Proposal of a capacity calculation Interim solution for the long-term time frames for the FR-UK border (LT CC Interim Solution)

October 7th, 2021

RTE taking into account the following:

Whereas

1. This document is a proposal developed by RTE on the French – UK Border for a capacity calculation process performed for the forward capacity allocation within the long-term time frames (hereinafter referred to as "LT CC Interim Solution"). This proposal is an Interim solution to the coordinated LT CC Methodology.

2. In accordance with article ENER 13 (f) of the EU/UK Trade and Cooperation Agreement ("TCA"), a long-term common capacity calculation methodology remains the target for the TSOs The approval of a LT CC Methodology being postponed to an undefined date, notably because TSOs still need guidance from the relevant authorities, the need of RTE is to establish defined rules and mechanisms to ensure secure system operation with maintenance operations while granting the most efficient use of systems in capacity allocation to the Interconnectors and the market. The rules and mechanisms are described in the following LT CC Interim Solution.

3. The rules and mechanisms described in the LT CC Interim Solution are based on the principles defined in the previous Long Term Capacity Calculation Methodology for Channel CCR that was established according to the Forward Capacity Allocation Regulation. The general approach to be used is a Net Transmission Capacity (NTC) approach coordinated between the French and the United Kingdom Transmission system operators for all the relevant timeframes.

4. The LT CC Interim Solution contributes to and does not in any way hinder the achievement of the objectives of the Trade and Cooperation Agreement. In particular, the LT CC Interim Solution:

   (a) Establishes processes for the capacity calculations by defining set of rules for long-term cross-border capacity calculation. This serves the objective of promoting effective long-term cross-border trade with long-term cross-border hedging opportunities for market participants.

   (b) Contributes to the objective of optimizing the calculation and allocation of long-term cross-border capacity by coordinating the timings for the delivery of inputs, the calculation approach and the validation requirements;

   (c) Contributes to the objective of providing non-discriminatory access to long-term cross-border capacity by ensuring that the capacity calculation is available to all market participants and is transparent;

   (d) Contributes to the objective of ensuring the same treatment for all the Interconnectors on the FR-UK border, and ensuring the most efficient capacity allocation on the FR-UK border without impact on the other borders, Interconnectors and market participants within the European Union.

   (e) Contributes to the objective of respecting the need for a fair and orderly forward capacity allocation and orderly price formation by providing market participants with information on the quantity of long-term cross-border capacity that can be released and the limitation

periods (if any);

(f) Contributes to the objective of ensuring and enhancing the transparency and reliability of information on forward capacity allocation by coordinating the inputs of the capacity calculation and requiring these inputsto be transparent;

(g) Contributes to the efficient long-term operation and development of the electricity transmission system and electricity sector in the European Union and the United Kingdom by providing TSOs and market participants with information on cross- border availability in a timely manner and ensuring that the results of each capacity calculation are based on the best possible forecast of the transmission systems at that point in time.

(h) Contributes to outline how future Interconnectors joining the FR-UK border would be incorporated within the capacity calculation.

SUBMIT THE FOLLOWING LT CC INTERIM SOLUTION TO THE FRENCH REGULATORY AUTHORITY:

TITLE 1 General provisions

Article 1 Subject matter and scope

1. The capacity calculation process as determined in this LT CC Interim Solution is the proposal of RTE as a temporary solution until the implementation of an approved coordinated capacity calculation methodology in accordance with Article ENER 13 of the Trade and Cooperation Agreement between the EU and the UK.

2. This LT CC Interim Solution applies solely to the long-term capacity calculations within the border between France and UK. Common capacity calculation methodologies within other capacity calculation regions or other timeframes are outside the scope of this proposal.

3. The LT CC Interim Solution covers the annual, monthly and weekly time frames, and it also describes the rules and mechanisms for any calculation performed for long term capacity on the FR-UK border, regardless of the timeframe

4. The methodology for splitting long-term cross-border capacity for the allocation mechanism is out of scope of this LT CC Interim Solution methodology.

Article 2 Definitions and interpretation

1. In the purposes of the LT CC Interim Solution, the terms used shall have the meaning given to them in the Trade and Cooperation Agreement between the EU and the UK.

2. In addition, the following definitions shall apply:

3.

Area of Influence	Area that contains one or several interconnectors that share the same CNECs as well as said CNECs.
CC	Capacity Calculation
CCR	Capacity Calculation Region
CNE	Critical Network Element
CNEC	Critical Network Element and Contingency
Critical Outage	Any relevant outage on RTE grid that might limit the capacity of an Area of Influence in which the outage is located. The list of Critical Outages is published by RTE on its website.

Cross-border Flow Sensitivity	Sensitivity of a CNE regarding an increase of the flow on a border. For instance, if the Cross-border Flow Sensitivity of a CNE is 10%, it means that an increase of the cross-border flow of 100 MW for the related border will result in 10MW more on that CNE.
EU	European Union
Fmax	Maximum Allowable Power Flow
FR	France
HVDC	High-Voltage Direct Current
$I_{\max}$	Maximum Admissible Current
LT	Long-Term. Period ranging up to three days before the delivery day (until D-3 23h59)
Maximum Secure Value	The maximum power transfer between two adjacent Bidding Zones respecting the operational security (no negative margin on the relevant CNECs)
Minimum Guaranteed Value	Minimum of the values offered during the first annual cross-border capacity calculation
MPTC	Maximum Permanent Technical Capacity of an Interconnector. For the avoidance of doubt,it means, for the relevant market time unit(s), the maximum permanent technical capacity which is the maximum continuous active power which a cross-zonal network element (interconnector/HVDC system) is capable of transmitting (taking into account potential reduced availability due to planned and unplanned outages of the Interconnector asset). This parameter is defined by the Interconnector, and only considers the Interconnector asset availability
NGESO	The British Transmission System Operator
NRA	National Regulatory Authority
NTC	Net Transmission Capacity
PTDF	Power Transfer Distribution Factor of a network element. It defines the resulting increase of flow on the limiting CNE when the flow on the network element is increased by 100MW. Example : if the PTDF of network element X is 10% then increasing the flow on network element X by 100 MW will lead to a 10 MW increase on the limiting CNE flow.
Remedial Action	Any measure applied by a TSO or several TSOs, manually or automatically, in order to maintain operational security, as defined in Article 2(13) of the CACM Regulation and Chapter 1 Articles 20-23 of

	SO GL.
RTE	The French Transmission System Operator
SO GL	Commission Regulation (EU) 2017/1485 of 2 August 2017 establishinga guideline on electricity transmission system operation
Timestamp	Timeslot in which a network situation is defined.
UK	United Kingdom

4. In this LT CC Interim Solution, unless the context requires otherwise:

   a. the singular indicates the plural and vice versa;

   b. headings are inserted for convenience only and do not affect the interpretation of this proposal; and

   c. any reference to legislation, regulations, directives, orders, instruments, codes or any otherenactment shall include any modification, extension or re-enactment of it when in force.

Article 3 Capacity calculation approach

1. This LT CC Interim Solution is based on a Net Transmission Capacity (NTC) approach on the different timeframes described in article 4.

TITLE 2 Requirements for long-term capacity calculations

Chapter 1 Long term capacity calculation methodology description

Article 4 Long-term capacity calculations process

1. The interim NTC long term capacity calculation will be performed following the methodology described in Chapter 1. The input for calculation are described in Chapter 2, the calculation procedure is described in Chapter 3.

2. RTE calculates the NTC for each Interconnector as described in this article. The capacities calculated by RTE are then offered to the market by the Interconnectors.

3. RTE shall calculate the NTC for each Interconnector and direction on the French UK border as follows:

   i. **By the end of February Y-1**, a single value of 35% of the MPTC is guaranteed during the whole annual period and can always be allocated to the market in the form of long term auctions. This will be the Minimal Guaranteed Value (MGV).

   ii. **By the end of September Y-1**, based on the maintenance works planned by RTE, the annual capacity calculation will assess the interconnector capacity limitation periods for each interconnector on the FR-UK Border. At this stage, the capacity limitation periods unit will be days.

   During these periods, the NTC shall range between the MGV and 100% of the MPTC for the days in which RTE planned Critical outages on the grid for maintenance operations. For the other days, the NTC will be equal to the MPTC of the interconnector.

   The calculation will result in a single NTC value per interconnector and per direction per period unit.

   iii. **By the end of December Y-1**, a new annual capacity calculation shall be done if the hypothesis used in the calculations have changed

   iv. Closer to real–time system operation, RTE gets a better view on the need for limitations of capacities and hazard management on maintenance works. Therefore, from September Y-1 and before D-2, re-assessments of the limitation days shall take place and lead to new–calculations that will reassess capacity subject to potential limitation periods.

   - By the end of M-2, a capacity calculation may be performed by RTE if updated hypothesis allow it. At this step, and for the following steps, the limitation periods unit shall be the hour.
   - **By the 15th COB of each M-1**, a Monthly capacity calculation is performed by RTE
   - **By the Friday COB of each W-1**, a Weekly capacity calculation is performed by RTE.

   v. At any moment after September Y-1, in case a critical outage needs to be scheduled in the area, a specific calculation will determine if a limitation of capacity is required or not.

vi. Using its best efforts, RTE will try to plan its Critical Outages at the same time than the Interconnector outages. In case an Interconnector requests a modification of planning for their interconnection outage, a new capacity calculation might be made due to the Critical Outage. If these calculation results lead to capacity limitations that weren't identified in previous capacity calculations, those capacity limitations shall entirely be applied to the requesting interconnector regardless of the other interconnectors in the area of influence.

For instance, if an interconnector has finished its maintenance plan earlier than agreed and requests to come back into service while RTE had planned a Critical outage at the same time, RTE will run a capacity calculation that might lead to a capacity limitation on the Interconnector coming back in service earlier than expected.

4. At each timeframe, the resulting NTC shall not be lower than the capacity that has been allocated by the interconnectors following previous capacity calculations ran by RTE nor the MGV.
5. The level of limitation shall be duly justified based on an individual analysis to demonstrate that additional capacity would cause operational security concerns. This analysis must be performed in a timely manner in order to release forward cross-border capacity before the day-ahead firmness deadline. A justification for the limitation (NTC, Critical Outage, and CNEC) shall be published by RTE according to REMIT rules.

Article 5 Capacity allocation

1. Capacity allocation for all long-term products shall be based on the latest NTC calculated.

2. For products with a duration greater than one month, the capacity subject to the allocation will be derived from annual capacity calculations. For products with a duration equal to or less than one month, the capacity will be derived from monthly capacity calculations or weekly capacity calculations if available.

3. The Interconnector will take the minimum value between the NTC calculated by RTE (which includes the period of limitation due to the Interconnector via the MPTC declaration) and the one calculated by NGESO if any.

Chapter 2 Input definition for calculation

Article 6 Critical Network Element and Contingency (CNEC) methodology

1. RTE shall perform the selection of the CNECs based on the assessment of the Cross-border Flow Sensitivity on the FR-UK border.

2. RTE shall consider as not significantly influenced the CNECs with Cross-border Flow Sensitivity below a certain threshold. Those not significantly influenced CNECs shall be ignored for the cross-border capacity calculation.

3. The Cross-border Flow Sensitivity threshold for the LT CC Interim Solution in the FR-UK border

is equal to 5%.

Article 7 Methodology for operational security limits

1. RTE shall define at least per season (spring, summer, autumn & winter) and for each CNE the maximum permanent allowable electricity flow according to RTE's operational security limits criteria defined in line with Article 25 of SO GL.

Article 8 Methodology for Remedial Actions in capacity calculation

1. RTE shall define the Remedial Actions, used for the calculation defined in Article 4 that shall be made available for the long-term capacity calculation within the FR-UK border. RTE shall, at minimum, ensure that all relevant non-costly Remedial Actions according to RTE's operational principles which are anticipated to be available on the day of delivery are used for calculation. The type of non-costly remedial action shall cover, among others, topological changes and phase shifting transformer tap changes.

2. When defining a Remedial Action, RTE shall specify:

   (a) The type of the Remedial Action and the sequence of actions to be implemented;

   (b) In case of quantifiable Remedial Action, the maximum and minimum values of the scalable quantity; and

   (c) Whether the Remedial Action is a shared Remedial Action and can be considered for all contingencies or whether it shall be limited to a subset of contingencies. In the latter case, RTE shall specify the list of contingencies.

3. In case a Remedial Action made available for the long-term capacity calculation in the French-UK border is also one which is made available in another CCR, the TSO taking control for the Remedial Action shall take care when defining it of a consistent use in its potential application in both borders to ensure a secure power system operation (e.g. by not giving the full range but only an equal part of the range on its phase-shifting transformers) as the Interim LT CC Solution for the FR-UK border will not cross-check the feasibility of the simultaneous usage of Remedial Actions in different CCRs.

4. RTE shall publish on its website the list of the offered Remedial Actions within 3 months after the implementation of the methodology and if relevant update this list after each capacity calculation within 1 month.

Article 9 Scenarios definition methodology

1. RTE shall develop a set of scenarios to be used for each long-term capacity calculation time frame.

2. The scenarios to be used by RTE will be the most representative for outages periods in terms of generation and load pattern and exchanges. RTE may consider using different scenarios according to the area of influence of the interconnectors.

Article 10 Timestamp selection

1. Long-term cross-zonal capacity will be computed only in respect of the periods including one or several planned Critical Outages.

2. The planning of the Critical Outages listed before is available through the Outage Planning Coordination database according to Articles 97, 98 & 99 of SO GL. Based on this database, the timestamp selection will use the planning of the Critical Outage of the FR-UK border as follows:

   (a) One timestamp will be selected for the concerned period. This granularity is fixed in advance and is 1 week for the annual, monthly and weekly NTC calculations.

   (b) The selected timestamp within the granularity is the period with the largest simultaneous number of planned outages.

   (c) In case two or more timestamps that are selected

   - take place within the same scenario defined, and

   - contain the same planned outages,

   then redundancy occurs because the selected timestamps contain identical input data. Consequently they will have identical calculation results and are therefore identified as redundant timestamps. Those redundant timestamps, except for one, will be ignored and the outcome will be considered as the outcome for the other redundant timestamps.

3. The timestamp selections based on the planning of the Critical Outages in the FR-UK border is proposed by RTE for each annual, monthly and weekly calculation.

Article 11 Inputs for the long-term capacity calculations

1. RTE will use the following inputs to perform the long-term capacity calculations:

   (a) The MPTC of the interconnectors;

   (b) Critical Network Elements and Contingencies (CNEC) in accordance with Article 6;

   (c) Maximum admissible current on a CNE (Imax) / Maximum allowable power flow (Fmax) in accordance with Article 7;

   (d) Remedial Actions in accordance with Article 8; and

   (e) A network situation scenario at the Ad hoc timestamp in accordance with Articles 9 and 10.

Chapter 3 Long Term capacity calculation process

Article 12 Long-term capacity calculations

RTE shall calculate the following:

- the Maximum Secure Value of simultaneous import
- the Maximum Secure Value of simultaneous export

over all the areas of influence of the French-UK border, for each timestamp following the process outlined in Article 10.

Article 13 Net Transmission Capacity process

RTE shall prepare grid models for the timestamp selected according to Article 10 to reflect the starting point by setting the exchanges on the Interconnectors at the level of their MPTC in the direction France towards Great-Britain or vice versa.

1. RTE shall run a contingency analysis on the grid model and evaluate results either allowing interconnector MPTC without further actions or indicating a potential interconnector import or export limitation as a result of a negative margin on a CNEor operational security standard violation.

2. For each negative margin on a CNE, RTE shall deploy the list of available Remedial Actions to alleviate such constraint. If Remedial Actions can alleviate the negative margin of the CNE, the interconnector MPTC can be made available for that scenario timestamp. If the Remedial Actions used in this respect cannot alleviate the CNE violation, the Maximum Secure Value of the interconnector capacity of the bidding zone where the limiting critical outage(s) is/are located should be progressively calculated in steps from starting points according to Article 14. Following each calculation, the contingency analysis should be repeated with the Remedial Actions already deployed until a level of the Maximum Secure Value of the interconnector capacity has been identified for which no CNE violations occur.

Article 14 Implementation of limitation of the interconnectors capacity

1. For the timestamp taken into consideration for calculation, RTE shall perform a limitation of the interconnector capacity as follows:

   (a) In case of negative margin on the CNE which cannot be solved with available Remedial Actions, RTE shall in its calculation reduce the capacity of all the Interconnectors which have an influence on the limiting CNE, which is all the Interconnectors in the Areas of influence this CNE belongs to.

   (b) The capacity limitation is spread between all the interconnectors in the relevant Areas of influence, proportionally to their MPTC (except for the case referenced in Article 4 3.vi) as follow :

$$Lim_{IC} = \frac{MPTC_{IC}}{\sum MPTC_{IC}} . Lim_{Totale}$$

Where:

- Lim_{IC} is the capacity limitation relative to the interconnector "IC"
- $MPTC_{IC}$ is the MPTC of interconnector "IC"
- $\sum MPTC_{IC}$ is the sum of all interconnectors' MPTC in the considered Area of Influence
- $Lim_{Totale}$is the total capacity limitation needed in the considered Area of Influence in order to respect the Maximum Secure Value.

(c) If network evolutions would lead to a situation with several interconnectors having a different influence on one or several CNEC, for which a negative margin remain at the end of the calculation, then a new proposal shall be made by RTE to the NRA regarding the limitation spread between interconnectors. That proposal shall take into account the influence of the interconnectors on the considered CNEC.

The influence of an interconnector on a CNEC is defined as the increase in MW on a CNEC resulting from an increment of the flow on the interconnector of 100MW.

2. In case of an unplanned Critical outage, reductions of already allocated capacity might be necessary and will go through specific curtailment procedures.

Article 15 Implementation of the power shift

When computing the capacity, RTE shall implement any shift of the power transfer between two bidding zones by adjusting the generation in each of the bidding zones

Article 16 N-1 security assessment of maximum import/export for each timestamp of the calculation

RTE shall perform N-1 security assessments for the timestamp selected in accordance with Article 10.

Article 17 Calculation consistency

1. For the first long-term calculation in September Y-1, for each interconnector in both import and export directions, the NTC value resulting from the calculation cannot be lower than the MGV validated in February Y-1 as described in Article 4.

2. For each remaining long-term calculation, for each interconnector in both directions, the NTC for the limitation period shall be the maximum value between :

    - The resulting NTC obtained in this calculation (NTC_{Calc})
    - The already allocated long-term capacity, if this capacity has been previously offered by RTE following a preceding calculation ($AAC_{offered}$)
    - The MGV

$$NTC = \max\left(MGV, \mathrm{NTC_{Calc}}, \mathrm{AAC_{offered}}\right)$$

Article 17 Fallback Procedures

1. If RTE fails to provide the annual capacity calculation results before the end of September Y-1, the NTC value to be considered shall be the MGV of the interconnector for the whole year.

2. If RTE fails to provide the monthly or weekly capacity calculation results in due time, the NTC value to be considered shall be the results of the last capacity calculation ran by RTE.

TITLE 3 Publication and implementation

Article 19 Publication of information

3. The list of Critical Outages and Remedial Actions shall be published by RTE on its website.
4. RTE shall regularly and at least once a year review and update the Critical Outage and Remedial Action lists.

   (a) If the operational security limits and contingencies used for the capacity calculation need to be updated, RTE shall publish the changes at least one week before the implementation.

   (b) RTE shall include the re-assessment of the further need of security constraints.

5. RTE shall publish the NTCs for all interconnectors, the Critical Outage, and the limiting CNEC following:

   (a) The annual capacity calculations and;

   (b) The monthly capacity calculation and;

   (c) The weekly capacity calculations.

6. The review of the common list of Remedial Actions taken into account in the capacity calculation shall include at least an evaluation of the efficiency of specific phase-shifting transformers and the topological Remedial Actions considered.

7. In case the review proves the need for updating the application of the methodologies in respect of CNECs, changes will have to be published at least three months before the final implementation.
8. Any changes of parameters have to be communicated to market participants, Interconnectors and the French NRA.

Article 20 Implementation of the LT CC Methodology

1. RTE shall publish the LT CC Interim Solution without undue delay after the French NRA approves the proposed LT CC Interim Solution.

2. RTE shall implement the LT CC Interim Solution no later than 12 months after the approval of this LTCC Interim Solution.

3. A transitory period of 12 months shall take place after the approval of the LT CC Interim Solution in which :

(a) An annual capacity calculation will be run as soon as possible according to the Critical Outage planning, the resulting NTC shall not be lower than the capacity already allocated by the Interconnectors.

(b) Calculations at the following timeframes, as described in Article 4, will then subsequently be made.

Article 21 Implementation of new interconnectors

1. The LTCC Interim Solution will apply by default to new Interconnectors until the implementation of the coordinated LT CC Methodology for the EU-UK border, in accordance with the Trade and Cooperation Agreement between the EU and the UK, is approved.

Article 22 Language

1. The reference language for this LT CC Interim Solution shall be French.
2. For the avoidance of doubt, in case of discrepancies between French and English versions of this document, RTE shall be obliged to eliminate any inconsistencies by providing a revised translation of this LT CC Interim Solution to their NRA.