

Balancing pilot projects update

23rd September 2015

Contributions and geographic extension of PP

Increase of social welfare and market liquidity

Pilot projects in operation are demonstrating that XB balancing is increasing social welfare and is giving more flexibility for TSOs (especially needed with increasing RES penetration). Challenge to keep local adequate incentives for BRPs in a cross border balancing market with marginal pricing.

Geographical extension

Several pilot projects have increased the number of participating TSOs / geographic scope because TSOs see benefits in wider cooperation:

- Pilot 1: feasibility studies for cooperation with PP 5 and 7 and aFRR cooperation with Austria
- Pilot 2: extension towards German, Austrian, Dutch and Swiss TSOs went live on April 7th;
- Pilot 4: REE, Swissgrid and ADMIE and potential future extension towards Eirgrid.
- Pilot 5: feasibility studies with Baltics, Poland and pilot 1
- Pilot 7: on going feasibility studies with pilot 1 and Austria
- Pilot 9: multilateral agreement will make easier for new TSO's to join

Pilot projects are actively contributing to the early implementation of NC EB and extend in geographical size. Harmonization increases among more TSOs

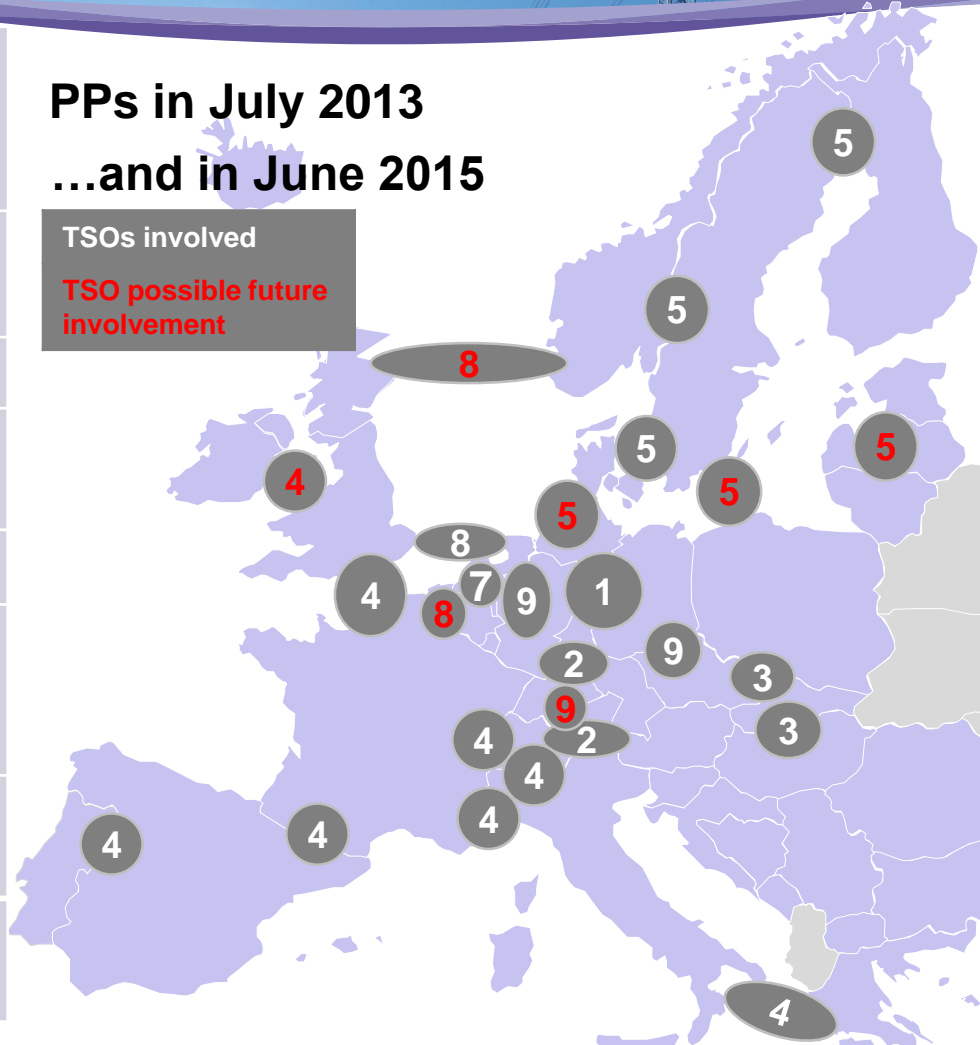
Cross border Pilot Projects (PP)



1	Common Merit Order (CMO) for mFRR and aFRR with real time flow based congestion management
2	Cross-border market for FCR based on TSO-TSO model
3	E-GCC (project on hold)
4	TERRE: Trans-European Replacement Reserves Exchange
5	Development of the Nordic RPM
7	Design and evaluation of a harmonised reactive balancing market with XB optimisation of Frequency Restoration
8	BritNed / TenneT / National Grid Balancing Services (project on hold)
9	IGCC Imbalance Netting, aFRR-Assistance and Flow-Based Congestion Management.

PPs in July 2013 ...and in June 2015

TSOs involved
TSO possible future involvement



mFRR – manual Frequency Restoration Reserves
aFRR – automatic Frequency Restoration Reserves
RPM – Regulating Power Market
IGCC – International Grid Control Cooperation
E-GCC - Grid Control Cooperation in CZ, SK and HU

ENTSO-E Balancing Pilot Project Report

Summary of learnings and barriers

Contributions and geographic extension of pilot projects

Several processes in the same CoBA

A clear example is the case of pilot 1, which delivers a working example for maximum optimization potential and can serve as basis for step-by-step implementation of Imbalance Netting, joint procurement of FCR, aFRR and mFRR as well as the CMOs for aFRR and mFRR.

Flow based approach

The implementation of the flow based approach for activation of aFRR in pilot 1 allows for an overview of the flows created by the CMO activation.

Standardization of balancing products

The design of products and the process to exchange them might affect local ACE quality, local reserve needs, local market liquidity and sourcing price, local ability to cover reserve needs.

Differences in the way TSOs are operating the system

- Central dispatch systems versus self dispatch systems
- Reactive systems versus proactive systems
- Some TSO's use scheduled products while others use direct activated products.
- Market time resolutions (Gate Closure Times, Time to restore frequency...)
- Some systems rely more on aFRR product while others on mFRR products.

Regulatory Issues

- Different cap and floors for balancing pricing due to different national legislation. → creates asymmetries for both bidding process and Imbalance settlement
- Some countries settle using pay as bid scheme while others use marginal pricing for XB TSO-TSO balancing energy.

Key learnings from pilot projects: barriers (i)



Experience shows that implementing pilot projects is a long process; examples:

Pilot 7: Tennet-Elia 2 years discussion (different control blocks and bidding zones is an issue)

Pilot 1: GCC (1 country, 1 NRA, 4 TSO's) 2 years (including common procurement and dimensioning)

Pilot 4: design phase not finished yet: long process; among other reasons, increasing number of TSO's participating (different needs, different local products different local regulatory frameworks with different timings/scheduling processes)

Additional barriers derived from:

Current lack of harmonized XB ID market in Europe → this is an important issue for defining common timing and scheduling for balancing: for instance, pilot 4: difficulties for defining common timing for updating bids to be submitted and updating ATC for XB balancing)

Some countries settle using pay as bid scheme due to National legislation while NC Balancing recommends marginal pricing for XB TSO-TSO balancing energy (this is an issue at pilots 1 and 4, for instance)

Key learnings from pilot projects: barriers (ii)

Fundamental difference with DA –ID of a balancing market due to the short distance to real time and security aspects involved

Operational real time market and local TSO responsibilities need to be respected (LFC&R);
TSO's should preserve reserves/ACE quality in a context of different system dynamics;
These TSO's tasks should be preserved independent of balancing markets extension.

Economic impact from balancing markets:

How to manage a reduction of balancing price, derived from a higher balancing market liquidity, while preserving adequate local incentives for BRPs to be balanced or help to restore the imbalance

Pilot projects and current proposal of manual products

	P-DA-15-15/30 (mFRR)	P-DA-10-10/25 (mFRR)	P-DA-5-5/20 (mFRR)	P-Sch-15-0/15 (mFRR)	P-Sch-30-15 (RR)	P-Sch-15-15 (RR)
FAT	15	10	5	15	30	15
Min delivery	15	10	5	0	15	15
Max delivery	30	25	20	15	15 / 60	15
Temporal divisibility	Mandatory yes. between min and max. Minute based resolution	Mandatory yes.	Mandatory yes.	NO	NO	NO
Links (temporal)	No	No	No	No	Yes / No	No
Activation method	Continuous process	Continuous process	Continuous process	Continuous process, or clearing	clearing	clearing
Pilot projects	Pilot 1, Pilot 5				Pilot 4	Pilot 7