



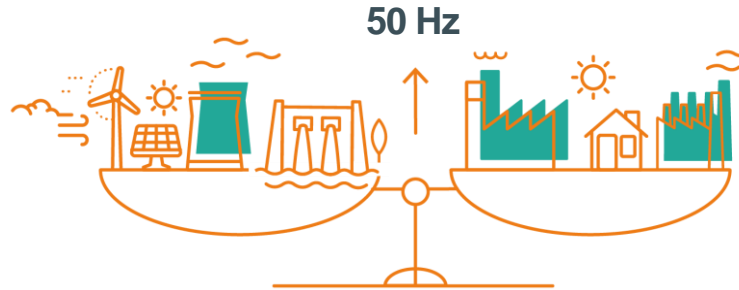
Electricity Consumption and Production: Is Balance Responsibility “renewables proof”?

James Matthys-Donnadieu, Head Market Development
February 20th, 2018

Balance Management: central role of the market participant

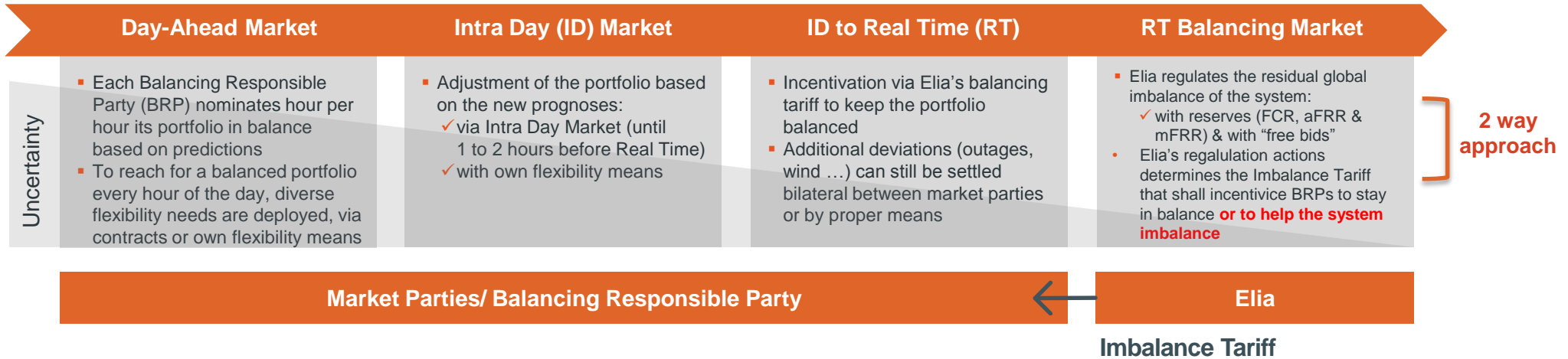
Needs

- Variability of the consumption
- Variability of the production, especially renewable sources
- Production incidents



Sources

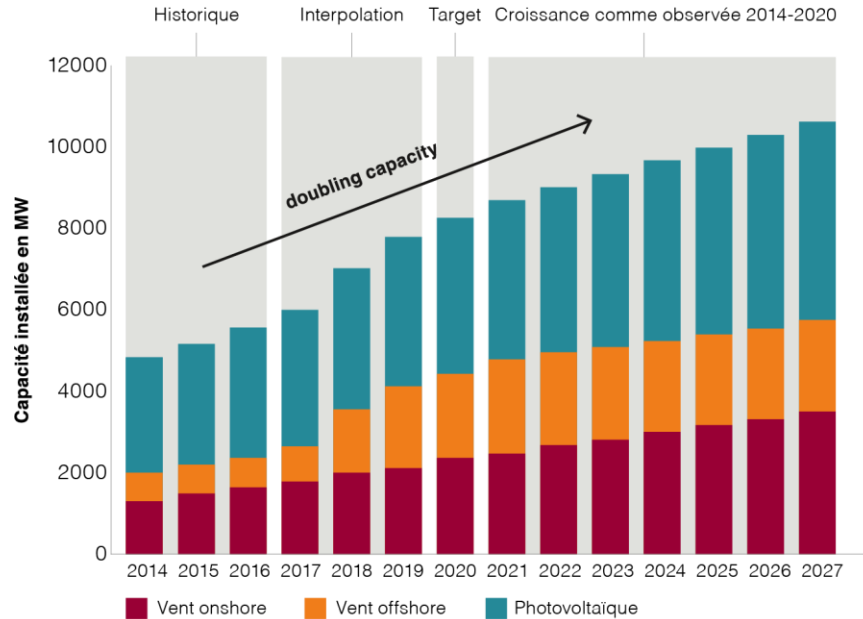
- Flexible set up of production units
- Flexible demand (demand response)
- Interconnections
- Storage



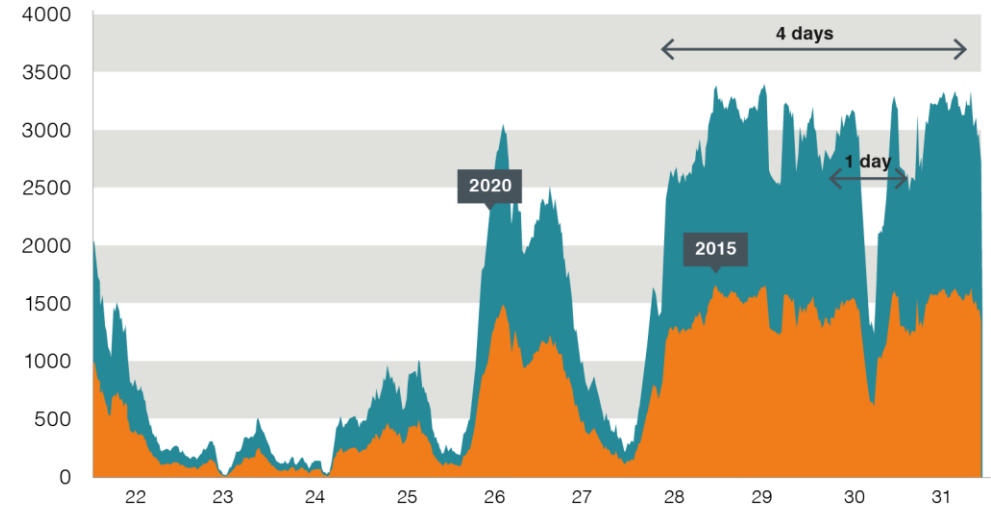
Integrating more renewables challenges the way we balance the system



Installed renewable generation capacity in Belgium – “Base” scenario



Example of wind generation in Belgium during some days in March [MW]



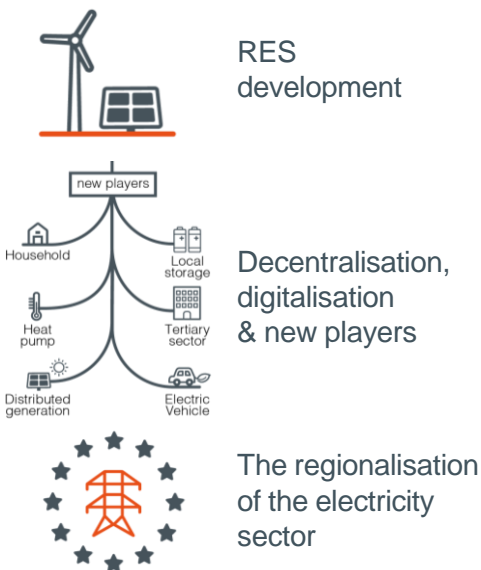
Source: Elia. Aggregated wind production for 2015, extrapolated for 2020 according to expected installed capacity

The variability of renewables need to be managed at different time-frames: not only daily but also weekly and seasonal. Need for (more) flexibility in the system is a consequence of the integration of (more) renewables.

Flexibility: challenges and opportunity

Context

A rapidly changing environment ...



Impact for Grid Operators

... with challenges & opportunities ...

Flexibility needs
More important & more volatile
Estimated increase in reserves
+ 25-40%

Flexibility sources
New technologies & players

Necessary Answers

... requires an ambitious but pragmatic approach

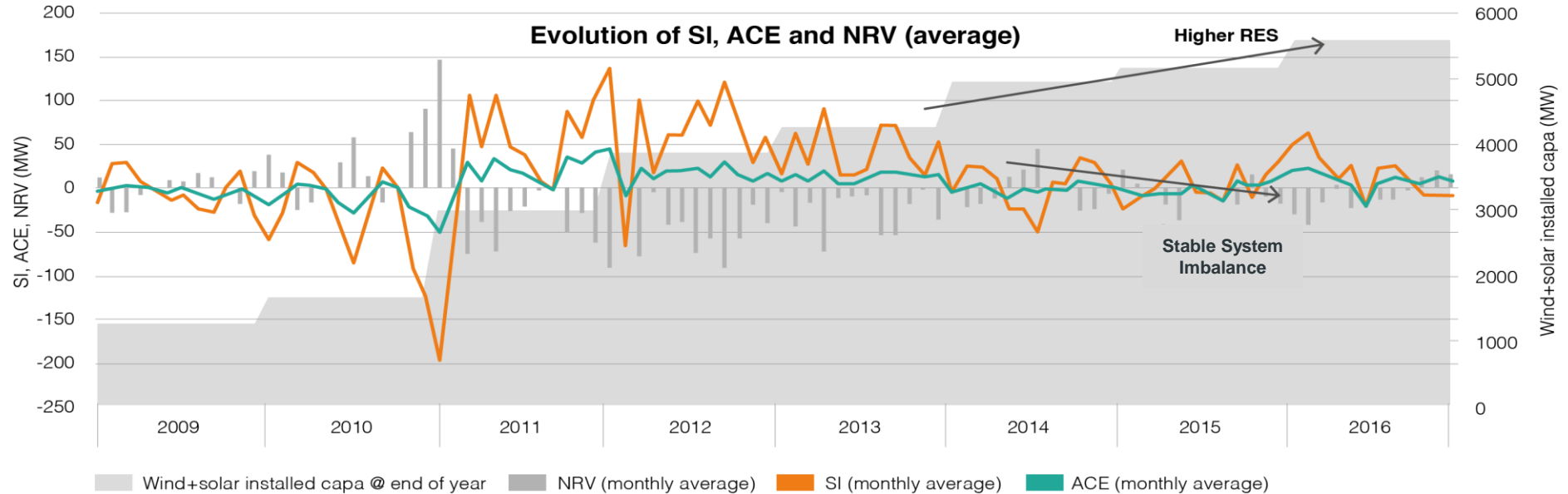
Keep “needs” under control

- **Enforced Balancing Responsible Party (BRP) role**
- Dynamic “needs” dimensioning
- Develop robust DA and ID markets

Cover “needs” efficiently

- Reserve sharing
- Cross border integration
- Shorter term procurement
- **Open market to all**
 - ✓ All technologies (batteries, load,..)
 - ✓ All players (independent FSP)
 - ✓ All voltage levels (TSO & DSO levels)

Despite higher RES penetration – stable system balance due to improvements of balancing market design



Key Improvements:

- Reactive balancing possibility
- Single Marginal Pricing
- Continuously improved published Forecasting Data
- Continuously improved transparency data

Balance Management: Balancing Products

2 Product Types



Automatic Frequency Restoration Reserve (aFRR)
Restores the balance of the control block (and hence restores frequency to 50Hz) within 15' (automatic activation; response time <7,5min).

Frequency Containment Reserve (FCR)
Stabilizes frequency of the synchronous area. (automatic activation ; response time < 30')

aFRR

mFRR ON OFF

Manual Frequency Restoration reserve (mFRR)
Manual activated reserve in addition to aFRR (in the event of large imbalances) to restore the balance of the control block. (response time <15min).

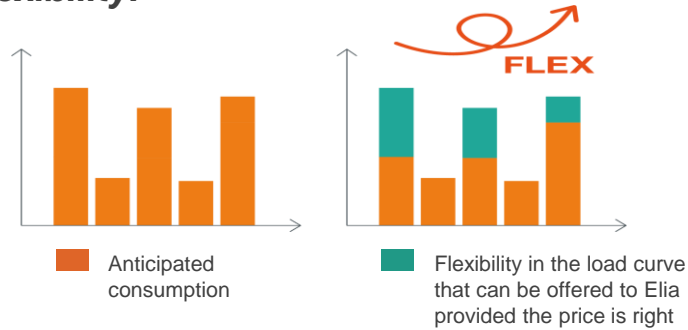
FCR

Order of activation

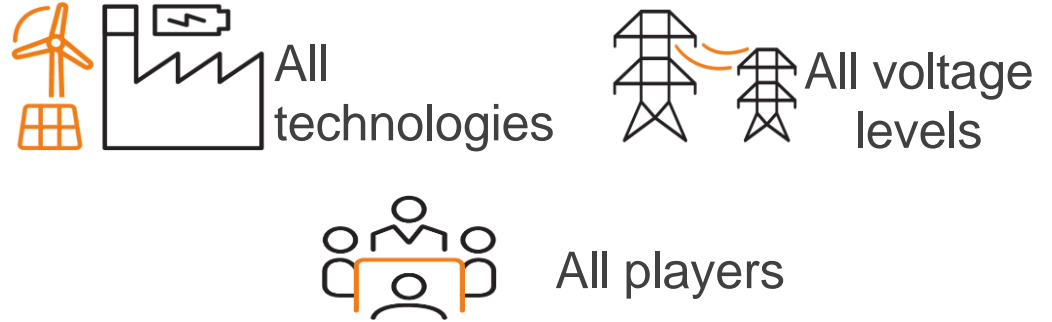
Pre-Contracted Volumes (=Reserves) availability guaranteed by contract – tendered weekly or monthly	“Free Bids” Not pre-contracted; availability only guaranteed during bid validity
<ul style="list-style-type: none"> mFRR “R3 Standard” mFRR “R3 Flex” 	<ul style="list-style-type: none"> Free mFRR Bids
<ul style="list-style-type: none"> aFRR Up aFRR Down 	<ul style="list-style-type: none"> NA
<ul style="list-style-type: none"> FCR symmetric 100 or 200MHz FCR asymmetric up or down 	<ul style="list-style-type: none"> NA

Full Market Opening for flexibility

Market players should be able to valorize flexibility:



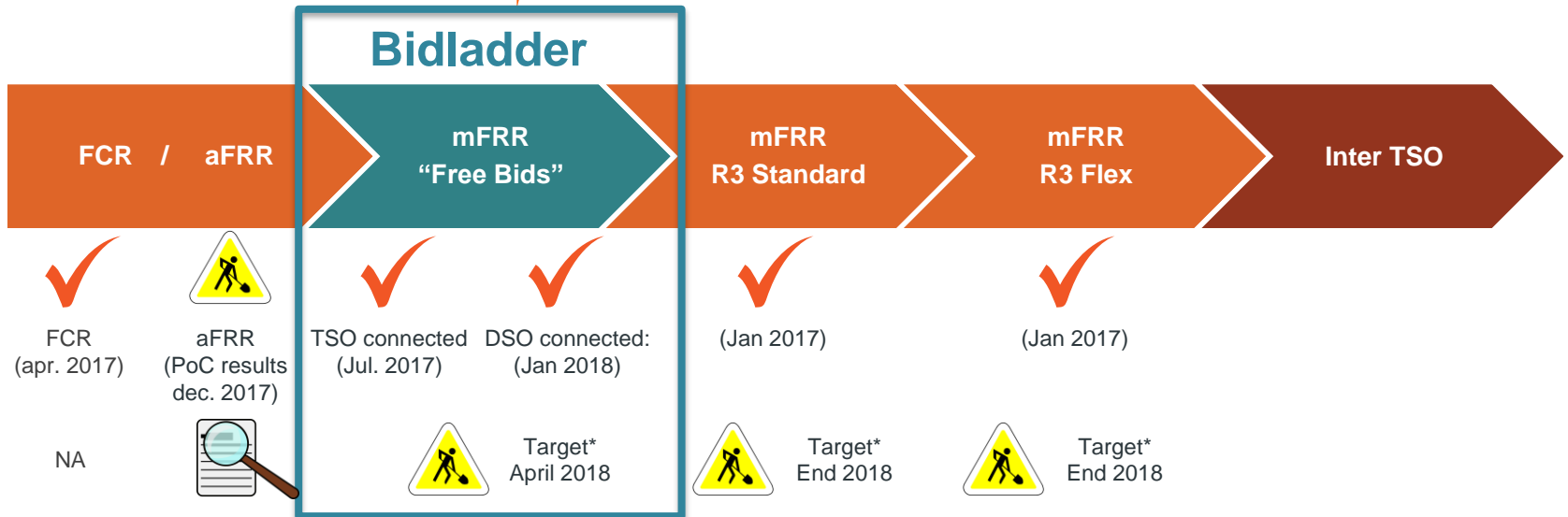
Opening Balancing Market to :



Elia's answer:
An ambitious roadmap

Opening to all technologies & Voltage levels

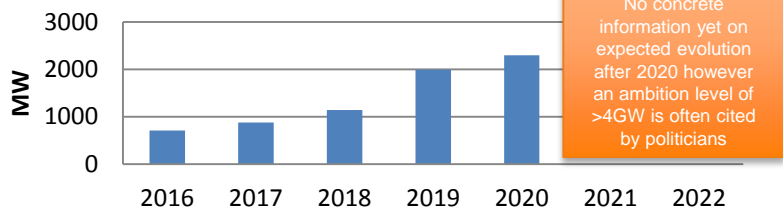
Access via ToE



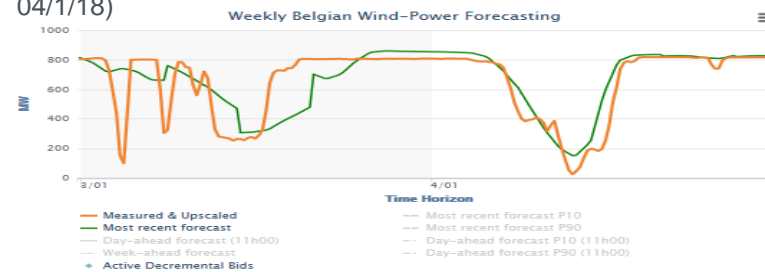
Managing upcoming off shore generation

With the evolution of offshore installed capacity, the **imbalance risk** on Belgian control area caused by wind speed variations **increases**.

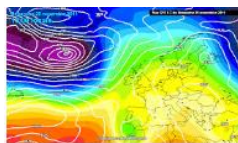
Evolution of offshore installed capacity in Belgium



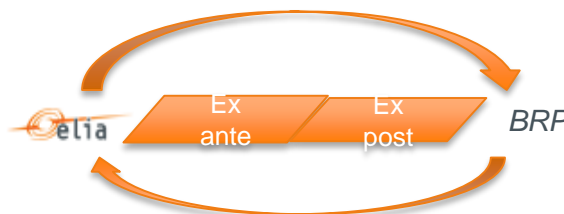
Example of wind production cut out due to storm event (03/1/18 and 04/1/18)



To help and incentivize offshore BRPs to respect their balancing responsibilities, ELIA will work on the following aspects



A **weather model** dedicated to storm forecasts in North Sea ; accessible to all stakeholders via our website



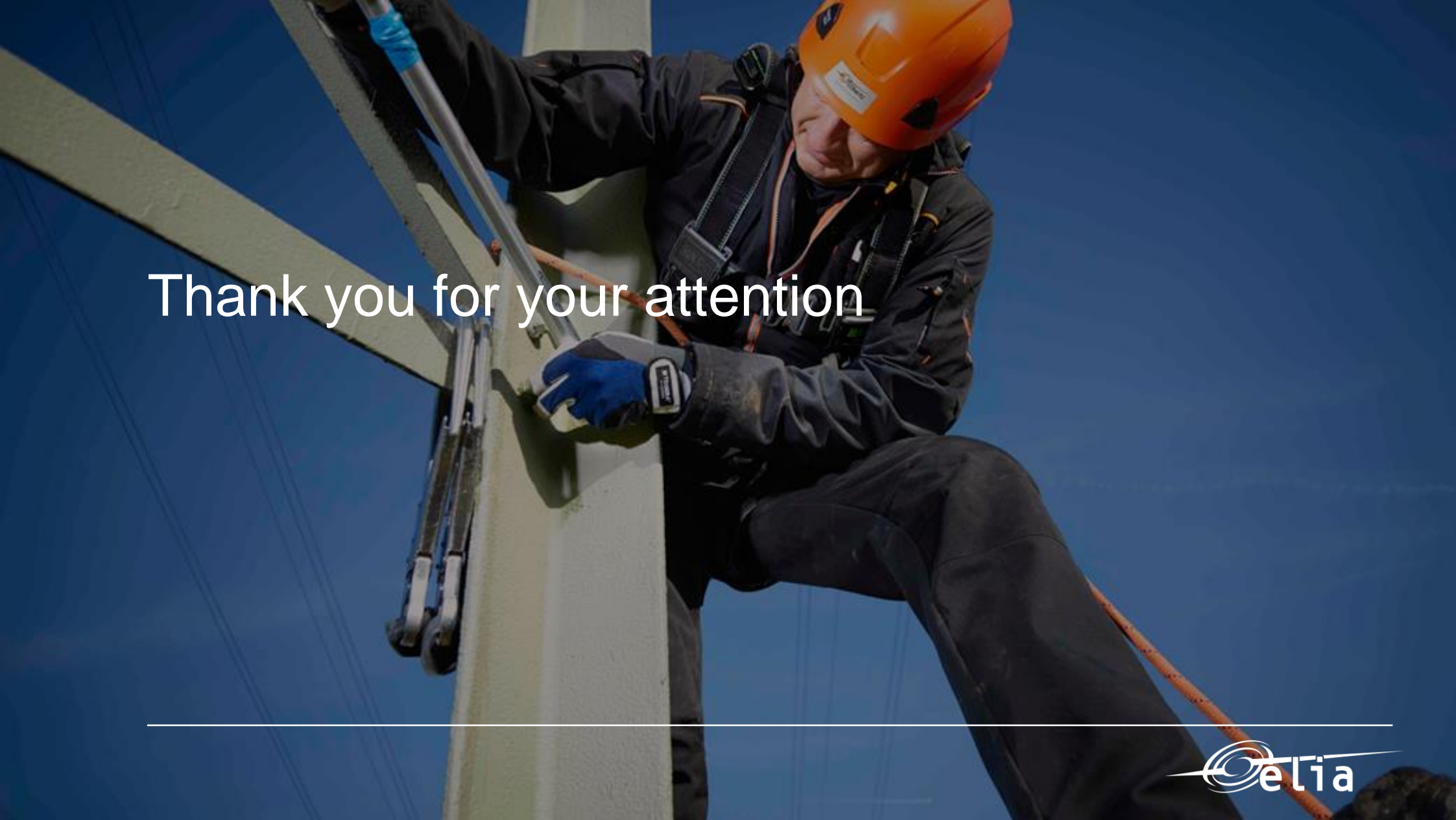
Specific **operational processes** between ELIA's and BRP's dispatching to coordinate actions dedicated to neutralize the imbalance risk caused by wind variations



Specific **process** triggered by ELIA (**exhausted reserve process**) if imbalance risk could not be neutralized by ex ante actions

Some take aways

- For the time being Elia continues to put the BRP at the center of balance management while:
 - Ensuring that as much flex in the system as possible can be unlocked – digitalization should enable further potential in the future
 - Ensuring that the BRP has the right (price) incentives to keep its portfolio balanced
 - Ensuring that, in specific case (e.g. off shore), additional ex ante and ex post operational processes are in place to ensure SoS
 - If this approach will be robust towards the future (e.g. beyond 2025-2030) remains to be proven. To assess this, Elia is involved in several studies investigating what the key market design elements should be in an energy landscape with the future anticipated RES and decentralized generation penetration.
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Thank you for your attention