
**All continental European TSOs' proposal for
Common settlement rules for intended exchanges
of energy as a result of the frequency
containment process and ramping period in
accordance with the Article 50(3) of Commission
Regulation (EU) 2017/2195 of 23 November 2017
establishing a guideline on electricity balancing**

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Contents

| | |
|---|----|
| <i>Whereas</i> | 3 |
| <i>Abbreviations</i> | 5 |
| Article 1 Subject matter and scope | 6 |
| Article 2 Definitions and interpretation | 6 |
| Article 3 High-level design of the common settlement | 7 |
| Article 4 Implementation of the common settlement | 8 |
| Article 5 Functions of the common settlement | 9 |
| Article 6 Settlement period | 9 |
| Article 7 Volume determination per TSO-TSO settlement period | 10 |
| Article 8 Pricing rules for TSO-TSO exchanges within SA CE | 10 |
| Article 9 Publication and implementation of the CCFR | 11 |
| Article 10 Language | 11 |

ALL CONTINENTAL EUROPEAN TSOS', TAKING INTO ACCOUNT THE FOLLOWING:

Whereas

- (1) This document is a common proposal developed by all Transmission System Operators in the Synchronous Area Continental Europe (hereafter referred to as "CE TSOs") regarding the development of common settlement rules for intended exchanges of energy as a result of the frequency containment process and ramping period (hereafter referred to as "frequency containment process energy and ramping period energy") in accordance with Article 50(3) of Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing (hereafter referred to as "EBGL"). This proposal is hereafter referred to as the "CCFR", which stands for 'common settlement rules for continental Europe for intended exchanges of energy as a result of the frequency containment process and ramping period'.
- (2) The CCFR takes into account the general principles and goals set in the EBGL as well as the Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity (hereafter referred to as the "Electricity Regulation") as well as Regulation (EC) No 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation (hereafter referred to as the "SOGL"). The goal of the EBGL is the integration of balancing energy markets. The integration of balancing energy markets should be facilitated with the establishment of common European platforms for operating the imbalance netting process and enabling the exchange of balancing energy from frequency restoration reserves and replacement reserves. Cooperation between TSOs should be strictly limited to what is necessary for the efficient and secure design, implementation and operation of those European platforms.
- (3) Articles 50(3) and 50(8) of the EBGL defines the deadline for the submission of the CCFR to NRAs and several specific requirements to its content:
 3. *By eighteen months after the entry into force of this Regulation, all TSOs intentionally exchanging energy within a synchronous area shall develop a proposal for common settlement rules applicable to intended exchanges of energy, as a result of one or both:*
 - (a) *the frequency containment process pursuant to Article 142 of Regulation (EU) 2017/1485;*
 - (b) *the ramping period pursuant to Article 136 of Regulation (EU) 2017/1485.*
 8. *All TSOs shall establish a coordinated mechanism for adjustments to settlements between all TSOs.*
- (4) The CCFR contributes to the objective of non-discrimination and transparency in balancing markets pursuant to Article 3(1)(a) and Articles 3(2)(a) and 3(2)(b) of the EBGL, since the same settlement rules will apply to the whole Synchronous Area Continental Europe and they will be publicly available.
- (5) The CCFR contributes to the objective of enhancing the efficiency of European and national balancing markets, pursuant to Article 3(1)(b) of the EBGL, since the compensation programme is replaced by the common settlement rules applicable to the whole Synchronous Area Continental Europe.
- (6) The CCFR serves the requirement of Article 3(2)(h) of the EBGL since the technical framework proposed is based on agreed European standards already in operation.

- (7) The CCFR was developed taking into account consistency with settlement rules of unintended exchange within the Synchronous Area Continental Europe in accordance with Article 51(1) of the EBGL.
- (8) The CCFR was developed taking into account consistency with settlement rules of intended exchanges of energy between synchronous areas in accordance with Article 50(4) of the EBGL and of unintended exchanges in accordance with Article 51(2) of the EBGL.
- (9) In conclusion, the CCFR contributes to the general objectives of the EBGL.

Abbreviations

The list of abbreviations used in this CCU is the following:

- ACE: area control error
- ACER: Agency for the Cooperation of Energy Regulators
- ANES: aggregated netted external schedules
- CCFR: common settlement rules for continental Europe for intended exchanges of energy as a result of the frequency containment process and ramping period
- CCU: common settlement rules for continental Europe for all unintended exchanges of energy
- EBGL: Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing
- Electricity Regulation: Regulation (EC) No 714/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity
- LFC area: load-frequency control area
- LFC block: load-frequency control block
- SA CE: Synchronous Area Continental Europe
- SOGL: Regulation (EC) No 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation
- TSO: Transmission System Operator

SUBMIT THE FOLLOWING CCFR TO ALL RELEVANT REGULATORY AUTHORITIES:

Article 1 **Subject matter and scope**

- (1) The common settlement rules for all intended exchange of energy as result of the frequency containment process and ramping period as determined in this CCFR is the common proposal of all SA CE TSOs in accordance with Article 50(3) of the EBGL.
- (2) The following settlement rules are out of scope of the CCFR:
 - (a) the common settlement rules for intended exchanges of energy in accordance with Article 50(1) of the EBGL;
 - (b) the common settlement rules for intended exchanges of energy in accordance with Article 50(4) of the EBGL;
 - (c) the common settlement rules for unintended exchanges of energy in accordance with Article 51(1) of EBGL;
 - (d) the common settlement rules for unintended exchanges of energy in accordance with Article 51(2) of the EBGL.
- (3) Governance, cost sharing and decision-making will be organised according to the requirements of the EBGL but are not within the scope of this CCFR.

Article 2 **Definitions and interpretation**

- (1) For the purposes of this CCFR, the terms used shall have the definitions given to them in Article 2 of the EBGL and Article 3 of the SOGL.
- (2) In addition, in this CCFR the following terms shall apply:
 - (a) CCU refers to the 'All continental European TSOs' proposal for common settlement rules for all unintended exchanges of energy in accordance with the Article 51(1) of Commission Regulation (EU) 2017/2195 of 23 November 2017 establishing a guideline on electricity balancing';
 - (b) 'frequency containment process energy' means the energy that has been imported or exported by each LFC area per TSO-TSO settlement period according to the frequency containment process according to Article 142 of the SOGL. The frequency containment process energy equals the integral of the frequency control error according to Article 3 of the SOGL over a TSO-TSO settlement period and corresponds to the intended exchanges of energy according to Article 50(3)(a) of the EBGL;
 - (c) 'ramping period energy' stands for the intended exchanges of energy according to Article 50(3)(b) of the EBGL and Article 136 of the SOGL;
 - (d) 'TSO-TSO settlement period' means, in the context of this CCFR, the time unit for which unintended exchanges of energy and intended exchanges of energy as a result of the frequency containment process and ramping period is calculated;
 - (e) 'unintended exchanges of energy' equals the integral of the area control error (ACE) according to Article 3 of the SOGL over a TSO-TSO settlement period.
- (3) In this CCFR, unless the context requires otherwise:
 - (a) prices for intended exchanges of energy are indicated in EUR/MWh;

- (b) 'Continental Europe' and 'SA CE' stand for Synchronous Area Continental Europe.
- (4) In addition, unless the context requires 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 CCFR;
 - (c) any reference to legislation, regulations, directive, order, instrument, code or any other enactment shall include any modification, extension or re-enactment of it then in force.
- (5) Settlement according to Articles 3(8) and 3(9) of this CCFR shall follow the sign convention in Table 1:

Table 1 Payment direction for TSO settlement pursuant to CCFR

| | TSO-TSO settlement price: positive | TSO-TSO settlement price: negative |
|--|---------------------------------------|---------------------------------------|
| TSO settlement volume: positive (TSO exports) | Payment to TSO | Payment from TSO |
| TSO settlement volume: negative (TSO imports) | Payment from TSO | Payment to TSO |

Article 3

High-level design of the common settlement

- (1) The common settlement performed by SA CE TSOs in accordance with this CCFR shall consist of the accounting function, the CCFR settlement function and the invoicing task.
- (2) The entity or entities entrusted with the CCFR accounting function shall collect all the data required to calculate the values of frequency containment process energy and ramping period energy over each TSO-TSO settlement period.
- (3) The input to the CCFR accounting function shall be:
 - (a) the value of the notified k-factor per LFC area of SA CE;
 - (b) the average frequency deviation over each TSO-TSO settlement period of SA CE, which shall be determined by a designated TSO;
 - (c) all aggregated netted external schedules (ANES) within SA CE.
- (4) The outputs of the CCFR accounting function shall be:
 - (a) the intended exchanges of energy as a result of ramping period for each TSO-TSO settlement period within SA CE;
 - (b) the intended exchanges of energy as a result of frequency containment process for each TSO-TSO settlement period within SA CE.
- (5) The entity or entities entrusted with the CCFR settlement function shall collect all the data required to calculate a price of frequency containment process energy and ramping period energy over each TSO-TSO settlement period and calculate, for each LFC block or LFC area, the financial result and financial flows.

- (6) The input to the CCFR settlement function shall be:
 - (a) the volumes of intended exchange as a result of the frequency containment process and ramping period and unintended exchange in accordance with Article 7 of this CCU;
 - (b) the day-ahead market price of each LFC Block in SA CE in accordance with Article 8(2)(a) of this CCFR;
 - (c) the average frequency deviation over each TSO-TSO settlement period of SA CE which shall be determined by a designated TSO;
 - (d) the volumes of unintended exchange in accordance with Article 7 of this CCFR.
- (7) The CCFR settlement function shall calculate the following outputs:
 - (a) the price for the intended exchanges of energy as a result of the frequency containment process for each TSO-TSO settlement period;
 - (b) the financial flows between all LFC blocks or LFC areas in SA CE as a result of intended exchanges of frequency containment process energy for each TSO-TSO settlement period.
- (8) All volumes of ramping period energy calculated for each LFC block or LFC area for each TSO-TSO settlement period, in accordance with Article 7 of this CCFR, shall be settled at the same price, calculated for that TSO-TSO settlement period in accordance with Article 8(1) of this CCFR.
- (9) All volumes of frequency containment process energy calculated for each LFC block or LFC area for each TSO-TSO settlement period in accordance with Article 7 of this CCFR shall be settled at the same price, calculated for that TSO-TSO settlement period in accordance with Article 8(2) of this CCFR.
- (10) The settlement shall be done on LFC area level unless:
 - (a) all TSOs of a single LFC block agree on settlement on LFC block level; or
 - (b) some TSOs of a single LFC block agree on a common settlement of their LFC areas.
- (11) The entity or entities entrusted with the invoicing task shall invoice the SA CE TSOs according to the results of the CCFR settlement function.
- (12) All SA CE TSOs shall accept the financial flows and are obliged to pay accordingly. Financial flows shall be reviewed in case an error is found in the calculations or in the data input to the calculations.

Article 4 **Implementation of the common settlement**

- (1) The SA CE TSOs shall implement the common settlement rules within 12 months after the approval of this CCFR, in accordance with Article 5(5) of the EBGL.
- (2) The following steps and timeline shall be used as the roadmap for the implementation of the common settlement rules:
 - (a) Adaption of all meters: All SA CE TSOs have changed their metering devices and are able to meter the exchanges of energy in the TSO-TSO settlement period.
 - (b) Appointment of the entities: The CCFR accounting function, CCU settlement function and invoicing tasks have been appointed to an entity or entities according to Article 3 of the CCU.
 - (c) Implementation of the CCFR accounting function: The entity or entities entrusted with the CCFR accounting function shall implement the CCFR accounting function. All SA CE TSOs shall implement their interfaces to the CCFR accounting function if needed.

- (d) Implementation of the CCFR settlement function: The entity or entities entrusted with the CCFR settlement function shall implement the CCFR settlement function. All SA CE TSOs shall implement their interfaces to the CCFR settlement function if needed.
 - (e) Implementation of the CCFR invoicing tasks: The entity or entities entrusted with the CCFR invoicing tasks shall implement the CCFR invoicing tasks. All needed interfaces shall be setup.
 - (f) Testing: All SA CE TSOs shall test the interfaces to the CCFR accounting, the CCFR settlement function and, if applicable, to the CCU invoicing task.
 - (g) Go-live: After all tests in accordance with Article 4(2)(f) of this CCFR have been successful, the common settlement will go live.
 - (h) Reviewal mechanism: After implementation of these common settlement rules, a reviewal mechanism shall start by end of 2022, in which SA CE TSOs will review the CCFR. A review shall take place at least every three years after the first review due by the end of 2022. In the reviewal mechanism, the possibility for evolving to balancing energy prices instead of day-ahead market prices shall be evaluated. In addition, the reviewal mechanism could affect, for example, the parameters of the pricing rules described in Article 8 of this CCFR, but also technical details such as data collection. Any changes to the CCFR shall be submitted to relevant regulatory authorities for approval.
- (3) All settlement functions pursuant to Articles 19-22 of the EBGL shall take into account that the volumes of intended exchanges of energy may have to be delivered in another time resolution if the TSO-TSO settlement period for frequency containment process energy and ramping period energy is changed.

Article 5 Functions of the common settlement

- (1) The common settlement in accordance with this CCFR shall consist of the CCFR accounting function and the CCFR settlement function.
- (2) The purpose of the CCFR accounting function shall be the calculation of the intended exchanges of energy as a result of ramping period and of the frequency containment process, for each TSO-TSO settlement period within SA CE, in accordance with Article 3 of this CCFR.
- (3) The purpose of the CCFR settlement function shall be the calculation of the price for the intended exchanges of energy as a result of the frequency containment process for each TSO-TSO settlement period and of the financial flows between all LFC blocks or LFC areas in SA CE as a result of intended exchanges of frequency containment process energy for each TSO-TSO settlement period, in accordance with Article 3 of this CCFR.

Article 6 Settlement period

- (1) The TSO-TSO settlement period shall be set at 15 minutes.
- (2) The TSO-TSO settlement period of each day shall begin right after 00:00 am. The TSO-TSO settlement periods shall be consecutive and not overlapping.

Article 7

Volume determination per TSO-TSO settlement period

- (1) The volume of intended exchanges of energy as the result of frequency containment process pursuant Article 50(3)(a) of the EBGL is calculated by the CCFR accounting function, for each LFC block or LFC area for each TSO-TSO settlement period, as the product of the notified k-factor and the average frequency deviation for that TSO-TSO-settlement period, in accordance with Article 3 of this CCFR.
- (2) The volume of intended exchanges of energy as the result of ramping period pursuant Article 50(3)(b) of the EBGL and Article 136 of the SOGL is calculated by the CCFR accounting function for each LFC block or LFC area and per TSO-TSO settlement period, in accordance with Article 136 of the SOGL.
- (3) The volume of unintended exchange pursuant Article 51(1) of the EBGL is calculated by the CCU accounting function, for each LFC block or LFC area per TSO-TSO settlement period, in accordance with the CCU.

Article 8

Pricing rules for TSO-TSO exchanges within SA CE

- (1) The price for intended exchanges of energy as the result of ramping period pursuant to Article 50(3)(b) of the EBGL is zero (0) EUR/MWh.
- (2) The price for intended exchanges of energy in accordance with Article 50(3)(a) of the EBGL shall be calculated by the entity entrusted with the CCFR settlement function as the sum of the following components in EUR/MWh, per TSO-TSO settlement period:
 - (a) A reference price component calculated for any given TSO-TSO settlement period as the average weighted day-ahead market price of all LFC blocks within SA CE for that TSO-TSO settlement period, weighted by the absolute value of the sum of intended exchanges of energy pursuant to Article 50(3)(a) of the EBGL and unintended exchanges of energy pursuant to Article 51(1) of the EBGL, of each LFC block. The following rules shall apply:
 - i. In case there is more than one day-ahead market price per LFC block for that TSO-TSO settlement period, a weighted average price is calculated by the entity entrusted with the settlement function and used in 8(2)(a) for the respective LFC block. The weighted average price of an LFC block is calculated by weighting the day-ahead market prices of the LFC areas in that LFC block with the respective notified k-factor of each LFC area. If there is no day-ahead market price in an LFC area within the LFC block, this LFC area is not considered for the calculation of the weighted average price of the LFC block.
 - ii. In case there are more than one day-ahead market price in an LFC area for that TSO-TSO settlement period, the TSO operating in the LFC area may decide which price or prices to utilise for defining the day-ahead market price of the LFC area.
 - iii. In case there is no day-ahead market price in an LFC block for that given TSO-TSO settlement period, the imbalance settlement price for that LFC block for that given TSO-TSO settlement period is used in Article 8(2)(a) instead of a day-ahead market price. In the case of dual pricing, an average price is calculated.
 - (b) A frequency-dependent component, applicable only if the absolute value of the average frequency deviation over the TSO-TSO settlement period exceeds the absolute value of the minimum threshold value (20 mHz) The frequency-dependent component is calculated as function of the average frequency deviation for each TSO-TSO settlement period, using a slope of between the minimum threshold and the maximum threshold (two (2) EUR/MWh/mHz). The following rules shall apply:
 - i. The absolute value of the minimum threshold value is 20 mHz.

- ii. The absolute value of the maximum threshold value is 100 mHz.
 - iii. The slope is two (2) EUR/MWh/mHz.
 - iv. In case of a positive average frequency deviation exceeding the minimum threshold value in positive direction (+20 mHz), but not exceeding the maximum threshold value in positive direction (+ 100 mHz), this function is applied to the average frequency deviation decreased with the absolute value of the minimum threshold value (20 mHz).
 - v. In case of a negative average frequency deviation exceeding the minimum threshold value in negative direction (-20 mHz), but not exceeding the maximum threshold value in negative direction (- 100 mHz), this function is applied to the frequency deviation increased with the absolute value of the minimum threshold value (20 mHz).
 - vi. In case of a positive average frequency deviation exceeding the maximum threshold in positive direction (+ 100 mHz), the frequency-dependent component is set as the frequency-dependent component calculated at a frequency deviation of the maximum threshold value in positive direction (+ 100 mHz).
 - vii. In case of a negative frequency deviation exceeding the maximum threshold in negative direction (-100 mHz), the frequency-dependent component is set as the frequency-dependent component calculated at a frequency deviation of the maximum threshold value in negative direction (-100 mHz).
 - viii. In case of an HVDC system connecting two SA CE TSOs, the frequency-dependant component may be not applicable.
- (3) In the case of a network split with more than one LFC block disconnected, the frequency-dependant component is set for each TSO-TSO-settlement period during that network split at zero (0) EUR/MWh/mHz per TSO-TSO settlement period.

Article 9

Publication and implementation of the CCFR

- (1) All SA CE TSOs shall publish the CCFR without undue delay after all SA CE relevant regulatory authorities have approved the proposed CCFR or a decision has been taken by ACER in accordance with Articles 5(7), 6(1) and 6(2) of the EBGL.
- (2) All SA CE TSOs shall implement the CCFR in accordance to Article 4 of this CCFR.

Article 10

Language

The reference language for this proposal shall be English. For the avoidance of doubt, where TSOs need to translate this proposal into their national language(s), in the event of inconsistencies between the English version published by TSOs in accordance with Article 7 of the EBGL and any version in another language, the relevant TSOs shall, in accordance with national legislation, provide the relevant national regulatory authorities with an updated translation of the proposal.