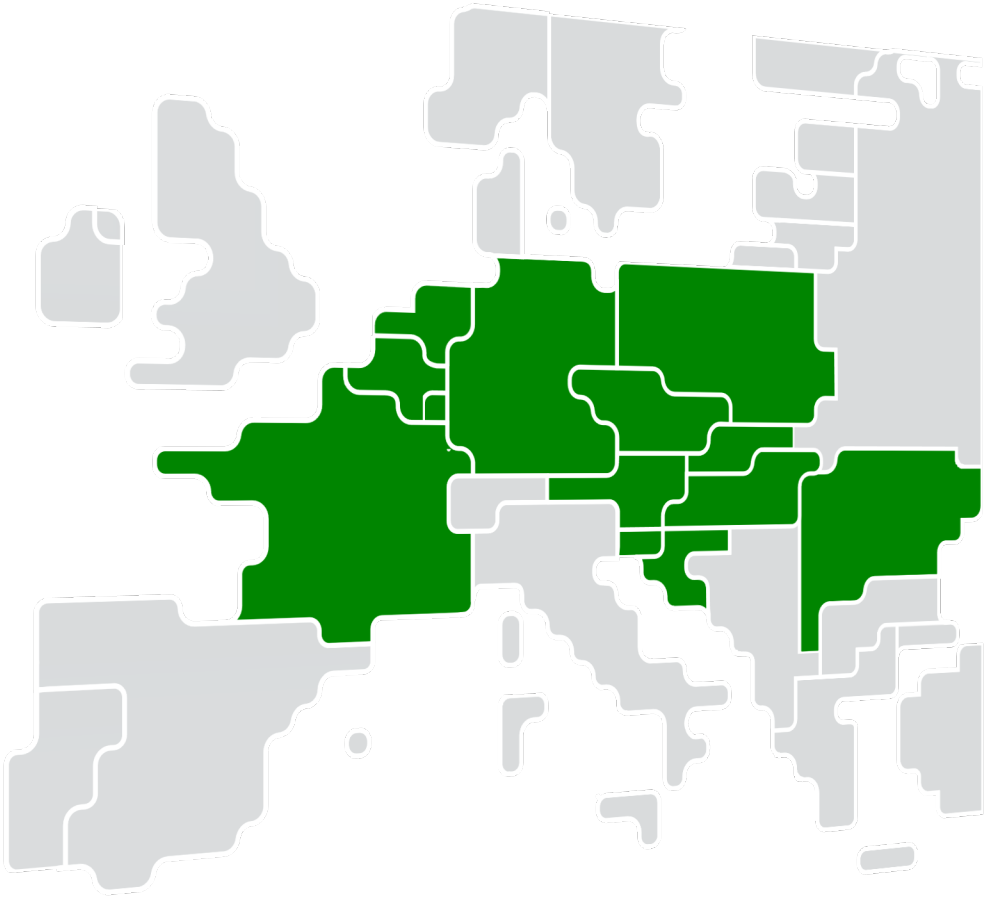
Core Consultative Group meeting

22 April 2021, 10:00 – 16:00

MS teams websession



1. Welcome and Introduction

R.OTTER/
H.ROBAYE

Practicalities, announcements and reminders

Co-chairs

Helene ROBAYE (Market Participants, Eurelectric)

Ruud OTTER (Core TSOs, Tennet BV)

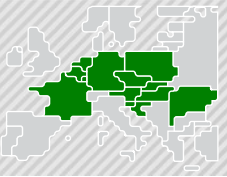
Practicalities

- During meeting
  - Use of ‘hand’ function will facilitate all participants to have the opportunity
  - Use of ‘chat’ function will give opportunity to address all questions and will facilitate proper tracking and answering
- Follow up
  - Minutes and final meeting documents will be shared with CCG distribution list
  - JAO Q&A forum
- MS teams workshop and Q&A will be recorded and made available for all Market Participants

1. Welcome and introduction

Agenda

R.OTTER/
H.ROBAYE

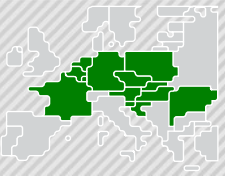


	SUBJECT	WHO	TIMING
1	**Welcome and introduction** • Announcements and reminders	R.OTTER/ H.ROBAYE	10.00 – 10.15
2	**Day Ahead Capacity Calculation & Market Coupling** • Core FB DA MC roadmap, important milestones and current status *Objective: inform on the general status related to Core FB MC and CC, what to expect and answer questions* • Fallback solution *Objective: inform on the Core FB MC go live fallback solution and present potential improved target solution(s)* • External parallel run *Objective:* *Inform on current status, disclaimers/assumptions document, challenges, give outlook* *Present first EXT//run results and what to expect regarding the timeline for the 6 months stable run prior go live* *Discuss Market Parties feedback and initial conclusions on first results published via JAO website*	M.PREGL/ G.MEUTGEERT	10:15 – 11:30
	break 11:30 – 11:45		
	• Publication tool *Objective: Explain the new publication tool and collect suggestions*	G.MEUTGEERT	11:45 – 12:00
	• Increasing Transparency FB MC in European Electricity Trading – Barriers, Solutions, and Key Indicators *Objective: Provide to TSOs specific suggestions we developed in the study with regard to accessibility and understanding (with also a focus on quick wins).*	A. GRUBER	12:00 – 12:30
	• Static Grid Model *Objective: Discuss how Market Parties can use the static grid model for their market analyses*	G.MEUTGEERT	12:30 – 12:45
	Lunch 12:45 – 13:45		
3	**Intraday Capacity Calculation and Allocation** • Core FB ID CC roadmap, important milestones and current status *Objective: inform on IDCC project status, explain project decisions and what to expect*	W.SNOEREN	13.45 – 14:30
	• Core ID Allocation improvements *Objective: MPs present their feedback on the ID improvements*	H.ROBAYE	14:30 – 14:50
4	**Regional Operational Security Coordination and Cost Sharing** *Objective: inform on ROSC and CS project status, explain project decisions and what to expect*	P.SCHÄFER	14:50 - 15:40
5	**AOB & closure** • Q&A forum on JAO website • Next CCG meeting	R.OTTER/ H.ROBAYE	15:40 – 16:00

2. Day Ahead Capacity Calculation & Market Coupling

Core FB DA MC roadmap, important milestones and current status

M.PREGL



Today

21/02/19 ACER referral and DA CCM approval

11/2020 TSOs' CC concept operationally implemented (CCC set up)

18/09/20 Market Design for Implementation re-approved

30/11/2020 Launch External // run

03/05/2021 Launch Joint MC testing

TSOs and NEMOs operational readiness for Market Go-Live

2018 | 2019 | 2020 | 2021 | 2022

Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1 | Q2 | Q3 | Q4 | Q1

FB DA Capacity Calculation project (TSO only)

- Acer referral and approval
- Operational and IT Implementation (pre & post coupling) (set up CCC) 2)
- Continuous improvement
- Internal parallel run 1)
- External Parallel run (min 6 months) 3)

FB DA Market Coupling project (Joint TSOs & NEMOs)

- Market Design
- Procedures
- Local (IT) implementations (+ PCR)
  - Isolated System Test
  - Pre-FIT Test
  - Full Integration Test (FIT)
  - Simulation Test
  - SDAC Simulation Test
  - Member Test
  - Acceptance Test
- Joint MC Testing 4)
- MTP
- preparations
- Go Live prep & Go No go decision 6)
- Operational contract

Core DA FB MC Go live window (01 – 02/2022)

External activities

- Euphemia smoke test
- PCR simulations 5)
- 09/02/2021 PL MNA go-live
- 06/2021 ICP go-live

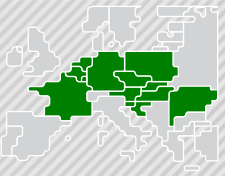
Assumptions and disclaimers:

1) finalisation of the so-called internal parallel run by Core TSOs in October 2020
2) based on the current Core FB DA CCM approved by ACER on 21/2/2019
3) legal obligation for a minimum of 6 months external //run (art. 20(8) CACM)
4) exact Joint MC integration test timings are under discussion and to be defined within the duration indicated
5) sufficient performance of Euphemia shown in a PCR simulation tests
6) possible timeline for NRAs to fulfil potential local requirements confirming the MC go live not included

2. Day Ahead Capacity Calculation & Market Coupling

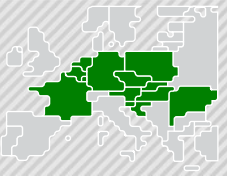
Core FB DA MC roadmap, important milestones and current status

M.PREGL



High-level planning, associated progress and status

ID	Activity	Start	Finish	Progress	
CRITICAL EXTERNAL MILESTONES/ DEPENDENCIES					
CORE FB MC PROJECT					
1	CORE COMPATIBILITY ASSESSMENT	01/06/2017	01/10/2017	Closed	100
2	PROJECT SET UP	20/08/2017	01/10/2017	Closed	100
3	MARKET DESIGN	02/07/2018	28/01/2020	Closed	100
4	PROCEDURES DESIGN	15/04/2019	28/07/2020	In progress	83
5	SIMULATION & VALIDATION	02/03/2019	30/03/2021	In progress	75
6	EXTERNAL PARALLEL RUN	01/09/2018	12/01/2022	In progress	70
7	EXTERNAL IMPLEMENTATION (to be managed by different projects)	03/10/2018	29/06/2021	In progress	87
8	MERGER WITHIN SDAC	03/10/2018	27/05/2021	In progress	68
9	MC TESTING	15/06/2019	04/02/2022	In progress	28
10	FINAL MARKET DESIGN AND PROCEDURES	10/09/2020	12/12/2021	Not started	12
11	GOVERNANCE AND CONTRACTUAL FRAMEWORK	01/06/2017	22/11/2021	In progress	83
12	COMMUNICATION AND STAKEHOLDER MANAGEMENT	02/05/2018	30/09/2021	In progress	58
13	Go-Live	30/09/2020	26/04/2022	Not started	0



2. Day Ahead Capacity Calculation & Market Coupling

Core FB DA MC roadmap, important milestones and current status

Main challenges in relation to the planning are

Procedures design – creation of normal, back-up, fallback and rollback procedures

- The main challenge here are the fallback procedure as the current approach would lead to large area being decoupled
- Core parties are working on an improved target for fallback in case of decoupling that will be shared with MPs once agreed
- → *There are more detailed slides on this specific topics*

External parallel run

- Start is made with publication of results since the beginning of November 2020 and transition towards EXT//Run
- There have been issues faced with the Simulation Facility to create Market coupling results (incorrect functionalities, lacking order books and incorrect configuration settings). Involved parties working on fixes - oral update will be given in the meeting

Market coupling Testing

- Preparations are on-going and all test scenarios are prepared and validated, main pending point is the detailed planning
- The detailed planning depends on the open points in relation to procedures (i.e. fallbacks), other projects (i.e. ICP), tight schedules for deploy of required systems, which creates a risk for the timely start of the testing
- All parties are committed to remove dependencies and optimise the planning to respect the agreed milestones

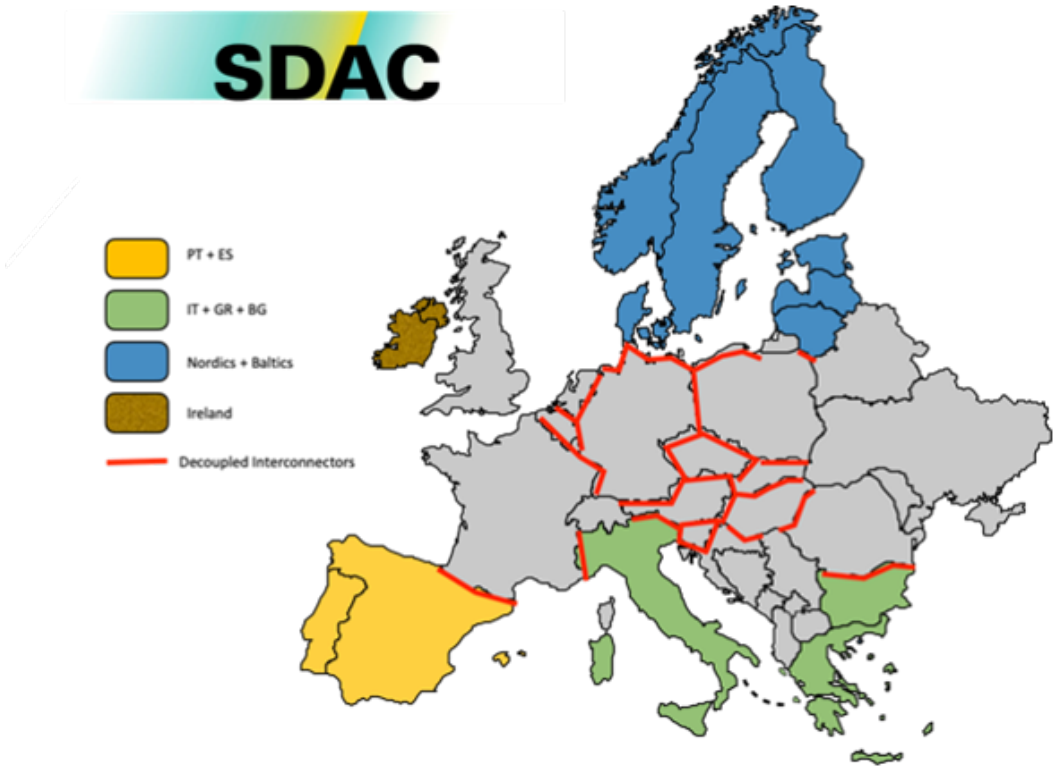
2. Day Ahead Capacity Calculation & Market Coupling

Fallback solution (1/3)

M.PREGL

Art. 4.2 of the Acer decision 10/2018 mentions that shadow auctions have to be used to allocate cross zonal capacity in case a BZ is not able to determine the market coupling results.

- As in FB domain the internal borders cannot be decoupled one by one, the application of this decision has been defined as the complete decoupling of all the Core borders: internal and external.



2. Day Ahead Capacity Calculation & Market Coupling

M.PREGL

Fallback solution (2/3)

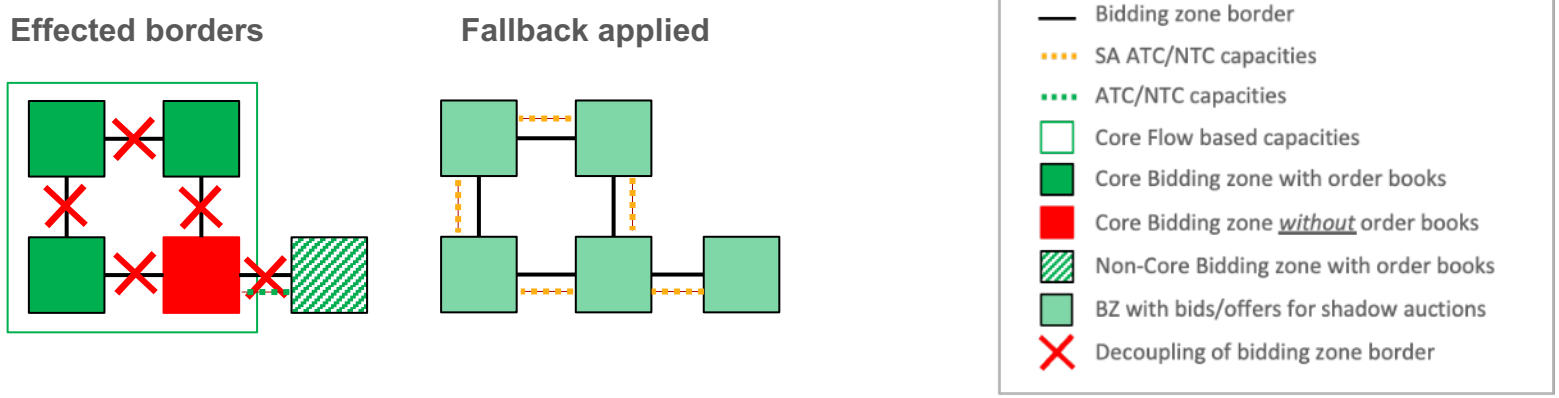
The fallback solution for the Single day-ahead coupling is defined in the framework of CACM article 44. In case SDAC “coupling process is unable to produce results”, shadow auctions are the fallback in Core.

Core FB MC parties concluded that a decoupling following missing NEMO order books (in non-MNA or in MNA for all NEMOs) would lead to full decoupling of Core and other affected borders and the impact is too significant

Core FB MC parties agreed to explore potential optimized fallback solutions, which would minimise the consequences of a decoupling due to missing order book, ‘isolate’ the issue and limit its impact as far as possible.

Condition for an improved fallback solution is that it can be developed, tested and implemented before FB MC go-live in and does not jeopardize the go-live.

Initial fallback solution in case of missing order books for a NEMO in a non-MNA of all NEMOs in MNA:



2. Day Ahead Capacity Calculation & Market Coupling

Fallback solution (3/3)

M.PREGL

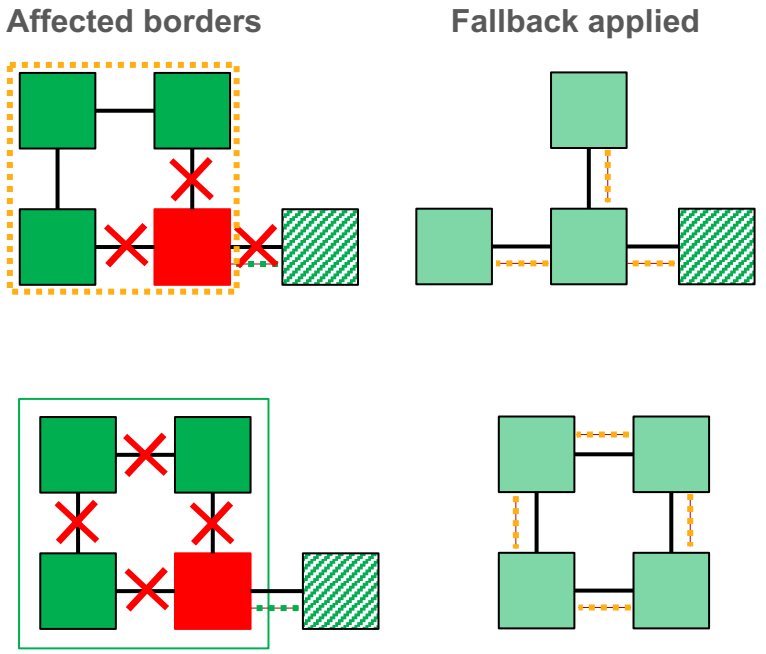
Core FB MC project parties are analyzing two main options considering the before mentioned conditions

option 1: all the borders remain coupled except those (External or Internal) connecting the affected Bidding Zone.

- Core internal Capacities would be allocated via NTC Market Coupling; Capacity on Core external borders is allocated via NTC
- Shadow auctions will be held for the borders linked to the affected Bidding Zone

option 2: external borders remain coupled and Core internal borders will be decoupled

- Shadow auctions will be held for the Core internal borders linked to the effected Bidding Zone



Core project parties will assess in the coming period if it is feasible to develop, test and implement the preferred option 1 Fallback solution prior to Core FB DA MC Go Live. If it will be concluded that the implementation of option 1 will not be feasible prior Go-live then option 2 will be implemented and option 1 will be implemented as soon as possible after Go-Live.

Market Parties will be informed on the outcome of the assessment as soon as available.

2. Core FB Day Ahead Capacity Calculation & Market Coupling

G.MEUTGEERT

External // run: introduction & status

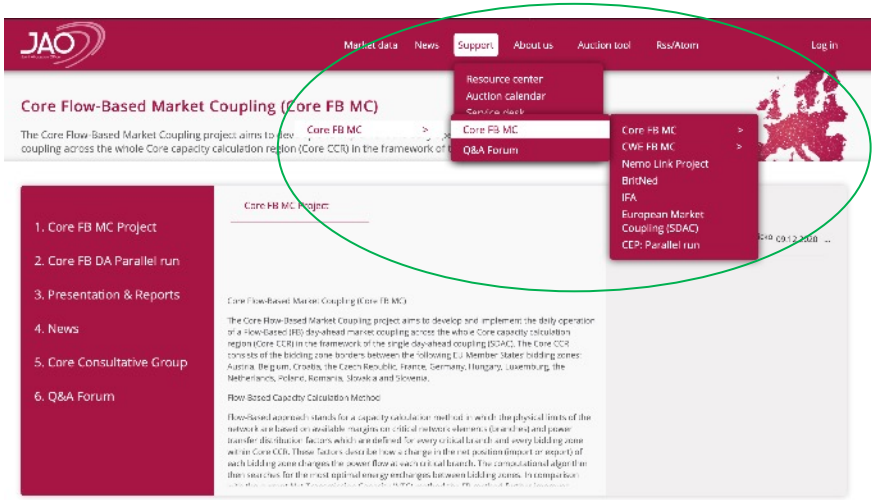
Core FB DA MC project presented the external parallel run approach, the FB DA capacity calculation method and the systems used for capacity calculation in the parallel runs in the CCG of 07/10/2020.

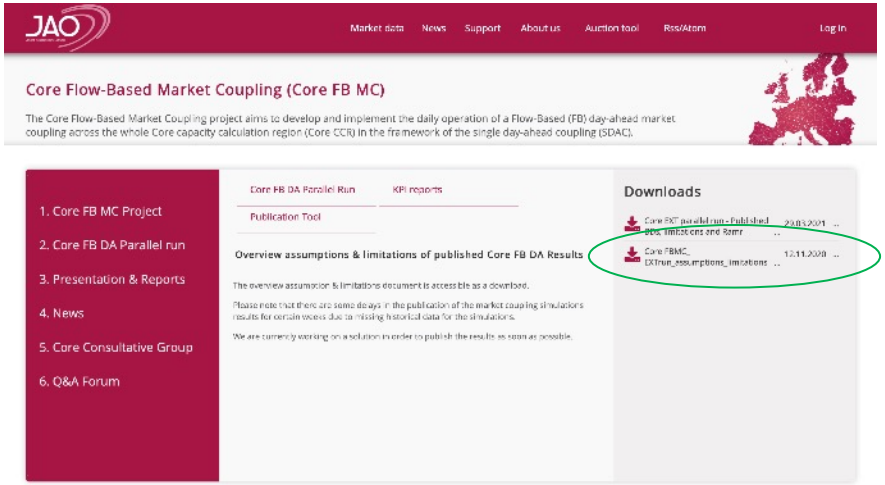
Since November 14th (Business day 16/11/20), Core TSOs started a progressive transition to the EXT // run and results that are deemed sufficiently representative were published weekly on JAO (Publication Tool)

- Link: https://core-parallelrun-publicationtool.jao.eu/

There are various assumptions and known limitations in relation to the capacity calculation results that have to be considered when interpreting the results.

- With the weekly publication of technically representative results, Core TSOs maintain an overview on these assumptions and limitations with the related BDs on the JAO website (link: https://www.jao.eu – see below for exact page)
- An important assumption to highlight is that so far the Non-Costly Remedial Action Optimizer (NRAO) to optimise available non-costly remedial actions is not yet implemented in the EXT // run and is therefore impacting the results.



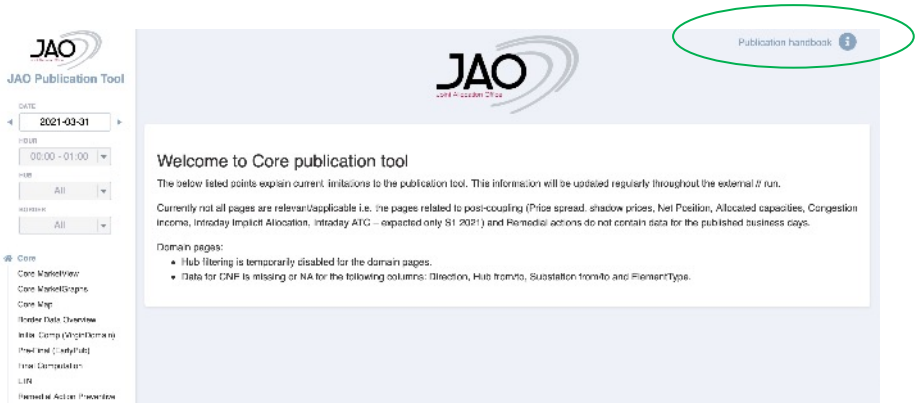


2. Core FB Day Ahead Capacity Calculation & Market Coupling

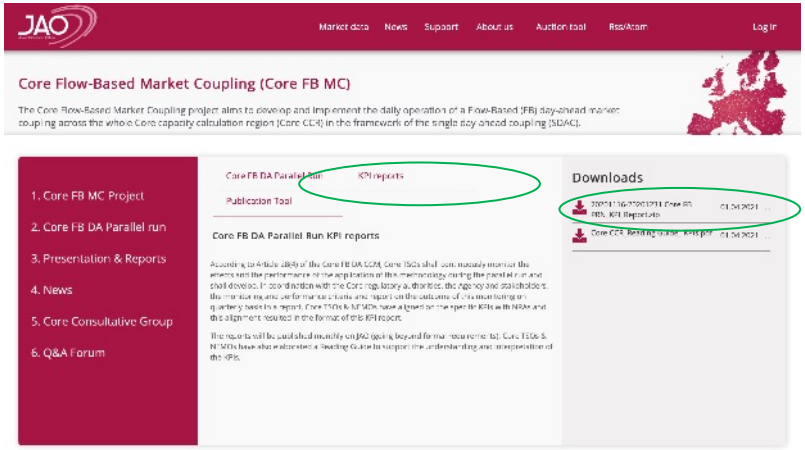
G.MEUTGEERT

External // run: introduction & status

To guide users of the JAO Publication Tool to navigate and better understand the results, Core TSOs created a Publication Handbook which can be found on the JAO website.

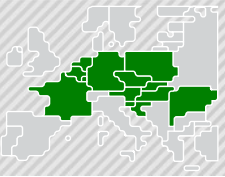


Next to technically representative results, Core TSOs have agreed with the NRAs and informed Market Parties on a set of monthly KPIs to be published. These KPIs are shared with Core MPs since end of March.



2. Core FB Day Ahead Capacity Calculation & Market Coupling

G.MEUTGEERT



External // run: summary of first results

Since November 14th (Business day 16/11/20), Core TSOs started a progressive transition to the EXT // run and results that are deemed sufficiently representative were published weekly on JAO (Publication Tool)

As announced with the aim to

- focus would be on stabilizing tools
- publication of results to facilitate Market parties to get acquainted with the Core flow based day-ahead results

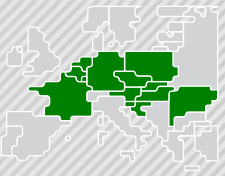
A short summary of the progress and status (until BD 14/03) in relation to the EXT//Run results:

Capacity calculation

- 74 BDs (from 133) were deemed sufficiently representative and published in the JAO Publication Tool
  - This means 59 BDs were unsuccessful due to process failures and/or limitations that significantly impacted representativeness
  - Main issues were related to
    - Common Grid Merging (CGM) - merging of Individual Grid Models into a Core CGM
    - Issues with TSO input of individual validation
    - Net Position Forecasting (NPF) - creating forecasted Net Positions of Core used in e.g. CGM & Base Case Improvement
    - Core Common Capacity calculation tool
- Since November, several new releases of used systems are deployed with fixes.
- In the last month, a few significant mitigations and improvements were implemented in relation to the above issues with a focus on processes, tools, external data sources, procedures and helpdesk
- Core TSOs therefore expect to see significant improvements of operational stability in the upcoming month

2. Core FB Day Ahead Capacity Calculation & Market Coupling

G.MEUTGEERT



External // run: summary of first results

Market coupling simulations

- November and December MC results are available, January is being finalized (by 06/04). February/March simulations ongoing.
  - Multiple topology changes in the observed period (Alegro, Brexit, Polish MNA,…)
  - Simulation Facility facing issues with available historical data delaying the provision of MC results

The next milestone linked to the EXT//Run is the start publishing results daily and for 7 out of 7 business days

- Core TSOs are progressing to stabilise the operational process with the latest system releases to make the next step in the external parallel run: publication of capacity calculation results immediately after the Core capacity calculation steps finishes
  - Market coupling Simulation results will still be published Week X + 21 days (Saturday). Performing simulations takes more time as confidential order books to perform simulations are available after 14 days and this will remain until Go Live.
- With the switch to daily publication, Core TSOs will facilitate external stakeholder with providing results and allow them to further gain experience with Core Flow based results towards the go-live in February 2022

This milestone of daily publication is reached on 13/03 for BD 15/04 as communicated in a Market Message on 14/04.

Results from the EXT//Run are now be published daily in the JAO publication tool.

2. Core FB Day Ahead Capacity Calculation & Market Coupling

G.MEUTGEERT

External // run: summary of first observations

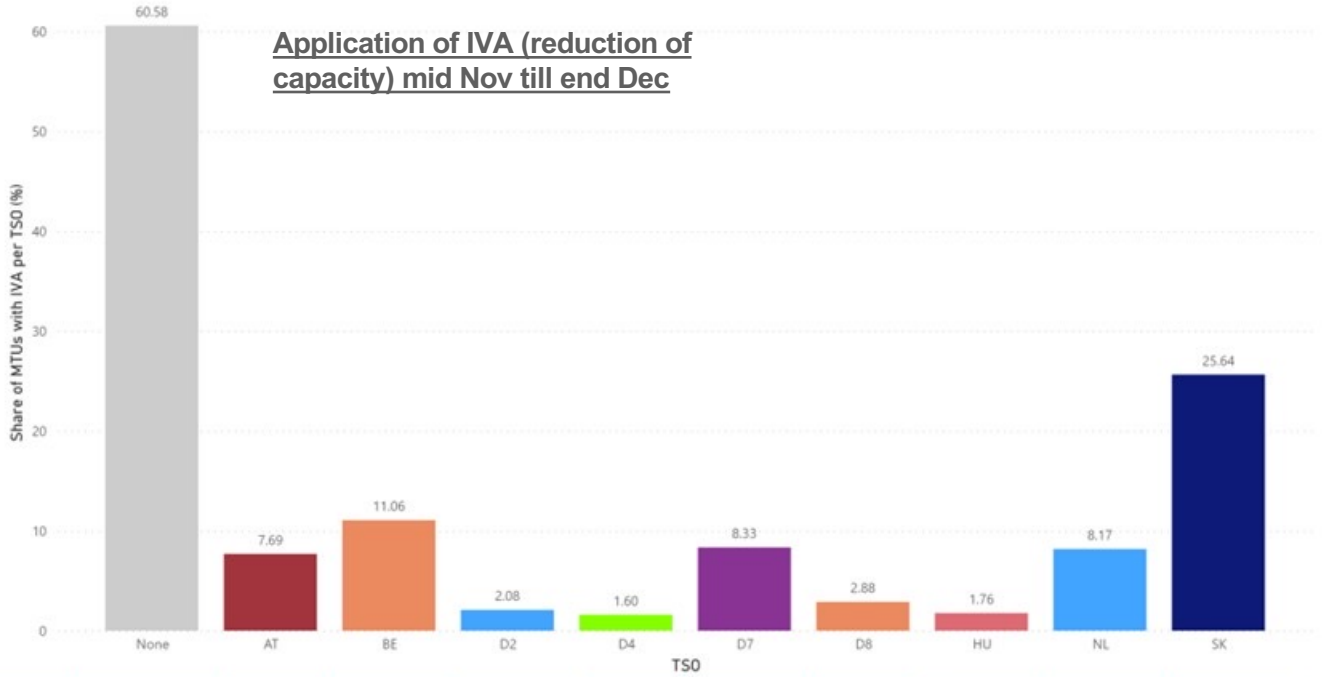
Below high-level observations can be shared based on the results of the EXT // run since November 14th (Business day 16/11/20)

- Application of virtual capacity (AMR, LTA margin) is structurally needed to reach the target capacities (Ramr assumptions)
- Around 40% of time Core TSOs have reduced capacities as there were no sufficient RA available to secure the grid

Example of virtual capacity applied on BD Nov 25

TSO	Average Maximum AMR+LTAmargin per BD (MW)
AT	701.21
BE	1,364.38
CZ	428.79
D2	465.79
D4	192.13
D7	257.71
D8	288.00
FR	775.42
HR	413.38
HU	495.58
NL	184.88
PL	789.67
RO	71.21
SI	415.04
SK	494.58

Application of IVA (reduction of capacity) mid Nov till end Dec



Total MTUs = 624 (26 BDs * 24h)	None	AT	BE	D2	D4	D7	D8	HU	NL	SK
Distinct MTUs with IVA	378	48	69	13	10	52	18	11	51	160
Share	60.58%	7.69%	11.06%	2.08%	1.60%	8.33%	2.88%	1.76%	8.17%	25.64%

2. Core FB Day Ahead Capacity Calculation & Market Coupling

G.MEUTGEERT

External // run: summary of first observations

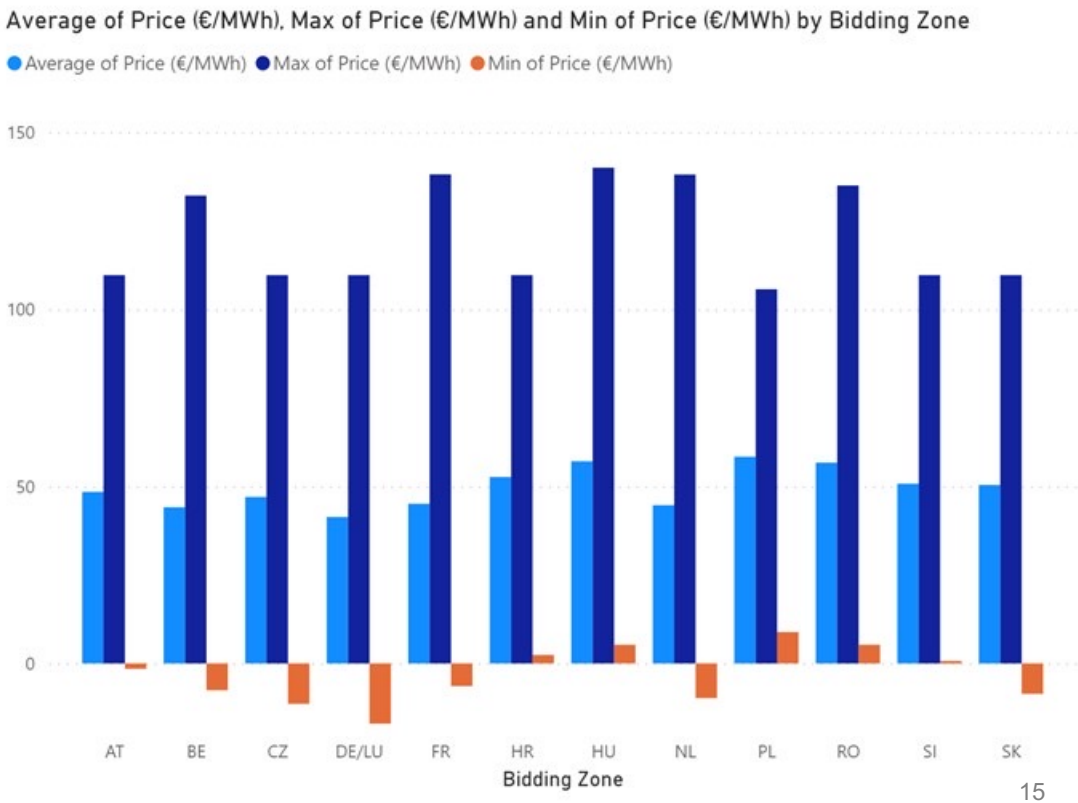
Below high-level observations can be shared based on the results of the EXT // run since November 14th (Business day 16/11/20).

- For November and December 2020 26 Business Days (624 h) with market coupling results were published on JAO, including the KPI Report.
- The outcomes of the capacity calculation and market coupling simulations are consistent, fluctuations can be generally explained, and no extreme values are appearing.
- During 77 h of the simulated 624 h (~12%) no critical network element was limiting the market outcome within the whole Core region. The following average, maximum and minimum prices were observed during these business days (based on KPI 9).*

Top 5 most often limiting CNEs**
- [PL-PL] Mikulowa AT1 [OPP] – 193 h
- [SK-SK] V.Dur - Levice 2 [DIR] – 151 h
- [D8-PL] Vierraden - Krajnik 1 [OPP] [PL] – 76 h
- [D2-NL] Diele - Meeden SCHWARZ [DIR] [D2] – 57 h
- [AT-D2] St. Peter 2 - Pleinting 258 [OPP] [AT] – 52 h

Full price convergence = share of hours without any Critical Network Element limiting the market:

12%

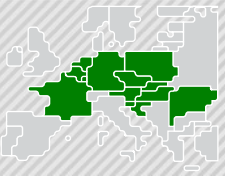


* Please consider the limitations as described in the KPI report.
** Based on KPI 10, excluding ALEGrO as it is a market optimization variable' and not a 'CNE limiting the FB domain'

2. Day Ahead Capacity Calculation & Market Coupling

Publication tool: current status & pending developments

G.MEUTGEERT



As of December 2020, the Publication tool has been in operation publishing (on a weekly basis) technically representative pre-coupling flows.

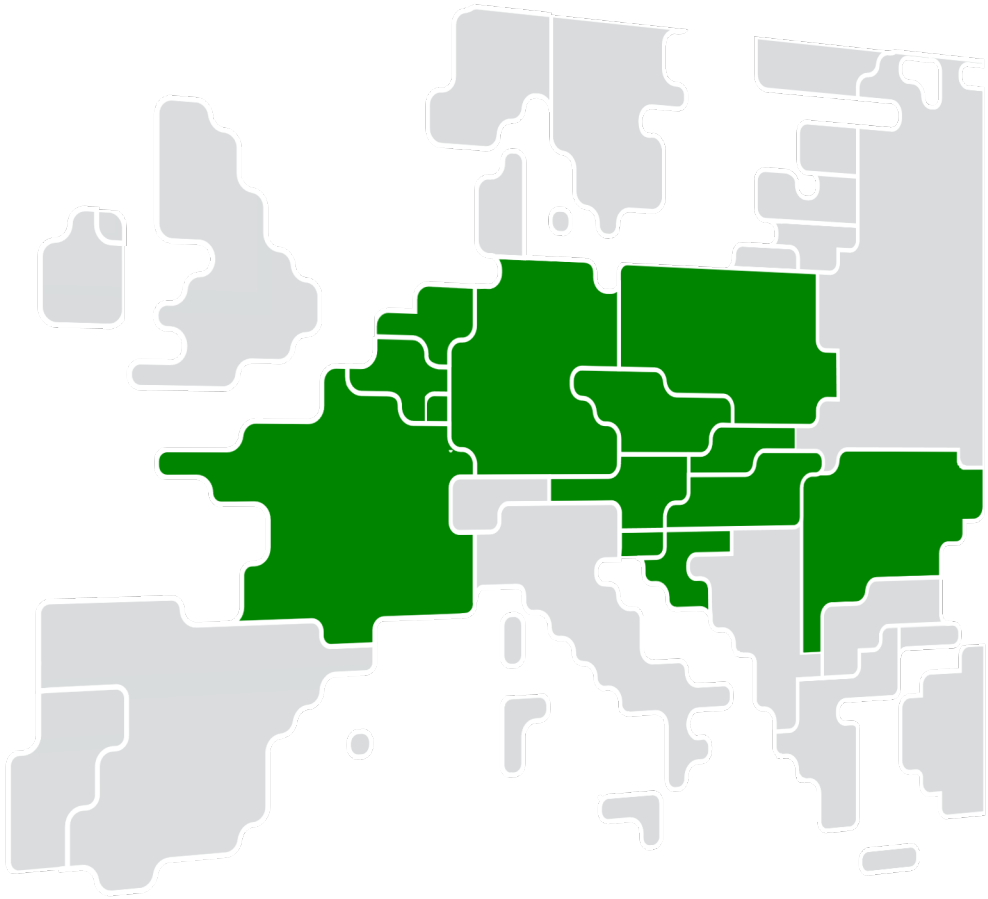
Over the course of the last few months, the tool has been constantly updated and improved to ensure quality publication.

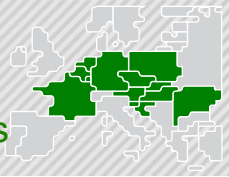
- There are some publications which are currently inactive/pending development:

Pre-coupling flows	Post-coupling flows
Allocation Constraints	Shadow Prices
Remedial Actions (Preventive/Curative)	Allocated Capacities
	Net Position
	Congestion Income
	Intraday ATC
	Price Spread

- Development of the pre-coupling flows is projected to be complete by the end of May 2021.
- Development of the post-coupling flows is planned over the summer months.

Question and Answers Session





Improving Transparency in Flow-Based Market Coupling

Results of a study commissioned by Oesterreichs Energie

Österreichische Energieagentur - Austrian Energy Agency
Angela Holzmann, Karina Knaus, Lukas Zwieb | 22nd April 2021 | Core CG

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Increasing transparency for FBMC

Overview

- **Complex algorithms**
  Market coupling (EUPHEMIA) and for capacity calculation
- **Complex processes**
  Network models, Calculation of input parameters, variety of order types, local features (PUNs)
- **Many players and stakeholders**
  TSOs, Exchanges, regulatory authorities, market participants
- **Processes developed over time**
  Variety of platforms (JAO, Nemo Committee, ACER, ENTSOE, Transparency,…) providing information and data (EU and national)

Methodology

- Outsiders‘ view
  Desk research, analysis
- Traders‘ view
  Questionnaire, interactive workshops

Processes

↓

Challenges

↓

Solutions

↓

KPIs

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Transparency is essentail for market trust, competition and efficiency

- **Informationen:**
  Documents and data are available, accessible, structured and easy to find. This includes systematic management of documents and any other content in adherence with established standards.
- **Usability:**
  Access and usability concept for all relevant target groups as-well as an easy to use access to all relevant data items (JAO Utility-Tool)
- **Knowledge transfer/interaction:**
  Feedback culture, knowledge transfer, communication channels etc.

» One-Stop-Shop and Key-Performance-Indicators (KPI)

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Recommendations
Documentation FBMC

Aim

Possibility to find documents easily, retrace seamlessly all steps of the development, determine topicality – with the lowest possible search and transaction costs

Requirement	Details	Category
Standardised document structure	Author and contact, date of preparation, date of beginning of validity, effective for which region, version number...	Quick Win
File format	Documents must be available in common file formats (HTML, PDF), including raw data in machine-readable format	Quick Win
Attachments accessible	Attachments mentioned must be findable in the document, via cross-reference or digital object identifier	Quick Win
Naming convention	File names must be consistent, intelligible, and include a preceding date format and the version number	Quick Win
Indexing in popular search engines		Quick Win
Systematic storage (one platform)	Findability of documents, traceability of changes through archiving and versioning (consolidated documents)	Large Gain

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Recommendations

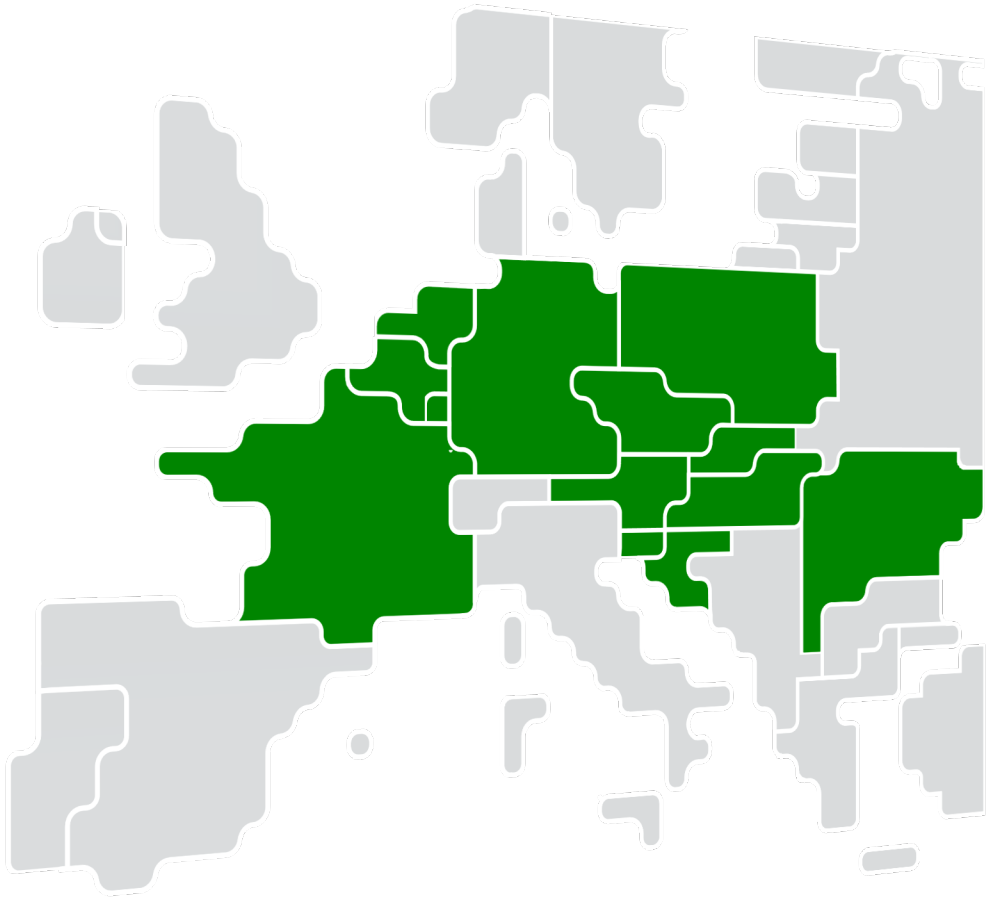
Data FBMC (JAO Utility Tool)

Aim

Low-threshold and comprehensible access to necessary data sets with minimised search and transaction costs.

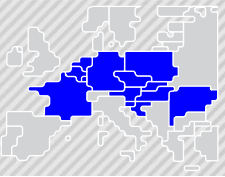
Requirement	Details	Category
Sources and contacts	Sources of individual data sets should be identifiable in the utility tool. Contacts should be available in case of problems of understanding or questions about the data.	Quick Win
Up-to-date and relevant documentation of the utility tool	Data sets must be intelligible and defined in relation to current methodology descriptions (including cross-references); updates must be communicated; versioning must be comprehensible	Quick Win
Availability, completeness, and accessibility of data	Mostly given by utility tool; further data should not be spread, for example, on the message board of the JAO website, but collected at a single access point	Large Gain
Higher performance of the utility tool	Smooth functionality and availability must be ensured; definition of performance standard and monitoring	Large Gain
Usability of web service	See examples, e.g. time stamp and documentation	Large Gain

Question and Answers Session



2. Core FB Day Ahead Capacity Calculation & Market Coupling

G. MEUTGEERT



Update of the Core Static Grid Model based on the results of the Public Survey

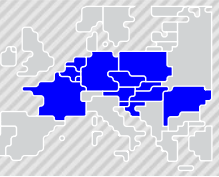
Public Survey on the Static Grid Model

- Core TSOs are obliged to publish a static grid model according to the Core CCM (article 25):
  - *The obligation every six months, the publication of an up-to-date static grid model by each Core TSO*
  - *Static grid model means a list of relevant grid elements of the transmission system, including their electrical parameters*
- Core CCM does not provide any further details about what exactly (parameters and models) is to be published.
- The intention of Core TSOs is to provide something meaningful for Market Parties in light of capacity calculation as preparation of static grid model and maintaining/updating them requires significant effort.
- A current practice in CWE FB can be used as reference.
- From 19 Feb 2021 – till 29 February 2021 – public consultation on Entso-e websites with the aim to find out what improvements beyond CWE practice would be welcomed by the Market participants (scope & format)

Results of the Survey

- Responses from 8 parties received (Market Parties, Universities, Consultancies)
- Intended use of the model and hence the requirements differed significantly --> Main usage seems to be forecasting
- 2 streams of requests identified: CWE concept evolution vs new dynamic concept
  - CWE concept evolution – extend and unify the time-proven concept; excel format
    - **Pros:** time-proven concept, ready to be extended to provide more technical details
    - **Cons:** not a standard format for LF software
  - New dynamic concept – dynamic load and generation data, substations configuration, remedial actions; CGM format
    - **Pros:** easy to use in standard LF software, more details included (depends on required simplification)
    - **Cons:** dynamic data (not owned by some TSOs; against nature of the Static Grid Model), complicated simplification of the *.uct CGM (only Core TSOs´ owned assets)

In Core TSOs' view, providing input to allow Market Parties to perform forecasting, is part of the vision behind the static grid model, but taking-over – partly – the forecasting is not seen as a responsibility of Core TSOs.



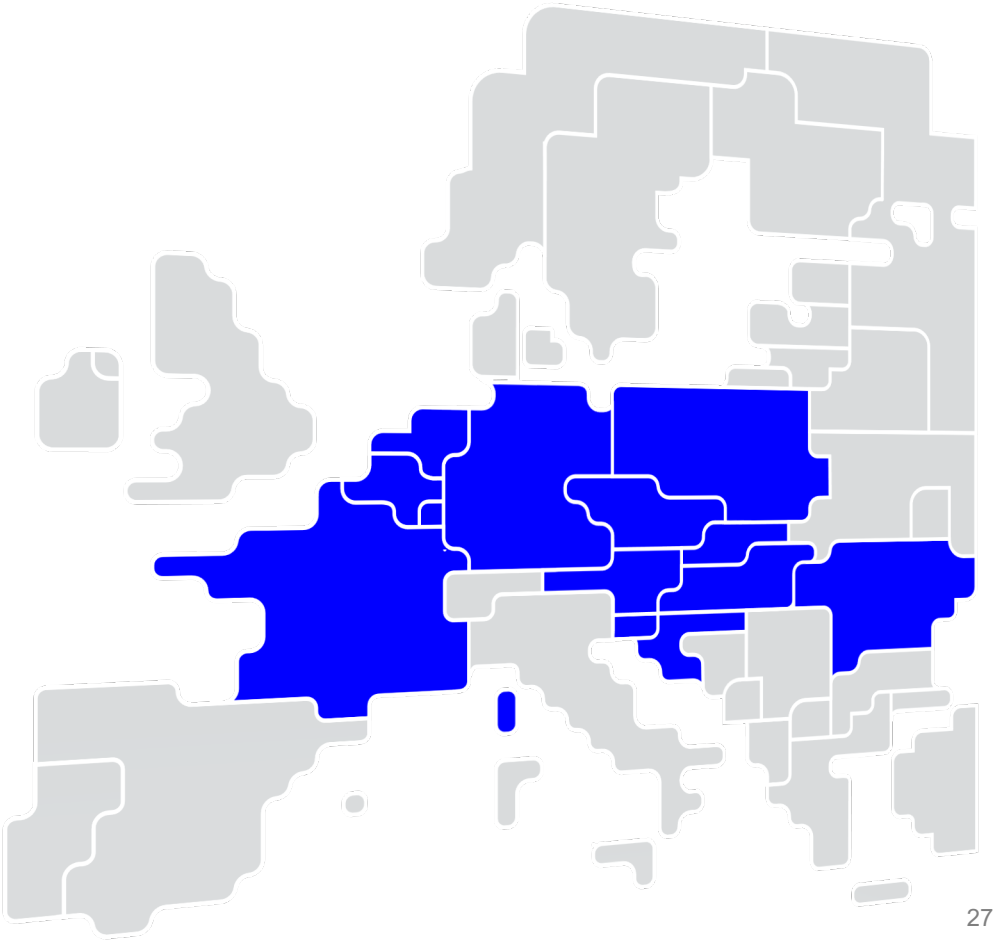
2. Core FB Day Ahead Capacity Calculation & Market Coupling

Update of the Core Static Grid Model based on the results of the Public Survey

Core TSOs proposal based on the input of the Survey

- Time-proven CWE practice will be significantly extended
- **Frequency:**
  - Every 6 months
  - First publication: 3 months before go-live
- **Scope:**
  - Grid elements: Lines, TieLines, Transformers, Remedial Actions
    - Remedial Actions: Name, TSO, Description
    - EIC Code
- **Format:**
  - Excel *.xlsx
- **Harmonization:**
  - Core Static Grid Model will be published centrally
  - Separate file for every Core TSO (to be discussed if some form of concatenation may be possible)
  - Harmonized elements description and naming convention (Publication Platform Naming Convention)
  - Easy filtering using TSO name field
- **Extra materials:**
  - Core Static Grid Model Handbook will be published
    - Detailed explanation of all the Core Static Grid Model Data Fields

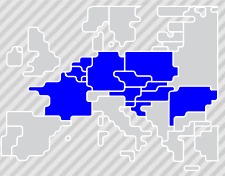
Question and Answers Session



3. Intraday Capacity Calculation and Allocation

Introduction

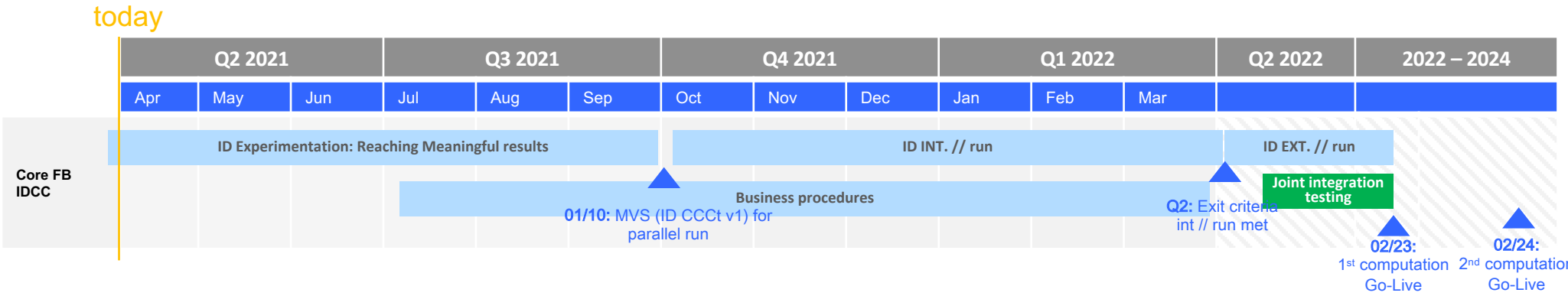
W. SNOEREN



The IDCC process has similarities to the foreseen FB DA process

- IDCC tool design is building on the fundamental components of the DA CC tool
- Use of CGMs in UCTE format foreseen at go-live, expected by 02/2023, with CGMES remaining as a target model
- Delivery in two steps: 1st computation @22PM D-1 by 02/2023, 2nd computation @10AM on BD itself by 02/2024

Roadmap, status and main milestones



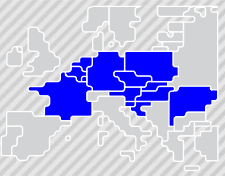
Detailed planning to be further defined

	Key project milestones	Target due date
1	Prototype IDCC tool ready for testing and experimentation	DONE
2	Offers for IT development approved	27/05/21
3	Minimum viable solution ready for Int // Run	01/10/21
4	Ext. // Run readiness	Q2 2022
5	FB IDCC Go-Live	01/02/23

Note: formally, the planning is dependent on the expected approval of the amended DA CCM, since implementation deadline for ID CCM is related to the deadline in DA CCM

3. Intraday Capacity Calculation and Allocation

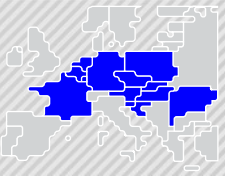
W. SNOEREN



Risks & Dependencies

The following relevant risks and dependencies were identified

Type	Description	Impact	Action plan
Risks	• Tight timeline for IT implementation • Tight window for executing IDCC process, hard to reach needed performance. • Reaching sufficient input quality for all parties • Possibly lower capacities available in ID compared to DA due to exclusion of minRAM & LTA	High	• Maximize synergy advantages by re-using parts of DA Ccct & NRAO • Implement input/process improvements to increase performance • Focus on getting towards first computation results with industrialized tools as soon as possible, allowing time to evaluate the process. • Early start with experimentation phase based on prototype to gain experience, manage expectations with project stakeholders
Dependencies	• Readiness NEMOs & allocation platform for IDCC • CGMES implementation • Alignment with future CSA/ROSC process • Third country integration	High	• Alignment with Core Joint WG & IDA SG • Avoid direct dependency on ENTSO-e CGM Program • Manage expectations on required input from CSA/ROSC and process timings by having regular alignment meetings between ROSC PT and IDCC PT • Monitor discussions closely to ensure timely involvement



3. Intraday Capacity Calculation and Allocation

Conclusion

IDCC implementation on schedule, with delivery in two steps:

- 1st computation @22PM D-1 by 02/2023
- 2nd (re-)computation @10AM on BD itself by 02/2024

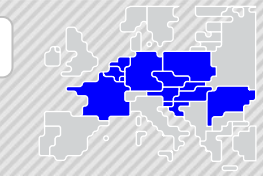
IDCC tool design is building on the fundamental components of the DA CC tool, to ease implementation

Aiming for an early start of the external parallel run during Q2 2022

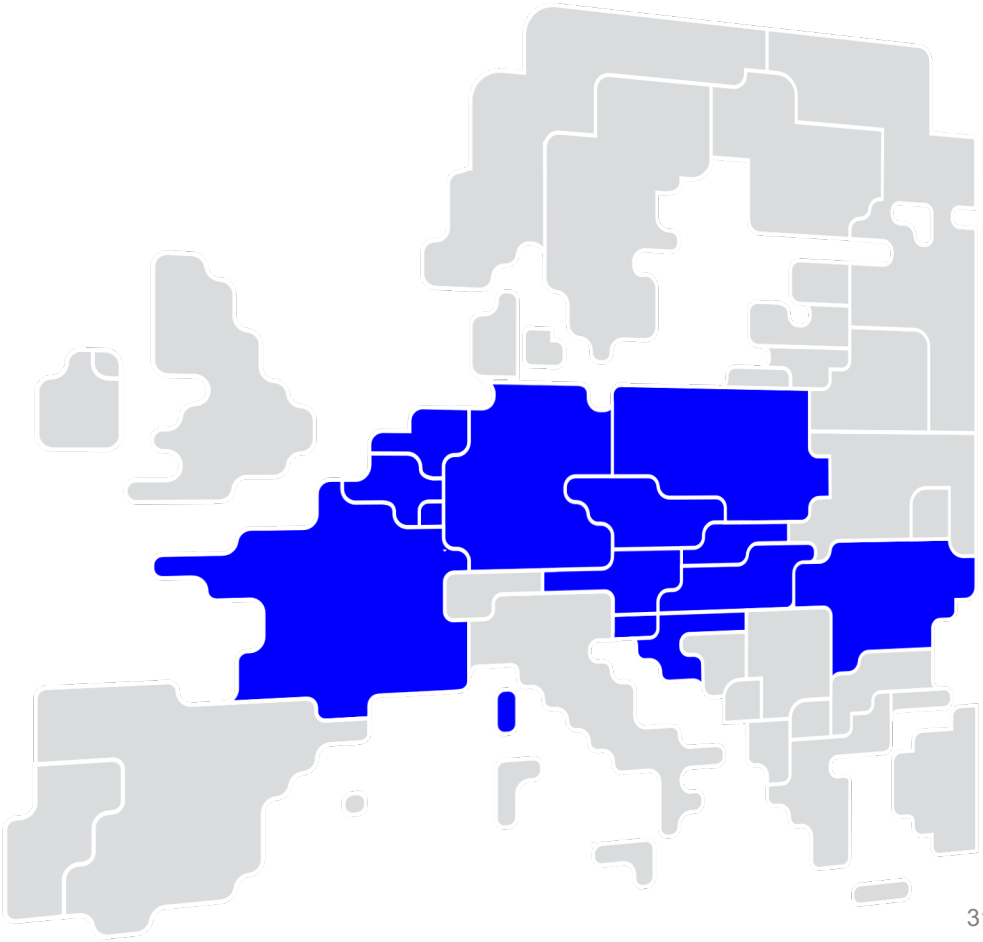
High impacting main dependencies:

- Readiness allocation platform to support both intraday auctions & continuous trade using intraday capacity domains
- Alignment with future ROSC process to ensure coordinated RAs during ROSC remain effective after making available cross-zonal capacity provided by IDCC.

ALL



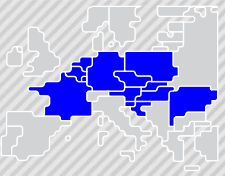
Question and Answers Session



3. Intraday Capacity Calculation and Allocation

Core ID Allocation improvements

H.ROBAYE/
J.LE PAGE



CORE CG, 22 April 2021

EFET slides on recent intraday developments

EFET Electricity Committee

EFET

European Federation of Energy Traders

SO YOU CAN RELY ON THE MARKET

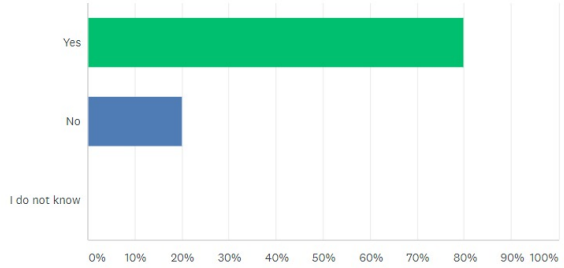
Disclaimer

The following slides present the result of a questionnaire submitted to EFET members. They show the view of individual market participants.

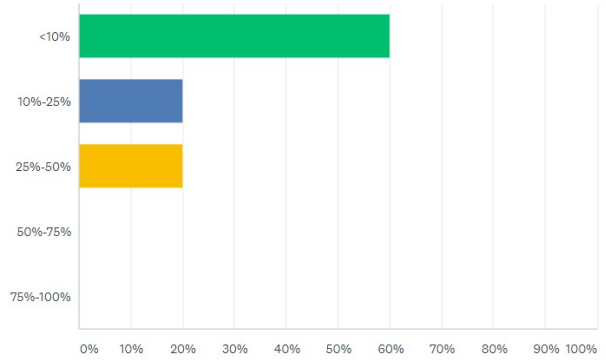
They are not constitutive of EFET positions unless mentioned otherwise.

EFET questionnaire results

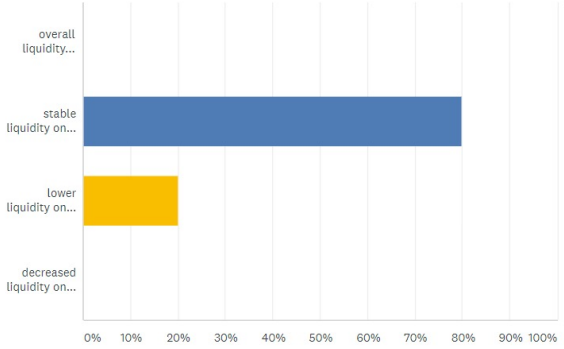
1) Do you find cross-border intraday products with a higher granularity at CWE borders useful?



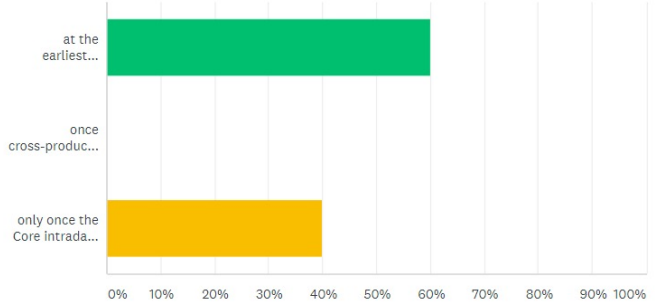
2) What is approximately the proportion of trades (in MWh volume) you make with 15- or 30-minute cross-border products vs. hourly cross-border products?



3) What effects have you observed on the market following the introduction of high granularity cross-border products?



4) Would you recommend the introduction of cross-border intraday products with a higher granularity at Core borders?



EFET

EFET questionnaire results

5) What, in your view, would be the most important development to increase liquidity and competition in intraday markets in the coming 5 years?

- the main developments would be the cross-product matching (to increase liquidity) and the sharing of order books between NEMOs after SIDC gate closure (to increase the competition).
- Cross-product matching seems to be essential to keep liquidity.
- Being able to stay imbalanced after delivery in all European countries: business model already implemented in the UK.
- Shifting idczgct closer to real time. Securing an SOB between NEMOs at all times up to delivery.

Feedback on SIDC

SIDC advantages

An integrated intraday market makes intraday trading more efficient across Europe because it results in

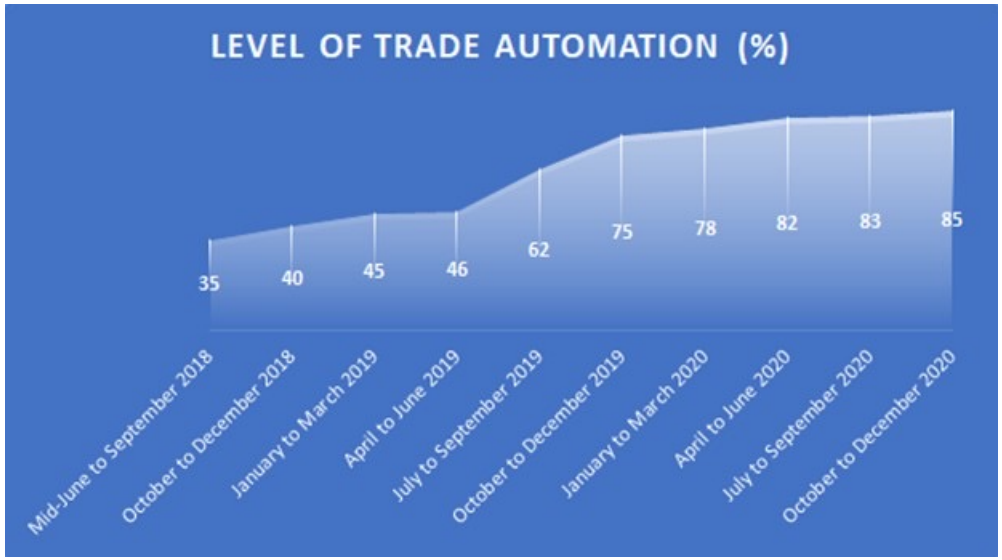
- **an increased liquidity on all products (H & QH)**
- **an improved allocation of the available XB capacity**
- **better price signals on the more illiquid countries**
- **Intraday indexes on illiquid countries (like BE/NL)**
- **Better pricing of customer contracts and offering of new products**

This allows us to

- **have a better valuation of our power portfolio**
- **Continuously offer our flexibility**
- **better cope with unplanned outages close to delivery**
- **Improve our balancing activity on renewables**
- **Automate part of our trading activity**

SIDC experienced @ the Trading Desk

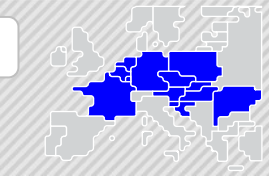
"The development on the XBID countries has resulted in an exponential growth of the liquidity in the formerly illiquid countries like Belgium and Netherlands. Also the coupling on the lowest granularity (i.e. QH), has given the market participants the opportunity to balance their portfolio. And finally it enables the offering of new products/contracts thanks to the creation of new indexes. Thanks to the increase in liquidity we were able to implement a decent level of automation, which allows us to focus more on market analysis"



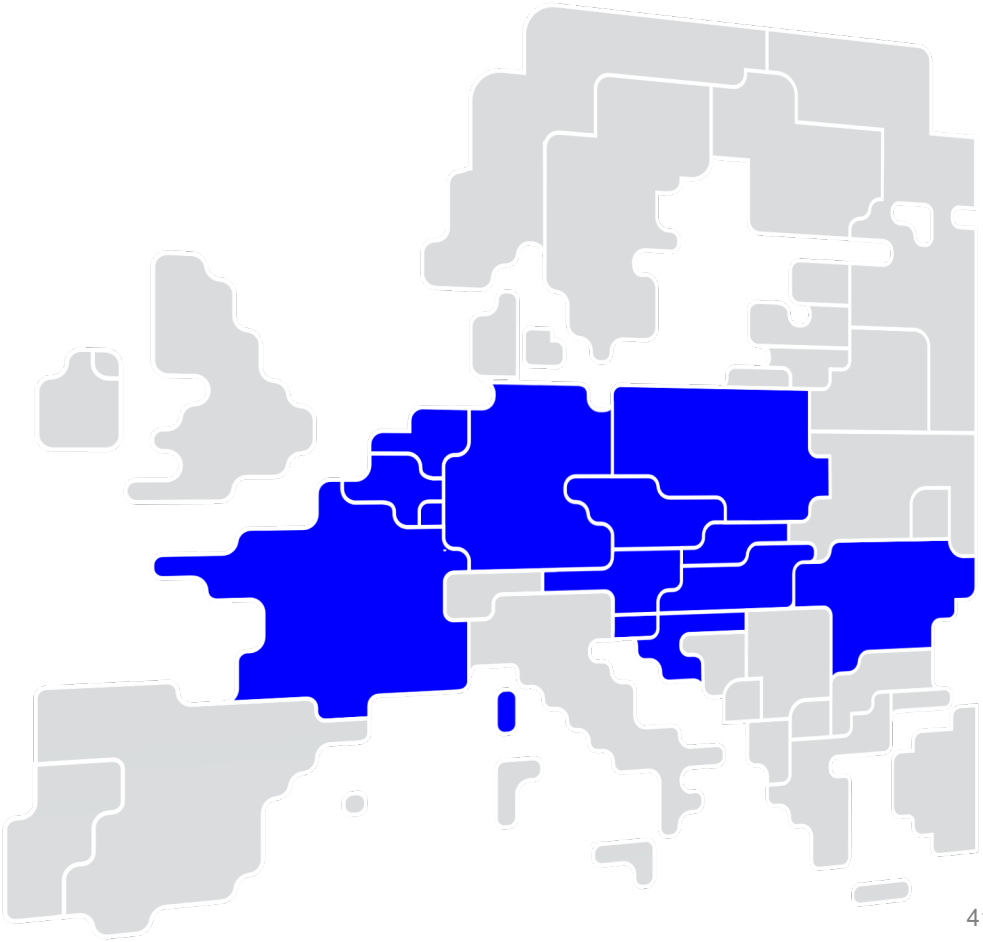
SIDC improvements

What we see as further improvements of the SIDC mechanism

- **X-product matching (H vs. QH vs. HH)**
- **Inclusion of other European borders**
- **Alignment on market mechanism throughout the SIDC zone (Continuous vs Auction). Continuous would be preferred.**
- **Sharing of NEMO order books outside the SIDC timeframe**
- **Extend the SIDC closer to delivery**



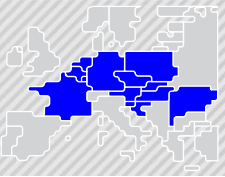
Question and Answers Session



4. Regional Operational Security Coordination and Cost Sharing

Goal of the ROSC+RAO and main challenges

P.SCHÄFER



A key element of the Regional Operational Security Analysis (ROSC) is the Remedial Action Optimization (RAO)

Goal of RAO: Core-wide identification of the most effective and economically efficient Remedial Action

Respecting following principles among others:

- The RAO shall aim at ensuring economic efficiency by minimizing the incurred costs of Remedial Actions as well as the effectiveness of the XRAs to address operational security violations
- The remedial RAO shall be performed with consideration of all available Remedial Actions in Core
- Identification of Remedial actions in a coordinated way wherever possible
- The RAO shall ensure energy balance of Remedial Actions

→ With this goal and principles, a fair solution on a level playing field for all parties can be achieved

→ No national Remedial Actions which possibly discriminating foreign actions

Challenges regarding costly Remedial Actions (RD&CT)

- A key element of the process is the firm provision of the RA potential as input of the RAO
- Otherwise, risk of additional Fast Activation processes increases which cannot be coordinated under all conditions

Further main challenges

- Integration of none-superposable RAs (topological measures) in global optimization
- Configuration of the inter-CCR coordination phase with other CCRs

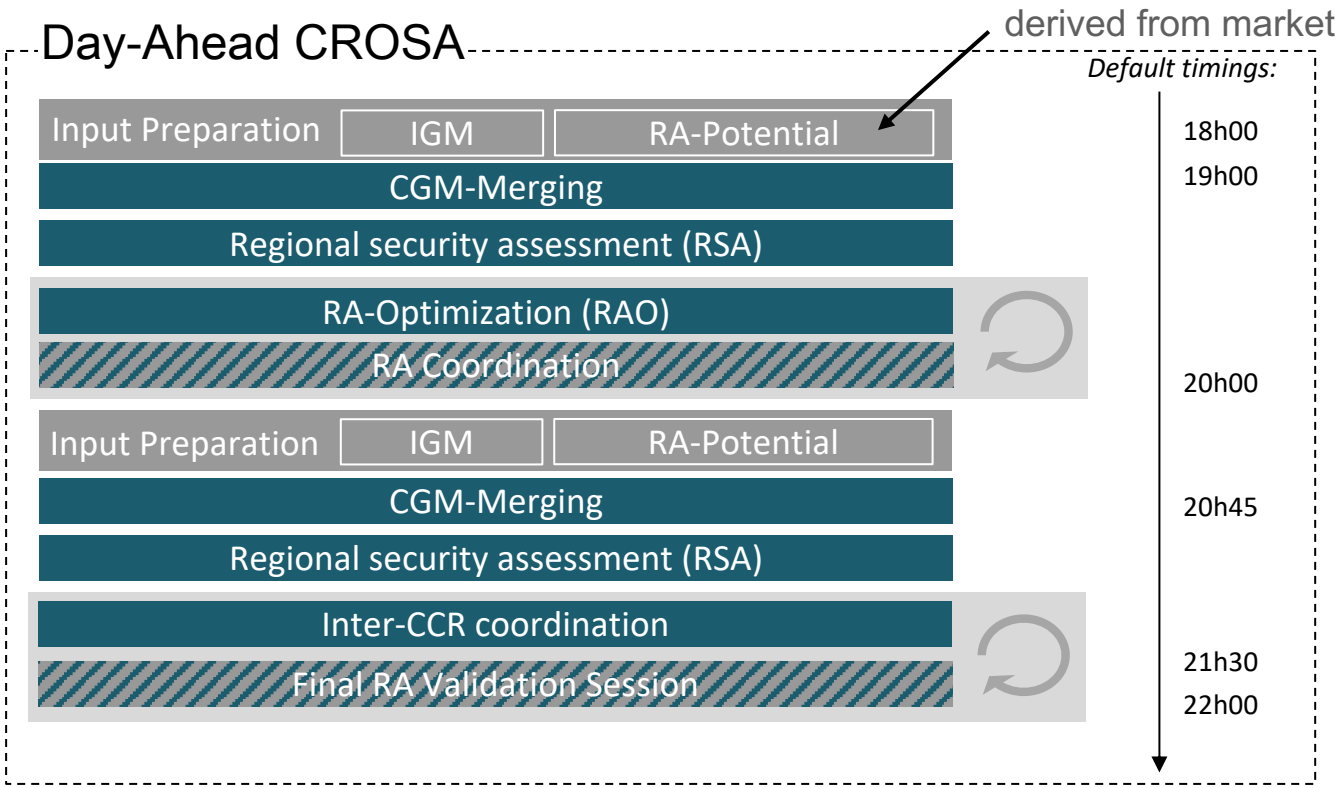
4. Regional Operational Security Coordination and Cost Sharing

P.SCHÄFER

Overview of the ROSC process to be implemented

Application of the Core ROSC 2nd version (2025) in several Coordinated Regional Operational Security Assessments (CROSA)

- 1 CROSA in DA (starting at 18:00)
- 3 CROSA in ID (00:00, 08:00 and 16:00)
- Fast activation process where it is not possible to wait for next CROSA



- Intraday CROSAs only contains one run per CROSA

Ordered Remedial Action:

- Agreed Remedial Actions for which TSOs and RSC(s) agree that their activation cannot be postponed until the next CROSA due to specific activation constraints (e.g. required activation time)
- Will be bindingly ordered after the end of CROSA

Activation of Remedial Actions:

- Ordered RA that has been implemented by the connecting TSO(s), or the request for their activation has been sent to the third-party RA provider
- At the latest time compatible with technical, operational and procedural constraints of the resources in accordance with CSAM

4. Regional Operational Security Coordination and Cost Sharing

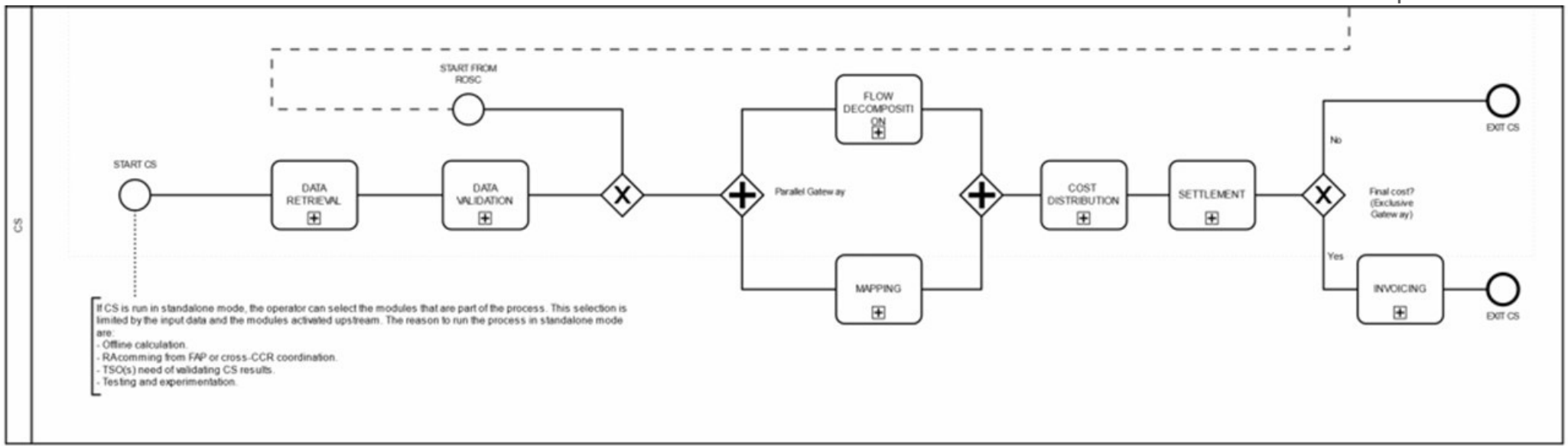
P.SCHÄFER

Overview of the Cost-Sharing process to be implemented

Application of the Core Cost Sharing methodology (CS)

- Ex-post offline process which only considers ordered RAs as output of each CROSA or Fast Activation process due to short-term unavailability of ordered RAs

ROSC output

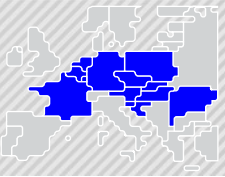


Cost deviation

- Costs and/or revenues of ordered XRAs shall be determined based on the prices and costs provided by TSOs and used in RAO
  - Deviations in costs and/or revenues resulting between costs provided for RAO and final incurred costs shall also be subject to cost sharing
  - All Core TSOs and RSC(s) shall monitor the deviations in costs and/or revenues of ordered Remedial Actions and identify systematic deviations or other potential abuse resulting from these deviations
  - In case of identified abuse, Core TSOs shall have the right to reject a specific deviation to be included in cost sharing

4. Regional Operational Security Coordination and Cost Sharing

P.SCHÄFER



Regulatory context

Coordinated Security Analysis (CSA) and Fast Activation Process (FAP) operational processes are covered by the Core ROSC (SOGL 76) and RD&CT (CACM 35) methodologies.

Cost Sharing ex-post process is governed by the Cost-Sharing methodology (CACM 74)

Core CCR started to develop the three aforementioned methodologies in 2017, for submission to NRA approval in 2019.

NC / GL	Public Consultation	NRA submission	NRA conclusion
CACM 74 (RD&CT CS)	N/A	28/02/2019	Referred to ACER
CACM 35 (RD&CT)	05/09/2018 – 05/10/2018 [PC report]	28/02/2019	
SOGL 76 (ROSC)	23/09/2019 – 23/10/2019 [PC report]	19/12/2019	

ACER approved methodologies on ROSC, RD&CT and CS:

- CACM 74 (RD&CT CS) methodology [LINK] – approved on 30/11/2020
- CACM 35 (RD&CT) methodology [LINK] – approved on 04/12/2020
- SOGL 76 (ROSC) methodology [LINK] – approved on 04/12/2020

4. Regional Operational Security Coordination and Cost Sharing

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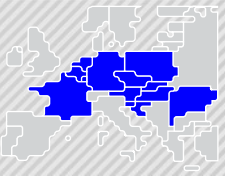


Key milestones given by ACER

Key milestones given by ACER are:

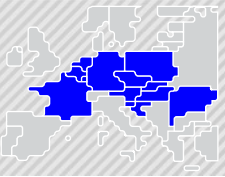
	Date	Milestone
1	DONE on 06/04/2021	Submit detailed implementation plan including milestones. Regular updates foreseen by Art.37(8)
2	June 2021	Each Core TSO shall develop a description of national rules and procedures for activation of remedial actions, with specific focus on redispatching actions
3	June-July 2022	Determine the list of XNEs and the list of scanned elements. Agree on a process for amendments and regular review of the lists.
4	**04-06-2023**	**Implementation of ROSC first version (with cost sharing and RAO)**
5	**04-06-2023**	**Implementation of RD&CT CS solution**
6	**04-06-2025**	**Implementation of ROSC second version**

During the ACER referral, Core TSOs have underlined to ACER that the implementation timeline decided is very challenging, if not impossible.

TSOs have assessed the implementation steps, a realistic planning: see next slides.

4. Regional Operational Security Coordination and Cost Sharing

P.SCHÄFER



Core CCR implementation timeline and scope

Core TSOs have defined a realistic planning that foresees a Go-live of ROSC V1 + CS in April 2024 and a ROSC V2 in 2025, with all ACER requirements.

The objectives respected by the realistic roadmap are:

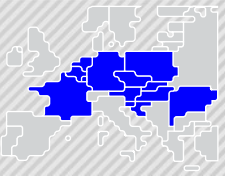
- Implement into operational tooling and process the ROSC and CS methodologies as defined by ACER decisions.
  - **Gain:** Compliancy with rules set in ACER methodology
- Implement robust and reliable solutions in operations in the shortest possible timeframe
  - **Gains:** Confidence in operational processes, limit the risk of operational issues which can severely affect grid security; Still implement the ROSC process as fast as possible to get more flexibility for TSOs in guaranteeing the grid security
- Develop a ROSC V1 which is the minimum viable product of ROSC V2
  - **Gains:** Modules from ROSC V1 are re-usable and improved in the ROSC V2, cost-sharing developed for ROSC V1 is then compatible with V2, limit the total duration for testing and limit the total implementation time (no double development)

The roadmap is concluded, by TSOs and RSCs, to be feasible, realistic and still challenging.

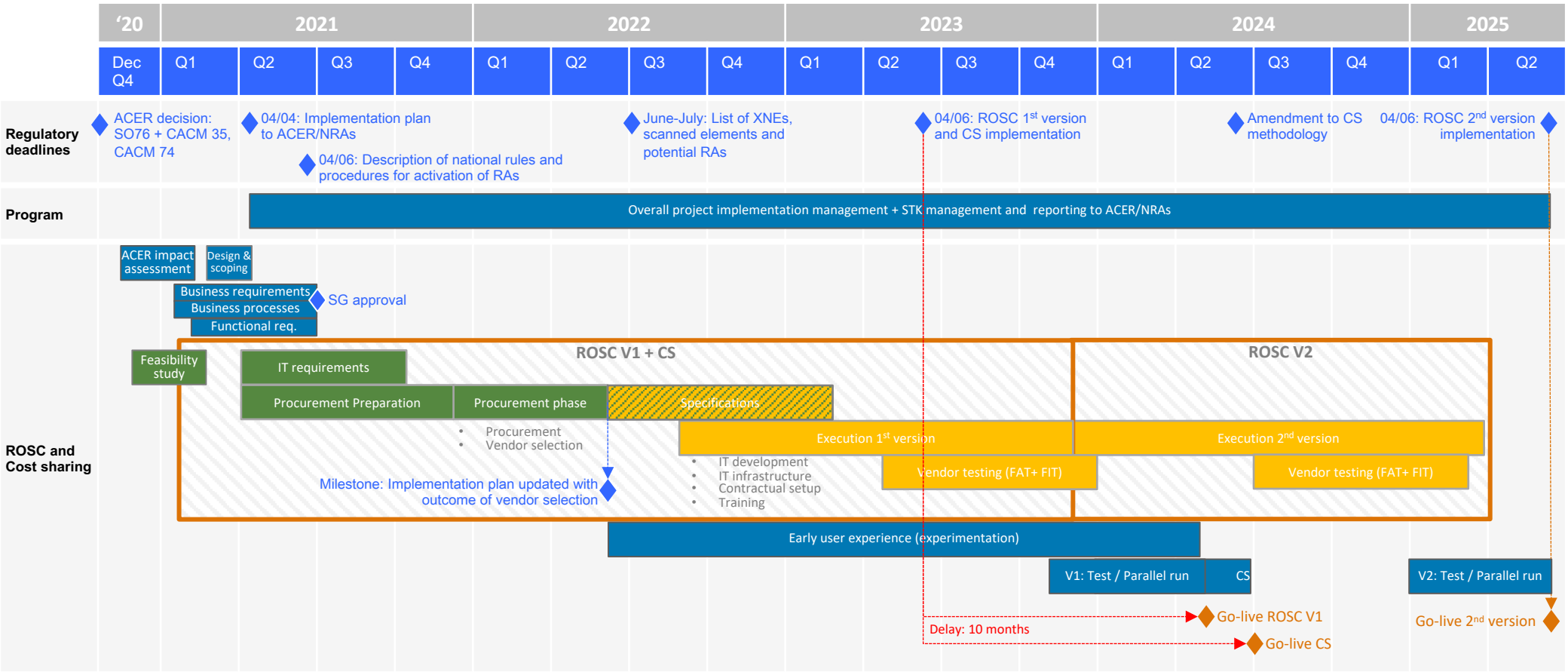
- *→ See the visualized roadmap in next slide*

4. Regional Operational Security Coordination and Cost Sharing

P.SCHÄFER



Core CCR implementation timeline and scope

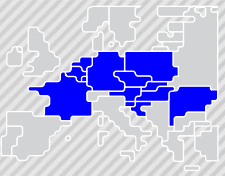


Scope and assumptions:

- IT developments for ROSC and CS are done by Core RSCs (Coreso and TSCNET)
- ROSC V1 includes DA CROSA but not ID CROSA and does not include integrated optimization of topological RAs → in line with ACER requirements
- Cost-Sharing (CS) is implemented together with the ROSC V1: decoupled Go-lives because CS is an ex-post process

4. Regional Operational Security Coordination and Cost Sharing

P.SCHÄFER



Conclusions

The ROSC, RD&CT and RD&CT CS methodologies have been defined, by ACER decisions.

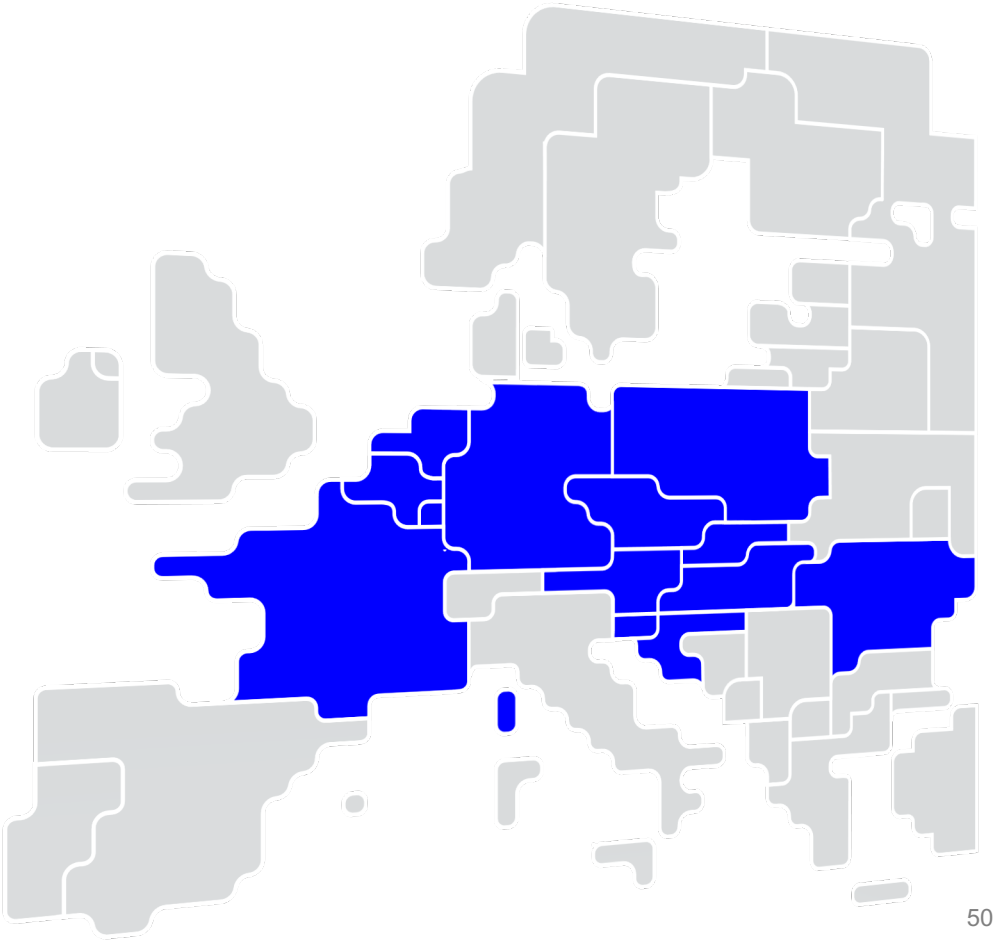
The goal is to provide a level playing field for Remedial Actions through a coordinated approach in Core CCR.

The realistic implementation plan cannot meet both deadlines and scope as defined by ACER:

- 2024: ROSC V1 + CS
- 2025: ROSC V2

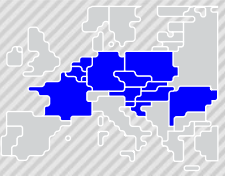
Core TSOs are investigating solutions to deal with this delta between methodology obligations and implementation constraints for ROSC V1.

Question and Answers Session



5. AOB & closure

R.OTTER/
H.ROBAYE



Existing Core communication channels

- **Core Consultative Group mailing list**
  - Register by sending an email to CoreCG@magnus.nl

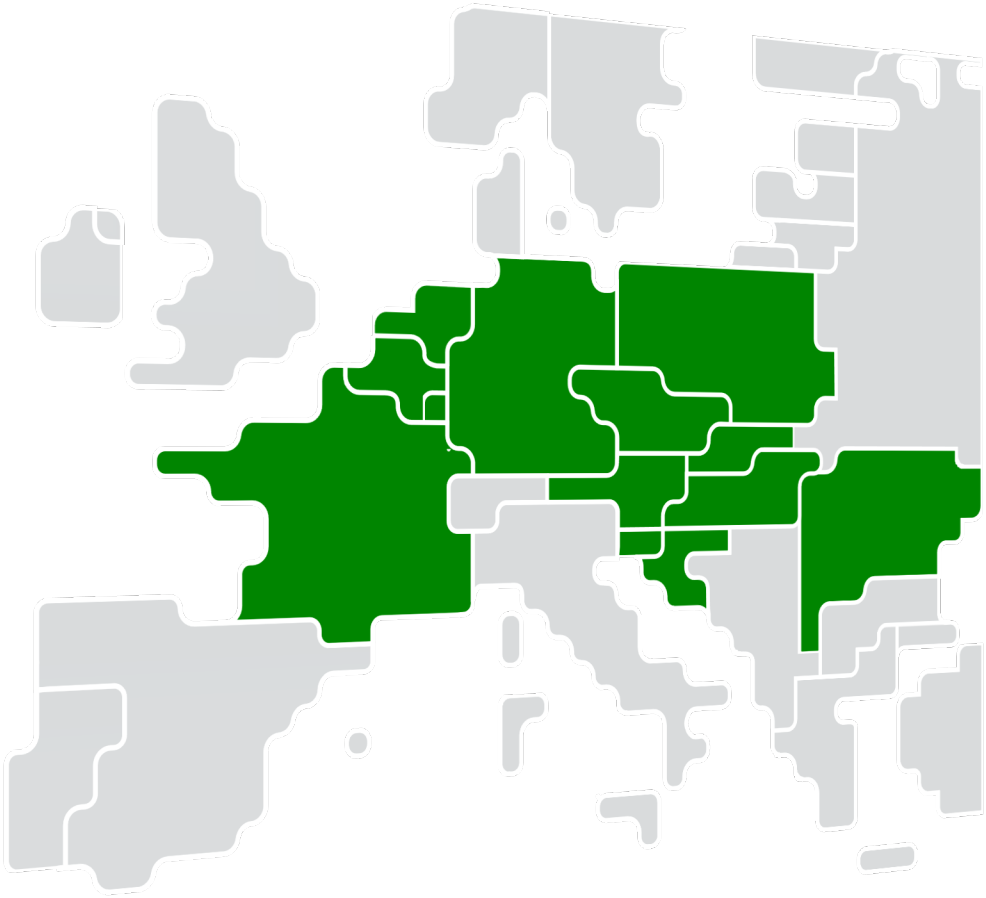
- **Core section on ENTSO-E website** (e.g. upload of methodologies and reports on public consultations, current status of the Core CCR program, CG minutes, …):
  - Link: https://www.entsoe.eu/network_codes/ccr-regions/#core

- **ENTSO-E newsletter** informs regularly about updates in the different CCRs (e.g. submitted methodologies, launch of public consultations, …)
  - Subscription via https://www.entsoe.eu/contact/

Q&A forum on JAO website

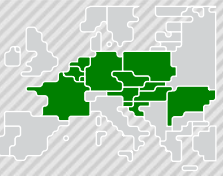
- **Q&A forum on the JAO website** which gives space to Market Participants to ask questions about the External Parallel Run and other relevant topics:
  - Link: http://coreforum.my-ems.net/

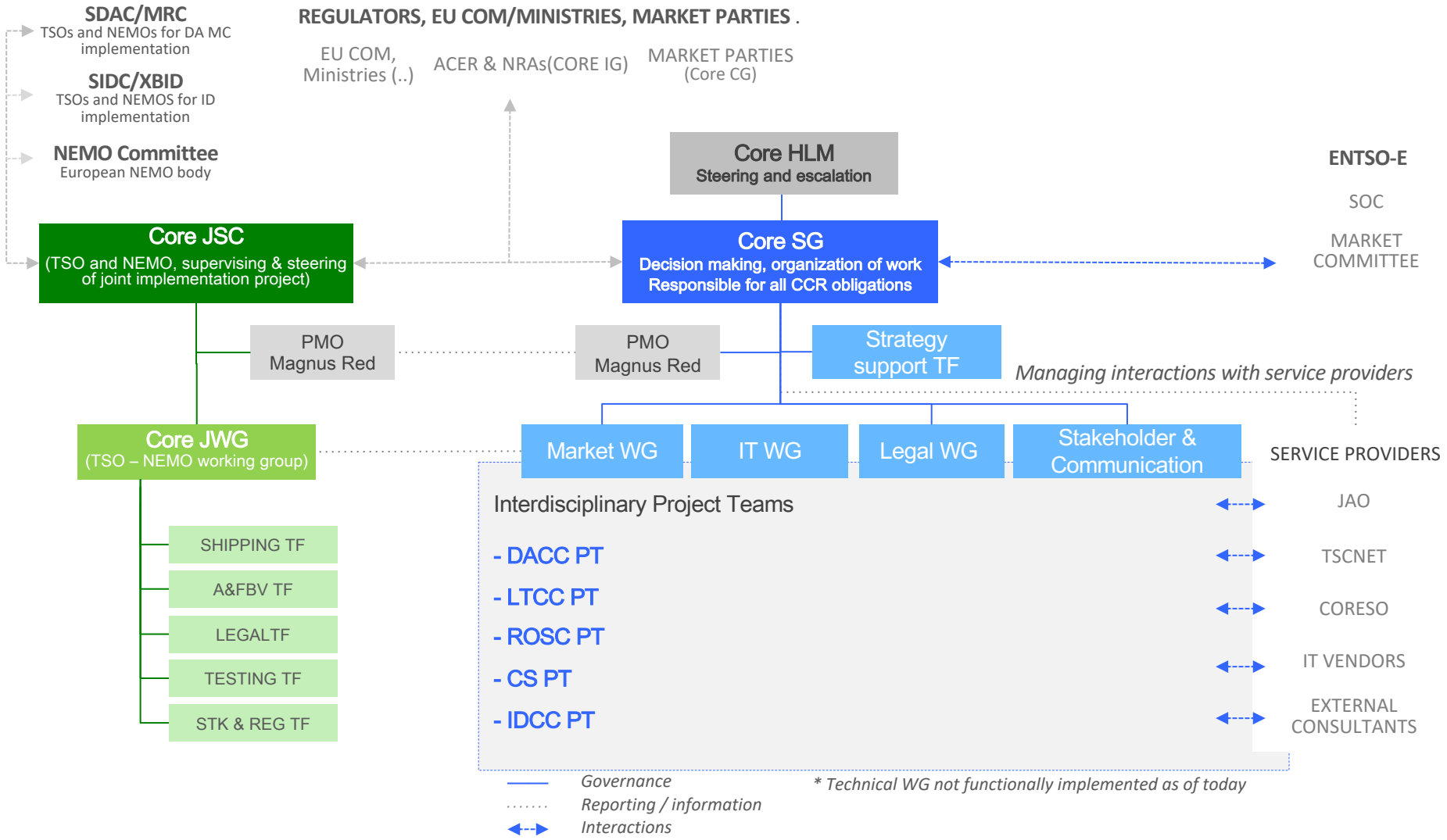
Appendix



Appendix

Core CCR and Core FB DA MC Governance structure



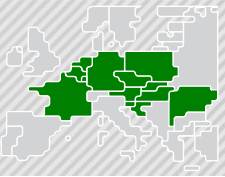


Market Coupling (TSOs and NEMOs)

Capacity Calculation (TSOs only)

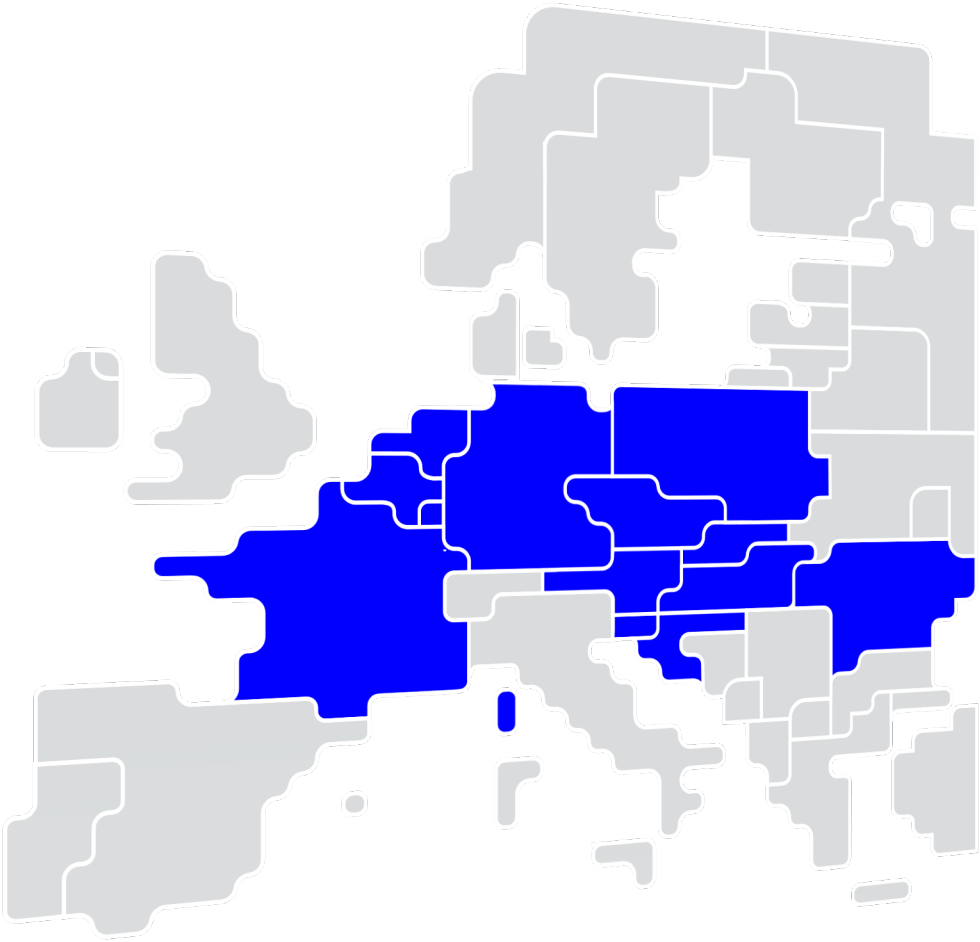
Appendix

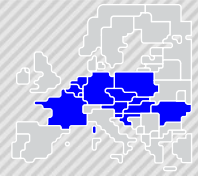
Glossary for Core Flow based day ahead



Core FB DA MC	Core Flow based Day ahead Market Coupling
CCC set-up	Coordinated Calculation Calculator
DA CCM	Day ahead Capacity calculation Methodology
EXT//Run	External parallel run
PCR	Price Coupling of Regions
MTP	Master Test plan
PL MNA	Polish Multi Nemo Arrangement
ICP	Interim Coupling Project
SDAC	Single Day ahead AlloCation
NEMO	Nominated Electricity Market Operator
CCG	Core Consultative Group
AMR	Adjustment for minimum RAM
Ramr	minRAM percentages (Ramr factors)
IVA	Individual Validation Adjustment
BD	Business Day

Appendix





Appendix

Glossary for ROSC and CS

ACER	Agency for the Cooperation of Energy Regulators
CACM	Capacity Allocation and Congestion Management
CC	Capacity Calculation
CCR	Capacity Calculation Region
CGM	Common Grid Model
CGMES	Common Grid Model Exchange Standard
CNEC	Critical Network Element with a Contingency
CS	Cost Sharing
CSA	Coordinated Security Analysis
CSAM	Coordinated Security Analysis Methodology
CROSA	Coordinated Regional Operational Security Assessment
DA	Day-Ahead
ENTSO-E	European Network of Transmission System Operators for Electricity
EU	European Union
FB	Flow Based
GSK	Generation Shift Key
GLSK	Generation Load Shift Key
IDCC	Intraday Capacity Calculation
IGM	Individual Grid Model
FAT	Final Acceptance Test
FIT	Functional Integration Test
KPI	Key Performance Indicator
LF-SA	Load Flow Security Analysis
NRA	National Regulatory Authority
RA	Remedial Action
RAO	Remedial Action Optimizer
RFI	Request for Information
RFP	Request for Proposal
ROSC	Regional Operational Security Coordination
RD&CT	Redispatching and Countertrading
RSC	Regional System Operator
TSO	Transmission System Operator
SO GL	System Operation Guideline
SAT	Site Acceptance Testing
SIT	System Integration Testing
V1/V2	Version 1/ Version 2
XNE	Cross-border element

Appendix

Overview of the ROSC process to be implemented