

PCR Status Report

Q3 2017

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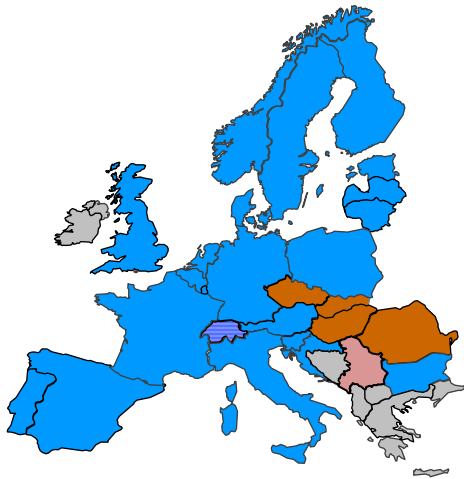
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I. PCR High Level Status

- Price Coupling of Regions (PCR) is the voluntary initiative of 7 European Power Exchanges, to develop a single price coupling solution to calculate electricity prices and allocate cross-border capacity on a day-ahead basis across Europe
- PCR has, since its Go-Live in Feb 2014, proven to be operationally robust and ready to facilitate the EU target of an integrated electricity market
- Major milestones achieved:**
 - 04 Feb '14: NWE Go-Live + SWE in common synchronised mode using PCR
 - 13 May '14: SWE Full Coupling
 - 19 Nov '14: Launch of the 4M Market Coupling using separate PCR Solution
 - 24 Feb '15: CSE Coupling (FR-IT, AT-IT, SI-IT)
 - 20 May '15: CWE FB Implementation
 - 16 Jun '15: Provision of PCR Simulation Facility to MRC users (PXs + TSOs)
 - 20 Jan '16: Bulgaria
 - 11 Feb '16: Croatia
 - 18 Feb '16: Serbia



Expansion PCR		
	Multi Regional Coupling (MRC): NWE, Poland, Baltic, SWE & CSE, Bulgaria, Croatia	Feb 2014 synchronous operation, May 2014 full price coupling, FEB 2015, integration CSE (FR-IT, AT-IT, SI-IT), Jan 2016 Bulgaria, Feb 2016 Croatia
	4MMC	Separate PCR Solution, Successfully launched on 19 Nov 2014. To be coupled to MRC as soon as possible (via CEE Flow Based/NTC)
	Serbia	Independent operation of algorithm
	Switzerland	TBD integration into MRC

II. Key Achievements – Outstanding Issues

OPSCOM/CCB

Completed:

- Implementation of TGE in PCR

Next Implementation:

- Extension of PCR: Ireland, EXAA, split Austria/Germany

Algorithm

- Euphemia 10.2 maintenance release development started. Go-live anticipated for Q1 2018
- Main focus on E10.3 MNA release that shall be go-live ready technically by June 2018:
 - Support for multiple NEMOs;
 - Anticipated support for scheduling area flows and inter NEMO flow calculations;

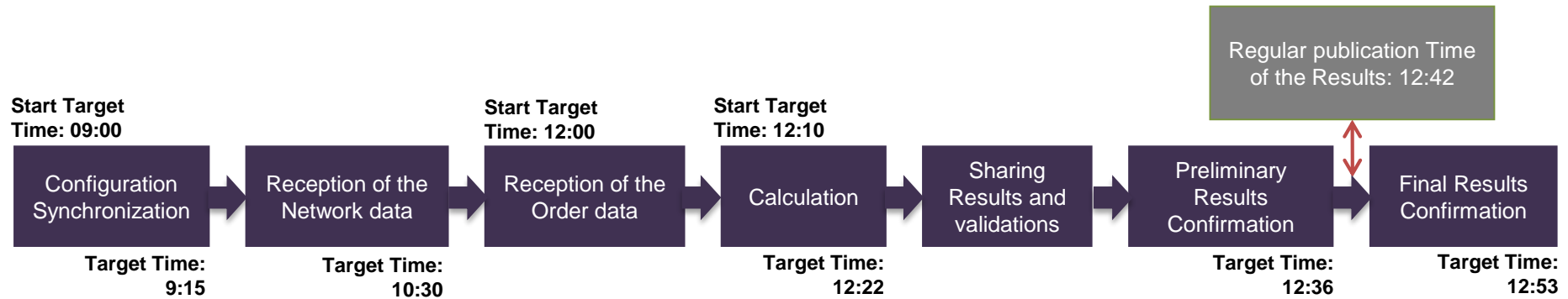
System Design

- Finalizing the specifications for PMB 10
- Analysing the multi-NEMO solutions and its impact on PMB and PMB-Euphemia Interface
 - Work on the partial decoupling scenarios is on-going
 - Work on rounding impact on PMB is on-going

Governance

- CACM compliance evaluation (3rd Amendment)

IV. Statistics - PCR Operational Indicators - Definitions



Network Data

Procedural Target Time for receiving the Network Data (containing Cross Zonal Capacities and Flow Base Matrix) is 10:30. Until 12:10 new versions can be sent (Network Data table only considers reception of last version). At 12:40 (the Partial Decoupling deadline), if a Network Data is still missing, a Partial Decoupling will be declared.

Order Data

The Order Data of all PXs must be validated at 12:10 at the latest. Before 12:10, new versions of Order Data can be sent (Order Data table only considers reception of last version). At 12:40 (the Partial Decoupling deadline), if an Order Data is still missing, a Partial Decoupling will be declared.

Calculation

Calculation starts at 12:10 and in normal situation the process takes 10 minutes at the most. If after that period, no valid solution is found in any PX, an Extension Time of 100 minutes is added automatically. In this situation, calculation will end when a first valid solution is found. Second round of calculation may be run in case of *Max Price / Thresholds / Second Auction* is detected in the first calculation and new data is required to improve the market situation (calculation table only considers the timing of the last calculation run).

Preliminary confirmation

Each PX has to accept or reject the Preliminary Confirmation of the Results. Target Time to have all Preliminary Confirmations is 12:36

Final confirmation

Each PX has the possibility to validate with external parties (TSOs, market participants, etc.) the results from the calculation. Then, each PX has to accept or reject the Final Results Confirmation. Target Time to have all Final Confirmations is 12:53.

IV. Statistics - PCR Operational Indicators (I)

Month	Network Data Reception* (TSO → PX) Average Time	Network Data Reception* (TSO → PX) Minimum Time	Network Data Reception* (TSO → PX) Maximum Time
Dec-16	09:49h	09:46h	11:27h***
Jan-17	09:52h	09:47h	11:28h†
Feb-17	09:55h	9:51h	12:05h†
Mar-17	09:58h	9:51h	10:56h††
Apr-17	09:54h	9:51h	10:27
May-17	09:58h	9:51h	11:46†††
June-17	10:00h	9:52h	11:26††††
July-17	9:58h	9:52h	10:28
August-17	10:00h	9:59h	11:01h‡
Sep-17	10:06h	9:56h	12:01h‡‡
Oct-17	9:58h	9:54h	11:00h**
Nov-17	10:04h	9:54h	11:39h***

(*) Process target timings: NDR = 10:30 h; OR = 12:10 h; CT = 10:00 min; FC = 12:53 h

(†) 2nd ATC version

(††) Late ATC file reception from a PX

(†††) Late ATC reception due to calculation and generating issues from a TSO

(††††) Late ATC reception due to calculation issue and system issue from a TSO

(‡) One PX encountered delay for sending ATC to PMB due to delay on TSO side

(‡‡) Cross-Check issue on TSO side

(**) ATC delay from a PX

(***) Two PXs had an issue to send their ATC to the PMB due to an issue on TSO side

There is a trend that TSOs send data later on average. Can TSOs explain what is going on?

IV. Statistics - PCR Operational Indicators (II)

Month	Orderbooks Reception* (PX → PCR) Average Time	Orderbooks Reception* (PX → PCR) Minimum Time	Orderbooks Reception* (PX → PCR) Maximum Time
Dec-16	12:05h	12:03h	12:13h***
Jan-17	12:05h	12:03h	13:19h†
Feb-17	12:06h	12:04h	12:40h††
Mar-17	12:05h	12:04h	12:15h†††
Apr-17	12:06h	12:04h	12:31h††††
May-17	12:05h	12:04h	12:17h†††††
June-17	12:05h	12:04h	12:10h
July-17	12:05h	12:03h	12:10h
August-17	12:05h	12:04h	12:23h‡
Sep-17	12:05h	12:04h	12:09h
Oct-17	12:06h	12:04h	12:29h‡‡
Nov-17	12:05h	12:04h	12:10h

(*) Process target timings: NDR = 10:30 h; OR = 12:10 h; CT = 10:00 min; FC = 12:53 h

(***) OBK delay from one PX on 01/12/2016 DD

(†) Portfolio allocation issue - 2nd OBK version

(††) A PX encountered trading system issues, then session with delays

(†††) OBK reception delay from a PX due to technical reason

(††††) PX encountered technical issues and slowness with its PMB, triggering a restarting of its PMB then delaying the session

(†††††) a PX encountered a trading system issue

(‡) The trading system server of a PX had to be relaunched during the session, then normal session with delay

(‡‡) A PX had a problem with the sending of the order book to the PMB

IV. Statistics - PCR Operational Indicators (III)

Month	PCR Calculation* Average Time	PCR Calculation* Minimum Time	PCR Calculation* Maximum Time
Dec-16	09:59 min	09:58 min	10:02 min [†]
Jan-17	09:59 min	09:58 min	10:01 min
Feb-17	09:58 min	09:58 min	09:59 min
Mar-17	09:59 min	09:58 min	09:59 min
Apr-17	09:59 min	09:58 min	09:59 min
May-17	09:59 min	09:58 min	10:00 min
Jun-17	10:08 min [‡]	09:58 min	10:37 min [‡]
July-17	10:11 min [‡]	09:59min	10:32 min [‡]
August-17	10:08 min [‡]	09:59min	10:30 min [‡]
Sep-17	10:11 min [‡]	09:59min	10:32 min [‡]
Oct-17	10:06 min [‡]	09:59min	10:16 min [‡]
Nov-17	10:11 min [‡]	09:59min	10:30 min [‡]

(*) Process target timings: NDR = 10:30 h; OR = 12:10 h; CT = 10:00 min; FC = 12:53 h

(†) A solution is found just shy of the 10 minute time limit. The 10' are (slightly) exceeded due to time it takes to write the solution to the database;

(‡) Since introduction of E10.1_fix1, Euphemia takes more time to interrupt after time limit

IV. Statistics - PCR Operational Indicators (IV)

Month	Preliminary Result Publication* Average Time	Preliminary Result Publication* Minimum Time	Preliminary Result Publication* Maximum Time
Dec-16	12:42h	12:42h	12:45h****
Jan-17	12:44h	12:42h	13:42h†
Feb-17	12:43h	12:42h	13:00h††
Mar-17	12:42h	12:42h	12:54h†††
Apr-17	12:42h	12:42h	12:48h††††
May-17	12:42h	12:42h	12:42h
June-17	12:42h	12:42h	12:42h
July-17	12:42h	12:42h	12:42h
August-17	12:42h	12:42h	12:44h‡
Sep-17	12:42h	12:42h	12:42h
Oct-17	12:43h	12:42h	12:57h‡‡
Nov-17	12:42h	12:42h	12:42h

(*) Process target timings: NDR = 10:30 h; OR = 12:10 h; CT = 10:00 min; FC = 12:53 h

(****) One PX got an issue with its Preliminary Confirmation on 14/12/2016 DD

(†) Portfolio allocation issue for one PX – New calculation done with that PX

(††) A PX encountered trading system issues, then session with delays

(†††) A PX was not able to send the Preliminary confirmation due to a failing file (DST)

(††††) A PX encountered technical issues and slowness with its PMB, triggering a restarting of its PMB then delaying the session

(‡) The trading system server of a PX had to be relaunched during the session, then normal session with delay

(‡‡) A PX did not send its preliminary confirmation to the PMB

IV. Statistics - PCR Operational Indicators (V)

Month	Final Confirmation of PCR results* (PX/TSO → PCR) Average Time	Final Confirmation of PCR results* (PX/TSO → PCR) Minimum Time	Final Confirmation of PCR results* (PX/TSO → PCR) Maximum Time
Dec-16	12:51h	12:45h	12:54h****
Jan-17	12:54h	12:51h	13:47h†
Feb-17	12:52h	12:51h	13:10h††
Mar-17	12:53h	12:51h	13:32h†††
Apr-17	12:52h	12:51h	12:56h††††
May-17	12:51h	12:50h	12:52h
June-17	12:51h	12:51h	12:52h
July-17	12:52h	12:51h	12:56h‡
Aug-17	12:52h	12:51h	12:57h‡‡
Sep-17	12:52h	12:51h	12:55h
Oct-17	12:52h	12:51h	13:06h‡‡‡
Nov-17	12:51h	12:51h	12:52h

(*) Process target timings: NDR = 10:30 h; OR = 12:10 h; CT = 10:00 min; FC = 12:53 h

(****) One PX got an issue with its Preliminary Confirmation on 14/12/2016 DD, Final confirmation step delayed accordingly

(†) Portfolio allocation issue from one PX – New calculation with that PX

(††) A PX encountered trading system issues, then session with delays

(†††) A PX was not able to send the Preliminary confirmation due to a failing file (DST)

(††††) A PX encountered technical issues and slowness with its PMB, triggering a restarting of its PMB then delaying the session

(‡) One PX was not able to confirm the results due to technical issue on TSO side.

(‡‡) The trading system server of a PX had to be relaunched during the session, then normal session with delay

(‡‡‡) Normal session with delay due to the delay of a PX in sending the PC to the PMB