prequalification. The BSP just informs the TSO about the changes and confirms the requirements are still met.
 - **SE**: The BSP can freely remove type-qualified units from the RPG as long as the decreased capacity is not lower than the minimum capacity initially tested in the PQ. Otherwise, a re-qualification is required.

When RPGs consist of **distributed generation, household and non-household consumers or storage units (other than pumped-hydro storage)** same procedures apply as shown in the maps with the exemption of LV and DE:

- **LV**: BSPs with RPGs of load can remove units without performing a new PQ
- **DE¹**: PQ tests are repeated once in a while (e.g., when a significant number of small units is removed), there are exemptions of time series per unit as part of the RPG's standardised ramping up/down test and the standard test at unit level is usually omitted when the RPG consists of small size units (<100kW).

Notes: ¹ Even though the German TSOs always require a new PQ after removals, they apply some simplifications and shortcuts in the new PQ process after removals such as synthesising units' standardised ramping up/down test with different timestamps to a virtual group's time series, the standardised ramping up/down tests may be used for different products (negative/positive, FRR/FCR) and may be combined with the test of the storage capacity, etc.

Decreasing capacity of the existing units of a prequalified RPG

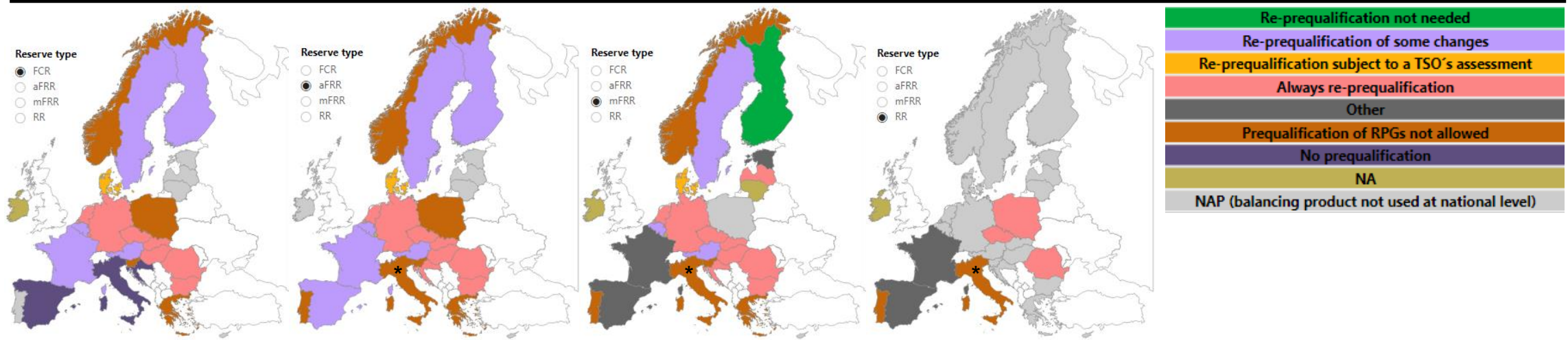


* In IT the prequalification of RPGs is allowed for units < 10MW within the framework of the pilot project UVAM. Only if more than 30% of the minimum/ maximum prequalified active capacity of a RPG is changed, the prequalified RPG is required to pass a new PQ process of the entire group as a whole.

Same as removals with only a couple of exceptions:

- **AT:** Like at removals, a new PQ is needed for changes that not only reduce the power but also require a change in the “pool concept”. Unlike at removals, the BSP has to prequalify first, the units with decreased capacity and second, the entire RPG as a whole.
- **FI:** Like at removals, the TSO always assesses on a case-by-case basis whether a new PQ process is needed. If needed, unlike at removals, the BSP only needs to prequalify the units with decreased capacity.

Changes in composition or distribution¹ of a prequalified RPG while keeping its prequalified reserve volume or capacity



* In IT the prequalification of RPGs is allowed for units < 10MW within the framework of the pilot project UVAM. Only if more than 30% of the prequalified capacity of a RPG is changed in composition or distribution, the prequalified RPG is required to pass a new PQ process.

✓ In 6 MSs only some changes in the composition/distribution require a new PQ:

- **AT:** If the changes require an adaptation of the pool concept.
- **BE:** Only changes in the composition of the RPGs.
- **ES:** In aFRR, if the changes impact the technical/communication requirements, the availability of the RPG or if the ratio (non-prequalified power/prequalified power) is > 10 %; in mFRR and RR, if the ratio is > 10 %.
- **FI (only FCR and aFRR):** If type-approval cannot be applied.
- **FR (only FCR and aFRR):** Only if > 10% of the units are changed (regardless of the type of change or how it may impact the capacity/volume provided by the group).
- **SE:** Only if the changes in composition or distribution are made on non-type-qualified units.

When RPGs consist of **distributed generation, household and non-household consumers or storage units (other than pumped-hydro storage)** same procedures apply as shown in the maps with the exemption of LV and DE:

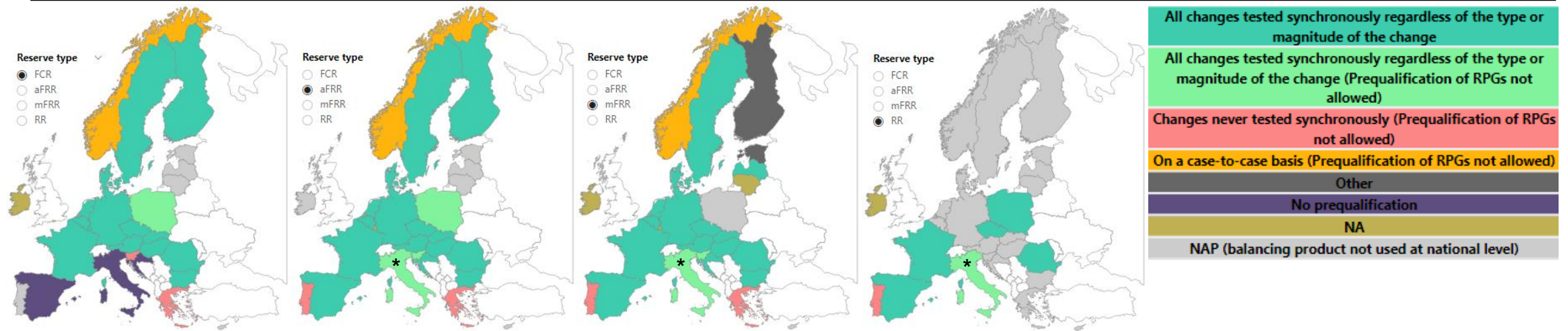
- **LV:** BSPs with RPGs of load can make changes in composition or distribution of units without performing a new PQ
- **DE²:** PQ tests are repeated once in a while (e.g., when a significant number of small units is added), there are exemptions of time series per unit as part of the RPG's standardised ramping up/down test and the standard test at unit level is usually omitted when the RPG consists of small size units (<100kW).

Notes: ¹ Changes in the composition of a prequalified RPG always imply removing some connection points or units connected to these connection points while others are added but keeping the same prequalified reserve capacity/volume. Changes in the distribution of a prequalified RPG refer to changes in the location of the connection points or the units connected to these connection points while keeping the same connection points and units (i.e. no changes in their prequalified reserve capacity/volume nor their features).

² Even though the German TSOs always require a new PQ after changes in the composition/distribution of RPGs, they apply some simplifications and shortcuts in the new PQ process after these changes in the composition or the distribution such as synthesising units' standardised ramping up/down test with different timestamps to a virtual group's time series, the standardised ramping up/down tests may be used for different products (negative/positive, FRR/FCR) and may be combined with the test of the storage capacity, etc.

Other relevant design features of the prequalification processes for reserve providing units and reserve providing groups

Verifying or testing multiple changes¹ in prequalified RPU or RPGs simultaneously

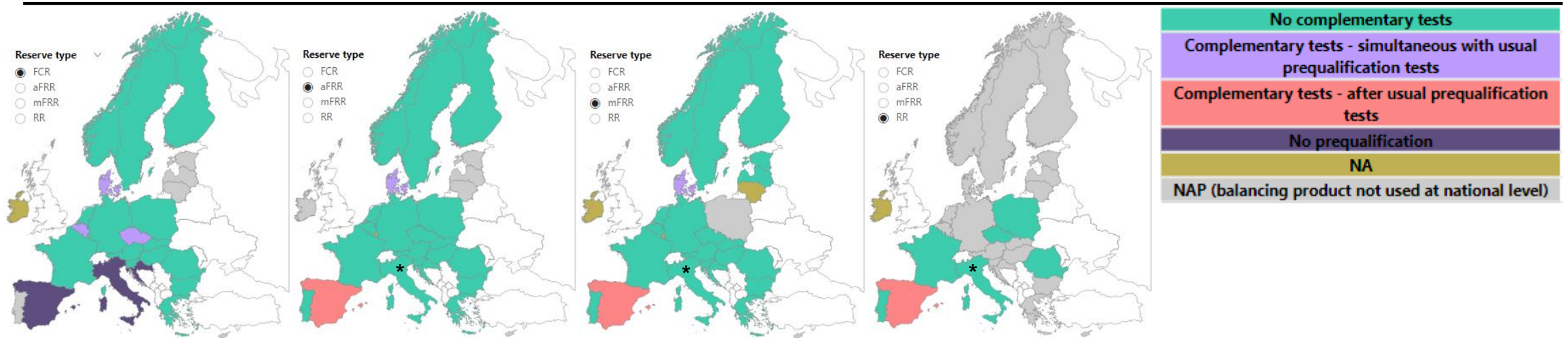


* In IT the prequalification of RPGs is allowed for units < 10MW within the framework of the pilot project UVAM. Under UVAM, the TSO verifies or tests all changes in prequalified RPGs simultaneously.

Only GR, PT and SI never verify or test multiple changes simultaneously.

In NO, even though there is no formal PQ of RPGs but “station groups”, the TSO usually gathers RPUs in “station groups” (aggregating generation and storage or demand and storage) to streamline the process, especially when units are small.

Complementary tests¹ for some technologies or market participants on top of the usual prequalification tests

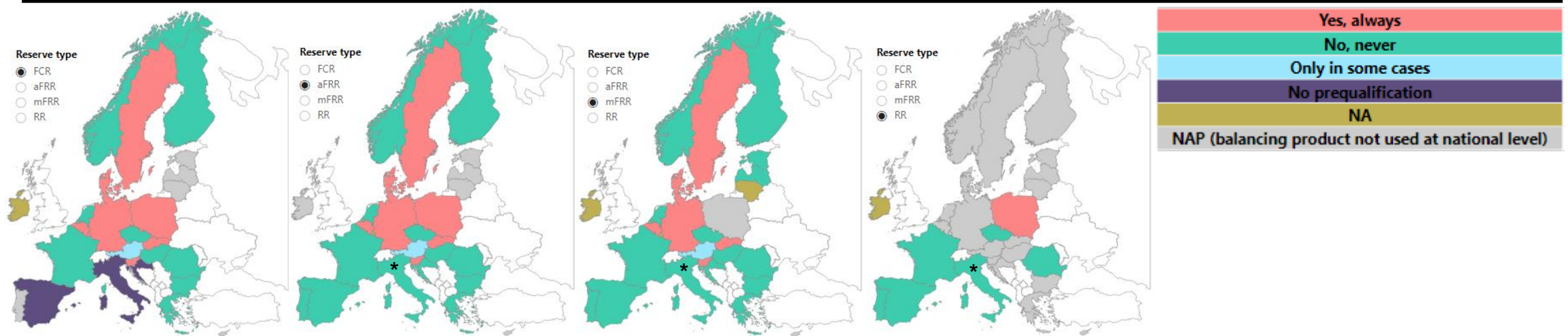


* In IT the prequalification of RPGs is allowed for units < 10MW within the framework of the pilot project UVAM. Under UVAM, there is no complementary test for RPGs on top of the usual prequalification tests.

In 4 MSs, TSOs perform complementary tests for some technologies:

- **ES (only aFRR, mFRR and RR):** renewable energy sources (RES), combined heat and power (CHP) and waste generation need to pass the so-called PCP test aiming to demonstrate their capacity to follow specific TSO instructions.
- **BE (only FCR):** BSPs with units with LER to provide an Energy Management Strategy demonstrating they meet the requirements.
- **CZ (only FCR):** Test units with LER to prove their ability to switch into reserve mode and sufficient reservoir capacity.
- **DK:** Test forecasting quality in wind and photovoltaics (PV) units.

Switching unchanged prequalified RPU or RPGs between BSPs for the same balancing product



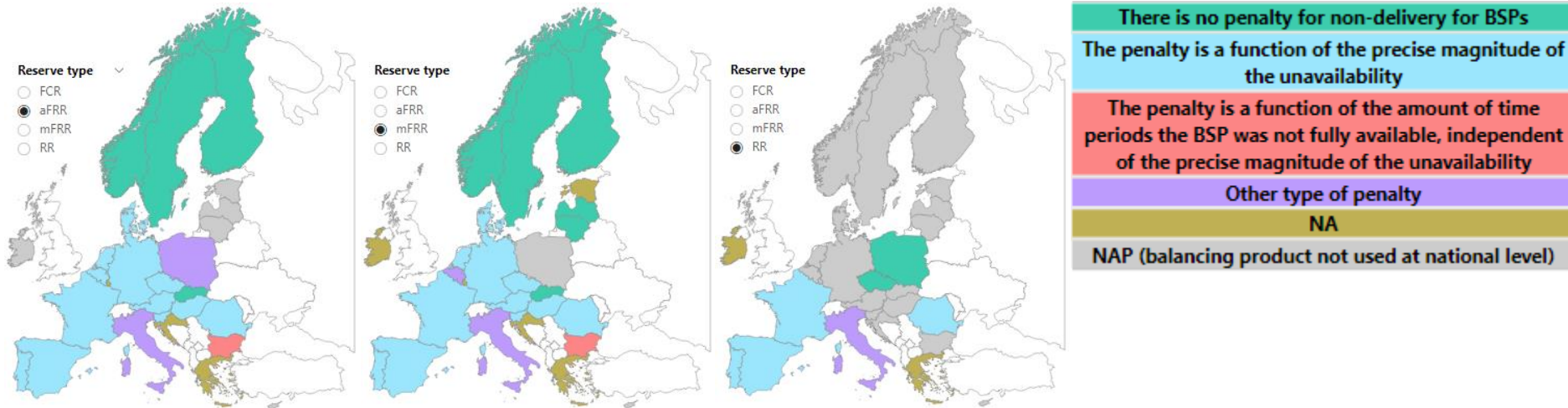
* In IT the prequalification of RPGs is allowed for units < 10MW within the framework of the pilot project UVAM. Under UVAM, the prequalified RPGs do not have to pass a new PQ process after switching to another qualified BSP.

In 7 MSs, the TSOs require the RPU/RPG to pass a new PQ process after switching to another qualified BSP.

- ✓ • **DE:** This new PQ may have some simplifications or shortcuts, e.g., with small and numerous units the German TSOs do not require a new test per unit or for the entire RPG, but rather test the integration of the new units into the acquiring BSP's portfolio.
- ✓ In AT, a new PQ is only needed if the new “pool concept” is adapted.

Penalty for non-delivery of balancing energy

Penalty for BSPs for non-delivery of balancing energy¹



6 MSs do not have any penalty in any balancing product while 2 MSs (PT and CZ) do not have any penalty in RR only.

Fifteen MSs have some kind of penalty for BSPs not delivering balancing energy.

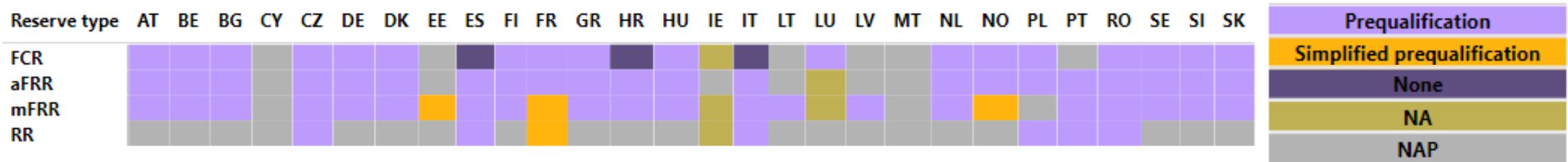
- **12 MSs**: the penalty is a function of the precise magnitude of the unavailability when TSOs requires activation.
- **BG**: the penalty is a function of the **amount of time periods the BSP was not fully available when requested by the TSO**, regardless of the precise magnitude of the unavailability. This penalty scheme may become restrictive for small units and it may be hard to justify since the TSO usually struggles more with bulk unavailability than with many small deviations.
- **PL (only aFRR)** and **IT**: other types of penalties. In PL, the TSO may impose a penalty after assessment only in special cases of long lasting non-deliveries, although this penalty is not a standard element of the settlement process. In IT, the TSO calculates the penalty based on the possible profit gained by the BSP due to the deviation from activation instructions.

Notes:

¹ It refers to any penalty for BSPs when they do not provide balancing energy after TSOs request activation. This penalty scheme is independent from the imbalance costs which are under BRP's responsibility. This overview does not assess any penalty for non-delivery of balancing energy for FCR since FCR does not require the calculation and settlement of balance energy as set in Article 46(1) of the EB Regulation.

Summary of findings

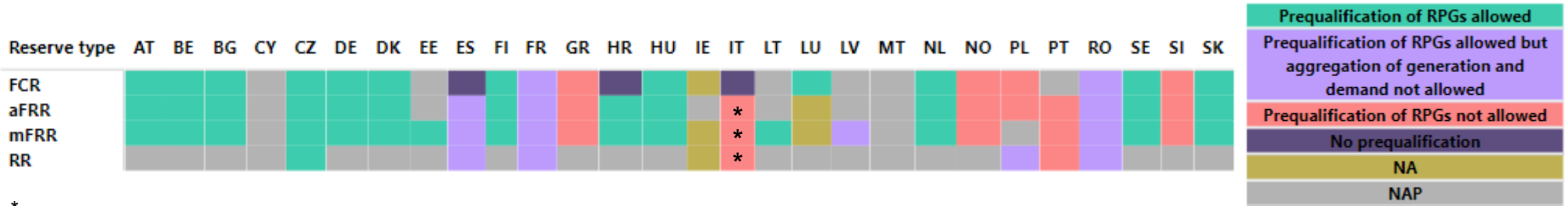
Only a few MSs apply simplified approaches to prequalification¹...



Some simplified approaches to prequalification have been identified for mFRR and RR in FR and for mFRR in EE and NO where the technical capabilities of the assets to provide the product are not verified ex-ante during the prequalification phase but ex-post during the service delivery. Other TSOs may consider similar approaches at least for BSPs with small RPU/RPGs to facilitate their market entry.

- In FR (only mFRR and RR), EE (mFRR) and NO (only mFRR), the TSOs do not require passing any ex-ante prequalification process nor test to verify the technical capabilities of the RPU/RPGs to deliver the balancing product. Instead, they perform a kind of **ex-ante administrative validation** where the BSP confirms that its RPU/RPG meets the requirements at RGU/RPG level (or at portfolio level in EE) and the TSOs verify and/or test the IT and communication requirements between TSO-BSP and the real-time data flows.

Prequalifying groups is still not possible in some MSs...

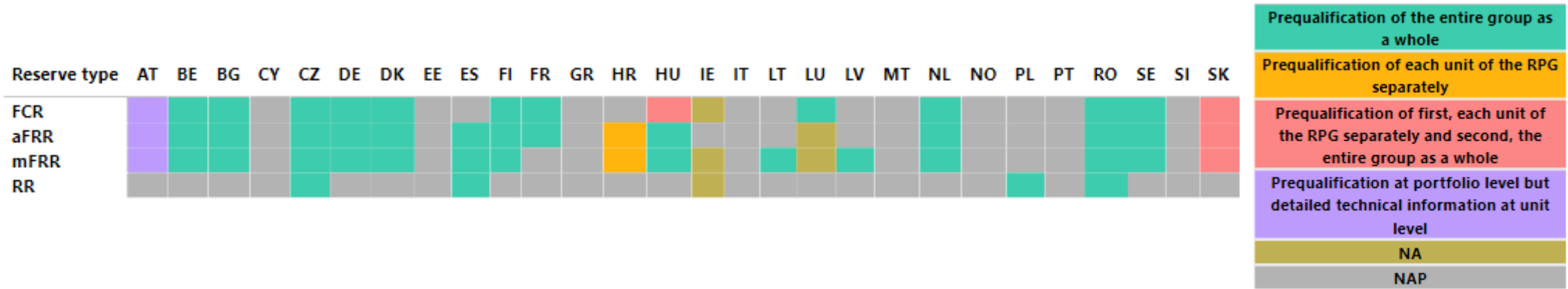


* In IT the prequalification of RPGs is only allowed within the framework of the pilot project UVAM.

The prequalification of RPGs (instead of RPUs) and the aggregation of generation and demand units under the same RPG, as set in SO Regulation, is still not possible in some MSs. This may represent an entry barrier for market participants engaged in aggregation of small units that would be required to demonstrate that each RPU (i.e., each connection point) meets the technical requirements set by TSOs for the corresponding balancing product.

- Six TSOs still do not allow a formal prequalification of **reserve providing groups in all balancing products**.
- Five TSOs allow prequalifying reserve providing groups but not **aggregating generation and demand units** under the same RPG as set in the SO Regulation.

When the groups comprise small units¹, a few MSs still require prequalifying each individual unit separately...



For the first prequalification of RPGs comprising of small units, most TSOs require prequalifying the entire group as a whole. On the contrary, HR, SK and HU verify that each individual unit of the RPG meets the technical requirements set by the TSO for some balancing products.

- HR (for aFRR and mFRR) requires prequalifying each unit of the RPG separately while SK and HU (the latter one only for FCR) require prequalifying first, each unit of the RPG separately and second, the entire RPG as a whole.
- Some TSOs make **simplifications or exceptions in the prequalification processes for RPGs comprising of small units**. Some examples include i) offering the BSP the option to prequalify the entire group as a whole or each individual unit of the RPG separately (BE), ii) prequalifying and testing a subset of the RPG (NL and FI) and iii) skipping some tests at unit level (DE).

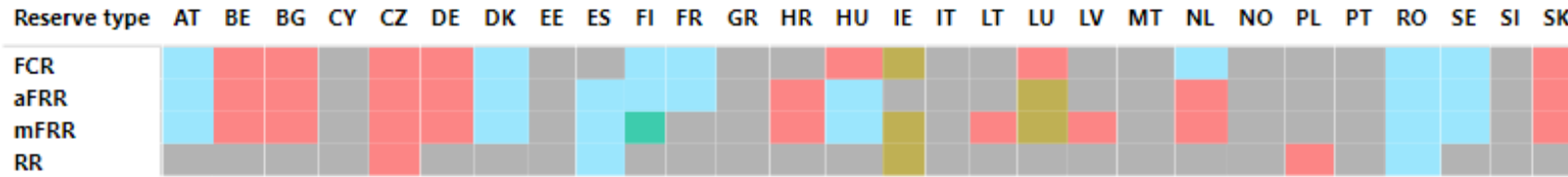
Notes:

¹ Some examples of small units are distributed generation, household consumers, non-household consumers connected to the distribution grid or storage units other than pumped-hydro storage.

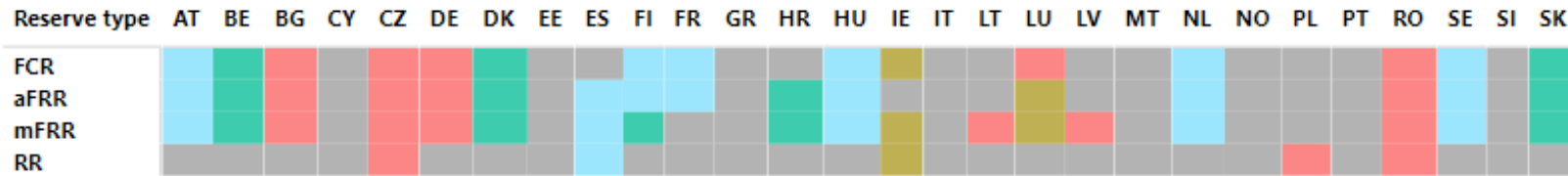
NAP refers to countries where the balancing product is not used at national level, where there is no prequalification process for FCR products (i.e. ES, HR and IT), where a prequalification of RPGs is not allowed for some balancing products (GR, IT, NO, PL, PT and SI) and where there is an administrative validation instead of a prequalification process (EE for mFRR and FR for mFRR and RR).

When the groups are subject to changes, some MSs require a re-qualification only if the changes are significant...

Re-qualification after adding new units or connection points or after increasing the capacity of the existing units



Re-qualification after removing units or connection points or after decreasing the capacity of the existing units

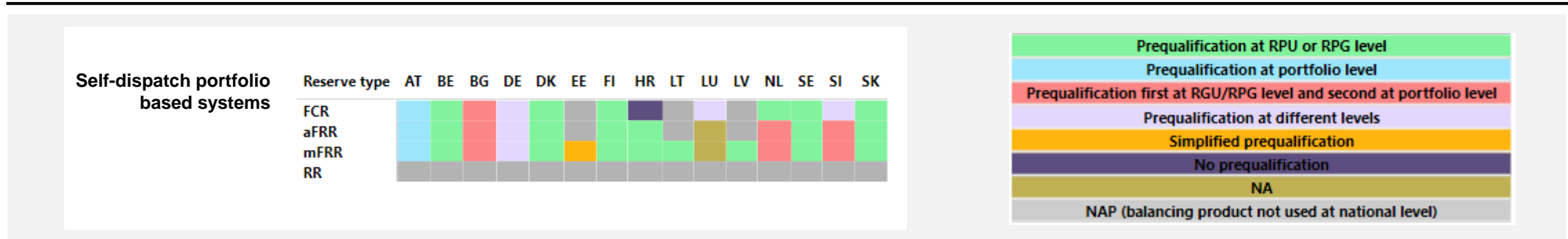


There is considerable room to simplify re-qualifications of RPGs. Some TSOs limit the need for re-qualification to the introduction of significant changes, which could be considered as a friendly practice for small participants.

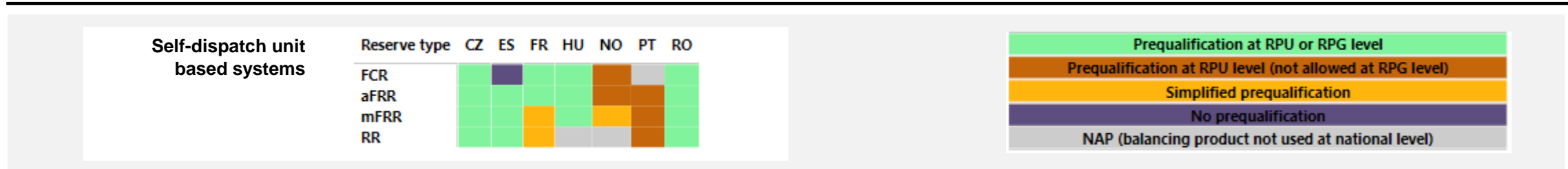
- Some TSOs set **thresholds requiring a re-qualification** only when they are overcome. Some examples are as follows: if the change impacts the pool concept (AT), if more than X% of the units of the RPG are changed (FR), if more than X MW are added or removed (DK), when the ratio active power of new units/active power of the RPG or the BSP is higher than X% (ES, RO), when the control loops are modified (RO) or when the prequalified reserve capacity increases or decreases (HU, NL, SE).
- SE and NL use **type-approval for small units** when their technical characteristics are equivalent to those units already included in the prequalified RPG. AT is working on **registration concepts** to add small units of already prequalified types/technologies by mere registration.

- TSOs are invited to consider to simplify and speed up the product prequalification processes by performing an **ex-post verification of the technical capabilities** to provide the product **during the service delivery**, in particular for less demanding and technically complex balancing products and for groups comprising of small units. Nevertheless, the TSO may need to receive some ex-ante data about the group to avoid unwanted compensation or rebound effects of activated resources.
- As foreseen in the SO Regulation, the **prequalification of groups** aggregating both **generation and demand units** should be allowed in all Member States.
- The prequalification of each **individual unit comprising a group** should be **avoided at least when such units are small**. Instead, all the units comprising the group should be prequalified as a whole to facilitate the access of small units to the provision of balancing services.
- The **re-prequalification of groups after changes** in their units or connection points consisting on addons or removals should be limited to i) **significant changes** that may have a relevant impact on system security or grid operation and to ii) the **units or connection points of the group that have been changed** requiring their re-prequalification **as a whole**.
- TSOs are invited to consider the **friendly practices** identified in this document not only for the prequalification processes for balancing services or but also when setting prequalification processes of products for solving physical congestions or for voltage control, if product prequalification processes are to be defined.

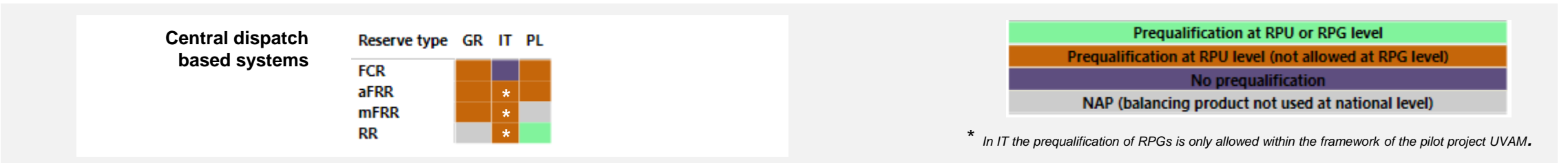
Annex I. Prequalification approaches for different types of balancing products



- **AT** (FCR, aFRR, mFRR): Even though the prequalification test (activation and communication) is performed at portfolio level, the BSP needs to provide detailed technical information at unit level to assess the “pool activation concept”
- **DE**: Different formal requirements and functional tests at technical unit, RPU/RPG and portfolio level.
 - In DE there is no difference between TSOs with regard to formal requirements in the prequalification process.
- **HR** (only FCR): FCR mandatory. No prequalification but verification tests during grid connection.
- **LU** (only FCR): Like DE, different formal requirements and functional tests at technical unit, RPU/RPG and pool level.
 - In LU, Creos Luxembourg S.A. has a service-level agreement with Amprion GmbH which operates the common LFC area between Creos and Amprion. Amprion defines the need for balancing reserves for the common LFC area and procures the reserves on the DE market. No unit connected to Creos can participate in the prequalification for aFRR or mFRR in the DE market although they can participate in the prequalification for FCR. These units have to sign a contract with Amprion and need to fulfil the prequalification process requirements as defined and approved for Germany. As of 31 December 2021, there was no application from these potential LU units. Consequently, this overview considers the same replies as DE for FCR and “NA” for aFRR and mFRR.
- **NL** (only aFRR and mFRR): First, prequalification of the BSP at RPU/RPG level. When BSP-portfolio is expanded, there is only a new prequalification at portfolio level when needed according to Article 159(6) of the SO Regulation and unless delivery took place demonstrably in accordance with specifications the previous year.
- **SI** (only aFRR and mFRR): RPUs are pre-checked individually (compliance assessment and tests but they do not have to fulfil all the requirements). Only approved units can be included into the portfolio. Official prequalification at portfolio level.
- **SI** (only FCR): First, technical tests at unit level (each RPU has to comply with all technical FCR requirements including responses, dead bands, thresholds, frequency meter accuracy, etc.); second, integration tests at portfolio level (communication tests, tests of signal aggregation, accounting/settlement document exchange, etc.)



- **ES** (only FCR): FCR mandatory. No prequalification but mandatory requirements per unit. Simulations performed by the OEM.
- **NO** (only FCR, aFRR): prequalification at RPU level (not allowed at RPG level).
 - The EU Network Codes entered into force in Norwegian law on 1 August 2021. NVE-RME expects to receive in the forthcoming months a number of proposals for national TCMs pursuant to EB and SO Regulation (e.g. the TCMs for BSP & BRPs pursuant to Article 18(1) of the EB Regulation) that will trigger significant changes to the current rules and procedures. At the same time, the common Nordic balancing market and common Nordic imbalance settlement are undergoing a major transition in the context of the Nordic Balancing Model (NBM). As part of this, the balancing processes are being automatised, modernised and set to change significantly. This will pave the way for further adjustments to national rules and procedures and easier participation of demand side response (DSR) in the balancing markets. Major changes in the Norwegian market setup concerning prequalification and aggregation are therefore very likely to happen gradually in the next 1-2 years as NO is further progressing with the implementation of the NBM.



- **IT** (only FCR): FCR mandatory for some type of generation units. No prequalification.
 - Together with the tests for grid connection, the national terms and conditions define the requirements on the amount of FCR to be provided, on the equipment to be installed and on the technical parameters. There is no ex-ante prequalification process nor test but the TSO has the right to perform inspection and testing.
- **IT*** (only aFRR, mFRR, RR): The prequalification of RPGs is only allowed within the framework of the pilot project UVAM where small units can participate in the different balancing products in an aggregated form.
- **GR** (all: FCR, aFRR, mFRR): Prequalification at RPU level (not allowed at RPG level).
 - In GR, the regulatory framework for the participation of demand response aggregators and RES aggregators as BSPs in the balancing market was completed in 2022.

Annex II. Acronyms, definitions and data sources

- ACER MMR: ACER Market Monitoring Report
- aFRR: automatic Frequency Restoration Reserve
- BRP: Balance Responsible Party
- BSP: Balancing Service Provider
- CHP: Combined Heat and Power
- DSR: Demand Side Response
- DP_{su}: Delivery point “single unit” (Belgian concept)
- DP_{pg}: Delivery point “providing group” (Belgian concept)
- EB Regulation: COMMISSION REGULATION (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing (available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02017R2195-20220619>)
- EU: European Union
- FCR: Frequency Containment Reserve
- IT: Information Technology
- LER: Limited Energy Reservoir
- mFRR: manual Frequency Restoration Reserve
- MS: EU Member State

- NA: Not Available (the TSO/NRA did not respond to the question)
- NAP: Not Applicable (the corresponding balancing product is not used by the TSO at national level)
- NBM: Nordic Balancing Model
- NRA: National Regulatory Authority
- OEM: Original Equipment Manufacturer
- PQ: Prequalification
- PV: Photovoltaics
- RES: Renewable Energy Sources
- RPU: Reserve Providing Unit
- RPG: Reserve Providing Group
- RR: Replacement Reserve
- SO Regulation: COMMISSION REGULATION (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (available at: <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02017R1485-20210315>)
- TCM: Terms and Conditions or Methodology
- TSO: Transmission System Operator

-
- “Balancing service provider”: a market participant with reserve providing units or reserve providing groups able to provide balancing services to TSOs (Article 2 of the EB Regulation)
 - “Reserve providing unit”: a single or an aggregation of power generating modules and/or demand units connected to a common connection point fulfilling the requirements to provide FCR, FRR or RR (Article 3(10) of the SO Regulation)
 - “Reserve providing group”: an aggregation of power generating modules, demand units and/or reserve providing units connected to more than one connection point fulfilling the requirements to provide FCR, FRR or RR (Article 3(11) of the SO Regulation)
 - “Portfolio”: for the purpose of this overview, the portfolio is considered as a set of reserve providing units or reserve providing groups belonging to the same BSP.



COUNTRY	TSO	NRA	COMMENT
AT	Austrian Power Grid AG (APG)		
BE	Elia System Operator SA (Elia)		
BG		Energy and Water Regulatory Commission / Комисия за енергийно и водно регулиране (dker)	
CY	-	-	CY does not have any balancing market
CZ	ČEPS a.s. (ČEPS)		
DE	TransnetBW GmbH (TransnetBW) TenneT TSO GmbH (TenneT DE) Amprion GmbH (Amprion) 50Hertz Transmission GmbH (50Hertz)		
DK		Forsyningstilsynet (DUR)	
EE	Elering AS		
ES	Red Eléctrica de España S.A. (REE)		
FI	Fingrid Oyj (Fingrid)		
FR	Réseau de Transport d'Electricité (RTE)	Commission de régulation de l'énergie (CRE)	
GR	-	Ρυθμιστική Αρχή Ενέργειας (RAE)	
HR	HOPS d.d. (HOPS)		
HU	MAVIR Magyar Villamosenergia-ipari Átviteli Rendszerirányító Zártkörűen Működő Részvénytársaság	Magyar Energetikai és Közmű-szabályozási Hivatal (MEKH)	
IE	-	-	IE did not respond to the questionnaire
IT		Autorità di Regolazione per Energia Reti e Ambiente (ARERA)	
LT	Litgrid AB (Litgrid)		
LU	-	Institut Luxembourgeois de Régulation (ILR)	
LV	AS Augstsprieguma tīkls (AST)		
MT	-	-	MT does not have any balancing market
NL	TenneT TSO B.V. (TenneT NL)		
NO		Norwegian Water Resources and Energy Directorate (NVE)	
PL	Polskie Sieci Elektroenergetyczne S.A. (PSE S.A)		
PT	-	Entidade Reguladora dos Serviços Energéticos (ERSE)	
RO	C.N. Transelectrica S.A. (Transelectrica)	Autoritatea Nationala de Reglementare in domeniul Energiei (ANRE)	
SE	Svenska Kraftnät		
SI	ELES, d.o.o. (ELES)		
SK	Slovenská elektrizačná prenosová sústava, a.s. (SEPS)		



Annex III. Disclaimer

- The classification of the practices throughout the document and the points for consideration in slide 30 are based on ACER's assessment of the questionnaire results considering the input from experts in the subject (Expert Group of the Framework Guideline on Demand Response¹) without reporting exhaustive and definitive conclusions. Friendly and non-friendly practices are derived by the data collected by the questionnaire and shall not be considered as an absolute gap assessment with respect to a defined target and/or according to a specific methodology. Therefore, friendly practices may facilitate market entry for new and small participants and non-friendly practices may constitute a barrier to their market entry depending on national specificities. The points of consideration in slide 30 are general and qualitative reflections that should be further assessed in the national context.
- This overview refers to the status of the prequalification processes as of 31 December 2021. In some countries some prequalification processes may have been amended since then or may currently be under an amendment process.
- Visualising the inputs, we distinguish between:
 - ✓ “NA” (not available) when no information was made available to ACER
 - ✓ “NAP” (not applicable) for countries where the corresponding balancing product is not used or the design feature analysed does not apply as explained in the relevant notes



European Union Agency for the Cooperation
of Energy Regulators

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 [linkedin.com/company/EU-ACER/](https://www.linkedin.com/company/EU-ACER/)