Users' Group

Working group Belgian Grid

1st october 2024

Agenda

1. GDC - GU Flex (C Bastiaensen)
2. Federal Development Plan – results of poll (L Mees & M Konings)
3. Conformity process (O Bronckart)
4. Connection Contract (F Dessain)
5. Access Contract (E Heerinckx)
6. Next WGBG dates & 2025

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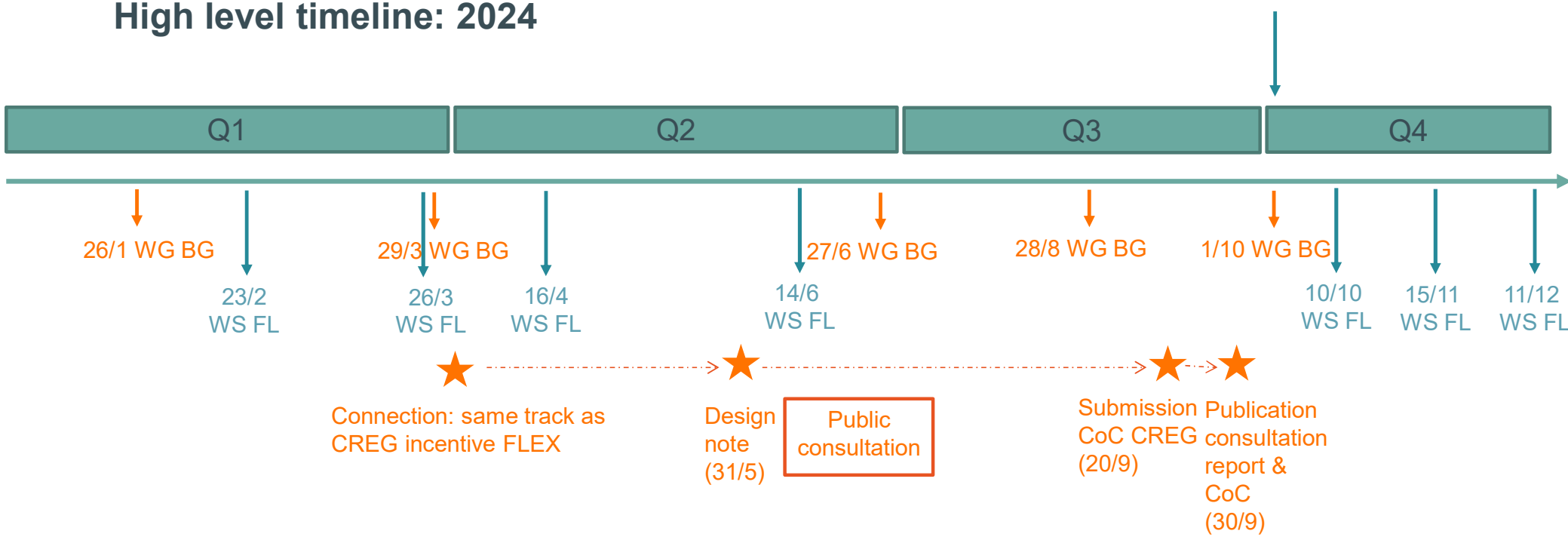
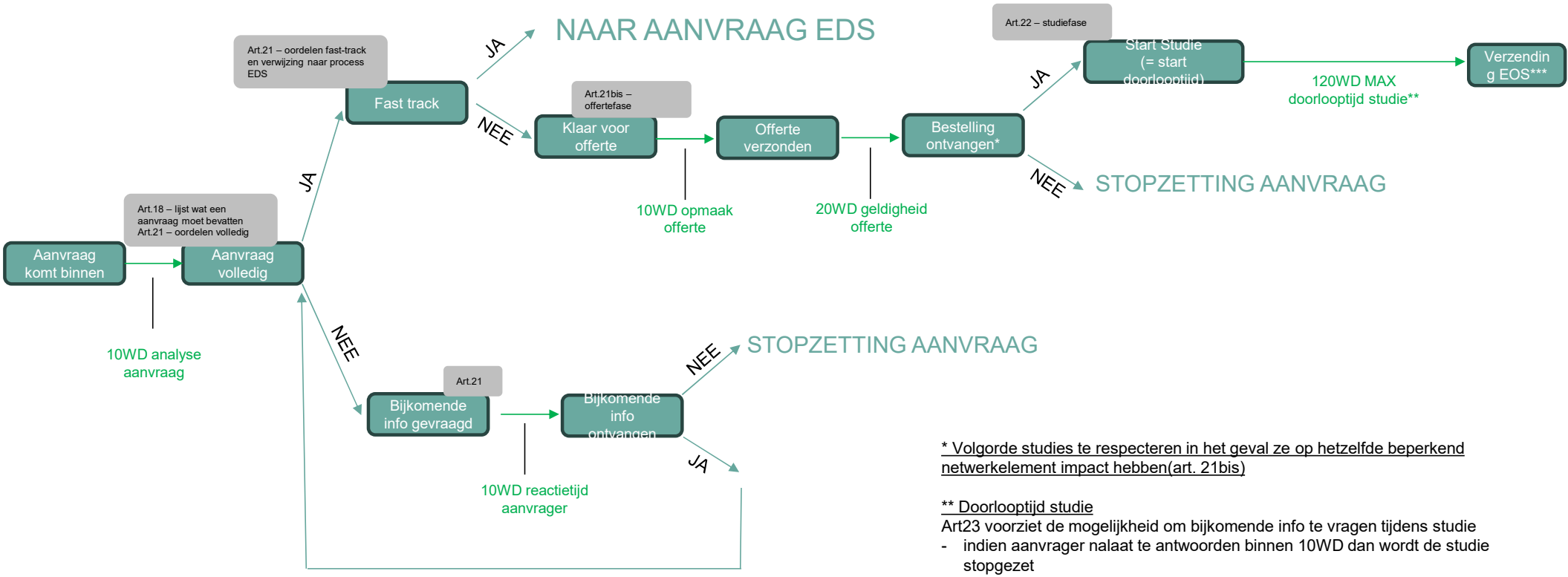
High level timeline: 2024



EOS



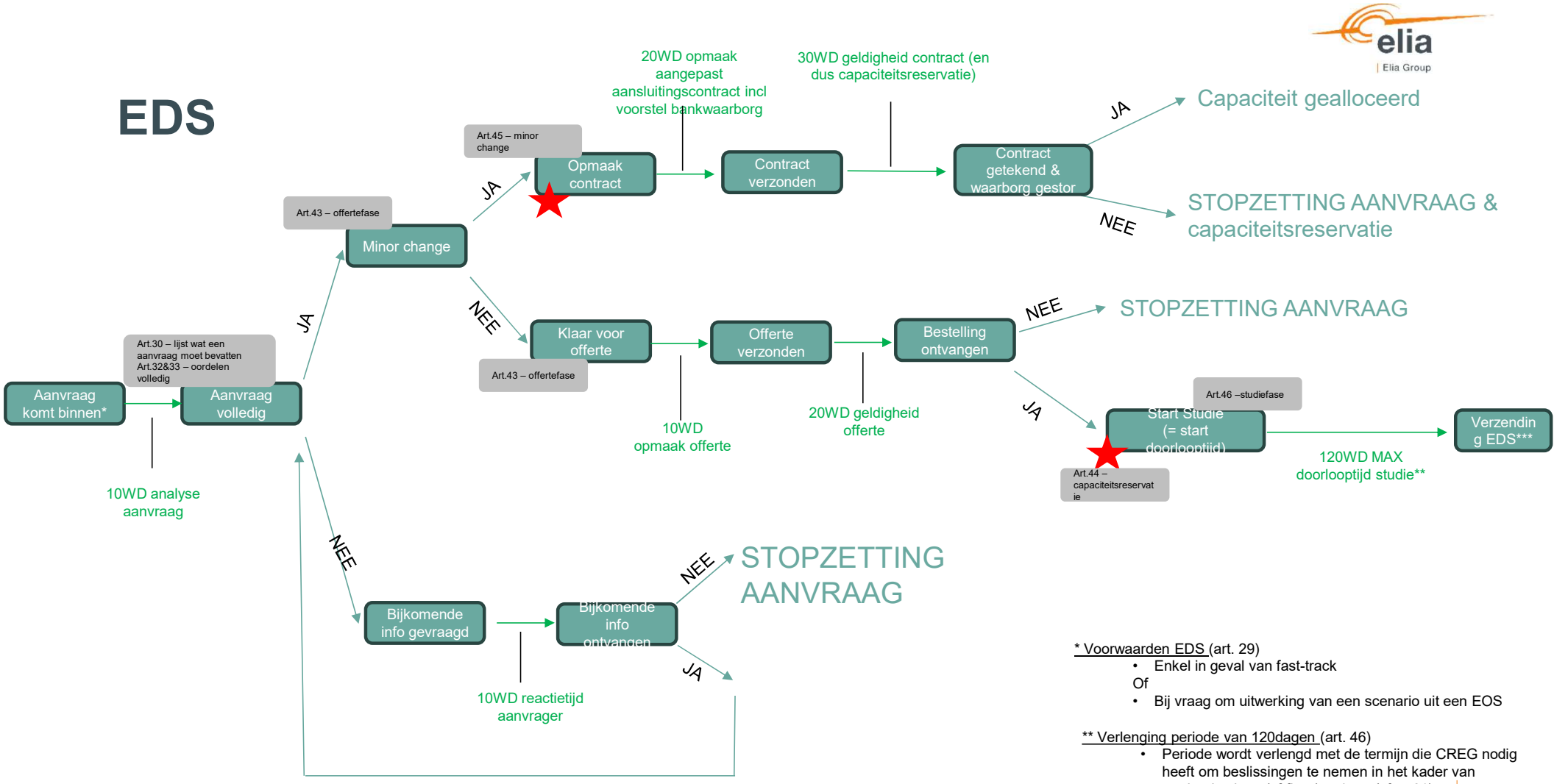
* Volgorde studies te respecteren in het geval ze op hetzelfde beperkend netwerkelement impact hebben(art. 21bis)

** Doorlooptijd studie
Art23 voorziet de mogelijkheid om bijkomende info te vragen tijdens studie
- indien aanvrager nalaat te antwoorden binnen 10WD dan wordt de studie stopgezet
    - Doorlooptijd wordt met deze periode verlengd

IMPACT FLEX :
- Art61 beschrijft flex process incl. beslissingbevoegdheid CREG
- Doorlooptijd EOS wordt verlengd met tijd die CREG nodig heeft om te beslissen

*** geen garantie op resultaten dus geen geldigheidstermijn van de studie (Art.25)

EDS



* Voorwaarden EDS (art. 29)

- Enkel in geval van fast-track

Of

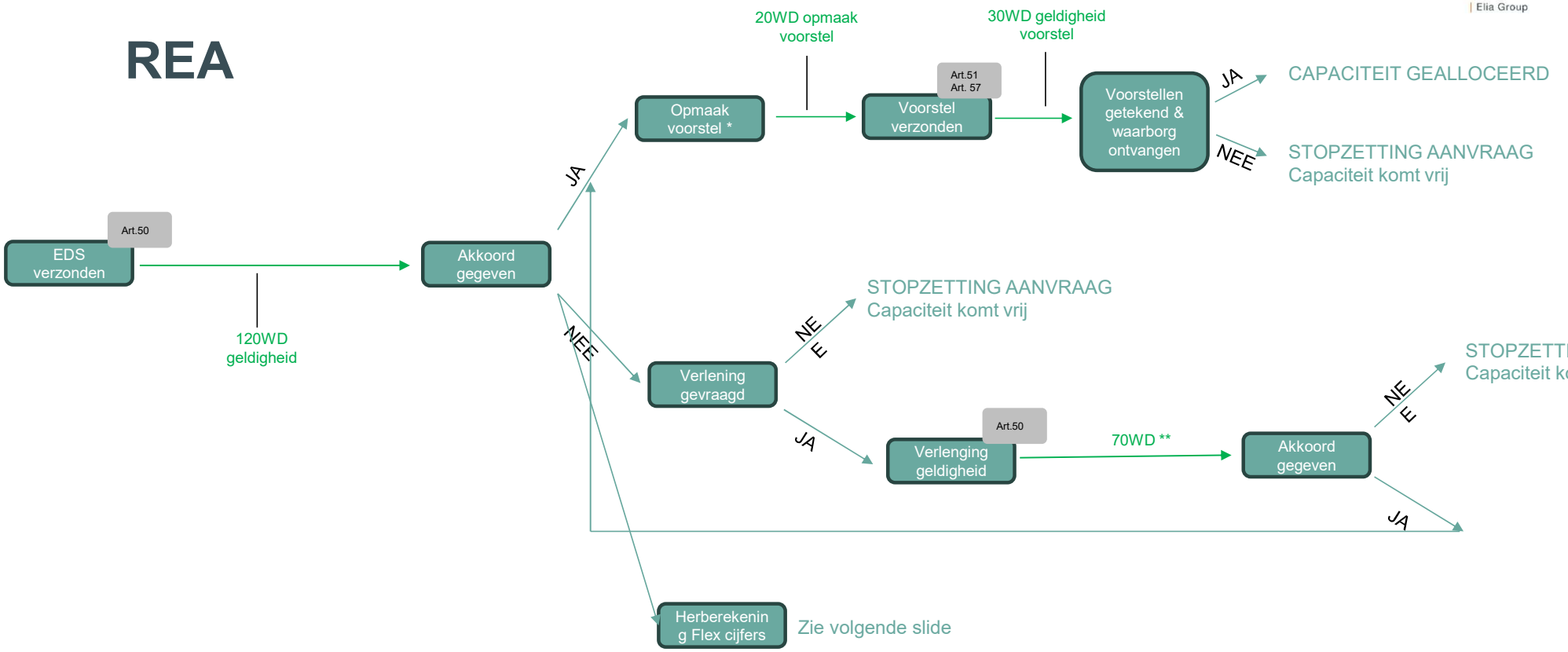
- Bij vraag om uitwerking van een scenario uit een EOS

** Verlenging periode van 120dagen (art. 46)

- Periode wordt verlengd met de termijn die CREG nodig heeft om beslissingen te nemen in het kader van modernisatie en/of flex (art 47 en/of art61)

★ Capaciteit gereserveerd

REA



* Opmaak voorstel REA (art. 50)

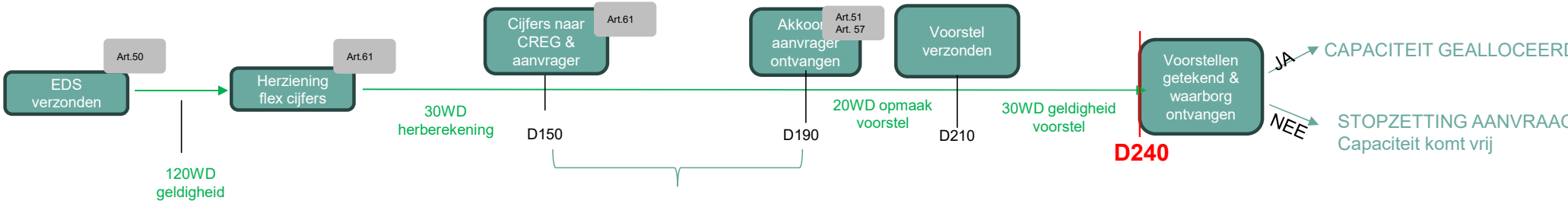
- Aansluitingscontract
- Offerte REA
- Hoogte bankwaarborg (art. 57)

** tweede geldigheidsperiode =70WD → **MAX periode gereserveerde capaciteit na verzending EDS = 240WD**

Herziening Flex cijfers

Randvoorwaarden:

- Herziening kan enkel gevraagd worden in het geval van een geldige EDS
- Herziening kan leiden tot betere of slechtere cijfers. Ongeacht het resultaat worden deze van toepassing (de vorige cijfers vervallen)
- Na 240 werkdagen vervalt capaciteit of wordt deze gealloceerd
  - Dwz dat er 50 werkdagen op het einde van het process voorzien moeten zijn voor de opmaak van het contract en ondertekening ervan.
- Een flex herberekening mag GEEN aanleiding geven tot een verlenging van de capaciteitsreservatie
- Overgangsbepaling: indien een herziening uitgevoerd wordt in het kader van een beslissing van CREG, is een herziening op vraag van de aanvrager niet meer mogelijk



40WD waarin:

- CREG kan bijkomende vragen stellen
- Aanvrager cijfers kan betwisten
- Beslissing CREG genomen moet worden
- Aanvrager moet beslissen tot realisatie over te gaan

Vragen?

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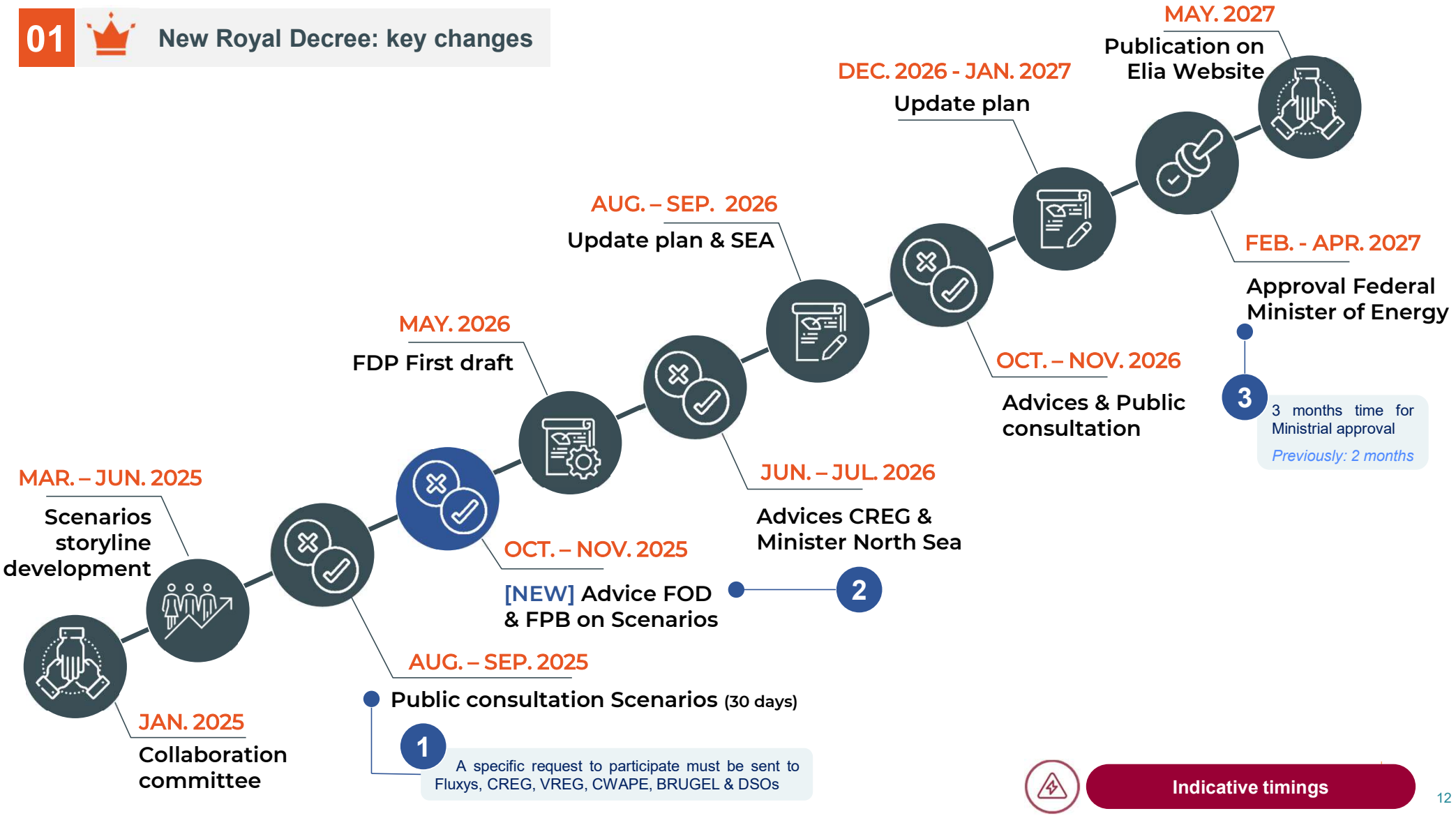
Preparation of Federal Development plan 2028-2038

01 Royal Decree – key Changes

02 Experience Feedback

03 Priority improvement levers

01 New Royal Decree: key changes



Indicative timings

02 Experience Feedback

Objective

Capture key feedback & priorities in order to start preparing implementation trajectories, which should start now as some topics might require development of a new or modified methodology!

We will not yet decide on the scope of the next FDP, but only on what the priorities are to be investigated further! Scope will be decided in collaboration with the CdC*.

(*) CdC = Comité de Collaboration: official preparation body with AD Energy, FPB/BFP and Elia, with CREG as observer

02 Experience Feedback

Thank you

Thank you for filling in the survey.

Your input and feedback is of great value to Elia and allows us to improve our collaboration even further.

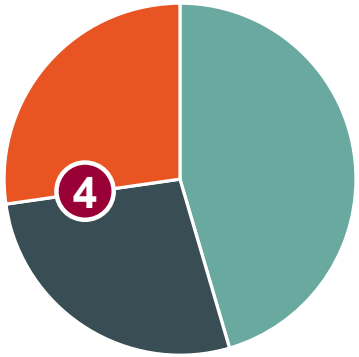
Results

11 responses

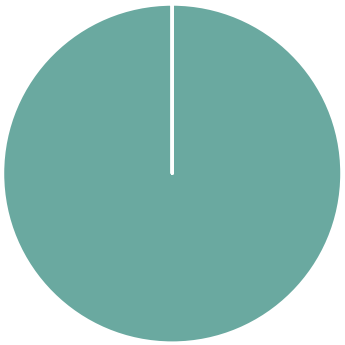
Response rate of ca. 10 % (invitees)

Survey Results

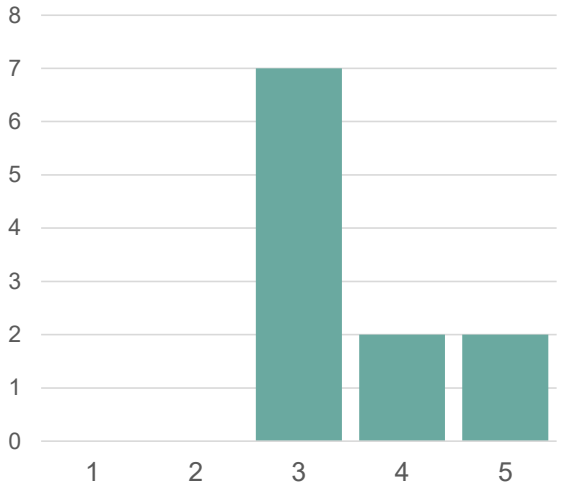
Length of the plan



Readability of the plan

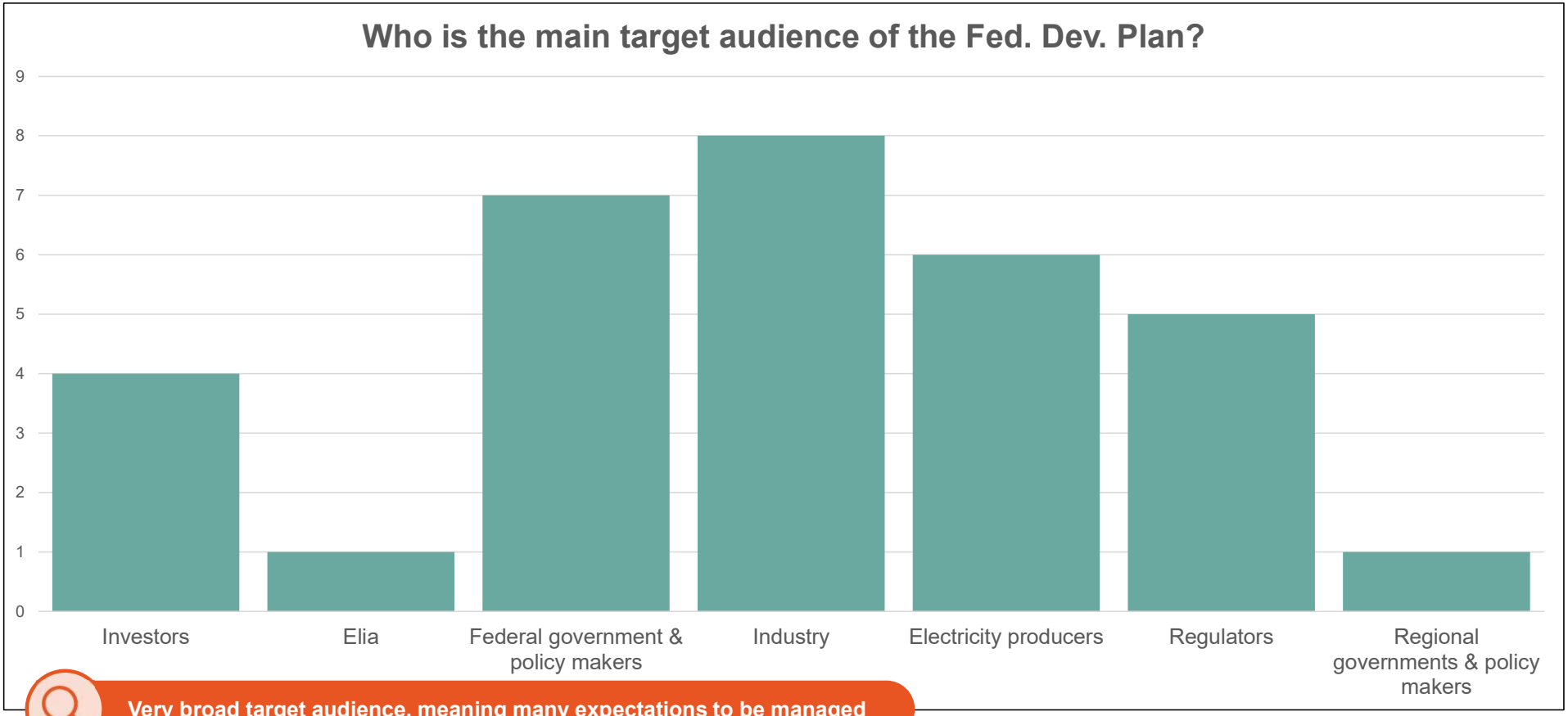


Coherence of the plan



Different preferences w.r.t. length of the plan : more concise vs. more detailed

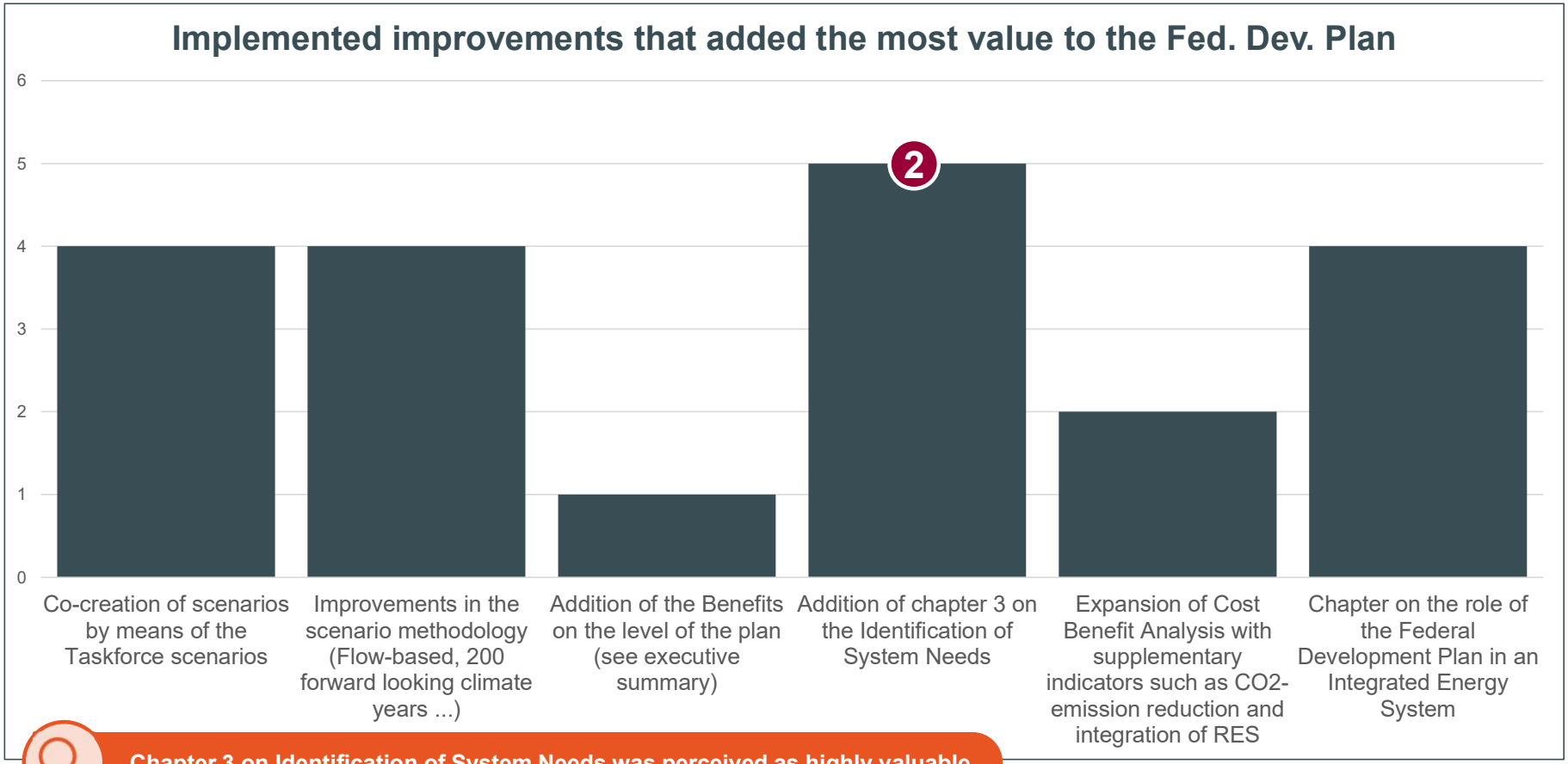
Survey Results



Very broad target audience, meaning many expectations to be managed

Survey Results

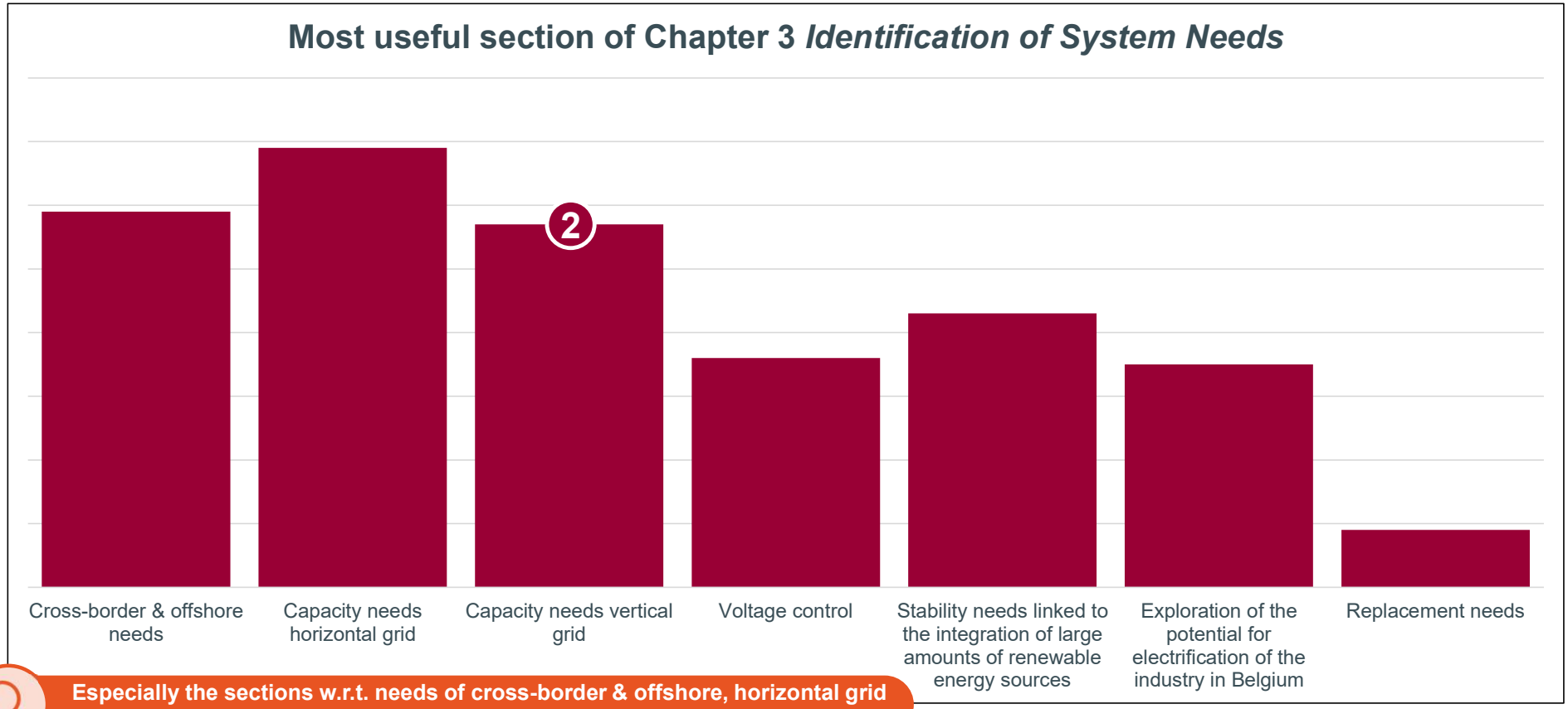
Implemented improvements that added the most value to the Fed. Dev. Plan



Chapter 3 on Identification of System Needs was perceived as highly valuable

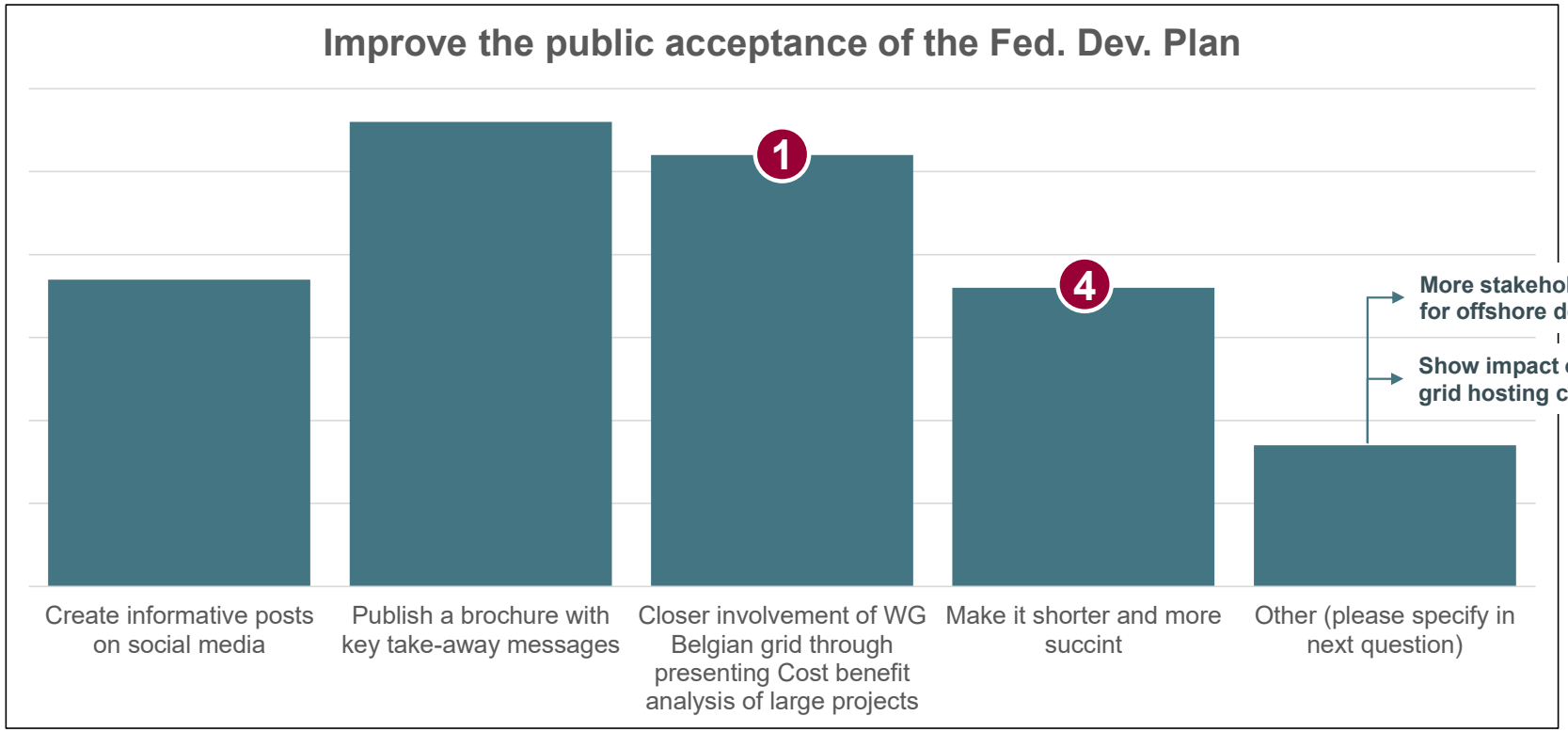
Survey Results

Most useful section of Chapter 3 *Identification of System Needs*

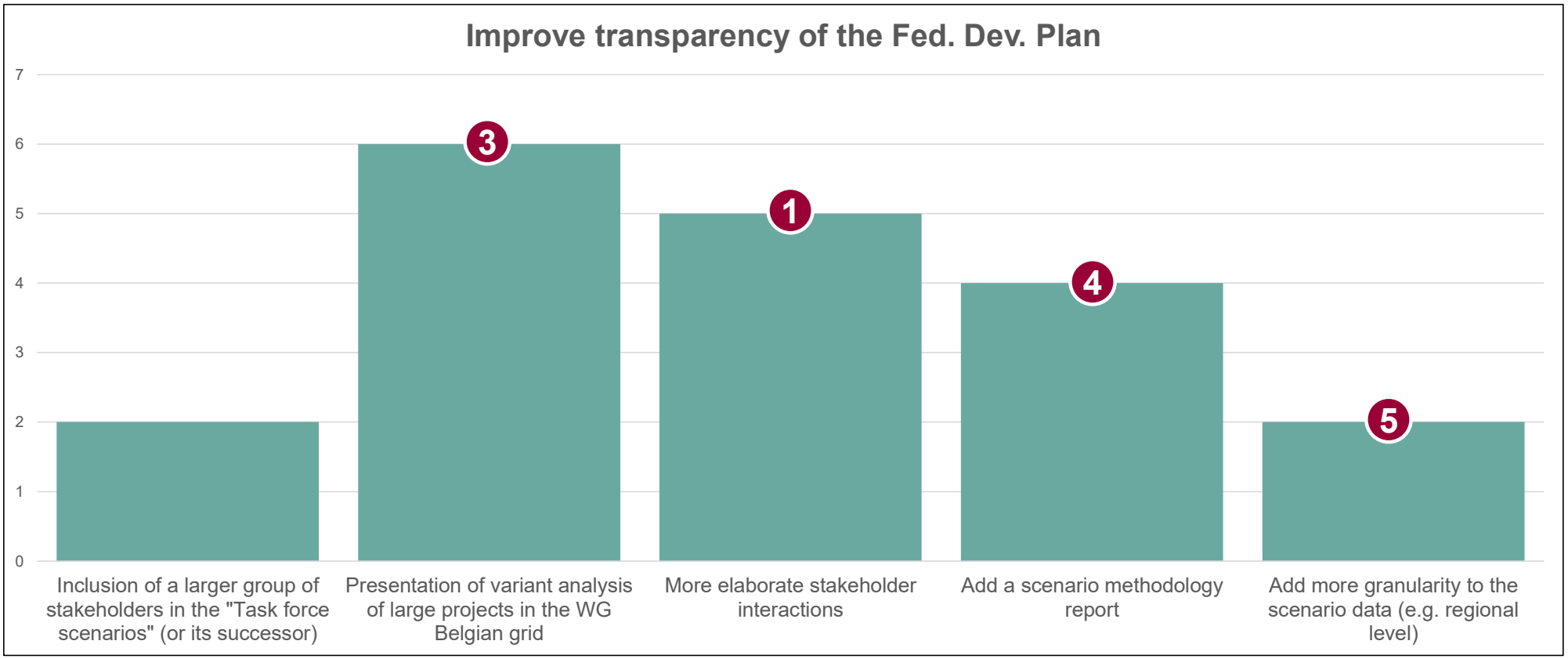


Especially the sections w.r.t. needs of cross-border & offshore, horizontal grid and vertical grid were considered highly relevant

Survey Results

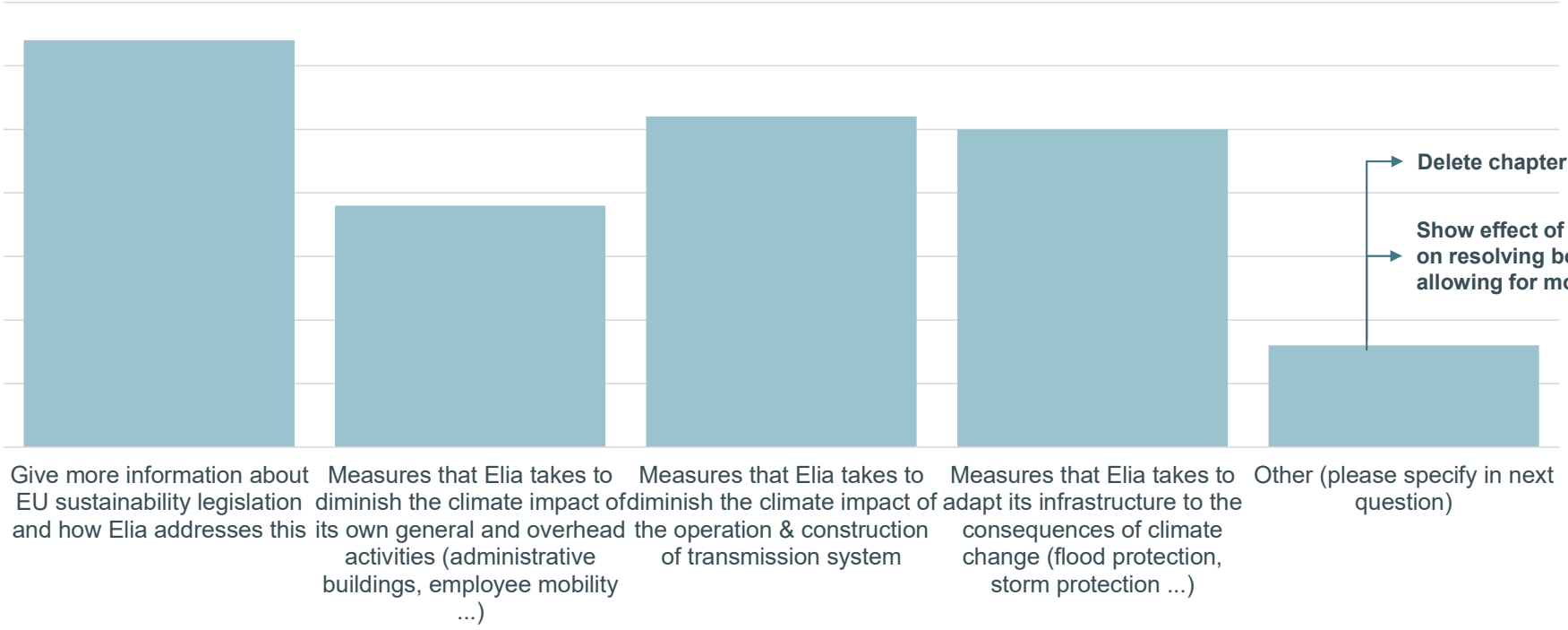


Survey Results



Survey Results

Interesting additions to the Fed. Dev. Plan concerning sustainability



03 Priority improvement levers

1 Stakeholder involvement

Enhanced Stakeholder engagement in an earlier phase of the elaboration of the plan

2 Identification of system needs

Identification of system needs chapter generated high interest and is seen as a key improvement

3 Readability & Transparancy

Balance to be found by having a comprehensive document & delivery of details

4 Modalities of new legislations

Impact of several revised legislations still under scrutiny: EED, EMDR, …

Improvement levers

- Increase interaction with relation to **geographical distribution of future load** — 5
- Closer involvement of **Work Group Belgian Grid** in elaboration of FDP — 1
- Improved **coordination with DSO's** on hypothesis — 5
- Investigate improvement **IOSN vertical system** — 2
- Include comparison of "**High-level variants"** for interconnector CBA's — 3
- From one big FDP document to an **FDP package** — 4
- Publication of **regional scenario data** for Wallonia, Brussels and Flanders — 5
- Assess how impact on **grid hosting capacity** can be made visible — 6

Feasibility to be confirmed

Questions?

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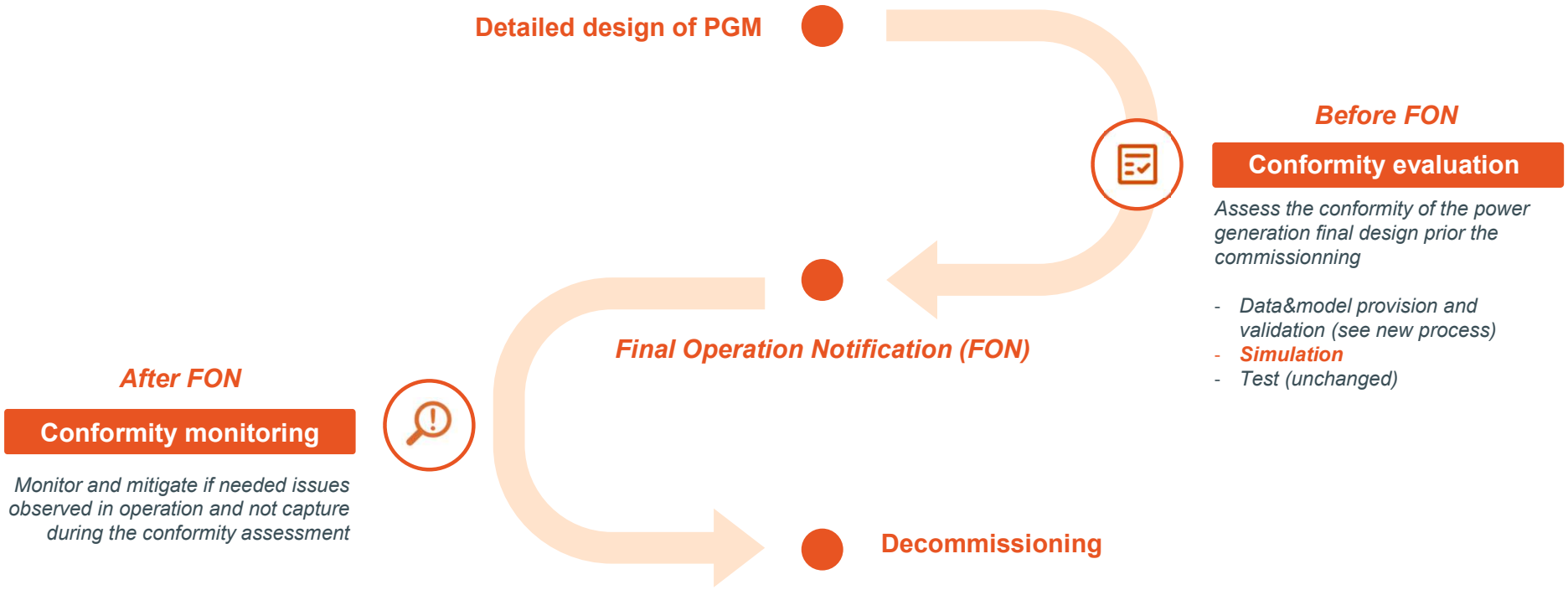
1 Conformity process

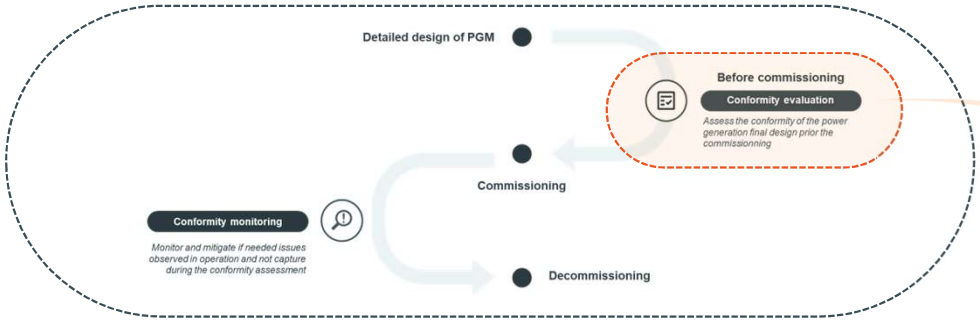
WG BG

1st of October 2024

Conformity assessments and lifecycle of Power Generation Module (PGM)



A conformity process already exists in Elia to assess dynamic performance of individual power generation module with simplied approach (Single Machine Infine Bus – SMIB)



EDS

Conformity process start after reception of EDS

Energization Operational Notification (EON)

Permits to energise the internal network by using the grid connection

Interim Operational Notification (ION)

Permits using the grid connection for a limited period of time and to initiate compliance tests to ensure compliance with the relevant specifications and requirements

Final Operational Notification (FON)

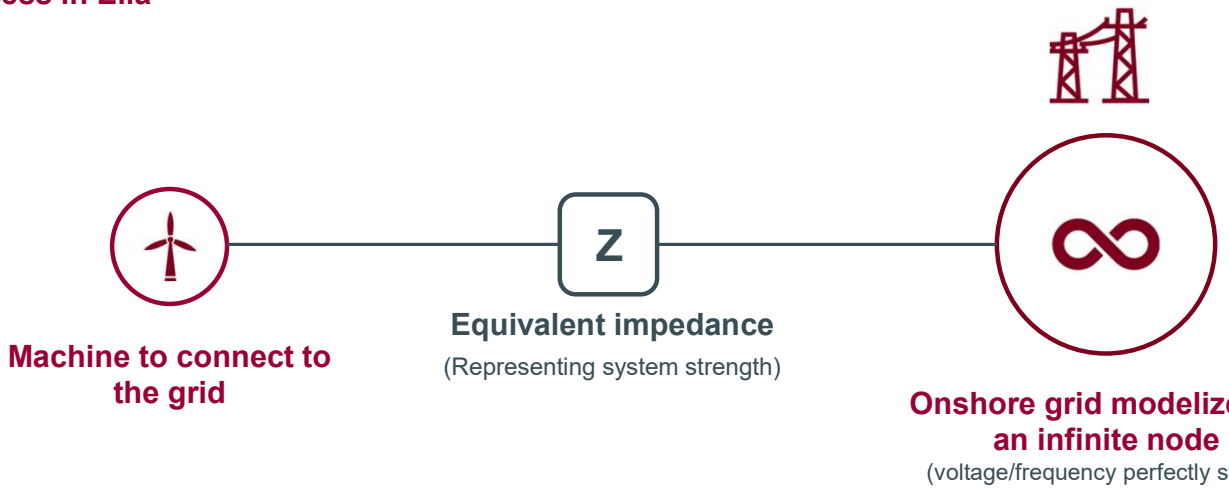
Permits to operate the module which compliant with the technical requirement by using the grid. At this stage only, the owner can receive the reimbursement from the bank for the loan

Current conformity process

EDS	Stage 0	Pre-requesites : provision of general documentation & preliminary relevant system information
EON	Stage 1	Kick-off & System operating envelope requirements
	Stage 2	Proof of compliance, Data & model provision and validation
ION	Stage 3	Individual conformity assessment (SMIB)
		a Individual SPGM/PPM/SPM within the control area
	Stage 4	Non-conformance individual mitigation
FON	Stage 5	Commissioning and compliance testing
		a PPM/SPM test
		b Model validation
		c Staged tests

Current practice for simulation based conformity assessment in Elia

Representation of approach used today for conformity process in Elia

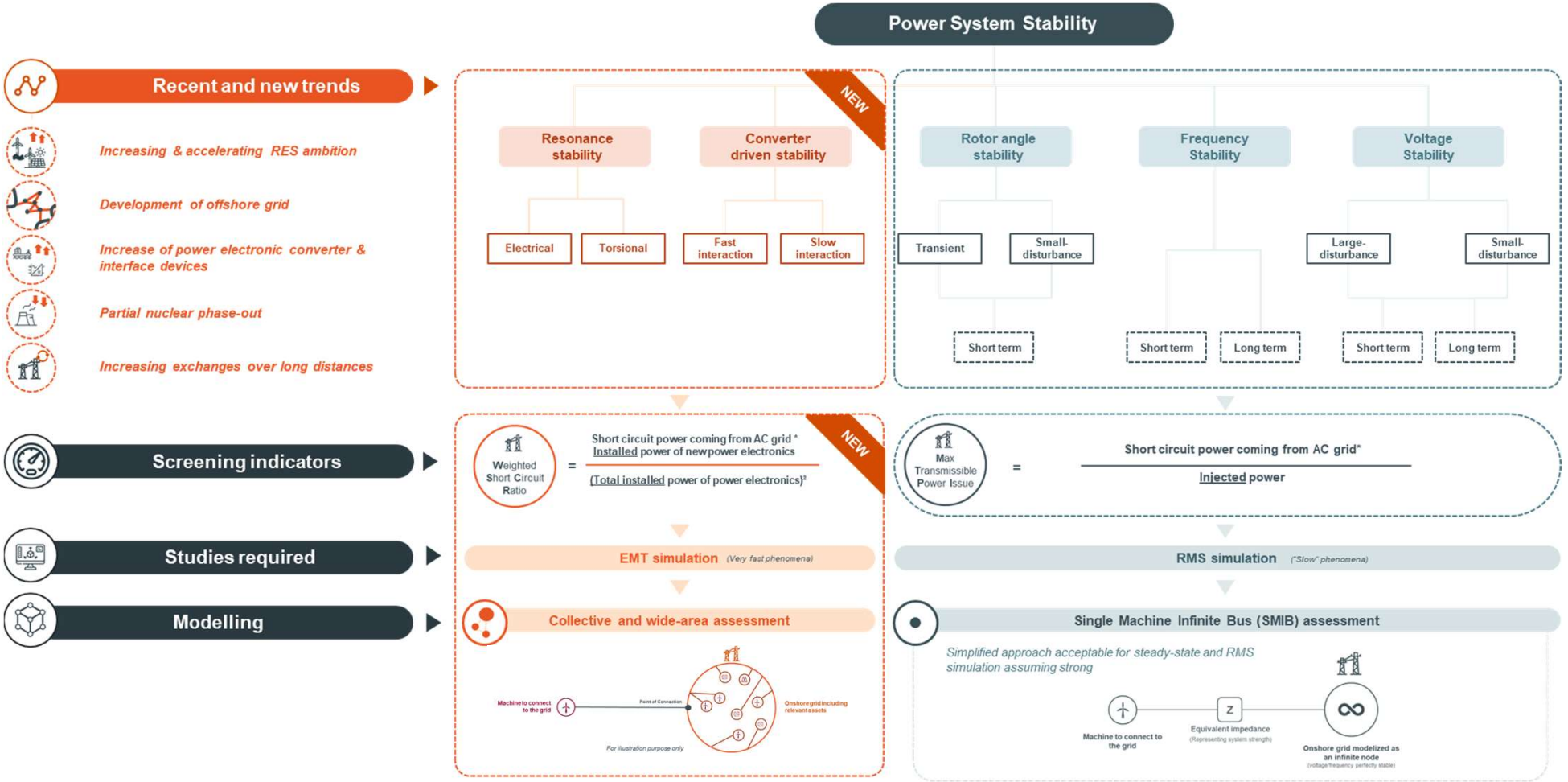


Conformity based on steady-state and RMS simulation

Such approach is acceptable for connection of synchronous machine or power park modules connected to strong grid, but **not acceptable** with the challenges/trends leanding to new stability phenomena we are facing

Challenges

BE and EU system will face massive changes in the coming years leading to new power system stability phenomena requiring upgraded of the generic conformity process applicable for any power generating module to properly assess the dynamic performance of new installations and to secure the grid



Improved conformity process needed to operate the system in reliable and stable way

Target

Improve conformity assessment and monitoring for power generation module (PGM) **to ensure reliable and stable operation of the system** and **secure timely delivery of FON**

Challenges

Modelling& Simulations

Wide-area EMT model development and simulations including relevant parts of other countries

Legal and regulatory

Consideration of IP restrictions for parties in **access to more data/model**

Develop solution which respects responsibilities **of each party (Elia/TSO, PGM and OEM)**

Future power system

Develop models and methodologies to predict a range of future power system performances

Capability to adapt PGM performance and settings if needed after commissioning

The objective is to **develop a solution** that will meet the target while answering the challenge in the **most proportionate and balanced way for the different parties**

Updates of the conformity process

Overview of the evolution of the conformity process

EON: Energization Operational Notification
ION: Interim Operational Notification
FON: Final Operational Notification

EDS
Conformity process start after reception of EDS

Energization Operational Notification (EON)
Permits to energise the internal network by using the grid connection

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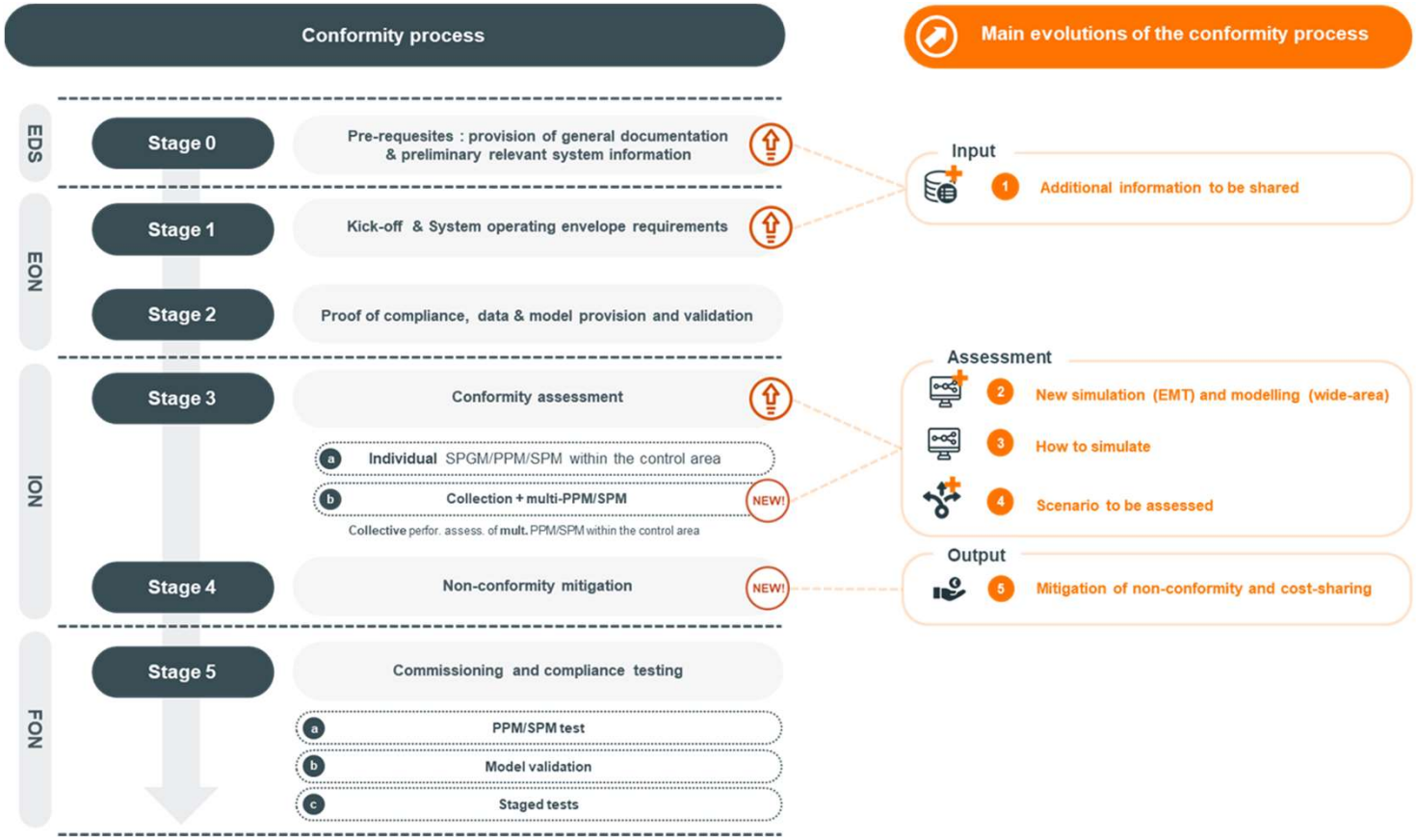

Criteria were defined to determine which type of simulation needs to be performed depending on the characteristics of the installation

SPGM: Synchronous Power Generation Module (nuclear, gas-fired unit, …)
PPM: Power Park Module (offshore wind park, onshore park, PV..)
SPM: Storage Park Module (batteries, pumped-storage…)
SCR: short-circuit ratio

Characteristics of the installation

SPGM
SPM
PPM

Type of the installation	Type A	Type B	Type C & D	Type D
Size of installation	=<1 MW	>1 MW	>=25 MW	>=75 MW
Aggregate SCR				< 3 (Calculated without XB contribution)

Simulation to be performed by the client

Type of modelling	No studies	SMIB	Wide-area BE + SMIB
Type of simulation		RMS	
			EMT

Split define to keep equilibrium between additional effort vs risk of such unit in the system

Aggregate SCR

$$= \frac{S_{cc_i}}{S_{nom_i} + \sum_j (MIIF_{ij} * S_{nom_j})}$$

$$= \frac{\text{Min. short circuit power at connection node of assessed asset}}{\text{Apparent power of the assessed asset and contribution of other relevant assets* impacted (=MIIF) by the assessed asset}}$$

Where

- **Scci** = Minimum short circuit power at connection node of Assessed PPM/SPM
- **Snomi** = Nominal Apparent Power of Assessed SPM/PPM
- **Snomj** = Nominal Apparent Power of Relevant Assets
- **MIIFij** = Voltage dip on connection node of relevant PPM/SPM j in case of 3-phases metallic short-circuit on connection node of Assessed SPM/PPM

Relevant Asset are determined by relative electrical distance (MIIF) > 0.1pu and relative size weighted by the electrical distance > 10%

Additional data needs to be shared by Elia to perform more detailed studies

Conformity process

EDS

- **Stage 0** — Pre-requesites : provision of general documentation & preliminary relevant system information

EON

- **Stage 1** — Kick-off & System operating envelope requirements
- **Stage 2** — Proof of compliance, data & model provision and validation
- **Stage 3** — Conformity assessment
  - Individual SPGM/PPM/SPM within the control area
  - Collective + multi-PPM/SPM
- **Stage 4** — Non-conformity mitigation
- **Stage 5** — Commissioning and compliance testing
  - PPM/SPM test

Additional **anonymized** data to be shared **by Elia to the client** (assessed PPM/SPM):

1. *Min and max Scc and X/R at the assessed SPM/PPM connection node*
2. ***When applicable**, list of relevant HVDC/SPM/PPM with Snomj and MIIFij with indication grid following/grid forming control mode*
3. ***When applicable,** list of relevant SPGM/synchronous condenser with Scc contribution to assessed SPM/PPM*
4. *Aggregate SCR*

Additional model/data to be shared **by the client to Elia**

Already covered with "data & model provision" presented in the past

SPGM: Synchronous Power Generation Module (nuclear, gas-fired unit, …)
PPM: Power Park Module (offshore wind park, onshore park, PV..)
SPM: Storage Park Module (batteries, pumped-storage…)
SCR: short-circuit ratio

Different alternatives were considered to perform the conformity assessment by the client. The “cloud”-based platform with indirect access to wide-area RMS and EMT models put at disposal by Elia was retained as the most adapted solution

1. PPM/SPM owner will **have direct access** to wide-area RMS and EMT models
2. **An independent organisation** with legal access to the wide-area RMS and EMT models will perform the simulation

→ **Discarded as not possible to guarantee** implementation in due time for PEZ.

For option 1, *main issues are related to intellectual property & regulatory changes*

For option 2, *required important regulatory change and create this indep. organisation*

3. PPM/SPM owner will have **indirect access** to wide-area RMS and EMT models **via secured Elia platform**

→ **BASE solution** *-The platform solution will allow the plant owner (via consultant and vendor) to directly perform the study and fine tune performance, avoiding unnecessary iteration with ELIA (saving of time and money)*

4. **Elia will conduct the studies by itself** and advise the PPM/SPM owner of the outcome

→ **FALL-BACK** *- ELIA remains as fall-back options where the ressources and cost of study will be imputed to the client*

Several simulations are required to perform the conformity process and ensure proper tuning of the installation to secure the grid

Several simulations/references shall be performed by the owner

- ***Generation profiles**: max PGM infeed + min PGM infeed*
- ***Connection topologies***
- ***System strength**: full (strong) grid and weakest grid cases*
- ***Contingency events***

The number and type of simulation per requirement shall be limited to the minimum required to correctly assessed performance and conformity

and this for **2** reference years (expected time of connection and target time horizon)

- **The client shall perform the simulation for the "expected time of connection" and "target time horizon" (year+5)**
- **Target time horizon:** time horizon that will include **all relevant asset(s) that will perform their conformity assessment in the next** 5 years after the Expected time of connection of the Assessed Asset
  - ***The best effort is a trade-off to allow ELIA delivering FON without waiting for the conformity assessment** of the last relevant asset in this target time horizon to ensure secure and stable operation of the grid with large concentration of IBRs*
  - *This best effort for the target time horizon is necessary **to create awareness of the need to improve dynamic performance** due to new relevant asset connection that will take place in the **near future and anticipate potential request for retuning***

Different principles are considered to manage the non-conformance mitigation

Rules for non-conformance mitigation in case of collective assessment

1 a In all cases solution will be **first look at the level of Assessed asset**

The asset owner shall have an obligation of means to monitor and solve potential non-conformity for the Expected connection time and Target time horizon to the limit of the retuning capability of control command performance while respecting the hard limits of the installation

b **Retuning of ELIA asset shall be considered** at same level as solution on generation

2 If required by Elia, **Committed assets have obligation of means to investigate** and implement possible solution within their installation. **Full responsibility and cost shall be beard by the asset Owner** under the following conditions

- ***Elia might*** *request investigating solution within period of* ***max 5 years following the reception of their FON status***
- *With* ***maximum 3 requests***
- *Investigated solution shall be limited to retuning of control command performance while* ***respecting the hard limits of the installation***
- *The Asset owner shall* ***keep its FON status if delivered***
- *In case the Asset owner is requested to analyze a possible retuning, time for the analysis shall be agreed with the TSO*
- *In case the Asset owner is requested to implement a solution, implementation time shall be agreed with the TSO*
- ***Rotating application of the request of assessment/implementation****, starting from the oldest eligible Committed Asset and including ELIA Assets*

3 If instabilities foreseen for Future asset and cannot be solved by the Assessed asset, **solutions will be further investigated during the conformity assessment of the Future asset**

4 If a solution would concern **an Existing asset**, its implementation shall be assessed **on a case by case basis**

List of candidates for solution in case of non-conformance

Assessed — generation/network assets **undergoing conformity assessment**

Future — generation/network assets with known connection point and size, **conformity ongoing or expected in the next 5 years** but conformity assessment has not yet started and performance has not been approved

Committed — generation/network assets whose **performance is approved and connected < 5 years**

Existing — generation/network assets **already connected for more than 5 years**

More information are available on Elia website

- **Detailed description and justification of the update of the conformity process** is available in the **Chapter 3.8** of the “Final Outcomes of the Task Force PEZ” on Elia website

https://www.elia.be/-/media/project/elia/elia-site/public-consultations/2024/20240717_final-outcome-of-the-task-force-princess-elisabeth-zone_elia_en.pdf

Next session: 30 min for Q&A

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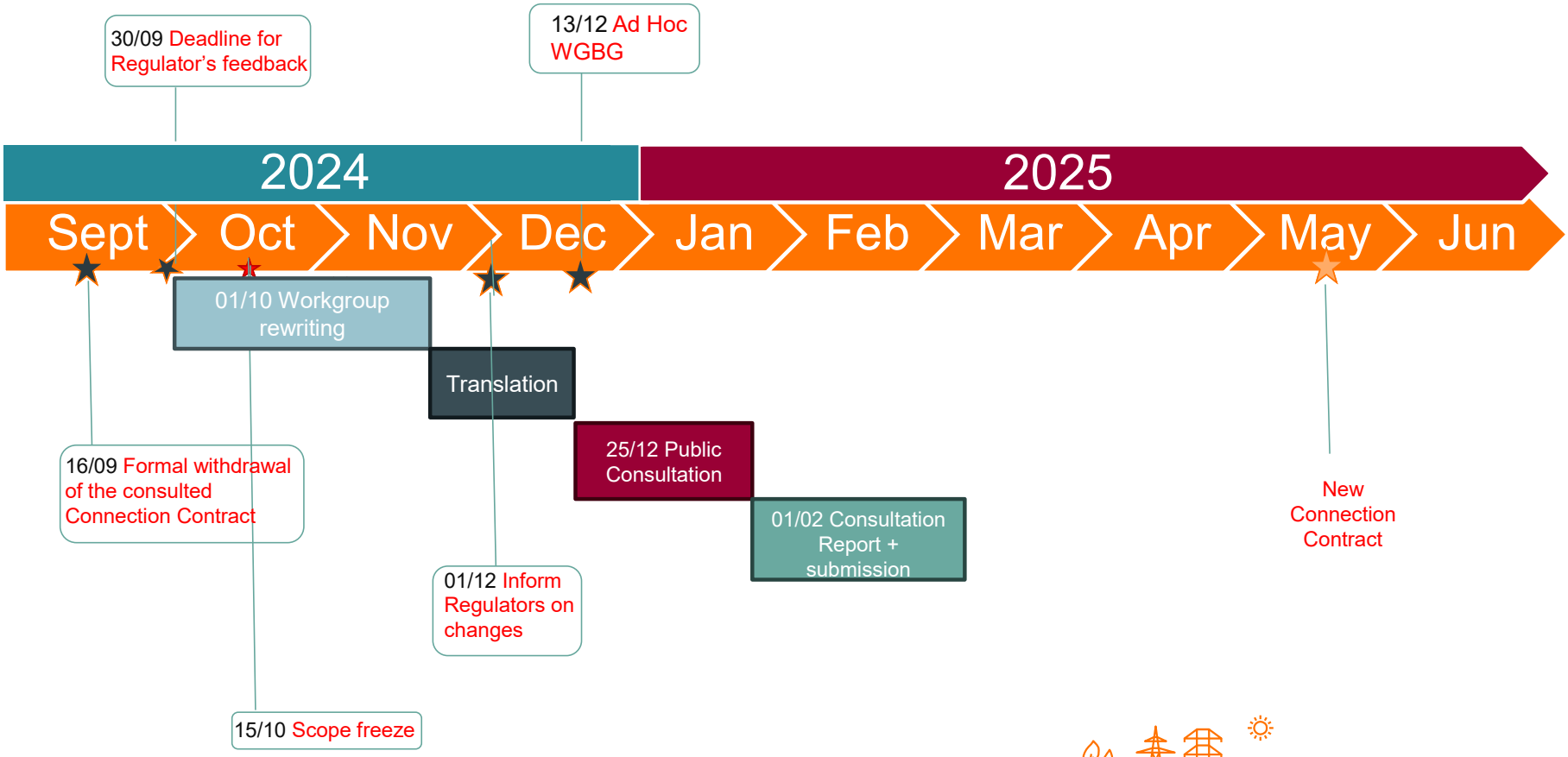
Connection Contract

Improvements based on Regulator’s feedback

Timelines


30/09 Deadline for Regulator's feedback
13/12 Ad Hoc WGBG
2024
2025
Sept
Oct
Nov
Dec
Jan
Feb
Mar
Apr
May
Jun
01/10 Workgroup rewriting
Translation
25/12 Public Consultation
01/02 Consultation Report + submission
16/09 Formal withdrawal of the consulted Connection Contract
01/12 Inform Regulators on changes
New Connection Contract
15/10 Scope freeze

Shared Connection

Management (Art 18)

Specific case of some parts being owned by Network User (monitoring, maintenance strategy, return to service after maintenance)

Access to the Installation

clarification on access rights in relation with BA4/5

Measuring equipment

Location between main counter & network users with smallest amount of counter

Connection

LFDD

Remarks raised by regulators on a few subjects

=> further rework of the wording and the practicalities of the LFDD foreseen

Amendments triggered by other workstreams

Reflect new EOS/EDS process

- Work sequence
- Bank guarantee

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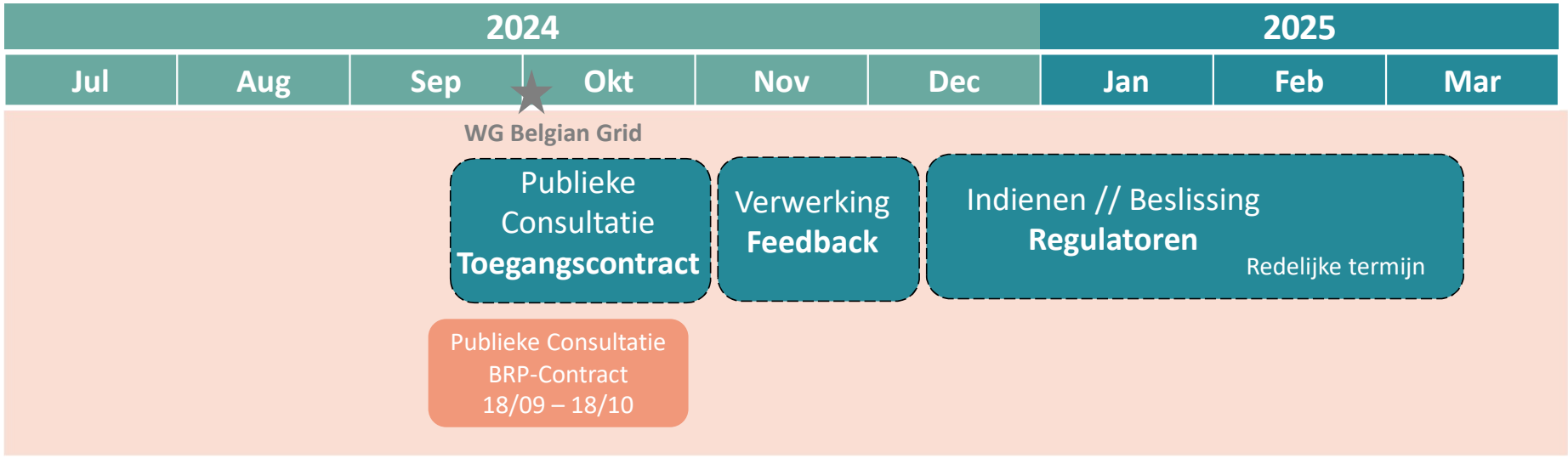
Aanpassingen aan het Toegangscontract

Publieke consultatie: **27 september – 27 oktober**

- Overlap met de publieke consultatie van het BRP-Contract
- Track-changes



Disclaimer: *lay-outing*
Om aan het verzoek van de marktpartijen tegemoet te komen en transparantie te waarborgen, hebben we gebruik gemaakt van '*track-changes*'.

DEEL I. – DEFINITIES EN VOORWERP

- Nieuwe definities of aanpassing aan bestaande definities
  - Leveringspunt, Evenwichtsverantwoordelijke belast met de Opvolging, Register van Leveringspunten, …

DEEL II. – ALGEMENE VOORWAARDEN

- Aligneren met het Aansluitingscontract
- Aansprakelijkheidsartikel

DEEL III. – TECHNISCHE VOORWAARDEN

- Aanpassingen om *Multiple* BRP-principe in te schrijven
- Drop-off procedure toe te laten op regionaal niveau

DEEL IV. – BIJLAGEN

- Schrappen Bijlage 1 = Digitaal Platform
- Nieuwe Bijlage 3*quate*r om *Multiple* BRP-principe toe te laten

Agenda

1. GDC - GU Flex (C Bastiaensen)
2. Federal Development Plan – results of poll (L Mees & M Konings)
3. Conformity process (O Bronckart)
4. Connection Contract (F Dessain)
5. Access Contract (E Heerinckx)
6. Next WGBG dates & 2025

Proposed next dates for WGBG in 2025

- 13 December 2024 09:30u – 12:30u

- 27 March 13:30u – 16:30u
- 10 June 09:30u – 12:30u
- 5 Sept 09:30u – 12:30u
- 2 Dec 09:30u – 12:30u

Thank you.