Implementation & Planning SG:
CoBA Proposals – Scenarios

October 2015
Content

- Introduction
- Imbalance netting CoBA Scenario
- RR CoBA Scenario
- FRR considerations
- mFRR CoBA scenarios
- Next Steps
Introduction: requirement of NC EB

- The Guideline on EB requires the establishment of CoBA’s for the exchange of Balancing energy or operating the Imbalance Netting Process.

- Not later than 6 months after the Guideline enters into force all TSOs shall jointly develop of proposal for the Coordinated Balancing Areas for RR, mFRR and aFRR

- The formation of CoBA was identified as one of the early implementation projects in the Terms of Reference of the Balancing Stakeholder Group

- First draft proposal shall be presented in November 2015
Introduction: considerations ENTSO regarding CoBA development

- CoBA concept: make implementation of the NC EB possible respecting deadlines

- Initial CoBAs are important: right balance between the ambition of pan-European harmonization and the practicalities of building on existing initiatives

- ENTSO-E has concerns about: the numbers of initial sets of CoBAs and the relationships between CoBAs for different processes being arbitrarily defined without due consideration or analysis

- ACER’s view on the consistency between CoBAs for different processes is not shared, in particular the relationship between mFRR & RR. The relationships between CoBAs for different processes should be determined instead through ENTSO-E’s analysis

- CoBA definition is highly correlated with market design choices which still need to be made in a later stage (pricing, products, algorithms, imbalance pricing). Hence ENTSOs can currently not take a firm commitment regarding the geographical configurations for CoBA proposals
## Introduction: ENTSOe work

<table>
<thead>
<tr>
<th>Month</th>
<th>Activities</th>
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</table>
| March-April | • Scoping work  
              • Survey on relevant information                             |
| April-May   | • Analyze results of survey  
              • Preliminary conclusions  
              • Identify strategic questions                                 |
| May-June    | • Develop First CoBA scenarios  
              • Identification & proposed answer on strategic questions  
              • Discussion WGAS and MC: ask for guidance                     |
| July-August | • Develop CoBA scenarios  
              • Validation by WGAS & MC                                       |
| September   | • Start informal discussions with ACER and stakeholders           |
| Oct-Nov     | • Validation by WGAS (14/10) & MC (29/10)  
              • First draft proposal to Balancing Stakeholder Group (Nov. 2015) |
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Imbalance Netting: CoBA - Proposal

Key:

- CoBA 1: Synchronous Area CE
Imbalance Netting: CoBA – Next steps

Start:
3 IN projects

Internal ENTSOE Workshop (28/10):
Identify Bottleneck issues

Agree on way forward
Sequential integration
or
Project merge
or
New project

Develop Roadmap
for CE IN CoBA

Considerations
- ambitious project
  - No XZ project in the past was realized on such a short time frame
  - Previous experience on imbalance netting: multiple years for limited geographical scope
- Dependent on integration scenarios might require fundamental changes in local market design & local rules imposed by NRA
- Due to tight timescales pragmatic solutions may be required as we progress to the final target model
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Who uses Replacement Reserves?
- TSOs shown in blue have indicated they use an RR process and intend to continue doing so

- TSOs shown in yellow have indicated that they are either stopping using RR or there is some uncertainty as to whether they will implement an RR CoBA or not
Replacement Reserves: CoBA Scenarios

- What are the targets for RR in the NC EB?
  - July 2018: RIM consisting of one or more CoBAs
  - July 2022: EIM consisting of one CoBA including all neighboring interconnected TSOs using RR

- What are the existing RR initiatives?
  - Only Project TERRE (blue)
  - TSOs shown in blue stripes would be required to join a single interconnected RR CoBA by the EIM
  - Baltic: uncertainty regarding RR CoBA implementation/further investigation required (use RR in future Baltic Area or not? management Baltic imbalance together with Russia)
  - Poland (red): no border with another country that is definitely implementing an RR CoBA
Replacement Reserves CoBA Scenarios

- What are the possible RR CoBA scenarios for the RIM?

  - Region Terre + HU/RO/BU
    - One large interconnected RR CoBA or not
    - However

  - Region Poland + Baltic
    - Common RR market or not
    - If the Baltics do not implement a CoBA for RR then Poland is isolated? – how does this sit with compliance

  - Linking of 2 regions only envisaged as a next step
    - complex transit arrangements
    - Interdependencies use of XZ capacity for other balancing processes (netting, aFRR, mFRR)

  - All relevant TSOs/ project should coordinate with each other to avoid potential issues associated with merging later on

BG: Don’t want to commit in CoBA scenarios
Replacement Reserves: considerations/discussion points

- **ENTSO-E** is in favor of extending Project TERRE to RO/HU/BU
  - One step vs two step approach, lower implementation costs of developing one single RR platform as opposed to developing two and trying to merge later on
  - However this requires first a detailed discussion between involved TSOs
  - Expansion of Terre project to three additional counties relatively late in the design stage of the project → potential impact on timing Terre project (feasibility deadline NC EB)
  - Should the date for achieving one large interconnected RR CoBA be the same as the RIM? 2020 -4Y after EIF) more reasonable date? Facilitate expansion of Terre/consider ambitious geographical scope

- **The feasibility of a Polish & Baltic RR CoBA** should be further investigated
  - Open questions to be answered
    - Will Baltic develop a common market for RR?
    - If yes, can Poland join the Baltic market for RR or not?
  - If Poland unable to join a CoBA for RR should not result in non-compliance with NC EB

- **Development of RR CoBA: very ambitious projects**
  - No XZ project in the past was realized on such a short time frame
  - More challenging then netting CoBA (product definition, algorithms, pricing, imbalance pricing)
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FRR Considerations: LFC&R responsibilities

- FRR process is the most important balancing process which is needed to fulfil most of the obligations as defined in the LFC&R code

- TSOs are responsible for the dimensioning of FRR and to achieve satisfactory FRCE (ACE) quality in their LFC Block
  - The harmonization and standardization of FRR and the exchange of products must not jeopardize the local responsibility regarding the ACE quality
  - Product harmonization/standardization (ramp/processes) might affect capacity volumes/capacity prices

- Exchange of balancing energy \(\Leftrightarrow\) potential impact capacity costs \(\Leftrightarrow\) link with access tariffs
- Above considerations are even more important for aFRR (=) aFRR study by ENTSO-E
FRR considerations for CoBA: differences in FRR processes (1/2)

Q 4.1 What kind of system are you operating?

- There are differences for operating the balancing market in Europe: CDS vs SDS
- Even within SDS there are significant differences
- TSOs using a forecasting imbalance are using relatively more manual FRR and RR products
- TSOs only using the real time imbalance are predominantly using aFRR
- While these are not necessarily barriers to forming a CoBA they need to be taken into account

Q 5. How do you currently perform the balancing of your LFC&R area; based on which information?

Disclaimer: picture on the right might not reflect reality due to different interpretations of questions
FRR considerations for CoBA: differences in FRR processes (2/2)

- The way how different balancing processes are used => different across Europe
- Collaboration between TSO having different optimization objectives might be complex
- Harmonization of optimization objectives; complex/ feasible ? (=> LFC&R responsibility/local cost)

Q 6.1 How do you currently perform the balancing of your LFC&R area; utilization of procured balancing sources?
FRR considerations for CoBA: ISP

- Currently different ISPs in Europe = ISP link to minimum boundaries for BGCT

Q 7.1 What is the current imbalance settlement period of your LFC&R area?

- ISPs may be harmonized across Europe as a required by the NC EB
Share of aFRR in total balancing energy

\[
\text{Share of activated aFRR balancing energy} = \frac{a\text{FRR}}{a\text{FRR} + m\text{FRR} + \text{RR}} \times 100\%
\]

- < 20%
- 20 – 40%
- 40 – 60%
- 60 – 80%
- > 80%
- No information
FRR considerations for CoBA: pricing

- Pricing mechanism for settlement still need to be defined
- Cross border cross product pricing is linking different balancing processes
- Bid prices on CMOs for CoBA are not firm as they might be changed ex-post by other processes (Cross product marginal pricing)

<table>
<thead>
<tr>
<th></th>
<th>Local pricing</th>
<th>XB pricing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Pay-as-bid</strong></td>
<td>Pay-as-bid is per definition local pricing</td>
<td>Not applicable</td>
</tr>
<tr>
<td><strong>Pay-as-cleared per product</strong></td>
<td>Local pay-as-cleared pricing per product</td>
<td>Cross-border pay-as-cleared pricing per product</td>
</tr>
<tr>
<td><strong>Pay-as-cleared cross-product</strong></td>
<td>Local pay-as-cleared pricing cross-product</td>
<td>Cross-border pay-as-cleared pricing cross-product</td>
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- Pricing mechanism => potential impact on CoBA Configuration
- In order to develop draft CoBA proposals XB pricing was not considered.
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Existing initiatives and studies

Key:

- Pilot BE NL
- Pilot GCC
- Initiative APG-Germany
- EXPLORE¹
- Nordic

¹ EXPLORE (European X-Border Project for Long-term Real-time balancing Electricity market design) is a common study of the Austrian, Belgian, Dutch and German TSOs investigating the potential design of a common FRR Balancing Market. EXPLORE aims at reaching common views on products, interaction with intraday markets, imbalance settlement and the use of cross-zonal capacity after intraday market.
aFRR CoBAs: current ramping requirements in Europe

Key:
- full activation time 3.5 minutes
- full activation time 5 minutes
- full activation time 6.5 minutes
- full activation time 7.5 minutes
- full activation time 15 minutes
- fix ramp 1MW/min
- fix ramp 2MW/min
- fix ramp 15MW/min
- contractual ramp/other

• Currently lot’s of differences in Europe
• No starting point for CoBA determination from products
  ➔ aFRR study ENTSO key input
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Existing initiatives and studies

Additional studies:
- Nordic – Baltic
- Nordic – Poland
- Nordic – Germany

Key:
- Pilot BE NL
- Pilot GCC
- Initiative APG-Germany
- EXPLORE
- TERRE discussing expansion to mFRR
- TERRE discussing GB-NL initiative
- TERRE discussing FR-DE initiative
- Possible RR based eastern CoBA
- Nordic pilot project
- Baltic-Nordic project
- Existing mFRR initiative (single control block)

EMS, CGES and MEPSO do have a initiative within single control block similar to mentioned ELES-HOPS-NOS initiative.
mFRR scenario 1: Based on existing initiatives

- **Concept**: use existing initiatives as much as possible

- **CoBAs based on existing/possible initiatives for RR**
  - TERRE (existing)
  - TERRE (possible extension)
  - Consider technical capabilities GR-IT interconnector

- **CoBAs based on existing/possible initiatives for mFRR**
  - EXPLORE
  - Nordic
  - Baltic
  - TERRE (thinking about implementing also mFRR)

- Czech Republic, Poland, Slovakia form an own CoBA or join existing initiative

- France & GB choose to stay in TERRE rather than join another initiative
  - Might have an impact on Italy, Portugal, Spain and Switzerland as they are not “connected” any more
mFRR scenario 1: based on current initiatives

Discussion points:

- What about the other TERRE countries if FR & GB join the EXPLORE CoBA?
- Nordic – Baltic CoBA only possible if implementation is on time.
- DE, BE & NL TSOs believe that CoBA for aFRR & mFRR should be congruent (but should not exclude inter CoBA exchanges for mFRR)
mFRR Scenario 2: Priorities RR solutions

- **Concept:** RR based because the same concept and algorithms could be used

- **CoBAs based on existing/possible initiatives for RR**
  - TERRE (existing)
  - TERRE (possible extension)
  - Consider technical capabilities GR-IT interconnector

- **CoBAs based on existing/possible initiatives for mFRR**
  - EXPLORE
  - Nordic-Baltic
  - TERRE (thinking about implementing also mFRR)

- **Poland either joins Nordic or EXPLORE**
  - Czech Republic & Slovakia join either EXPLORE (or South East RR CoBA (despite they don’t use RR)
mFRR scenario 2: Link to RR solutions

Discussion points:

- Poland may join Nordic or EXPLORE CoBA?
- Slovenia & Croatia may join EXPLORE, South East or South West CoBA?
- Czech Republic and Slovakia can join EXPLORE or South East CoBA?
- DE, BE & NL TSOs believe that CoBA for aFRR & mFRR should be congruent (but should not exclude inter CoBA exchanges for mFRR)
mFRR Scenario 3: Starting point PLEF ++ CoBAs

- **Concept:** based on historical, regional cooperation for other market time frames
  - PLEF (Penta Lateral Energy Forum)
  - Nordic
  - Baltic

- **TERRE (south eastern countries)**
  - Countries that are not PLEF members
  - Possible extension countries
  - Countries not in TERRE but in-between (SI, CR)

- Czech Republic, Poland, Slovakia form an own CoBA
mFRR Scenario 3: Starting point PLEF ++ CoBAs

Key:
- CoBA 1: PLEF
- CoBA 1 extended: PLEF++
- CoBA 2: South East (Part of TERRE)
- CoBA 3: North East
- CoBA 4: Nordic (incl. total DK)
- CoBA 5: Baltics

Discussion points:
- GB, IR, ES, PT may join PLEF CoBA?
- DE, BE & NL TSOs believe that CoBA for aFRR & mFRR should be congruent (but should not exclude inter CoBA exchanges for mFRR)
mFRR scenario 4: To be feasible for consistency with aFRR

- **Concept:** CoBA mFRR equal to CoBA aFRR
- **Configuration of mFRR CoBA driven by:**
  - configuration aFRR as NC EB requests “consistency between CoBAs”
  - RR CoBAs are taken 2nd criterion
  - Non aFRR or non RR countries area together in own CoBAs
- **Additionally: in case of “cross product pricing”:**
  - linking optimization of aFRR, mFRR & RR CMOs
mFRR Scenario 4: To be feasible for consistency with aFRR

Key:
- CoBA 1: EXPLORE
- CoBA 2: South West
- CoBA 3: South East
- CoBA 4: North East
- CoBA 5: Nordic (incl. total DK)
- CoBA 6: Baltics
- CoBA 7: GB/Ireland
- CoBA 8: South Central

Discussion points:
- In case GB/Ireland implement aFRR (based on CBA) they may join either EXPLORE or TERRE or Nordic
Timeline

- Discussion & approval MC 29/10
- Meeting Subgroup Implementation & planning November 4\textsuperscript{th}
- When required written MC approval November 6\textsuperscript{th}
- Presentation Balancing Stakeholder Group meeting November 27\textsuperscript{th}

After this proceed with further work on proposals CoBA configurations
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