FUTURE ROLES AND RESPONSIBILITIES FOR THE DELIVERY OF ANCILLARY SERVICES

Market Development

11/12/2017

Version management

Version	Date	Summary of changes
1	11/12/2017	Original version

EXECUTIVE SUMMARY

Historically the Access Responsible Party (ARP) provided all ancillary services to ELIA, in particular by using large production facilities connected to the ELIA grid. The production facilities had to be subject to the CIPU contract for the Coordination of the Injection of Production Units.

Fundamental shifts in the Belgian and European regulatory contexts regarding the balancing market and the provision of ancillary services to a TSO are triggering a broad review of the organization for the delivery of ancillary services.

The recently developed European Guidelines aim to create a framework which facilitates the participation of new technologies and lowers the barriers for new parties to enter the markets. **The result is a new framework with modified existing roles as well as new roles for the delivery of ancillary services**. The framework refers to roles and not parties therefore still allowing, if the Grid User decides it so, a continuation of the current practice that a single party takes on the responsibility of the different roles.

This document explains the changing context for each role, including the interdependency with other roles and the important milestones in the years to come at which point new regulatory and contractual frameworks are expected to enter into implementation, which is dependent on the entry into force of the new Federal Grid Code.

The **Grid User** plays a key part in the appointment of the roles, the coordination between them, and the liability for assuring compliance with regulation. ELIA will monitor coherence between the information received from the different agents and will in some cases restrict the delivery of information if incoherent, at which time the agent will have to address the Grid User for more explanation.

The **Access Holder** is not directly affected by the changing context.

The **Outage Planning Agent**[1] is a new role responsible for the delivery of outage plans (as part of the coordination of assets). ELIA develops the new design for outage planning in the iCAROS project. As the Outage Planning Agent determines the periods of availability of an assets, the outage planning defines the operational margins of the other roles to deliver ancillary services on the concerned asset.

The **Scheduling Agent**[2] is a new role responsible for the delivery of schedules in Day-ahead and Intraday (as part of the coordination of assets). ELIA also assigns the responsibilities regarding the offering of congestion bids to the Scheduling Agent. The new design for scheduling and redispatching is developed in the iCAROS project. The schedules equally determine the operational margins of the other roles to deliver ancillary services on the concerned asset (e.g., the flexibility available to offer balancing services). In addition the schedules are used as a baseline for activations for both redispatching and balancing. Schedules are, however, distinct from the nominations provided by the Balance Responsible Party.

[1] Role created in the European Guideline on Electricity Transmission System Operation.

[2] Role created in the European Guideline on Electricity Transmission System Operation.

The role of the **Balance Responsible Party (BRP)**[3] (today included in the responsibilities of the Access Responsible Party, which ends to exist) is limited to a responsibility for imbalances. The BRP is affected by the actions of the Scheduling Agent as ELIA binds the Scheduling Agent to follow the schedule in case of congestion risks, thereby limiting the use of the assets flexibility for the balancing actions of the BRP. Activations of flexibility by ELIA (for redispatching with the Scheduling Agent or for balancing with the Balancing Service Provider) are corrected in the perimeter of the BRP to prevent a negative impact on the BRP's imbalance position.

The **Balancing Service Provider (BSP)**[4] offers flexibility to the TSO for FCR, aFRR, or mFRR, in both a reserved way (balancing capacity) as non-reserved (balancing energy). ELIA develops and adapts the designs of the different products in different projects represented in the Rx Roadmap 2016-2020. The BSP's operational margin on an asset is determined by the decisions of the Outage Planning Agent and Scheduling Agent. Available schedules are used as a baseline for balancing activations. ELIA will restrict the use of flexibility for balancing in areas with a congestion risk.

The **Voltage Service Provider (VSP)**[5] provides reactive power reserves to assist ELIA in maintaining the voltage within the normal operational margin. As the technical support for voltage regulation depends on the running mode of the asset, the VSP's service is determined by the availabilities and schedules set by the Outage Planning Agent and Scheduling Agent. The ancillary service for voltage regulation and reactive power management is part of a redesign project starting in 2018.

The **Defence Service Provider (DSP)**[6] provides services as part of the defence plan to avoid that the system enters into blackout state. The **Restoration Service Provider (RSP)**[7] provides services as part of the restoration plan to restore the system from a blackout state back to normal state. The design for both roles is part of a project starting in 2018.

[3] Role created in the European Guideline on Electricity Balancing.

[4] Role created in the European Guideline on Electricity Balancing.

[5] Term coined by ELIA. The European Guideline on Electricity Transmission System Operation does not refer to a particular agent or provider but only to the provision of service to the TSO.

[6] Role created in the European Guideline on Electricity Emergency and Restoration.

[7] Role created in the European Guideline on Electricity Emergency and Restoration.

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1. Introduction[8]

Both on Belgian and European level the context regarding the balancing market and provision of ancillary services to a TSO is fundamentally changing.

After a high-level overview of this changing context, this document describes the future different roles related to the balancing market and the provision of ancillary services, including the following aspects per role:

- A summary of the historical role and responsibility for the ancillary service
- A description of the future role following the European Guidelines
- The impact of the European Guidelines on the organization of the ancillary service in Belgium
- An indicative timeline of the most important milestones of projects towards implementation of the future framework
- A high-level overview of the interdependencies with other roles
- A reference to useful (existing and new) documentation

2. Context

Today, to operate the grid in a secure way ELIA has organized the balancing market and ancillary services as follows:

- Balance responsibility by the Access Responsible Parties (ARPs)
- Balancing reserves (FCR, aFRR, mFRR) delivered by the ARPs (for flexibility on CIPU units) and by the Balancing Service Providers (on non-CIPU units)
- Voltage Regulation
- Black Start
- Long-term coordination of large power units: Outage planning and coordination
- Short-term coordination of large power units: Scheduling & redispatching

Historically the Access Responsible Party (ARP) provided all these ancillary services to ELIA (both the contractual and operational interfaces in the hands of the ARP), in particular by the use of large production facilities connected to the ELIA grid. The **CIPU contract** (for the Coordination of the Injection of Production Units) played a central role: **only production units subject to a CIPU contract could (initially) provide the services.**

The CIPU contract itself contains four blocks (see Figure 1): it assures ELIA the possibility to coordinate production units based on information **(1)** on maintenance planning and **(2)** on scheduled output based on the trades in Day Ahead and Intraday Markets. Additionally via CIPU ELIA can **(3)** determine non-reserved flexibility available for balancing

[8] A list of relevant terminology is given in annex 1 of this document.

purposes and **(4)** for redispatching purposes. Specifically **the impact of the new context on the CIPU contract implies a split of the different procedures covered by the contract today across different future roles**. This will require a strong coordination role of the Grid User between the different providers and agents. **It remains possible that one party takes on the different roles,** such as the Grid User or the Balance Responsible Party (as today).

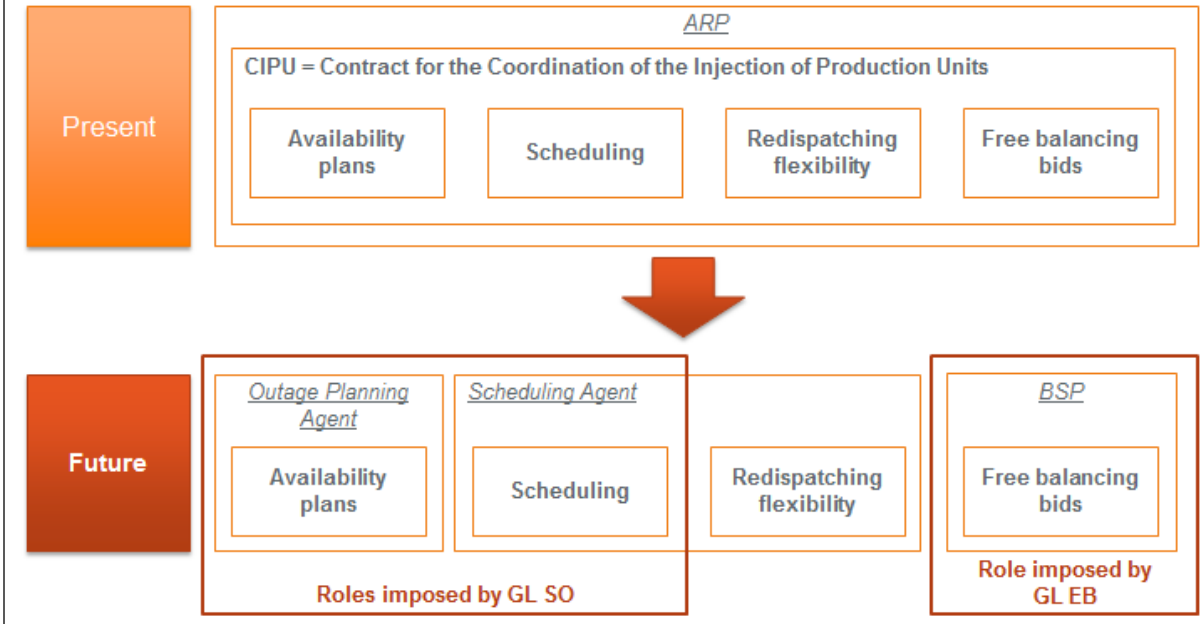

Figure 1. Evolution of responsibilities covered in CIPU

Both the contractual and operational interfaces of the ancillary services were in the hands of the ARP. The past years ELIA has created for some balancing reserves a separate (operational and contractual) framework enabling the participation of new technologies (non-CIPU production, storage, and demand flexibility) provided by new types of market players (aggregators). Shifts in the regulatory context (European guidelines and connection codes), in the energy landscape (decommissioning of thermal units; rise of decentralized & intermittent production), the emergence of new types of market players, stakeholder concerns with the existing contractual/operational/legal framework, and evolving needs for ELIA's grid operations motivate **a broader review of the organization for the delivery of ancillary services.**

Recently different European Guidelines have been developed. Besides the improvement of competition, efficiency and European integration of the markets, these Guidelines are also having as objective to create a framework which facilitates the participation and entry of new technologies and to lower the entry barriers for new entrants while ensuring system security. Otherwise stated the different Guidelines are having the **same objective as the road maps which have been launched by ELIA since 2016** for some of the balancing products: **open up the different products and services to all technologies (demand side management, storage), independent to the type of connection (TSO/DSO) and the type of provider (incl. Non BRPs)**.

As explained further on in this document, **the Guidelines are modifying existing roles and are even creating new roles in order to develop a unique regulatory and contractual framework** for delivery of ancillary services and execution of responsibilities in

the balancing market. Hence once implemented, the operational and contractual frameworks for large power plants and new technologies, which currently are separated (for certain products), will be merged.

This document provides an overview of the impact of the European Guidelines on the roles and responsibilities of parties involved in the provision of ancillary services in Belgium as a whole. The need for a clarifying overview of the new roles was requested by the stakeholders in the discussion on the redesign of the coordination of assets (thereby replacing the CIPU contract) in the iCAROS[9] Task Force. The iCAROS project focuses on the procedures relating to outage planning, scheduling and redispatching[10] (and therefore elaborates on the roles of the Outage Planning Agent and the Scheduling Agent) and on the use of ancillary services in congested areas (with an impact on the Balancing Service Provider in specific)[11].

Figure 2 depicts the changing context of roles which should be appointed by or have an agreement with the Grid User to deliver ancillary services on the connection point. The roles and changing responsibilities are explained in **more detail for each provider in the following chapters:**

- Grid user – see chapter 3
- Access Holder – see chapter 4
- Outage Planning Agent – see chapter 5
- Scheduling Agent – see chapter 6
- Balance Responsible Party (BRP) – see chapter 7
- Balancing Service Provider (BSP) – see chapter 8
- The guidelines do not appoint a particular agent or provider for the provision of flexibility for voltage regulation but they do refer to the use of the TSO of such services. – see chapter 9
- Defence Service Provider (DSP) – see chapter 10
- Restoration Service Provider (RSP) – see chapter 11

The creation of **a new framework with different market roles does not exclude the possibility in line with the current practice** that one single entity is accountable for the delivery of the different ancillary services associated to one single connection point. The new framework creates the possibility for the grid user to appoint different entities for the different relevant roles associated to its connection. ELIA's design proposal includes independent contractual structures which guard confidentiality between the different roles (if the roles are taken on by different entities) but acknowledges the logical operational links between the information that ELIA receives from each role. **The Grid User has a key role to play to coordinate the different entities, oversee coherence between their operations, and assure that they operate in compliance with the regulation.** In the development of the implementation trajectory ELIA will discuss with stakeholders the need

[9] iCAROS refers to "integrated Coordination of Assets for Redispatching and Operational Security".

[10] See the "Design note for the coordination of assets: Part I – Outage Planning" and the "Design note for the coordination of assets: Part II – Scheduling and Redispatching".

[11] See the "Design note for the coordination of assets: Part III – Congestion Risk Indicator".

and possibilities for interfaces that facilitate an efficient and well-arranged coordination by the Grid User.

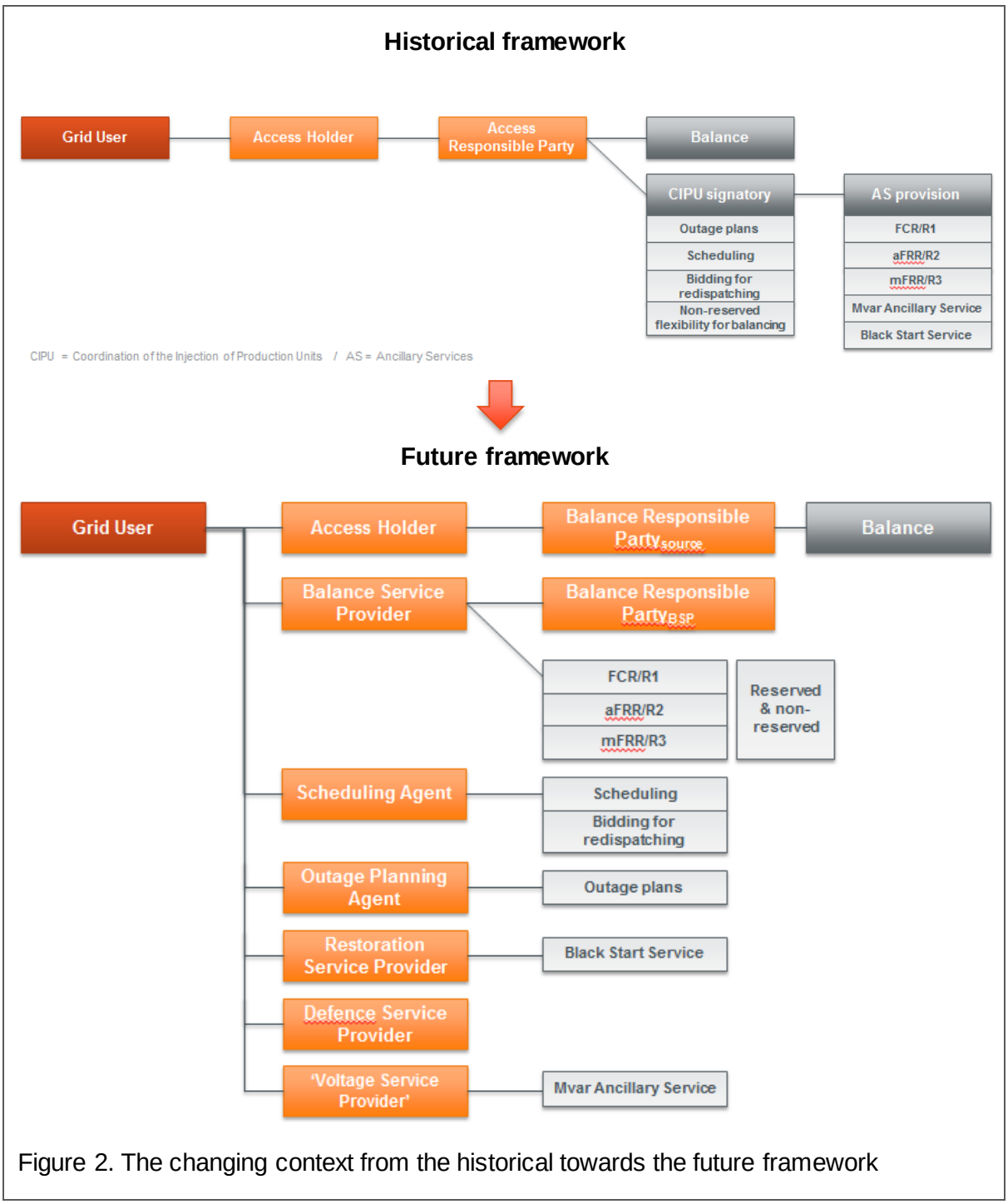

Figure 2. The changing context from the historical towards the future framework

Figure 3 provides a total overview of interdependencies between roles which are elaborated on in the next chapters.

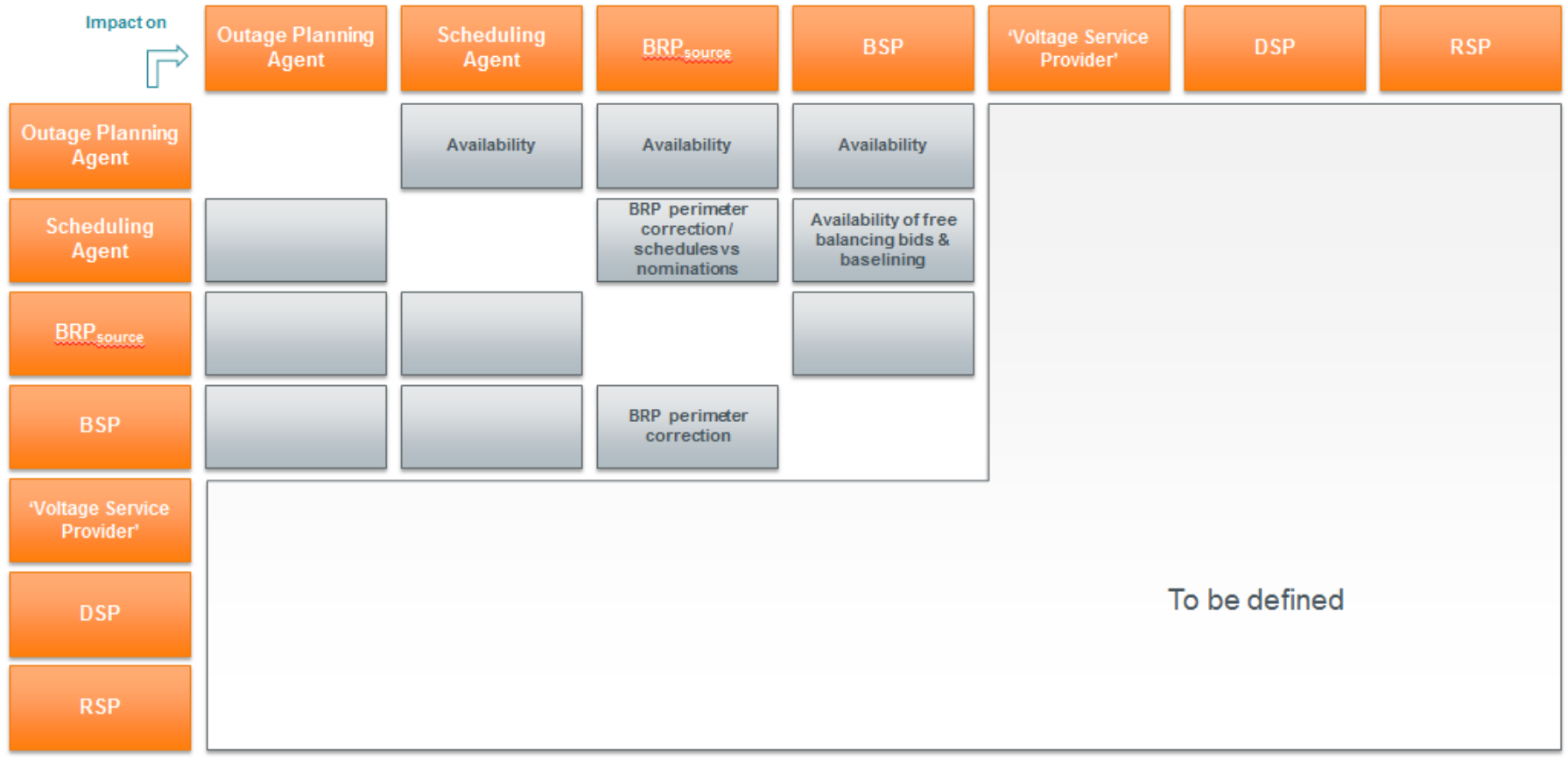

Figure 3. Overview of interdependencies between roles for the provision of ancillary services

3. Grid User

Belgian regulation (federal and regional) defines the 'Grid User' as

a natural or legal entity connected to the transmission or (closed) distribution grid with the possibility to take electricity off the grid or to inject electricity on the grid

The **Grid User enters into a connection contract with the relevant system operator** to assure that the user can inject or take off electricity from the grid. The connection contract includes technical and locational information on assets, operations of the connection facilities, tariffs, ownership, rights, and obligations in the relation between ELIA and the Grid User. In addition the Grid User is **obliged to appoint an Access Holder** (see chapter 4) to assure operational access to the grid (permission to inject or offtake).The access holder **appoints an Access Responsible Party (ARP)** (see chapter 7).

In addition the Grid User may be obliged or can voluntarily appoint or enter into a contract with other parties to deliver ancillary services (as depicted in Figure 2 and explained throughout this document). **Given the interdependencies between these roles (as referred to in this document), especially when they are not fulfilled by the same party, the central role of the Grid User as coordinator among them is critical**.

The Grid user may decide to take on any of these roles or appoint a third party, within the degrees of freedom laid out by ELIA in the specific regulatory and contractual frameworks.

Note that according to European regulation, even when the Grid User appoints a third party for a role, the Grid User remains responsible for assuring that the third party operates in compliance with the regulation. Specifically, this means that:

- the Grid User remains liable in case the Outage Planning Agent or Scheduling Agent does not **deliver the operational information** to the TSO as required by and in accordance with the modalities described in the European Guideline on Electricity Transmission System Operation.[12]
- the Grid User is responsible for **executing the availability plan in Real-time** as agreed between the Outage Planning Agent and the TSO[13].

More detailed information for the Grid User can be found in (see annex 4 for a short description):

1) Federal Grid Code
2) Connection Contract

[12] The relevant article can be found in annex 3 of this document.
[13] The relevant article can be found in annex 3 of this document.

4. Access Holder

The ELIA Access Contract describes the agreement between ELIA and the Access Holder on the conditions for access to the ELIA grid for the Grid User.

Access to the grid implies the use of the ELIA grid for offtake or injection and the use of ancillary services.

The Access Holder is the party which requests access to the grid and enters into an Access Contract with ELIA. The Access Holder is either the Grid User or another natural or legal entity appointed by the Grid User (in compliance with applicable law and regulation).

The Access Point refers to the point where the net injection on or net offtake from the ELIA grid is measured.

The role of the Access Holder is not discussed in the new European Guidelines. The future context does not change for the Access Holder directly but indirectly via its currently strong relation[14] to the Access Responsible Party (ARP), which changes to Balance Responsible Party (BRP) (see chapter 7).

More detailed information for the Access Holder can be found in (see annex 4 for a short description):

1) Federal Grid Code
2) Access Contract

[14] Today the Access Responsible Party (ARP) is appointed in the Access Contract by the Access Holder.

5. Outage Planning Agent

European Guideline on Electricity Transmission System Operation

Article 3 Definitions

Definition 87: 'outage planning agent' means an entity with the task of planning the availability status of a relevant power generating module, a relevant demand facility or a relevant grid element;

Article 89 Appointment of outage planning agents

1. Each TSO shall act as the outage planning agent for each relevant grid element it operates.

2. For all other relevant assets, the owner shall appoint, or act as, the outage planning agent for the concerned relevant asset and shall inform its TSO about that appointment.

Article 103 Real-time execution of the availability plans

1. Each power generating facility owner shall ensure that all relevant power generating modules it owns and which are declared 'available' are ready to produce electricity pursuant to their declared technical capabilities when necessary to maintain operational security, except in case of forced outages.

2. Each power generating facility owner shall ensure that all relevant power generating modules it owns and which are declared 'unavailable' do not produce electricity.

3. Each demand facility owner shall ensure that all relevant demand facilities it owns and which are declared 'unavailable' do not consume electricity.

[...]

Today outage planning is part of the **CIPU contract**, thereby delivered by the **BRP** and only on power units subject to CIPU.

In the **future** the **Outage Planning Agent** as defined in the European Guideline will deliver the outage planning to ELIA, consisting of an availability plan and information on temporary modifications to the active power capacity. Outage planning information is delivered on asset level (Power Generating Module or Power Unit, Energy Storage devices, Demand Facility).

Note that the Grid User can take on the role of Outage Planning Agent himself or appoint a third party. The Guideline does not impose or forbid a relation between the agents and another market party, such as the BSP or BRP. Regardless of which party is Outage Planning Agent, the Guideline underlines **the liability of the Grid User in case the availability plan is not correctly executed** in Real-Time.

Important milestones for implementation (estimation December 2017)

2017-2018	New **design** on coordination of assets, including outage planning **(iCAROS project)** open for consultation between 11/12/2017 – 15/01/2018

2018	**KORRR (Key Organizational Requirements, Roles and Responsibilities)** Public consultation ongoing (31/10-1/12/2017) Final proposal to be submitted to the National Regulating Authorities by 14/3/2018 (6 months after entry into force of the European Guideline on Electricity Transmission System Operation)
End 2018	Expected entry into force of new **Federal Grid Code including transition period for implementation**
20xx **(To be determined in the framework of the iCAROS implementation project)**	Implementation of **iCAROS project**: : entry into force of T&C Outage Planning Agent and new contractual framework replacing CIPU Continuation of CIPU until then requires the BRP of the concerned CIPU-unit to take on the roles of Outage Planning Agent, Scheduling Agent, and BSP. Other parties may from 20xx onwards take on these roles for power units that were historically under CIPU contract. ➢ Stop existing CIPU framework and start of new framework ➢ Stop distinction between CIPU and non CIPU framework for the delivery of balancing services

Future interdependencies with other roles

ELIA's design proposal includes independent contractual structures but acknowledges the logical operational links between the information received from each role. However certain aspects need to be coordinated in an indirect way via the Grid User or will be organized by ELIA.

Impact on Voltage Service Provider & Restoration Service Provider – Coordinated by ELIA/Grid User:

- The outage planning of a power unit determines its availability for ancillary services

  ELIA will take into account the availability plan of the Outage Planning Agent to determine the availability of services of the Voltage Service Provider and the Restoration Service Provider, who need to contact the Grid User in order to detect the reason for this.

Impact on Balance Responsible Party (BRP) & Scheduling Agent – Coordinated by ELIA/Grid User:

- The Outage Planning Agent delivers ELIA the information on whether or not a particular asset will be available for exchanging energy in the electricity

markets. The availability status therefore defines the operational margin of the BRP and Scheduling Agent during a specific day.

ELIA may block the Scheduling Agent or BRP to submit information that is incoherent with the availability plan. They need to contact the Grid User for the reason of this.

Impact <u>on</u> Balancing Service Provider (BSP) & Scheduling Agent – Coordinated by ELIA/Grid User:

- ELIA agrees with the Outage Planning Agent on periods for maintenance and tests, during which the flexibility on the asset cannot be commercialized.

  ELIA may restrict bidding possibilities and notify the BSP and Scheduling Agent if a restriction is applicable for a particular delivery point. The BSP needs to contact the Grid User in order to detect the reason for this.

Impact <u>on</u> Scheduling Agent and Balancing Service Provider (BSP) – Coordinated by Grid User:

- The different information must be exchanged on a coherent level ('delivery point') for all services to allow a correct coordination. For example, if outage planning and schedules are required per Power Unit within a Power-Generating Module, then the flexibility must be offered per Power Unit as well.

  ELIA will restrict the delivery of schedules and flexibility bids on the data entry platforms and notify the Scheduling Agent and BSP if a restriction is applicable. A coherent level can be a precondition to offer services (during prequalification). The Scheduling Agent and Balancing Service Provider should contact the Grid User in order to detect the reason for this.

<u>More detailed information for the Outage Planning Agent can be found in (see annex 4 for a short description):</u>

1) European Guideline on Electricity Transmission System Operation
2) Key Organizational Requirements, Roles and Responsibilities (KORRR)
3) Federal Grid Code
4) Framework of Terms & Conditions and/or General Framework Agreement Outage Planning Agent: to be determined
5) Design note on the coordination of assets: Part I – Outage Planning

In addition also the following documents are relevant for the Outage Planning Agent:

6) Design note on the coordination of assets: Part II – Scheduling & Redispatching
7) Transparency regulation

6. Scheduling Agent

European Guideline on Electricity Transmission System Operation

Article 3 Definitions

Definition 90: 'scheduling agent' means the entity or entities with the task of providing schedules from market participants to TSOs, or where applicable third parties;

Article 110 Establishment of scheduling processes

[...] 3.For each power generating facility and demand facility subject to requirements for scheduling set out in the national terms and conditions, the concerned owner shall appoint or act as a scheduling agent. [...]

Today the delivery of schedules and flexibility for redispatching is part of the **CIPU contract**, thereby delivered by the **BRP** and only on power units subject to CIPU.

In the **future** the **Scheduling Agent** as defined in the European Guideline will deliver the schedules in Day-ahead and Intraday to ELIA. ELIA also assigns the responsibility for the bidding of flexibility for redispatching to the Scheduling Agent (as explained in the Design note on the coordination of assets: Part II – Scheduling & Redispatching).

Note that the Grid User can take on the role of Scheduling Agent himself or appoint a third party as Scheduling Agent for the provision of generation and consumption schedules on the Grid User's assets. The Guideline does not impose or forbid a relation between the agents and another market party, such as the BSP or BRP. ELIA defines the relation between the Scheduling Agent and the other market parties in the Design note on the coordination of assets: Part II – Scheduling & Redispatching.

The European Guideline on Transmission System Operation refers to the use of flexibility on TSO- and DSO-connected assets for redispatching by the TSO (article 22), however, without assigning the role of the provision of flexibility for redispatching to a particular agent or provider. **ELIA assigns the bidding of flexibility for redispatching to the responsibilities of the Scheduling Agent[15]. As the activation of a redispatching bid implies an imposition of a new schedule, Elia consider this as the only feasible solution.**

Note that in ELIA's design for coordination of assets, **Power-Generating Modules & Energy Storage device type B/C/D are subject to obligations for both scheduling and bidding for redispatching**. Demand facilities can voluntarily offer flexibility to be used for redispatching and are not subject to scheduling obligation[16].

Important milestones for implementation (estimation December 2017)

2017-2018	New **design** on coordination of assets, including scheduling and bidding for redispatching **(iCAROS project)** open for consultation between 11/12/2017 – 15/01/2018

[15] See Design note for the Coordination of Assets: Part II – Scheduling and Redispatching

[16] Specific criteria are explained in the Design note for the Coordination of Assets: Part II – Scheduling and Redispatching

2018	**KORRR (Key Organizational Requirements, Roles and Responsibilities)** Public consultation ongoing (31/10-1/12/2017) Final proposal to be submitted to the National Regulating Authorities by 14/3/2018 (6 months after entry into force of the European Guideline on Electricity Transmission System Operation)
End 2018	Expected entry into force of new **Federal Grid Code including transition period for implementation**
20xx **(To be determined in the framework of the iCAROS implementation project)**	Implementation of **iCAROS project**: : entry into force of T&C Scheduling Agent and new contractual framework replacing CIPU Continuation of CIPU until then requires the concerned BRP to take on the roles of Outage Planning Agent, Scheduling Agent, and BSP. Other parties may from 20xx onwards take on these roles for power units that were previously under CIPU contract. ➢ Stop existing CIPU framework and start of new framework ➢ Stop distinction between CIPU and non CIPU framework for the delivery of balancing services

Future interdependencies with other roles

ELIA's design proposal includes independent contractual structures but acknowledges the logical operational links between the information received from each role. However certain aspects need to be coordinated in an indirect way via the Grid User or will be organized by ELIA.

Impact of Outage Planning Agent – Coordinated by ELIA/Grid User:

- The Outage Planning Agent delivers ELIA the information on whether or not a particular asset will be available for exchanging energy in the electricity markets. The availability status therefore defines the operational margin of the BRP and Scheduling Agent during a specific day.

  ELIA may block the Scheduling Agent or BRP to submit information incoherent with the availability plan. They need to contact the Grid User for the reason of this.

- ELIA agrees with the Outage Planning Agent on periods for maintenance and tests, during which the flexibility on the asset cannot be commercialized.

  ELIA may restrict bidding possibilities and notify the BSP and Scheduling Agent if a restriction is applicable for a particular delivery point. The BSP needs to contact the Grid User in order to detect the

reason for this.

Impact of Outage Planning Agent and Balancing Service Provider (BSP)– Coordinated by ELIA/Grid User:

- The different information must be exchanged on a coherent level ('delivery point') for all services to allow a correct coordination. For example, if outage planning and schedules are required per Power Unit within a Power-Generating Module, then the flexibility must be offered per Power Unit as well.

  ELIA will not accept incoherent levels for data exchange. ELIA will restrict the delivery of schedules and flexibility bids on the data entry platforms. The Scheduling Agent can be blocked from providing information. The Scheduling Agent should contact the Grid User for the reason of this.

Impact on Balancing Service Provider (BSP) – Coordinated by ELIA/Grid User:

- ELIA may reserve a May-Not-Run schedule, during which the flexibility on the asset cannot be commercialized by the BSP (via reserved balancing capacity or freely offered balancing energy). However, in specific circumstances in which the May-Not-Run reservation is revoked by ELIA, the flexibility should be available to be offered by the BSP.

  ELIA expects the Grid User to coordinate between the Scheduling Agent and the BSP. ELIA will restrict the delivery of balancing services by the BSP in case of an agreed May-Not-Run. ELIA will penalize the BSP in case of unavailability of the flexibility when ELIA revokes the May-Not-Run. The BSP needs to contact the Grid User in order to detect the reason for this.

- In case ELIA receives a DA/ID MW schedule for an asset (Power Generating Module/Power Unit or Energy Storage device), then ELIA will use the MW schedule as the baseline for activations of flexibility for balancing purposes.

  Applied by ELIA based on regulated rules.

- Non-reserved flexibility offered for balancing may also be activated for redispatching purposes (via the Scheduling Agent).

  ELIA will set balancing bids as 'unavailable' if balancing bids have not been updated since a redispatching occurred on one of the delivery points of the balancing bid.

Impact on Balance Responsible party (BRP)[17] – Coordinated by Grid User/ELIA:

- ELIA may reserve a Must-Run or May-Not-Run schedule on an asset, which restricts the possible nomination on the level of the access point (logical coherence).

  ELIA may block nomination programs: in case of inconsistencies with schedules ELIA will contact the BRP. The BRP need to contact the Grid User in order to detect the reason for inconsistency.

- Upwards or downwards modulation of assets for portfolio or reactive balancing purposes[18] is not always possible if restrictions are active on schedules due to congestion risks.

  Coordination to be agreed between Grid User, Scheduling agent and BRP.

- BRP perimeter correction in case of activation of flexibility for redispatching (not in application scope of Transfer of Energy).

  Performed by ELIA based on regulated rules

Impact of and on 'Voltage Service Provider'– Coordinated by ELIA/Grid User:

- According to the technical requirements for the provision of voltage regulation, the availability of the service depends on the level of active power output (the schedule).

  The Voltage Service Provider needs to contact the Grid User in order to detect the reason for the services (un)availability.

More detailed information on the future responsibilities of the Scheduling Agent can be found in (see annex 4 for a short description):

1) European Guideline on Electricity Transmission System Operation
2) Key Organizational Requirements, Roles and Responsibilities (KORRR)
3) Federal Grid Code
4) Framework of Terms & Conditions and/or General Framework Agreement Scheduling Agent: to be determined

[17] Note that both the BRP and Scheduling Agent deliver information on active power exchanges to the TSO which should be coherent, although they represent a different content:
- The schedules of a Scheduling Agent represent the generation or consumption of an asset.
- The nominations of a BRP represent the estimation of net injection or net offtake at the access point.

To distinguish both, ELIA will use the term 'schedule' for indicating generation and consumption schedules of the Scheduling Agent and the term 'nomination' for indicating the information on net injection and net offtake received from the BRP.

[18] This paragraph is not applicable to balancing bids to the TSO as this is done by the BSP.

5) Design note on the coordination of assets: Part II – Scheduling & Redispatching:

In addition also the following documents are relevant for the Scheduling Agent:

6) Design note on the coordination of assets: Part I – Outage Planning

7) Transparency regulation

7. Balance Responsible Party (BRP)

European Guideline on Electricity Balancing

Article 2. Definitions

'balance responsible party' means a market-related entity or its chosen representative responsible for its imbalances;

Today the Access Responsible Party (ARP) plays a key role in the provision of the ancillary services. The Access Responsible Party is responsible for maintaining a balanced portfolio of the injections and offtakes on the access points in the ARP's portfolio (corrected with intraday hub deals and import/export) on quarter-hourly basis: **the Access Responsible Party as Balance Responsible Party (BRP).**

The Grid User has the responsibility to ensure that his access point to the grid is placed in the portfolio of a BRP. If it is not the case the access to the grid of his access point can be refused or interrupted.

The Grid User can be BRP himself, or can appoint an Access Holder, who will at his turn and on behalf of the Grid user appoint a BRP for his Access Point.

Currently the ARP is also the sole signatory of the CIPU contract. Large production units (typically > 25MW) connected to the ELIA grid and production units with a significant impact on the grid are subject to a CIPU contract. As in the past having signed a CIPU contract was a precondition for the delivery of balancing reserves, **only the ARP could offer production units for ancillary services** and only on production units[19] subject to a CIPU contract.

In recent years balancing services have been opened up (or planned to be in the future) for other parties to offer flexibility on non-CIPU units via a separate framework. The balancing flexibility on CIPU units, however, remains offered by the ARP via the CIPU contract (see Figure 4).

In the future the provision of balancing services will be transferred completely (for CIPU and non-CIPU units) to a single contractual framework for the Balancing Service Provider (BSP) due to the implementation of the European Guideline on Electricity Balancing (see chapter 8) **and to a new operational framework due to** the implementation of a new design of the coordination of relevant assets (see chapter 5 & chapter 6; see Figure 5).

The appointment of the BRP (by the Access holder), however, does not change.

[19] ELIA developed the possibility of having virtual powerplants in the CIPU contract enabling the participation of aggregated smaller power plants.

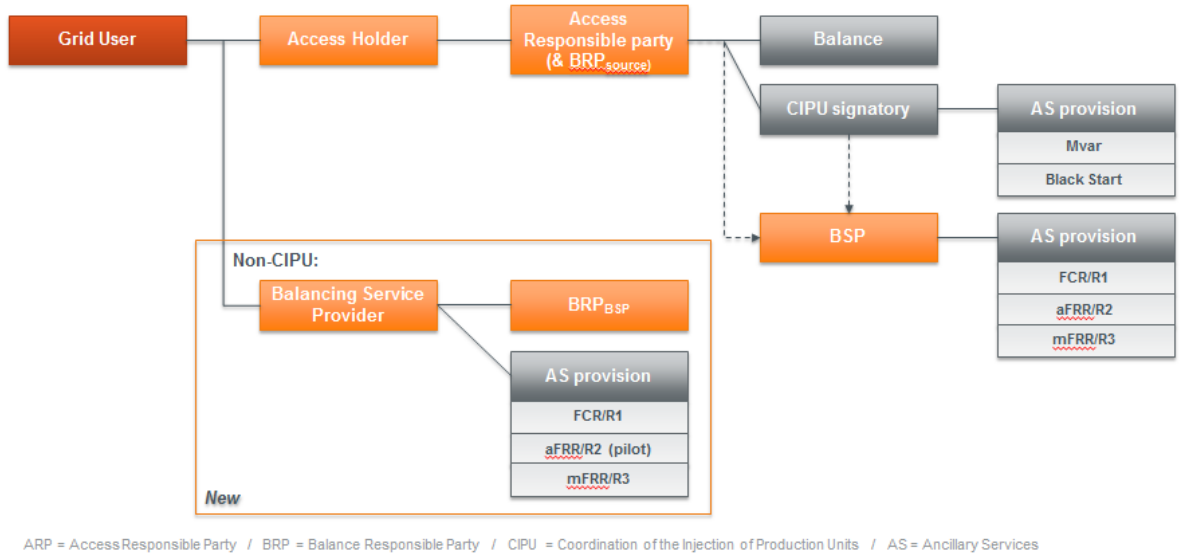

Figure 4. Recent evolutions in balancing services

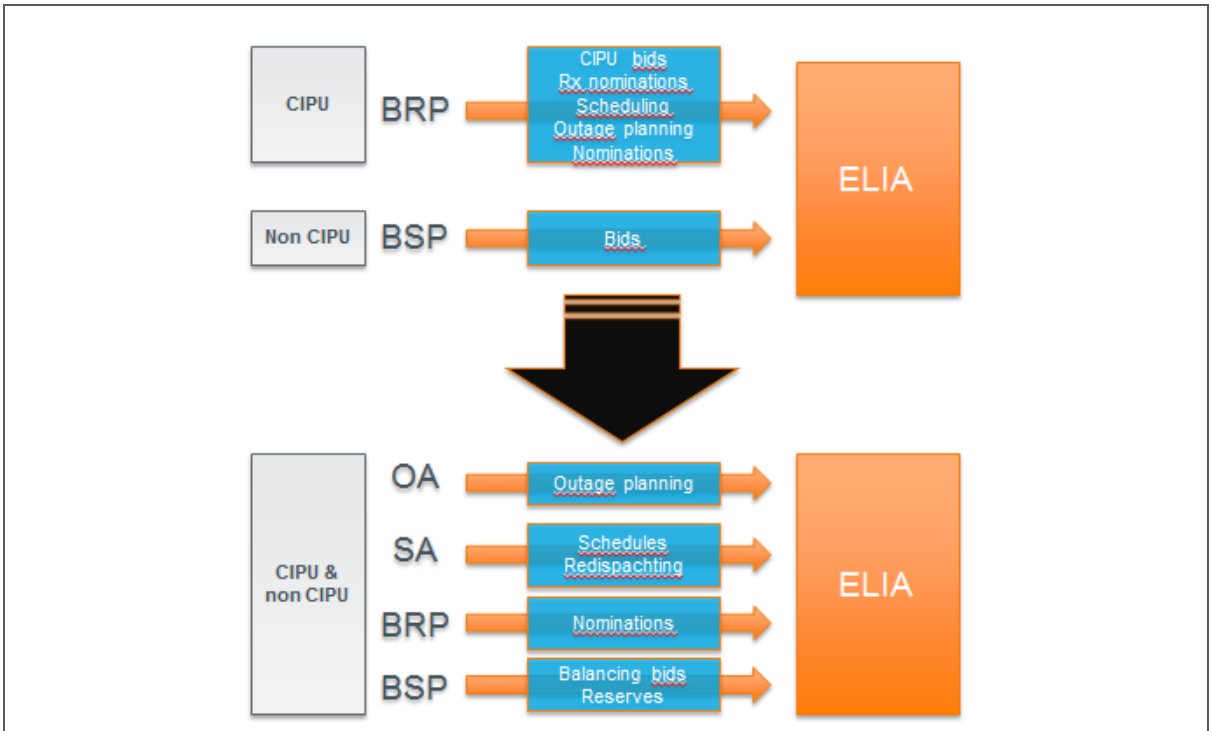

Figure 5. IT implementation impact for the BRP

Note in figure 5 that while today the BRP is responsible for providing both access point nominations and CIPU schedules (which are also used in the verification of the balance of the BPR portfolio) these responsibilities will in the future be spread across the Scheduling Agent and BRP. Annex 5 explains this in further detail.

Important milestones for implementation (estimation December 2017)

End 2018	Expected entry into force of new **Federal Grid Code & new framework of the T&C for BRPs (replacing the current regulated ARP contract)** ELIA will organize a public consultation and submit the first version of the T&C BRP by mid 2018.
2019 – 20xx **(To be determined in the framework of the iCAROS implementation project)**	Transition towards implementation of **iCAROS project**: **CIPU units are via the CIPU contract compliant with European requirements for outage planning & scheduling:** Continuation of CIPU requires the BRP of the concerned CIPU-unit to continue taking on the roles of Outage Planning Agent, Scheduling Agent, and BSP until completion of the iCAROS project roadmap (see next line). **A transitory regime can be created for assets not subject to a CIPU contract*** but with obligations for outage planning and scheduling imposed by the European Guidelines, for example: - Default status at "available" and notification to ELIA of unavailability and testing via e-mail - Default schedule at "ON" and notification to ELIA of "OFF" schedule via e-mail A concrete and pragmatic approach aimed at compliance with European regulation before the full iCAROS design can be implemented and agreed with the relevant stakeholders in 2018.
20xx **(To be determined in the framework of the iCAROS implementation project)**	Implementation of **iCAROS project**: Gradually and in line with the implementation roadmap defined within iCAROS, processes from existing CIPU will be transferred to a new contractual regime and be concluded with other parties. ➢ Stop existing CIPU framework and start of new framework ➢ Stop distinction between CIPU and non CIPU framework for the delivery of balancing services
2020	Expected entry into force of new design for **Mvar AS**: new role for 'Voltage Service Provider' instead of BRP *(Currently annual contracts. Indicative timing dependent on entry into force of Federal Grid Code and redesign of Mvar AS in 2018-2019.)*

2021	Expected entry into force of new design for **Black Start Service**: new role for Restoration Service Provider instead of BRP *(Contracting period for current design until 31/12/2020. Indicative timing dependent on entry into force of Federal Grid Code and redesign of Black Start Service in 2018-2020).*

Future interdependencies with other roles

ELIA's design proposal includes independent contractual structures but acknowledges the logical operational links between the information received from each role. However certain aspects need to be coordinated in an indirect way via the Grid User or will be organized by ELIA.

Impact of Balancing Service Provider (BSP) – Coordinated by ELIA

- BRP perimeter correction in case of activation of flexibility for balancing (with application of Transfer of Energy rules when needed).

  Performed by ELIA based on regulated rules

Impact of Outage Planning Agent – Coordinated by Grid User/ELIA

- BRP will still need to submit in the future in Day-ahead a balanced program of his portfolio. The maintenance planning as submitted by the Outage Planning Agent will restrict the possible nominations per access point.

  ELIA will restrict nomination possibilities and notify the BRP if there is an inconsistency. The BRP needs to contact the Grid User in order to detect the reason for inconsistency.

Impact of Scheduling Agent[20] – Coordinated by Grid User/ELIA

- ELIA may reserve a Must-Run or May-Not-Run schedule on an asset, which restricts the possible nomination on the level of the access point (logical coherence).

  ELIA may block nomination programs: in case of inconsistencies with schedules ELIA will contact the BRP. The BRP need to contact the Grid User in order to detect the reason for inconsistency.

- Upwards or downwards modulation of assets for self-balancing or reactive balancing purposes[21] is not always possible if restrictions are active on schedules due to congestion risks.

[20] Note that both the BRP and Scheduling Agent deliver 'schedules' to the TSO which should be coherent. However, the schedules represent a different content:
- The schedules of a Scheduling Agent represent the generation or consumption of an asset.
- The schedules of a BRP represent the 'commercial' schedule and therefore the net injection or net offtake.

To distinguish both, ELIA will use the term 'schedule' for indicating generation and consumption schedules of the Scheduling Agent and the term 'nomination' for indicating the information on net injection and net offtake received from the BRP.

Coordination to be agreed between Grid User, Scheduling agent and BRP.

- BRP perimeter correction in case of activation of flexibility for redispatching (not in application scope of Transfer of Energy).

  Performed by ELIA based on regulated rules

Impact of or on Restoration Service Provider (RSP)/ Defence Service Provider (DSP):

- To be defined

Impact of 'Voltage Service Provider':

- No immediate impact, but via the Scheduling Agent Must-Run schedules or start-up bids may be activated to increase the availability of reactive power reserves.

  Coordination to be agreed between Grid User, Scheduling agent and BRP.

More detailed information on the future responsibilities of the BRP can be found in (see annex 4 for a short description):

1) European Guideline on Electricity Balancing
2) Federal Grid Code
3) Terms & Conditions BRP
4) Transfer of Energy rules

In addition the design on the coordination of assets is relevant for the BRP:

5) Design note on the coordination of assets: Part I – Outage Planning
6) Design note on the coordination of assets: Part II – Scheduling & Redispatching

[21] This paragraph is not applicable to balancing bids to the TSO as this is done by the BSP.

8. Balancing Service Provider (BSP)

European Guideline on Electricity Balancing

Article 2. Definitions

'balancing service provider' means a market participant with reserve-providing units or reserve-providing groups able to provide balancing services to TSOs; (GL on EB art. 2)

'balancing services' means either or both balancing energy and balancing capacity;

'balancing energy' means energy used by TSOs to perform balancing and provided by a balancing service provider;

'balancing capacity' means a volume of reserve capacity that a balancing service provider has agreed to hold and in respect to which the balancing service provider has agreed to submit bids for a corresponding volume of balancing energy to the TSO for the duration of the contract;

Today balancing services for particular products are delivered on CIPU units (by the BRP) and on non-CIPU units (by a BSP-like role) (see Figure 2). Although the goal of both is the same—i.e. the use of flexibility to balance the system—the contractual and regulatory frameworks are customized to the characteristics of CIPU versus non-CIPU flexibility.

In the **future** the **Balancing Service Provider (BSP)** as defined in the European Guideline will represent a unique role in the market with **its own contractual and regulatory framework** and with specific business processes **generalized across different sources of flexibility.** The result will be that in the future the BSP offering flexibility on an asset subject to a 'CIPU like' contract (replacement via the iCAROS project) will no longer have to be the same party as the BRP of the Grid User.

This evolution is executed in a **phased approach**: **first the balancing products are made technology neutral** but separate contracts will remain to exist depending on the source of flexibility. In a second phase **the contracts will be merged into one general framework agreement applicable for both CIPU and non-CIPU flexibility.** ELIA will organize the role of the BSP in such a way that entities can deliver the service only requiring a **close collaboration with the Grid User** (without consent of other roles).

Important milestones for implementation (estimation December 2017)

2016-2020	A set of projects on the future evolutions of FCR/R1, aFRR/R2, and mFRR/R3 as part of the **Rx Roadmap**. The Roadmap has as objective to open up the different products and services to all technologies (demand side management, storage), independent to the type of connection (TSO/DSO) and the type of provider (incl. Non BRPs).
End 2018	Expected entry into force of new **Federal Grid Code & new framework of the T&C for BSPs (replacing the current contracts for balancing services).** ELIA will organize a public consultation and submit the first version of the T&C BSP by mid 2018.

20xx **(To be determined in the framework of the iCAROS implementation project)**	The **contractual merge of balancing services on CIPU and non-CIPU flexibility** can only be implemented once the CIPU contract is fully replaced by a new design (as proposed in the iCAROS project). *(ICAROS design proposal open for public consultation; Implementation trajectory in function of stakeholder feedback)* All balancing bids shall be submitted via BMAP (Belgian Market Activation Platform)[22].

Future interdependencies with other roles

ELIA's design proposal includes independent contractual structures but acknowledges the logical operational links between the information received from each role. However certain aspects need to be coordinated in an indirect way via the Grid User or will be organized by ELIA.

Impact on Balance Responsible Party (BRP) – Coordinated by ELIA:

- The access point of the Grid User remains part of the portfolio of the Grid User's BRP ("BRP_{source}"). However every BSP must have appointed a BRP of its own ("BRP_{BSP}") to assume balancing responsibility over the activated balancing service.
- BRP perimeter correction in case of activation of flexibility for balancing (with application of Transfer of Energy rules when needed).

Applied by ELIA based on regulated rules

Impact of Outage Planning Agent – Coordinated by ELIA/Grid User:

- ELIA agrees with the Outage Planning Agent on periods for maintenance and tests, during which the flexibility on the asset cannot be commercialized by the BSP.

ELIA may restrict bidding possibilities and notify the BSP if a restriction is applicable for a particular delivery point. The BSP needs to contact the Grid User in order to detect the reason for this.

Impact of Scheduling Agent – Coordinated by ELIA/Grid User:

- ELIA may reserve a May-Not-Run schedule, during which the flexibility on the asset cannot be commercialized by the BSP. In specific circumstances ELIA may revoke the May-Not-Run reservation and start up the asset, at which time the flexibility for balancing offered by the BSP should be available.

ELIA may restrict bidding possibilities and notify the BSP if a

[22] Previously known as "Bidladder".

restriction is applicable for a particular delivery point. The BSP need to contact the Grid User in order to detect the reason for this.

- In case ELIA receives a DA/ID MW schedule for an asset (Power Generating Module/ Power Unit or Energy Storage device), then ELIA will use the MW schedule as the baseline for activations of flexibility for balancing purposes.

  Applied by ELIA based on regulated rules

- Non-reserved flexibility offered for balancing may also be activated for redispatching purposes (via the Scheduling Agent).

  ELIA will set balancing bids as 'unavailable' if balancing bids have not been updated since a redispatching occurred on one of the delivery points of the balancing bid. ELIA will notify the BSP.

More detailed information on the future responsibilities of the BSP can be found in (see annex 4 for a short description):

1) European Guideline on Electricity Balancing
2) Federal Grid Code
3) Terms & Conditions BSP
4) Transfer of Energy rules
5) Design note on the coordination of assets: Part III – Congestion Risk Indicator

In addition the design on the coordination of assets is relevant for the BSP:

6) Design note on the coordination of assets: Part I – Outage Planning
7) Design note on the coordination of assets: Part II – Scheduling & Redispatching

9. Voltage Service Provider (VSP)

European Guideline on Electricity Transmission System Operation

Article 3 Definitions

Definition 57: 'reactive power reserve' means the reactive power which is available for maintaining voltage;

Article 29 Obligations of all TSOs concerning voltage and reactive power management in system operation

3. Each TSO shall ensure reactive power reserve, with adequate volume and time response, in order to keep the voltages within its control area and on interconnectors within the ranges set out in Annex II.

6. Each TSO shall be entitled to use all available transmission-connected reactive power capabilities within its control area for effective reactive power management and maintaining the voltage ranges set out in Tables 1 and 2 of Annex II of this Regulation.

9. When relevant for the voltage and reactive power management of the transmission system, a TSO may require, in coordination with a DSO, a distribution-connected SGU to follow voltage control instructions.

Currently the Grid User's ARP/BRP offers the reactive power reserve on a production unit to ELIA via the ancillary service contract for voltage regulation. Although the European Guideline on Electricity Transmission System Operation discusses the monitoring of reactive power reserves by the TSO to assure sufficient reserves for daily operations and discusses the use by the TSO of reactive power capabilities available in the control area, **the guideline does not assign a particular role for the provision of the reactive power reserves to ELIA.** The guideline therefore allows opening the provision of this ancillary service to other parties as well. **ELIA currently refers to the role as 'Voltage Service Provider'.**

The exact translation towards the Belgian context is yet to be determined.

Important milestones for implementation (estimation December 2017)

2018	The results of **a study on the future Mvar Ancillary Service design** (in response to an incentive of the CREG) will be published for consultation in September 2018.
End 2018	Expected entry into force of new **Federal Grid Code including transition period for implementation**
2020	Expected entry into force of new design for **Mvar AS**: new role for 'Voltage Service Provider' instead of BRP *(Currently annual contracts. Indicative timing dependent on entry into force of Federal Grid Code and redesign of Mvar AS in 2018-2019.)*

Future interdependencies with other roles

ELIA's design proposal includes independent contractual structures but acknowledges the logical operational links between the information received from each role. However certain aspects need to be coordinated in an indirect way via the Grid User or will be organized by ELIA.

Impact of Outage Planning Agent – Coordinated by ELIA/Grid User:

- The outage planning of a power unit determines its availability for ancillary services

  ELIA will take into account the availability plan of the Outage Planning Agent to determine the availability of services of the Voltage Service Provider, who needs to contact the Grid User in order to detect the reason for this.

Impact of Scheduling Agent – Coordinated by ELIA/Grid User:

- According to the technical requirements for the provision of voltage regulation, the availability of the service depends on the level of active power output (the schedule).

  The Voltage Service Provider needs to contact the Grid User in order to detect the reason for the services (un)availability.

The interdependencies between the Voltage Service Provider and other roles will be more concretely determined during the study in 2018.

More detailed information on the future responsibilities of the 'Voltage Service Provider' can be found in (see annex 4 for a short description):

1) European Guideline on Electricity Transmission System Operation
2) Federal Grid Code
3) General Framework Agreement for Voltage Service Provider

In addition also the following document is relevant:

4) Design note on the coordination of assets: Part I – Outage Planning

10. Defence Service Provider (DSP)

European Guideline on Electricity Emergency and Restoration

Article 3 Definitions

'defence service provider' means a legal entity with a legal or contractual obligation to provide a service contributing to one or several measures of the system defence plan;

European Guideline on Electricity Transmission System Operation

Article 3 Definitions

'system defence plan' means the technical and organisational measures to be undertaken to prevent the propagation or deterioration of a disturbance in the transmission system, in order to avoid a wide area state disturbance and blackout state;

The European Guideline on Electricity Emergency and Restoration creates a **Defence Service Provider (DSP)** responsible for delivering **a service which is not part of the ancillary services that ELIA contracts today.** The services of the DSP can be activated when the system is in emergency state to avoid a blackout state.[23]

ELIA will organize the role of the DSP in such a way that entities can deliver the service only requiring a **close collaboration with the Grid User** (without consent of other roles).

Important milestones for implementation (estimation December 2017)

End 2018	Expected entry into force of new **Federal Grid Code including transition period for implementation**

Future interdependencies with other roles

The interdependencies between the Defence Service Provider and other roles will be more concretely determined during the study in 2018.

More detailed information on the future responsibilities of the Scheduling Agent can be found in (see annex 4 for a short description):

1) European Network Code on Electricity Emergency and Restoration
2) Federal Grid Code
3) Terms & Conditions or General Framework Agreement Defence Service Provider (DSP)

[23] The description of system states can be found in annex 2 of this document.

11. Restoration Service Provider (RSP)

European Guideline on Electricity Emergency and Restoration

Article 3 Definitions

'restoration service provider' means a legal entity with a legal or contractual obligation to provide a service contributing to one or several measures of the restoration plan;

'restoration plan' means all technical and organizational measures necessary for the restoration of the system back to normal state;

Currently the Grid User's Access/Balance Responsible Party (ARP/BRP) can offer Black Start services to ELIA. The European Guideline on Electricity Emergency and Restoration assigns the **future role of providing Black Start services to a Restoration Service Provider (RSP)** which is an entity that is legally (e.g., via de grid code) or contractually appointed as such. Note that the RSP role does not have to be appointed to the Grid User's ARP/BRP (who is currently the provider of the Black Start service).

ELIA will organize the role of the RSP in such a way that entities can deliver the service only requiring a **close collaboration with the Grid User** (without consent of other roles).

Important milestones for implementation (estimation December 2017)

2018	The results of **a study on the future Black Start Ancillary Service design** (in response to an incentive of the CREG) will be published for consultation in October-November 2018.
End 2018	Expected entry into force of new **Federal Grid Code including transition period for implementation**
2021	Expected entry into force of new design for **Black Start Service**: new role for Restoration Service Provider instead of BRP *(Contracting period for current design until 31/12/2020. Indicative timing dependent on entry into force of Federal Grid Code and redesign of Black Start Service in 2018-2020).*

Future interdependencies with other roles

ELIA's design proposal includes independent contractual structures but acknowledges the logical operational links between the information received from each role. However certain aspects need to be coordinated in an indirect way via the Grid User or will be organized by ELIA.

Impact of Outage Planning Agent – Coordinated by ELIA/Grid User:

- The outage planning of a power unit determines its availability for ancillary services

ELIA will take into account the availability plan of the Outage Planning

Agent to determine the availability of services by the Restoration Service Provider, who needs to contact the Grid User in order to detect the reason for this.

The interdependencies between the Restoration Service Provider and other roles will be more concretely determined during the study in 2018.

More detailed information on the future responsibilities of the Scheduling Agent can be found in (see annex 4 for a short description):

1) European Network Code on Electricity Emergency and Restoration
2) Federal Grid Code
3) Terms & Conditions or General Framework Agreement Restoration Service Provider (RSP)

In addition also the following document is relevant:

4) Design note on the coordination of assets: Part I – Outage Planning

SUMMARY

Fundamental shifts in the Belgian and European regulatory contexts regarding the balancing market and the provision of ancillary services to a TSO are triggering a broad review of the organization for the delivery of ancillary services. While before the Access Responsible Party (ARP) provided all ancillary services to ELIA, the different responsibilities will in the future be spread across different roles created in the recently developed European Guidelines:

- Outage Planning Agent: provision of outage plans of assets
- Scheduling Agent: provision of schedules in Day-ahead and Intraday, and the bidding of flexibility for congestion management
- Balance Responsible Party (BRP): responsible for holding a balanced position and thereby avoid imbalances in the system
- Balancing Service Provider (BSP): offer balancing services (reserved and non-reserved FCR, aFRR, mFRR)
- Voltage Service Provider (VSP): provide reactive power reserves
- Defence Service Provider (DSP): provide services as part of the defence plan to avoid a system lapse into blackout state
- Restoration Service Provider (RSP): provide services as part of the restoration plan to restore a system from blackout state

The impact is to be translated into Belgian contractual, operational, and regulatory frameworks (including the new Federal Grid Code).

The framework refers to roles and not parties therefore still allowing, if the Grid User decides it so, a continuation of the current practice that a single party takes on the responsibility of the different roles.

As the roles all act on the same asset or access point, there are interdependencies between them. The Grid User plays a key part in the appointment of the roles, the coordination between them, and the liability for assuring compliance with regulation.

ELIA has launched several projects to (further) develop the designs of the different products and to translate the defined responsibilities of each role into new contractual and operational frameworks.

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ANNEX

Annex 1. Terminology

The table below provides a list of **definitions and concepts referred to in the design notes on the coordination of assets**. Some definitions are copied from external sources, such as the European Guidelines; in this case the reference is added in the description.

Asset
An asset in this note refers to a demand facility or a power generating module (PGM) (GL SO, ref [1]), extended to the notion of energy storage units. The asset is part of the ELIA control area, directly or indirectly via a connection in a distribution system or closed distribution system. An asset is explicitly listed in the connection agreement with the relevant system operator.
Availability plan
(GL SO, ref [1]) “the combination of all planned availability statuses of a relevant asset for a given time period”
Availability status
(GL SO, ref [1]) “the capability of [an asset or grid element] to provide a service for a given time period, regardless of whether or not it is in operation”
(Physical) Congestion
(GL CACM, ref [5]) “any network situation where forecasted or realised power flows violate the thermal limits of the elements of the grid and voltage stability or the angle stability limits of the power system”
Connection agreement
(NC RfG, ref [4]) “a contract between the relevant system operator and either the power-generating facility owner, demand facility owner, distribution system operator or HVDC system owner, which includes the relevant site and specific technical requirements for the power-generating facility, demand facility, distribution system, distribution system connection or HVDC system”
Connection Point (CP)
(NC RfG, ref [4]) “the interface at which the power-generating module [own addition: or power unit], demand facility, distribution system or HVDC system is connected to a transmission system, offshore network, distribution system, including closed distribution systems, or HVDC system, as identified in the connection agreement” The connection point separates the transmission grid from installations of which the

tripping only has an effect on the grid user connection to the concerned point. The connection agreement indicates the physical location and the voltage level of the point of connection to the grid**.**
(Cross-border) relevant demand facility
(GL SO, ref [1]) “a demand facility which participates in the outage coordination and the availability status of which influences cross-border operational security”
Day-ahead procedure
The time frame of the Day-ahead procedure for the coordination of assets is from 12:00 to 18:00 hour on day D-1
Delivery Point (DP)
A point on an electricity grid or within the electrical installations of a grid user connected to TSO or DSO grid where the concerned ancillary service is delivered. This is associated with a metering system that enables ELIA to control and assess the delivery of the service.
Demand Facility
(NC DCC, ref [3]) “a facility which consumes electrical energy and is connected at one or more connection points to the transmission or distribution system. A distribution system and/or auxiliary supplies of a power generating module do not constitute a demand facility.” Note that a Demand facility can contain one or more Demand units. Note that following the definition of an Asset, the Demand Facility as such is explicitly identified in the Connection Agreement with the relevant system operator. Examples of a Demand Facility: - a commercial building (e.g., shopping mall) - a factory - each of the factories on an industrial site (if a connection point per factory)
Demand unit
(NC DCC, ref [3]) “an indivisible set of installations containing equipment which can be actively controlled by a demand facility owner or by a CDSO, either individually or commonly as part of demand aggregation through a third party” Note that a Demand unit can be (a set of) installation(s) behind a Delivery Point for the delivery of ancillary services to ELIA, but the requirements in this design note are at the level of the Demand facility. Examples of a Demand Unit: - a motor on an industrial site - an air conditioning system or refrigerator - a charging station for electric vehicles

ELIA grid

ELIA operates the following grids:

- Belgian transmission grid: above 70kV to 380kV high-voltage transmission system (legal monopoly for ELIA)
- Local or regional transmission grids until 70kV in Flanders (Plaatselijk Vervoernet), Wallonia, and the Brussels-Capital region

Throughout the design note “TSO” or “TSO-connected” in the Belgian context refers to these grids.

Energy Storage device

In this design note an Energy storage device is considered as a device used with the purpose to store electrical energy that is to be injected into the system at a later time for the grid user’s own use or as a service offered to the system operator for balancing or congestion management.

Properties of an energy storage device:

- An energy storage device has a limited energy reserve which implies a maximum period of consecutive quarter-hours during which the device can be continuously charged (loading) or discharged (injecting).
- The energy storage device can be charged by taking energy off the grid or by injection from a Power Generating Module.
- The energy storage device has a permanent connection point to the TSO or (C)DSO grid (directly or locally via a demand facility).

(NC RfG, ref [4]) A specific type is Pump-Storage, i.e., a hydro unit in which water can be raised by means of pumps and stored to be used for the generation of electrical energy.

Note that following the definition of an Asset, an Energy storage device as such is explicitly identified in the Connection Agreement with the relevant system operator.

ELIA proposes to apply the same classification as for Power Generating Modules (of which types B, C, D are considered as significant):

- Type D:
  - All energy storage devices connected to 110kV or higher
  - All energy storage devices ≥ 75MW
- Type C:
  - Energy storage device between 25 – 75 MW and connected below 110kV
- Type B:
  - Energy storage device between minimum threshold – 25 MW and connected below 110kV
  - The minimum threshold is between 0.25 – 1 MW (to be confirmed)
- Type A:
  - Energy storage device smaller than type B minimum threshold and connected below 110kV

Forced Outage
(GL SO, ref [1]) “the unplanned removal from service of a relevant asset for any urgent reason that is not under the operational control of the operator of the concerned relevant asset”
Grid User
each natural or legal entity owning an asset connected to the transmission or (closed) distribution grid with the possibility to take electricity off the grid or to inject electricity on the grid
Intraday procedure
The time frame of the Intraday procedure for the coordination of assets is from day D-1 18:00 until real-time.
Outage Planning Agent
(GL SO, ref [1]) “an entity with the task of planning the availability status of a relevant power generating module, a relevant demand facility or a relevant grid element” ⇨ See “Design note for the coordination of assets: Part I – Outage Planning.”
Power Generating Module (PGM)
(NC RfG, ref [4]) “either a synchronous power-generating module or a power park module” **“‘synchronous power-generating module’ (SPGM)** means an indivisible set of installations which can generate electrical energy such that the frequency of the generated voltage, the generator speed and the frequency of network voltage are in a constant ratio and thus in synchronism;” **“‘power park module’ (PPM)** means a unit or ensemble of units generating electricity, which is either non-synchronously connected to the network or connected through power electronics, and that also has a single connection point to a transmission system, distribution system including closed distribution system or HVDC system;” The Power-Generating Modules are classified in four types: PGM type A/B/C/D. - PGM type D: ▪ All PGM connected to 110kV or higher ▪ All PGM ≥ 75MW - PGM type C: ▪ PGM between 25 – 75 MW and connected below 110kV - PGM type B: ▪ PGM between minimum threshold – 25 MW and connected below 110kV ▪ The minimum threshold is between 0.25 – 1 MW (to be confirmed)

- PGM type A:
    - PGM smaller than PGM type B minimum threshold and connected below 110kV

Note that following the definition of an Asset, a Power-Generating Module as such is explicitly identified in the Connection Agreement with the relevant system operator. A Power-Generating Module can have one or more connection points to the grid. Several Power-Generating Modules can also share a connection point to the grid.

PGM type B/C/D are defined as Significant Grid Users (SGU) in the European Guideline for Transmission System Operations (ref [1], therefore applicable for the requirements for operational data exchange in the framework of the coordination of assets.

Power Unit (PU)

A physical installation which can generate electrical energy and that can be part of a set of installations forming a Power-Generating Module. Contrary to a Power-Generating Module, a Power Unit has only 1 connection point to the grid.

(See the section "Questions & Answers" for examples)

Scheduling Agent

(GL SO, ref [1]) "the entity or entities with the task of providing schedules from market participants to TSOs, or where applicable third parties"

⇨ See "Design note for the coordination of assets: Part II – Scheduling and Redispatching."

Setpoint

(NC RfG, ref [4]) "the target value for any parameter typically used in control schemes"

Significant Grid User (SGU)

The Significant Grid Users in the European Guidelines on Electricity Transmission System Operation (GL SO, ref [1]) and therefore applicable to the requirements on operational information exchange and this design note are:

- existing and new Power Generating Modules type B/C/D (ELIA-connected & (C)DSO-connected)
- existing and new ELIA-connected demand facilities;
- existing and new ELIA-connected closed distribution systems;

According to the Guidelines also the following are Significant Grid Users, however not applicable in this design note[24]:

- existing and new demand facilities, closed distribution systems and third parties if they provide demand response directly to the TSO in accordance with the criteria in Article 27 of Commission Regulation (EU) 2016/1388 (3);

[24] It concerns Power Generating Modules type A and Demand facilities that deliver ancillary services other than outage planning, scheduling, and flexibility for redispatching. The operational requirements are described in the design of the concerned ancillary service.

- providers of redispatching of power generating modules or demand facilities by means of aggregation and providers of active power reserve in accordance with Title 8 of Part IV of this Regulation;
Week-ahead
(GL SO, ref [1]) “the week prior to the calendar week of operation”
Year-ahead
(GL SO, ref [1]) “the year prior to the calendar year of operation”

Annex 2. Classification of system states

European Guideline on Electricity Transmission System Operation – see ref [1]

Article 18 Classification of system states

1. A transmission system shall be in the normal state when all of the following conditions are fulfilled:

(a) voltage and power flows are within the operational security limits defined in accordance with Article 25;

(b) frequency meets the following criteria:

(i) the steady state system frequency deviation is within the standard frequency range; or (ii) the absolute value of the steady state system frequency deviation is not larger than the maximum steady state frequency deviation and the system frequency limits established for the alert state are not fulfilled;

(c) active and reactive power reserves are sufficient to withstand contingencies from the contingency list defined in accordance with Article 33 without violating operational security limits; (d) operation of the concerned TSO's control area is and will remain within operational security limits after the activation of remedial actions following the occurrence of a contingency from the contingency list defined in accordance with Article 33.

2. A transmission system shall be in the alert state when:

(a) voltage and power flows are within the operational security limits defined in accordance with Article 25; and

(b) the TSO's reserve capacity is reduced by more than 20 % for longer than 30 minutes and there are no means to compensate for that reduction in real-time system operation; or

(c) frequency meets the following criteria:

(i) the absolute value of the steady state system frequency deviation is not larger than the maximum steady state frequency deviation; and

(ii) the absolute value of the steady state system frequency deviation has continuously exceeded 50 % of the maximum steady state frequency deviation for a time period longer than the alert state trigger time or the standard frequency range for a time period longer than time to restore frequency; or

(d) at least one contingency from the contingency list defined in accordance with Article 33 leads to a violation of the TSO's operational security limits, even after the activation of remedial actions.

3. A transmission system shall be in the emergency state when at least one of the following conditions is fulfilled:

(a) there is at least one a violation of a TSO's operational security limits defined in accordance with Article 25;

(b) frequency does not meet the criteria for the normal state and for the alert state defined in accordance with paragraphs 1 and 2;

(c) at least one measure of the TSO's system defence plan is activated;

(d) there is a failure in the functioning of tools, means and facilities defined in accordance with Article 24(1), resulting in the unavailability of those tools, means and facilities for longer than 30 minutes.

4. A transmission system shall be in the blackout state when at least one of the following conditions is fulfilled:

(a) loss of more than 50 % of demand in the concerned TSO's control area;

(b) total absence of voltage for at least three minutes in the concerned TSO's control area, leading to the triggering of restoration plans.

A TSO of GB and IE/NI synchronous areas may develop a proposal specifying the level of demand loss at which the transmission system shall be in the blackout state. The TSOs of GB and IE/NI synchronous areas shall notify this instance to ENTSO for Electricity.

5. A transmission system shall be in the restoration state when a TSO, being in the emergency or blackout state, has started to activate measures of its restoration plan.

Annex 3. EU regulation on Grid User referenced to in the document

Key Organisational Requirements, Roles and Responsibilities (KORRR) relating to Data Exchange – see ref [2]

Article 3 General responsibilities

8. Subject to the agreement of the TSO, parties required to provide data under the KORRR shall be allowed to delegate all or part of any tasks assigned to it under Regulation 2017/1485 to one or more third parties like BRP, BSP, aggregators or similar entities, in case the third party can carry out the respective function at least as effectively as the delegating entity. The delegating entity shall remain responsible for ensuring compliance with the obligations under Regulation 2017/1485, including ensuring access to information necessary for monitoring by the regulatory authority.

European Guideline on Electricity Transmission System Operation – see ref [1]

Article 103 Real-time execution of the availability plans

1. Each power generating facility owner shall ensure that all relevant power generating modules it owns and which are declared 'available' are ready to produce electricity pursuant to their declared technical capabilities when necessary to maintain operational security, except in case of forced outages.

2. Each power generating facility owner shall ensure that all relevant power generating modules it owns and which are declared 'unavailable' do not produce electricity.

3. Each demand facility owner shall ensure that all relevant demand facilities it owns and which are declared 'unavailable' do not consume electricity.

4. Each relevant grid element owner shall ensure that all relevant grid elements it owns and which are declared 'available' are ready to transport electricity pursuant to their declared technical capabilities when necessary to maintain operational security, except in case of forced outages.

5. Each relevant grid element owner shall ensure that all relevant grid elements it owns and which are declared 'unavailable' do not transport electricity.

6. Where specific grid-related conditions apply for the execution of the 'unavailable' or 'testing' status of a relevant grid element in accordance with Article 96(6), the TSO, DSO or CDSO concerned shall assess the fulfilment of those conditions before the execution of that status. If those conditions are not fulfilled, it shall instruct the relevant grid element owner to not execute the 'unavailable' or 'testing' status or a part thereof.

7. Where a TSO identifies that executing an 'unavailable' or 'testing' status of a relevant asset leads or could lead the transmission system out of normal state, it shall instruct the owner of the relevant asset when it is connected to the transmission system, or the DSO or CDSO if connected to a distribution system or to a closed distribution system, to delay the execution of that 'unavailable' or 'testing' status of that relevant asset according to its instructions and to the extent possible, while respecting the technical and safety limits.

Annex 4. Overview of documentation on future responsibilities of different roles

Legally binding documents:

1) European Guideline on Electricity Balancing

   A European regulation prescribing the roles and responsibilities of the BSP and the BRP, as well as modalities on balancing by the TSO (e.g., European balancing platforms, imbalance tariff, ...).

2) European Guideline on Electricity Transmission System Operation

   A European regulation prescribing, among other operational requirements, the role of the Outage Planning Agent and Scheduling Agent, the obligations to deliver outage plans on all Power-Generating Modules type B/C/D, and the modalities for outage coordination for cross-border relevant assets and grid elements in particular.

3) Key Organizational Requirements, Roles and Responsibilities (KORRR)

   Relating to Data Exchange in accordance with Article 40(6) of the Commission Regulation (EU) 2017/1485 of 02 August 2017 establishing a Guideline on Transmission System Operation.

   The document (a joint proposal of the TSOs) prescribes rules for operational information exchange for the implementation of the respective articles in the European Guideline on Electricity Transmission System Operation. It concerns responsibilities of TSOs, DSOs, as well as Significant Grid Users.

4) European Network Code on Electricity Emergency and Restoration

   A European regulation prescribing the operations for grid management in emergency, black start, and restoration states of the system, including the roles of Restoration Service Provider (RSP) and Defence Service Provider (DSP).

5) Transparency regulation:

   For the purpose of Transparency the Commission Regulation ((EU) No 543/2013 of 14 June 2013 on submission and publication of data in electricity markets and amending Annex I to Regulation (EC) No 714/2009 of the European Parliament and of the Council) prescribes requirements for data exchange related to outage planning and scheduling.

6) Federal Grid Code

   National regulation prescribing the fundamental responsibilities regarding balancing services, the Black Start Service, Mvar Ancillary Service, Access to the grid, coordination of assets, and congestion management, and reference to the national organization of the service (Terms & Conditions and General Framework Agreements).

In case services are provided from delivery points connected to the DSO grid, the regional regulation may complement the modalities described in the Federal Grid Code, Terms & Conditions, and General Framework Agreements.

7) Terms & Conditions BRP

Following article 18 of the European Guideline on Electricity Balancing ELIA develops a set of terms and conditions (T&C) describing the rights and obligations of the Balance Responsible Party (BRP), to be submitted for approval by the regulator.

8) Terms & Conditions BSP

Following article 18 of the European Guideline on Electricity Balancing ELIA develops a set of terms and conditions (T&C) describing the rights and obligations of the Balancing Service Provider (BSP), to be submitted for approval by the regulator.

9) "Transfer of Energy" rules

A set of rules defined by ELIA on the principles on the organization of transfer of energy by the provider of flexibility services. In particular it concerns:

- Principles for determination of activated flexibility volume
- Principles on the correction of the BRP imbalance position due to the activation of the flexibility
- Exchange of information necessary for the implementation of the transfer of energy
- Phased implementation of transfer of energy in different markets.

10) Connection Contract

The agreement between ELIA and the Grid User on the conditions for connection to the ELIA grid, including technical requirements, property and management of installations, structural information, and physical location.

11) Access Contract

The agreement between ELIA and the Access Holder on the conditions for access to the ELIA grid for the Grid User.

12) Framework of Terms & Conditions and/or General Framework Agreement Outage Planning Agent: to be determined

ELIA develops a new regulatory and contractual framework describing the rights and obligations of the Outage Planning Agent in replacement of the parts of the CIPU contract with respect to outage planning.

13) Framework of Terms & Conditions and/or General Framework Agreement Scheduling Agent: to be determined

ELIA develops a new regulatory and contractual framework describing the rights and obligations of the Scheduling Agent in replacement of the parts of the CIPU contract with respect to outage planning.

14) Framework of Terms & Conditions and/or General Framework Agreement Restoration Service Provider (RSP): to be determined

    ELIA develops a new regulatory and contractual framework describing the rights and obligations of the Restoration Service Provider in replacement of the Black Start contract.

    The organization of the service via T&C or GFA will be determined based on the study for a redesign in 2018-2020.

15) Framework of Terms & Conditions and/or General Framework Agreement Defence Service Provider (DSP): to be determined

    ELIA develops a new regulatory and contractual framework describing the rights and obligations of the Defence Service Provider.

    The organization of the service via T&C or GFA will be determined in 2018.

16) General Framework Agreement for Voltage Service Provider

    In replacement of the Mvar Ancillary Service contract.

    The organization of the service via T&C or GFA will be determined in 2018.

Design notes:

17) Design note on the coordination of assets: Part I – Outage Planning:

    A document describing the modalities of outage planning and therefore the scope of the role and responsibilities of the Outage Planning Agent. The relevance for the BSP is indicated above.

18) Design note on the coordination of assets: Part II – Scheduling & Redispatching:

    A document describing the modalities of scheduling and bidding flexibility for redispatching in Day-ahead and Intraday, thereby focusing on the scope of the role and responsibilities of the Scheduling Agent. The relevance for the BSP is indicated above.

19) Design note on the coordination of assets: Part III – Congestion Risk Indicators

    A document describing the relation between congestion management and balancing, in particular to avoid the activation of balancing energy that may cause or aggravate congestion risks on the grid.

Annex 5. Distinction between Schedules of the Scheduling Agent and Nominations of the BRP

As the BRP is currently the signatory of the CIPU contract, BRP nominations on access point level and CIPU schedules on power unit level are closely linked. As in the future the BRP will not have a direct role as Scheduling Agent (unless if the market party with BRP responsibility is also the Grid User or BSP), the link between BRP nominations and ICAROS schedules will be revised. BRP nominations are as such not in scope of this design note, but this section serves to nonetheless inform the relevant stakeholders of the evolutions in the relationship between BRP nominations on access level on the one hand and generation or consumption schedules on asset level on the other hand.

Current BRP nominations – coexisting with CIPU

The modalities for BRP nominations currently take into account that the BRP is also the signatory of the CIPU contract and therefore delivers generation schedules of CIPU units to ELIA. The BRP is required to nominate on access point level the offtake off the grid or injection into the grid that would occur if the CIPU unit was not connected. The offtake or injection could represent gross or net values as there may be other productions connected on the same site that are not subject to a CIPU contract.

Example for quarter-hour t:

- The CIPU unit (PGM type C) produces 27MW.
- The PGM type B (non-CIPU) produces 4.5 MW.
- The aggregation of PGM type A (non-CIPU) produces 0.5MW.
- The consumption (or gross offtake) of the demand facility is 100MW. Of this, 32MW is being fed locally by the CIPU and the non-CIPU production units.
- The net offtake of the grid is therefore equal to 68MW.

→ The BRP nominates on the access point a net offtake of 95MW, i.e., the consumption of the demand facility that is fed either by the local CIPU unit or by the grid.

Future BRP nominations – coexisting with ICAROS schedules

The party with BRP responsibility does not by default have the Scheduling Agent responsibility. It is, however, important to note that ELIA assumes that the Grid User takes responsibility to coordinate between different parties and consequently both the BRP's nominations and the Scheduling Agent's schedules should be based on the same information and be consistent up to a certain level.

The BRP will have to nominate on access point level the net offtake off the grid or net injection into the grid. The BRP nominations will be used to verify the balance position of the BRP in Day Ahead.

The Scheduling Agent will be required to provide generation schedules (gross injection) and consumption schedules (gross offtake) on the level of the asset (coherent with a connection point that allows ELIA to aggregate the schedules per node).

Example for quarter-hour t

- The PGM type C produces 27MW: for this PGM ELIA receives a 27MW schedule.
- The PGM type B produces 4.5 MW: for this PGM ELIA receives a 4MW schedule or an ON schedule.
- The aggregation of PGM type A produces 0.5MW.
- The consumption (or gross offtake) of the demand facility is 100MW. Of this, 32MW is being fed locally by PGM A/B/C.
- The net offtake of the grid is therefore equal to 68MW.

→ The BRP nominates on the access point a net offtake of 68MW, i.e., the consumption of the demand facility that is not fed by a local PGM.

What in case of illogical differences between schedules and BRP nominations?

There will be cases of access points where only assets with scheduling obligations are connected to: the nomination of the BRP on the level of the access point should in this case be equal to aggregation of schedules of the Scheduling Agent on asset level.

For example: in case of an access point representing only PGM that are directly connected to the grid, the sum of the generation schedules should be equal to the net injection on the grid, provided an acceptable error margin for impact of auxiliary demand.

ELIA will determine detectors for assessing whether a distinction between nominations and schedules is acceptable or not. In the latter case, ELIA will inform the BRP that the nomination is not coherent with the scheduled information that ELIA received.

ELIA will also determine detectors for assessing whether a nomination of a BRP is such that ELIA cannot accept the nomination. For example, the BRP nominates a high amount of active power injection on an access point representing assets that are all in maintenance. In such a case the information received from the Outage Planning Agent and/or Scheduling Agent will prevail and the nomination of the BRP will not be accepted. The BRP is to contact the Grid User to clarify such issues and properly coordinate between the different parties.

What if the same market party takes on the role of BRP and of Scheduling Agent?

In such case ELIA and the BRP can mutually agree that the Schedules can also serve as BRP nominations in order to avoid a double data flow.

Conclusion: BRP nomination (net on access point) versus Schedules (gross on asset level)

In the future framework for coordination of assets the BRP might not be responsible for delivery of schedules on asset level (the BRP role is not by default taken on by the same market party as the Scheduling role). As a result there is a distinction to be made in exchanged information and responsibilities:

- BRP: nominations of net offtake or net injection on access point level
- Scheduling Agent : schedules of gross generation or gross consumption on asset level or on connection point level