ACER Decision on Algorithm methodology: Annex Ia

(for information only)

Methodology for the price coupling algorithm and the continuous trading matching algorithm

also incorporating a common set of requirements in accordance with Article 37(5) of the Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management

26 July 2018

Deleted: ¶
¶
¶
¶
All NEMOs' proposal

Deleted: for

Deleted: ,

Deleted: TSO and NEMO proposals for

Deleted: ,

Deleted:

Deleted:

Deleted: 13 November 2017¶
¶
¶
Page Break
¶
All NEMOs, taking into account

Table of Contents

Whereas 1
TITLE 1 4
General provisions 4
Article 1 4
Subject matter and scope 4
Article 2 5
Definitions and interpretation 5
Algorithms 7
Article 3 7
Algorithm requirements 7
Article 4 8
Price coupling algorithm 8
Article 5 11
Continuous trading matching algorithm 11
TITLE 3 13
Algorithm performance management 13
Article 6 13
Monitoring algorithm performance 13
Article 7 15
Scalability management 15
Article 8 16
Corrective measures 16
TITLE 4 17
Algorithm change management 17
Article 9 17
Change control methodology 17
Article 10 18
Submission of requests for change 18
Article 11 18
Evaluation and treatment of requests for change 18
Article 12 19
Decision-making and implementation of requests for change 19
TITLE 5 20
Transparency and monitoring 20
Article 13 20
Publications 20
Article 14 21
Monitoring 21

Deleted: 11
Deleted: 44
Deleted: 44
Deleted: 44
Deleted: 44
Deleted: 55
Deleted: 55
Deleted: ` 666¶
Deleted: 77
Deleted: 77
Deleted: 77
Deleted: 88
Deleted: 88
Deleted: 1111
Deleted: 1111
Deleted: 1313
Deleted: 1313
Deleted: 1313
Deleted: 1313
Deleted: 1515
Deleted: 1515
Deleted: 1616
Deleted: 1616
Deleted: 1717
Deleted: 1717
Deleted: 1717
Deleted: 1717
Deleted: 1818
Deleted: 1818
Deleted: 1818
Deleted: 1818
Deleted: 1919
Deleted: 1919
Deleted: 2020
Deleted: 2020
Deleted: 2020
Deleted: 2020
Deleted: 2121
Deleted: 2121

TITLE 6 21
Final provisions 21
Article 15 21
Language 21

Annex 1 to the Algorithm methodology: Common set of requirements for the price coupling algorithm

Annex 2 to the Algorithm methodology: Common set of requirements for the continuous trading matching algorithm

Deleted: 2121

Deleted: 2121

Deleted: 2121

Deleted: 2121

Deleted: Whereas . ¶
TITLE 1 . 4¶
General provisions . 4¶
Article 1 . 4¶
Subject matter and scope . 4¶
Article 2 . 5¶
Definitions and interpretation . 5¶
TITLE 2 . 7¶
Algorithms . 7¶
Article 3 . 7¶
Algorithm requirements . 7¶
Article 4 . 8¶
Price coupling algorithm . 8¶
Article 5 . 11¶
Continuous trading matching algorithm . 11¶
TITLE 3 . 13¶
Algorithm performance management . 13¶
Article 6 . 13¶
Monitoring algorithm performance . 13¶
Article 7 . 15¶
Scalability management . 15¶
Article 8 . 16¶
Corrective measures . 16¶
TITLE 4 . 17¶
Algorithm change management . 17¶
Article 9 . 17¶
Change control methodology . 17¶
Article 10 . 18¶
Submission of requests for change . 18¶
Article 11 . 18¶
Evaluation and treatment of requests for change . 18¶
Article 12 . 19¶
Decision-making and implementation of requests for change . 19¶
TITLE 5 . 20¶
Transparency and monitoring . 20¶
Article 13 . 20¶
Publications . 20¶
Article 14 . 21¶
Monitoring . 21¶
TITLE 6 . 21¶
Final provisions . 21¶
Article 15 . 21¶
Language . 21¶

Deleted: following:¶
Whereas¶
¶
Background¶
This document is a common proposal developed by all Nominated Electricity Market Operators (hereafter referred to as "NEMOs")

Deleted: and

Whereas

(1) This document establishes the methodology for the price coupling algorithm and for the continuous trading matching algorithm ('algorithm methodology') in accordance with Article 37(5) of Commission Regulation (EU) 2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management ('CACM Regulation'). It incorporates, as an annex, a common set of requirements for the price coupling algorithm ('DA algorithm requirements') and for the continuous trading matching algorithm ('ID algorithm requirements') in accordance with Article 37 of the CACM Regulation.

(2) This Algorithm methodology takes into account the general objectives of capacity allocation and congestion management described in Article 3 of the CACM Regulation as set out below in paragraphs (3) to (12).

(3) The Algorithm methodology promotes effective competition in the generation, trading and supply of electricity (Article 3(a) of the CACM Regulation) as it establishes a level playing field for competition among all market participants through an objective function which maximises the economic surplus and transparent conditions to participate in the price coupling and continuous trading matching.

(4) The Algorithm methodology ensures that the cross-zonal capacity is allocated in a way that maximises economic surplus and thus contributes to ensuring optimal use of the transmission infrastructure (Article 3(b) of the CACM Regulation).

(5) The Algorithm methodology ensures that cross zonal trading within the single day-ahead coupling ('SDAC') and single intraday coupling ('SIDC') respects the cross-zonal capacities and allocation constraints provided by coordinated capacity calculators and thereby ensures that operational security is not endangered by the operation of SDAC and SIDC (Article 3(c) of the CACM Regulation).

(6) The Algorithm methodology facilitates both the coordinated net transmission capacity approach as well as flow-based approach and thereby supports the optimisation of the calculation of cross-zonal capacity (Article 3(d) of the CACM Regulation). As regards the allocation of cross-zonal capacity, the Algorithm methodology promotes implicit allocation of cross-zonal capacity, which is considered as more efficient than explicit allocation of cross-zonal capacity and allows for the usage of explicit cross-zonal capacity allocation.

(7) The Algorithm methodology ensures fair and non-discriminatory treatment of TSOs, NEMOs, and market participants (Article 3(e) of the CACM Regulation). The non-discriminatory treatment of TSOs and NEMOs is achieved by allowing an open access to participation in SDAC and SIDC to all NEMOs and TSOs and by allowing both to define their requirements in relation to the development and operation of SDAC and SIDC. Non-discriminatory treatment of market participants is achieved through the support of different products that meet the market participants' needs. Moreover, the matching of their orders is based on an objective function, which maximises the economic surplus. The Algorithm methodology has no impact on the non-discriminatory treatment of the Agency and regulatory authorities.

(8) The Algorithm methodology ensures and enhances transparency and reliability of information (Article 3(f) of the CACM Regulation) through transparent management of the algorithms' development and operation. This is achieved via transparent rules for monitoring and managing the algorithm performance, the corrective measures and the requests for changes to the algorithms. Transparency and reliability is also achieved through the requirements on regular reporting, the publication of documents related to these processes and the disclosure to the interested public of information needed to monitor the functioning of the algorithms.

Moved (insertion) [1]

Deleted: (hereafter referred to as the "Algorithm Proposal")

Deleted: the

Deleted: (hereafter referred to as the "

Deleted: Regulation").

Deleted: proposed by NEMOs and TSOs

Deleted: (hereinafter referred to as "DA Algorithm Requirements" and "

Deleted: Algorithm Requirements" respectively

Deleted: <#>According to Article 37(1) of the CACM Regulation: *"By eight months after the entry into force of this Regulation: (a) all TSOs shall jointly provide all NEMOs with a proposal for a common set of requirements for efficient capacity allocation to enable the development of the price coupling algorithm and of the continuous trading matching algorithm. These requirements shall specify functionalities and performance, including deadlines for the delivery of single day-ahead and intraday coupling results and details of the cross-zonal capacity and allocation constraints to be respected; (b) all NEMOs shall jointly propose a common set of requirements for efficient matching to enable the development of the price coupling algorithm and of the continuous trading matching algorithm."*¶
After both proposals for common set of requirements were prepared, all NEMOs and all TSOs have cooperated to finalise the sets of the TSOs' and NEMOs' DA and ID Algorithm Requirements. Subsequently, "*all NEMOs shall develop a proposal for the algorithm in accordance with these requirements.*

Deleted: <#>*proposal shall indicate the time limit for the submission of received orders by NEMOs required to perform the MCO functions in accordance with Article 7(1)(b).*" ¶
In accordance with Article 37(3) of the CACM Regulation the NEMOs' proposal for the algorithm "*shall be submitted to all TSOs. If additional time is required to prepare this proposal, all NE*... [1]

Moved up [1]: <#>Whereas

Deleted: <#> (1) of the CACM Regulation, "*The urgent con*... [2]

Deleted: <#>in every capacity calculation region in accord... [3]

Deleted: <#>cooperation

Deleted: <#>. The DA and ID Algorithm Requirements aim... [4]

Deleted: <#>(12)(12)(12)

Deleted: procedures for maintaining

Deleted: algorithms aim at

Deleted: ,

Deleted: , NRAs and ACER.

Deleted: DA

Deleted: ID Algorithm Requirements support trading with... [5]

Deleted: while facilitating a level playing field for NEMOs.... [6]

Deleted: by more than one TSO

Deleted: one or both sides of a bidding zone border.

Deleted: Further, the

Deleted: Proposal

Deleted: through the provision of suitable

Deleted: documentation,

Deleted: reporting to all involved stakeholders and a tran... [7]

Deleted:

(9) The Algorithm methodology contributes to an efficient long-term operation and development of the electricity transmission system and electricity sector in the Union (Article 3(g) of the CACM Regulation) as it ensures that all electricity markets and networks in the EU and other eligible third countries can participate in the SDAC and SIDC. This provides for an environment in which these markets can operate efficiently, where the cheapest generation can meet the highest demand and where efficient signals for the operation and development of the electricity sector are provided for.

(10) The algorithms apply clear rules for the price formation, which do not allow for discrimination among market participants. Therefore, the Algorithm methodology respects the need for a fair and orderly market and a fair and orderly price formation (Article 3(h) of the CACM Regulation) by ensuring that the algorithms always maximise the economic surplus and that their outcome is repeatable and scalable to the extent needed to support the extension of SDAC and SIDC to the whole EU and other eligible third countries.

(11) The Algorithm methodology supports the creation of a level playing field for NEMOs (Article 3(i) of the CACM Regulation) as it allows the participation by more than one NEMO in one bidding zone and provides equal opportunities for all NEMOs to compete with their services, with the exception of the national legal monopoly, in accordance with Article 5 of the CACM Regulation. The Algorithm methodology also ensures that the needs of NEMOs to customise the products for their customers are treated equally and in a non-discriminatory way, while taking into account the impact of those needs on the algorithm performance.

(12) The Algorithm methodology ensures non-discriminatory access to cross-zonal capacity (Article 3(j) of the CACM Regulation) as it ensures the application of implicit capacity allocation which allocates cross-zonal capacities to market participants' orders in a way which maximises the economic surplus at a specific point of time.

(13) The Algorithm methodology should provide assurance that the price coupling algorithm and the continuous trading matching algorithm are able to find for all days a solution that is compliant with the concept of market coupling and implicit capacity allocation in the permitted time. The Algorithm methodology should provide an objective framework to monitor and communicate on the operational performance, as well as to ensure stakeholders' understanding of the functioning of the algorithm.

(14) Changes to the price coupling algorithm and continuous trading matching algorithm should be managed in an open, transparent and non-discriminatory way by seeking stakeholder input, where relevant. These changes should provide assurance that the algorithm performance is maintained at adequate levels and over a reasonable period of time in the future, assuming plausible market growth and development. To achieve this, individual NEMO's or TSO's requests should be supported to the extent that they do not harm any party or include measures to mitigate any harm in a way that ensures non-discrimination.

(15) While the existing day-ahead ('DA') and intraday ('ID') algorithm solutions support all existing requirements and all individual products established in the products that can be taken into account by NEMOs in the single day-ahead coupling and single intraday coupling ('DA and ID products'), such support may not be achievable in a situation where the SDAC and SIDC are extended to many additional bidding zones and where the usage of products is greatly increased. In such a situation, the algorithm should support at least a combination of products, which does not significantly restrict the needs of market participants and requirements specified in a way that enables TSOs to perform their duties pursuant to CACM Regulation. A specific methodology for deciding on requests for changes and corrective measures is needed to provide clarity regarding such limitations to products or requirements.

(16) In order to address all the requirements of the CACM Regulation, the existing DA and ID algorithm

Deleted: <#>The Algorithm Proposal establishes that the operational performance, security and compliance shall be managed in accordance with principles that:¶
Provide an objective basis to monitor and communicate operational performance; ¶
Provide

Deleted: Algorithm Performance (for DA and ID) is at an acceptable level. In particular, that the

Deleted: is

Deleted: able to find

Deleted: solution to

Deleted: problem

Deleted: ;¶
Support

Deleted: algorithms

Deleted: The Algorithm Proposal establishes that changes

Deleted: shall

Deleted: accordance with principles that:¶
Provide

Deleted: ,

Deleted: to manage Request for Changes, including

Deleted: ; ¶
Provide

Deleted: Algorithm Performance shall be

Deleted: acceptable

Deleted: now

Deleted: ;

Deleted: <#>Enable individual NEMO or TSO requests to be supported where this does not harm any party or includes measures to mitigate any harm in a way that ensures non-discrimination;¶
Establish a fair and efficient process that supports timely market development.¶
Interim and Enduring solutions ¶
In order to deliver a solution fully compliant with the CACM Regulation for the price coupling algorithm and continuous matching algorithm, starting from the existing solutions, an implementation timeline is proposed. Such timeline includes an interim solution based on which all NEMOs shall carry out research and development activity (hereafter referred to as the "prototyping phase") in order to achieve the enduring solution. Legal basis, motivation and proposals for such interim and enduring solution and for the relative implementation timeline are provided in the following paragraphs. ¶

Deleted: <#>guarantee

Deleted: <#>for

Deleted: <#>referred to

Deleted: <#> proposals for

Deleted: <#>and intraday coupling process in accordance with Articles 40 and 53 of the CACM Regulation (hereafter referr ... [8]

Deleted: <#>*per trade for the intraday market time-frame* ... [9]

Deleted: <#>*these increase economic efficiency for the re* ... [10]

Deleted: <#>

Deleted: <#>*set out in Article 37(1)(a), all NEMOs perfor* ... [11]

Deleted: <#>According to Article 59(4) of the CACM Regu ... [12]

solutions require further research and development on the IT solution supporting the algorithm operation and the algorithm design, aiming to maintain adequate performance of the algorithm. All NEMOs should regularly inform the regulatory authorities and other stakeholders about the expected outcome of the research and development process, in order to allow for adapting their own operational processes to the newly developed solutions.

(17) The price coupling algorithm needs to support the products (and requirements) ranging across more than one market time unit ('MTU') and often having the all-or-nothing acceptance criterion. This requires complex combinatorial calculations to compute a number of alternative (CACM Regulation compliant) solutions. In order to allow the algorithm to provide the results within the time limit specified by all TSOs in accordance with Articles 48(1) and 59(4) of the CACM Regulation, the algorithm may not have enough time to search for all feasible solutions in order to find an optimal solution, which maximises the economic surplus. In that respect, the requirement to maximise the economic surplus for SDAC or SIDC should be understood as the requirement to find the highest possible economic surplus among all the feasible solutions found by the algorithm within the time constraints. This may, in specific cases, have an impact on the requirement to respect the need for a fair and orderly price formation in accordance with Article 3(h) of the CACM Regulation. Since the maximisation of the economic surplus (i.e. optimal solution) is considered as the best guarantee to fulfil this requirement, all NEMOs should minimise the degree to which the solution found within the time constraints deviates from the optimal solution.

(18) According to Article 38(1)(e) of the CACM Regulation, the price coupling algorithm must be repeatable, which means that it must consistently produce the same results during the repeated execution with identical inputs. However, since the solution found by the price coupling algorithm is time dependent, the repeatability can only be ensured within the same conditions, i.e. on the same specific configuration of hardware and software and the same number of algorithm iterations.

(19) According to Article 51(1)(e) of the CACM Regulation, the continuous trading matching algorithm must be repeatable. Since the matching of orders in the continuous trading matching algorithm is based on their price and submission time, the continuous trading matching algorithm does not contain any element of randomness. Therefore, the continuous trading matching algorithm is by default repeatable. For this reason, the monitoring of continuous trading matching algorithm's repeatability is not necessary.

(20) According to Articles 38(1)(e) and 51(1)(e) of the CACM Regulation, the algorithms must be scalable. This means that they must be able to accommodate an enlargement of the SDAC and SIDC to new bidding zones (and new NEMOs), as well as the enlargement of the use of DA and ID products and an enlargement of the algorithm requirements. However, unlimited scalability is (i) not feasible, since any configuration of hardware and software is subject to technical constraints that can become limiting under extreme conditions, (ii) not efficient, since it entails costs, which are not proportionate to the results that can be achieved and (iii) not needed, since the dimensions of the market coupling are not infinite in terms of geographical scope, number of NEMOs, products and requirements. Hence, the scalability should be adequate to accommodate the objectives of the CACM Regulation.

(21) With regard to additional bidding zones, the completion of a fully functioning and interconnected internal energy market makes the extension of market coupling to all eligible bidding zones and NEMOs the highest priority objective. Thus, at the time of the adoption of this methodology, the algorithm should support all eligible bidding zones and NEMOs as well as the existing requirements of TSOs and existing DA and ID products. However, as the number of eligible bidding zones and NEMOs will increase in the future (e.g. due to extension to third countries), the algorithms should be continuously upgraded to accommodate all additional bidding zones (and NEMOs) eligible to

Deleted: TSO

Deleted: (MTU) with

Deleted: search for

Deleted: , and considering the complexity of the requirements to be respected and the number of solutions to be assessed, in

Deleted: Article

Deleted:

Deleted: some stopping criterion need to be applied to the procedure for searching the optimal solution. This entails that

Deleted: the global

Deleted: .¶
An algorithm producing an adequate maximized

Deleted: is an algorithm that delivers

Deleted: solution with

Deleted: limit specified in accordance with Article 48(1) and 59(4) of the CACM Regulation

Deleted: <#>Enduring solution – adequately repeatable¶

Deleted: <#>The need of a stopping criterion referred to under Whereas 24 implies that any solution found by the algorithm is time dependent. As consequence repeatability can only be ensured on the same machine and at the same number of iterations, which allows for assessing exactly the same set of potential market solutions.¶
An adequately repeatable algorithm is an algorithm that delivers the exact same result for two different runs of the algorithm performed on the same machine and with the same number of iterations.¶
Enduring solution – adequately scalable¶
According to Article 38(1)(e) and 51(1)(e) of the CACM Regulation, the algorithm must be scalable. ¶
According to Article 38(2) of the CACM Regulation, "*The price coupling algorithm shall be developed in such a way that it would be possible to apply it to a larger or smaller number of bidding zones*". ¶
The urgent

Deleted: EU Member states

participate in the SDAC and SIDC as well as the additional requirements from TSOs that may arise from the development of capacity calculation methodologies in capacity calculation regions.

(22) The implementation and management of the algorithms requires the monitoring of the algorithm performance. If due to unexpected evolution, the performance of the algorithm deteriorates, all NEMOs should apply corrective measures to restore the performance. These measures should be coordinated with TSOs and should be timely communicated to stakeholders. An efficient and transparent governance is crucial for this process.

(23) The future evolution of the algorithms in terms of their scalability requires changes to the algorithms' functionalities or to the usage of already existing functionalities. To accommodate these changes, all NEMOs should cooperate with all TSOs where these changes affect TSOs' algorithms' requirements or algorithms' performance and communicate these changes to stakeholders in a timely manner. An efficient and transparent governance is crucial for this process.

(24) The development and operation of the price coupling algorithm and the continuous trading matching algorithm require close cooperation between all NEMOs and all TSOs as part of the day-to-day management of the single day-ahead and intraday coupling pursuant to Article 10 of the CACM Regulation. For this purpose, NEMOs and TSOs should collaborate in the processes for managing the algorithm performance, in the processes leading to a change in the algorithms, as well as in the development of the underlying rules governing these processes.

(25) The development and operation of the algorithms require highly transparent processes. For this reason, all NEMOs should publish in a timely manner all relevant information and reports having an impact on the algorithm operation, management, performance and future evolution. Moreover, all NEMOs should ensure that the interested public is able to understand the functioning of the algorithm and therefore publish and continuously update a detailed description of the price coupling algorithm and of the continuous trading matching algorithm.

(26) The future evolution of various terms and condition or methodologies developed by TSOs or NEMOs in accordance with the CACM Regulation may require some additional changes to the algorithms. In such a case, all TSOs and all NEMOs should update the DA and ID algorithm requirements and subsequently all NEMOs should update the Algorithm methodology and submit it to all regulatory authorities for approval. In particular, detailed methodologies for monitoring the algorithm performance and for managing the requests for changes to the algorithms should be developed by all NEMOs in coordination with all TSOs and submitted to all regulatory authorities as an amendment to this Algorithm methodology.

TITLE 1

General provisions

Article 1

Subject matter and scope

1. This Algorithm methodology determines the single day-ahead price coupling algorithm and the single intraday continuous trading matching algorithm in accordance with Article 37 of the CACM Regulation. The Algorithm methodology incorporates the DA and ID algorithm requirements (as per Annex 1 and Annex 2).

2. The following provisions and related decisions of all NEMOs shall apply subject to applicable laws and regulations.

Deleted: <#>Unlimited scalability is not feasible, since any machine is subject to technical constraints that can be triggered under extreme conditions, neither efficient, since it entails costs which are not proportionate to the results that can be achieved, nor needed, since the dimensions of the market coupling are not infinite in terms of geographical scope, number of NEMOs and product usage. Hence adequate scalability is needed.¶
An adequately scalable algorithm is an algorithm able to accommodate the enlargement of the market coupling to new bidding zones and new NEMOs on a European scale as well as the reasonable use of products as defined in the Product Proposals. ¶
Interim solution ¶
According to Whereas 14 of the CACM Regulation, "*For efficiency reasons and in order to implement single day-ahead and intraday coupling as soon as possible, single day-ahead and intraday coupling should make use of existing market operators and already implemented solutions where appropriate, without precluding competition from new operators*". ¶
According to Article 36(4) of the CACM regulation, "*Where possible, NEMOs shall use already agreed solutions to efficiently implement the objectives of this Regulation*".¶
The existing solutions for DA and ID markets were designed before the entry into force of the CACM Regulation and therefore they were not designed to necessarily meet all requirements of the CACM Regulation.¶
In order to make the DA and ID existing solutions fully compliant with all requirements of the CACM Regulation, further development is needed, including research and

Deleted: activity on the IT solution supporting the algorithm

Deleted: and the algorithm design, aiming to increase the performance of the

Deleted: ; prototyping activity aiming to test the performance of the newly proposed solutions; industrialization activity aiming to deliver a full functioning

Deleted: deployed in its expected production environment; timely communication to NRAs and other stakeholders of t ... [13]

Deleted: a last resort measure. ¶
¶ ... [14]

Deleted: . *They shall meet regularly to discuss and decide on day-to-day operational issues. TSOs and NEMOs shall invite the* ... [15]

Deleted: implementation

Deleted: proposed

Deleted: requires close cooperation between

Deleted: and TSOs, especially with regard to

Deleted: and change management.

Deleted: modalities of such cooperation shall be jointly agreed

Deleted: and NEMOs in the organization of the day-to-day management of the single day-ahead and intraday coupling

Deleted: Article 10 of

Deleted: <#>The day to day management shall include, among others, the management of operational incider ... [16]

Deleted: <#>11

Deleted: The present Algorithm Proposal shall be considered as the common proposal of all NEMOs

Deleted:

Deleted: ¶
The annexed

Deleted: Algorithm Requirements shall be considered as the common proposal of all NEMOs and all TSOs, in accordanc ... [17]

Article 2

Definitions and interpretation

1. The terms used in this algorithm methodology shall have the meaning given to them in Article 2 of Regulation (EC) No 714/2009, in Article 2 of Regulation (EU) No 543/2013, in Article 2 of the CACM Regulation, in Article 2 of Directive 2009/72/EC, in Article 3 of Regulation (EU) 2017/1485, with the exception of the definition of 'scheduling area', and in the Market Coupling Operator ('MCO') Plan.

2. In addition, the following definitions shall apply:

   a) **Algorithm monitoring methodology**: means a methodology developed jointly by all NEMOs in coordination with all TSOs in order to assess the performance of the price coupling algorithm and of the continuous trading matching algorithm.

   b) **Algorithm performance**: means the ability of the price coupling algorithm and the continuous trading matching algorithm to (i) ensure reliability of the process to find solutions, (ii) maximise economic surplus, and (iii) ensure an adequate level of repeatability and scalability.

   c) **Anticipated usage**: means a reasonable expected effective usage of a functionality by each individual NEMO or TSO.

   d) **Back-up methodology**: means the methodology developed in accordance with Article 36(3) of the CACM Regulation and approved in accordance with Article 9 of the CACM Regulation, including any amendments, which have been approved in accordance with that Article 9.

   e) **Change control methodology:** means a methodology developed jointly by all NEMOs in coordination with all TSOs in order to manage requests for change to the price coupling algorithm and to the continuous trading matching algorithm.

   f) **Corrective measure**: means a last resort measure taken by all NEMOs in case of performance degradation of the price coupling algorithm or of the continuous trading matching algorithm with the aim to restore their adequate performance.

   g) **Effective usage**: means the observed relevant historic usage of a functionality by each individual NEMO or TSO.

   h) **Existing DA algorithm solution**: means the algorithm which has been developed and implemented by some NEMOs for the day-ahead market coupling within the day-ahead coupling project pre-existing the CACM Regulation in accordance with the MCO Plan.

   i) **Existing ID algorithm solution**: means the algorithm, which has been developed and implemented by some NEMOs for the intraday market coupling within the intraday coupling project pre-existing the CACM Regulation in accordance with the MCO Plan.

   j) **Fallback methodology**: means the methodology developed for robust and timely fallback procedures to ensure efficient, transparent and non-discriminatory capacity allocation in the event that the single day-ahead coupling process is unable to produce results, in accordance with Article 44 of the CACM Regulation and approved in accordance with Article 9 of the CACM Regulation, including any amendments, which have been approved in accordance with that Article 9.

   k) **Functionality**: means any market or network feature or design element embodied in the systems, communications and procedures that support the price coupling algorithm or the continuous trading matching algorithm in accordance with the DA and ID algorithm requirements.

   l) **Future Requirements**: means requirements proposed according to Article 37 of the CACM

Deleted: For the purpose of this proposal,

Deleted: document

Deleted: the definitions included

Deleted: other items of legislation referenced therein and MCO

Deleted: Monitoring Procedure

Deleted: procedure designed

Deleted: control

Deleted: respectively

Deleted: Performance

Deleted: elaborated solution, to aim to maximize

Deleted: to

Deleted: , as described in Article 3. Algorithm Performance is measured and monitored according to dedicated metrics (indicators) described in DA and ID Algorithm Requirements and established by all NEMOs in coordination with all TSOs

Deleted: <#>**Anticipated Usage:** means a reasonable expected Effective Usage of a Functionality by each individual NEMO or TSO. The Anticipated Usage for a new Functionality is indicated by the same NEMO or TSO in the submitted Request for Change. For existing Functionalities, the Anticipated Usage shall be derived from the Effective Usage according to a formula commonly defined amongst all NEMOs and stated in the Change Control Procedure. Anticipated Usage is used for the purpose of testing the impact of Request for Changes at a time horizon set by all NEMOs (typically 1 year). ¶
Change Control Procedure

Deleted: a procedure designed

Deleted: Requests

Deleted: Change

Deleted: respectively

Deleted: measures

Deleted: to be

Deleted: based on

Deleted: decision

Deleted: allow restoring

Deleted: scalability

Deleted: Usage

Deleted: Functionality in production

Deleted: Algorithm Solution

Deleted: DA

Deleted: among some NEMOs, as recognized under Article 5(1) of

Deleted: approved

Deleted:

Deleted: <#>**Existing ID Algorithm Solution**: means the algorithm which has been developed for the intraday market coupling within the ID coupling project pre-existing the CACM Regulation among some NEMOs, as recognized under Article 5(2) of the approved MCO Plan. ¶

Deleted: DA

Deleted: ID Algorithm

Deleted: Algorithm Requirements.

Regulation, which are needed to extend further the functionalities of the price coupling algorithm and of the continuous matching algorithm.

m) **Initial Requirements**: means requirements proposed according to Article 37 of the CACM Regulation, which need to be implemented at the beginning of the operation of the price coupling algorithm and of the continuous trading matching algorithm.

n) **MCO Plan**: means the plan on joint performance of market coupling operator functions developed in accordance with Article 7(3) of the CACM Regulation and approved in accordance with Article 9 of the CACM Regulation, including any amendments, which have been approved in accordance with that Article 9.

o) **Methodology for calculating scheduled exchanges**: means the methodology developed in accordance with Articles 43(1) and 56(1) of the CACM Regulation and approved in accordance with Article 9 of the CACM Regulation, including any amendments, which have been approved in accordance with that Article 9.

p) **NEMO trading hub**: means a virtual trading point collecting all orders received by a NEMO with delivery in a specific scheduling area.

q) **Paradoxically rejected orders**: means sell/buy orders covering multiple MTUs, which, although their order price is lower/higher than the average market clearing price for all the MTUs included in the order, have been rejected by the price coupling algorithm on the ground that if they had been accepted, the average market clearing price in the respective MTUs would have either decreased/increased below/above their order price or the economic surplus calculated by the price coupling algorithm would have decreased.

r) **DA products** and **ID products**: means the products that can be taken into account in the single day-ahead or intraday coupling, respectively, developed in accordance with Articles 40(1) and 53(1) of the CACM Regulation and approved in accordance with Article 9 of the CACM Regulation, including any amendments, which have been approved in accordance with that Article 9.

s) **Request for change**: means a formal request by one or more NEMO(s) or TSO(s) for any modification to the price coupling algorithm and to the continuous trading matching algorithm or to its usage.

t) **Scheduling area**: means a scheduling area according to Article 3(2)(91) of the Regulation (EU) 2017/1485 with at least one NEMO trading hub.

u) **Scheduled exchange between NEMO trading hubs**: means an electricity transfer scheduled between NEMO trading hubs within or between scheduling areas or bidding zones.

v) **Usage range**: means an estimated maximum level of usage of a specific functionality supported by the algorithm in conditions of adequate scalability.

3. Unless the context requires otherwise or unless specified otherwise:
   a) the singular indicates the plural and vice versa;
   b) the table of contents and headings are inserted for convenience only and do not affect the interpretation of this Algorithm methodology; and
   c) any reference to legislation, regulations, directives, decisions, orders, instruments, codes or any other enactment shall include any modification, extension or re-enactment thereof when in force.

Deleted: shall comply with after the initial start of the single day-ahead or intraday coupling, where necessary subject to clarification of the requirements and technical assessment of the impact on Algorithm Performance.

Deleted: the

Deleted: shall comply with from the start of operation of the single day-ahead or intraday coupling (as further defined in the MCO Plan).

Deleted: document

Deleted: by all NEMOs in order to describe the plan that sets out how they jointly set up and perform the MCO functions, elaborated according to requirements of Article

Deleted: by all NRAs in June 2017.

Deleted: <#>**MTU**: means market time unit.¶

Deleted: the set of

Deleted: submitted

Deleted: the market participants to

Deleted: NEMO within a bidding zone

Deleted: **Change**

Deleted: be made to

Deleted: in production

Deleted: **Flow**: means allocated flow

Deleted: two bidding zones, two

Deleted: two NEMO trading hubs that is obtained as a result of the MCO function

Deleted: **Range**

Deleted: assessment of the

Deleted: requirement

Deleted: related to the Anticipated Usage through a function defined by all NEMOs in coordination with all TSOs

Algorithms

Article 3

Algorithm requirements

1. The algorithm requirements comprise a common set of requirements proposed by all TSOs, a common set of requirements proposed by all NEMOs and a common set of requirements jointly proposed by both all TSOs and all NEMOs, in line with Article 37 (1) of the CACM Regulation.
2. The common set of requirements for the price coupling algorithm and the continuous trading matching algorithm are set out in Annex 1 and Annex 2, respectively, of this Algorithm methodology.
3. All NEMOs shall maintain the functionalities (following their implementation) to be compliant with the requirements that are set out in Annex 1 and Annex 2 of this Algorithm methodology.
4. Any modification to the functionalities, including the modifications needed to meet any future requirements, shall be implemented according to a request for change, which shall include an assessment of its feasibility and of its impact on the algorithm performance.
5. The price coupling algorithm and the continuous trading matching algorithm shall support the requirements for the calculation of scheduled exchanges between bidding zones and between scheduling areas as well as scheduled exchanges between NEMO trading hubs in accordance with the methodology for calculating scheduled exchanges for the day-ahead and respectively intraday timeframe.
6. The price coupling algorithm and the continuous trading matching algorithm shall support all DA and ID products and all requirements defined in Annex 1 and Annex 2 to this Algorithm methodology. However, if such support leads to a deterioration of the algorithm performance, all NEMOs may apply, through the procedures for corrective measure and/or change requests:
   a) limitations to specific products or their usage in specific bidding zones; and/or
   b) limitations to specific algorithm requirements or their usage, if these requirements are specified in a way that excessively impacts the algorithm performance.

   When applying those limitations, all NEMOs shall respect the rules referred to in Article 9(4) of this Algorithm methodology.
7. All NEMOs shall ensure that the price coupling algorithm produces the results set out in Article 39(2) of the CACM Regulation while fulfilling the requirements referred to in Article 38(1) and Article 40(2) of the CACM Regulation:
   a) The price coupling algorithm shall aim at maximising the economic surplus for all biding zones participating in the SDAC for the next trading day while respecting cross-zonal capacity and allocation constraints within the maximum calculation time. The price coupling algorithm shall facilitate efficient price formation by using the marginal price principle according to which all accepted orders have the same price per bidding zone and per MTU;
   b) The price coupling algorithm shall be repeatable, which means that any execution of the algorithm on the same hardware and software and their configuration consistently delivers the same result after the same number of iterations. All NEMOs shall be able to fully replicate the results of the price coupling algorithm for a specific historic delivery day if requested by any regulatory authority or the Agency pursuant to their monitoring duties in accordance with Article 82(1) of CACM Regulation;
   c) The price coupling algorithm shall be scalable, thus ensuring that it can support in a non-discriminatory way all bidding zones and all NEMOs eligible to participate in the SDAC at any time, all DA algorithm requirements and all products set out in the DA products, as well as their

Deleted: Requirements
Deleted:
Deleted: DA Algorithm Requirements are those
Deleted: Proposal, the ID Algorithm Requirements are those set out in Annex 2 of this Algorithm Proposal.
Deleted: Functionalities to be compliant with the list of Initial Requirements plus Future Requirements
Deleted: Functionality
Deleted: Future Requirements
Deleted: Request
Deleted: Change, including
Deleted: impact
Deleted: scheduled exchange
Deleted: function requirements, which relate to the joint ... [18]
Deleted: in accordance with Article 8(2)(g) of the CACM ... [19]
Deleted: While the
Deleted: respectively
Deleted: guarantee
Deleted: for
Deleted: individual
Deleted: referred to in the DA (respectively ID) Product F ... [20]
Deleted: under
Deleted: ,
Deleted: combination of
Deleted: one single bidding zone or
Deleted: combination of
Deleted: could not be guaranteed (i.e. feasible only unc ... [21]
Deleted: under
Deleted: 3).
Deleted: fulfils
Deleted: requirements described
Deleted: Annex 1
Deleted: Algorithm Proposal and
Deleted: set of
Deleted: , aimed at ensuring an adequate level of performance
Deleted: maximizing
Deleted: and being consistent with time limitations
Deleted: , in order
Deleted: ensure that
Deleted: bids
Deleted: market unit. The results of the price coupling ... [22]
Deleted: thus ensuring the delivery of the same result f ... [23]
Deleted: machine and
Deleted: ensuring the possibility to apply the algorithm ... [24]
Deleted: the coupling of
Deleted: in the EU plus Norway;¶ ... [25]

reasonable usage based on anticipated and effective usage;

d) The price coupling algorithm shall be able to accommodate orders resulting from products covering one MTU and multiple MTUs;

e) The price coupling algorithm shall be reliable, which means that it shall be able to find at least one solution within the time limit as set out in the operational procedure and timings; and

f) The price coupling algorithm shall provide for a fair and orderly price formation as required by Article 3(h) of the CACM Regulation.

8. All NEMOs shall ensure that the continuous trading matching algorithm produces the results set out in Article 52(1) of the CACM Regulation while fulfilling the requirements of Article 51(1) and Article 53(3) of the CACM Regulation:

a) The continuous trading matching algorithm shall aim at maximising economic surplus for the SIDC per trade for the intraday market time-frame by allocating cross-zonal capacity to orders which can be matched in accordance with the their price and submission time, while respecting the cross-zonal capacity and allocation constraints;

b) The continuous trading matching algorithm shall be repeatable, which means that for a given (i) set of orders, their associated submission time and cross-zonal capacities and allocation constraints for a specified delivery date and (ii) an adequate and suitable storage and computational capacity of the algorithm and related IT assets, the same results originally obtained for the indicated delivery date can be reproduced;

c) The continuous trading matching algorithm shall be scalable, thus ensuring that it can support in a non-discriminatory way all bidding zones and all NEMOs eligible to participate in the SIDC at any time, all ID algorithm requirements and all products set out in the ID products, as well as their reasonable usage based on anticipated and effective usage; and

d) The continuous trading matching algorithm shall be able to accommodate orders covering one MTU and multiple MTUs.

Article 4

Price coupling algorithm

1. The price coupling algorithm shall produce at least the following results simultaneously for each MTU:

a) a single clearing price for each bidding zone and MTU in EUR/MWh;

b) a single net position for each bidding zone and each MTU;

c) the matched volumes of each bidding zone for each relevant MTU;

d) the scheduled exchanges between bidding zones (in case of DC interconnectors separately for each of them) and between scheduling areas as well as scheduled exchanges between NEMO trading hubs for each relevant MTU;

e) the information which enables the execution status of orders to be determined; and

f) the acceptance ratio for each block as defined in the DA products.

2. The price coupling algorithm shall calculate scheduled exchanges between bidding zones and between scheduling areas as well as scheduled exchanges between NEMO trading hubs in accordance with the methodology for calculating scheduled exchanges for the day-ahead timeframe.

3. For the purpose of calculating scheduled exchanges, the price coupling algorithm shall calculate the net positions as follows:

a) for the bidding zones consisting of more than one scheduling area, the net position for each MTU will be calculated for each scheduling area; and

b) for the scheduling areas where more than one NEMO operates, the net position for each MTU will

Deleted: approach

Deleted: <#>support the operation of multiple NEMOs in a same bidding zone;¶
The price coupling algorithm shall be able to accommodate orders resulting from products covering one MTU and at least one kind of product covering …ultiple MTUs, in line with Article 40(2) of the CACM Regulation … [26]

Deleted: <#>Support a reasonable usage of the products reported under previous letter iv), to be assessed against the anticipated/effective usage;¶
…he price coupling algorithm shall be reliable. By reliability, it is meant the ability of the algorithm… which means that it shall be able to ensure finding…ind at least one solution within the given timeframe. … [27]

Deleted: fulfils…roduces the requirements described…esults set out in Annex 2…rticle 52(1) of the Algorithm Proposal and…ACM Regulation while fulfilling the set of …equirements referred to in of Article 51(1),… and Article 53(2) and Article 53(…) of the CACM Regulation, aimed at ensuring an adequate level of performance … [28]

Deleted: maximizing the…aximising economic surplus for the SIDC per trade for the intraday market time-frame by allocating cross-zonal capacity to orders for… which it is feasible to match…an be matched in accordance with the their price and time of …ubmission time, while respecting the cross-zonal capacity and allocation constraints. The results of the continuous trading matching algorithm shall fulfil the optimality thresholds defined according to Article 9(4); … [29]

Deleted: <#>The continuous trading matching algorithm shall respect the delivery of results according to Article 60 of the CACM Regulation;¶
The continuous trading matching algorithm shall be repeatable, which means that,…for a given a…i) set of order books…rders, their associated submission time stamp …nd existing grid…ross-zonal capacities and allocation constraints for a specified delivery date, provided…and (ii) an adequate and suitable capacity in terms of …torage and calculation … [30]

Deleted: the possibility to apply the algorithm to a larger number of i)…hat it can support in a non-discriminatory way all bidding zones, ii)…and all NEMOs, iii) volumes of bids and offers…eligible to participate in the SIDC at any time, all ID algorithm requirements and at least one kind of product c … [31]

Deleted: be based on the Existing DA Algorithm Solution, as improved at the end of the prototyping phase dedicated to research and development processes. ¶
The price coupling algorithm shall provide as outcome a so … [32]

Deleted: the market… single clearing prices of…rice for each bidding zone for each relevant…nd MTU, … [33]

Deleted: ,

Deleted: <#>the net position of each bidding zone, scheduling area and NEMO hub for each relevant MTU,¶
the Scheduled Flow…he scheduled exchanges between bidding zones, NEMO Hubs and …(in case of DC interconnectors … [34]

Deleted: selection…nformation which enables the execution status of executed block, complex, merit, and PUN …rder … [35]

Deleted: accepted percentage…cceptance ratio for each curtailable …lock.¶
Between two solutions with the same value of economic surplus,…as defined in the price coupling algorithm shall … [36]

Deleted: the Scheduled Flows…cheduled exchanges between bidding zones,…and between scheduling areas and…s well as scheduled exchanges between NEMO trading hubs, ensuring consistency among…in accordance with the three differen … [37]

Deleted: containing several NEMOs

be calculated for each NEMO trading hub.

4. To find a solution, the price coupling algorithm shall evaluate different combinations of block orders and complex orders and try to find values for the remaining variables that fulfil the market and network requirements expressed as constraints in the optimisation problem. Every evaluated combination is a node.

5. In order to ensure reliability of operation, the price coupling algorithm shall first aim to find a first solution compliant with the input constraints. In order to maximise the economic surplus, it shall then seek to find new solutions with higher economic surplus by exploring new nodes until the overall optimal solution is found and verified in the process of maximising the economic surplus or until the time limit referred to in paragraph 6 has been reached. In case the price coupling algorithm finds two or more solutions with the same value of economic surplus, it shall select the one that maximises the traded volume.

6. Under normal operations, all NEMOs shall execute the price coupling algorithm using the time limit stopping criterion, which shall be equal to the maximum calculation time established in the operational procedure and timings referred to in Article 4(18).

7. The price coupling algorithm shall perform checks on every solution found to validate that all the market and network requirements, expressed as constraints in the optimisation problem, are respected within a tolerance which shall be agreed between NEMOs and TSOs. The last solution found that is fulfilling this condition shall be the result of the execution of the price coupling algorithm.

8. Orders used in the price coupling algorithm shall be anonymous and processed in a non-discriminatory way. There shall be no identification of the originating market participant or NEMOs.

9. A single execution of the price coupling algorithm operated by the coordinator shall calculate the results for all NEMO trading hubs participating in the SDAC.

10. The input data to the price coupling algorithm referred to in Article 39(1) of the CACM Regulation shall be available to any authorised operator, who is entitled to perform the price coupling calculation in parallel.

11. Under normal operations, all NEMOs shall submit orders to the MCO Function by the time defined in the operational procedure or otherwise back-up procedures shall be applied as set out in the back-up methodology.

12. Under normal operations, all NEMOs performing the MCO functions shall provide (i) all TSOs, all coordinated capacity calculators and all NEMOs with the results of the SDAC referred to in paragraph 1(a), (b), and (c) above; and (ii) all NEMOs with the results specified in paragraph 1 above, by 13:00 market time day-ahead and anyway not later than 15:30 market time day-ahead.

13. All NEMOs shall provide TSOs with the scheduled exchanges between bidding zones and between scheduling areas as referred to in paragraph (2) above, calculated in accordance with the methodology for calculating scheduled exchanges for the day-ahead timeframe.

14. All NEMOs shall perform continuous research and development activities to allow for incremental improvement of the performance of the price coupling algorithm in order to ensure adequate scalability as referred to in Article 3(7)(c) and in order to monitor and preserve the fairness of the price formation according to the principles laid out in Article 3(7)(f).

15. All NEMOs shall ensure that the price coupling algorithm meets the algorithm requirements as follows:

    a) by 1 August 2018, the price coupling algorithm shall be able to support:

        (i) all initial requirements, set out in Annex 1 to this Algorithm methodology, except the

Deleted:

Deleted: <#>For the bidding zones containing several TSOs separating their scope in different scheduling areas, the net position for each MTU and where relevant for each NEMO Hub will be calculated for each scheduling area. ¶
The inter bidding zone flow calculation functionality shall ensure that, when several routes might be possible for a given set of net positions, the price coupling algorithm shall provide the Scheduled Flows of the solution by minimizing a cost function on Scheduled Flows, using for this calculation a deterministic rule.¶
To find solutions… solution, the price coupling algorithm shall evaluate different combinations of selected/non-selected blocks…lock orders and complex orders, trying…and try to find values for the resting…emaining variables that fulfil the market and network requirements expressed as constraints in the optimisation problem. Every new …valuated combination is a node. ... [38]

Deleted: maximize…aximise the economic surplus, it shall then seek to find new solutions with higher economic welfare…urplus by exploring new nodes until the stopping criterion ... [39]

Deleted: <#>The price coupling algorithm shall stop when one of following stopping criteria is met:¶
The optimal solution is found;¶
Time limit: the elapsed time has reached the set permitted time to run;¶
Iteration limit: the algorithm stops after it has completely processed a number of nodes;¶
Solution limit: the algorithm stops after having found a number of solutions. ¶
Under normal operations, all NEMOs shall run…xecute the price coupling algorithm using the time limit stopping criterion, set…hich shall be equal to the maximum calculation time allowed. This maximum allowed time shall be …stablished in the operational procedure and timings referred to under…n Article 4(15). ... [40]

Deleted: given …olerance. ... [41]

Deleted: <#>The last solution found that is fulfilling the checks under Article 4(10) contains the values that are considered the result of the execution of the price coupling algorithm.¶
Orders used in the price coupling algorithm shall be anonym ... [42]

Deleted: instance…xecution of the price coupling algorithm operated by the Coordinator…oordinator shall calculate the results for all coupled …EMO trading hubs. ... [43]

Deleted: Operator

Deleted: All NEMOs, in cooperation with TSOs where relevant, shall establish…nder normal operations, all NEMOs shall submit orders to the MCO Function by the time defined in the operational procedure and timings, including both normal procedures a ... [44]

Deleted: NEMOs shall submit orders to the MCO Function by the time stated in the operational procedure or else backup procedures shall apply.¶ ... [45]

Deleted: relevant outcome…cheduled exchanges between bidding zones and between scheduling areas as referred to under Article 4(4) …n case such TSOs decide to use the price cou ... [46]

Deleted: <#>All NEMOs shall create and maintain a document with the detailed description of the price coupling algorithm, including the rules to calculate Scheduled Flows between N ... [47]

Moved down [2]: <#>Article 5¶

Deleted: <#>Price coupling algorithm Implementation timeline ¶
The price coupling algorithm implementation timeline begins with the approval of the Algorithm Proposal by all NRAs.¶ ... [48]

Deleted: By the end of June…y 1 August 2018, the DA interim solution…rice coupling algorithm shall be able to support ... [49]

Deleted: Initial Requirements reported…nitial requirements, set out in Annex 1, ... [50]

requirement referred to in point (b) of this paragraph;

(ii) the requirement of maximisation of the economic surplus as referred to in Article 3(7)(a); and

(iii) the requirement on delivery of results as referred to in paragraph 1.

b) by 1 November 2018, the price coupling algorithm shall be able to support:

(i) the requirement for the operation of multiple NEMOs in a bidding zone;

(ii) the requirement of scalability as referred to in Article 3(7)(c); and

(iii) the requirement for the calculation of scheduled exchanges as referred to in paragraph 2.

c) by 1 February 2020, the price coupling algorithm shall be able to support the requirement of adequate repeatability referred to in Article 3(7)(b); and

d) by 1 August 2022, the price coupling algorithm shall be able to support all future requirements set out in Annex 1 to this Algorithm methodology.

16. The timely delivery of the functionality for the calculation of scheduled exchanges within the price coupling algorithm shall be conditional on the final approval of the methodology for the calculation of scheduled exchanges for the day-ahead timeframe. If the approved methodology for the calculation of scheduled exchanges for day-ahead timeframe requires changes in the calculation of scheduled exchanges as currently implemented in the existing DA algorithm solution, the delivery of the functionality for the calculation of scheduled exchanges shall be postponed until 12 months after the approval of the methodology for the calculation of scheduled exchanges for the day-ahead timeframe.

17. All NEMOs and all TSOs shall jointly establish the operational procedures and timings for the price coupling algorithm to comply with Article 48 of the CACM Regulation. These operational procedures and timings shall define the modalities for coordinating the operation of the SDAC market between NEMOs and TSOs both in ordinary and non-ordinary conditions and shall detail all relevant actions to be taken together with relevant subjects, timings and processes. These operational procedures and timings shall make reference to the back-up methodology developed in accordance with Article 36(3) of the CACM Regulation.

18. Every year, all NEMOs shall provide all regulatory authorities with a report on incidents in the operation of the price coupling algorithm and the application of back-up and fallback procedures in accordance with the back-up methodology and fallback methodology. The report shall provide at least a list of incidents in the operation of the price coupling algorithm and the application of back-up and fallback procedures, including the reasoning of their occurrence and applied or anticipated remedies to prevent them in the future.

19. Every year, all NEMOs shall provide all regulatory authorities with a report on research and development activities on the price coupling algorithm. All NEMOs shall consult the draft report with the relevant stakeholder fora organised in accordance with Article 11 of the CACM Regulation, before submitting it to all regulatory authorities. The report shall provide at least:

a) the status of the research and development activity in relation to the earlier agreed all NEMOs' approaches and targets; and

b) the planning of the future research and development activity, including an estimation of the identified workload.

20. All NEMOs shall create and maintain a document with the detailed description of the price coupling algorithm, including the description of calculation of scheduled exchanges in accordance with the methodology for calculating scheduled exchanges for the day-ahead timeframe. This document shall be published and kept updated with every new version of the price coupling algorithm. The document shall be publicly available by all NEMOs on a public webpage.

Deleted: adequate maximization described under Article 3(7)(a),

Deleted: Multi-Nemo operation,

Deleted: schedule exchange calculation functionalities according to methodology

Deleted: calculation of Scheduled Exchanges and the coupling of all

Deleted: zones in

Deleted: EU plus Norway,

Deleted: described

Deleted:)(i).

Deleted: By June

Deleted: DA interim solution

Deleted: described

Deleted:).

Deleted: <#>By the end of the first year of the prototyping phase, all NEMOs shall communicate to all NRAs and make publicly available to all stakeholders the Change Control Procedure and the Algorithm Monitoring Procedure referred to the existing solutions. ¶
By the end of the extended Prototyping Phase, all NEMOs shall consult with the relevant stakeholder forums organised in accordance with Article 11 of the CACM Regulation and send to all NRAs the report on outcomes of the research and development activities carried out;¶
By the end of the industrialization phase the DA interim solution

Deleted: <#>Future Requirements reported in Annex 1 and the requirement of adequate scalability, described under Article 3(7)(c). ¶
By the end of the industrialization phase, all NEMOs shall also communicate to all NRAs and make publicly available to all stakeholders the detailed description of the enduring solution, the Change Control Procedure and the Algorithm

Moved down [3]: <#>Monitoring

Deleted: <#>Procedure referred to the enduring solution.¶
By the end of the industrialization phase, all NEMOs shall start the prototyping phase of the other functionalities as described in Annex 1, following the Change Control Procedure.¶
The consultation indicated in Article 5(4)(iv) shall be carried

Deleted: <#>latest at the end of the extended prototyping phase activity and shall be considered for the activation of the one-year extension to perform the industrialization.

Deleted: <#>At the end of consultation indicated in Article 5(4)(iv) all NEMOs shall, if the prototyping phase(s) and the following consultation has led to a need to amend the Algorithm Proposal, send to all NRAs for approval an amended version of Algorithm Proposal.¶
On a periodic basis, at least on a yearly basis, during the prototyping phase all NEMOs shall send to all NRAs a report on research and development activities providing:¶
Status

Deleted: (prototyping)

Deleted: beforehand among All NEMOs

Deleted: approach(es)

Deleted: Planning

Deleted: for the coming period

Deleted: on

Article 5

Continuous trading matching algorithm

1. All NEMOs, as part of their MCO function, shall ensure that the continuous trading matching algorithm produces at least the following results:
   a) the execution status of orders and prices per trade;
   b) a single net position for each bidding zone participating in the SIDC and each MTU; and
   c) the scheduled exchanges between bidding zones (in case of DC interconnectors separately for each of them) and between scheduling areas as well as scheduled exchanges between NEMO trading hubs for each relevant MTU.
2. The continuous trading matching algorithm shall comprise a shared order book ('SOB') module and a capacity management module ('CMM'). The SOB module shall manage order entry, order management and order matching, while the capacity management module shall manage and allocate cross-zonal capacities and allocation constraints.
3. The continuous trading matching algorithm shall enable all NEMOs to connect to the SOB module. All NEMOs shall enter orders into the SOB module through local trading solutions. All valid orders entered in time in the local trading solution shall automatically enter the SOB module. Market participants are not entitled to access the SOB module directly.
4. The continuous trading matching algorithm shall calculate the scheduled exchanges between bidding zones and between scheduling areas as well as scheduled exchanges between NEMO trading hubs in accordance with the methodology for calculating scheduled exchanges for the intraday timeframe. This functionality shall be implemented by all NEMOs, together with all TSOs, through the shipping module.
5. Matching of orders shall be performed within the SOB module, irrespectively of the scheduling areas through which the orders were entered, including from the same area. The SOB module shall maintain a consolidated order book for all contracts based on the available cross-zonal capacities and allocation constraints.
6. The CMM shall provide information on the currently available cross-zonal capacities and allocation constraints. When cross-zonal matching is performed, the required cross-zonal capacities shall be implicitly allocated in the CMM.
7. Market participants requesting explicit access to cross-zonal capacity in accordance with Article 64 of the CACM Regulation and subject to regulatory approval shall directly access the CMM for explicit cross-zonal capacity allocation.
8. The SOB module shall determine the local view of all orders that can be matched in a selected scheduling area.
9. The SOB module shall apply deterministic matching procedures. Orders shall be matched in the SOB module on the price-time-priority principle:
   a) Price: orders shall be executed at the best price. This means that the best buy order, i.e. the order with the highest price, shall be executed against the best sell order, i.e. the order with the lowest price, first.
   b) Time: when an order is entered into the SOB, it shall be assigned a timestamp. This timestamp is used to prioritise orders with the same price. At the same price, orders with earlier timestamps shall be executed with a higher priority than orders with a later timestamp.
10. The trade execution price for a newly entered order that is matched shall be the order price of the best order which is already in the SOB:

Moved (insertion) [2]

Deleted: <#>In case the prototyping phase does not conclude in the given timeframe, the activation of the extended prototyping phase may take place. In such a case, all NEMOs shall inform all NRAs about such activation three months prior to the deadline of the prototyping phase.¶
The timely delivery of the specific schedule exchange calculator functionalities, requested by all TSOs in the methodology for the calculation of Scheduled Exchanges shall be dependent on the final approval by all NRAs of such methodology and on the confirmation of the formulas for Scheduled Flows between bidding zones and scheduling areas already implemented in the existing solution or in course of implementation. ¶
¶
Article 6¶

Deleted: <#>

Deleted: The …ll NEMOs, as part of their MCO function, shall ensure that the continuous trading matching algorithm shall be based on Existing ID Algorithm Solution. … [51]

Deleted: (SOB…'SOB') module and a capacity management module (CMM…'CMM'). The SOB module shall manage order entry, order management and order matching, while the capacity management module shall manage transmission capacity management … [52]

Deleted: enables multiple…hall enable all NEMOs to connect to the SOB module. Orders are entered in the…ll NEMOs shall enter orders into the SOB module through local trading solutions; all… All valid orders entered in time in the local trading solution are…hall automatically entered into…nter the SOB; market…module. Market participants are not entitled to access the SOB module directly. … [53]

Deleted: Scheduled Flows…cheduled exchanges between bidding zones,…and between scheduling areas and …s well as scheduled exchanges between NEMO trading hubs, ensuring consistency among…in accordance with the three different kind of flow … [54]

Deleted: contracts…rders shall be performed in…ithin the SOB module, irrespectively of the scheduling areas through which the orders were entered (… including from the same area)…. The SOB module maintains…hall maintain a consolidated order book for all contracts based on the available transmission capacity …ross-zonal capacities and allocation constraints between bidding zone … [55]

Deleted: the current capacity availability …nformation….on the currently available cross-zonal capacities and allocation constraints. When cross border trades are …zonal matching is performed, the required cross border capacity … [56]

Deleted: Explicit…arket participants requesting explicit access to cross-zonal capacity in accordance with Article 64 of the CACM Regulation and subject to regulatory approval shall directly access the CMM to perform…or explicit cross-zonal capacity res … [57]

Deleted: executed…atched in the… selected scheduling … [58]

Deleted: Contracts…rders shall be executed…atched in the SOB module on the price-time-priority principle: … [59]

Deleted: The…his means that the best buy order … i.e. the order with the highest price, shall be executed against the best sell order first (the best price for buy orders is the highest price, for sell orders it is… i.e. the order with the lowest price). … [60]

Deleted: prioritize…rioritise orders with the same price limit… At the same time…rice, orders with earlier timestamps shall be executed with a higher priority than orders with a later tim … [61]

Deleted: clearing

a) If a newly entered buy order is matched against an existing sell order, the price of the sell order shall become the trade execution price.
b) If a newly entered sell order is matched against an existing buy order, the price of the buy order shall become the trade execution price.

11. Where a possible cross-zonal trade is identified in the SOB module, a request for implicit allocation of cross-zonal capacity shall be submitted to the CMM. Requests for implicit capacity allocation shall be queued along with requests for explicit capacity allocation, and cross-zonal capacity shall be allocated on a first-come-first serve basis respecting also allocation constraints. If the necessary cross-zonal capacity is not available, the cross-zonal trade shall not be matched.

12. CMM shall not discriminate between implicit capacity allocation for matching of single-time-unit products (e.g. hourly, half-hourly and quarter-hourly), implicit capacity allocation for matching of user-defined blocks and explicit capacity allocation to explicit capacity allocation requests. These requests from both implicit continuous matching and explicit allocation shall all be treated in the CMM on a first-come-first served basis.

13. NEMOs shall provide TSOs with the scheduled exchanges between bidding zones and between scheduling areas as referred to in paragraph 4 above and in accordance with the methodology for calculating of scheduled exchanges for the intraday timeframe.

14. All NEMOs shall perform continuous research and development activities to allow for incremental improvement of the performance of the continuous trading matching algorithm in order to ensure adequate scalability, according to the principles laid out in Article 3(8)(c).

15. All NEMOs shall ensure that the continuous trading matching algorithm meets the algorithm requirements as follows::
    a) By 1 August 2018 the continuous trading matching algorithm shall be able to support:
        (i) all initial requirements defined in Annex 2 to this Algorithm methodology;
        (ii) the requirement of maximisation of economic surplus as referred to in Article 3(8)(a);
        (iii) the requirement for the operation of multiple NEMOs in a bidding zone;
        (iv) the requirement of scalability as referred to in Article 3(8)(c);
        (v) the requirement of adequate repeatability as referred to in Article 3(8)(b);
        (vi) the requirement on delivery of results as referred to in paragraph 1; and
        (vii) the requirements for the calculation of schedule exchanges as referred to in paragraph 4;
    b) By 1 August 2019 the continuous trading matching algorithm shall be updated with the complete functionality of enhanced preferred shipper;
    c) By 1 August 2023, the continuous trading matching algorithm shall be able to support all future requirements set out in Annex 2 to this Algorithm methodology.

16. The timely delivery of the functionality for the calculation of scheduled exchanges within the continuous trading matching algorithm shall be conditional on the final approval of the methodology for the calculation of scheduled exchanges for the intraday timeframe. If the approved methodology for the calculation of scheduled exchanges for the intraday timeframe requires changes in the calculation of scheduled exchanges as currently implemented in the existing ID algorithm solution, the delivery of the functionality for the calculation of scheduled exchanges shall be postponed until 12 months after the approval of the methodology for calculating scheduled exchanges for the intraday timeframe.

17. All NEMOs and all TSOs shall jointly establish the operational procedures and timings for the continuous trading matching algorithm to comply with Article 60 of the CACM Regulation. These operational procedures and timings shall define the modalities for coordinating the operation of the SIDC market between NEMOs and TSOs both in ordinary and non-ordinary conditions and shall detail

Deleted: limit
Deleted: becomes
Deleted: limit
Deleted: becomes
Deleted: the associated
Deleted: made
Deleted: requests
Deleted: treated in time sequence.
Deleted: is
Deleted: There
Deleted: be no discrimination
Deleted: the
Deleted: orders, the
Deleted: multiple-time-unit (i.e. block) orders and granting
Deleted: relevant outcome referred to under Article 6(4) in case such TSOs decide to use the continuous trading matching algorithm to provide the single
Deleted: exchange calculator functionality recalled to in the methodology for the calculation of Scheduled Exchanges, according to Article 43 of the CACM Regulation. For such purpose and in such cases NEMOs shall, together with TSOs, implement the Shipping Module (SM). The SM shall be able to provide the necessary information for calculating Scheduled Exchanges
Deleted: Scheduled Flows between NEMO trading hubs. ¶ NEMOs shall create and maintain a document
Deleted: detailed description
Deleted: continuous trading matching algorithm. This document shall be kept updated with every new version of the continuous trading matching algorithm. The document is made publicly available by NEMOs on public internet webpage.
Deleted: activate
Deleted: d
Deleted: <#>¶ ¶ *Article 7*¶ Continuous
Deleted: <#>implementation timeline
Deleted: The
Deleted: implementation timeline begins with the approval
Deleted: algorithm proposal by all NRAs
Deleted: <#>In order to reach to an ID enduring solution compliant with requirements listed in Article 3, the implementation timeline is structured in four phases: ¶ First implementation phase: up to one year dedicated for go-live of the Existing ID Algorithm Solution, to be considered as SIDC interim solution;¶ Prototyping phase: up to three years after the first implementation phase is completed: dedicated to the activity of research and development aimed to reach a solution complying with the properties of the enduring one described under Article 3;¶ Extended prototyping phase: up to one further year, to be granted to all NEMOs by all NRAs at the end of the prototyping phase, based on a request provided by all NEMOs in order to finalize the research and development activity;¶ Industrialization phase: up to one further year, dedicated to the industrialization of the prototype delivered by the

all relevant actions to be taken together with relevant subjects, timings and processes. These operational procedures and timings shall make reference to the back-up methodology developed in accordance with Article 36(3) of the CACM Regulation.

18. Every year, all NEMOs shall provide all regulatory authorities with a report on incidents in the operation of the continuous trading matching algorithm and the application of back-up and fallback procedures in accordance with the back-up methodology and fallback methodology. The report shall provide at least a list of incidents in the operation of the continuous trading matching algorithm and the application of back-up procedures, including the reasoning of their occurrence and applied or anticipated remedies to prevent them in the future.

19. Every year, all NEMOs shall provide all regulatory authorities with a report on research and development activities on the continuous trading matching algorithm. All NEMOs shall consult the draft report with the relevant stakeholder forums organised in accordance with Article 11 of the CACM Regulation, before submitting it to all regulatory authorities. The report shall provide at least:
    c) the status of the research and development activity in relation to the earlier agreed all NEMOs' approaches and targets; and
    a) the planning of the future research and development activity, including an estimation of the identified workload.

20. All NEMOs shall create and maintain a document with the detailed description of the continuous trading matching algorithm, including the description of calculation of scheduled exchanges in accordance with the methodology for calculating scheduled exchanges for the intraday timeframe. This document shall be published and kept updated with every new version of the continuous trading matching algorithm. The document shall be publicly available by all NEMOs on public webpage.

TITLE 3

Algorithm performance management

Article 6

Monitoring algorithm performance

1. All NEMOs, in coordination with all TSOs, shall monitor the performance of the price coupling algorithm and the continuous trading matching algorithm and their compliance with the CACM Regulation and this methodology. This monitoring shall be based on the principles set out in this Article.

2. By 1 August 2019, all NEMOs in coordination with all TSOs shall jointly develop the algorithm monitoring methodology, which shall further elaborate the principles defined in this Article, and all NEMOs shall propose it as an amendment of this methodology in accordance with Article 9(13) of the CACM Regulation. After its approval in accordance with Article 9 of the CACM Regulation, the algorithm monitoring methodology shall form an annex to this methodology.

3. The algorithm monitoring methodology pursuant to paragraph 2 shall include at least, for the price coupling algorithm:
    a) the relevant indicators to monitor the algorithm's ability to maximise the economic surplus, which shall include at least:
        i. indicators on economic surplus;
        ii. indicators on the loss of economic surplus due to limited calculation time with respect to extended calculation time;
        iii. indicators of the time spent by the algorithm to reach a first solution as referred to in Article

Deleted: if such prototype has been proven suitable, announcing to stakeholders the specific features of the enduring solution and to draft if needed an amended

Deleted: Algorithm Proposal.

Deleted: <#>All NEMOs shall have the chance, at any phase, to introduce modifications in the approach adopted for the research and development activity in case the latter does not provides outcomes compatible with the target of the enduring solution within the proposed timeline. Such change shall be properly reported to all NRAs according to Article 7(6).¶
All NEMOs shall ensure at least the achievement of the following mid-term milestones:¶
By the end of 2018 the SIDC interim solution shall be able to support all Initial Requirements reported in Annex 2, the Multi-Nemo support and the requirement on delivery of results described under Article 3(8)(b) and maximization the economic surplus described under Article 3(8)(a);¶
To ensure the second go-live, the SIDC interim solution shall be updated with the rest of the functionality of enhanced preferred shipper by 2019; ¶
By the end of the first year of the prototyping phase, all NEMOs shall communicate to NRAs and make publicly available to all stakeholders the Change Control Procedure and the Algorithm Monitoring Procedure; ¶
By the end of the industrialization phase, all NEMOs shall communicate to NRAs and make publicly available to all stakeholders the detailed description of the SIDC enduring solution;¶
By the end of the industrialisation phase, all Future Requirements reported in Annex 2 and adequate scalability described under Article 3(8)(d), shall be supported.¶
By the end of the industrialization phase, all NEMOs shall communicate to NRAs and make publicly available to all stakeholders the Change Control Procedure and the Algorithm Monitoring Procedure referred to the SIDC enduring solution.¶
At the end of consultation indicated in Article 7(4) (iv) all NEMOs shall, if the prototyping phase(s) and the following consu ... [62]

Moved (insertion) [4]

Deleted: and

Deleted: organize the day to day management of the single day-ahead and intraday coupling, pursuant to Article 10 of the CACM Regulation. The scope of such activity and of the provisions ... [63]

Deleted: management of

Deleted: joint responsibilities of NEMOs and TSOs, without prejudice for the specific responsibilities of separately all NEMOs and of all TSOs. The modalities and scope of such joint org ... [64]

Deleted: 10

Deleted: <#>The day to day management of both single day-ahead and intraday coupling shall include, among others and without prejudice for other agreements of TSOs and NEMO ... [65]

Moved down [5]: <#>Article 10

Deleted: <#>.¶ ... [66]

Moved up [4]: <#>Article 6

Deleted: <#>(15).¶
All NEMOs and all TSOs shall jointly:¶ ... [67]

Deleted: algorithm optimality

Deleted: of the level of welfare;

Deleted: to evaluate

Deleted: welfare

Deleted: limitation;

Deleted: ;

4(5);

iv. indicators on paradoxically rejected orders;
v. indicators on the fulfilment of the network constraints.

b) the indicators to monitor algorithm repeatability, which shall include at least the indicators on the differences in the same relevant outputs from the algorithm due to repeated calculations on the same specific configuration of hardware and software.

c) the relevant indicators to monitor the algorithm scalability, which shall include at least over time:
   i. indicators on the evolution of the number of bidding zones and network constraints;
   ii. indicators on the evolution of the number of submitted orders of each product type per bidding zone over time, and the corresponding total volume;
   iii. indicators on the evolution of number of matched orders and paradoxically rejected orders of each product type per bidding zone over time, and the corresponding total volume;
   iv. indicators on the evolution of the use of network constraints along the time;
   v. indicators on the time spent in every phase of the algorithm calculation process.

d) the relevant thresholds (including critical thresholds) to identify performance deteriorations;

e) the frequency, level of detail, confidentiality and process for the different reporting of the outcome of the monitoring activity towards all NEMOs, all TSOs, all regulatory authorities and the relevant stakeholder fora organised in accordance with Article 11 of the CACM Regulation;

f) the process to be followed to address performance deterioration in case needed, in coordination with all TSOs and informing all regulatory authorities;

g) the introduction and detailed elaboration of rules for performance improvement; and

h) the relevant information to be disclosed to third parties.

4. The algorithm monitoring methodology pursuant to paragraph 2 shall include at least for continuous trading matching algorithm:

a) the relevant indicators to monitor the algorithm's ability to maximise the economic surplus, which shall include at least:
   i. indicators of the time needed to process an order;
   ii. indicators of the time needed to process a trade;
   iii. indicators of the time needed to produce post-coupling output.

b) the relevant indicators to monitor the algorithm scalability, which shall include at least:
   i. indicators on the evolution of the topology over time, in terms of number of bidding zones and network constraints;
   ii. indicators on the evolution of the number of submitted orders of each product type per bidding zone over time, and the corresponding total volume.

c) indicators on the evolution of the number of matched orders of each product type per bidding zone over time, and the corresponding total volume;

d) the relevant thresholds (including critical thresholds) to identify performance deteriorations;

e) the frequency, level of detail, confidentiality and process for the different reporting of the outcome of the monitoring activity towards all NEMOs, all TSOs, all regulatory authorities and the relevant stakeholder fora organised in accordance with Article 11 of the CACM Regulation;

f) the process to be followed to restore performance and compliance in case needed, in coordination with all TSOs and informing all regulatory authorities;

g) the introduction and detailed elaboration of rules for performance improvement; and

h) the relevant information to be disclosed to third parties.

5. The algorithm performance shall be measured against the criteria specified in paragraphs 3 and 4 and further elaborated in the algorithm monitoring methodology. Whenever a performance deterioration or a non-compliance with an implemented functionality is detected according to the algorithm monitoring methodology, all NEMOs shall:

Deleted: block
Deleted: and paradoxically rejected minimum income condition orders;
Deleted:
Deleted: relevant
Deleted: :¶
Deleted: repeatability of results
Deleted: machine
Deleted: topology over time, in terms of
Deleted:
Deleted: Indicators
Deleted:
Deleted: along the time
Deleted: NRAs
Deleted: forums
Deleted: NRAs
Deleted: and the relative channels
Deleted: Algorithm Monitoring Procedure
Deleted: ,
Deleted: algorithm optimality
Deleted: Indicators
Deleted:
Deleted: Indicators
Deleted: Indicators
Deleted:
Deleted: Indicators
Deleted: NRAs
Deleted: forums
Deleted:
Deleted: NRAs
Deleted: and the relative channels
Deleted: Algorithm Performance
Deleted: as
Deleted: this Article 9.
Deleted: Algorithm Requirement
Deleted: procedures under previous Article 9(1),

a) promptly inform all TSOs and all regulatory authorities;
b) investigate to the fullest extent possible and share its findings with relevant stakeholder fora organised in accordance with Article 11 of the CACM Regulation;
c) evaluate any potential improvement of the algorithm, to be introduced following a request for change;
d) communicate to all TSOs and all regulatory authorities the solution identified, supported by relevant documentation; and
e) eventually initiate the request for change process described in Title 4.

6. All NEMOs in coordination with all TSOs shall jointly develop and publish a yearly report on the outcome of the monitoring of the algorithm performance, which should contain at least: (i) all items listed in paragraph 1 and 2 of this Article; (ii) all cases of performance deterioration or non-compliance with an implemented functionality; (iii) a description of the reasons of these occurrences and the used or suggested remedies or future improvements; and (iv) a presentation of the conclusions made in cooperation with the relevant stakeholder fora organised in accordance with Article 11 of the CACM Regulation.

Article 7

Scalability management

1. All NEMOs shall guarantee the usage of any functionality by any NEMO or TSO that impacts the algorithm performance up to an upper bound defined by the usage range taking into account the requirement of adequate scalability.

2. Usage range shall be calculated as a function of the anticipated usage commonly agreed by all NEMOs in coordination with all TSOs and shall be defined in the change control methodology pursuant to Article 10.

3. All NEMOs shall monitor the effective usage of any functionality by any NEMO or TSO impacting the algorithm performance in accordance with Article 6.

4. When the algorithm supports a specific functionality, the effective usage and the anticipated usage of the functionality shall serve as the basis for future assumptions related to the impact on the algorithm performance of this functionality (including the testing of other requests for change). The anticipated usage for a new functionality is indicated by the same NEMO or TSO in a submitted request for change. For existing functionalities, the anticipated usage shall be derived from the effective usage according to a formula commonly agreed amongst all NEMOs and shall be defined in the change control methodology. Anticipated usage is used for the purpose of testing the impact of a request for change at a time horizon set by all NEMOs in the change control methodology.

5. All NEMOs shall review annually the usage range of any functionality impacting the algorithm performance on the basis of the estimated level of scalability and report about them in the scalability report referred to in paragraph 7 below.

6. All NEMOs shall estimate each year for the following years the level of scalability on the basis of at least the following information related to the received requests for change and research and development activities:
a) the extension of the SDAC and SIDC to additional bidding zones and/or NEMOs;
b) the implementation of operation of multiple NEMOs within a bidding zone or a scheduling area;
c) the extension of the usage of products and requirements to additional bidding zones and/or NEMO trading hubs; and
d) the anticipated results from the activity of research and development.

Deleted: NRAs
Deleted: and
Deleted: forums
Deleted: Request
Deleted: Change
Deleted: NRAs
Deleted: Request
Deleted: Change
Deleted: under
Deleted: 10
Deleted: <#>¶ The
Deleted: <#>in production
Deleted: <#>of any Functionality impacting the Algorithm Performance, with related adequacy of scalability and impact on the Algorithm Performance, shall be guaranteed only
Deleted: <#>Usage Range
Deleted: The Effective
Deleted: production
Deleted: of any Functionality
Deleted: Algorithm Performance shall be subject to monitoring following the Algorithm Monitoring Procedure.
Deleted: After a Functionality is available in production, the Effective Usage and the Anticipated Usage of
Deleted: Functionality
Deleted: Algorithm Performance
Deleted: Functionality
Deleted: Requests for Change).
Deleted: The Usage Range
Deleted: Functionality
Deleted: Algorithm Performance shall be reviewed yearly,
Deleted: adequate scalability
Deleted: The level of adequate scalability is estimated
Deleted: , among others,
Deleted: included in the Request for Change referred to:
Deleted: The
Deleted: The
Deleted: local multi NEMO
Deleted: The
Deleted: in further
Deleted: The

7. All NEMOs shall develop, publish and send to all regulatory authorities a yearly scalability report including at least:
   a) the outcome of the assessment of the estimated level of scalability for the following years and whether this level meets the adequate scalability, including the assessment of the effective usage, anticipated usage and usage range; and
   b) the perspective projects scoped for the research and development activity with the related estimated workload.

Article 8

Corrective measures

1. In case all NEMOs detect an unanticipated degradation of the algorithms' performance below the thresholds referred to in Article 6(3)(d) and Article 6(4)(d) due to an overall effective usage higher than the usage range, they may decide to apply specific corrective measures with the aim to maintain adequate performance of the algorithms.
2. Any NEMO(s) and/or TSO(s) may initiate a proposal for the application of a corrective measure. The proposal shall be submitted to all NEMOs by a request for change in accordance with the principles defined in Article 10. Any specificities on the submission of requests for change proposing the application of corrective measures shall be specified in the change control methodology in accordance with Article 9.
3. All NEMOs in coordination with all TSOs shall jointly evaluate any requests for change proposing the application of corrective measures in an objective and non-discriminatory manner in accordance with the principles defined in Article 11. Any specificities on the evaluation of requests for change proposing the application of corrective measures shall be specified in the change control methodology in accordance with Article 9.
4. All NEMOs in coordination with all TSOs shall jointly decide on submitted requests for change proposing the application of corrective measures in an objective and non-discriminatory manner in accordance with the principles defined in Article 12. Any specificities on the decision making process for the requests for change proposing the application of corrective measures shall be set out in the change control methodology in accordance with Article 9.
5. The corrective measures referred to in paragraph 1 may be applied only for a limited time period to solve unanticipated impacts on the algorithm performance. After the deadlines referred to in Article 4(15)(d) and Article 5(15)(c), the application of a corrective measure shall be limited to six months and an extension of it shall not be possible.
6. The corrective measures referred to in paragraph 1 shall be limited to:
   a) limitations to combinations of products that NEMOs are allowed to use;
   b) limitations to the algorithm requirements; and
   c) limitations on the usage of products or requirements based on usage range; and
   d) changes in parameters related to the operation of the algorithm, the algorithm monitoring methodology or the change control methodology.
7. Corrective measures referred to in paragraph 6(c) may be applied only if other corrective measures in paragraph 6 prove to be infeasible or insufficient for restoring the algorithm performance.
8. In case all NEMOs apply a corrective measure to limit the usage of products or requirements whose effective usage turns out to be higher than the usage range pursuant to paragraph 6(c), they shall limit the usage of these functionalities according to the sharing rules that shall be defined in the change

Deleted: NEMO
Deleted: NRAs and publish
Deleted: The methodology and
Deleted: adequate
Deleted: ;
Deleted: The
Moved (insertion) [6]
Moved (insertion) [7]
Moved up [7]: <#>Corrective measures¶
Deleted: <#>Algorithm Performance
Deleted: <#>critical
Deleted: <#>indicated
Deleted: <#>9
Deleted: <#>9
Deleted: <#>is detected according to the Algorithm Monitoring Procedure,
Deleted: <#>Effective Usage
Deleted: <#>Usage Range, all NEMOs shall
Deleted: <#>which
Deleted: <#>Corrective
Deleted: <#>are to be applied, if any, as a last resort measure
Deleted: <#>allow restoring
Deleted: <#>scalability. ¶
Where a decision in accordance with previous Article 9(12) impacts the algorithm requirements proposed by all TSOs (or by all TSOs and all NEMOs jointly), all TSOs shall have
Deleted: <#>right to approve or reject the decision from all NEMOs. For this purpose, all NEMOs shall provide all TSOs all relevant information and deemed approval of all NEMOs decisions will apply in case no different decision is communicated by TSOs before an agreed timeline.
Deleted: Corrective measures
Deleted: include, among others,
Deleted: combination
Deleted: or
Deleted: , or of
Deleted: ,
Deleted: the Usage Range.
Deleted: Any Corrective

control methodology. In such a case, all NEMOs and all TSOs shall implement measures to ensure their compliance with these agreed limitations. In case any NEMO(s) or TSO(s) breaches such limitations and fails to take timely measures, each NEMO shall report such events to the competent regulatory authority.

9. Any corrective measure shall guarantee non-discriminatory principles among market participants and NEMOs.

10. All NEMOs shall announce publicly any introduction or discontinuation of a corrective measure at least seven calendar days before its introduction or discontinuation and maintain an up-to-date publicly accessible list of currently applied corrective measures.

11. No later than four weeks after the introduction of a corrective measure, all NEMOs shall publish a report indicating the corrective measure applied and the reasons for applying it. After the discontinuation of a corrective measure, the report shall be updated with additional information on the future measures planned by all NEMOs to address the problems that have caused the application of a corrective measure.

TITLE 4

Algorithm change management

Article 9

Change control methodology

1. All NEMOs in coordination with all TSOs shall jointly manage the requests for change to the price coupling algorithm's or continuous trading matching algorithm's functionalities and usage, according to the principles set out in this Article.

2. By 1 August 2019, all NEMOs in coordination with all TSOs shall jointly develop a change control methodology and all NEMOs shall propose it as an amendment to this Algorithm methodology in accordance with Article 9(13) of the CACM Regulation. After its approval in accordance with Article 9 of the CACM Regulation, the change control methodology shall form an annex to this methodology.

3. The change control methodology shall further develop the principles for the submission, evaluation, decision and implementation of requests for change as set out in Articles 10 to 12. Specifically, the change control methodology shall at least contain the following:
   a) the methodology for calculating the effective usage, anticipated usage and usage range in accordance with Article 7(2) and 7(4);
   b) the specificities for the submission evaluation and submission of requests for change proposing the application of corrective measures in accordance with Article 8(2) to (4);
   c) the rules for sharing the limitations on the usage of functionalities among individual NEMOs and TSOs in accordance with Article 8(8);
   d) the process and template for submission of requests for change in accordance with Article 10(2);
   e) the principles and criteria for the evaluation of requests for change in accordance with Article 11(1) including the periodicity of evaluation in accordance with Article 11(4);
   f) the modalities of coordination between all NEMOs and all TSOs in the decision-making on requests for change in accordance with Article 12(1);
   g) the procedure for the establishment of the independent arbitral tribunal and nomination of its members, as well as the decision process through which the tribunal shall reach a binding decision in accordance with Article 12(5).

Deleted: Market Participants

Deleted:

Deleted: In case limitations

Deleted: the usage are

Deleted: issue

Deleted: public

Deleted: Corrective measures

Deleted: Remedial Action(s).

Deleted: <#>All NEMOs or TSOs shall in such case implement measures to prevent violation of the agreed limitations to the usage. In case any NEMO or TSO breaches the limitations to the usage and fails to take timely measures, the other NEMOs are entitled to report it to all NRAs. ¶
At the end of industrialization phase, all NEMOs are entitled to apply Corrective measures only on a temporary basis, and anyway not beyond 6 months, to solve unanticipated impacts on Algorithm Performance. In the prototyping phase, all NEMOs are entitled to apply Corrective measures to

Deleted: consequences of limited scalability. ¶
Article 10¶
Change Management Principles¶
All NEMOs shall manage changes

Deleted: algorithm

Deleted: algorithm Functionalities

Deleted: in this Article 10. The principles shall be incorporated into the Change Control Procedure as provided under

Moved up [6]: Article 8

Deleted: (2)(d), which will be published and maintained updated according to Article 11(2) provisions.

4. The change control methodology shall also define the rules for deciding on limitations on products or their usage in specific bidding zones or requirements supported by the algorithm in case not all products or requirements can be supported as referred to in Article 3(6). Such rules shall not discriminate among and between NEMOs and TSOs and, in case of change requests, between change requests and the already implemented requirements, products and functionalities.

Article 10

Submission of requests for change

1. Any NEMO(s) and/or TSO(s) is entitled to submit to all NEMOs at any time a request for change to the price coupling algorithm or continuous trading matching algorithm for the usage of existing functionalities and the implementation of new functionalities.

2. The NEMO(s) and/or TSO(s) requesting a change shall submit a request for change to all NEMOs according to a template and process, which shall be described in the change control methodology. The NEMO(s) and/or TSO(s) requesting a change shall fully specify their requirement, including the anticipated usage and any subsequent effect on other processes or systems.

3. NEMO(s) and/or TSO(s) submitting a request for change to all NEMOs shall ensure that the request for change induces only a proportionate and controlled impact on the algorithm performance and avoids significant harm to any other functionality already included in the price coupling algorithm or continuous trading matching algorithm.

5. Requests for change shall be compatible with the requirements after they have been implemented in accordance with the deadlines set out in Article 4(15) and Article 5(15).

6. Any NEMO(s) or TSO(s) may join a request for change submitted by another NEMO(s) or TSO(s). The NEMO(s) or TSO(s) that originally submitted the request for change and the NEMO(s) or TSO(s) joining the request for change may decide jointly to modify the submitted request for change.

7. Requests for change that aim to improve the algorithm performance shall be deemed to be to the benefit of all NEMOs and/or all TSOs and those NEMOs and/or TSOs shall be entitled to define such requests for change as a common proposal of all NEMOs and/or all TSOs.

8. Any request for change shall specify whether the associated costs arising from this change shall be treated as national, regional or common in accordance with Article 80(2) of the CACM Regulation.

Article 11

Evaluation and treatment of requests for change

1. All NEMOs in coordination with all TSOs shall jointly evaluate any request for change in an objective and non-discriminatory manner and shall jointly issue an evaluation report for each submitted request for change. The evaluation shall be performed in line with the principles and criteria that are set out in this Article. Those principles and criteria may be further detailed in the change control methodology.

2. When evaluating a request for change, all NEMOs in coordination with all TSOs shall take into account any impact of a request for change on the performance of the MCO function, systems and processes. The impact of a request for change on the algorithm performance, existing functionalities, adjacent systems and processes shall be evaluated based on the anticipated usage of the new functionality together with the anticipated usage of existing functionalities, in order to ensure its

Moved (insertion) [5]

Deleted: ¶
Moderation and control¶
¶
Any Request for Change shall induce

Deleted: ,

Deleted: Algorithm Performance

Deleted: no

Deleted: Functionality

Deleted: Any Request

Deleted: Change

Deleted: Initial Requirements and Future Requirements following their implementation.

Deleted: <#>Any impact on the performance of related MCO function systems and processes shall also be taken into account.¶
¶
Fair and Non-Discriminatory Treatment of

Deleted: *Change*¶
¶
All NEMOs and TSOs are entitled to use any Functionality subject to approval of a Request for Change. ¶
NEMOs shall handle any Request for Change in an objective and non-discriminatory manner, according to the criteria set out in the Change Control Procedure. ¶
Requests for Change

Deleted: Algorithm Performance are

Deleted: of

Deleted: to

Deleted: ,

Deleted: shall be decided upon by

Deleted: . Similarly, all NEMOs are

Deleted: decide that any Request

Deleted: Change is considered

Deleted: <#>Any NEMO respectively TSO is entitled to join another NEMOs´ respectively TSOs´ Request for Change provided that (i) the additional NEMO(s) respectively TSO(s) is entitled to request modifications to the Request for Change and which the original requesting NEMO(s) respectively TSO(s) shall consider in good faith and not unreasonably reject, and that (ii) the original requesting NEMO(s) respectively TSO(s) and any additional NEMO respectively TSO shall, as long as Article 10(7) is not deemed by all NEMOs to apply, bear the associated costs (where any cost sharing shall be in accordance with the CACM Regulation). ¶
All NEMOs respectively TSOs are entitled to request for the implementation of a new Functionality subject to approval ... [68]

Deleted: or other systems.¶

Deleted: Request

Deleted: Change

Deleted: Algorithm Performance

Deleted: Functionalities

Deleted: assessed

Deleted: Anticipated Usage

Deleted: Functionality

Deleted: Anticipated Usage

Deleted: Functionalities

technical feasibility and consistency with the performance criteria approved in the algorithm monitoring methodology.

3. The evaluation of the submitted requests for change shall classify the requests into one of the following categories:
   a) Non-notifiable change (type I): is a change without impact on market participants nor potential adverse impact on the algorithm performance and therefore stakeholders do not need to be informed of the change;
   b) Notifiable change (type II): is a change which has no potential adverse impact on the algorithm performance, but it has an impact on market participants. In such a case, stakeholders shall be informed of the change at least one month ahead of its implementation;
   c) Consulted change (type III): is a change with potential adverse impact on the algorithm performance. In such a case, NEMOs shall consult stakeholders according to the process agreed upon in the relevant stakeholders' committee and will take their responses into consideration;
   d) Methodology amendment (type IV): is a change which requires an amendment to the Algorithm methodology or its annexes. In such a case, all NEMOs shall follow the formal amendment process set out in Article 9(13) of the CACM Regulation, including the consultation process as described in Article 12 of the CACM Regulation.

4. The evaluation of requests for change shall be carried out periodically in different evaluation timeframes based on the issuing date and/or the anticipated go live date of the request for change according to the criteria described in the following paragraphs and the periodicity of evaluation defined in the change control methodology.

5. The evaluation of the requests for change related to the same implementation timeframe shall first be considered in combination. Where such a combination breaches the performance criteria referred to in paragraph 2, a second evaluation based on individual impact shall be done.

6. In case multiple requests for change can be implemented individually, but not together, the following prioritisation shall apply:
   a) First: extending the SDAC and SIDC to all bidding zones and all NEMOs eligible to participate in the SDAC and SIDC; and
   b) Second: supporting the extension of the set of products or requirements used in one or more bidding zones.

7. In case the requests for change involves simultaneously more than one of the principles referred to in paragraph 6 above, the requests for change shall be evaluated on a case-by-case basis depending on the specific nature of the request.

8. In case an evaluation by all NEMOs in coordination with all TSOs shows that a request for change requires an amendment of this methodology, i.e. type IV pursuant to paragraph 3, the procedure pursuant to Article 9(13) of the CACM Regulation shall be followed before taking any decision on that request.

Article 12

Decision-making and implementation of requests for change

1. Requests for change shall be approved or rejected jointly by all NEMOs in coordination with all TSOs. The modalities of such a coordination may be defined in the change control methodology and possible agreements between NEMOs and TSOs.

2. The decision on a request for change shall be completed within six months after all NEMOs have

Deleted: Algorithm Monitoring Procedure

Deleted: <#>Depending on the Impact assessment reported in the Request for Change submission, Requests for Change are classified as ¶

Deleted: Notifiable…otifiable change (type I): where no…is a change without impact on market parties…articipants nor potential adverse impact on the Algorithm Performance in such a case …lgorithm performance and therefore stakeholders a … [69]

Deleted: where the…is a change which has no potential adverse impact on the Algorithm Performance…lgorithm performance, but it has an impact on market parties…articipants. In such a case, stakeholders are … [70]

Deleted: where there…is a change with potential adverse impact on the Algorithm Performance.…lgorithm performance. In such a case, NEMOs shall consult stakeholders,…according to the format…rocess agreed upon in the relevant Stakeholders Committee…takeholders' committee and will take respor … [71]

Deleted: where…is a change is required…hich requires an amendment to the Algorithm Proposal…ethodology or its annexes. In such a case the… all NEMOs shall follow the formal CACM Regulation … [72]

Deleted: Requests for Change can be submitted on a continuous basis, provided that evaluation is…he evaluation of requests for change shall be carried out periodically in different assessment…valuation timeframes based on the basis of…issuing date and/or the anticipated go live date of the Request…equest for Change,…hange according to the criteria described in the following articles, with such…aragraphs and the periodicity being…f evaluation defined in the Change Control Procedure … [73]

Deleted: assessment…valuation of Request…he requests for Change…hange related to the same implementation timeframe shall first be considered in combination. Where such a combination breaches the acceptance…erformance criteria referred to in paragraph 2, a second assessment … [74]

Deleted: Requests…equests for Change are supported …hange can be implemented individually, but not together, the following prioritization … [75]

Deleted: Extending…irst: extending the SDAC or…nd SIDC to the scope anticipated under the CACM Regulation; … [76]

Deleted: <#>Supporting multiple NEMO operation per bidding zone;¶
Supporting…econd: supporting the extension of the set of products or requirements used in one or more bidding zones, in order to allow for fair and non-discriminatory treatment of different parties … [77]

Deleted: Requests…equests for Change…hange involves simultaneously more than one of the principles under Article 10(16),…eferred to in paragraph 6 above, the Requests…equests for Change…hange shall be evaluated on a case …by …case basis depending on the specific nature of the request and a public report shall be issued, indicating the decision, the reason for the decision, the principles behind the decision and the specific assessm … [78]

Deleted: the Requests…n evaluation by all NEMOs in coordination with all TSOs shows that a request for Change implies a …hange in the methodologies as envisioned in…equires … [79]

Moved (insertion) [8]

Deleted: <#>At the end of the industrialization phase, all Requests for Change respecting previous criteria, shall be implemented within a reasonable timeframe, following i … [80]

Deleted: <#>¶
Requests for Change must…hange shall be approved by all NEMOs based on an objective evaluation report.¶ … [81]

Deleted: Any

received the request for change.

3. The decisions by all NEMOs in coordination with all TSOs shall be justified by the evaluation report referred to in Article 11(1) and the objectives set out in Articles 3 and 37 of the CACM Regulation.

4. Any NEMO(s) and/or TSO(s) is entitled to challenge a decision by all NEMOs in coordination with all TSOs pursuant to paragraph 1 by requesting a referral to an independent arbitral tribunal for a binding decision.

5. The independent arbitral tribunal shall be appointed jointly by all NEMOs in coordination with all TSOs. The procedure for the establishment of the independent arbitral tribunal and nomination of its members, as well as the decision process through which the tribunal shall reach a binding decision shall be defined in the change control methodology pursuant to Article 9(2).

6. Instead of taking the decisions themselves, all NEMOs in coordination with all TSOs may decide to refer their decision pursuant to paragraph 1 and paragraph 2 respectively to an independent arbitral tribunal for a binding decision.

7. All NEMOs shall provide all relevant information regarding the status of a request for change to all interested parties requesting such information.

8. After the decision on the request for change, all NEMOs in coordination with all TSOs shall issue a public report indicating the decision, the reason for the decision, the principles behind the decision and the evaluation report as referred to in Article 11(1), in order to ensure transparency on the change request process.

9. All accepted requests for change shall be implemented within a reasonable timeframe, following, if needed, the prioritisation principles referred to in Articles 11(6) and 11(7).

TITLE 5

Transparency and monitoring

Article 13

Publications

1. All NEMOs shall publish and maintain a set of documents to be formally updated and consulted with the relevant stakeholder fora, organised in accordance with Article 11 of the CACM Regulation.

2. All NEMOs shall publish, continuously update and consult in the relevant stakeholder fora the following draft documents:
   a) the public description of the price coupling algorithm as referred to under Article 4(20);
   b) the public description of the continuous trading matching algorithm as referred to under Article 5(20).

3. All NEMOs shall develop and publish with the relevant periodicity the following reports:
   a) the report on incidents in the operation of the price coupling algorithm and the continuous trading matching algorithm and on the application of back-up and fallback procedures in accordance with the back-up methodology and fallback methodology and in accordance with Article 4(18) and Article 5(18);
   b) the report on research and development activities in accordance with Article 4(19) and Article 5(19);
   c) the reports on the outcome of the monitoring of the algorithm performance in accordance with Article 6(6);

Deleted: required

Deleted: accordance

Deleted: this Algorithm Proposal

Deleted: motivated

Deleted: reference

Deleted: <#>Before rejecting the Request for Change, all NEMOs are entitled to decide to refer a decision in accordance with this Algorithm Proposal to an independent arbitral tribunal for a binding decision.¶

Deleted: <#>

Deleted: <#>Request for Change approved or rejected in accordance with this Algorithm Proposal

Deleted: Referrals under Articles 10(25) and 10(26)

Deleted: :¶
follow procedures

Deleted: established

Deleted: ,

Deleted: ;

Deleted: be submitted

Deleted:

Deleted: whose members shall be jointly appointed by all NEMOs and all TSOs

Deleted: *<#>Article 11*¶
Stakeholders involvement¶
In order to promote market transparency and proper level of stakeholder involvement, and to ensure that the price coupling algorithm and the continuous trading matching algorithm is managed and developed in an objective and non-discriminatory manner, the following provisions apply.¶
All NEMOs shall

Deleted: ¶

Deleted: public description,

Deleted: on a periodic basis

Deleted: forums

Deleted: , of the following documents:

Deleted: as referred to under Articles 4

Deleted: 6;¶
the Algorithm Monitoring Procedure as referred to under Article 9;¶
the Change Control Procedure, referred to under Article 10;¶
the appointment of the independent arbitral tribunal, referred to under Articles 10(27).¶
All NEMOs shall maintain an updated public record of:¶
approved and rejected Requests for Change referred to under Article 10(21), with the relevant motivation;¶
applied Corrective measures, referred to under Article 9(16);¶
the performance results of the algorithm, measured accordingly to the criteria referred to in the Algorithm Monitoring Procedure;¶
any incident visible to market parties, and

Deleted:

Deleted: fall-back

Deleted: .¶ ... [82]

Deleted: the price coupling algorithm implementation f ... [83]

Deleted: <#>¶

Moved up [8]: <#>Article 12¶

d) the report on scalability in accordance with Article 7(7);
e) the report on the application of corrective measures in accordance with Article 8(11); and
f) the reports on the decisions on requests for change in accordance with Article 12(7).

4. All NEMOs shall publish and maintain a continuously updated record of the currently and historically applied corrective measures.

5. All NEMOs shall publish, pursuant to Article 62(2) of the CACM Regulation:
   a) the aggregated volumes of all trades made per contract per bidding zone – two values are requested, sell volumes and buy volumes;
   b) the volume-weighted average intraday prices per contract and bidding zone[1]; and
   c) the volume-weighted average intraday prices per contract and bidding zone that took place during the last trading hour[2].

   The information shall be published no later than 12:00 on the day following the trading day.

Article 14

Monitoring

Moved (insertion) [3]

1. The regulatory authorities or relevant authorities primarily responsible for monitoring NEMOs in accordance with Article 82(1) of the CACM Regulation shall have the power to request from the respective NEMOs all information and data used in the monitoring of the algorithm performance, historical input data used by the algorithms in calculating SDAC and SIDC results, as well as the access to the source code of the algorithms subject to non-disclosure agreement. They shall provide access to this information and data to other regulatory authorities and the Agency.

2. The regulatory authorities or relevant authorities primarily responsible for monitoring NEMOs in accordance with Article 82(1) of the CACM Regulation shall have the power to request from the respective NEMOs the simulation of the algorithm results, respecting adequate repeatability pursuant to Article 3(7)(b) and Article 3(8)(b) of this methodology. They shall provide access to this possibility to other regulatory authorities and the Agency.

TITLE 6

Final provisions

Article 15

Language

The reference language for this Algorithm methodology shall be English. For the avoidance of doubt, where NEMOs need to translate this Algorithm methodology into the national language(s) of a relevant national regulatory authority, in the event of inconsistencies between the English version published by the NEMOs in accordance with Article 9(14) of the CACM Regulation and any version in another language, the relevant NEMOs shall be obliged to dispel any inconsistencies by providing a revised translation of this Algorithm methodology to the relevant national regulatory authorities.

Deleted: proposal

Deleted: proposal

Deleted: their

Deleted:),

Deleted: proposal

Deleted: their

Deleted: ¶
ANNEX 1 – Price coupling algorithm requirements¶
ANNEX 2 – continuous trading matching algorithm requirements

[1] For the calculation of this indicator, all trades where either the seller, the buyer or both are located in the relevant bidding zone are to be considered and weighed equally.
[2] See footnote 1.

Page 1: [1] Deleted	Author

proposal shall indicate the time limit for the submission of received orders by NEMOs required to perform the MCO functions in accordance with Article 7(1)(b)."

In accordance with Article 37(3) of the CACM Regulation the NEMOs' proposal for the algorithm "*shall be submitted to all TSOs. If additional time is required to prepare this proposal, all NEMOs shall work together supported by all TSOs for a period of not more than two months to ensure that the proposal complies with paragraphs 1 and 2.*"

In accordance with Article 37(4) of the CACM Regulation "*The proposals referred to in paragraphs 1 and 2 shall be subject to consultation in accordance with Article 12*". The consultation on all proposals - i.e., the TSOs' and NEMOs' DA and ID Algorithm Requirements and the NEMOs' proposal for the Algorithm Proposal - was prepared in cooperation between all TSOs and all NEMOs and was consulted upon together to ensure efficient assessment of their content by market participants.

In accordance with Article 37(5) of the CACM Regulation the all NEMOs' proposal for the Algorithm Proposal, incorporating the TSOs' and NEMOs' DA and ID Algorithm Requirements and taking into account the comments from the consultation, has been submitted to the regulatory authorities for approval no later than 18 months after the entry into force of the CACM Regulation - i.e., 14 February 2017.

In accordance with Article 9(12) of the CACM Regulation all NRAs sent to all NEMOs a "Request for amendment by all Regulatory Authorities agreed at the Energy Regulators' Forum", providing a detailed request commonly agreed among NRAs of improving the Algorithm Proposal, as well as the DA Algorithm Requirements and the ID Algorithm Requirements.

In accordance with the a

(1)

Page 1: [2] Deleted	Author

(1) of the CACM Regulation, "*The urgent completion of a fully functioning and interconnected internal energy market is crucial to the objectives of maintaining security of energy supply, increasing competitiveness and ensuring that all consumers can purchase energy at affordable prices.*"

Future evolution of capacity calculation methodologies in accordance with the CACM regulation may require additional input parameters. In this case, all TSOs shall send a request for amendments of the DA Algorithm Requirements to all NEMOs and later on for all NRAs' approval. An assessment of the additional functionalities shall take place at the latest when the proposal for the capacity calculation

(2)

Page 1: [3] Deleted	Author

in every capacity calculation region in accordance with the CACM Regulation is being developed by the TSOs. All TSOs and all NEMOs shall cooperate to propose any amendments if deemed necessary when the above proposals for the capacity calculation methodology is submitted for approval to the NRAs.

All NEMOs shall establish, consistent with the MCO plan, through the All NEMO Cooperation Agreement entered into by all NEMOs, the All NEMO Committee and associated governance arrangements compliant with the CACM Regulation. Joint NEMOs decisions and responsibilities regarding this Algorithm Proposal shall be coordinated via the All NEMO Committee and associated governance arrangements.

Impact on the objectives of CACM Regulation

The Algorithm Proposal

(3)

Page 1: [4] Deleted	Author

. The DA and ID Algorithm Requirements aim in particular at ensuring optimal use of the transmission

infrastructure (optimizing the calculation and allocation of cross-zonal capacity) and promoting effective competition in the generation, trading and supply of electricity while respecting the need for a fair and orderly market and fair and orderly price formation (encouraging the development of market liquidity).

(4)

Page 1: [5] Deleted **Author**

ID Algorithm Requirements support trading with multiple

(5)

Page 1: [6] Deleted **Author**

while facilitating a level playing field for NEMOs. The algorithms also allow

(6)

Page 1: [7] Deleted **Author**

reporting to all involved stakeholders and a transparent process (including consultation where relevant) to manage

(7)

Page 2: [8] Deleted **Author**

and intraday coupling process in accordance with Articles 40 and 53 of the CACM Regulation (hereafter referred to as the "Product Proposals"), support of some combinations of products in one single bidding zone might be not guaranteed. The same might apply to combinations of specific requirements. During the prototyping phase such combination might be adopted according to outcomes of Change Control Procedure depending on the impact on Algorithm Performance and with possible adoption of limits on the usage of such combinations.

In case the research and development activity carried out in the prototyping phase will not remove limitations on adoption of specific combinations of product as reported in Whereas 17, in the enduring solution the adoption of such combinations shall be forbidden.

Enduring solution – adequately maximized economic surplus

According to Article 38(1)(a) of the CACM Regulation, the price coupling algorithm "*aims at maximising economic surplus for single day-ahead coupling for the price-coupled region for the next trading day*".

According to Article 51(1)(a) of the CACM Regulation, the continuous trading matching algorithm "*aims at maximising economic surplus for*

(8)

Page 2: [9] Deleted **Author**

per trade for the intraday market time-frame by allocating capacity to orders for which it is feasible to match in accordance with the price and time of submission".

According to Article 2(46) of the CACM Regulation, "*economic surplus for the single day-ahead or intraday coupling' means the sum of (i) the supplier surplus for the single day-ahead or intraday coupling for the relevant time period, (ii) the consumer surplus for the single day- ahead or intraday coupling, (iii) the congestion income and (iv) other related costs and benefits*

(9)

Page 2: [10] Deleted **Author**

these increase economic efficiency for the relevant time period, supplier and consumer surplus being the difference between the accepted orders and the clearing price per energy unit multiplied by the volume of energy of the orders".

According to Article 48(1) of the CACM Regulation, "*No later than by the time specified by all TSOs in the*

(10)

Page 2: [11] Deleted **Author**

set out in Article 37(1)(a), all NEMOs performing MCO functions shall deliver the single day-ahead coupling results".

(11)

Page 2: [12] Deleted **Author**

According to Article 59(4) of the CACM Regulation, "*The intraday energy trading for a given market time unit for a bidding zone border shall start at the latest at the intraday cross-zonal gate opening time of the relevant bidding zone borders and shall be allowed until the intraday cross-zonal gate closure time*".

Considering that the presence of

(12)

Page 4: [13] Deleted **Author**

deployed in its expected production environment; timely communication to NRAs and other stakeholders of the expected outcome of the process, in order to allow them adapting their own operational processes to the newly delivered solutions.

Since the final outcome of the research and development activity is still unknown, an amended detailed description of the enduring solution if needed shall be communicated to all NRAs and other stakeholders by the end of the prototyping phase.

In order to implement the SDAC and SIDC as soon as possible (e.g. market coupling in all EU plus Norway), an interim solution, based on the existing solutions, shall be adopted until solution fully compliant with the CACM Regulation, the enduring solution, is delivered.

In order to minimize the risk of decoupling, some limits to the usage of the existing Functionalities might be imposed

(13)

Page 4: [14] Deleted **Author**

a last resort measure.

Day to day management

According to Article 10 of the CACM Regulation, "*TSOs and NEMOs shall jointly organise*

(14)

Page 4: [15] Deleted **Author**

. They shall meet regularly to discuss and decide on day-to-day operational issues. TSOs and NEMOs shall invite the Agency and the Commission as observers to these meetings and shall publish summary minutes of the meetings".

(15)

Page 4: [16] Deleted **Author**

The day to day management shall include, among others, the management of operational incidents, aiming to secure reliability of market coupling, plus the monitoring of algorithm performance and the management of Request for Changes to the algorithm from the NEMOs or TSOs, aiming to preserve adequate scalability.

According to Article 51(1)(e) of the CACM Regulation, continuous trading matching algorithm should be repeatable. Since continuous trading matching algorithm is based on price order principle and input time order principle and since it doesn't contain any element of randomness, current version of algorithm on the initial products is already repeatable from a theoretical point of view. This is the reason why there are no indicators about repeatability included in this Algorithm Proposal.

Implementation timeline

The implementation timeline for both single day-ahead coupling (SDAC) and single intraday coupling (SIDC) relies on the approval by All NRAs of All NEMOs Methodologies and proposals, on the approved MCO Plan implementation timeline and content until June 2018.

The implementation timeline shall include a proper phase dedicated to research and development activity to be carried out on existing solutions for DA and ID aimed at reaching a solution complying with the properties of the enduring solution, e.g. based on stipulations described in Whereas 16-40 above (prototyping phase).

SUBMIT THE FOLLOWING ALGORITHM PROPOSAL TO ALL REGULATORY AUTHORITIES:

Page 4: [17] Deleted **Author**

Algorithm Requirements shall be considered as the common proposal of all NEMOs and all TSOs, in accordance with Article 37 of the CACM Regulation.

1.

Page 7: [18] Deleted **Author**

function requirements, which relate to the joint responsibility of TSOs to calculate and publish Scheduled Exchanges on borders

1.

Page 7: [19] Deleted **Author**

in accordance with Article 8(2)(g) of the CACM Regulation

2.

Page 7: [20] Deleted **Author**

referred to in the DA (respectively ID) Product Proposal and for

3.

Page 7: [21] Deleted **Author**

could not be guaranteed (i.e. feasible only under limited scalability) or even not allowed. Such combinations shall be indicated in the Algorithm Monitoring Procedure as further

a)

Page 7: [22] Deleted **Author**

market unit. The results of the price coupling algorithm shall fulfil the maximization thresholds defined according to Article 9(3);

a)

Page 7: [23] Deleted **Author**

thus ensuring the delivery of the same result for two different runs

b)

Page 7: [24] Deleted **Author**

ensuring the possibility to apply the algorithm to a larger number of i) bidding zones, ii) NEMOs, iii) volumes of bids and offers, with reference to the whole European extension. At the end of the prototyping phase, the enduring solution of the price coupling algorithm shall at least:

Page 7: [25] Deleted **Author**

in the EU plus Norway;

respect allocation constraints applying both ATC methodology and flow-

c)

Page 8: [26] Deleted **Author**

support the operation of multiple NEMOs in a same bidding zone;

Page 8: [26] Deleted **Author**

support the operation of multiple NEMOs in a same bidding zone;

Page 8: [26] Deleted **Author**

support the operation of multiple NEMOs in a same bidding zone;

Page 8: [27] Deleted **Author**

Support a reasonable usage of the products reported under previous letter iv), to be assessed against the anticipated/effective usage;

d)

Page 8: [27] Deleted **Author**

Support a reasonable usage of the products reported under previous letter iv), to be assessed against the anticipated/effective usage;

e)

Page 8: [27] Deleted **Author**

Support a reasonable usage of the products reported under previous letter iv), to be assessed against the anticipated/effective usage;

f)

Page 8: [27] Deleted **Author**

Support a reasonable usage of the products reported under previous letter iv), to be assessed against the anticipated/effective usage;

g)

Page 8: [28] Deleted **Author**

fulfils

4.

Page 8: [28] Deleted **Author**

fulfils

5.

Page 8: [28] Deleted **Author**

fulfils

6.

Page 8: [28] Deleted	Author

fulfils

7.

Page 8: [28] Deleted	Author

fulfils

8.

Page 8: [28] Deleted	Author

fulfils

9.

Page 8: [28] Deleted	Author

fulfils

10.

Page 8: [28] Deleted	Author

fulfils

11.

Page 8: [28] Deleted	Author

fulfils

12.

Page 8: [29] Deleted	Author

maximizing the

a)

Page 8: [29] Deleted	Author

maximizing the

b)

Page 8: [29] Deleted	Author

maximizing the

c)

Page 8: [29] Deleted	Author

maximizing the

d)

Page 8: [29] Deleted	Author

maximizing the

e)

Page 8: [30] Deleted	Author

The continuous trading matching algorithm shall respect the delivery of results according to Article 60 of the CACM Regulation;

Page 8: [30] Deleted	Author

The continuous trading matching algorithm shall respect the delivery of results according to Article 60 of the CACM Regulation;

Page 8: [30] Deleted	Author

The continuous trading matching algorithm shall respect the delivery of results according to Article 60 of the CACM Regulation;

Page 8: [30] Deleted	Author

The continuous trading matching algorithm shall respect the delivery of results according to Article 60 of the CACM Regulation;

Page 8: [30] Deleted **Author**

The continuous trading matching algorithm shall respect the delivery of results according to Article 60 of the CACM Regulation;

Page 8: [30] Deleted **Author**

The continuous trading matching algorithm shall respect the delivery of results according to Article 60 of the CACM Regulation;

Page 8: [30] Deleted **Author**

The continuous trading matching algorithm shall respect the delivery of results according to Article 60 of the CACM Regulation;

Page 8: [30] Deleted **Author**

The continuous trading matching algorithm shall respect the delivery of results according to Article 60 of the CACM Regulation;

Page 8: [30] Deleted **Author**

The continuous trading matching algorithm shall respect the delivery of results according to Article 60 of the CACM Regulation;

Page 8: [31] Deleted **Author**

the possibility to apply the algorithm to a larger number of i)

f)

Page 8: [31] Deleted **Author**

the possibility to apply the algorithm to a larger number of i)

g)

Page 8: [31] Deleted **Author**

the possibility to apply the algorithm to a larger number of i)

h)

Page 8: [31] Deleted **Author**

the possibility to apply the algorithm to a larger number of i)

i)

Page 8: [32] Deleted **Author**

be based on the Existing DA Algorithm Solution, as improved at the end of the prototyping phase dedicated to research and development processes.

The price coupling algorithm shall provide as outcome a solution, composed by a set of values for

1.

Page 8: [32] Deleted **Author**

be based on the Existing DA Algorithm Solution, as improved at the end of the prototyping phase dedicated to research and development processes.

The price coupling algorithm shall provide as outcome a solution, composed by a set of values for

2.

Page 8: [33] Deleted **Author**

the market

a)

Page 8: [33] Deleted	Author

the market

b)

Page 8: [33] Deleted	Author

the market

c)

Page 8: [33] Deleted	Author

the market

d)

Page 8: [34] Deleted	Author

the net position of each bidding zone, scheduling area and NEMO hub for each relevant MTU, the Scheduled Flow

e)

Page 8: [34] Deleted	Author

the net position of each bidding zone, scheduling area and NEMO hub for each relevant MTU, the Scheduled Flow

f)

Page 8: [34] Deleted	Author

the net position of each bidding zone, scheduling area and NEMO hub for each relevant MTU, the Scheduled Flow

g)

Page 8: [35] Deleted	Author

selection

h)

Page 8: [35] Deleted	Author

selection

i)

Page 8: [35] Deleted	Author

selection

j)

Page 8: [36] Deleted	Author

accepted percentage

k)

Page 8: [36] Deleted	Author

accepted percentage

l)

Page 8: [36] Deleted	Author

accepted percentage

m)

Page 8: [36] Deleted	Author

accepted percentage

n)

Page 8: [37] Deleted	Author

the Scheduled Flows

3.

Page 8: [37] Deleted	Author

the Scheduled Flows

4.

Page 8: [37] Deleted **Author**

the Scheduled Flows

5.

Page 8: [37] Deleted **Author**

the Scheduled Flows

6.

Page 8: [37] Deleted **Author**

the Scheduled Flows

7.

Page 9: [38] Deleted **Author**

For the bidding zones containing several TSOs separating their scope in different scheduling areas, the net position for each MTU and where relevant for each NEMO Hub will be calculated for each scheduling area. The inter bidding zone flow calculation functionality shall ensure that, when several routes might be possible for a given set of net positions, the price coupling algorithm shall provide the Scheduled Flows of the solution by minimizing a cost function on Scheduled Flows, using for this calculation a deterministic rule.

Page 9: [38] Deleted **Author**

For the bidding zones containing several TSOs separating their scope in different scheduling areas, the net position for each MTU and where relevant for each NEMO Hub will be calculated for each scheduling area. The inter bidding zone flow calculation functionality shall ensure that, when several routes might be possible for a given set of net positions, the price coupling algorithm shall provide the Scheduled Flows of the solution by minimizing a cost function on Scheduled Flows, using for this calculation a deterministic rule.

Page 9: [38] Deleted **Author**

For the bidding zones containing several TSOs separating their scope in different scheduling areas, the net position for each MTU and where relevant for each NEMO Hub will be calculated for each scheduling area. The inter bidding zone flow calculation functionality shall ensure that, when several routes might be possible for a given set of net positions, the price coupling algorithm shall provide the Scheduled Flows of the solution by minimizing a cost function on Scheduled Flows, using for this calculation a deterministic rule.

Page 9: [38] Deleted **Author**

For the bidding zones containing several TSOs separating their scope in different scheduling areas, the net position for each MTU and where relevant for each NEMO Hub will be calculated for each scheduling area. The inter bidding zone flow calculation functionality shall ensure that, when several routes might be possible for a given set of net positions, the price coupling algorithm shall provide the Scheduled Flows of the solution by minimizing a cost function on Scheduled Flows, using for this calculation a deterministic rule.

Page 9: [38] Deleted **Author**

For the bidding zones containing several TSOs separating their scope in different scheduling areas, the net position for each MTU and where relevant for each NEMO Hub will be calculated for each scheduling area. The inter bidding zone flow calculation functionality shall ensure that, when several routes might be possible for a given set of net positions, the price coupling algorithm shall provide the Scheduled Flows of the solution by minimizing a cost function on Scheduled Flows, using for this calculation a deterministic rule.

Page 9: [38] Deleted **Author**

For the bidding zones containing several TSOs separating their scope in different scheduling areas, the net position for each MTU and where relevant for each NEMO Hub will be calculated for each scheduling area. The inter bidding zone flow calculation functionality shall ensure that, when several routes might be possible for a given set of net positions, the price coupling algorithm shall provide the Scheduled Flows of the solution by minimizing a cost function on Scheduled Flows, using for this calculation a deterministic rule.

Page 9: [38] Deleted **Author**

For the bidding zones containing several TSOs separating their scope in different scheduling areas, the net position for each MTU and where relevant for each NEMO Hub will be calculated for each scheduling area. The inter bidding zone flow calculation functionality shall ensure that, when several routes might be possible for a given set of net positions, the price coupling algorithm shall provide the Scheduled Flows of the solution by minimizing a cost function on Scheduled Flows, using for this calculation a deterministic rule.

Page 9: [39] Deleted **Author**

maximize

8.

Page 9: [39] Deleted **Author**

maximize

9.

Page 9: [39] Deleted **Author**

maximize

10.

Page 9: [40] Deleted **Author**

The price coupling algorithm shall stop when one of following stopping criteria is met:
The optimal solution is found;
Time limit: the elapsed time has reached the set permitted time to run;
Iteration limit: the algorithm stops after it has completely processed a number of nodes;
Solution limit: the algorithm stops after having found a number of solutions.

Page 9: [40] Deleted **Author**

The price coupling algorithm shall stop when one of following stopping criteria is met:
The optimal solution is found;
Time limit: the elapsed time has reached the set permitted time to run;
Iteration limit: the algorithm stops after it has completely processed a number of nodes;
Solution limit: the algorithm stops after having found a number of solutions.

Page 9: [40] Deleted **Author**

The price coupling algorithm shall stop when one of following stopping criteria is met:
The optimal solution is found;
Time limit: the elapsed time has reached the set permitted time to run;
Iteration limit: the algorithm stops after it has completely processed a number of nodes;
Solution limit: the algorithm stops after having found a number of solutions.

Page 9: [40] Deleted **Author**

The price coupling algorithm shall stop when one of following stopping criteria is met:
The optimal solution is found;

Time limit: the elapsed time has reached the set permitted time to run;
Iteration limit: the algorithm stops after it has completely processed a number of nodes;
Solution limit: the algorithm stops after having found a number of solutions.

Page 9: [40] Deleted **Author**

The price coupling algorithm shall stop when one of following stopping criteria is met:
The optimal solution is found;
Time limit: the elapsed time has reached the set permitted time to run;
Iteration limit: the algorithm stops after it has completely processed a number of nodes;
Solution limit: the algorithm stops after having found a number of solutions.

Page 9: [40] Deleted **Author**

The price coupling algorithm shall stop when one of following stopping criteria is met:
The optimal solution is found;
Time limit: the elapsed time has reached the set permitted time to run;
Iteration limit: the algorithm stops after it has completely processed a number of nodes;
Solution limit: the algorithm stops after having found a number of solutions.

Page 9: [41] Deleted **Author**

given

11.

Page 9: [41] Deleted **Author**

given

12.

Page 9: [42] Deleted **Author**

The last solution found that is fulfilling the checks under Article 4(10) contains the values that are considered the result of the execution of the price coupling algorithm.

Page 9: [42] Deleted **Author**

The last solution found that is fulfilling the checks under Article 4(10) contains the values that are considered the result of the execution of the price coupling algorithm.

Page 9: [42] Deleted **Author**

The last solution found that is fulfilling the checks under Article 4(10) contains the values that are considered the result of the execution of the price coupling algorithm.

Page 9: [43] Deleted **Author**

instance

13.

Page 9: [43] Deleted **Author**

instance

14.

Page 9: [43] Deleted **Author**

instance

15.

Page 9: [43] Deleted **Author**

instance

16.

Page 9: [44] Deleted **Author**

All NEMOs, in cooperation with TSOs where relevant, shall establish

17.

Page 9: [44] Deleted **Author**

All NEMOs, in cooperation with TSOs where relevant, shall establish

18.

Page 9: [44] Deleted **Author**

All NEMOs, in cooperation with TSOs where relevant, shall establish

19.

Page 9: [44] Deleted **Author**

All NEMOs, in cooperation with TSOs where relevant, shall establish

20.

Page 9: [45] Deleted **Author**

NEMOs shall submit orders to the MCO Function by the time stated in the operational procedure or else backup procedures shall apply.

Under normal operations, NEMOs

21.

Page 9: [45] Deleted **Author**

NEMOs shall submit orders to the MCO Function by the time stated in the operational procedure or else backup procedures shall apply.

Under normal operations, NEMOs

22.

Page 9: [45] Deleted **Author**

NEMOs shall submit orders to the MCO Function by the time stated in the operational procedure or else backup procedures shall apply.

Under normal operations, NEMOs

23.

Page 9: [45] Deleted **Author**

NEMOs shall submit orders to the MCO Function by the time stated in the operational procedure or else backup procedures shall apply.

Under normal operations, NEMOs

24.

Page 9: [45] Deleted **Author**

NEMOs shall submit orders to the MCO Function by the time stated in the operational procedure or else backup procedures shall apply.

Under normal operations, NEMOs

25.

Page 9: [45] Deleted **Author**

NEMOs shall submit orders to the MCO Function by the time stated in the operational procedure or else backup procedures shall apply.

Under normal operations, NEMOs

26.

Page 9: [46] Deleted	Author

relevant outcome

27.

Page 9: [46] Deleted	Author

relevant outcome

28.

Page 9: [46] Deleted	Author

relevant outcome

29.

Page 9: [46] Deleted	Author

relevant outcome

30.

Page 9: [47] Deleted	Author

All NEMOs shall create and maintain a document with the detailed description of the price coupling algorithm, including the rules to calculate Scheduled Flows between NEMO trading hubs. This document shall be kept updated with every new version of the price coupling algorithm. The document is made publicly available by all NEMOs on public internet webpage.

All NEMOs shall activate

31.

Page 9: [47] Deleted	Author

All NEMOs shall create and maintain a document with the detailed description of the price coupling algorithm, including the rules to calculate Scheduled Flows between NEMO trading hubs. This document shall be kept updated with every new version of the price coupling algorithm. The document is made publicly available by all NEMOs on public internet webpage.

All NEMOs shall activate

32.

Page 9: [47] Deleted	Author

All NEMOs shall create and maintain a document with the detailed description of the price coupling algorithm, including the rules to calculate Scheduled Flows between NEMO trading hubs. This document shall be kept updated with every new version of the price coupling algorithm. The document is made publicly available by all NEMOs on public internet webpage.

All NEMOs shall activate

33.

Page 9: [48] Deleted	Author

Price coupling algorithm Implementation timeline

The price coupling algorithm implementation timeline begins with the approval of the Algorithm Proposal by all NRAs.

In order to reach to an enduring solution compliant with requirements reported in Article 3 by starting from the adoption of Existing DA Algorithm Solution, the implementation timeline is structured in three phases:

Prototyping phase: up to three years dedicated to developing the activity of research and development on the Existing DA Algorithm Solution aimed at reaching a solution complying with the properties of the enduring solution described under Article 3. During the prototyping phase all NEMOs adopt the DA interim solution as further described in Article 5(4)(i);

Extended prototyping phase: up to one further year at the end of the prototyping phase, if necessary to finalize the research and development activity;

Industrialization phase: up to one year, dedicated to the industrialization of the prototype delivered by the research and development activity, if such prototype has been proven suitable, announcing to stakeholders the specific features of the enduring solution and to draft if needed an amended version of the Algorithm Proposal.

All NEMOs shall have the chance, at any phase, to introduce modifications in the approach adopted for the research and development activity in case the latter does not provides outcomes compatible with the target of the enduring solution within the proposed timeline. Such change shall be properly reported to all NRAs according to Article 5(7).

Page 9: [48] Deleted **Author**

Price coupling algorithm Implementation timeline

The price coupling algorithm implementation timeline begins with the approval of the Algorithm Proposal by all NRAs.

In order to reach to an enduring solution compliant with requirements reported in Article 3 by starting from the adoption of Existing DA Algorithm Solution, the implementation timeline is structured in three phases:

Prototyping phase: up to three years dedicated to developing the activity of research and development on the Existing DA Algorithm Solution aimed at reaching a solution complying with the properties of the enduring solution described under Article 3. During the prototyping phase all NEMOs adopt the DA interim solution as further described in Article 5(4)(i);

Extended prototyping phase: up to one further year at the end of the prototyping phase, if necessary to finalize the research and development activity;

Industrialization phase: up to one year, dedicated to the industrialization of the prototype delivered by the research and development activity, if such prototype has been proven suitable, announcing to stakeholders the specific features of the enduring solution and to draft if needed an amended version of the Algorithm Proposal.

All NEMOs shall have the chance, at any phase, to introduce modifications in the approach adopted for the research and development activity in case the latter does not provides outcomes compatible with the target of the enduring solution within the proposed timeline. Such change shall be properly reported to all NRAs according to Article 5(7).

Page 9: [49] Deleted **Author**

By the end of June

a)

Page 9: [49] Deleted **Author**

By the end of June

b)

Page 9: [49] Deleted	Author

By the end of June

c)

Page 9: [50] Deleted	Author

Initial Requirements reported

(i)

Page 9: [50] Deleted	Author

Initial Requirements reported

(ii)

Page 11: [51] Deleted	Author

The

1.

Page 11: [51] Deleted	Author

The

2.

Page 11: [52] Deleted	Author

(SOB

3.

Page 11: [52] Deleted	Author

(SOB

4.

Page 11: [52] Deleted	Author

(SOB

5.

Page 11: [53] Deleted	Author

enables multiple

6.

Page 11: [53] Deleted	Author

enables multiple

7.

Page 11: [53] Deleted	Author

enables multiple

8.

Page 11: [53] Deleted	Author

enables multiple

9.

Page 11: [53] Deleted	Author

enables multiple

10.

Page 11: [53] Deleted	Author

enables multiple

11.

Page 11: [53] Deleted	Author

enables multiple

12.

Page 11: [54] Deleted	Author

Scheduled Flows

13.

Page 11: [54] Deleted	Author

Scheduled Flows

14.

Page 11: [54] Deleted	Author

Scheduled Flows

15.

Page 11: [54] Deleted	Author

Scheduled Flows

16.

Page 11: [54] Deleted	Author

Scheduled Flows

17.

Page 11: [55] Deleted	Author

contracts

18.

Page 11: [55] Deleted	Author

contracts

19.

Page 11: [55] Deleted	Author

contracts

20.

Page 11: [55] Deleted	Author

contracts

21.

Page 11: [55] Deleted	Author

contracts

22.

Page 11: [55] Deleted	Author

contracts

23.

Page 11: [55] Deleted	Author

contracts

24.

Page 11: [56] Deleted	Author

the current capacity availability

25.

Page 11: [56] Deleted	Author

the current capacity availability

26.

Page 11: [56] Deleted	Author

the current capacity availability

27.

Page 11: [56] Deleted	Author

the current capacity availability

28.

Page 11: [57] Deleted	Author

Explicit

29.

Page 11: [57] Deleted	Author

Explicit

30.

Page 11: [57] Deleted	Author

Explicit

31.

Page 11: [58] Deleted	Author

executed

32.

Page 11: [58] Deleted	Author

executed

33.

Page 11: [58] Deleted	Author

executed

34.

Page 11: [59] Deleted	Author

Contracts

35.

Page 11: [59] Deleted	Author

Contracts

36.

Page 11: [59] Deleted	Author

Contracts

37.

Page 11: [60] Deleted	Author

The

a)

Page 11: [60] Deleted	Author

The

b)

Page 11: [60] Deleted	Author

The

c)

Page 11: [60] Deleted	Author

The

d)

Page 11: [61] Deleted	Author

prioritize

e)

Page 11: [61] Deleted	Author

prioritize

f)

Page 11: [61] Deleted	Author

prioritize

g)

Page 11: [61] Deleted	Author

prioritize

h)

Page 13: [62] Deleted	Author

All NEMOs shall have the chance, at any phase, to introduce modifications in the approach adopted for the research and development activity in case the latter does not provides outcomes compatible with the target of the enduring solution within the proposed timeline. Such change shall be properly reported to all NRAs according to Article 7(6).

All NEMOs shall ensure at least the achievement of the following mid-term milestones:

By the end of 2018 the SIDC interim solution shall be able to support all Initial Requirements reported in Annex 2, the Multi-Nemo support and the requirement on delivery of results described under Article 3(8)(b) and maximization the economic surplus described under Article 3(8)(a);

To ensure the second go-live, the SIDC interim solution shall be updated with the rest of the functionality of enhanced preferred shipper by 2019;

By the end of the first year of the prototyping phase, all NEMOs shall communicate to NRAs and make publicly available to all stakeholders the Change Control Procedure and the Algorithm Monitoring Procedure;

By the end of the industrialization phase, all NEMOs shall communicate to NRAs and make publicly available to all stakeholders the detailed description of the SIDC enduring solution;

By the end of the industrialisation phase, all Future Requirements reported in Annex 2 and adequate scalability described under Article 3(8)(d), shall be supported.

By the end of the industrialization phase, all NEMOs shall communicate to NRAs and make publicly available to all stakeholders the Change Control Procedure and the Algorithm Monitoring Procedure referred to the SIDC enduring solution.

At the end of consultation indicated in Article 7(4) (iv) all NEMOs shall, if the prototyping phase(s) and the following consultation has led to a need to amend the Algorithm Proposal, send to all NRAs for approval an amended version of Algorithm Proposal.
On a periodic basis, at least on a yearly basis, during the prototyping phase all NEMOs shall send to all NRAs a report on research and development activities providing:

Status of the research and development (prototyping) activity in relation to beforehand among All NEMOs agreed approach(es) and targets;

Planning of the research and development activity for the coming period, including estimation on identified workload.

In case the prototyping phase does not conclude in the given timeframe, the activation of the extended prototyping phase may take place. In such a case, all NEMOs shall inform NRAs about such activation three months prior to the deadline of the prototyping phase.

The timely delivery of the specific schedule exchange calculator functionalities, during properly planned phase, as described in Article 3(5), requested by all TSOs in the methodology for the calculation of Scheduled Exchanges, shall be dependent on the final approval by all NRAs of such methodology and on the confirmation of the formulas for Scheduled Flows between bidding zones and scheduling areas already implemented.

Article 8

Day to day

Page 13: [63] Deleted **Author**

organize the day to day management of the single day-ahead and intraday coupling, pursuant to Article 10 of the CACM Regulation. The scope of such activity and of the provisions pursuant the following Articles 8(2), 8(3) and 8(4) shall be limited to

1.

Page 13: [64] Deleted **Author**

joint responsibilities of NEMOs and TSOs, without prejudice for the specific responsibilities of separately all NEMOs and of all TSOs. The modalities and scope of such joint organization and cooperation shall be elaborated jointly by the TSOs and NEMOs

2.

Page 13: [65] Deleted **Author**

The day to day management of both single day-ahead and intraday coupling shall include, among others and without prejudice for other agreements of TSOs and NEMOs pursuant to Article 10 of the CACM Regulation, the joint drafting with TSOs and the application in cooperation with TSOs of:
the operational procedure, referred to under Article 4(15);
the procedures for the management of operational incidents;
the procedures for monitoring of the price coupling algorithm and continuous matching algorithm usage and performance, according to principles laid out in Article 9;

the procedures for the management of Request for Changes to the price coupling algorithm and continuous matching algorithm, according to principles laid out in

3.

Page 13: [66] Deleted **Author**

.

All NEMOs shall also cooperate with all TSOs in the definition of the principles, scope and workload for the development of the algorithm, according to principles laid out in Article 4 (20) and

4.

Page 13: [67] Deleted **Author**

(15).

All NEMOs and all TSOs shall jointly:

define the needed joint governance arrangements to support day to day management of the of the single day-ahead and intraday coupling;

meet regularly to discuss and decide on day-to-day operational issues;

invite the Agency and the Commission as observers to these meetings;

publish summary minutes of these meetings on public internet webpage.

Article 9

Algorithm Management Principles

All NEMOs shall manage operational performance and compliance of the price coupling algorithm and the continuous trading matching algorithm according to the principles in this Article 9. The principles shall be incorporated into the Algorithm Monitoring Procedure as provided under Article 8(2) (c), which will be published and maintained updated according to Article 11(2) provisions.

Algorithm Monitoring

Performance shall be controlled and measured by all NEMOs, in coordination with all TSOs, according to the provisions of the Algorithm Monitoring Procedure.

Such Algorithm Monitoring Procedure

5.

Page 18: [68] Deleted **Author**

Any NEMO respectively TSO is entitled to join another NEMOs´ respectively TSOs´ Request for Change provided that (i) the additional NEMO(s) respectively TSO(s) is entitled to request modifications to the Request for Change and which the original requesting NEMO(s) respectively TSO(s) shall consider in good faith and not unreasonably reject, and that (ii) the original requesting NEMO(s) respectively TSO(s) and any additional NEMO respectively TSO shall, as long as Article 10(7) is not deemed by all NEMOs to apply, bear the associated costs (where any cost sharing shall be in accordance with the CACM Regulation).

All NEMOs respectively TSOs are entitled to request for the implementation of a new Functionality subject to approval of a Request for Change. Such new Functionality is available to be used by all NEMOs respectively TSOs that initially contributed to its development plus any other NEMO respectively TSO that is willing to contribute to the development cost of this new Functionality in compliance with the CACM Regulation sharing rules.

Request for Change process

The NEMO(s) respectively TSO(s)proposing a change shall issue a Request for Change to all NEMOs according to a template and process described in the Change Control Procedure referred to under Article 10(1).

The NEMO(s) respectively TSO(s)proposing a Request for Change is responsible for fully specifying their requirement, including the requested Anticipated Usage and any subsequent effect on

1.

Page 19: [69] Deleted **Author**

Notifiable

a)

Page 19: [69] Deleted **Author**

Notifiable

b)

Page 19: [69] Deleted **Author**

Notifiable

c)

Page 19: [69] Deleted **Author**

Notifiable

d)

Page 19: [69] Deleted **Author**

Notifiable

e)

Page 19: [70] Deleted **Author**

where the

f)

Page 19: [70] Deleted **Author**

where the

g)

Page 19: [70] Deleted **Author**

where the

h)

Page 19: [70] Deleted **Author**

where the

i)

Page 19: [71] Deleted **Author**

where there

j)

Page 19: [71] Deleted **Author**

where there

k)

Page 19: [71] Deleted **Author**

where there

l)

Page 19: [71] Deleted **Author**

where there

m)

Page 19: [71] Deleted **Author**

where there

n)

Page 19: [71] Deleted **Author**

where there

o)

Page 19: [72] Deleted **Author**

where

p)

Page 19: [72] Deleted **Author**

where

q)

Page 19: [72] Deleted **Author**

where

r)

Page 19: [72] Deleted **Author**

where

s)

Page 19: [72] Deleted **Author**

where

t)

Page 19: [73] Deleted **Author**

Requests for Change can be submitted on a continuous basis, provided that evaluation is

1.

Page 19: [73] Deleted **Author**

Requests for Change can be submitted on a continuous basis, provided that evaluation is

2.

Page 19: [73] Deleted **Author**

Requests for Change can be submitted on a continuous basis, provided that evaluation is

3.

Page 19: [73] Deleted **Author**

Requests for Change can be submitted on a continuous basis, provided that evaluation is

4.

Page 19: [73] Deleted **Author**

Requests for Change can be submitted on a continuous basis, provided that evaluation is

5.

Page 19: [73] Deleted **Author**

Requests for Change can be submitted on a continuous basis, provided that evaluation is

6.

Page 19: [73] Deleted **Author**

Requests for Change can be submitted on a continuous basis, provided that evaluation is

7.

Page 19: [73] Deleted **Author**

Requests for Change can be submitted on a continuous basis, provided that evaluation is

8.

Page 19: [74] Deleted **Author**

assessment

9.

Page 19: [74] Deleted **Author**

assessment

10.

Page 19: [74] Deleted **Author**

assessment

11.

Page 19: [74] Deleted **Author**

assessment

12.

Page 19: [74] Deleted **Author**

assessment

13.

Page 19: [75] Deleted **Author**

Requests

14.

Page 19: [75] Deleted **Author**

Requests

15.

Page 19: [75] Deleted **Author**

Requests

16.

Page 19: [76] Deleted **Author**

Extending

a)

Page 19: [76] Deleted **Author**

Extending

b)

Page 19: [76] Deleted **Author**

Extending

c)

Page 19: [77] Deleted **Author**

Supporting multiple NEMO operation per bidding zone;
Supporting

d)

Page 19: [77] Deleted **Author**

Supporting multiple NEMO operation per bidding zone;
Supporting

e)

Page 19: [78] Deleted **Author**

Requests

17.

Page 19: [78] Deleted **Author**

Requests

18.

Page 19: [78] Deleted **Author**

Requests

19.

Page 19: [78] Deleted **Author**

Requests

20.

Page 19: [78] Deleted **Author**

Requests

21.

Page 19: [78] Deleted **Author**

Requests

22.

Page 19: [78] Deleted **Author**

Requests

23.

Page 19: [78] Deleted **Author**

Requests

24.

Page 19: [79] Deleted **Author**

the Requests

25.

Page 19: [79] Deleted **Author**

the Requests

26.

Page 19: [79] Deleted **Author**

the Requests

27.

Page 19: [79] Deleted **Author**

the Requests

28.

Page 19: [79] Deleted **Author**

the Requests

29.

Page 19: [79] Deleted **Author**

the Requests

30.

Page 19: [80] Deleted **Author**

At the end of the industrialization phase, all Requests for Change respecting previous criteria, shall be implemented within a reasonable timeframe, following if needed the prioritization principles recalled under previous Articles 10(16) and 10(17). In the prototyping phase, the same principles could be applied to identify which Requests for Change shall not be supported.

Page 19: [81] Deleted **Author**

Page 19: [81] Deleted **Author**

Page 19: [81] Deleted **Author**

Page 19: [81] Deleted **Author**

Page 19: [81] Deleted **Author**

Page 19: [81] Deleted	Author

Page 20: [82] Deleted	Author

.

All NEMOs shall also involve stakeholders

a)

Page 20: [83] Deleted	Author

the price coupling algorithm implementation timeline activities as further detailed in Article 5 and in the continuous trading matching algorithm implementation timeline activities as further detailed in Article 7.

b)