Working Group Balancing

Tuesday 25/06/2019

Agenda

1. Approval of the MoM of previous WG Balancing
2. Imbalance prices on the 7th of June
3. Volumes reserves 2020
4. aFRR: open points new design
5. Offshore: feedback workshop & next steps
6. Status Updates projects
   - FCR product developments
   - ID market access
   - mFRR: stakeholder consultation feedback & next steps
   - iCAROS
   - ToE pass-thourgh contracts
7. Winter product
8. RT DGO Allocation platform
9. European Integration

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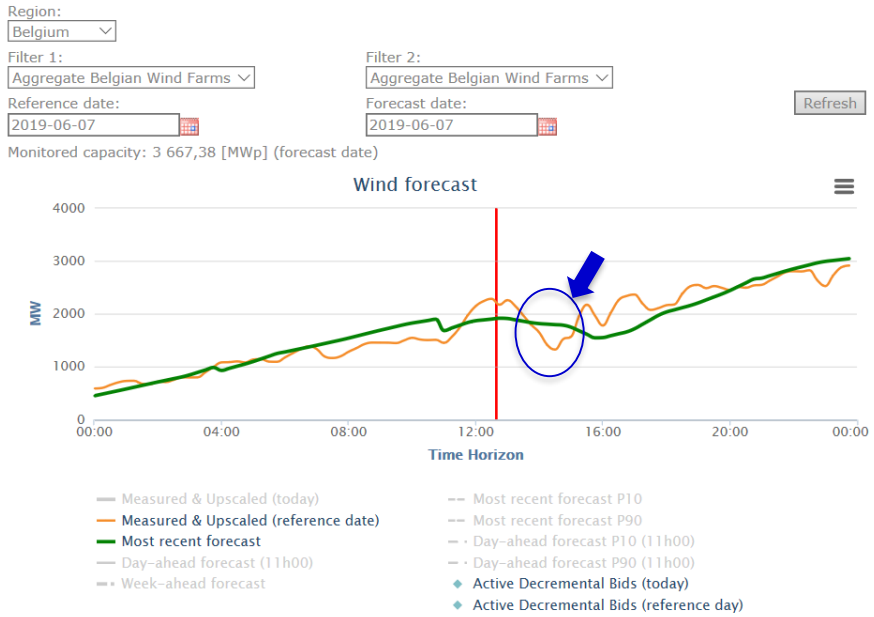
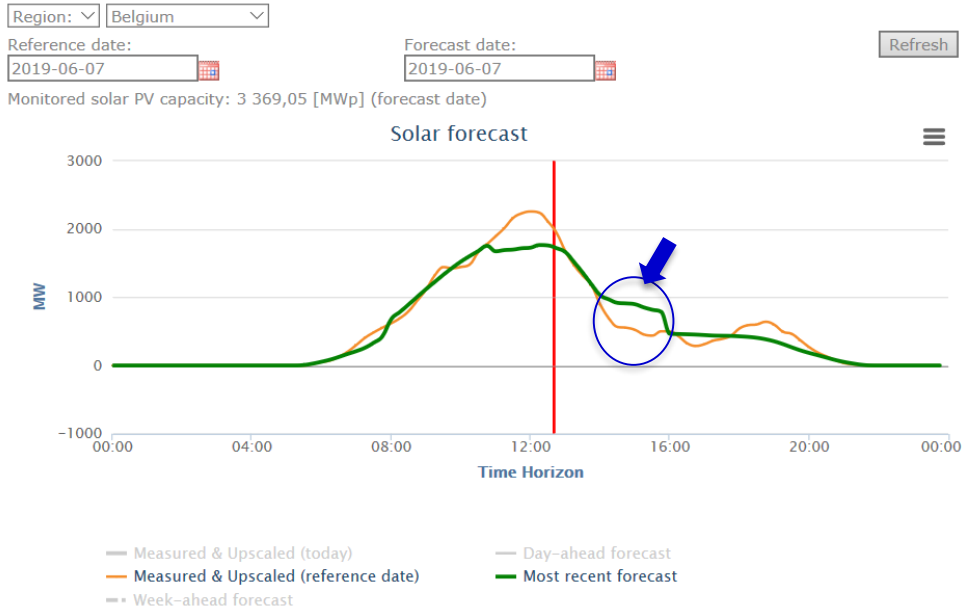
2. Imbalance prices on the 7th of June

Imbalance Prices on 7 June (1)





Status	Date	Quarter	SI (MW)	α (€/MWh)	MIP (€/MWh)	MDP (€/MWh)		SI < -I C	POS (€/MWh)	NEG (€/MWh)
Not validated	07/06/2019	14:00 -> 14:15	-1211,234	37,84	**1036,75**	0,00			**1036,75**	**1074,59**
Not validated	07/06/2019	14:15 -> 14:30	-1477,258	54,80	**515,47**	0,00			**515,47**	**570,27**
Not validated	07/06/2019	14:30 -> 14:45	-1109,604	64,94	**1000,00**	0,00			**1000,00**	**1064,94**
Not validated	07/06/2019	14:45 -> 15:00	-729,703	69,31	**1000,00**	3,63			**1000,00**	**1069,31**

All data available on Elia website:
http://www.elia.be/en/grid-data/balancing/imbalance-prices
http://www.elia.be/en/grid-data/power-generation/Solar-power-generation-data/Graph
http://www.elia.be/en/grid-data/power-generation/wind-power

Imbalance Prices on 7 June (2)

				Upward regulation Volume						
Status	Date	Quarter	NRV (MW)	GUV (MW)	IGCC+ (MW)	R2+ (MW)	Bids+ (MW)	R3 Std (MW)	R3 Flex (MW)	Inter-TSO Import (MW
Not validated	07/06/2019	14:00 -> 14:15	917,000	**917,000**	145,000	145,000	367,0	260,0		
Not validated	07/06/2019	14:15 -> 14:30	1068,696	**1068,696**	120,396	145,000	401,3	402,0		
Not validated	07/06/2019	14:30 -> 14:45	1048,583	**1048,583**	141,083	145,000	204,5	374,0	184,0	
Not validated	07/06/2019	14:45 -> 15:00	759,014	**846,270**	41,561	41,809	204,9	374,0	184,0	

				Incremental Prices						
Status	Date	Quarter	NRV (MW)	MIP (€/MWh)	IGCC+ (€/MWh)	R2+ (€/MWh)	Bids+ (€/MWh)	R3 Std (€/MWh)	R3 Flex (€/MWh)	Inter-TSO Import (€/MWh)
Not validated	07/06/2019	14:00 -> 14:15	917,000	1036,75	58,37	58,37	1036,75	402,37		
Not validated	07/06/2019	14:15 -> 14:30	1068,696	515,47	58,37	58,37	485,39	515,47		
Not validated	07/06/2019	14:30 -> 14:45	1048,583	1000,00	58,37	58,37	236,75	390,47	1000,00	
Not validated	07/06/2019	14:45 -> 15:00	759,014	1000,00	58,37	58,37	236,75	390,47	1000,00	

All data available on Elia website:
http://www.elia.be/en/grid-data/balancing/using-regulation-capacity

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3. Volumes reserves 2020

Regulatory framework Volumes 2020

2018	Dossier Volume 2018 -> explain methodology for needs -> determination of needs -> determination of means	#N/A#	#N/A#
2019	Dossier Volume 2019 -> explain methodology for needs -> determination of needs -> determination of means	LFC BOA 2019 -> explain methodology for needs -> determination of needs	#N/A#
2020	#N/A#	LFC BOA 2020 -> explain methodology for needs -> determination of needs	Means document 2020 -> explain methodology for means -> determination of means

Q3 2019 consultation by Elia
Q4 2019: decision CREG

Status LFC BOA 2019

- Elia submitted it's LFC BOA to the CREG on September 14, 2019
- May 14, Elia submitted modifications to the document following CREG's Request for Amendment on Mars 14, 2019
- The document was approved by CREG on May 27, 2019 with a few modifications on the original version
  - Specification of ramping restrictions of 100 MW/min on NEMO-link in the LFC Block operational agreement
  - Elaboration of the FRCE-measure in case of risk of 'high' FRCE following reserve exhaustion or extra-ordinary event
  - Removal escalation and exhausted reserve procedure (to be developed towards next version)
  - Additional clarifications and minor changes

- Final version published on the website of Elia : http://www.elia.be/en/products-and-services/balance/balancing-mechanism

No modifications were conducted on the methodology for dimensioning of FRR
(approved for 2019 under CREG decision B1808 – 18 October 2018)

Expectations regarding contracted volumes

2019 Applicable volumes

Upwards
- aFRR: 145 MW
- mFRR: 844 MW

Downwards
- aFRR: 145 MW
- mFRR: 0 MW

2020 expectations

- No mFRR down will be contracted
- Similar volumes of aFRR and mFRR up will be contracted

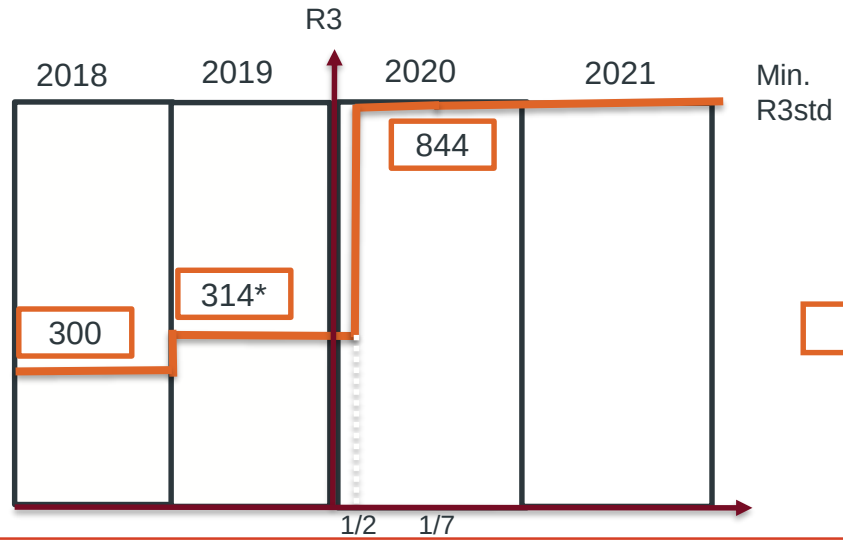
Disclaimer: Volumes on this slides are indicative. Final volumes can only be communicated after decision CREG

Minimum volume R3 standard

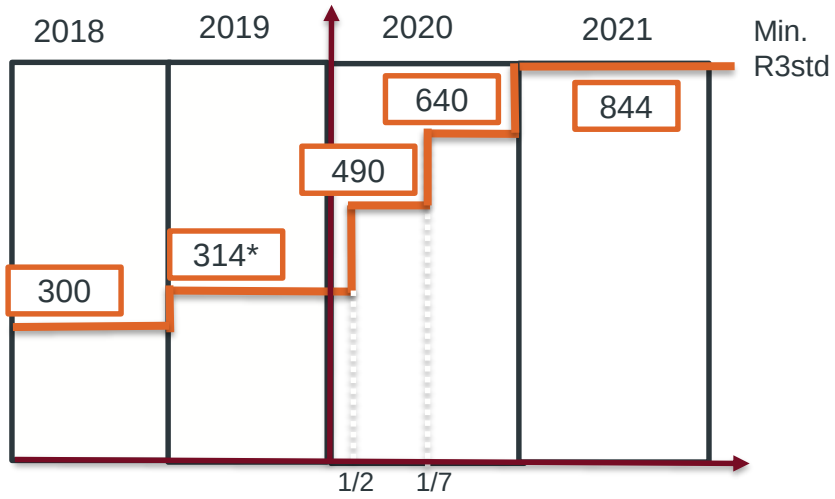
- Initial proposal by Elia – conform the initial road map R3 - was to stop the mFRR flex product at February 2020
- Stakeholders feedback: such a change is too sudden and too soon.
- Elia has developed a new proposal with a transition period:
  - February 2020: minimum volume of mFRR standard at 490 MW
  - Foresee a gradual increase of mFRR standard in later stages

Disclaimer: new proposal still need to be validated by CREG

Initial Proposal



New Proposal



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4. aFRR: open points new design

Content

- aFRR capacity tender methodology
- Priority aFRR/mFRR activations
- Participation of batteries at the aFRR design

aFRR capacity tender

Trajectory of the methodology for the aFRR capacity tender

Decisions already taken for the aFRR capacity tender:

- Separated procurement FCR and aFRR
- Daily procurement for aFRR
- Allow sourcing in 6 times 4-hour blocks

aFRR workshop in May

- Elia has presented several options and has indicated his preferred option.
- Elia has asked and received feedback of the stakeholders on this topic.

Reminder: Fundamental criteria for the aFRR capacity tender methodology

- **Impact on the aFRR cost**:
  The cost of the new aFRR design should remain acceptable (compared to today's budget). Therefore cost risks should be mitigated were possible.

- **Attractiveness for non-CIPU assets**:
  Enable new entrants (eg. Non-CIPU assets) to become active on the aFRR market with small volumes and become selected in case they offer competitive prices.

- **Transparency**:
  The price formation and selection criteria should be transparent in order to facilitate bidding competition.

- **Complexity**:
  The capacity tendering procedure should be organized each day in a period of 30 minutes. Therefore a robust and performant tendering process is required.

Timing implementation:

- the choice regarding the tendering methodology must be made **before end June**
- **Complexity** implementation should remain **limited**

Combination of CCGTs assets and new entrants

- The combination of opening the aFRR market to non-CIPU units together with taking into account the specific characteristics of the CCGTs is not a straight forward exercise.

- At the beginning of the opening of the aFRR market to all technologies, CCGTs are still indispensable for the delivery of the aFRR services

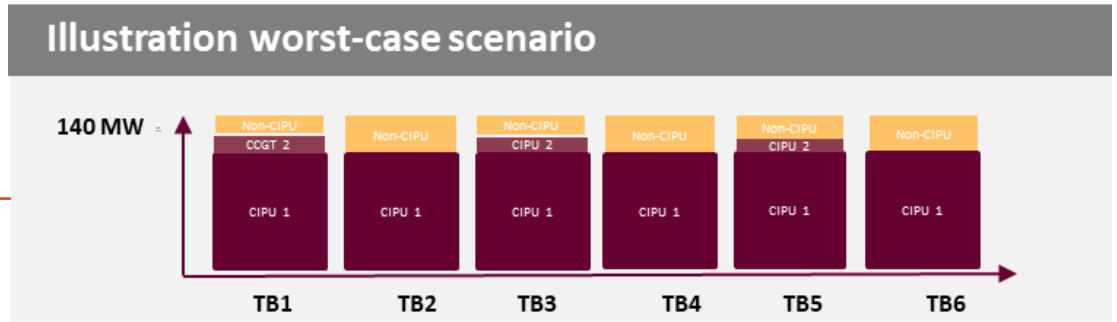
- CCGTs have a specific cost structure:
  - Start-up costs
  - Fixed must-run costs
  - Variable must-run costs
  - Opportunity costs

Last proposal of Elia:
Total cost optimization with 6 blocks of 4-hours where the start-up costs are offered separately

- **Bidding methodology:**
  - Allow only 4-hour blocks (6 blocks of 4 hours) with symmetrical bids
  - Variable cost in €/MW/h
  - Fixed cost (start-up cost) in € is added separately
  - Total cost optimization per block of 4 hour.

- **Selection of the offers**
  1. The block in the peak-hours where non-CIPU is available (e.g. block 3&4) will be cleared first. For this block, the cheapest reserved volume will be selected based on a total cost optimization. The fixed cost is taken into account in the total cost optimization.
  2. In the next step, the adjacent block will be selected with the largest flexibility. In case an aFRR supplier is selected for adjacent blocks, **the fixed costs will not be taken into account for the adjacent blocks.**

Level playing field	Cost efficiency	Transparency	Complexity
• Technically, it is possible to offer bids and Non-CIPU assets can benefit from increased aFRR prices when CIPU do not apply a flat bidding curve • Attractive for CIPU assets	• Limited cost increase since the start-up costs for adjacent blocks will not be taken into account. Worst case scenario gives **4 start-ups per day** • No impact on the must-run costs	• Risk that bids with a price below the average price of the selected bids are not selected • The separation of start-up cost makes the price formation harder to grasp	• The algorithm complexity is medium since the optimization problem needs to take into account dependency between blocks • Implementation effort is medium



Feedback of the stakeholders (summary)

Feedback of producers:

- Last proposal of Elia:
  - Unfair that start-up cost have to compete with non-CIPU for each block that they are not selected.
  - The design does not sufficiently take into account the technical constraints of CCGTs

- Proposal for a two step approach
  - Baseload block to allow a weekly or daily product
  - Asymmetric tender for 4-hour blocks for the remaining volume

Feedback of consumers

- In favour (to be validated when quantitative analysis becomes available) for a methodology where the sourcing risk is limited. A total cost optimization approach where the start-up costs are offered separately (preferred option of Elia)

Feedback of aggregators:

- Important design features for the aFRR capacity methodology:
  - 4 hour blocks or 8h blocks or peak/off-peak or shorter
  - Asymmetric merit order selection
  - Divisible bids
- Other proposals
  1. Tender with 4-hour blocks with separated start-up costs and a combination of a total cost and merit order selection in one step.
  2. Tender with linking of bids (blocks bids) as in the day-ahead market

- Up till now Elia has tried to find one single solution. This is maybe not the most optimal way to proceed:
  - Mechanism will be complex for Elia & Market players
  - One single compromise methodology means always suboptimal design for one or more parties
  - Complexity will lead to suboptimal transparency for bidders and make true competition difficult
  - Risks for cost increase are not fully mitigated

New proposal of Elia: 2 step approach

- **Methodology**
  - 2 step approach:
    - Step 1 @ D-2: independent total cost optimization for the 24-hour block for aFRR up and aFRR down together (e.g. 140MW)
    - Step 2 @ D-1: a merit order selection for upward and downward reserves separately and pure divisible 4-hour bids (e.g. 5 MW)

- **Volume allocation rules:**
  - Daily rules to gradual increase volumes selected via step 2 in case of low prices in step 2:
    - E.g. if average cost (14 Days) step 2 < 120% average costs (30 days) step 1, then volume increase with 5 MW in Step 2 in cheapest direction
    - E.g. if average cost (14 Days) step 2 < 80% average costs (30 days) step 1, then volume increase with 10 MW in Step 2 in cheapest direction
  - A rule to decrease volumes selected via step 2 in case of large prices in step 2:
    - E.g. if average cost (21 Days) Step 2 > 150% average costs (60 days) step 1, then volume decrease with 5 MW in Step 2 in most expensive direction
  - Allocation rules can be tuned differently:
    - E.g. recalculate the volume to be sourced in step 1 and step 2 each day
    - E.g. take the average cost on a shorter period (e.g. 7 days).

Level playing field	Cost efficiency	Transparency	Complexity
• Step 1 is difficult for non-CIPU assets to fulfill an obligation for 24 hours. But is attractive for CIPU assets • Step 2 is attractive for non-CIPU assets • good tuned allocation rule should create also competition between the volumes participating in step 1 & step 2	• The potential start-up and must run costs should be covered in step 1 • In step 2: it is not foreseen to have additional start-up or must run costs.	• Step 1: Risk that bids with a price below the average price of the selected bids are not selected • Step 2: full transparency	• The algorithm complexity is low • Implementation effort is low • Operational point of view: 2 tenders have to be organized

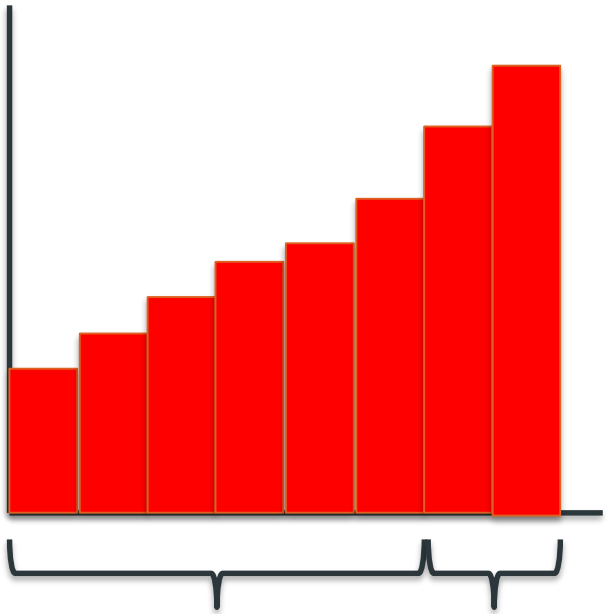
perform an evaluation after 1 year

Priority aFRR versus mFRR during the activations

Recap: impact of new aFRR design on available aFRR volumes for activation

Today: Pro-rata activation

- Volume cap = reserved volume
- Price cap ≈ 100€/MW/h

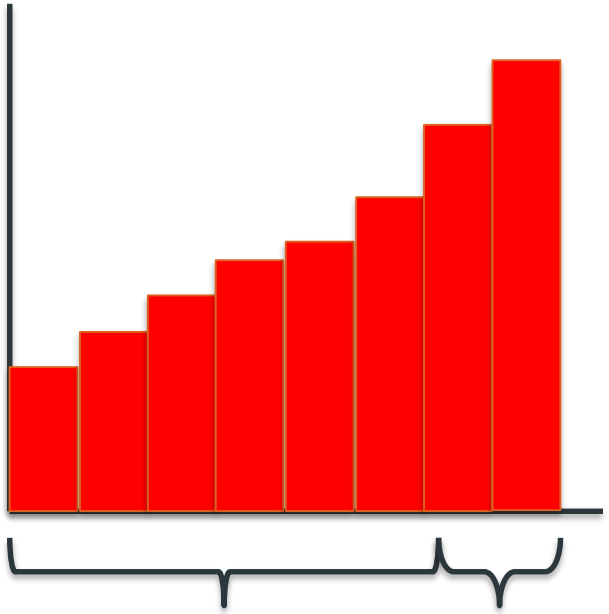


145 MW selected for aFRR

- Not selected for aFRR
- Volume is available for I/D bids

Future: merit order activation

- No volume cap
- Re-introduction of a price cap

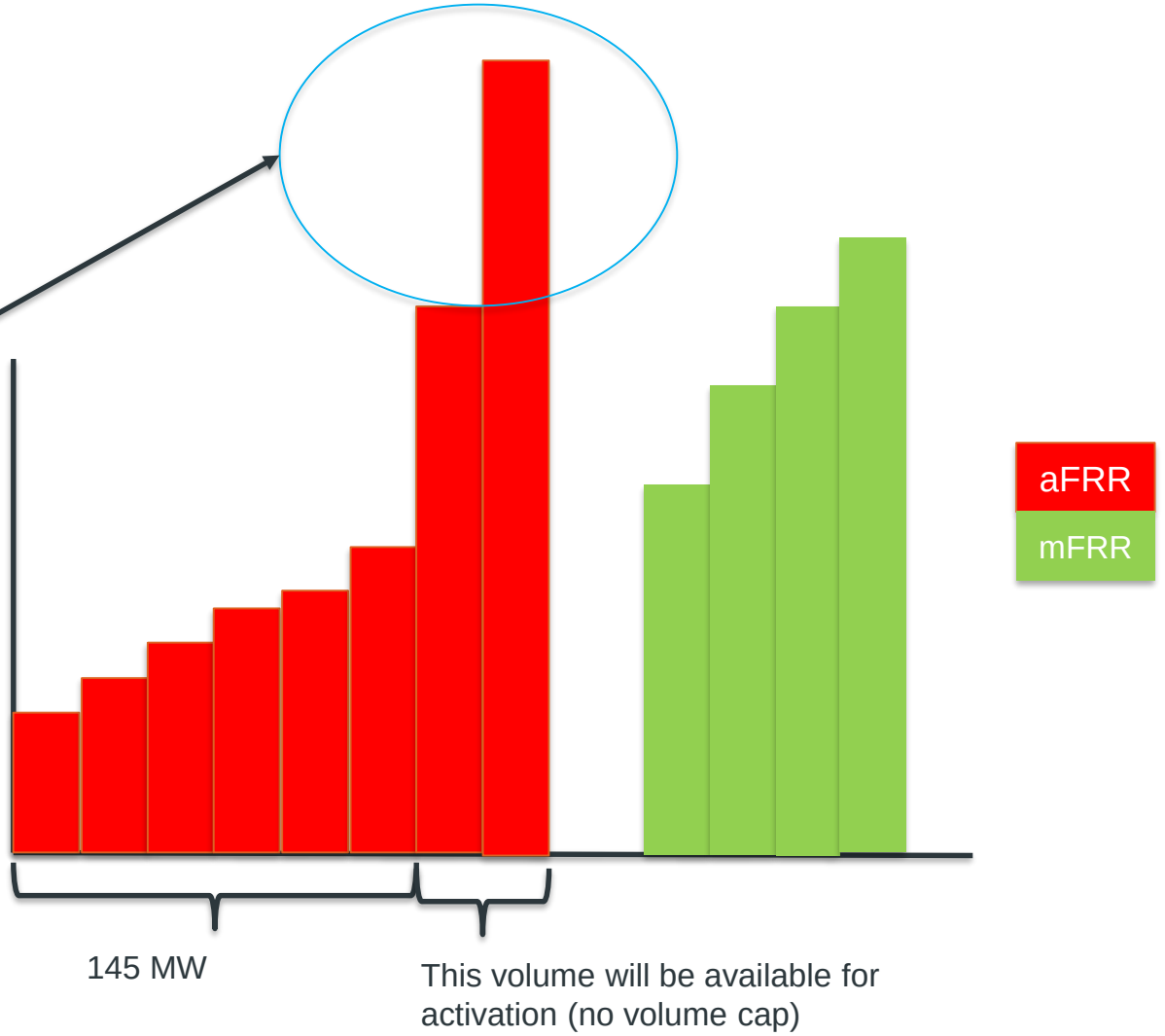


145MW

This volume will be available for aFRR activation

Balance between aFRR and mFRR activations

- aFRR is activated automatically
- Risk that more expensive aFRR is activated before mFRR
- This situation is also linked to the limited liquidity of aFRR



Balance between aFRR and mFRR activations

preventive activations of mFRR not realistic:

- A forecast of the power deviations is required
- These preventive activations require arbitrage rules for Elia.
- Preventive activations of mFRR will also affect the activation of cheaper aFRR bids

→ This methodology is not 100% waterproof. aFRR is an automatic product and activations of bids with large prices cannot be avoided in case of quickly changing power deviations

Once the connection to the **European platform** is put in place:

- All bids of the European platform are at the disposal of Elia.
  - Elia bids can be activated for Elia;
  - Elia bids can be activated for another TSO;
  - Bids of other TSOs can be activated for Elia.

- Available volumes for Belgium in the Common Merit Order List are not know ex-ante:
  - Other TSOs might also activate volumes
  - The use of ATC is in real-time attributed.

Situation will change each 4 seconds

- Available prices for Belgium in the Common Merit Order list are not known ex-ante:
  - Cross border marginal pricing: preventive activations not possible as prices only known ex post

→ economic optimization becomes very difficult in an European context

Balance between aFRR and mFRR activations

The only way to avoid the activation of aFRR bids which are more expensive than the mFRR bids is the introduction of a **price cap**.

Elia proposes to re-introduce a price cap:
- 1000€/MWh in the upward direction
- -1000€/MWh in the downward direction

If the price cap is reached for several quarter-hours, Elia proposes to re-evaluate the value for the price cap (in coordination with CREG)

The price cap together with an **average weighted pricing mechanism** mitigates the risk of having too large impacts of price peaks on the imbalance tariffs.

Situation without price cap

Price of bid 1 [€/MWh]	activation time of bid 1 [sec]	activated volume of bid 1 [MW]	Price of bid 2 [€/MWh]	activation time of bid 2 [sec]	activated volume of bid 2 [MW]	Imbalance price [€/MWh]
10000	60	5	60	840	145	**76**
10000	60	20	60	840	130	**137**
10000	300	5	60	600	145	**150**
10000	600	10	60	300	140	**463**

Situation with price cap

Price of bid 1 [€/MWh]	activation time of bid 1 [sec]	activated volume of bid 1 [MW]	Price of bid 2 [€/MWh]	activation time of bid 2 [sec]	activated volume of bid 2 [MW]	Imbalance price [€/MWh]
1000	60	5	60	840	145	**56**
1000	60	20	60	840	130	**57**
1000	300	5	60	600	145	**50**
1000	600	10	60	300	140	**63**

Participation of energy limited assets larger than 25MW

Energy limited assets (e.g. batteries) > 25MW

Proposal:

- Unit based prequalification: test takes 90 min
  Since the test is well planned beforehand, this should be feasible

- Unit based availability test: test takes 30 minutes
  The delivery of the service should be always possible for at least 30 minutes

- Unit based bidding
  aFRR provider can nominate a back-up bid (to ensure energy requirements are always met) for e.g. 1MW in line with the current bidding rules for energy bids. This bid is taken into account for the activation control.

- Portfolio based activation and activation control
  A set-point is sent per BSP and the units are activated on a portfolio basis. Activation control is performed on BSP level.

- Proposed approach is in line with the current design
- If Elia notices that the participation of this kind of assets is increasing and the current measures are not sufficient, Elia will perform a detailed analysis how the design could be improved in the future.

Next steps

Next steps

- Update of design note (foreseen in July)
- Working further on the implementation trajectory
- Technical implementation note is foreseen in Q4 2019
- Go-live is foreseen in July 2020

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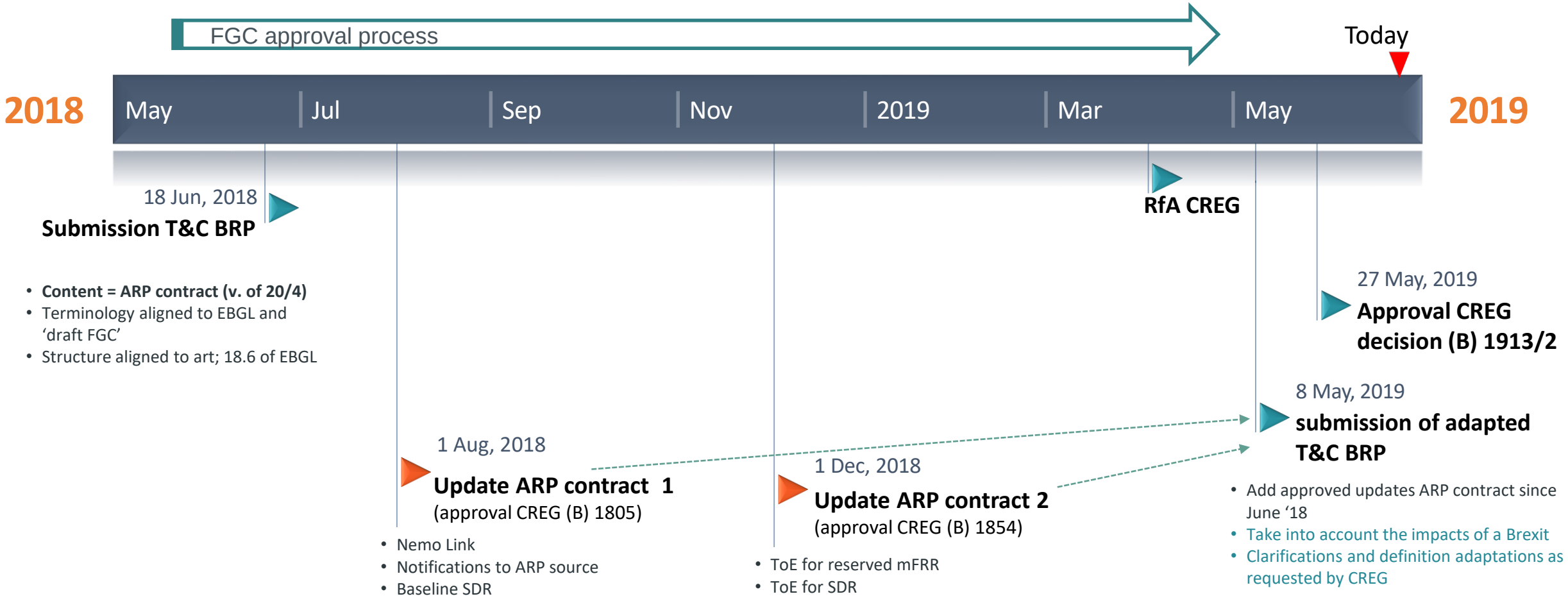
T&C BRP



- **Content = ARP contract (v. of 20/4)**
- Terminology aligned to EBGL and 'draft FGC'
- Structure aligned to art; 18.6 of EBGL

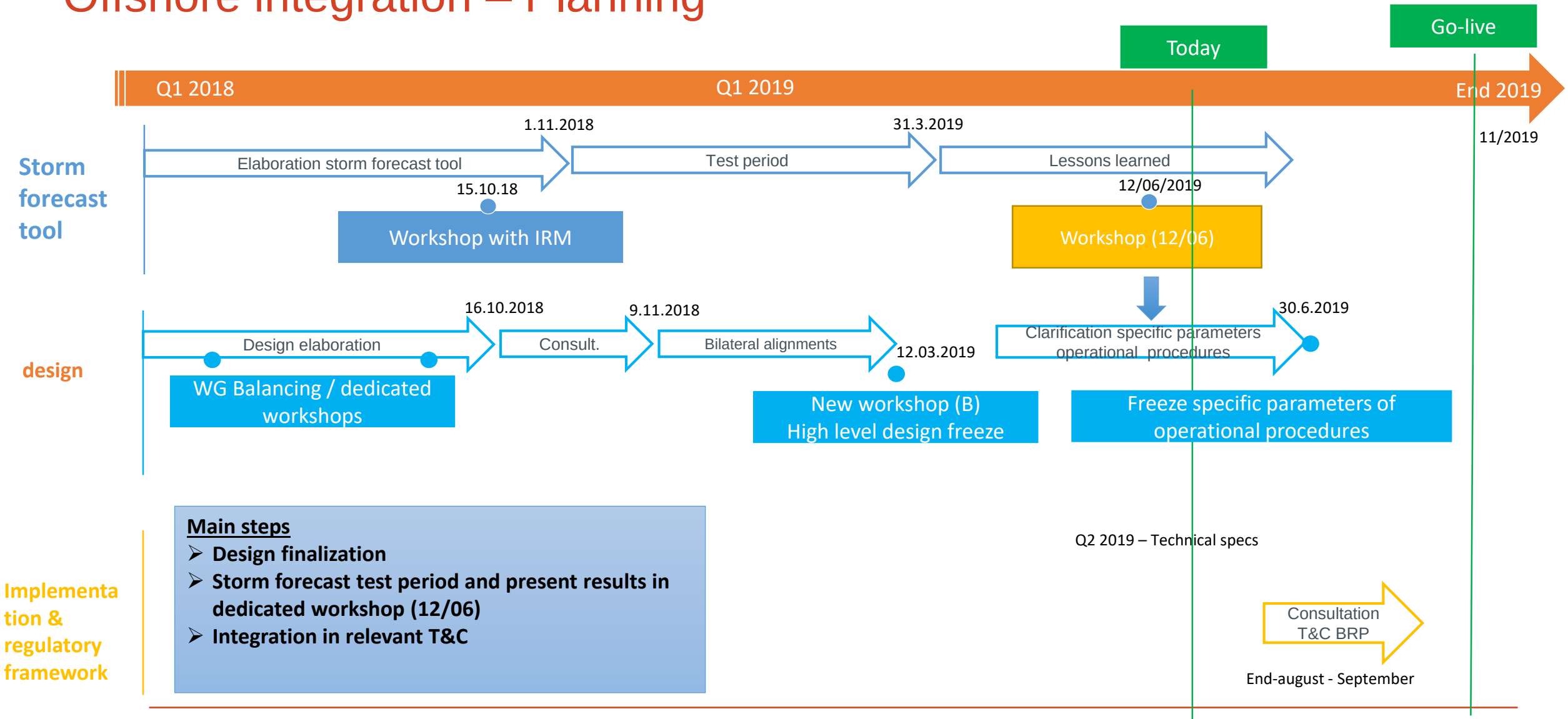
- Nemo Link
- Notifications to ARP source
- Baseline SDR

- ToE for reserved mFRR
- ToE for SDR

- Add approved updates ARP contract since June '18
- Take into account the impacts of a Brexit
- Clarifications and definition adaptations as requested by CREG

- The T&C BRP comprises the new BRP Contract that will replace our current ARP Contract 3 months after CREG's approval➔ 27/08/2019
- Considering the important change of the legal framework (EBGL and FGC), Elia will proceed to the signature of this new BRP Contract.

Offshore integration – Planning



Offshore integration: workshop 12/06/2019 – Topics

- ✓ **Description of the storm forecast model and possible improvements**
  - Presentation of the model by the storm forecast supplier
  - Improvements of the Storm forecast Tool

- ✓ **Lessons learned on storm forecast tool**
  - Assessment of the to forecast accuracy during a test period (November 2018 to March 2019)
  - Retro-analysis on past winters

- ✓ **Publication and communication of storm events**
  - Total storm impact and timings on Elia website and via RSS feeds
  - Storm impact per park for impacted offshore BRP's via dedicated tool

- ✓ **Storm detection**
  - Triggers to detect a storm and start the storm procedure

- ✓ **Determination of specific parameters of the operational procedure**
  - Timings of the storm procedure
  - Wrap-up of the proposed design

Offshore integration: workshop 12/06/2019 - Feedback

1. **On the storm forecast model and possible improvements**
   - The integration of new wind park technologies (“high-wind ride through”) in the model is considered as a critical point
   - The willingness from involved market parties to help improving the storm forecast model (calibration with historical data, integration of new technologies) has been again confirmed

2. **On the lessons learned on storm forecast tool**
   - Due to the limited number of storm events during the test period, it is difficult to draw complete conclusions about the accuracy of the model

3. **On the storm detection**
   - The inclusion of new wind park technologies has to be also well considered in the defined triggers to detect a storm

4. **On the operational procedure**
   - The timings of the storm procedure have to be well integrated in the overall procedure
   - The actions required by the operational procedure (adaptation of outage planning; adaptation of schedules,…) and their consequences have to be clarified

Offshore integration - Next steps

Q2	12th June	Specific workshop to detail results of storm forecast test period, define procedure parameters and present improvements of the model
	End of June	• No IT specs for market parties ➔ Storm tool is a web application • Update of the design note based on feedback from 12/06 workshop
Q3	July-August	Last improvements of the storm forecast model (calibration with historical data, integration of new technologies of wind parks) Continuation of the retro-analysis of the model accuracy on past winters
	End August September	• Public consultation of T&C BRP • Possible next workshop on offshore integration • User manual of the storm tool
Q4	November	Go-live of the storm procedure

Offshore integration in T&C BRP

T&C BRP will be modified to integrate the elements related to the storm mitigation procedure

✓ **Individual balancing obligation for BRP's (art. 15).**

- BRP has to take measures to consider and anticipate forecastable Storm Events that could lead to imbalances on its perimeter. In particular, BRP has to have a forecasting tool to detect storm events
- BRP has to prepare mitigation measures to keep the balance on its perimeter
- BRP has to follow the **storm mitigation procedure** in case of storm events in order to efficiently anticipate the imbalance risk
  - The relevant information have to be communicated to Elia (storm detection, mitigation measures)
  - The communicated mitigation measures have to be visible in outage planning and schedules provided via CIPU contract
  - The communicated mitigation measures have to be applied when the storm starts

✓ **Description of the storm mitigation standard procedure in appendix**

The public consultation of T&C BRP will start at the end of August

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FCR product developments

FCR – Reminder of main evolutions for 2020

Daily Procurement with 4 hours product

- Procurement via the regional platform only ➔ EU harmonization
- 4 hours product
- Procurement separated from aFRR

Procurement of 200mHz service only

- Symmetric FCR 200mHz only
- End of procurement for asymetric and symetric 100mHz FCR services

Merge of CIPU and non-CIPU contracts into one T&C BSP FCR

- Harmonization of products has been performed
- One portfolio per BSP
- Simplification of contracts management and operational procedure

Evolution of the providing group definition

- Evolution of the nomination and settlement processes
- Simplification of operational procedure

EU harmonization

Local evolution

FCR – Design note feedback

- ✓ **The design note describing the evolutions was consulted from April to end of May**

- ✓ **Feedback was provided by market parties on the design note:**

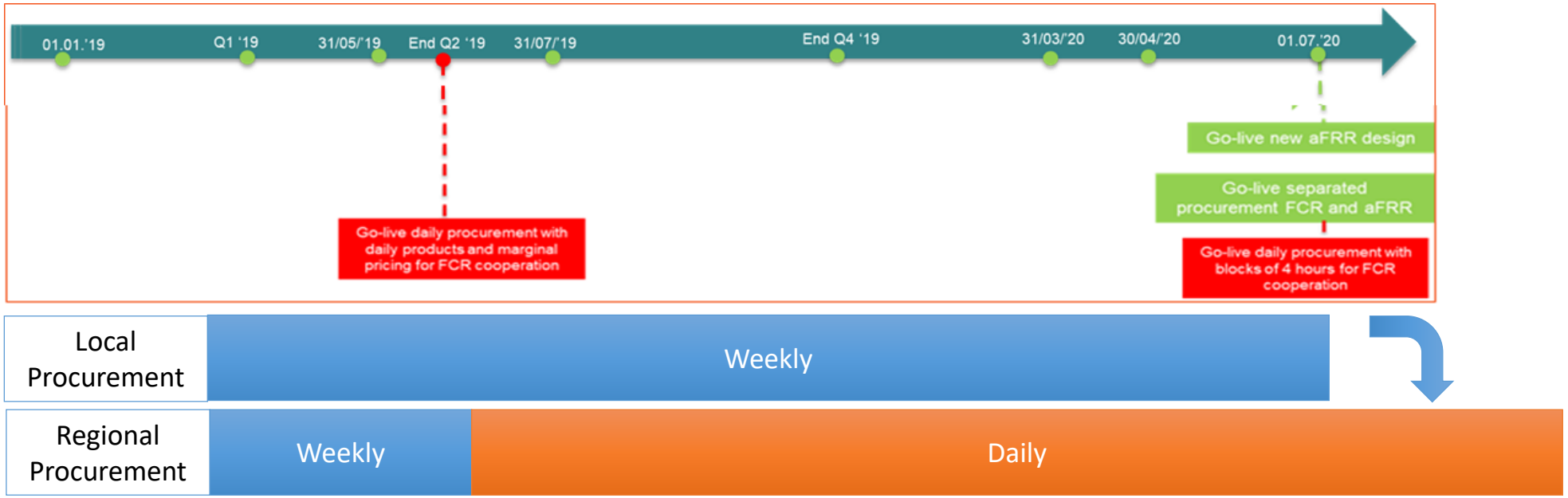
1. Principles related to energy limited assets need to be clarified
   - Requirements for the energy limited assets
   - Requirements for the Energy Management Strategy (EMS)
   - EMS management during the availability test

2. Principles of the availability test need to be clarified
   - Verification of availability test success
   - Availability test for 200 mHz service only

3. Alignment with points included in the current GFA
   - Clarification of the penalty mechanism

FCR – Planning and next steps

✓ **FCR evolution planning**



✓ **Design note integrating the received feedback is available on Elia website**

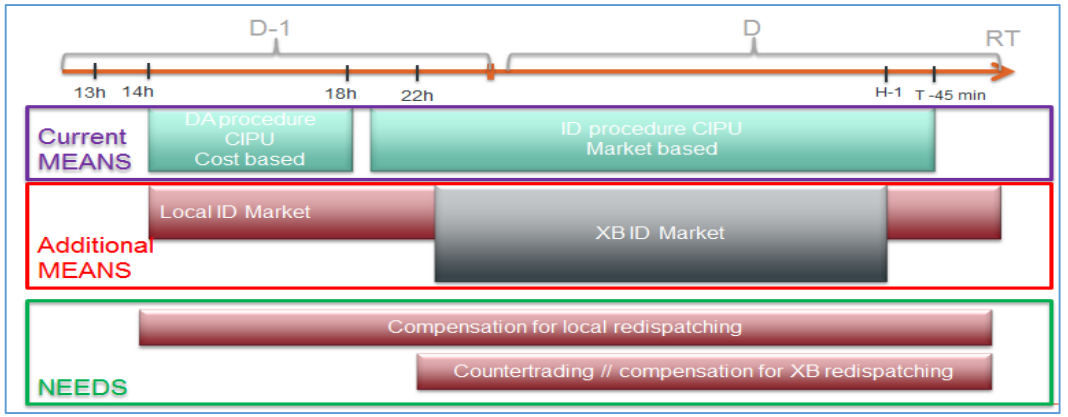
✓ **Next step: T&C BSP FCR**

6. Status updates
ID Market access

Intraday Market Access – Principle and objective

- **Due to the Go-Live of Nemo Link HVDC cable**
  - The possible volumes to be compensated in case of **countertrading** could be **much higher**
  - It could be hard to find these volumes with the current means used for the compensation of countertrading

- **Intraday (ID) Market Access could be used as a compensation mean for countertrading**
  - The principle is to get **access to the ID local and cross-border markets** to find the necessary volumes to compensate the countertrading activations
  - The following advantages are foreseen:
    1. Increase of the available liquidity for the compensation mechanism
    2. Cost optimization of compensation bids due to local and cross-border markets coupling
    3. Preservation of reserves obligation for balancing management purpose



A **one year trial period** is planned to evaluate the added value of the access to Intraday Market

Intraday Market Access – Rules and activation

Rules for activation of the ID market as compensation mean:

- **ID market access will be used in the following cases:**
  1. A need of **countertrading on Nemo Link** is detected after 18h in DA by Elia to solve internal congestions on the axis Gezelle-Horta
  2. A need of **countertrading on Nemo Link** is detected after 18h in DA by the English TSO to solve congestions in the United Kingdom
- **Out of scope for the use of ID market**
  - A need of countertrading/redispatching is detected before 18h in DA
  - Cross-border redispatching
  - Internal redispatching in Belgium if the compensation has to be precisely localized

Activation of Intraday Market Access

- **During the trial period:**
  - The tool and process will not be developed by Elia
  - Access to the ID market will be performed with the support of a **neutral third party**
    - With no direct access to BE market
    - With the necessary experience and tools

Intraday Market Access – Status and next steps

- ✓ **Intraday Market Access rules in the context of congestion management have been validated by the CREG for a trial period**

- ✓ **The trial period started on the 1st of May 2019 and will end on the 30th of April 2020**
  - The objectives of the trial period are to evaluate:
    1. The added value of the ID Market Access in terms of **flexibility, liquidity and cost**
    2. The possible **consequences** for involved parties

- ✓ **Transparency and publications**
  - A report will be made available around the **end of the trial period** with:
    1. An evaluation of the objectives described previously
    2. A summary of the activations of the ID market access for the compensation of countertrading on Nemo Link
  - Following REMIT obligations, the congestion on the Gezelle-Horta axis requiring an activation of the ID access for compensation will be published
  - The evolutions of intraday cross-border capacity in intraday will be published on the JAO website
  - The total cost and number of activations of ID market access will be published ex-post on the website (on a monthly basis and if ID access was used)

- ✓ **A new proposal of the rules has to be submitted on the 1st of February 2020**
  - The extension of the Intraday Market Access will be discussed based on the new proposal

6. Status updates
mFRR: stakeholder consultation feedback & next steps

Received feedback

Stakeholder responses:

- FEBEG
- FEBELIEC
- Restore
- Actility
- Eneco

Main points:

- Availability test frequency & remuneration
- Prequalification test profile CIPU
- Pay-as-cleared settlement mechanism
- Administration daily procurement

Other minor points (not presented today)

Point 1: Availability tests

Stakeholder concerns that Elia's proposal on the availability tests will rule out Demand Response of mFRR.

Issue:

- *Availability tests are not remunerated.*

Elia design: no change

- *The number of activations for availability tests may exceed the contracted amount of activations, rendering the delivery point unavailable for 'normal activation'.*

Design adaptation: Elia understands the concerns of the stakeholders that flexibility will only be activated for the purpose of an availability test and this should be avoided.

Elia will adapt the organization of availability tests.

⇒ Goal is to have 12 availability tests per year per BSP

⇒ In case of good test performance the amount of tests may be reduced from 12 to 6 per BSP per year.

⇒ In case of good test performance the amount of bids included in a test may be reduced (meaning, not all delivery points have to be included in all the tests).

However:

- Elia maintains the right for additional tests in case of clear indications that the reserve is not available.
- Elia maintains the right to verify the availability of balancing capacity on all delivery points.
- In case a bid is only partially activated for an availability test and there is underdelivery, the penalty will be applied on the full bid as it concerns a control of availability.

Point 2: Prequalification test profile

Stakeholder concerns with assumption of linear ramp up and how the energy during the ramp-up quarter-hour is used to determine the max prequalified power.

Issue:

- Prequalification process: half the requested energy is expected during ‘ramp up qh’.
- But not all production units have a linear ramp up.
- This constraint is difficult to respect for these units (because of their non-linear ramp up profile) and would result in a loss of flexibility.

Design adaptation: Elia understands the concerns of the stakeholders and will adapt the design as follows.

- Only the energy delivered after the ramp-up quarter hour will be considered to determine the max prequalified power.

However, Elia repeats that the requested power must be reached by the end of the 1st quarter-hour (ramp-up).

Point 3: Pay-as-cleared settlement mechanism

Stakeholder request to apply clearing price on both mFRR standard and mFRR flex activations.

Issue:

- *Pay-as-clear for mFRR flex set based on the mFRR flex activated bids only.*

Elia design: no change

- mFRR flex is bound to less requirements than mFRR standard, has different product characteristics and should therefore not receive the same remuneration.
- Reward for mFRR standard to driving flexibility towards mFRR standard products.
- Full PAC mechanism between mFRR standard and mFRR flex would not result in lower costs for Elia given current position of mFRR in merit order.

Stakeholder concerns that evolution towards pay-as-cleared mechanism will result in a more expensive settlement model.

Elia design: no change

Cfr. Study on pay-as-bid versus pay-as-cleared (2017)

Point 4: Administration daily procurement

Stakeholder concerns on the administrative impact of daily procurement. Reference to FEBEG's proposal of 2018 to buy part of the mFRR volume in another timeframe than daily.

Elia design: no change

Cfr. Study on dynamic procurement proving the added value of evolving to daily procurement.

Next steps

- Elia will bilaterally contact stakeholders for responses on their other **feedback**.
- An updated version of the **design note** will be published online by mid July including the design adaptations based on the consultation feedback (see previous slides)
- **Material for IT-implementation** at stakeholder side: Elia will share technical documentation of B2B interfaces by end July.
- After the summer, Elia will share **didactic business documentation** and organize a workshop to respond to questions.
- **T&C BSP mFRR**
  - Q3 2019 workshop + public consultation
  - Q4 2019 Decision CREG

In case of questions:
Contract manager – Amandine.Leroux@elia.be
Design – Sofie.Vandenwaeyenberg@elia.be

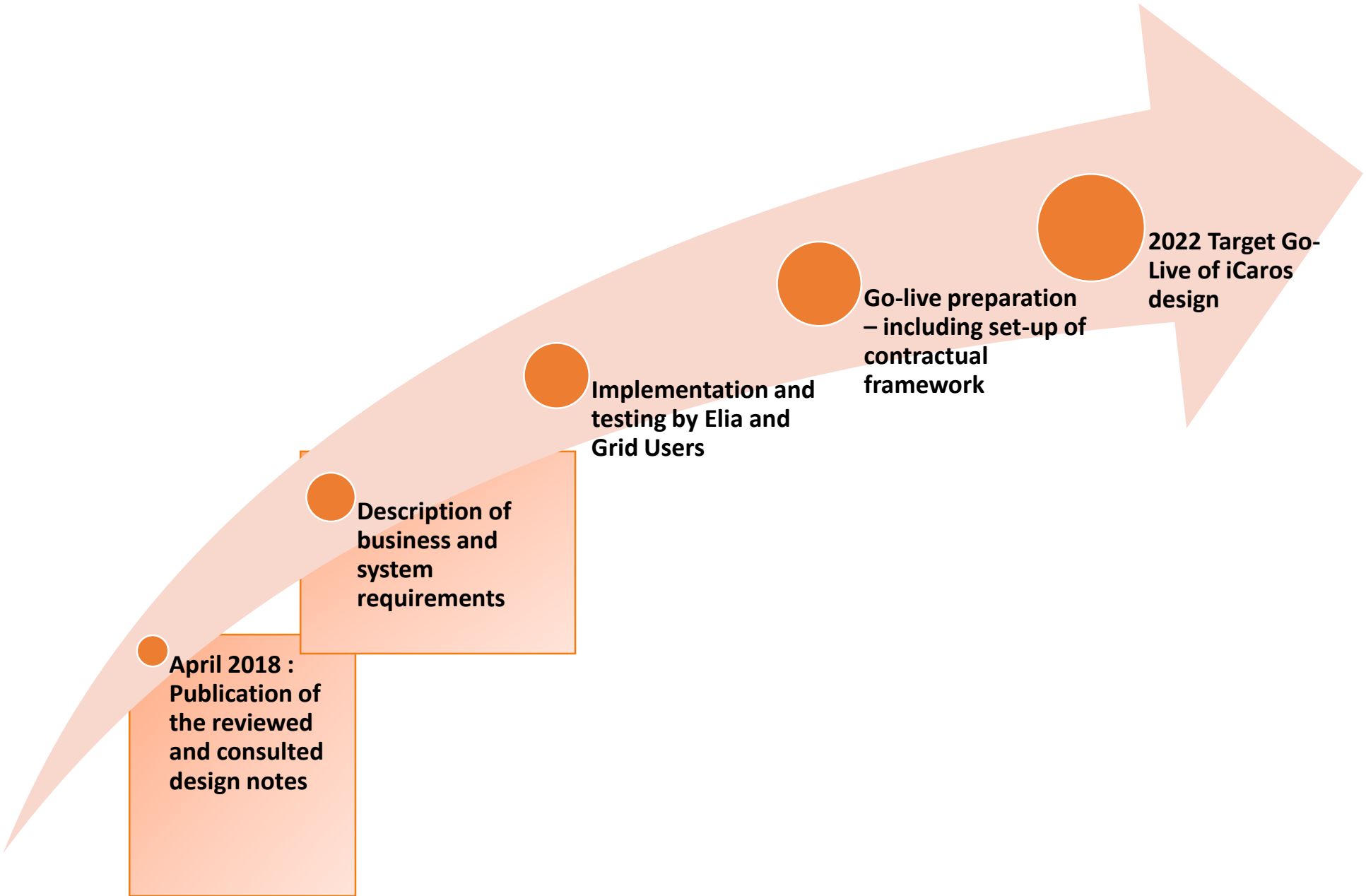
6. Status updates
iCaros Implementation project

Deliverables 2019

- **Delivery of regulatory package version 1.0** (content : T&C OPA version 1.0, T&C SA version 1.0, coordination rules version 1.0 & implementation plan for iCAROS design) in line with current Elia procedures and tools – **focus on TSOs connected PGMs D&C ≥ 25 MW (including those connected through a TSO-connected CDS)**
  - Public consultation : *one month consultation between September and mid-October 2019*
  - Submission date towards regulatory authorities end October 2019
- **Translation of design iCAROS in business/functional requirements and non-functional requirements** to be included in regulatory package version 2.0 (T&C OPA version 2.0, T&C SA version 2.0 and coordination rules version 2.0) in line with iCAROS design – **focus on ALL TSO-connected assets (including those connected through a TSO-connected CDS)**

  2019 - fine-tuning of design and business requirements

High level indicative planning



Collect input from current (and future) users/stakeholders in order to fine-tune dessign and business requirements focus on assets on TSO grid & TSO-connected CDS

7 fine-tuning sessions (2hours) – topics of sessions are communicated to current (and future) users/stakeholders at least one week before session

- 2/4 : The following topics were discussed
  - Bidding of flexibility for redispatching: bid properties
  - Scheduled data exchange DA/ID for Energy storage
- 22/5 : The following topic was discussed :
  - processes that will enter into force regarding outage planning with the Go-live of the iCAROS design – explanation of the new feature in the delivery of information of unavailabilities namely “tentative unavailability”
- 24/6 : The following topic was discussed :
  - processes that will enter into force regarding scheduling with the Go-live of the iCAROS design

6. Status updates
ToE: pass-through contracts

Context

Feedback from market actors on consultation of aFRR design note (2018):

- market players deplored the lack of a solution for net-injection delivery points in the context of ToE
- 2 actors proposed an alternative set-up for delivery points where grid user signed a PT contract
  - ➢ This allows small generation assets (also net-offtake) easy market access via an independent BSP (without needing prior consent from BRPsource or Supplier)

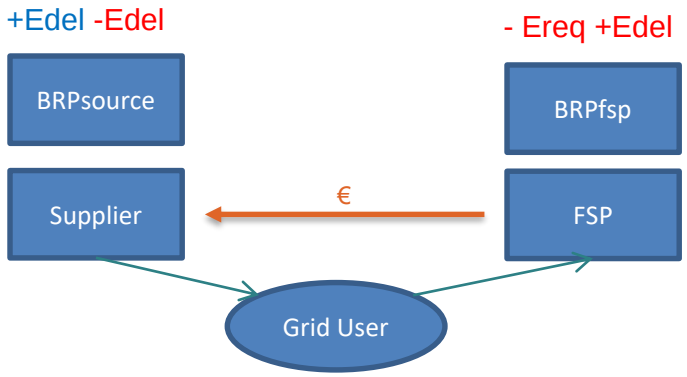
✓ Elia consulted on the **alternative solution for PT contract** holders via
1. the consultation of the aFRR implementation plan (link)
2. WG BAL November 2018 (link)

✓ Market players welcomed the alternative solution for PT-contract holders and requested
1. **Product neutrality:** adopted also for mFRR
2. Technology neutrality: applicable for both net-injection and net-offtake units

Comparative summary of possible schemes

Legend:
► Deviation induced by activation
► correction

ToE

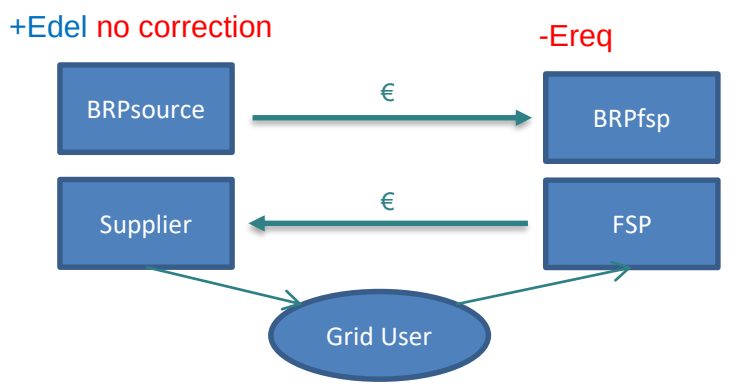


Condition to participate:
- Proof of *agreed price or default price*

- Elia corrects BRPs' perimeters and calculates all volumes necessary for the settlement between supplier-FSP
- Settlement between BSP and Supplier based on published ToE volumes*

* Volumes of Edel calculated by Elia & DSOs

Opt-out



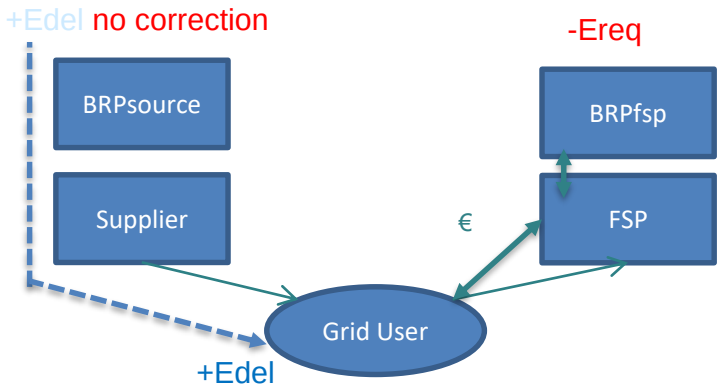
Condition to participate:
- Proof of *Op-out agreement*

➢ *BRPsource,FSP, supplier & BRPfsp work together, they **collaborate** in providing flexibility*

The same corrections take place

- Elia corrects only with Ereq
- BRPsource, BRPfsp, Supplier and FSP settle by their own

Pass-through



Condition to participate:
- Proof that GU has a pass-through contract

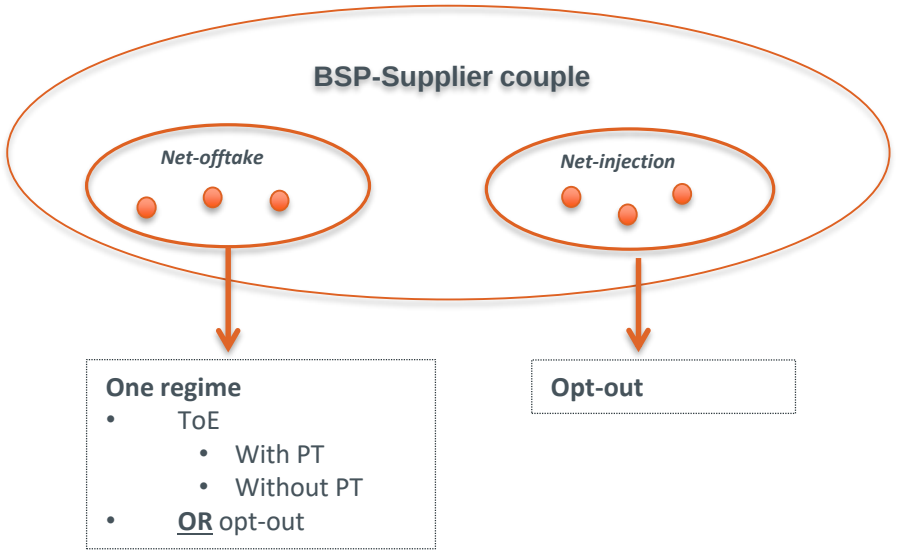
➢ *In PT regime, BRPsource/Supplier are **not impacted** by the activation; they pass their imbalance to the GU thus agreement between 4 parties not necessary .*

- Elia corrects only with Ereq
- GU,FSP and BRPfsp settle by their own

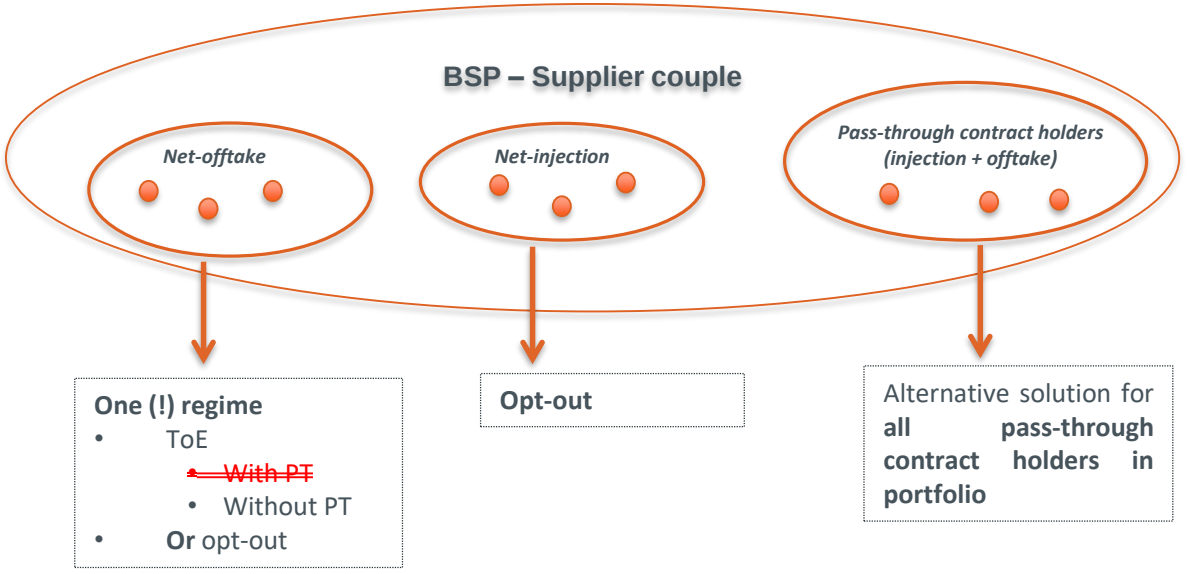
Advantages:
- ✓ FSP/BRPs/Sup. Completely independent
- ✓ Confidentiality ensured
- ✓ No impact on BRPsource/supplier

Target design

AS IS



TO BE



- Elia foresees the new pass-through regime for **aFRR**, In parallel with the next developmens onf the concerned products:
  - mFRR: in // with the introduction of dayly sourcing (Feb 2020)
  - aFRR: in // with the opening of the **aFRR to** non-CIPU units (July 2020).
  - SDR: winter period 2020 - 21

Next steps

Planning closely linked with consultations of **T&C BSPs** (+ go-live **new mFRR** and **aFRR design** in 2020)

- ✓ **18 - June:** Public consultation ToE-rules
- ✓ **End of august – September** : submission ToE-rules for decision to CREG

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   - ToE pass-thourgh contracts
7. Winter product
8. RT DGO Allocation platform
9. European Integration

7. Winter product

Context

- In the context of the adequacy issues that had been identified for winter 2018-19 Elia implemented the “Slow Non-CIPU R3 NR” .
- Goal of the product:
  - provide a quick alternative to the Strategic Reserve for the winter 2018-19
  - provide to the slow flexibility a quick way to the market
    - this flexibility technically not able to react within 15’ in order to participate to the balancing market
    - no ToE possibility for DA/ID
- The product had the following characteristics:
  - ToE applicable
  - No capacity reservation
  - Flexibility in participation: Bid can be withdrawn / adapted till h-2 ➔ possibility for parties to sell on ID instead
  - Call for bids 8-12 hours beforehand based on adequacy analysis
- Pursuant to decision (B)1857 the CREG Elia evaluated the experienced feedback relative to this product and the relevance of maintaining it.

Feedback Analysis

- Despite the interest of stakeholders only a few MW had been contracted with delivery points located in distribution grid. All of them had participated to SDR drop-by in the past.

- Besides that adequacy circumstances evolved positively in the first weeks of the winter period and there has been no activation

Evolutions ?

- The product "as it is" is meant to be and can be used only for adequacy issues
  - Bids are called upon by Elia after adequacy trigger with a notice period of 8-12h
  - No firmness of bids as they can be withdrawn
- For the coming winter, the interest for this product "as it is" strongly depends on the adequacy situation
  - Conform the Minister's decision of 15/01/2019 the volume of Strategic Reserve needed for the winter 2019-20 is = 0MW
    - ⇨ No adequacy issue implying limited opportunities for market players
- For the Future:
  - ⇨ When Minister's decision indicates a need followed by an SR tender
    - ⇨ The SR product "fills the gap" and solves the adequacy issue
    - ⇨ No place for a substitute du the SR if there is already SR
    - ⇨ Besides that we can expect, especially now that SR has ToE and that SR, there is more interest of the market parties for SR
  - ⇨ The reactivation of the winter product for 2019-2020 would be useful only in case of unexpected event that increases the need while strategic reserve cannot anymore be constituted

Remarks:

- Implementation of ToE in DA/ID providing access to the market to the "slow" assets is foreseen for 2020 (subject to the results of the ongoing study)
- Elia's products will gradually become technology neutral ➔ same approach is targeted in the future also for slow reserves (slow CIPU and slow non-CIPU) . This could probably imply design adaptations (ex: call for bids, firmness of the bids…)

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8. RT DGO Allocation platform

CREG Discretionary Incentives

2016 – CREG Requests study on feasibility of real-time BRP imbalance calculation through discretionary incentive for 2017 (cf. . DECISION (B)160630-CDC-658E/38)

2017 – Elia performs study

Analysis of different imbalance components

PoC for real-time estimation of DGO Allocation

PoC is based on statistical methods (machine learning) for determining an optimal regression model

PoC provides acceptable accuracy, with the exception of the months of January and February (client switching not captured by machine learning algorithm)

2018 – CREG requests, through discretionary incentive for 2019, the operationalization of PoC built in 2017, along with a proposal for improvement of the estimation methodology (cf. DECISION (B)658E/52)

DGO Allocation estimation model

The estimation model built in 2017 is a linear regression model, the RT DGO Allocation for instant qh is calculated using variables also at instant qh

$$RT\ DGO\ Alloc\ Estimate_{BRP_i}(qh) = Intercept_{BRP_i} + \sum_{j=1}^{N} Coeff_{BRP_i}(j) * Variable_j(qh)$$

The variables in the model are numerous (infeed, solar, wind…) and the coefficients (Coeff) are calculated individually for each BRP and variable, in order to maximize the model performance.

The model of 2019 is also a linear regression model, with improvements in terms of additional variables and variable selection

Additional variables in model for 2019

Infeed	SLP
Solar Forecast	Wind Forecast
Solar RTU	Wind RTU
Prices	Temperature
Calendar	DGO Nominations
Load Forecast	Load RT

- Tested and selected in 2017
- Tested but discarded in 2017*
- Tested and selected in 2019*

* variable selection has been fine-tuned in 2019 model. Some of the variables discarded in 2017 might be selected in 2019

Note that these represent families of variables, behind these you can find multiple variables. For instance, the infeed variable family has hundreds of individual variables.

BRP ID-card – Variable selection

The methodology improvement research in 2019 has shown that a selection of variables specific to each BRP provides better results than a general model, with all variables, for each BRP.

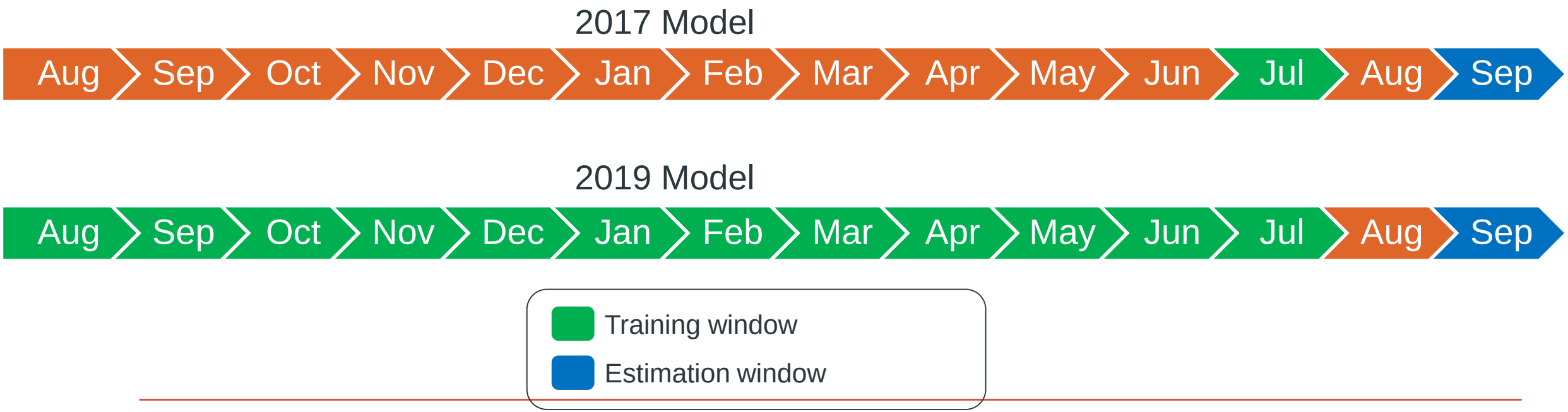
The variable selection for each BRP is defined in a BRP ID-card. It can be done using machine learning techniques, or with knowledge of the BRP portfolio.

Variable family	BRP A Large residential customer base	BRP B Solar Aggregator	BRP C Wind portfolio
Infeed	*		*
SLP	*		
Solar		*	
Wind			*
Nominations	*	*	*

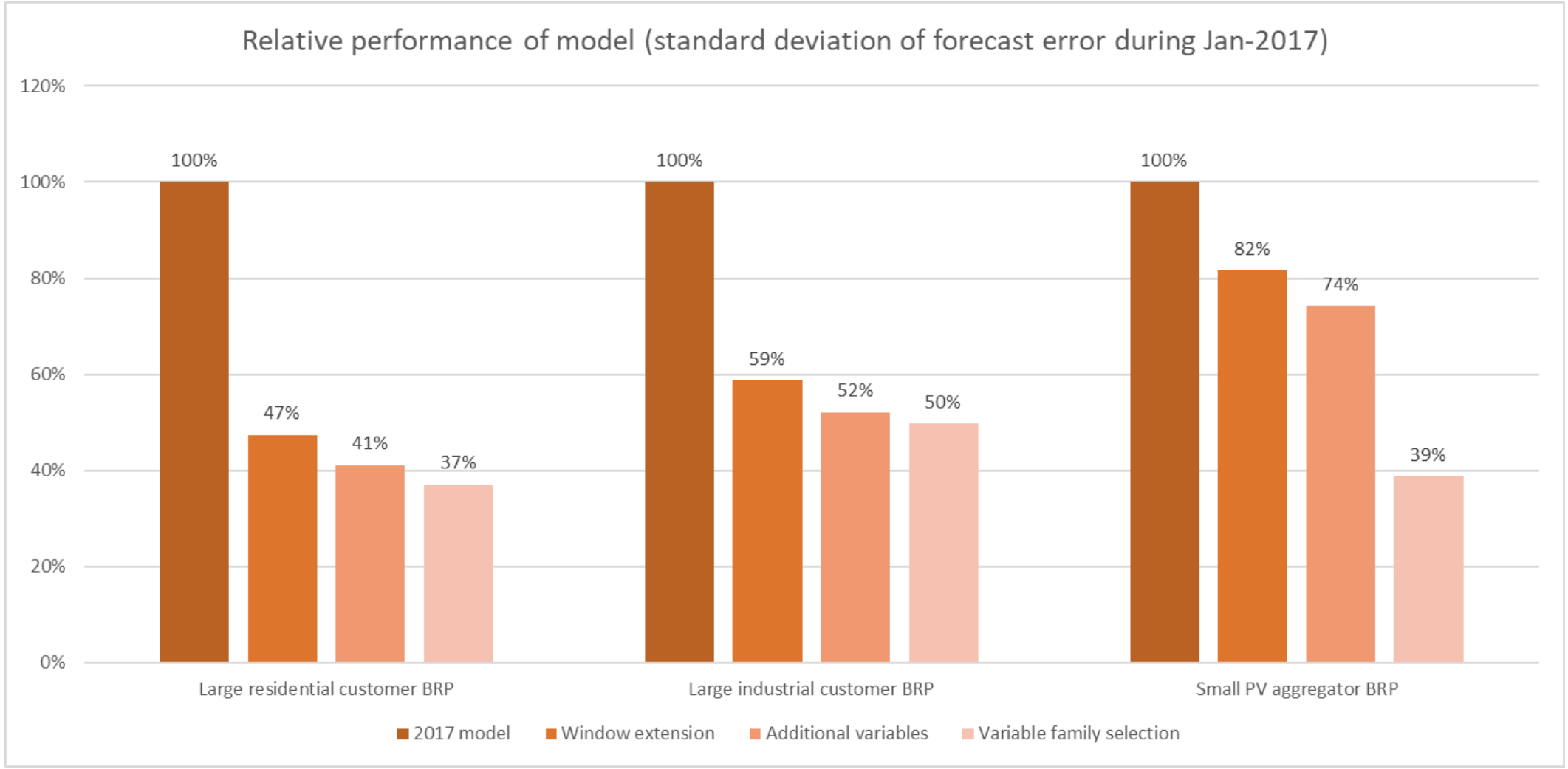
Training period extension

Another improvement with respect to 2017 is the extension of the training window of the machine learning algorithm.

In 2017, the algorithm used 4 weeks, where in 2019 this has been extended to 12 months, allowing capturing seasonal events.



Summary of methodology improvement impact



Data quality on real-time

Each variable has a weighting in the quality of the estimation (i.e. how much the estimation precision degrades when the variable is missing

	Available	BRP A (%)	BRP B (%)	BRP C (%)
DGO Infeed	Yes	54%	17%	27%
Solar Forecast	**No**	~~22%~~	~~77%~~	~~66%~~
SLP	Yes	15%	6%	2%
DGO Nominations	Yes	9%	0%	5%
Quality of estimation		**78%**	**23%**	**34%**
Proceed with estimation & publication		**Yes**	**No**	**No**

(mock data)

	Available	BRP A (%)	BRP B (%)	BRP C (%)
DGO Infeed	**No**	~~54%~~	~~17%~~	~~27%~~
Solar Forecast	Yes	22%	77%	66%
SLP	Yes	15%	6%	2%
DGO Nominations	Yes	9%	0%	5%
Quality of estimation		**46%**	**83%**	**73%**
Proceed with estimation & publication		**No**	**Yes**	**Yes**

(mock data)

⇒ Need to asses weight of variable on estimation quality (per BRP)

⇒ Allows for providing a quality of estimation indicator on real-time

Messages sent to BRP

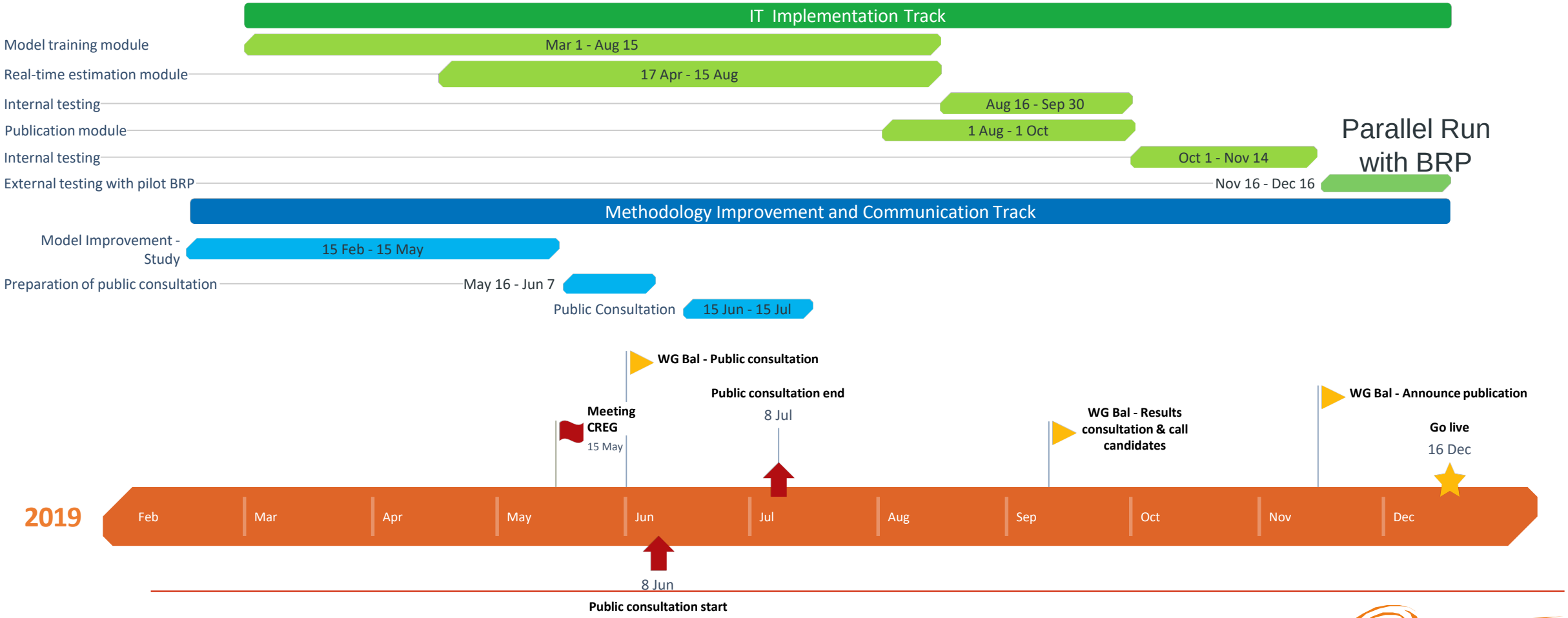
Messages will be sent to BRP, on quarter-hourly basis, with their DGO Allocation estimation for the current day

The message format will follow the standards used by EVMS (cf. Metering Manual), allowing for different possibilities for BRP for receiving the message (csv or xml format)

csv sample

```
[header];10X1001A1001A094;22XTEST-ARP-ARPA;2019-09-14T22:00:00Z;IMBALANCE;10;Intermediate
[data];DGOOfftakeEstimation;22XTEST-ARP-ARPA;OUT
[schedule];2019-09-13T22:00:00Z;1440;15;A;N;C;ALP;KW;695939,469;N;
[end]
```

Implementation Planning



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EU Balancing: Latest developments

EUROPEAN UNION

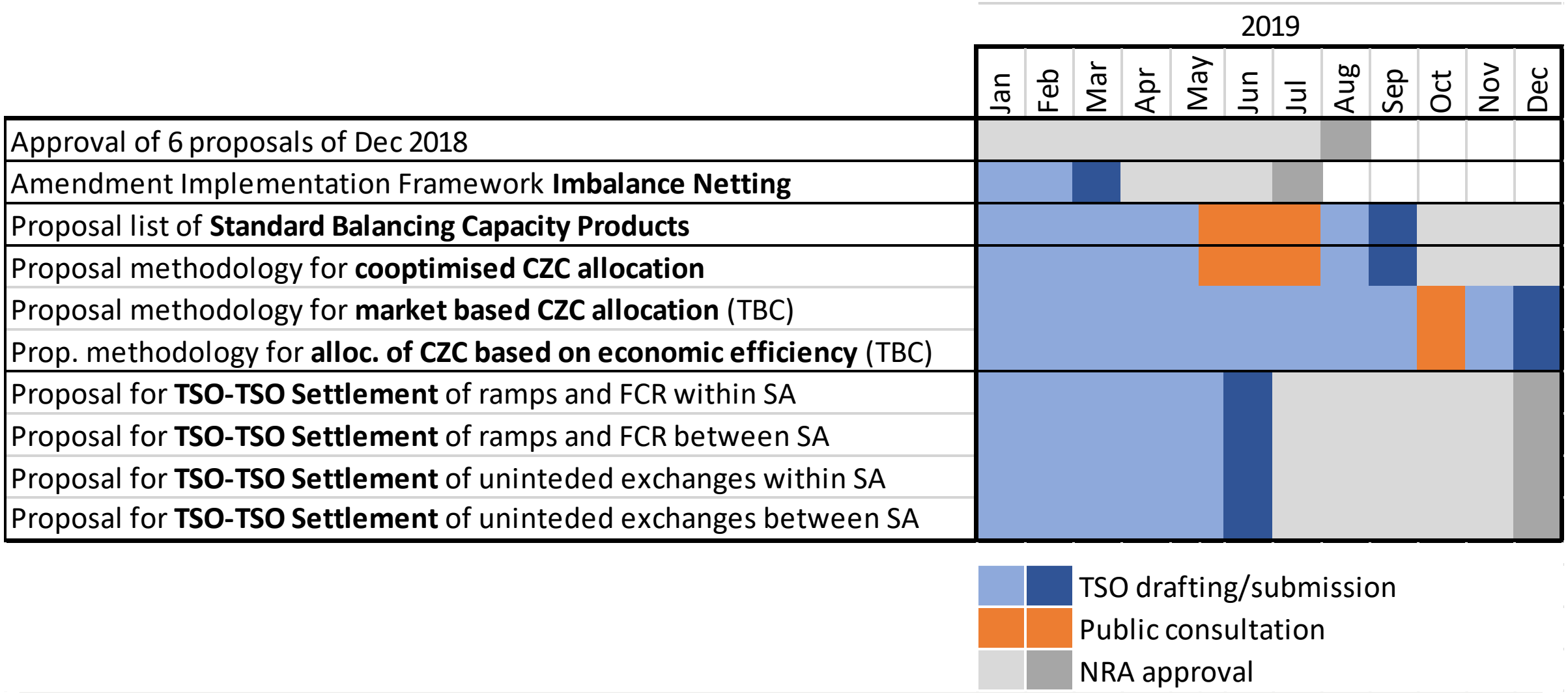
- 2 proposals have been submitted to public consultation last May
  - **Standard balancing capacity product**
  - Methodology for **cooptimized Cross-Zonal Capacity allocation**

- A workshop has taken place on these 2 proposals on the 6th of June.

- The proposals, the explanatory documents and the slides of the workshop are available on ENTSO-E website: https://www.entsoe.eu/events/2019/06/06/ebgl-stakeholder-workshop-on-the-methodology-for-co-optimisation-of-the-cross-zonal-capacity-allocation-and-the-list-of-standard-products-for-balancing-capacity/

EU Balancing: Proposals

EUROPEAN UNION



EU Balancing: Implementation projects

EUROPEAN UNION

IGCC

- **10 additional TSOs to join** IGCC in 2019/2020, in a sequential way

FCR coop.

- **As of July 1st, D-2 daily auctions, 24h products, marginal pricing, divisible & indivisible bids**
- Aim to **further harmonise** rules on aggregation/power measurement location, backup requirements, monitoring and penalties
- Public consultation end 2019/early 2020 (tbc)

PICASSO

- **Implementation of the platform has started** in parallel with proposals' approval process
- Dicussions on platform design, IT implementation and governance

MARI

- **Implementation of the platform has started** in parallel with proposals' approval process
- Dicussions on platform design, IT implementation and governance

AOB & questions

Many thanks for your attention!

ELIA SYSTEM OPERATOR
Boulevard de l'Empereur 20
1000 Brussels

+32 2 546 70 11
info@ elia.be

www.elia.be
An Elia Group company