
ENTSO-E Cross Border Electricity Balancing Pilot Projects

2 Month Report on Pilot Project 4

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15 November 2015

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1. Introduction

This report comprises of the following general issues:

1. The main information of the pilot project;
2. The implementation of relevant targets ahead of the Network code on Electricity Balancing (NC EB);
3. An update on any specific targets of the pilot project not directly linked to NC EB, but key for the pilot project itself;
4. An update on any additional general and particular success/monitoring indicators of each pilot project, taking into account what pilots are or not under a “go live” phase;
5. Balancing products: products implemented/to be implemented at pilot project level, analysing the possibility to harmonise between different pilot projects that deal with the same type of balancing product.

The table below indicates when information has been last updated.

	Last updated
2.a Participating TSOs	Feb 2015
2.b Scope and goals of the pilot project	Feb 2015
2.c Recent achievements of the pilot project	Oct 2015
2.d Learning points	Oct 2015
2.e Specific questions	Oct 2015
3.a Updated project roadmap	Oct 2015
3.b Impact on current practice and future market design	Feb 2015
3.c Cross-border exchange relevant data	Feb 2015
3.d Matching, ATC management and bids update process	Feb 2015
3.e Pricing-Settlement	Oct 2015
3.f Experience from the implementation	Feb 2015
3.g Extensibility and cooperation	Feb 2015
4.a Pilot project roadmap in comparison to NC EB	Oct 2015
4.b Contribution to standard product definition	Feb 2015

2. Executive summary

a) Participating TSOs

Terna, RTE, National Grid Electricity Transmission Plc, National Grid Interconnectors Limited, REN, REE, Swissgrid and ADMIE
Observer: ERGRID and SONI

b) Scope and goals of the pilot project

The scope of the Project is to test the feasibility of a multi-TSO coordinated exchange of Replacement Reserve - Cross Border Balancing Energy on the basis of the last version of the Network Code Electricity Balancing at the Effective Date.

c) Recent achievements of the pilot project

The target of the Project is to:

- Assess and experience the impact of the designed cross-border balancing solution in terms of (i) expected benefits and costs, (ii) potential barriers, (iii) needed market design changes and (iv) IT development, and
- Report on the experience and knowledge gained which will contribute to the implementation, at European level, of the target model for cross-border electricity balancing as identified in the above mentioned Network Code.

In particular, potentialities could be:

- The reduction of balancing costs through the introduction of an optimization based matching process;
- The increase of the available balancing energy for each TSO with positive impact on the security of supply and on the integration of renewable energy in the electric systems.
- A more efficient use of cross border interconnectors after Intraday Markets

The project plan is agreed, and the signature processes of the MoU and NDA were launched.

The pilot project TERRE was organized in six subgroups (working axes):

1. Definition of standard products (led by Terna)
2. Matching process (led by Swissgrid)
3. Financial issues regarding CBA analysis (led by NG)
4. Settlement issues (led by REE)
4. Timing and scheduling (led by REN)
5. ATC management (led by RTE and NGIC)
6. Governance issues (led by legal group)

d) Learning points

Learnings Q1: Identify learnings that can be useful for other pilots or collaboration initiatives in general

- Pilot CoBA extension: 7 TSOs involved (4 TSOs were involved at the beginning of the project)
- Product harmonization: The current definition of the standard balancing product P-SCH-30-15 is compliant with TERRE product
- The elasticity of TSOs RR need is agreed
- Settlement method: Marginal price at TSO-TSO level
- CMO: An algorithmic optimization is defined. The optimization will include a netting of RR balancing TSO needs.
- XB capacity management: Independent ATC (compliant with the future XB Intraday market)
- Good trend of go-live indicators (both economic & technical): The NRAs are now involved in the project TERRE.
 - An “Implementation Group” was set up in order to discuss the project issues between TSOs and NRA.
 - The differences between the current local balancing market rules were highlighted by the TSOs.
 - Additionally to the Implementation Group framework, each TSO is working on these issues with its respective NRA.
- Other learning (CBA, renewable/demand. IT issues): A questionnaire aimed to know more on the existing balancing IT platform which are currently implemented was sent toward IT

<p>providers.. The CBA is under finalization. The modeling of the current balancing markets, needed for the financial simulation represents a huge challenge.</p> <ul style="list-style-type: none"> • Additionally: <ul style="list-style-type: none"> ○ When several TSOs are involved, different particularities need to be considered in the design phase what may lead to longer process duration. ○ Interaction of RR process with Intraday market: Difficulties as European ID market not yet harmonized (local or/and XB markets)→ Difficulties for defining common timing for updating bids to be submitted to TERRE and updating ATC for XB balancing. ○ Target of setting up of an implicit XB balancing solution/market and expected timescales are challenging
<p>Learnings Q2: Identify learnings that can be useful towards the NC EB implementation</p> <ul style="list-style-type: none"> • Based the TSO-TSO settlement on a marginal price could set a XB congestion rent • Progressive harmonization of terms and conditions: Gate Closure Times, etc • Despite the fact that there are many TSOs involved in TERRE with different local market designs, near to set up a design solution on which these TSOs all agree.

e) Specific questions

<p>Potential Q1: What are the expected benefits? (quantify) Who will benefit and how are the benefits distributed (e.g. grid tariffs)?</p> <ul style="list-style-type: none"> • Under progress
<p>Potential Q2: Is the potential benefit of any other balancing cooperation affected by this initiative?</p> <ul style="list-style-type: none"> • No
<p>Key regulatory/legal issues overcome or blocking at each pilot project</p> <ul style="list-style-type: none"> • The NRAs are involved in the project. The differences between the current local balancing market rules will be highlighted by the TSOs. • Additionally to the Implementation Group framework, each TSO will work on these issues with its respective NRA.

3. Detailed of the pilot project

a) Updated project roadmap

The detailed project roadmap is to be added in the Annex 1 of this report. Deliverables of WPs and milestones in the project implementation should be shown in it. Please report and additional information to that here.

<p>Additional information on the pilot project road map</p>
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b) Impact on current practice and future market design

<p>Scope/influence 1: Are there side-effects on existing markets (price, liquidity, gate-closure time)?</p>
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<ul style="list-style-type: none"> • The TSOs and NRA, in the aim of the construction of the RR COBA are looking for a compromise regarding the harmonization of caps and floors offers prices • In the same framework (Implementation Group meeting) the TSOs and the NRA are considering the harmonization of the ID GCT issue • The balancing prices and the liquidity of each current local market will certainly be impacted
<p>Scope/influence 2: Does the pilot provide for a better integration of renewable / demand-side flexibility into the market?</p> <ul style="list-style-type: none"> • The project is not able at this stage to quantify the impact on existing market but the intention of pilot projects is to follow the aim of the NC EB in terms of participation of renewable and demand side in the balancing markets
<p>Incentives 1: Are there any changes to BRP incentives? (e.g. via imbalance settlement, to be balanced in day-ahead/real-time, to help restoring the system balance, to become active in day-ahead/intraday trading)</p> <ul style="list-style-type: none"> • Should be developed at a later stage of the project when the definition of the RR CoBA will be “clearer”
<p>Incentives 2: Does the pilot provide special incentives to certain BSP units (generators/load)? (Incentives for investment in new/existing technology enforced/void)</p> <ul style="list-style-type: none"> • Should be analyzed at a later stage of the project but taking into account that no discrimination should be applied
<p>Incentives 3: What are the TSO’s incentives for economic efficiency?</p> <ul style="list-style-type: none"> • The implementation of the most efficient solution for sharing balancing energy under XB available capacity constraints aimed for that. One of the TERRE project goals is to improve the economic efficiency of each balancing market
<p>System security: Q1: Does the pilot project provide an enhancement/impairment to system security in the involved control zones?</p> <ul style="list-style-type: none"> • The implementation of TERRE should not generate an impairment of the TSO system security. The TERRE design should tackle this issues
<p>Transparency Q1: What is the (additional) operational information that is provided to BSPs and BRPs in the participating systems?</p> <ul style="list-style-type: none"> • Will be answered when the design will be terminated
<p>Transparency Q2: Is there a continuous evaluation and communication of quality?</p> <ul style="list-style-type: none"> • Will be answered when the design will be terminated...but probably yes

c) Cross-border exchange relevant data

****SPOCs can provide either the table from the existing reporting template, either add their own report in the Annex or provide links to the websites of respective TSOs where information can be found.****

d) Matching, ATC management and bids update process

Matching algorithm (First Come First Served or CMO through an optimisation tool or others)

An algorithmic optimization is defined. The optimization will include a netting of RR balancing TSO needs.

The possibility for pricing TSO's need is agreed

Cross border capacity management (ATC/flow based) and its interaction with intraday market and previously activated slower balancing products.

Independent ATC (and the methodology will be compliant with the future XB Intraday market)

Centralized ATC management

No interaction with ID market

Balancing bids update process and how this update process is coordinated with previous intraday energy market and previously activated slower balancing products

Under study

e) Pricing – Settlement

Information on TSO-TSO settlement scheme

The calculation of the marginal price is defined.

The specific cases were highlighted and the settlement impact was defined

- **Case 1: only netting of need**
- **Case 2: indeterminacy on volume and price results**

Information on TSO-BSP settlement scheme

Under the responsibility of the TSOs participant.

Should be harmonized at least before 3Y after EIF of the NCEB (request from the code), i.e. at least when the CoBA for RR is properly constituted.

BRP's imbalance settlement scheme

Not in the scope of TERRE as a pilot project. It's more linked to the implementation of the RR CoBA

How cross border balancing actions will be taken into account at the imbalance settlement mechanism?

It is not in the scope of the studies to be made between all the participants of TERRE

Details about imbalance settlement period at pilot project level

It is not in the scope of the studies to be made between all the participants of TERRE

f) Experience from the implementation

CBA finished for a certain process.

First results are analysed.

The CBA methodology will be developed in harmonization with the ENTSOE Working group involved in these discussions

<p>Internal regulatory change approval, cost recognition from NRAs. A public and common consultation phase is expected on Q1 2016. The NRA approval of TERRE design which will include the consultation result is expected Q2 2106</p>
<p>Update about on-going internal regulatory changes associated with pilot project objective. Under the responsibility of each TSO participant</p>
<p>Reporting about contracts signed (at TSO-TSO level, for instance MoU signature between participating TSOs, at TSO – platform owner level, etc.) MoU and NDA signed Accession agreements for the involvements of ADMIE, REE and Swissgrid were signed The Cooperation Agreement which will cover the implementation and operational phases is under discussion (drafting phase)</p>
<p>What were the implementation costs and risks? Under analysis</p>
<p>Governance issues: platforms management and ownership. Preparation of the cooperation agreement under progress</p>
<p>Flow based approach (and associated feasibility study accomplished, if proceed). Depends on the ID Market Flow Based implementation</p>
<p>Reporting about stakeholder involvement at pilot project level (Workshops held, relevant feedback obtained from stakeholders) Some local Workshops were held. The first regional Stockholders event was organized on May 2015. The second stakeholder meeting (Co Organized by the TSOs and NRAs) is scheduled for the 1st of December 2015</p>
<p>Cross Border capacity reservation experience Will be tackled under CBA Working Package</p>
<p>Other comments.</p>

g) Extensibility and cooperation

<p>Extensibility Q1: Identify any potential extensions of this project towards other pilots or other areas in general Non other pilot project on RR Regarding the extension toward other areas: the project TERRE is opened for all TSOs using replacement reserve.</p>
<p>Extensibility Q2: Please provide details about potential harmonisation of balancing products of the same process or justify any possible barriers. The design of the TERRE project aimed to harmonize the product shared via a centralized balancing solution.</p>
<p>Extensibility Q3: Under which conditions can the cooperation be extended? (Reciprocity for BRPs and BSPs is guaranteed, specific regulatory/legal framework required?) The cooperation could be extended if there are interests of other TSOs for sharing RR.</p>

This interest could be provided also from the BSPs whose are able and applicant for participating into TERRE. Taking into account that TERRE is TSO-TSO model, this participation should be done through the Connecting TSO. This kind interest should be discussed at a local level.

Extensibility Q4: What is the regional extensibility of the method, due to technical restrictions? (Uniformly applicable within regions of limited extension or no restrictions on extensibility)

There is no restriction.

4. Contribution of Pilot Project to NC Implementation

a) Pilot project roadmap in comparison to NC EB

Where relevant explain briefly the expected or the already achieved contribution of each pilot to any of the NC milestones (A-J) listed below and also complete the timing in the corresponding table.

A. Proposal of regional implementation framework:

7 TSOs are involved in TERRE today which represents more than 80% of the TSOs which used RR for the balancing.

We can start the construction of the COBA TERRE (should be discussed with NRAs)

B. Implementation of the regional integration model:

Please refer to answer above

C. Proposal of modification of the European integration model

Possibility of setting up a unique centralized platform for all scheduled product should be analysed by ENTSOE.

This platform could be used of course for different process (RR, mFRR) independently (without overlap or mixing of processes)

D. Proposal of the European implementation framework

Proposal to set up an Implementation Group (TSOs + NRA) under the scope of the “COBA TERRE”

E. Proposal of common settlement rules

The go live of TERRE will held before the NCEB request for the harmonization of the settlement rules.

The pilot project will help this harmonization at least regarding the RR product.

F. Proposal of settlement harmonisation

Please refer to answer above

G. Proposal of standard products definition

Please refer to answer above

H. Proposal of standard products pricing

TSO-TSO Settlement = pay as cleared / Marginal price

<p>I. Proposal of standard products algorithms</p> <p>TERRE CMO (1 CMO) will be based on an algorithm optimisation close to a “clearing solution”</p>
<p>J. Proposal for common settlement rules of intended exchanges of energy associated to the Frequency Containment Process</p> <p>Nothing at this stage</p>
<p>Other expected contributions? (if yes, explain contribution and indicate both NC road map and pilot project road map)</p>

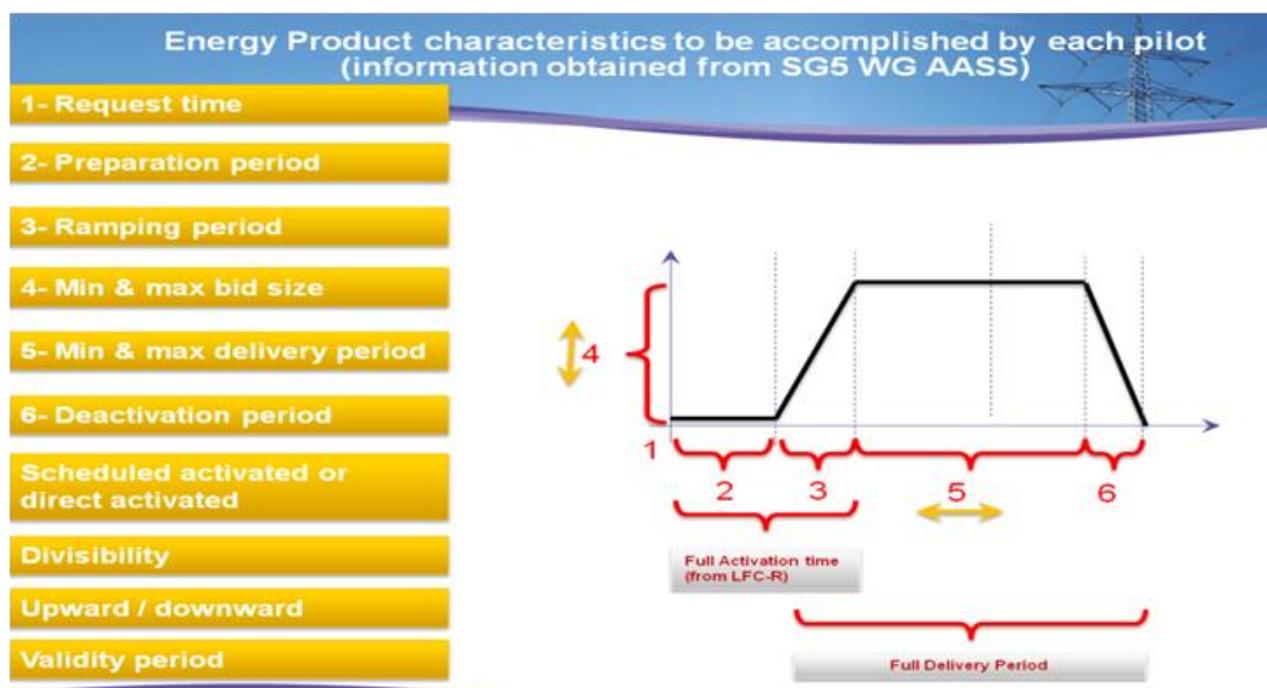
The timing of the pilot project in relation to the NC EB implementation schedule (A-J), should be completed where applicable. Note: EIF is estimated in Q4 2015.

Process	A	B	C	D	E	F	G	H	I
RR									
Deadline from NC EB (EIF+)	6m	2.5y	4y	5y	2y	3y	1y	1y	1y
Pilot Project 4	Q1 2016	Q2 2017	Q4 2018	Q2 2019	Q2 2018	Q2 2018	Q3 2015	Q3 2015	Q3 2015

<p>Describe current or expected mismatches of pilot project with respect to the NC EB.</p> <p>No mismatches foreseen</p>
<p>Describe the reasons behind these mismatches.</p>
<p>Describe (if feasible) forecasted date to overcome mismatches.</p>

b) Contribution to standard product definition

The table below provides details about the technical characteristics of the standard product that is to be exchanged in the scope of the pilot project. The explanation of the terms used is given below:



RR	
Request time	0
Preparation period	Between 0 and 30min
Ramping period	Between 0 and 30min
Full RR Activation Time	30 min
Minimum and Maximum bid size	Min = 1MW -In case of divisible offer, no max is requested. - In case of indivisible offer, the local rules will be implemented
Minimum and Maximum delivery period	15 min and 1 hour
Deactivation period	= Under TSO responsibility but \leq FAT
Scheduled activated or direct activated (when applicable)	Scheduled activated
Divisibility: only divisible bids or divisible/indivisible conditions allowed?	Volume : Under the responsibility of BSP (Min volume = 1MW and Resolution = 0,1MW)
Upward/downward	Upward and downward offers
Validity period of the bid (next hour, ...):	defined by BSP but equal or less than 60 min

5. Additional relevant information of the pilot project

