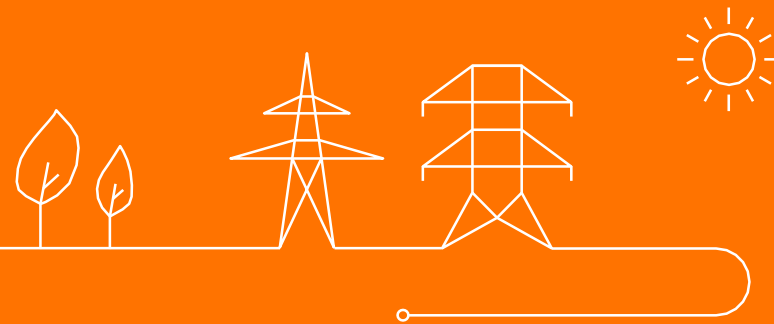


Users' Group

Working group Belgian Grid

Wednesday, May 17



1. Tariff proposal 2024-2027: results of public consultation

2. Access contract: main modifications

3. Connection contract: main modifications

4. Incentives

4.1. Hosting capacity maps

4.2. Incentive MVAR

4.3. Incentive CBA: Cost benefit analysis on Requirements for Generators applicable on existing and new generating units between 1 and 25 MW

5. Miscellaneous

5.1. Next meeting: Tuesday, 5 September 14h – 17h



1. **Tariff proposal 2024-2027**: results of public consultation

Beslissende elementen inzake de voorziene ontwikkelingen in het **tariefdossier 2024-2027**

Periode publieke consultatie: **14 februari tot 20 maart '23**

11 (niet-confidentiële) reacties:

- BOP
- BSTOR
- Essenscia
- ABVV, ACV, BV-OEVO (gezamenlijke reactie)
- FEBEG
- FEBELIEC
- Fluvius
- Infrabel
- Nyrstar
- VREG
- Vyria



Agenda

1. **Tariff proposal 2024-2027:** results of public consultation

2. **Access contract:** main modifications

3. **Connection contract:** main modifications

4. **Incentives**

4.1. **Hosting capacity maps**

4.2. **Incentive MVAR**

4.3. **Incentive CBA:** Cost benefit analysis on Requirements for Generators applicable on existing and new generating units between 1 and 25 MW

5. **Miscellaneous**

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A wide-angle photograph of an offshore wind farm. Numerous wind turbines are visible, stretching across the horizon over a vast expanse of blue sea. The sky is filled with soft, white clouds. The text "Access Contract" is overlaid in large white letters in the lower-left quadrant of the image.

Access Contract

Agenda

- Triggers for modification
- Main amendments to contract - Object & general conditions
- Main amendments to access contract –Technical Conditions – xBRP
- Next steps & timelines
 - Dutch translation available on May 19th
 - Feedback from regulators expected June 2nd
 - Public Consultation to Start on June 19th

Triggers

- Modifications following Regulator's questions/objections from previous consultation
- Harmonize definitions
- Include Multiple BRP

Main amendments to contract (object & general conditions)

- 1. Definitions
- 4.1 Déclarations & garanties (également au nom de l'UR) => clarify the commitments of different parties (CWaPE)
- 6.5 Protection des données à caractère personnel (garantie/diligence du détenteur d'accès lorsqu'il diffuse/communique des informations) => raise awareness on the duties of the party providing/dealing with personal data
- 10. Solvabilité financière (moyens de preuve à fournir par le détenteur d'accès: spécifiquement: relevé de sa situation financière) => solvency evidence required (CREG)

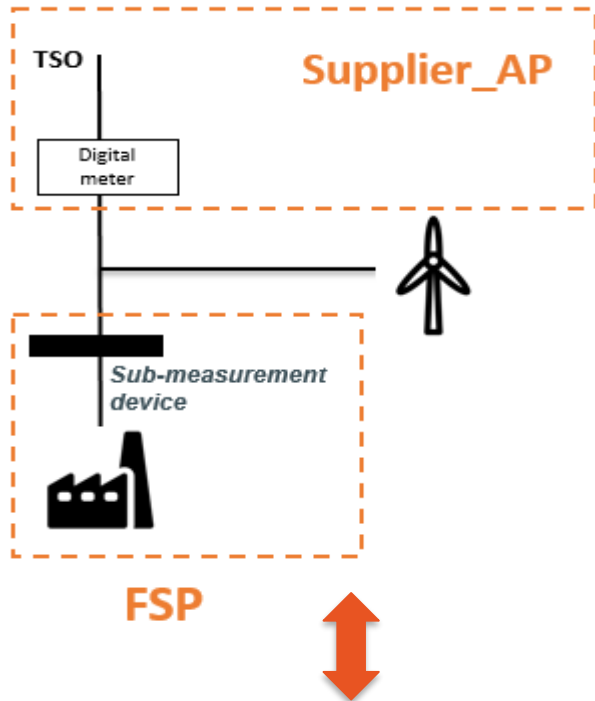
Definitions

1. CDS => reflect dispositions from Regional Texts
2. Code de Bonne Conduite => reflect evolutions of Code de Bonne Conduite
3. Contrat d'Agent de Programme (aka SA) => explain relation between SA & ELIA (used in art 18 & 21)
4. Contrat Elia – Fournisseur => Clarify data exchange between supplier & ELIA to leverage participation to flexibility services
5. Décrets
6. Jours Ouvrables => addition of notion of “jours fériés légaux” (CwAPE)
7. Ordonnance Bruxelloise
8. Plateforme Digitale => explain the concept of the ELIA customer portal
9. Point de Livraison => new concept to accommodate the xBRP approach
10. Registre des Points de Livraison => explain the principles behind the repository held by ELIA with different R&R
11. Règlements Techniques de Transports Régionaux et Locaux
12. Situation de défaut de paiement => clarify in which specific cases such a situation occurs (CREG)

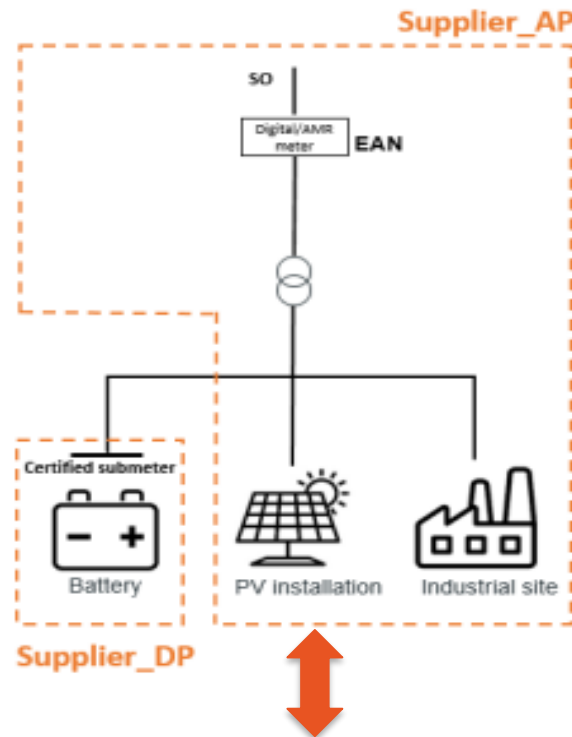
Multiple BRP & CCMD

Flexibility Services that will require a correction model

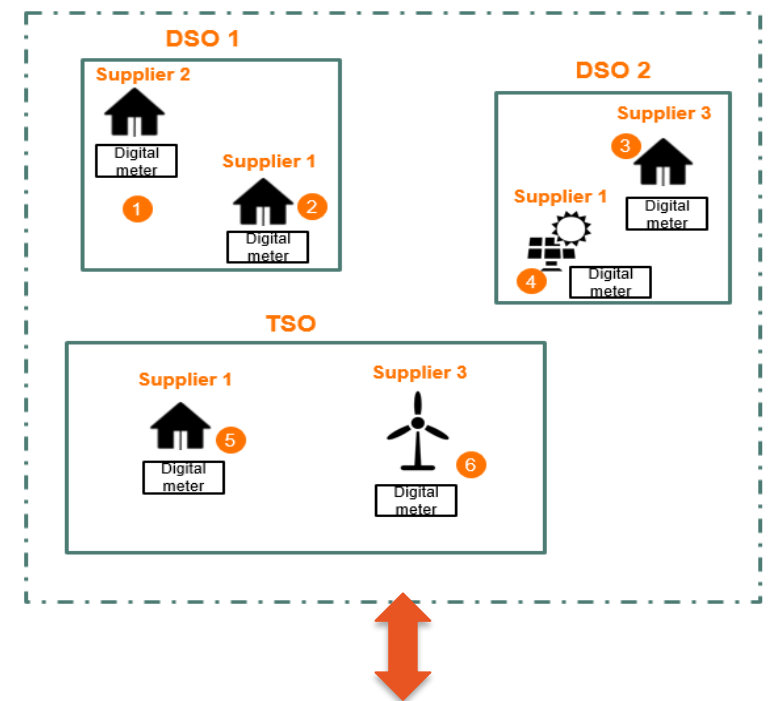
Explicit flexibility



Multiple BRP / Supplier



Energy communities



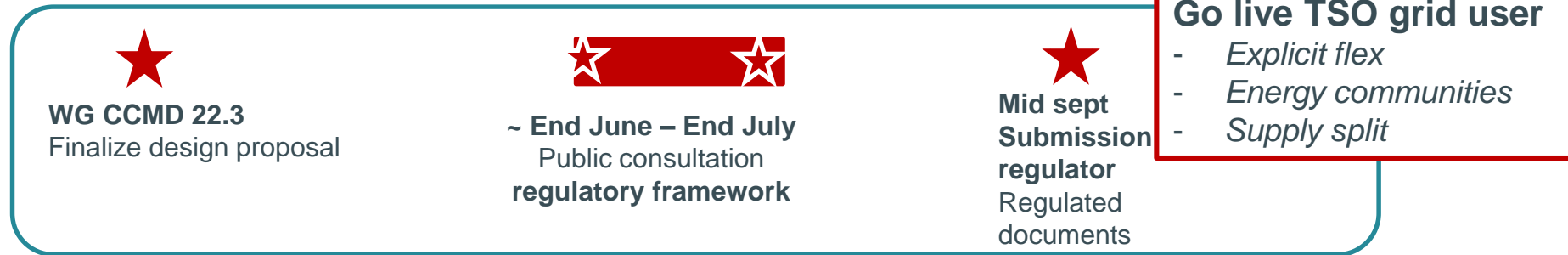
Consumer Centric Market Design

**The terminology 'CCMD Services' used in this presentation refers to the possibilities offered to an Energy Service Provider to valorize its flexibility, with the system operator playing a role of facilitator.*

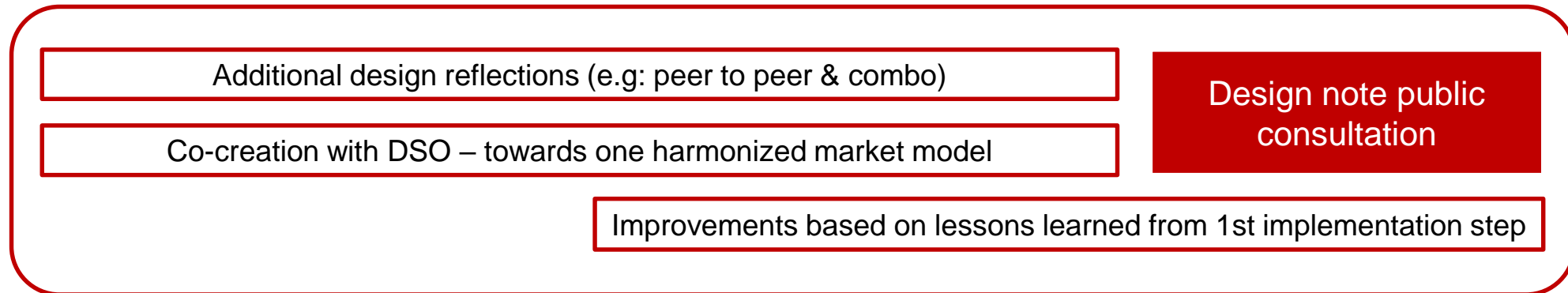
CCMD design in 2023 and 2024



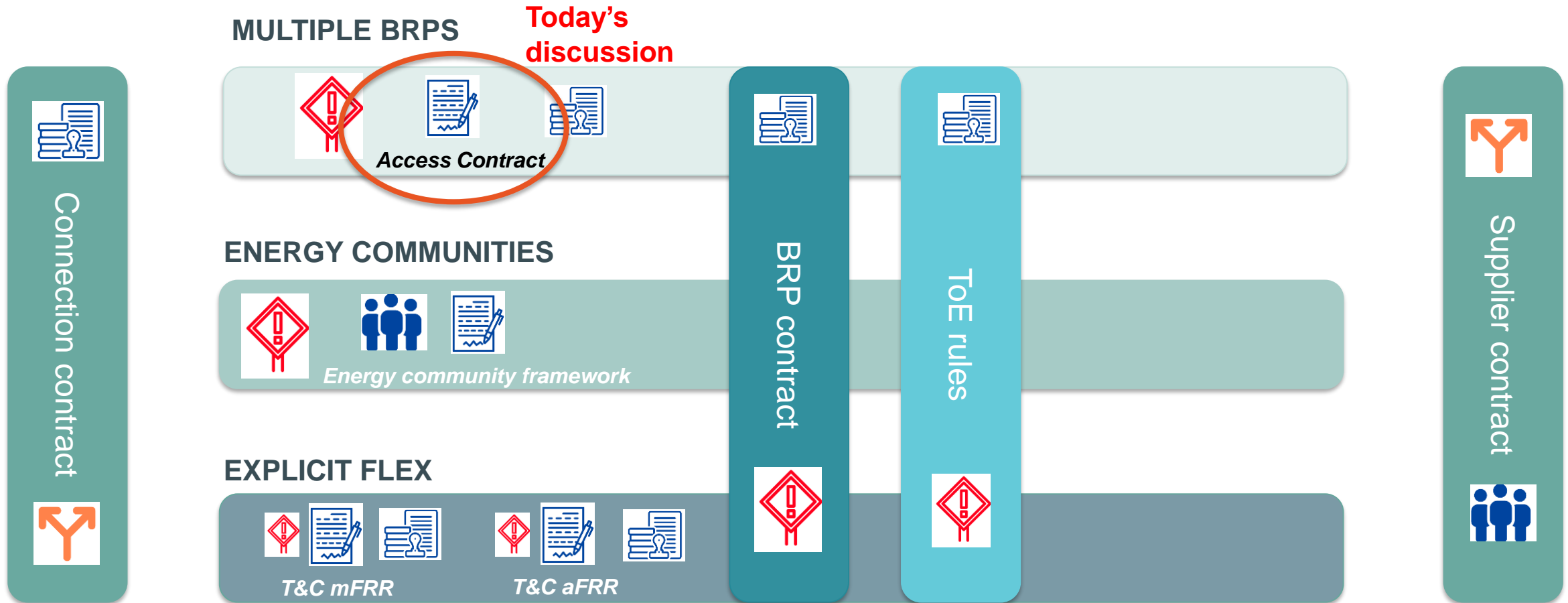
Design 1.0 (focus 1st go-live TSO connected – end 2023)



Design 2.0 (Focus 2nd go live – end 2024)



Regulatory framework evolutions required to reflect CCMD design 1.0



Regulated
 Non regulated
 Pre-requisite to go live
 Workaround possible

Access contract - evolutions due to CCMD

Notion of delivery point

Definition of “Delivery Point”

Un Point d’Accès ou un point faisant partie des installations de l’Utilisateur de Réseau à partir duquel un service est fourni. Ce point est associé à un ou plusieurs équipement(s) de mesure, selon les modalités précisées dans le contrat de ce service, et permet à ELIA de contrôler et vérifier la livraison de ce même service.

« Registre des Points de Livraison »

Registre tenu par ELIA tel qu’adapté le cas échéant qui indique, entre autres :

- pour chaque Point de Livraison la référence du Contrat d’Accès et le Point d’Accès en vertu duquel l’Accès au Réseau Elia est attribué ;
- pour chaque Point de Livraison, la désignation du Responsable d’Équilibre chargé du suivi et la désignation du Fournisseur ;

Access contract - evolutions due to CCMD

Registration of a Delivery Point by the Access Holder

Art. 17.4

- New article introduced to reflect the current procedure to add an Access Point to the portfolio of an Access Holder to the Delivery Point level
- Annex 2 adapted accordingly (to reflect the registered DP)
- Once a DP is registered into Annex 2, a couple BRP/Supplier can be designated as per procedure of article xx (and Annex 3 quarter)

Procedure to designate a BRP/Supplier at DP level

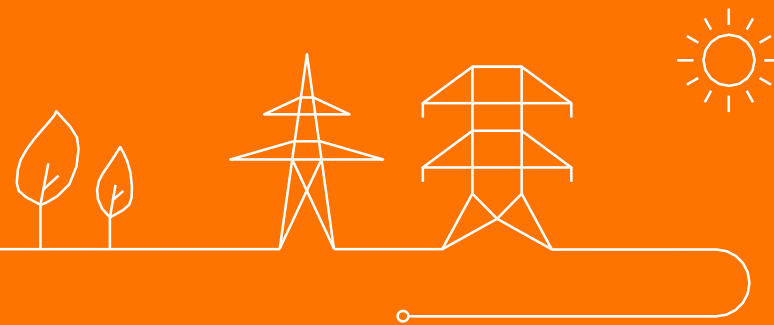
Art. 20.3 – 21.4

- New articles introduced to reflect the current procedure to designate a BRP/Supplier at an Access Point to the portfolio of an Access Holder to the Delivery Point level
- Annex 3 quarter added (to cover the registered DP)
- Procedure to renew BRP designation at DP level (same approach than for the existing procedure at access Point level, with the difference that the fallback in case of no valid BRP at DP level is a takeover by the BRP at AP (by default, instead of disconnection)

Questions?



Thank you



Backup

Main amendments to access contract – Technical Conditions - xBRP

- 2.2 Scope of contract
- 17.1 Catégories de détenteurs d'accès (~~adaptations des annexes 3~~)
- 17.4 Procédure pour l'ajout d'un point de livraison (cfr explication détaillée sur multiple BRP)
- 20.1 Type de responsable d'équilibre par point d'accès et/ou point de livraison
- 20.3 Procédure de désignation du responsable d'équilibre par point de livraison (+lien avec Annexe 3 quater)
- 21 Modification – reconduction du responsable d'équilibre (incl 21.1, 21.2 & 21.4)
- 23 Identification d'un ou plusieurs fournisseurs

Afstemming Toegangscontract op bepalingen Gedragscode (art. 95)

- Betalingsmodaliteiten: art 12
- Onbetaalde sommen: art 11 en 12
- Vertrouwelijkheid van de commerciële gegevens: art 6
- Bemiddeling en arbitrage: art 15
- Gevaar voor de fysieke integriteit van personen of voor materiële schade: art 8
- Aanduiding van de toegangshouder +hernieuwing: art 17-18
- Identificatie van de leverancier(s) voor elke toegangspunt: art 23
- De aanduiding, door de toegangshouder, van de evenwichtsverantwoordelijke: art 20-21
- Procedure van eenzijdige opzegging: art 19 (toegangshouder) en art 22 (BRP)
- Opschorting en verbreking van het toegangscontract door de transmissienetbeheerder en/of de toegangshouder: art 13
- Regels betreffende het beheer van de toegang van de CDS-gebruikers: annexe 6
- Toegang tot het net, geheel of gedeeltelijk, voor een tijdelijke periode te onderbreken: art 13.1.2

Agenda

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5.1. Next meeting: Tuesday, 5 September 14h – 17h



A wide-angle photograph of an offshore wind farm. Numerous wind turbines are visible, stretching across the horizon over a vast expanse of blue ocean. The sky is filled with soft, white clouds. The text "Revision Connection Contract" is overlaid in large white font on the left side of the image.

Revision Connection Contract

Status Connection Contract

- **Parts A & B have been revised and submitted based on:**
 - Regulator's feedback (only part A)
 - Legislative evolution
 - Technical reality (mainly part B)
 - Digitalization
 - Evolutions of other contracts
- **Annexes have been updated**
- **ICAROS has been included**
- **Next steps:**
 - Dutch translation available by June 8th
 - Public Consultation planned for Q4 2023



Art 1 Definitions and interpretation:

Main triggers:

- Alignment new regulation
- Consistency
- Scoping extension
- Stakeholders'/regulators' input

- **References to legislation/regulation** = as amended from time to time
- **Extra definitions have been added**: Autres Installations de Raccordement, BSP Contract, Contrat BSP, Contrat OPA/SA, **Cocontractant**, Code de Bonne conduite, Code de Réseau Européen E&R, Code de Réseau Européen HVDC, Datalogger, Décret Flamand, Décret Wallon, Détenteur d'Access, Railway traction grid (including regional), Etablissement, Gestionnaire du CDS, GU installation, CDSU Installation, Installation de Comptage, **Installation de Production d'Electricité**, **Installation de Stockage d'Energie**, Ligne Directrice Européenne CACM-EBGL-SOGLEPIC, Méthodologie Tarifaire, EON/ION/LON, Ordonnance Bruxelloise, **Plateforme Digitale**, **Point de Livraison**, Première Travée de Raccordement, Préposé, **Raccordement Partagé**, Règles de Fonctionnement, Réseau de Traction Ferroviaire, Réseau de Traction Ferroviare Régional, Sous- comptage, Système HVDC, Utilisateur du CDS, Utilisateur Significatif du Réseau, Control Area, Législation sur les données privées,...
- **Some definitions have been deleted when not used**: Exploitation d'une Unité de Production d'Electricité, Ilotage, Travée de Raccordement, ...
- **Other definitions have been amended** (e.g. based on the remarks from Regulators & Market Parties): CDS, **Installation**, Point d'Access, Point d'Interface, **Propriétaire**, Règlement Technique Fédéral (nom), Règlements Techniques Régionaux (nom),



Art 1 Definitions and interpretation (1/3)- Installations

Focus on some definitions - Installations

Installation

Current connection contract:

“toute Installation de Raccordement, Installation de l’Utilisateur du Réseau ou ligne directe”

New proposal:

« toute Installation de Raccordement, Installation de l’Utilisateur du Réseau, ou ligne directe **et, le cas échéant, toute Unité de Production d’Electricité, Installation de Stockage d’Energie, et/ou, si le Cocontractant est également Gestionnaire du CDS, toute Installation de l’Utilisateur du CDS, reliée, en aval, aux Installations de l’Utilisateur du Réseau** »

Installation de l’Utilisateur du Réseau

Current contract

« tout équipement, en propriété ou en usage, de l’Utilisateur du Réseau, raccordé par un Raccordement au Réseau Elia »

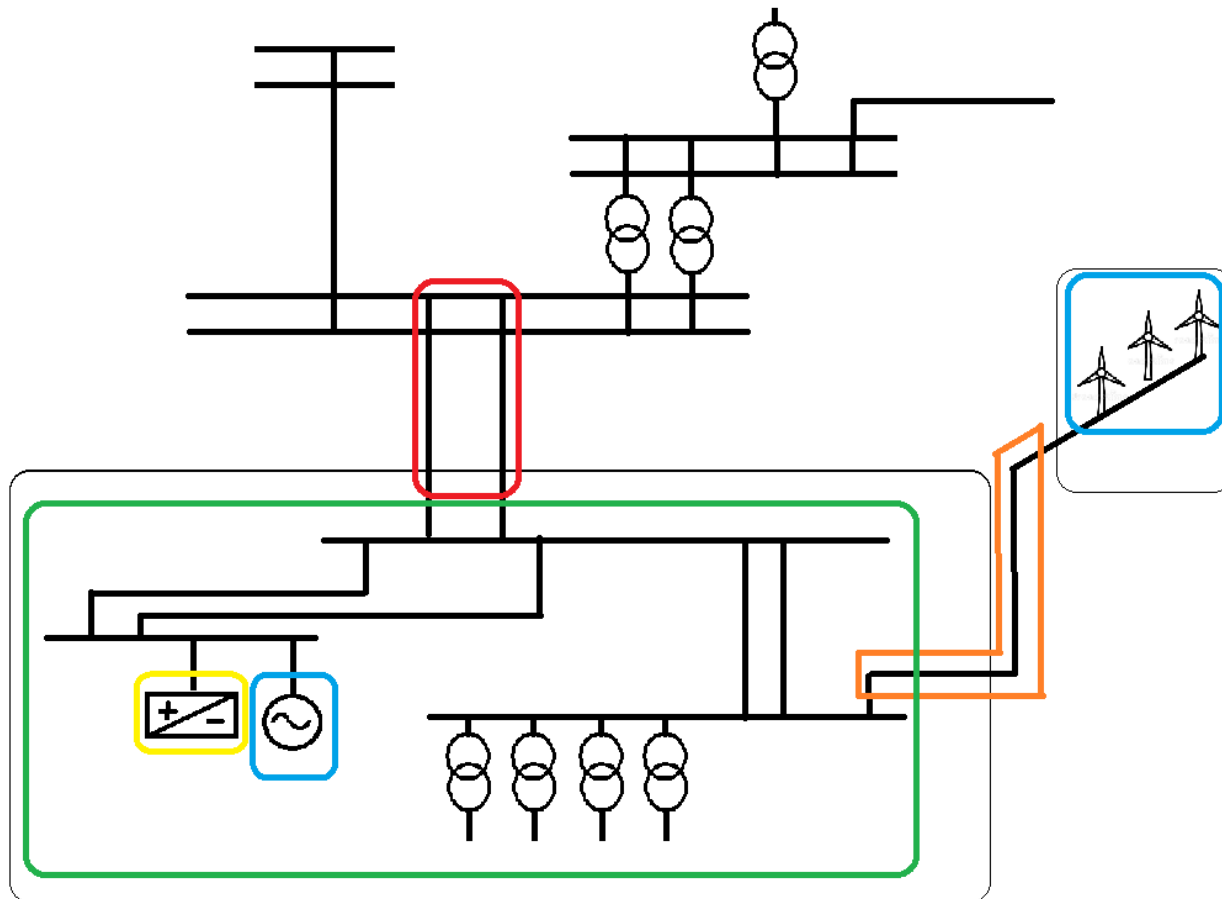
New Proposal:

« tout équipement dont le Cocontractant **est Propriétaire**– en ce compris, selon le cas, une Installation de Production d’Électricité, une installation de consommation, une Installation de Stockage d’Énergie, un Système HVDC et/ou un CDS – raccordé par un Raccordement au Réseau Elia, **à l’exclusion des Installations de l’Utilisateur du CDS** »

New Definition: Installation de l’Utilisateur du CDS

« tout équipement de l’Utilisateur du CDS »

Définition “Installation”



Installation de Raccordement

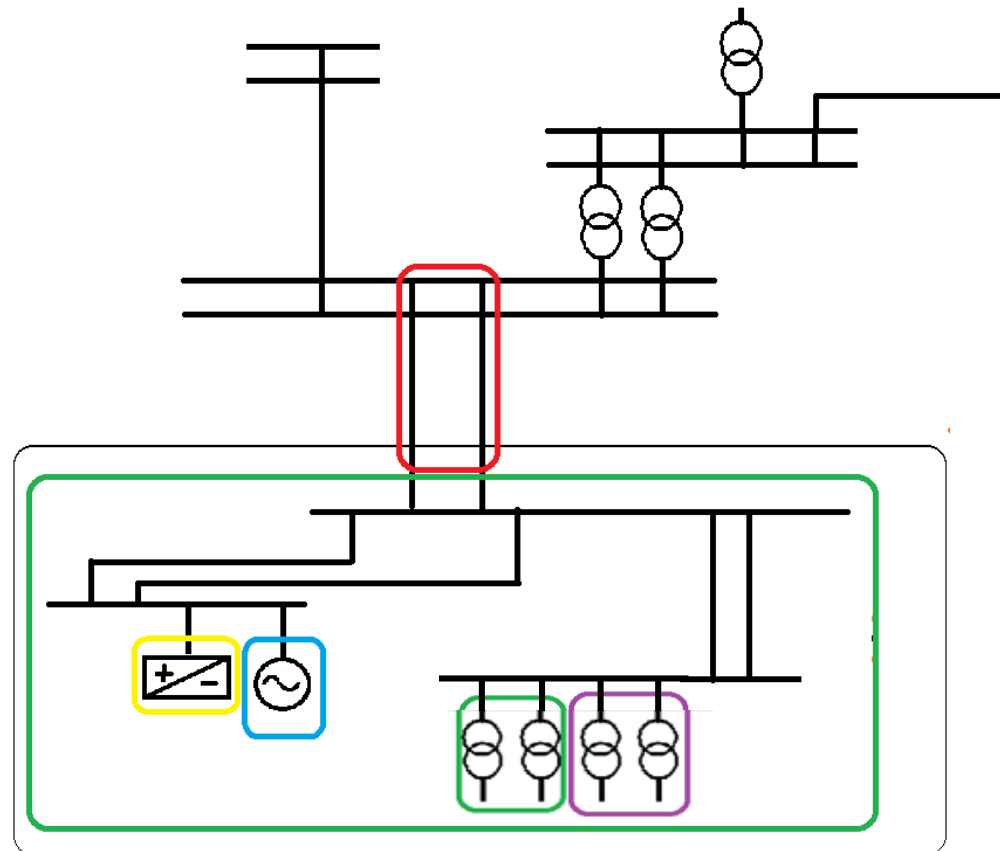
Ligne directe

Installation de l'Utilisateur du Réseau

Unité de Production d'Electricité

Installation de Stockage d'Energie

Définitions “Installation” – “Installation de l’Utilisateur du Réseau”



Installation de Raccordement

Installation de l’Utilisateur du Réseau

Installation de l’Utilisateur du CDS :

CDS Grid User 1: Unité de Production d’Electricité

CDS Grid User 2: Installation de Stockage d’Energie

CDS Grid User 3 (prélèvement)

CDS Grid User 4 (prélèvement)

Art 1 Definitions and interpretation- (2/3)

New definitions

Cocontractant: the Grid User (GU) who signs the Contract.

Installation de comptage: tout équipement de mesure pour effectuer des comptages.

Point de Livraison: Un Point d'Accès ou un point faisant partie des installations de l'Utilisateur de Réseau à partir duquel un service est fourni. Ce point est associé à un ou plusieurs équipement(s) de mesure, selon les modalités précisées dans le contrat de ce service, et permet à ELIA de contrôler et vérifier la livraison de ce même service.

See Annex 1: table with identification of DP's and new annexe 4bis Installations de sous-comptage

Plateforme Digitale: La plateforme digitale qu'ELIA met à la disposition des Utilisateurs du Réseau pour la sauvegarde de leurs données de contact en vue du respect de leurs obligations contractuelles en ce sens ;

See Annex 7 (see current Access contract) is on this Platform.

Propriétaire : pour les besoins du présent Contrat seulement, toute personne qui dispose du droit de propriété ou, si un tiers avec lequel cette personne est en relation contractuelle dispose du droit de propriété, du droit d'utilisation sur une ou plusieurs Installations qui peuvent avoir une influence sur la sécurité, la fiabilité et/ou l'efficacité du Réseau Elia.

Art 1 Definitions and interpretation (3/3)

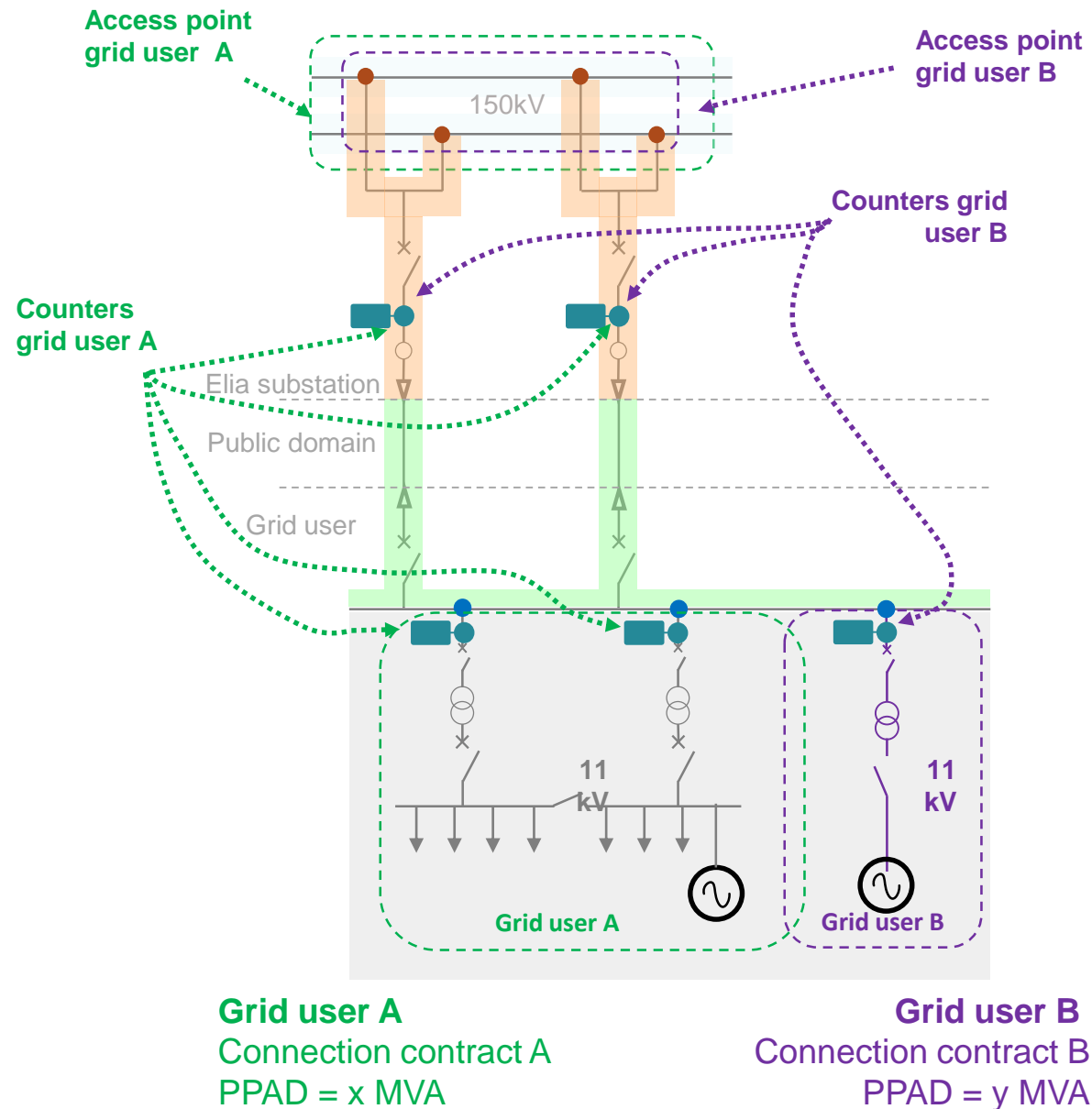
Raccordement Partagé: le Raccordement partagé par deux Utilisateurs du Réseau, réalisé conformément aux dispositions du Code de Bonne Conduite, aux dispositions correspondantes des autres Règlements Techniques applicables et aux dispositions du présent Contrat ;

See also Annex 9 Modalités du Raccordement Partagé in line with the Gedragscode

Art. 40. Elk van de aansluitingscontracten van de transmissienetgebruikers betrokken bij de gedeelde aansluiting wordt aangevuld met het akkoord gesloten tussen de transmissienetgebruikers, die de aansluiting delen, en de transmissienetbeheerder. Dat akkoord stelt de rechten en plichten van de partijen vast betreffende de gedeelde aansluiting overeenkomstig de betrokken bijlage in de type-aansluitingsovereenkomst goedgekeurd door de CREG.

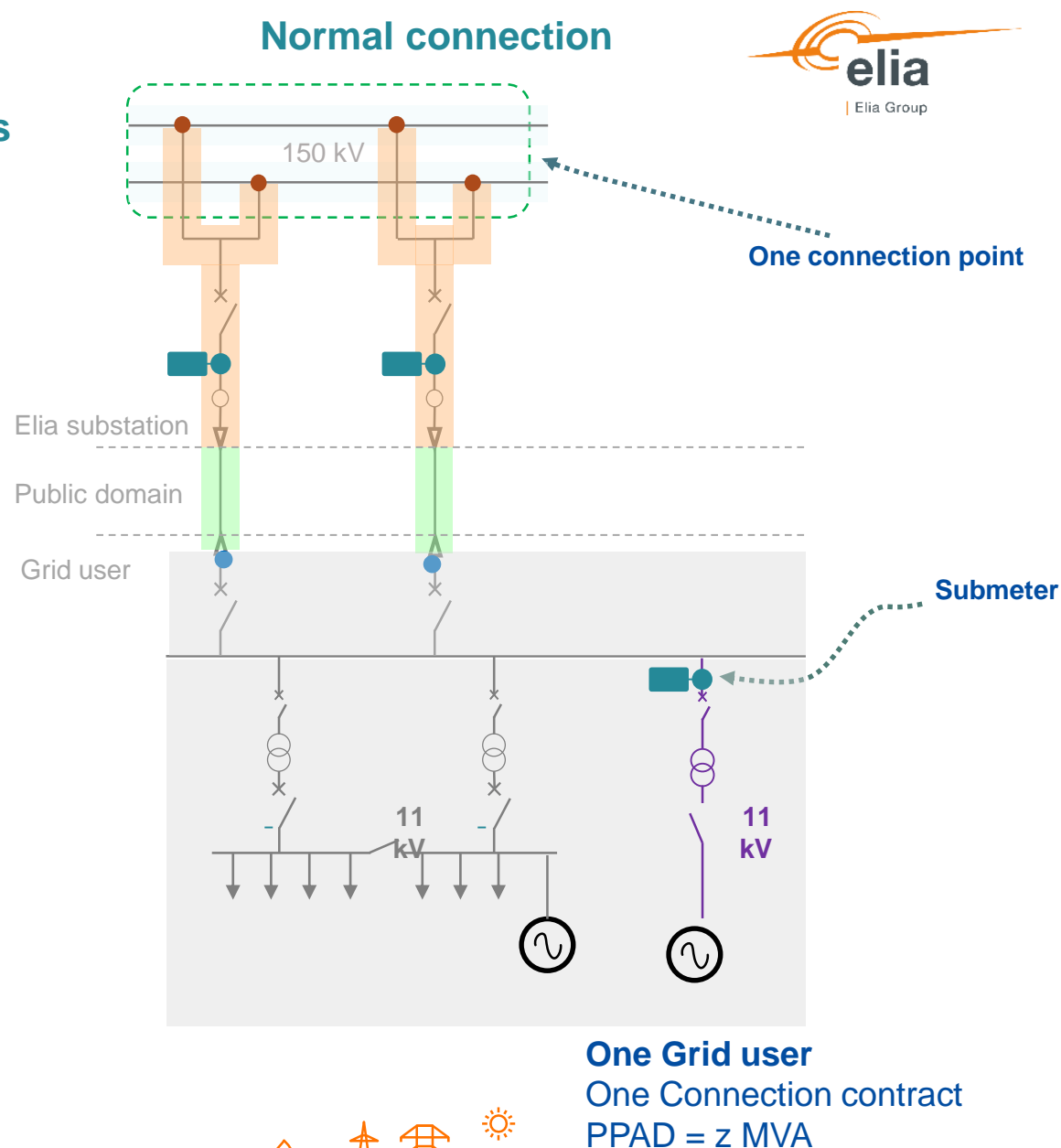
De betrokken bijlage van het aansluitingscontract bevat in elk geval de specifieke modaliteiten inzake de conformiteit van de gedeelde aansluiting, de eigendomsafbakening van de gedeelde aansluitingsinstallaties, de beheerswijze van deze installaties, de rollen en verantwoordelijkheden inzake onderhoud en exploitatie van de aansluitingsinstallaties die geen eigendom zijn van de transmissienetbeheerder en desgevallend niet door de transmissienetbeheerder beheerd worden. Deze bijlage zal, in voorkomend geval, ook uitdrukkelijk de operationele beperkingen inzake aansluiting en toegang voor de nieuwe transmissienetgebruiker bevatten

Shared connection



Versus

Normal connection



Art 1 Interpretations

- Extended interpretation rule:
 - Priority articles of contract unless specific disposition in Annexe
 - Priority of content Annexe above “schéma unifilaire”



Art 6.1 (old art 5)– Confidential information

- Text has been adapted according to numerous remarks
- Communication to subcontractors/consultants, subject to same confidentiality obligation

Art 8.2 (old art 7.2) - État d’alerte, d’urgence, de panne généralisée (black-out) ou de reconstitution

-Addition: The Cocontractant “guarantees/ gives an undertaking/ vouch for” (se porter fort/sterkmaken) that the Significant Gridusers connected to the Installations of the Griduser (incl. a CDS) respects the Elia instructions in case of état d’urgence/black-out/ reconstitution

-Art 8.2 last 4§§ under construction according to the evolution of the rescue code



Art 8.3 – Force Majeure

- Clarifications on concepts such as:
 - processes & communication (f.e. phone + mail confirmation)
 - New: situation of exceptional risk during which the sudden unavailability of a CDS or Battery is caused
 - Terms (long force majeure)



Art 11 Invoicing and payment

- *Reference to annex 7 on the Digital Platform (ex. Invoicing address)*
- Timing for settlement of credit note: next invoice
- In case of electronic invoices: formal notice for late payment also per e-mail
- [Where can I consult my invoices in EPIC? – Help Center \(epic-portal.io\)](#)
- [Sign in - epic \(b2clogin.com\)](#)



Art 12.1 Consequences of interrupting/ending contract & 12.2 Contract Termination

- Clarification on the conditions for **Elia** to take initiative in interrupting/stopping a contract (see also full size management) if impact on grid security, reliability and efficiency,
 - in case of unilateral modification of connection installations,
 - In case of refusal to invest in modifications asked by Elia,
 - In case of impossibility for Elia to perform works due to lack of interruption time
- Clarification on the (similar) rights of the **GU** when using Elia as fullsize manager or Elia has the property of Connections Installations, also when risk for CDSU installations and for production/storage assets
- Clarification on the processes/communications duties of both parties around interruption (no interruption of payment of applicable tariff)



Main triggers:

- Feedback public consultation
- Interaction with part B
 - Experience based

Art 12.1 suspension of contract

EXISTING CONTRACT

Right to suspend for Elia and for GU

- For non-conformity of installations
- Affecting safety, reliability and efficiency Elia Grid/connection/connection third party GU, human safety (AREI, ...),
- End of LON validity

Process:

- Letter of default
- Consultation on works
- In case of default=> total/partly decommissioning or suspension,

NEW TEXT PROPOSAL: additions

- Clarification on the conditions for Elia to take initiative in suspending a contract (see also full size management)
- Scoping: installations GU + generation/storage assets and connection (if fullsize done by GU) having potential impact on Elia-grid
- Circumstances:
 - Cf existing text, except: ...LON ... => FON...
 - in case of unilateral modification of connection installations,
 - In case of refusal to invest in modifications asked by Elia,
 - In case of impossibility for Elia to perform works due to lack of interruption time
- Clarification on the suspension rights of the GU when using Elia as full size manager, also when risk for CDSU installations and for production/storage assets
- clarification on the process: total/partly decommissioning or suspension 5th day after 2nd letter

Main triggers:

- Feedback public consultation
- Interaction with part B
 - Experience based
 - Take into account reality behind the connection

Art 12.2 termination of contract

EXISTING CONTRACT

- Resolution
- By GU: 3 months notice when connection not used any more
- By ELIA: ...
 - Stop of the project
 - Non-use of connection (no current)
 - End of use of generation asset
 - Proposal to end contract, subject for the GU to propose maintenance of its rights for 3 reasons => approval by Elia on maintenance
- Based on agreement (essentially linked to stop of project or of activities of the Instalations)

NEW TEXT PROPOSAL: additions

- By GU: ...+ *dismantling agreement*
- By ELIA: rewording
 - Stop of the project *better substantiated*
 - Non-use of connection (no current/*voltage*)
 - End of use of generation+*storage* asset
 - *GU also to inform owner*
 - Proposal to end contract, subject for the GU to propose maintenance of its rights for 4 *reasons* => approval by Elia on maintenance (*right of appeal before CREG*)
 - *Dismantling agreement*
- Based on agreement : linked to end of activities of Installations + *dismantling agreement*
- Resolution : *partial or complete + dismantling agreement*

Art 12.3 Consequences of suspension-termination contract

- Specification that suspension/termination can be both partial or total
- Specification that cost of interventions in respect of decommissioning in case of suspension/termination is for GU if cause is non-conformity

Art 12.4 - CRM Participation

- General remarks on CRM have been taken into account, keeping it as “light touch”
- More details to be found in CRM functioning rules

Trigger: Avoid contractions with further evolutions of Functioning Rules



Art 13.3 Boiler plate clauses

- 13.3 modifications contact persons list: Arrangements with respect to EPIC info exchange
- 13.9 priority on existing contracts: limited to historic situations



Connection Contract – Part B – Conditions Techniques

Art 16 Condition precedent regarding the conformity of a new or modified Connection

Art 17.2 Property rights

New art 16 /Old art 8: Condition suspensive relative à l'utilisation d'une installation d'un nouveau raccordement ou d'un raccordement modifié

Clear description of conditions (conformity) for commissioning:

- only after EON/ION/LON

access point included in access contract

-contract OPA/SA

New article 17.2/ Old art 11: Droits de propriété intellectuelle

New § on IPR applicable in case of exchange of technical documents by the Parties.

Art 18.1/old art 12 Establishment, modifications, provision, management

Trigger:

- Better distinction between capex and opex
- consistency with tariffs

Owner of Connection Installations (partly or 100%) in charge of:

- Realisation in accordance with the modalities agreed between Parties in the framework of this Contract
- Modification:
 - Adaptation functionalities with physical impact on the installations
 - Relocations/adaptations required by public authorities and third parties
 - Renewal
 - Dismantling
 - Curative maintenance work after guarantee period (10/20 y) (19.3.1) or non-warranty interventions (art 18.2.2)
- If Elia is owner => application of tariffs
- Elia always owner of connections in its substations, except historical situations: 1st connection bay owned by GU: GU invests according to request Elia
- Commissioning subject to access point being part of access contract

Substantial nature of modification not relevant here

Tariff:

- 1st bay: periodic tariff
- Other connection installations:
 - Realisation/modification: price estimate
 - Existing: fin. Interventions GU taken into account



Triggers:

- Better distinction between capex and opex
- Experience based
- consistency with tariffs

Art 18.2/old 12.2 Light & Full-size Management

— Light :

- Monitoring of connection
- Operation ((de-) activation via command of 1st bay, selective (de-)activations via command of other bays for shared connections,
- Management of operation procedures (incl writing of operating notes)
- Definition of maintenance policy of connection installations
- Signaling alarms
- Clearing and commissioning

— Fullsize:

- (Includes light, if Elia owner or in charge of full size operation of connection installations concerned
- Switching operations on connection installations, including management of switching processes,
- Maintenance tasks
 - Administrative tasks (management of plans, schemes, legal doc)
 - Periodic maintenance (general rules in art 24 and Annex 3)
 - Curative maintenance (without change of characteristics, within guarantee period 10/20y)

Separate periodic light tariff (lumpsum) for installations not covered by fullsize operation

Principle:

- Elia on 1st bay: if not owned by Elia=>Elia decides: GU or Elia
- GU for other connection installations it owns; no obligation for Elia to take over/continue fullsize under certain conditions (non conformity, lack investments, interface point not asset based, ...)
- Fullsize management covered by periodic fullsize tariff



Art 18.2.3/old 12.2.3 Designation of the party in charge of Full-size management

Existing principles remain:

- For the first Connection Bay or the other Connection Facilities owned by Elia: Elia responsible full-size management
- For the first Connection Bay not owned by Elia: choice for Elia after consultation with GU (art.18.2.4)

New:

- For the other Connection Installations not owned by Elia: GU responsible full-size management without prejudice to historical situations (started before the start of this new version of Connection Contract)
- No obligation for Elia to take over/continue full-size under certain conditions (non- conformity, no transfer of guarantee, modification, lack of investments, no possibility to perform the necessary works, incident on other connection Installations and interface point not asset based)



Financial Guarantee & Art 19 Tariffs

- **Financial Guarantee (old art 14)**

- for new or substantial modification of connection is no longer requested

- **Tariffs (art 19/old art 13 Redevances):**

- Art 19.1 determination of tariffs also based on “Installations de comptage” not part of Connection Installations
- 19.2.2: deletion of reference to financial guarantee and clear description of “historical situation”
- 19.3.1: in case of full-size management by Elia: tariffs includes “light” management.
- 19.3.2: in case of full-size management by the GU: payment by GU of periodical tariffs for “light” management.



Link between the annexes and the core of the contract

- General clauses in Annexes moved to the relevant articles
- **Art 20 - description of the connection:** (identification of connection installations, installations of GU and, if and when, third party installations behind connection, which can have impact on security, reliability and efficiency grid) contains ‘must haves’ to be detailed in the annexes 1, 4 and 8.
- **Art 21 - Metering :** basis for both annex 4 (metering) and annex 4bis (new – submetering); includes general clauses of annex 5 (power quality) and describes (potential) interfering installations requiring conformity study, role of Elia RE technical specs on protections, complementary technical requirements for Installations, calibration and precision control of metering equipment, transition regime for non-conform metering equipment
- **Art 22 - conformity of installations:** conformity with (new) regulatory framework; information duty on non-conformity, deterioration and modifications; clarifications
- **Art 23 - protection of and access to installations:** clarifications
- **Art 24 - management and maintenance:** clarifications on management (see annex 2) and maintenance (see annex 3); sharing of electric diagrams of installations; clarification of switching process and of rules in case of planned outages; in general, better distribution of content between annexes and this article
- **Art 25 - data exchange:** cf. infra
- **Art 26 - permitting:** some clarifications

Art 20/ old article 15 Description of the Connection and Installations that may have an influence on the safety, the reliability and/or efficiency of the Elia-Grid and the metering installations

Art 20.1: General:

new §§:

Territorial limitations

“Le Point de Raccordement et le Point d’Interface pour les Installations de haute tension se trouvent en tout cas sur le territoire de la Belgique ou dans sa zone économique exclusive. Les Installations qui se trouvent au-delà de ses frontières sont d’office considérées comme des Installations de l’Utilisateur du Réseau. »

Rights of use on Optical Fibres

« L’Annexe 1 identifie les liaisons basse tension et/ou fibres optiques nécessaires pour assurer les services de communication dans le cadre de l’exploitation du Raccordement. Dans la mesure où ELIA n’est pas Propriétaire des Installations de Raccordement, elle se réserve le droit d’utilisation sur les autres fibres optiques et/ou liaison basse tension faisant partie des Installations de Raccordement . »

Art 20.2: Identification

- Point 2 of current Annex 1: Protections, is integrated in the main body of the contract.
- Minimal content of Annexes 1,4, 4 bis and 8 is listed.
- New in Annexe 1 and 4bis: Delivery Points.
- Description of « schéma unifilaire » in Annexe 8

Art 21/ old art. 16 Counting and metering

- Art 21.1 Description of **Installations de (Sous-) Comptage** and **method of calculation** in

*Annex 4: **MESURES ET COMPTAGES AINSI QU'ÉCHANGE DE DONNÉES***

*Annexe 4bis: **INSTALLATIONS DE SOUS-COMPTAGE***

- Art 21.2 Procedure of **DP creation**

In case of DP different from Access point a submetering installation is installed

- Art 21.3 Power quality

Integration of content of current Annex 5 in this article

Description of Disturbing Installations

Annex 5: rules for disturbing installations in different stages (evaluation procedure of emission limits)

- Art.21.6 Calibrations and 21.7 Transitory Provisions

Content from current Annex 4 moved to body of contract

Art 22/ old art 17 Conformity of the Installations

Art. 23/old art 18 Protection of and access to the Installations

Conformity (art 22)

Art 22.2 General

- Conformity of Installations of GU and **all other Installations** with possible impact on Elia Grid (incl Installations of CDS user)
- Reference to technical specifications in “Etude de Détail” in annexe 7 and relevant annexes

Art 22.5 Tests: clarification and more structure

Protection and Access (art 23)

- In case Elia employees don't meet safety requirements, the GU will guide these employees
- Contract to be signed (see template Annex 3) pursuant to the law of 04.08.1996 also in case of access to Installations of the GU or other persons.
- The GU also provides power to ELIA's facilities on its site, including security and telecommunications facilities and interface cabinets, as further described in Annex 1

Art 24/ old art 19 Operation and maintenance of Installations that may influence the safety, reliability and/or efficiency of the Elia Grid

Art 24.1 General

Specific arrangements between the Parties related to operation and maintenance/other interventions of Connection Installations in Annexes 2 and 3.

Also specific arrangements related to operation and maintenance of GU Installations that may influence the safety, reliability and/or efficiency of the Elia Grid.

New:

The Co-contractor will provide ELIA with single line diagrams of the GU's Installations at its request and will notify ELIA of any changes to these single line diagrams. ELIA may request that these be uploaded to the Digital Platform.

Description of content of these single line diagrams.

Art 24.2 Planning

Applicable instructions defined in art 24 and completed with specific arrangements in Annex 2.

Specific rules and procedure in case of planned interruptions, necessary to perform maintenance on Elia Grid and other Installations by Elia.

Art 24.4 Maintenance of buildings, grounds and fences

Each Party shall be responsible for the maintenance and repair of the buildings and grounds owned by it or over which it has a right of use granted by a third party.

Specific obligations of GU: cleaning, maintenance, deratting, fire-protections system, etc...

Art 24.6: Security measures and procedures (content from current annex 3)

- Manoeuvres
- Certificate of provision
- Work permit
- Earthing
- Safety equipment

Art 25/ old art 20 Data Exchange

New art 25.2 (Data published by Elia)

The data required by the European Transparency Regulation are to be transmitted by the Co-contractor to ELIA for publication by ELIA on the ENTSO-E platform.

New 25.3 (Structural Data- Identification Data)

The Co-contractor 'Network User' will provide the structural data relating to the Electricity Generating Installations or Energy Storage Installations (as listed in Annex 1) connected to the Elia Network and located on its site, as well as the identification data of the owners of the aforementioned Installations, in order to assess the impact of these Installations on the safety, reliability and efficiency of the Elia Network.

New art 25.4 Designation of OPA/SA

GU responsible in the name and on behalf of the Owner of Electricity Generating installations, Energy Storage Facility or consumer installations, for appointing the person responsible for unavailability planning ('OPA') and the person responsible for scheduling ('SA'), on the basis of the declaration of the Network User included in the appendix to the OPA contract and the SA contract.

Art 26 Permits/ Old art 21

Article aligned with specific regional legislation and modified content of Connection agreement

General overview of Annex contents

1. Description of connection and installations GU : more detailed and restructured
2. Management of connection: general rules moved to core of the contract
3. Maintenance of connection: general rules moved to core of the contract
4. Metering and 4bis sub metering: more detailed and restructured, new references, general rules moved to core of the contract.
5. Power Quality: general rules moved to core of the contract
6. Tariffs: PM
7. Modalities for the execution of works: cf. infra
8. Plans and diagrams
9. Shared connection: specific arrangements (see also new chapter in code of conduct)
10. Offshore connections: based on existing documents

Former annex 7 (contact details) embedded in EPIC



Alignment new regulation

2009 =>2023 : new regulation

⇒ new wording, new references, new definitions,

Eg. Netcodes, code of conduct since split of federal grid code, ...

⇒ Compliance with new regulation

Eg. technical requirements RFG, DCC, commissioning new/ modified connection or installation
GU dependent upon, not only upon inclusion of access point in access contract but also upon
EON, ION, FON depending on applicable rule



Annex 3 SPECIFIC AGREEMENTS FOR MAINTENANCE AND OTHER INTERVENTIONS ON CONNECTION INSTALLATIONS THAT MAY AFFECT THE SAFETY, RELIABILITY OR EFFICIENCY OF THE ELIA GRID

- General rules moved to core of the contract
- Indication of « full-size » management responsible per installation
- Limits of management of installations
- Periodical maintenance obligation for Party in charge of Full size management: For some maintenance/inspection/monitoring activities, the time between maintenance/inspection/monitoring is determined by the condition and/or technology of the asset and/or environmental factors. The period between two maintenance/inspection/checks may be longer in case of good condition and/or new technology or shorter in case of bad condition, but never longer than the maximum periods specified below, if applicable. In the absence of a "maximum" or "average" time, the times are fixed.
- Specific arrangements between the Parties related to operation and maintenance/other interventions of Connection Installations-see template

Annexes 4, 4bis, 5, and 6

Annex 4: Mesures et comptages ainsi qu'échange de données

Annexe 4bis: Installations de sous-comptage

Description of Installations de (Sous-) Comptage and method of calculation in

Annex 5 Power Quality & 6 Tariffs general rules moved to core of the contract

Annex 7 : TERMS AND CONDITIONS AND TIMEFRAMES FOR THE INSTALLATION OF A NEW CONNECTION OR SUBSTANTIAL MODIFICATION OF AN EXISTING CONNECTION, AS WELL AS THE COMMISSIONING OF A POWER GENERATION UNIT

- Deadlines: regime already integrated at the occasion of CRM related modifications has been further clarified and completed with assumptions.
- Deadlines and scoping of GU's works (Installations and/or connection) clarified
- General requirements and information exchange
- Financial modalities (< GC detailed study)
- Complementary works (< GC detailed study)

=> Technical specs of detailed study will be integrated in other annexes, after commissioning.



Annex 8 (Plans and diagrams) revised

- Centralization of all plans & diagrams in this Annex.



Annex 9: Modalities of Shared Connection

- In accordance with the provisions of the Code of Conduct and, where applicable, the Regional Technical Regulations, an agreement shall be entered into between the GU's sharing the Connection, setting forth the rights and obligations of each GU with respect to such Shared Connection in accordance with this Annex. This Annex specifies certain additional terms and conditions of the Agreement as a result of the sharing of Connection Installation.
- This Appendix contains the specific terms and conditions regarding the conformity of the Shared Connection, the limits of ownership and management of the Shared Connection Installations, as well as the roles and responsibilities regarding the maintenance and operation of the Connection Installations that are not owned and, if applicable, managed by ELIA.
- Before the Shared Connection is realised, the affected Network Users shall also agree on financial compensation. Where applicable, this Annex shall also contain the operational restrictions on connection and access for the new Network User.

Annex 10 Offshore

- Formalization of an already informally used Annex
- More generic concept of « Offshore installation » rather than « island » or « platform »
- No « right of way » (servitude) for 3rd parties on Elia's offshore installations



Necessary changes for ICAROS



Context - Designation of the Outage Planning Agent (OPA) and Scheduling Agent (SA)

- Regulatory framework is not ‘aligned’ regarding **who is responsible to appoint OPA and SA**

	Article	OPA/SA appointed by
SOGL	89 and 110	Asset Owner
Reglement Federal + Vlaams		Grid User

- **Asset and Asset owner** need to be defined

- An Asset refers to a Technical Facility (demand facility or a power generating module (PGM including sPGM and PPM))
 - Technical Facility **is or should be explicitly listed** in the Connection Contract with the relevant system operator. PGMs are identified currently in the Connection Contract, but this is not the case for Demand Facilities
- Assets owners of these Technical Facilities are currently not identified in the Connection Contract
- There is currently no legal relation between Elia and the Asset Owner (nor in the electricity law nor in the Code of Conduct)
 - Role of Asset owner is to be formalized

Modifications to Connection Contract

List of Technical Facilities and Asset Owners

- List of all (sPGM, PPM, Demand facilities) Technical Facilities
- Clear identification and formalization of the role of the Asset owner → per Technical Facility, identification of the Asset owner (the Grid User of a third party) including the necessary contact details

Appointment of OPA/SA per Technical Facility

- By default: responsibility of the Grid User of the Technical Facility
- **Possibility to delegate the appointment** of service providers (SA and OPA) from the Grid User to the concerned Asset owner via a **jointly signed declaration in the Connection Contract (new annex)**.
 - Define if Asset owner or Grid User will have the responsibility to assign the SA and OPA per technical facility.
 - Grid user remains end responsible in the framework of its connection contract in case the Asset owner fails to take up its responsibilities
- Appointment of SA/OPA remains in respective SA/OPA contracts by Grid User or Asset owner (via a Grid User or Asset owner declaration)

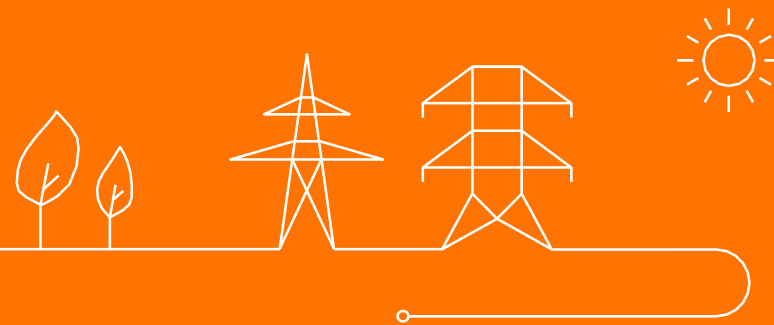


For CDS:

- The CDSO is seen as Elia's counterpart and as such as 'Grid User' (as he signs the connection contract with Elia)
- The CDSU (CDS-user), in this framework, will be able (after delegation by the CDSO) to appoint the SA and OPA (as described above for the 'Asset owner').



Thank you



Agenda

1. **Tariff proposal 2024-2027:** results of public consultation
2. **Access contract:** main modifications
3. **Connection contract:** main modifications

4. Incentives

4.1. Hosting capacity maps

4.2. Incentive MVAR

4.3. Incentive CBA: Cost benefit analysis on Requirements for Generators applicable on existing and new generating units between 1 and 25 MW

5. Miscellaneous

5.1. Next meeting: Tuesday, 5 September 14h – 17h



Roadmap to publication of Hosting Capacity Maps

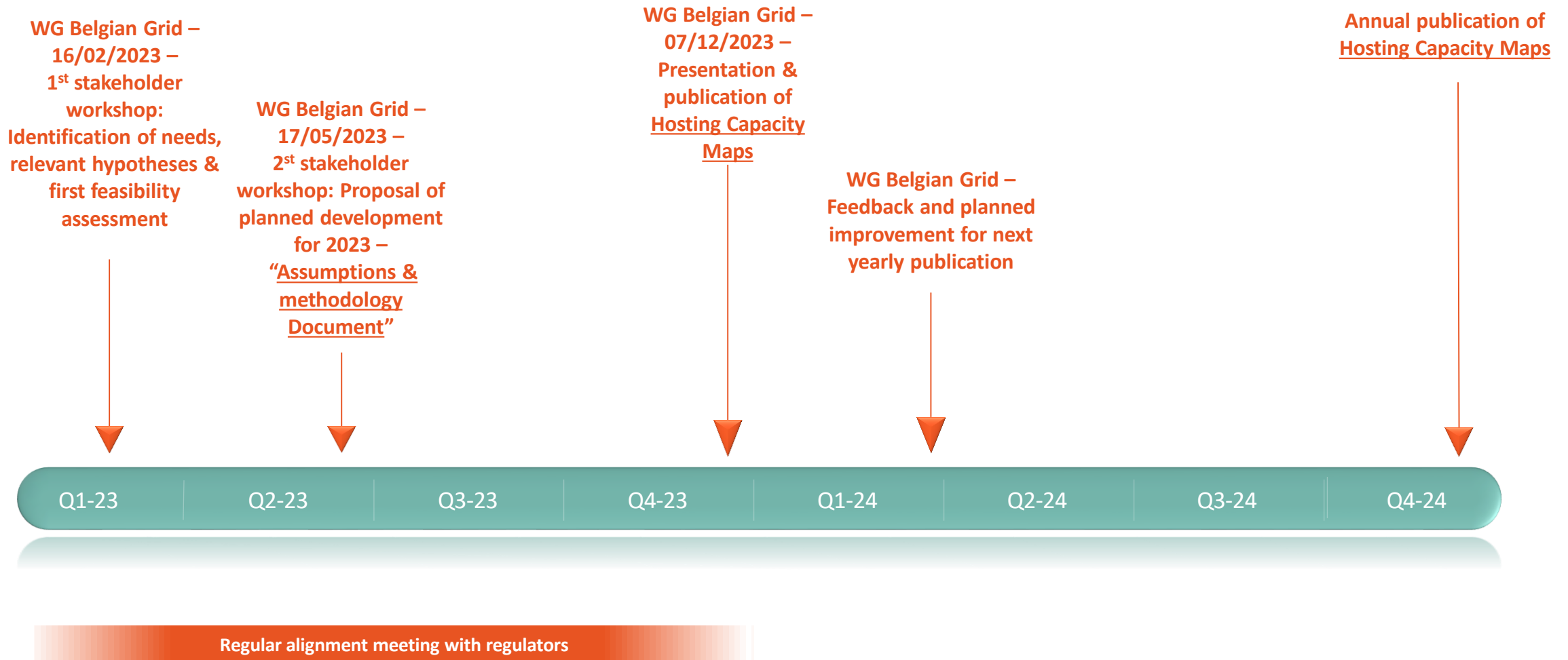
WG Belgian Grid

17/05/2023 R. Devolder, N. Bragard, J. Sprooten

Agenda

1. Planning and milestones
2. Recap of Stakeholder comments received
3. Proposed hosting capacity map
 - an interactive tool
 - assumptions & methodology
 - disclaimers
4. Conclusion & next steps

Planning and milestones



Agenda

1. Planning and milestones
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Recap of Stakeholder comments received

Overall, we see indeed that such a digital map would be very useful, even if the main bottleneck for larger projects are related to permits, connection is often also a big hurdle for project developers.

Comments/remarks:

- The map should not cause large projects to avoid Belgium because of insufficient hosting capacity. → disclaimers needed
- Is the validity period of the map sufficient? It will be outdated after each new capacity reservation.
- The hosting capacity is needed on the substation level and a distinction per voltage level is relevant.
- Target Year? Y+3 is probably the most useful time horizon. However, considering new investments on a longer time horizon could be interesting. (e.g. Y+5 or Y+6)
- The information shown on the map should also be available in a numerical format. (e.g. Excel file)
- Batteries could also help the grid → need to take into account a certain flexibility in the production/consumption profile.
- A common hosting capacity map TSO-DSO would be useful to also have a view on the lower voltage levels.
- Elia should increase the hosting capacity in regions where there is insufficient. Various grid users require firm capacity.

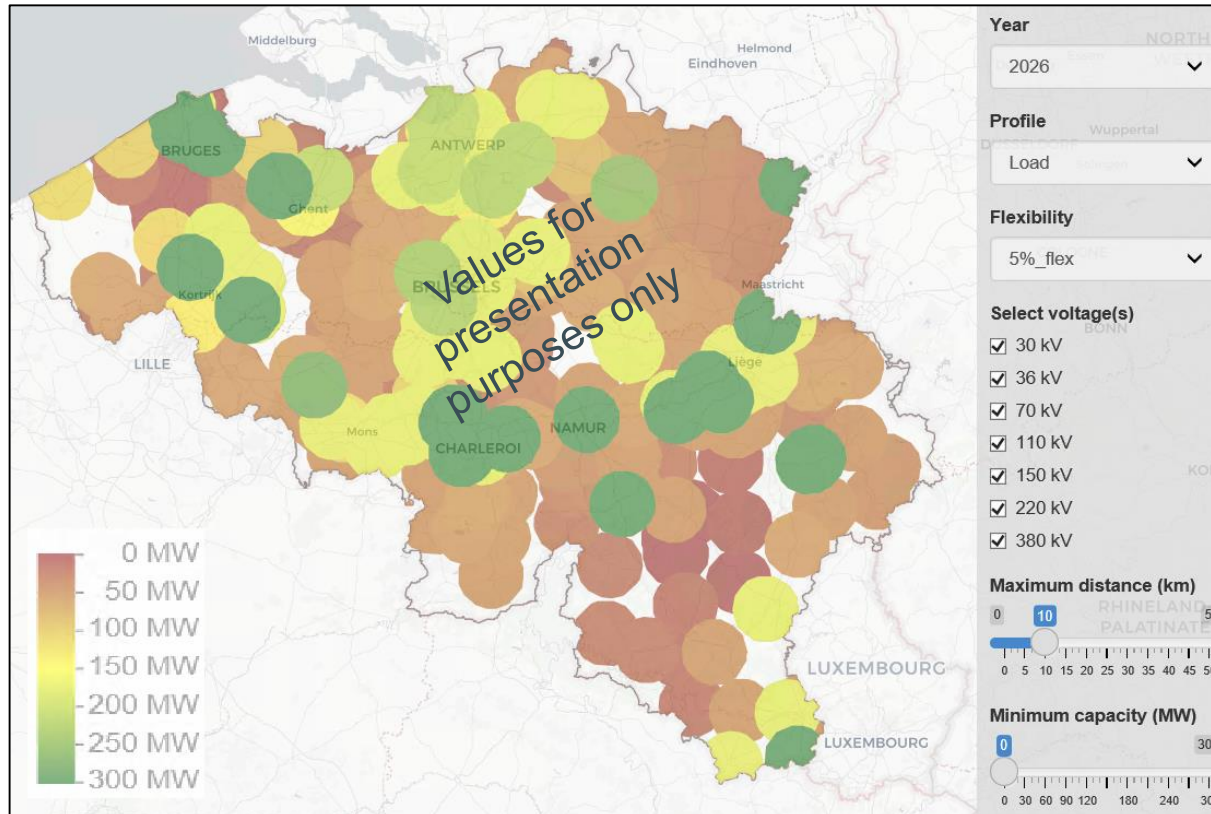
Agenda

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Proposed hosting capacity map - an interactive tool

- **Mock-up** showing the outcome of a selection

Dynamic map based on user input:



- **Target year:** 2026 or 2031
- **Type grid user (new connection):**
 - Load } Flat profile (production & consumption equally likely at all times)
 - Generation }
 - Batteries }
 - Solar } Specific profile based on weather conditions
 - Wind }
- **Possibility of curtailment of energy:** none (0%) or limited amount (e.g. 5%)
- **Voltage levels:** 30kV, 36kV, 70kV, 110kV, 150kV, 220kV and/or 400kV
- **The maximum distance:** e.g. 1km, 5km, 10km or 20km (part B)
- **The minimum connection capacity in MW**

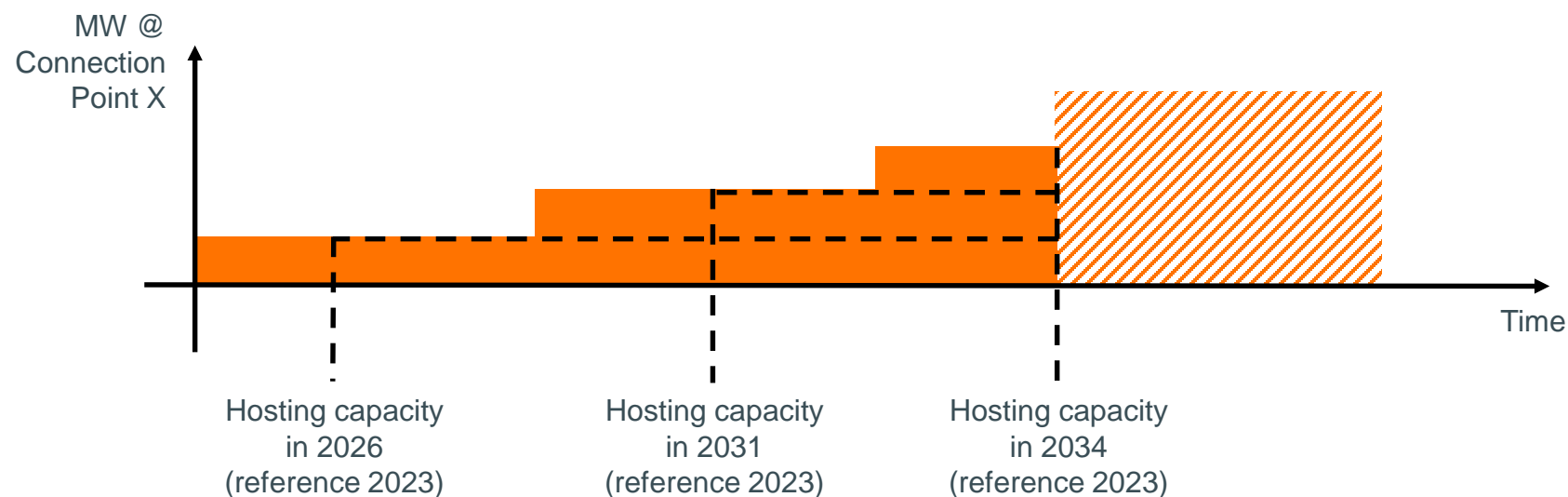
- Additionally, the hosting capacity will also be available in an Excel format

Proposed hosting capacity map - Assumptions & methodology (1/4)

- The hosting capacity takes into account future reservations & foreseen evolutions of the development plans

→ The displayed hosting capacity needs to be available until 2034

(if necessary Elia will propose new investments in future development plans to maintain the hosting capacity >2034)



Proposed hosting capacity map - Assumptions & methodology (2/4)

- A reference context is defined based on the expected situations of the electrical system in future years. It is built on the basis of :

Reference context contains

the planned evolution of the electrical network

the capacities reserved for new or increase of load, injections & storage

an evolution of the global level of load (from consumption facilities and storage units) and injections (from generation and storage units)

the geographical distribution of load and injections

- For the computation of the local hosting capacity, this reference context is then locally* adapted as follows:

For hosting capacity of ...

the following capacities of the local* reference context is set to zero

renewable energy generation unit

local* non-reserved capacities of generation and storage units

non-renewable energy generating unit

local* non-reserved capacities of non-renewable energy generating units and storage

consumption facility

local* non-reserved capacities of consumption and storage facilities

storage unit

local* non-reserved capacities of non-renewable energy production units and storage units

*local: nearby capacity in concurrence with the computed hosting capacity

Proposed hosting capacity map - Assumptions & methodology (3/4)

- The transmission system is a network infrastructure which is of common interest (societal interest)
- In order to reach this objective, Elia is entitled to propose connections for grid users which are inline with an harmonious development of the transportation system
- In the computation of the hosting capacity maps, this is translated into a limitation of the hosting capacity per voltage level in order to avoid that a socialized grid reinforcement is only benefiting a single grid user.

For voltage levels ...	Hosting Capacities are limited to ...	
30 & 36kV	60MW in main* substation	20MW in remote* substation
70kV	60MW in main* substation	50MW in remote* substation
110kV	150MW in main* substation	100MW in remote* substation
150kV	300MW in main* substation	175MW in remote* substation
220kV	175MW in main* substation	175MW in remote* substation

* Main substation, supplied by injection transformer from higher voltage levels

* Remote substation, supplied by cable or line from other substation of the same voltage level

Proposed hosting capacity map - Assumptions & methodology (4/4)

- LV load and generation evolution
 - The hosting capacity of generation and storage is reduced at local level by the expected evolution of low voltage distribution-connected PV which do not require a capacity reservation
 - => A % share of the future non-reserved PV of each substation will be considered as a representation of the LV part. This share will be considered as “pre-reserved”
 - The hosting capacity of demand and storage is reduced at local level with the expected evolution of low voltage distribution-connected load which do not require a capacity reservation
 - => A % share of the future non-reserved PV of each substation will be considered as a representation of the LV part. This share will be considered as “pre-reserved”
- Operational means to increase hosting capacity
 - A small additional margin (x%) is allowed on all potentially limiting grid elements where operational solutions, not modeled in the tools, are expected available to increase hosting capacity (e.g. optimization of the grid topology, PST taps, curative actions,...)



Proposed hosting capacity map - Disclaimers

- **Scope:** This map visualizes an approximation of the hosting capacity for Elia grid capacities < 300MW.
 - Higher capacities cannot be estimated without location-specific detailed analysis
 - Connections on low voltage grids are possible, regardless of the hosting capacities provided in this map.
- **Validity:** All information shown is non-binding, but based on the best estimation of scenarios and realization of the infrastructure project portfolio known at the time of computation of these maps.
- **Uncertainty:** The later is the time horizon for the computed hosting capacity, the higher is the uncertainty in the hosting capacity determination due to uncertainties in the forecasting of the reference context as well as the possibility to adapt the development plans.
- **Added value of connection studies:** Identifying the actual hosting capacity always requires expert analysis, calculations based on the latest information and considering voltage, short-circuit power, stability phenomena, permits, technical feasibility, grid and topological optimizations as well as adaptation of the development plans in common interest of society. Therefore grid user connection proposal could either go beyond or be more limited than the values computed in these maps.
- **Involvement of Elia:** Please do not hesitate to contact Elia to discuss your grid connection needs. The sooner Elia is involved in your project, the sooner a suitable solution can be developed.

Agenda

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Conclusion & next steps

- Elia will continue the development of the hosting capacity map
- The hosting capacity map will be presented & published during the WG Belgian Grid of 07/12/2023
- A feedback session will be organized in 2024 in the WG Belgian Grid to identify improvements for the next yearly publication

Thank you.



Agenda

1. **Tariff proposal 2024-2027:** results of public consultation
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3. **Connection contract:** main modifications

4. Incentives

4.1. Hosting capacity maps

4.2. Incentive MVAR

4.3. **Incentive CBA:** Cost benefit analysis on Requirements for Generators applicable on existing and new generating units between 1 and 25 MW

5. Miscellaneous

5.1. Next meeting: Tuesday, 5 September 14h – 17h



Voltage service - Incentive

17/05/2023

MVAr service incentive – Summary

Context and goals of the incentive

- Following entry into force of the new design in 2020, some **return of experience** is available
- This study intends to analyze **further possible design improvements** for the voltage and reactive power control service in order to:
 - Optimize the efficiency of the service and the remuneration
 - Increase participation to the service

Content of the study

- Identification of **design improvements** together with market parties and the CREG and proposal of solutions
 - Based on **return of experience** from the current design
 - Including at least a review of the modalities for the penalties
 - Realization of a **EU benchmark** concerning the components (fixed or variable) for an **ideal remuneration** of the service
 - Specific analysis of the potential improvements that **might facilitate the participation of non mandatory units** (such as demand response) to the service
 - Identification of **evolutions of the market design** to facilitate the participation of non-mandatory units
 - Adequate procurement mechanism for the participation of non-mandatory units
 - Other aspects: type of service allowed/recommended (automatic, manual or other), simplified prequalification/communication process/tools for non mandatory units...
- ➔ This analysis will consider a **ratio between the potential** that represent these units for the voltage and reactive power regulation as well as their added value for the service **compared to the additional costs and complexity**



MVAr service incentive – Review and recommendations for design optimisations

1. **Continuous** activation control for manual and automatic activation
2. **Penalties**
 1. With continuous activation control, the penalties for the manual control will become similar to the automatic control
3. **Simplification** for the participation of smaller units
 1. Investigate whether a derogation on the **communication requirements** can make the participation more feasible
 2. Improve the broad understanding of the service
 3. Cost optimization of the participation
4. **Dynamic versus static remuneration**
 1. Investigate the value of the different types of units for the power system
5. **Remuneration of the service**
 1. Review based on the European benchmark
6. **Communication** with Elia
 1. The current communication is done via Revolt and is limited in the type of messages that can be sent.
 2. Investigate the option for additional interactions
7. Indication of the **need for MVAR service**
 1. In order to be able to better estimate the number of activations for a certain unit, the need in a certain area will be better clarified
8. **Price setting** during the tendering process
 1. The possibility of offering a formula instead of a fixed price is being investigated
 2. Review the options of prices and bandwidths that can be offered
9. **Participation of units on an industrial site**
 1. Improve the interactions with the grid tariffs for reactive power
10. Introduce the option to send a zero setpoint to units that are below the Pmin



MVAr service incentive– Planning

Indicative timeline:



Agenda

1. **Tariff proposal 2024-2027:** results of public consultation
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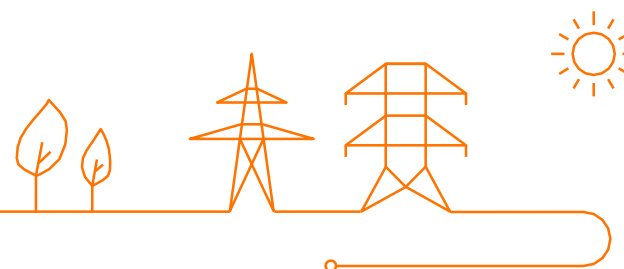
**Cost benefit analysis on Requirements for
generators applicable on existing and new
generating units between 1 and 25 MW**

Belgian Grid

17/05/2023 | N. Bragard, O. Bronckart, C. Hoedenaeken, S. Temtem

Agenda

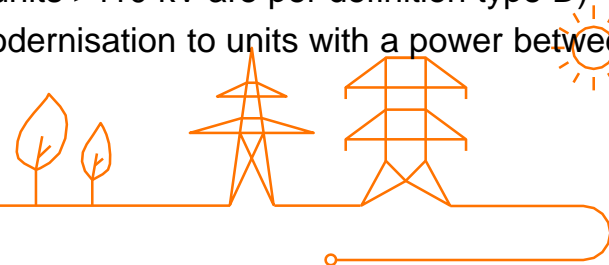
1. Objectives of the incentive
2. High level methodology
3. Planning and milestones



Objective of the incentive

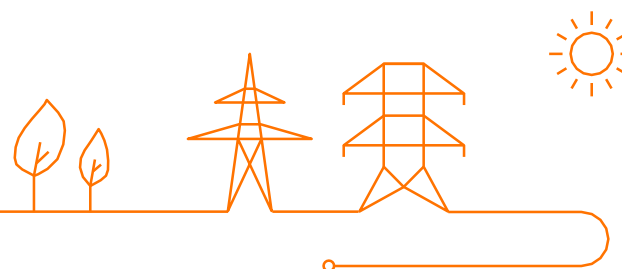
The objective of the incentive is to :

- Identify the differences between the prescriptions applicable to existing and new PGMs between 1 and 25 MW (not included) and connected to Elia grid (Belgium).
- Perform a cost-benefit analysis :
 - Focused on the PGMs with a power between 1 and 25 MW
 - on the possible application on existing PGMs of requirements applicable to new PGMs
 - by applying the methodology described in the EU code RfG (art 4, 38 & 39)
- The outcomes of the CBA will be used as an input for:
 - Application of Art 4.1b of the EU code RfG (application of some new requirements on existing units by the regulatory authority)
 - Possible prolongation of the derogation from the application of the principle of substantial modernisation for PGMs of type D with a maximal installed capacity lower than 25 MW and > 110 kV (all units >110 kV are per definition type D)
 - Evaluate the opportunity to extend the concept of substantial modernisation to units with a power between 1 and 25 MW (currently substantial modernisation is only applicable to type C & D units)



Agenda

1. Objective of the incentive
- 2. High level methodology**
3. Planning and milestones



What are the requirements applicable to new PGMs between 1 and 25 MW ?

Official requirements (also sent to clients)



Elia all levels : EU Codes (RFG&DCC)



Elia regional level: Requirements of general application
→ approved officially by the 3 regional regulators



Elia federal and regional levels : Grid codes



Elia all levels : Connection contract approved by all regulators



Elia all levels : "Technische richtlijnen voor de aansluiting van decentrale producties" & "Technische specificatie voor de aansluiting van netgebruikers"



Elia all levels : RGIE

Internal notes

Requirements	Requirements Reference Document	Compliance	Overall Status
1) Data Questionnaire			
1	data questionnaire	FGC: Art 354 and Annex 3	Compliance proof
2) PGM internal statement of compliance (RGIE, Icc max, fault clearing time, agreement on protection scheme)			
2	Equipment and protection requirements - RGIE	RFG : Article 32	Compliance proof
2	Equipment and protection requirements - Annexe 1B - Icc max	Grid codes annexes applicable to new installations (FTR : art. 43)	Compliance proof
2	Equipment and protection requirements - Annexe 2B - Protections	Grid codes annexes applicable to new installations (FTR : art. 44)	Compliance proof
2	Specific protections scheme agreement	GR RFG: 4.2.1	Compliance proof
3) Statement of Compliance via simulations or by proof/documentation			
1	Simulation models	Simulation Document	Model
1	Model documentation/Userguide	Simulation Document	Model
3	Frequency withstand capability	GR RFG: 3.1.1	Compliance proof
3	Rate of Change of Frequency (ROCOF)	GR RFG: 3.1.2	Compliance proof
3	Maximum allowable Power Reduction	GR RFG: 3.1.5	Compliance proof
3	Voltage withstand capability	GR RFG: 2.1.1	Compliance proof
3	LFSM-O	GR RFG: 3.1.4	Simulation Needed
3	Reactive Power Capability	GR RFG: 4.4.2	Simulation Needed
3	Fault Ride Through	GR RFG: 4.4.1	Simulation Needed
3	Fault current & dynamic voltage support	GR RFG: 4.4.3	Simulation Needed
3	Post-fault power active recovery	GR RFG: 4.4.4	Simulation Needed
4	Information exchanges (communication channels)	GR RFG: 4.2.2	
4	Information exchanges (content)	GR RFG: 4.2.2	
5	Remote Control Reductions	GR RFG: 4.1.1	Compliance proof
6	Power quality requirements (if required)	Connection contract	Compliance proof
7	Automatic Connection	GR RFG: 3.1.7	Compliance proof
7	Automatic Reconnections	GR RFG: 4.1.2	Compliance proof
8	Loss of Main Protection by ROCOF	GR RFG: 3.1.3	Compliance proof
4) Presence of a decoupling protection			
8	Verification of presence of decoupling protection (Elia standards)		Compliance proof
5) Compliance statement of the connection (VISA for MSI) and requested additional equipment by Elia			
0	Compliance of the connection	FGC: 159	Compliance proof
6) Planned tests			
0	List and agreement of planned tests	FGC: Art. 177	List of tests
ION			
7) Statement of Compliance by field tests			
3	Active Power Control	GR RFG: 4.1.1	Test needed
3	LFSM-O	GR RFG: 3.1.4	Test needed
3	Voltage Control	GR RFG: 4.4.2	Test needed
3	Reactive Power Capability	GR RFG: 4.4.2	Report
4	Telecom tests (communication channels)	GR RFG: 4.2.2	Test needed
4	Telecom tests (content)	GR RFG: 4.2.2	Test needed
6	Power quality tests (if required)	Connection contract	Test needed
7	Automatic Reconnection	GR RFG: 4.1.2	Test needed
0	Test Report		Report
0	Wire Break Test		Test needed
8) Committed Data submission (updated data questionnaire, model tuning and validation)			
1	Availability of updated data questionnaire		Compliance proof
FON			

Example of a check-list for compliance of a type B PPM

Types of requirements for new PGMs type B:

- 1) Data questionnaire & models
- 2) Internal compliance proof (RGIE) & protection scheme
- 3) Voltage & frequency requirements
- 4) Real-time information / Telecom requirements
- 5) Balancing/Congestion management requirements
- 6) Power quality requirements (as from 10 MW)
- 7) Emergency & restoration requirements
- 8) Protections requirements



Comparison with requirements applicable to existing PGMs between 1 and 25 MW?

Requirements applicable to existing units

Comparison table

Official requirements



Elia federal and regional levels: Grid codes (section existing units)



Elia all levels: Connection contract approved by all regulators

Internal notes



Elia all levels: "Technische richtlijnen voor de aansluiting van decentrale producties" &

"Technische specificatie voor de aansluiting van netgebruikers"

Official requirements



Elia all levels: RGIE

Requirements	Applicable to Existing unit ?
1) Data Questionnaire	
1 data questionnaire	Y
2) PGM internal statement of compliance (RGIE, Icc max, fault clearing time, agreement on protection scheme)	
2 Equipment and protection requirements - RGIE	Y
2 Equipment and protection requirements - Annexe 1B - Icc max	Y
2 Equipment and protection requirements - Annexe 2B - Protections	Y
2 Specific protections scheme agreement	Y
3) Statement of Compliance via simulations or by proof/documentation	
1 Simulation models	Y
1 Model documentation/Userguide	Y
3 Frequency withstand capability	Y
3 Rate of Change of Frequency (ROCOF)	N
3 Maximum allowable Power Reduction	Y
3 Voltage withstand capability	Y
3 DeltU/F range	Y
3 LFSM-O	N
3 no equipment that will act against the primary control of the system	Y
3 Reactive Power Capability	Y
3 Fault Ride Through	Y
3 Fault current & dynamic voltage support	Y
3 Post-fault power active recovery	Y
3 Voltage Control	N
4 Information exchanges (communication channels)	N
4 Information exchanges (content)	N
5 Remote Control Reductions	N
6 Power quality requirements (if required)	Y
7 Automatic Connection	N
7 Automatic Reconnections	N
8 Loss of Main Protection by ROCOF	Y
4) Presence of a decoupling protection	
8 Verification of presence of decoupling protection (Elia standards)	Y
5) Compliance statement of the connection (VISA for MSI) and requested additional equipment by Elia	
O Compliance of the connection	Y
6) Planned tests	
O List and agreement of planned tests	N
ION	
7) Statement of Compliance by field tests	
3 Active Power Control	N
3 LFSM-O	N
3 Voltage Control	N
3 Reactive Power Capability	N
4 Telecom tests (communication channels)	N
4 Telecom tests (content)	N
6 Power quality tests (if required)	N
7 Automatic Reconnection	N
O Test Report	N
O Wire Break Test	N
8) Committed Data submission (updated data questionnaire, model tuning and validation)	
1 Availability of updated data questionnaire	N
FON	

For example only... work in progress...

Selection of requirements to be analysed via the CBA:

- Requirements already applicable to existing PGMs : **out of scope**
- Requirements applicable only for new PGMs : **in the scope**
- Requirements already applicable to existing PGMs but in a different way: **in the scope**



Number of existing and new PGMs between 1 and 25 MW

Amount of existing vs new PGMs (#)

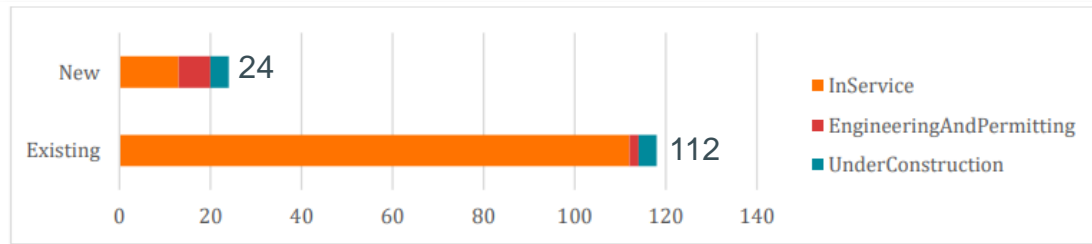


Figure 1 Amount of new and existing PGMs connected to the Elia network

Amount of existing vs new PGMs (MW)

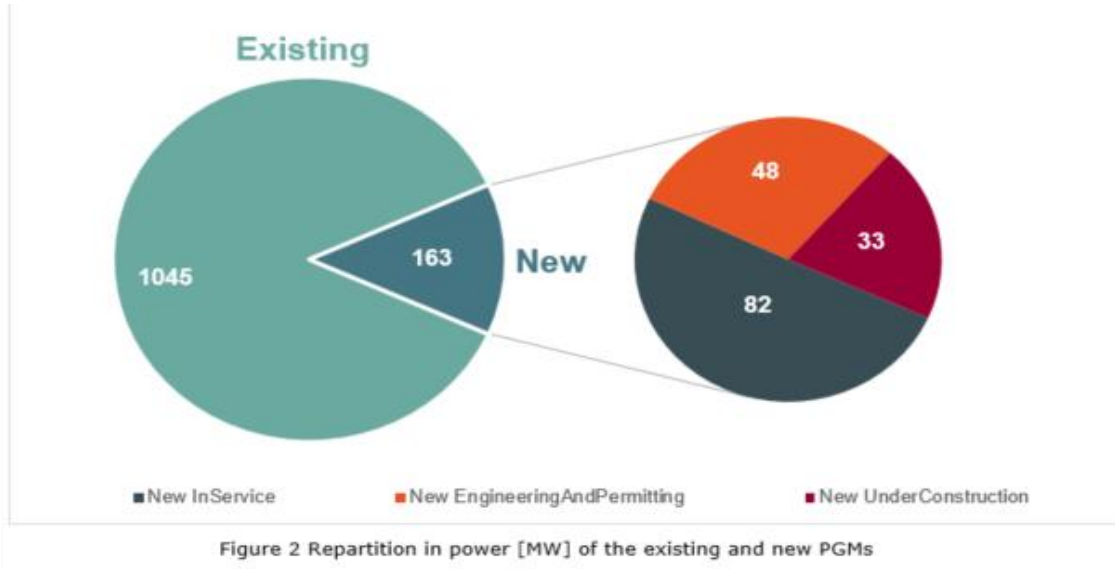


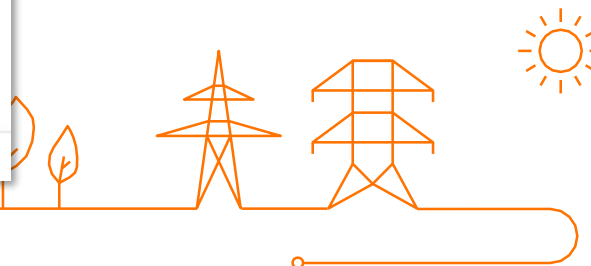
Figure 2 Repartition in power [MW] of the existing and new PGMs

From a pragmatic point of view:

- Elia communicated requirements for new PGMs as from 27/04/2019 (date of publication of federal grid code) at federal and regional level

Conclusion:

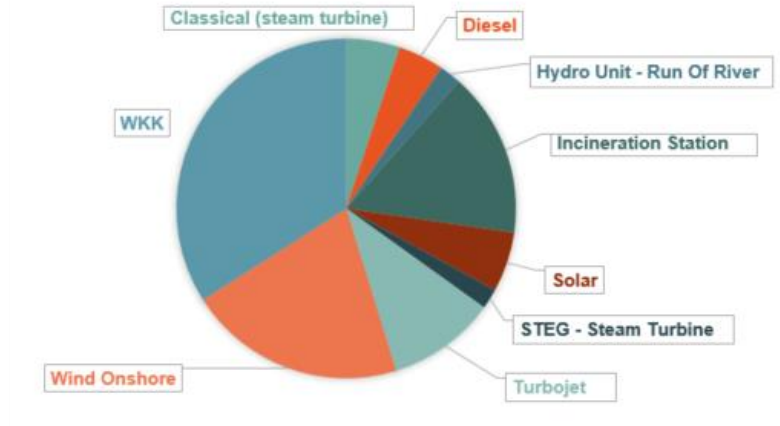
- All PGMs whose detailed study was still open after 27/04/2019 are considered as new



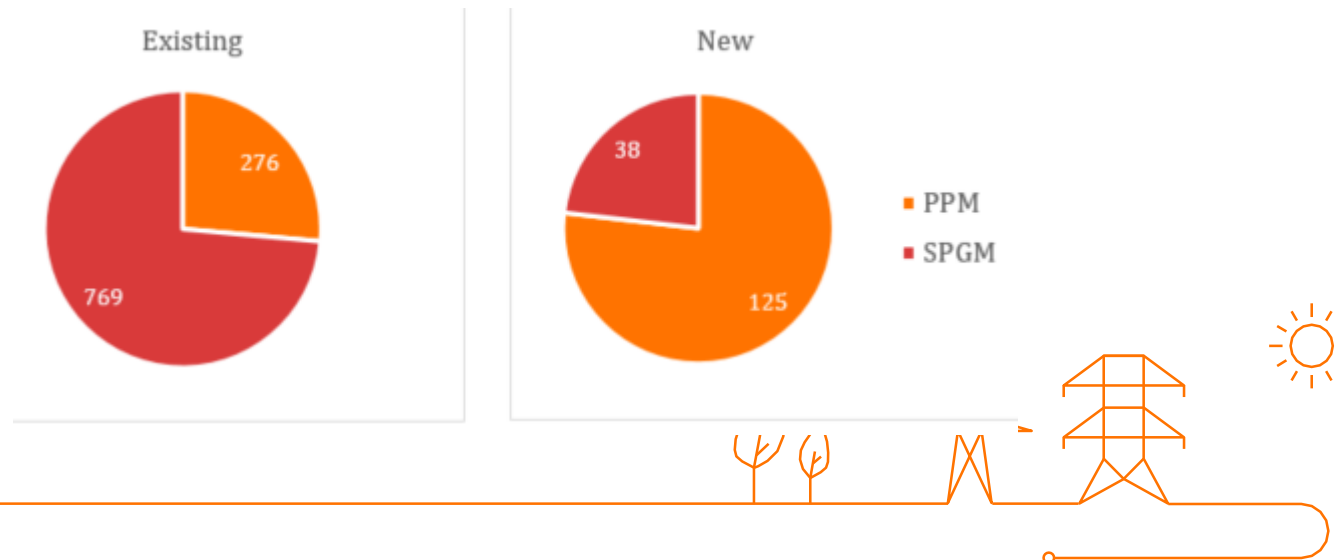
Focus on the existing PGMs between 1 and 25 MW

Repartition per type of existing PGMs

PRODUCTION TYPE	INSTALLED POWER (MW)
Classical (Steam Turbine)	53,4
Diesel	45,6
Hydro Unit - Run Of River	21,8
Incineration Station	164,318
Solar	59,63
STEG - Steam Turbine	20
Turbojet	108
Wind Onshore	216,6
WKK	355,783
TOTAL	1045,131



Repartition SPGM vs PPM for existing and new PGMs



Comparison of requirements type B PGM

Categories of requirements for PGMs:

- 1) Data questionnaire & models
- 2) Internal compliance proof (RGIE) & protection scheme
- 3) Voltage & frequency requirements
- 4) Information exchange / Telecom requirements
- 5) Balancing/congestion man. requirements
- 6) Power quality requirements
- 7) Emergency & restoration requirements
- 8) Protections requirements

More stringent or new	
Less stringent	
Small changes/identical	

Summary of the gap analysis of the requirements

Category of requirements	Sub category	GAP analysis	Remark	Eligible for incentive
Category 1	Data questionnaire & Models	Data questionnaire	Small changes	
		Models	More stringent	X
Category 2	Internal compliance proof (RGIE) & protection scheme	RGIE	Identical	
		Annex 1 : lcc max	More stringent	Not in the scope : DCC
		Annex 2 : Protections	Small changes	
		Protection schemes	Identical	
Category 3	Voltage & frequency requirements	Frequency withstand capability	Small changes	
		Rate of change of frequency (ROCOF)	More stringent	X
		Maximal allowable power reduction	Less stringent	
		LFSM-O	More stringent	X
		Voltage withstand capability	More stringent	X
		Voltage control (SPGM)	More stringent	X
		Reactive power capability	More stringent	X
		Fault Ride Trough	Less stringent	
		Fault current & dyn. Voltage support (PPF)	More stringent	X
		Oscillation and damping control	Small changes	
Post-fault power recovery (PPM)	More stringent	X		
Category 4	Information exchange / Telecom requirements	Information exchange	More stringent	X
Category 5	Balancing/congestion man. requirements	Remote control reductions	More stringent	X
Category 6	Power quality requirements		Identical	
Category 7	Emergency & restoration requirements	Automatic connection	More stringent	X
		Automatic reconnection	More stringent	X
Category 8	Protections requirements	Loss of main protection by RoCoF	Identical	
		Decoupling protection	Small changes	

CBA: Qualitative assessment

Benefits evaluation (Expert view)

3 ways to sort the requirements :

I) 4 technical families of requirements :

- Voltage
- Frequency
- Current
- Other

II) 2 operational system states :

- Normal state
- Emergency / restoration state

III) 2 ways of evaluating the robustness:

- Be robust (stay connected following an event)
- Give robustness (limit variations following an event)



Expert view
classification as
MUST /
NICE to HAVE



Benefit classification
**2 MUST = High
benefit**

Costs evaluation (Expert view)

For requirement, a cost category (LOW, MEDIUM, HIGH) has been assigned based on expert knowledge.

CBA : Qualitative assessment

Benefits evaluation (Expert view)

4 technical families of requirements :

- **Frequency** : lack of performance or robustness in terms of frequency requirements might endanger the security of the whole synchronous area and can expose the system to black-out → **MUST for the system**
- **Voltage** : local characteristic of the system with limited perimeter → **nice to have for the system**
- **Current** : local characteristic of the system with limited perimeter → **nice to have for the system**
- **Other** : case by case analysis

2 operational system states:

- **Normal state** : system is operated within its normal operational limits → **nice to have for the system**
- **Emergency** : system is operated out of its normal operational limits → **MUST for the system**

2 ways of evaluating the robustness:

- **Be robust** (stay connected following an event) → **MUST for the system**
- **Give robustness** (limit variations following an event) → **nice to have for the system**

CBA : Qualitative assessment

Benefits evaluation (Expert view)

Criteria : at least 2 MUST = High benefit

Sub category	GAP analysis	Eligible for incentive	Frequency vs voltage vs current		Normal state vs Emergency		Be robust vs give robustness		Impact/benefit
			Classification	Benefit	Classification	Benefit	Classification	Benefit	
Models	More stringent	X	Other	Nice to have	Normal	Nice to have	Give robustness	Nice to have	MEDIUM
Rate of change of frequency (ROCOF)	More stringent	X	Frequency	MUST	Emergency	MUST	Be robust	MUST	HIGH
LFSM-O	More stringent	X	Frequency	MUST	Emergency	MUST	Give robustness	Nice to have	HIGH
Voltage withstand capability	More stringent	X	Voltage	Nice to have	Normal	Nice to have	Be robust	MUST	MEDIUM
Voltage control (SPGM)	More stringent	X	Voltage	Nice to have	Normal	Nice to have	Give robustness	Nice to have	MEDIUM
Reactive power capability	More stringent	X	Voltage	Nice to have	Normal	Nice to have	Give robustness	Nice to have	MEDIUM
Fault current & dyn. Voltage support (PPM)	More stringent	X	Voltage	Nice to have	Normal	Nice to have	Give robustness	Nice to have	MEDIUM
Post-fault power recovery (PPM)	More stringent	X	Frequency	MUST	Normal	Nice to have	Give robustness	Nice to have	MEDIUM
Information exchange	More stringent	X	Other	Nice to have	Normal	Nice to have	Give robustness	Nice to have	MEDIUM
Remote control reductions	More stringent	X	current	Nice to have	Emergency	MUST	Give robustness	Nice to have	MEDIUM
Automatic connection	More stringent	X	Frequency	MUST	Emergency	MUST	Be robust	MUST	HIGH
Automatic reconnection	More stringent	X	Frequency	MUST	Emergency	MUST	Be robust	MUST	HIGH

CBA : Qualitative assessment

Cost evaluation (Expert view)

Criteria :

- low = minor adjustments (settings)
- medium = replacement of some elements of the PGM or addition of elements
- high = replacement of major elements of the PGM

Categories of costs to be evaluated (RfG Art. 39):

- direct costs
- costs associated to loss of opportunity
- costs associated to change in maintenance and operation

			Costs
Sub category	GAP analysis	Eligible for incentive	
Models	More stringent	X	LOW
Rate of change of frequency (ROCOF)	More stringent	X	LOW
LFSM-O	More stringent	X	LOW
Voltage withstand capability	More stringent	X	HIGH/LOW
Voltage control (SPGM)	More stringent	X	LOW
Reactive power capability	More stringent	X	HIGH/MEDIUM
Fault current & dyn. Voltage support (PPM)	More stringent	X	HIGH/LOW
Post-fault power recovery (PPM)	More stringent	X	HIGH/LOW
Information exchange	More stringent	X	MEDIUM
Remote control reductions	More stringent	X	MEDIUM
Automatic connection	More stringent	X	LOW
Automatic reconnection	More stringent	X	MEDIUM

CBA : Qualitative results

Sub category	GAP analysis	Frequency vs voltage vs current		Normal state vs Emergency		Be robust vs give robustness		Impact/benefit	Costs	Results of the CBA
		Classification	Benefit	Classification	Benefit	Classification	Benefit			
Models	More stringent	Other	Nice to have	Normal	Nice to have	Give robustness	Nice to have	MEDIUM	LOW	positive CBA
Rate of change of frequency (ROCOF)	More stringent	Frequency	MUST	Emergency	MUST	Be robust	MUST	HIGH	LOW	positive CBA
LFSM-O	More stringent	Frequency	MUST	Emergency	MUST	Give robustness	Nice to have	HIGH	LOW	positive CBA
Voltage withstand capability	More stringent	Voltage	Nice to have	Normal	Nice to have	Be robust	MUST	MEDIUM	HIGH/LOW	CBA to be performed
Voltage control (SPGM)	More stringent	Voltage	Nice to have	Normal	Nice to have	Give robustness	Nice to have	MEDIUM	LOW	positive CBA
Reactive power capability	More stringent	Voltage	Nice to have	Normal	Nice to have	Give robustness	Nice to have	MEDIUM	HIGH/MEDIUM	CBA to be performed
Fault current & dyn. Voltage support (PPF)	More stringent	Voltage	Nice to have	Normal	Nice to have	Give robustness	Nice to have	MEDIUM	HIGH/LOW	CBA to be performed
Post-fault power recovery (PPM)	More stringent	Frequency	MUST	Normal	Nice to have	Give robustness	Nice to have	MEDIUM	HIGH/LOW	CBA to be performed
Information exchange	More stringent	Other	Nice to have	Normal	Nice to have	Give robustness	Nice to have	MEDIUM	MEDIUM	CBA to be performed
Remote control reductions	More stringent	current	Nice to have	Emergency	MUST	Give robustness	Nice to have	MEDIUM	MEDIUM	CBA to be performed
Automatic connection	More stringent	Frequency	MUST	Emergency	MUST	Be robust	MUST	HIGH	LOW	positive CBA
Automatic reconnection	More stringent	Frequency	MUST	Emergency	MUST	Be robust	MUST	HIGH	MEDIUM	positive CBA

Key findings :

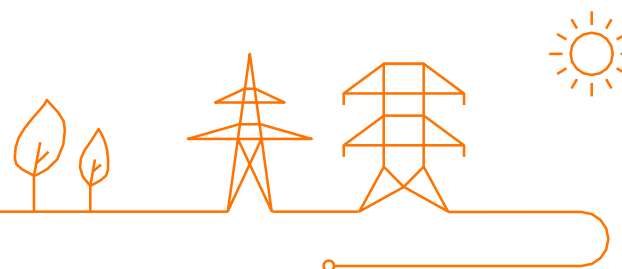
- Requirements with a **HIGH** global Impact/Benefit and a **NON-HIGH** Costs have a positive CBA
- Requirements with a **MEDIUM** impact/benefit and **LOW** costs have a positive CBA
- **Other requirements should be further investigated through a quantitative CBA**

Call for inputs from market parties :

- confirm the categories of costs (low/medium/high)
- give detailed costs estimations for the quantitative CBA to be performed

Agenda

1. Objectives
2. High level methodology
- 3. Planning and milestones**

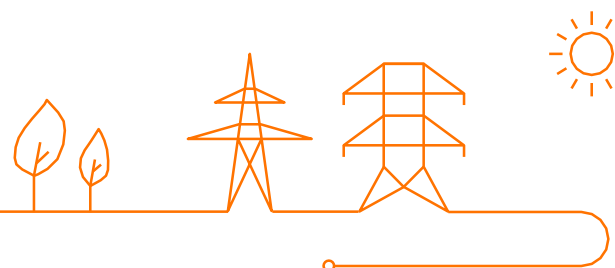


Planning and milestones

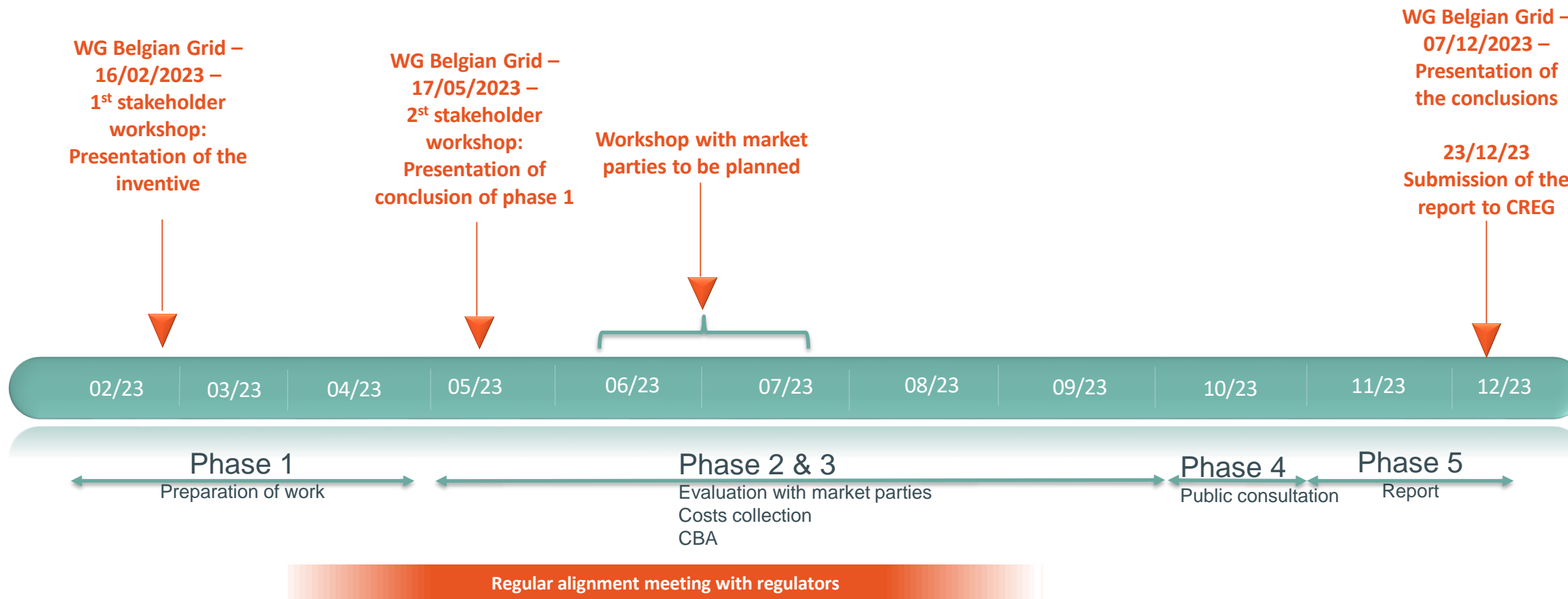
- **Phase 1 : Preparation of work – Elia**
 - Inventory of existing and new PGMs between 1 & 25 MW
 - Comparison of the requirements applicable to existing and new PGMs
 - First evaluation of the requirements in terms of benefits for the grid and selection of candidate requirements for the CBA
 - First proposal for the different categories of costs to take into account
- **Phase 2: Evaluation with market parties – Elia & Market parties**
 - Of the candidate requirements for the CBA
 - Of the CBA methodology
 - Of the categories of costs
- **Phase 3: Data collection and CBA – Elia & Market parties**
 - Data collection with market parties for the costs part for the selected requirements for the CBA
 - CBA performed by Elia
- **Phase 4 : Public consultation - Elia & Market parties**
- **Phase 5 : Report and conclusions – Elia**



Workshops & discussions
with market parties
Call for inputs from market
parties !



Planning and milestones



Thank you.



Agenda

1. **Tariff proposal 2024-2027:** results of public consultation
2. **Access contract:** main modifications
3. **Connection contract:** main modifications

4. Incentives

4.1. Hosting capacity maps

4.2. Incentive MVAR

4.3. **Incentive CBA:** Cost benefit analysis on Requirements for Generators applicable on existing and new generating units between 1 and 25 MW

5. Miscellaneous

5.1. Next meeting: Tuesday, 5 September 14h – 17h

