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Methodology for GB Commercial Arrangements relating to Interconnector Capacity Calculation

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Purpose

This document outlines the GB methodology for commercial arrangements for payments relating to interconnector (IC) capacity restrictions resulting from NTC limits set by NGESO. The commercial arrangements in this document should be applied to:

- All interconnector projects (existing and future) that are connected to the GB transmission system.
- Capacity calculations made both before and after the Firmness Deadline.

Overview of Net Transfer Capacity (NTC)

What are NTCs?

NTC or Net Transfer Capacity is method of communicating the maximum capacity that an interconnector can carry. This is based on multiple inputs, firstly, by the asset rating, condition and any relevant outages as determined by the asset owner, but it may also be set by the ESO due to other system conditions meaning that security is jeopardised. As part of the process to calculate capacity, NGESO may submit NTC limits for interconnector capacity in Day Ahead (DA) and Intraday (ID) timeframes where operationally required, before capacity is allocated. If NGESO sets an NTC limit lower than the capacity made available by the IC owner NTC, this will result in an NTC restriction being applied. The resulting impact on the capacity of the interconnector can be classified into four scenarios; allocated capacity or unallocated capacity which can be both restricted going into either the DA or ID auctions.

NB; the current Interconnector Transfer Limits (ITLs) only cover one quadrant of the NTC tool, which limits unallocated capacity that feeds into the ID auctions.

How does NGESO apply NTC?

NTC are applied as part of a trilaterally agreed capacity calculation process co-ordinating with both the interconnector and remote TSO.

Commercial Principles

Where NTC limits submitted by NGESO result in the Interconnector capacity being restricted NGESO will make payment for such restriction. The GB commercial arrangements for payments for NTCs comply with the following principles:

(A) This methodology covers the commercial arrangements between the interconnector and National Grid Electricity System Operator (NGESO) and does not deal with the terms either between the interconnector and the holders of transmission capacity through the interconnector capacity auction processes or the other connecting TSO.

(B) To ensure cost neutrality, payments to interconnectors for reduction to:

- Allocated capacity should reflect the cost of remunerating transmission capacity holders as set out in the relevant interconnector's Access Rules
- Unallocated capacity should reflect the likely cost to the interconnector, as compared to a scenario where the action had not been taken.

(C) Any payments should consider that interconnectors may generate additional income through a reduction in capacity (e.g. as capacity becomes scarce this may increase the price of capacity and congestion income may increase). They should also take into account instances where interconnectors should receive congestion income. This may result in interconnectors paying rather than receiving payments;

(D) Any payment must only cover the volume of interconnector capacity being reduced from the NTC limits set by NGESO at that time; e.g. No payment will be due if the capacity reduction is the result of factors outside the GB National Electricity Transmission System (NETS) (e.g. reduced availability of the interconnector circuits or constraints in the connecting European grids by the other connecting TSOs). In the case of loss of access resulting from the interconnector's assets (such as a trip by the interconnector), there will be no compensation to the interconnector via this mechanism;

(E) Ex-ante capacity reductions resulting from planned maintenance or works on the NETS shall not result in any compensation between the NGESO and the interconnector owner if the Bilateral Connection Agreement (BCA) for that interconnector describes a reduction of the Transmission Entry Capacity (TEC) for that specific planned outage condition;

(F) A reduction of capacity can only be paid once; should NTCs by two TSOs simultaneously result in a capacity restriction, in order to avoid a duplication in compensation, the GB commercial arrangements shall cover half of the common NTC value with the other connecting TSO. Any additional reduction beyond the common value, will be wholly picked up by the respective TSO. For example, if NGESOs NTC limits reduce capacity by 100MW and the other connecting TSO reduce capacity by 125MW, the GB commercial arrangements shall be applicable to 50MW only (half of the common amount). Whereas, if NGESOs NTC reduce capacity by 125MW and the other connecting TSO reduce capacity by 100MW, the GB commercial arrangement shall be applicable to 75MW ((100/2) + 25).

(G) All parties will be responsible for ensuring that the working mechanism for calculating capacity ahead of allocation at the relevant timeframes is carried out as agreed. This can be achieved via any agreed party (or indeed a third party).

(H) This methodology will be implemented via the necessary interconnector agreement changes to reflect the NTC calculation process in the operating protocols and relevant settlement agreements.

Principles of use

This section provides understanding of the principles of when and how NTC limits will be applied. NTC limits are used to ensure secure system operation. Sometimes there are limited or unfeasible alternative tools available to relieve particularly constraints, potentially resulting in a need to use emergency tools, such as Emergency Assistance and Emergency Instruction to avoid secure system operation being compromised.

1. Calculation of NTC limits will be based on:
    a. the best forecast of system conditions at the time
    b. the best view of credible alternative actions that *will* be available
2. In general, NGESO will only use DA NTC on a given IC;
    a. Where ID options* do not exist, or;
    b. Once more is known regarding the impact of DA NTCs on Social welfare**
3. NGESO will seek to move the allocated flow to within securable limits via trading or other SO-SO trades
4. (ID) NTC limits will be submitted:
    a. In case of further ID (re)nominations
    b. In case of NGESO trading or SO-SO trades actions fail *for any reason*
5. Where multiple ICs jointly contribute/exacerbate a particular constraint the available capacity will be shared equally as far as is practicable
6. NGESO will assign an NTC value that allows maximum capacity but which is consistent with operational security
7. Any DA NTCs that would restrict *nominated* Long Term capacity will not be applied or executed

**this means either:*

- *an established explicit ID energy market, where the throughput of energy volumes in the connecting market meets or exceeds that requested by NGESO; or*
- *some other form of ID service provided by either the IC, connecting SO or another third party with reasonable availability and firmness.*

***NGESO would publish this data and analysis when it is available.*

GB Commercial Arrangements Methodology

Applicable Terminology

Allocated

Capacity that has been sold to market participants through auctions in any timescale and not yet lapsed, or capacity that that has been implicitly allocated as a result of an implicitly coupled auction (and therefore scheduled a flow).

Unallocated

For DA capacity calculation, unallocated capacity is capacity that has not been sold within the interconnector's previous long-term auctions. For ID capacity calculation, unallocated capacity is capacity that remains unutilised (either not allocated, or not nominated for physical flow) following a Day Ahead explicit auction or Day Ahead implicit allocation process, that the interconnector, proposes to make available for intraday allocation.

Implicit

Implicit allocation is in accordance with the market coupling mechanisms in day ahead and/or intraday timeframes where capacity is not bought directly but is implicitly bought with the energy product and therefore the flow is directly allocated (& nominated).

Explicit

Explicit allocation is where capacity rights are bought directly by parties and is then nominated afterwards to produce a flow (but nomination is not mandatory).

Firmness Deadline

The point in time after which cross-zonal capacity becomes firm for each interconnector, in accordance with their respective Access Rules.

Curtailment

When an NTC limit results in allocated capacity being restricted in the final round of market activity (this is usually the ID phase), which therefore means curtailing the final nominated flow. This should only occur in a 'force majeure' or emergency situation.

GB Commercial Methodology

Tables 1, 2 & 3 illustrate the GB commercial arrangements for each capacity regime on each bidding zone border and for where different categories of capacity restriction occurs.

These tables represent the different coupling arrangements that exist across GB borders currently, and therefore each table references the relevant mechanism for clarity. The principles of the commercial methodology are consistent across the different coupling arrangements. This document will be updated when these arrangements change over time or as new ICs connect.

For a more in-depth explanation of the settlement methods in each box (labelled 1, 2, 3, 4a, 4b), please see Appendix 1.

Table 1: GB Commercial Arrangements matrix for explicit DA, and explicit ID

For example, IFA, BritNed, NEMO, IFA2

Timing of NTC & type of capacity affected	Restricted capacity that is allocated (but only unnominated long term*)	Unallocated capacity restricted
Capacity management feeds into Day Ahead auctions (i.e. before FD)	(1) See relevant Access Rules	(4a) Net capacity revenue loss/gain calculated from unrestricted marginal price (4b) For 0MW auctions; the rolling quarterly calculated, directional, median or mean (lower of) marginal price
Capacity management feeds into Intraday auctions (i.e. after FD, before ID auction opening)	(3) Net imbalance charge from both markets	(4a) Net capacity revenue loss/gain calculated from unrestricted marginal price (4b) For 0MW auctions; the rolling quarterly calculated, directional, median or mean (lower of) marginal price

**Any long term capacity that is nominated is considered firm and will not be restricted – as per Principle of Use 7.*

Table 2: GB Commercial Arrangements matrix for implicit ID

For example, Moyle and EWIC

Timing of NTC & type of capacity affected	Allocated capacity restricted (including FTRs)	Unallocated capacity restricted
Capacity management feeds into Day Ahead auctions (i.e. before FD)	N/A	N/A
Capacity management feeds into Intraday auctions (i.e. after FD, before ID auction opening)	(3) Net imbalance charge from both markets	(2) Where practicable, the difference in congestion rent from a re-run of the coupling algorithm without restriction OR, the loss adjusted, market spread adjusted for increased scarcity by 'correction factor'

T*able 3: GB Commercial Arrangements matrix for implicit DA.*

For example, NSL

Timing of NTC & type of capacity affected	Allocated capacity restricted	Unallocated capacity restricted

Capacity management feeds into Day Ahead auctions (i.e. before FD)	N/A	(2) Where practicable, the difference in congestion rent from a re-run of the coupling algorithm without restriction OR, the loss adjusted, market spread adjusted for increased scarcity by 'correction factor'
Capacity management feeds into Intraday auctions (i.e. after FD, before ID auction opening)	N/A	N/A

Future Developments

- **Correction Factor**: For implicit coupling where it is unpracticable to re-run the coupling algorithm, an alternative will be to create a simplified model of this relationship and apply a suitable 'correction factor' to account for the increased spread resulting from the increased scarcity. However due to a lack of available data this will be set to '1' or 100% for at least the first year to allow for data collection and analysis before proposing a suitable correction factor model.
- **ITL Transition:** Where existing interconnector agreements make reference to the term ITLs, to be consistent with the wider terminology used, the term ITLs will be replaced as NTC when updating relevant agreements.
- **Trade and Co-operation Agreement Transition (TCA)**: NTCs shall be used in parallel to the development of the Capacity Calculations envisaged within the TCA. This document shall be revisited, if needed, following the finalisation of the Capacity Calculations
- **Loose Volume Coupling**: As part of the TCA a new Day Ahead auction is being developed. It is expected that this will result in a form of implicit coupling being implemented. As described above, for implicit auctions the best approach is to re-run the new algorithm, with and without NTC limits to determine if the interconnectors gain or lose congestion income. If this is considered too complicated the correct factor approach can be taken. This can be revisited once we understand the details of the new arrangements.

Settlement

Payments between the interconnectors and NGESO will only commence when there is an agreed bilateral agreement for this between the interconnector and NGESO, that is in line with the arrangements and principles within this document. The detail of the settlement and payment arrangements shall also be outlined in each party's bilateral agreements.

To support the invoicing arrangements, NGESO will collect the available data required to support the settlement of the commercial arrangements outlined in this document. Should the data not be able to be retrieved, interconnectors are requested to provide the data.

Please refer to Appendix 1 for details of settlement.

Implementation Method

Tripartite discussions between the interconnector, NGESO and the connecting TSO shall be needed to include the relevant NTC processes in the trilateral Operating Protocol (OP).

In addition, the applicable interconnector specific settlement agreements shall be updated accordingly to align the processes outlined in the Operating Protocol.

Appendix 1 – Settlement

The Calculation Process

Considering the number of variables involved between interconnectors, auction regimes and various scenarios, calculating any settlement becomes complex. Below, NGESO outlines the process that will be undertaken to run this calculation. For the avoidance of doubt, the formula set out below is illustrative and generalised for all interconnectors. The final formula will be set out and agreed in the trilateral interconnector settlement agreements.

Where restricted volumes are concerned losses will be accounted for as appropriate, according to each interconnector's Access Rules.

A. "Build the Picture"

Before calculating any settlement data, we must build the picture of the volume of each type of capacity was restricted at each horizon. This uses the **Auction Data, Interconnector Nominated Flow** and **Outages / Commercial Availability** sources detailed above.

With this data, we know the volume of unallocated and allocated capacity restricted through NTC at both the DA and Intraday stage, for each settlement period.

Data Sources Required

NGESO and Remote-End TSO NTC data

The first step is to ascertain what NTC values have been submitted from both system operators.

- RNP provides this data on some Interconnectors

Outages/Commercial Availability

To know how much capacity was restricted from the NTC limits being set, we cannot assume the interconnector could have run at maximum flow – we must account for this by considering the commercial availability of the interconnector at the time of auction. Our initial approach has been to utilise Elexon's BM Reports/REMIT data, filtered as appropriate, to determine the maximum flow for the interconnector for each auction.

- https://www.bmreports.com/bmrs/?q=remit provides a user interface for exporting data as needed. Elexon also has an API feature which can be used to fetch this data.
- RNP could prove an alternative source of this data for some interconnectors

Interconnector Nominated Flow

In order to distinguish what capacity was allocated, unallocated, nominated and unnominated across DA and ID horizons, the Total Nominated Flow is needed.

For DA Auctions:

- The nominated capacity is the sum of nominations made separately across import and export. This value can either be provided directly, or derived from the auction specifications (offered capacity) and the commercial availability of the interconnector.

- The unallocated capacity would be any capacity not sold across the relevant Long Term auctions. On IFA for example, 15% of capacity is reserved for Day Ahead auctions.
- The allocated but unnominated capacity can then either be calculated either as the difference between the two above values, or fetched by assessing the volume of capacity sold across all Long Term auctions.

A similar process follows for intraday NTC. The exact source of this data may vary across interconnectors. As an example, NemoLink's nominations at Long Term, Day Ahead and Intraday are available on ENTSO-E's transparency platform - https://transparency.entsoe.eu/transmission-domain/r2/totalCapacityNominated/show.

B. Gather Commercial Data

The next step is to gather **Auction Data**, **Day Ahead Prices** and **Imbalance/System Prices**, for each settlement period. We can now calculate the Day-Ahead spreads, the net imbalance costs, and we can recalculate explicit auction clearing prices. These calculations are explained in Step C.

C. Apply Settlement Formulae:

Depending on the interconnector's specific auction profile (see tables 1-3), different calculations apply for different types of capacity restrictions. These calculations are captured by 4 methods, labelled 1-4 in their respective tables.

(1) Allocated Capacity restricted before FD

See the relevant Access rules for the details of how capacity holders are remunerated. But for explicit auctions it will be as follows:

$$Settlement_1 = P^{DA}_{CLEAR} x\ V^{DA}_{ALLOCATED}$$

Where:

P^{DA}_{CLEAR} **= Clearing price of the Day Ahead auction, where restricted capacity would have been sold.**

$V^{DA}_{ALLOCATED}$ **= The Volume of Allocated Capacity restricted through NTC.**

Data Sources Required

DA Prices:

The Day Ahead Wholesale Price is needed in each relevant region to calculate the difference between them – the Day Ahead spread. A common data source for all regions should be used for NGESO's compensation calculation – ensuring the final settlement figure is fully cost-reflective and fair across parties. For 'remote-end' countries neighbouring GB, ENTSO-E serves as a common source for the DA Price. For GB, whilst single Intra-GB coupling is not in place, a volume-weighted average of the two hubs will be used.

- https://transparency.entsoe.eu/transmission-domain/r2/dayAheadPrices/show provides the user interface for exporting this data using ENTSO-E's transparency platform. NGESO will be using ENTSO-E's API to automate the gathering of this data as needed.
- https://eu.data.energy/#eu provides EPEX Day Ahead Price and Volume data (as well as some imbalance data covered below). This source requires paid membership.
- https://www.nordpoolgroup.com/historical-market-data/ provides historical data on N2EX Day Ahead Prices and Volumes.

(2) Unallocated Capacity restricted, impacting an implicit auction

Any volume of capacity restricted under these conditions will be paid either according to the net loss/gain in congestion rent as determined by the coupling algorithm (Option 1) or the loss adjusted, scarcity corrected, day-ahead market spread (Option 2).

Option 1 is the preferred option, but the feasibility of this is yet to be ascertained.

Option 1:

Here we re-run the implicit market coupling algorithm with the restriction removed. This provides a simulated congestion revenue, which can be calculated using the formula below.

$$Settlement_{2,\ OPTION\ 1} = (((P^{DA}_{GB,RERUN} \times R_{GBP\_EUR}) - P^{DA}_{RE,RERUN}) \times V^{DA}_{RERUN}) - (((P^{DA}_{GB,ACT} \times R_{GBP\_EUR}) - P^{DA}_{RE,ACT}) \times V^{DA}_{ACT})$$

Where:

$P^{DA}_{GB,ACT}$ = The Coupling Algorithm's "Live Outcome" DA Price in GB,

R_{GBP_EUR} = The exchange rate to convert GBP to EUR,

$P^{DA}_{RE,ACT}$ = The Coupling Algorithm's "Live Outcome" DA Price in the Remote-End region,

$P^{DA}_{GB,RERUN}$ = The Coupling Algorithm's "Rerun Outcome" DA Price in GB,

$P^{DA}_{RE,RERUN}$ = The Coupling Algorithm's "Rerun Outcome" DA Price in the Remote-End region,

V^{DA}_{ACT} = The Interconnector Flow determined by the Coupling Algorithm's "Live Outcome",

V^{DA}_{RERUN} = The Interconnector Flow determined by the Coupling Algorithm's "Rerun Outcome".

$$P^{DA}_{GB,LA} R_{GBP\_EUR} P^{DA}_{RE,LA} V^{DA}_{UNALLOCATED} F_{CORRECTION}$$

Option 2:

Should access to the coupling algorithm prove impracticable, we will pursue the following method.

Data shows that the increased scarcity of capacity going into an implicit allocation process impacts on the prices in each relevant bidding zone, and hence the spread. To ensure the compensation is cost-reflective the raw spread is not enough on its own to calculate an appropriate payment. A simplified model can be constructed to account for this increased scarcity and spread and then a "correction factor" can be applied to represent this.

At present, quantitative figures are unavailable for constructing the model to determine the correction factor. Thus, if this calculation approach is used, it will be set at 1 (or a value that causes no effect mathematically) for the first 12 months of this methodology and revised once data is available for analysis.

Please refer to the Future Development section for more information.

$$Settlement_{2,\ OPTION\ 2} = ((P^{DA}_{GB,LA} \times R_{GBP\_EUR}) - P^{DA}_{RE,LA}) \times V^{DA}_{UNALLOCATED} \times F_{CORRECTION}$$

Where:

$P^{DA}_{GB,LA}$ = The Loss Adjusted Day Ahead Wholesale Price in GB (weighted between EPEX and NordPool),

R_{GBP_EUR} = The exchange rate to convert GBP to EUR,

$P^{DA}_{RE,LA}$ = The Loss Adjusted Day Ahead Wholesale Price in the Remote-End region,

$V^{DA}_{UNALLOCATED}$ = The Volume of Unallocated Capacity restricted through NTC,

$F_{CORRECTION}$ = The modelled correction factor.

$P^{DA}_{GB,ACT} R_{GBP\_EUR}\ P^{DA}_{RE,ACT} P^{DA}_{GB,RERUN} P^{DA}_{RE,RERUN} V^{DA}_{ACT} V^{DA}_{RERUN}$ Data Sources Required

DA Prices:

The Day Ahead Wholesale Price is needed in each relevant region to calculate the difference between them – the Day Ahead spread. A common data source for all regions should be used for NGESO's compensation calculation – ensuring the final settlement figure is fully cost-reflective and fair across parties. For 'remote-end' countries neighbouring GB, ENTSO-E serves as a common source for the DA Price. For GB, whilst single Intra-GB coupling is not in place, a volume-weighted average of the two hubs will be used.

- https://transparency.entsoe.eu/transmission-domain/r2/dayAheadPrices/show provides the user interface for exporting this data using ENTSO-E's transparency platform. NGESO will be using ENTSO-E's API to automate the gathering of this data as needed.
- https://eu.data.energy/#eu provides EPEX Day Ahead Price and Volume data (as well as some imbalance data covered below). This source requires paid membership.
- https://www.nordpoolgroup.com/historical-market-data/ provides historical data on N2EX Day Ahead Prices and Volumes.

(3) Allocated Capacity restricted after FD

Settlement₃ $= (P_{GB}^{IMB} \times V_{ALLOCATED}^{ID} \times S_{GB}) + (P_{RE}^{IMB} \times V_{ALLOCATED}^{ID} \times S_{RE})$

Where:

P_{GB}^{IMB} **= The imbalance price in GB,**

P_{RE}^{IMB} **= The imbalance price in the Remote-End region,**

$V_{ALLOCATED}^{ID}$ **= The Volume of Allocated Capacity restricted through NTC,**

S_{GB} **= A binary value (either -1 or +1) to describe if the GB system was either in surplus or deficit,**

S_{RE} **= A binary value (either -1 or +1) to describe if the RE system was either in surplus or deficit.**

Any volume of capacity restricted under these conditions will be paid such as to hold the relevant interconnector whole on imbalance, netted across both market zones. By doing this, NGESO holds the cost/risk for such restrictions.

Data Sources Required

Imbalance/System Prices and Volumes

There is no single source for System Prices across europe (ENTSO-E is inconsistent in this area). Some sources have been outlined:

- EnAppSys (https://eu.data.energy/#fr/elec/pricing) - FR, NO
- TenneT (https://www.tennet.org/english/operational_management/export_data.aspx) - NL
- Re.alto (https://portal.realto.io/browse-apis/elia-imbalance-data-be/details) - BE
- SEM-O (https://www.sem-o.com/market-data/dynamic-reports/#BM-026) - ISEM

(4) Unallocated Capacity restricted, impacting an explicit auction

a. Unrestricted vs restricted revenues

Restricting the capacity going into an explicit auction introduces scarcity in that auction. To compensate for these restrictions, NGESO will look to calculate the unrestricted clearing price – NGESO looks at answering the question "without the restriction, what would the auction have cleared at?"

The amount to be paid for capacity restricted under these conditions will be equal to the difference in the restricted and unrestricted auction revenue. It could be positive or negative – the settlement looks to hold the interconnector financially whole.

$$Settlement_{4a} = (P^{CLEAR}_{WITH\ NTC} \times V_{WITH\ NTC}) - (P^{CLEAR}_{WITHOUT\ NTC} \times V_{WITHOUT\ NTC})$$

Where:

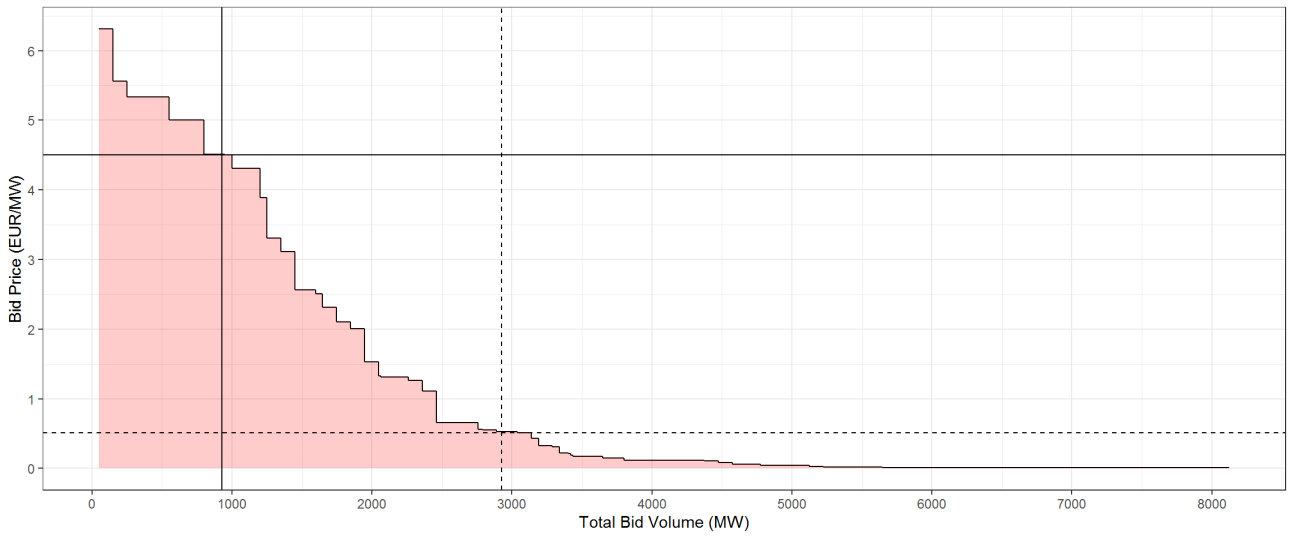
$P^{CLEAR}_{WITH\ NTC}$ **= The Auction Clearing Price, when the NTC is applied,**

$P^{CLEAR}_{WITHOUT\ NTC}$ **= The Auction Clearing Price, when the NTC is not applied,**

$V_{WITH\ NTC}$ **= The Volume of Offered Capacity in the auction, when the NTC is applied,**

$V_{WITHOUT\ NTC}$ **= The Volume of Offered Capacity that would have been sold in the auction, when the NTC is not applied. This value is essentially the sum of** $V_{WITH\ NTC}$ **and the volume of capacity restricted due to NTC (calculated as part of "Build the Picture").**

To further visualise this, please see the example plot below. This is an explicit auction bid ladder, with intercept lines to highlight volumes and clearing prices both with and without NTC.



b. 0MW auctions

Restrictions on capacity under these conditions may result in 0MW capacity being offered in the auction – in other words, the auction doesn't take place. NGESO will assess the historical clearing prices in both the value and non-value direction

(according to the relevant DA Price Spread), for each hour of the day. NGESO will look at the previous 724 (31 days x 24 hours,) auctions, and calculate both the median and mean clearing price. The lower of these two prices will be used to compensate restrictions of this type.

Settlement$_{4b}$ = MINIMUM (MEAN(P^{CLEAR}) , MEDIAN(P^{CLEAR})) x $V_{WITHOUT\ NTC}$

Where:

P^{CLEAR} = A list of monthly, directional ("value" and "non-value") auction clearing prices,

$V_{WITHOUT\ NTC}$ = The volume of capacity that would have been sold, had no NTC been applied.

Data Sources Required

DA Prices:

The Day Ahead Wholesale Price is needed in each relevant region to calculate the difference between them – the Day Ahead spread. A common data source for all regions should be used for NGESO's compensation calculation – ensuring the final settlement figure is fully cost-reflective and fair across parties. For 'remote-end' countries neighbouring GB, ENTSO-E serves as a common source for the DA Price. For GB, whilst single Intra-GB coupling is not in place, a volume-weighted average of the two hubs will be used.

- https://transparency.entsoe.eu/transmission-domain/r2/dayAheadPrices/show provides the user interface for exporting this data using ENTSO-E's transparency platform. NGESO will be using ENTSO-E's API to automate the gathering of this data as needed.
- https://eu.data.energy/#eu provides EPEX Day Ahead Price and Volume data (as well as some imbalance data covered below). This source requires paid membership.
- https://www.nordpoolgroup.com/historical-market-data/ provides historical data on N2EX Day Ahead Prices and Volumes.

Explicit Auction and Bid Data:

Auction specifications, bid ladders and results for explicit capacity auctions. The exact source of this data varies across each interconnector, but JAO serves as a publicly available example of the data, covering data for IFA, IFA2 and Nemo.

- https://www.jao.eu/main provides a user interface to export data manually from JAO. NGESO will be using JAO's new API tool to fetch this data automatically as needed.

D. Apply Cost-Sharing Principles

Once we have calculated the settlement figures for each box, for each settlement period, we must then consider Principle F – for each settlement period, what proportion of the total settlement figure is NGESO responsible for?

In practice this involves repeating the calculations in Step A, but calculating how much capacity was restricted individually by NGESO and the RE TSO, rather than just using the lower value.

Invoicing process

Monthly invoices will be produced by the party who is owed money based on the net value of transactions for the month. The invoice will be sent electronically in PDF format by email. The standard timescales shall be as follows or as otherwise detailed in respective settlement agreements:

- By the 8th business day from the 1st day of the month, the preliminary statement for the previous month shall be issued by NGESO to the interconnector.

  For example, by 10th June 2020, a preliminary statement will be issued for the NTC transactions which occurred between 1st May 2020 to 31st May 2020.

- Data shall be reviewed by the two parties between the issue of the preliminary statement and the issue of the invoice.

- By the 18th business day from the 1st day of the month, an invoice will be issued by the party who is owed money.

  For example, by 24th June 2020, an invoice will be issued.

- From 6 business days from the issue of the invoice, payment will be made.

  For example, the payment outlined on the invoice will be made from 2nd July 2020.

Currency

We will look to settle NTC in Euros where appropriate. It does not however make sense to convert GB imbalance costs from GBP to Euros for this purpose.

This will mean providing two monthly invoices:

1. Settlement for any incurred GB imbalance from formula 3, in GBP;
2. Settlement for all other compensation formulae, in EUR.