

## Inter TSO Compensation (ITC) option for changes to the GB Charging Methodology

*For discussion purposes only*  
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### Issue

Once guidelines for an Inter TSO Compensation, ITC, mechanism have been approved under European Regulation 1228/2003 (the regulation) National Grid will be required to join the ITC mechanism. This discussion paper puts forward options for consequential changes to the GB charging methodology as a result of joining the ITC scheme and compliance with the regulation.

### Background

The regulation sets out the framework for an inter TSO compensation mechanism (ITC), through 'guidelines'. A non-mandatory mechanism already exists with the majority of TSOs in Europe already party to this. Once the guidelines are established, National Grid is required to become a party to the mechanism. The guidelines describe the methodology of the ITC mechanism to be implemented by TSOs. Article 4 of the regulation also requires National Grid to take account of payments and receipts associated with the ITC mechanism when setting 'charges for network access.'

The proposed guidelines deal with the costs for infrastructure and losses separately. However, in both cases a charge is determined (compensation) and then a fund is set up to pay (contribution). The value of the fund is considered as the net position from both elements. In the case of compensation GB will be seen to benefit from the effect of transits (as they flow from south to north). As a result, for most conceivable scenarios the position for GB will be a net payment (negative compensation). In addition there will also be a net payment associated with the net import (which causes transit on other systems), contribution. With only two interconnectors the situation is relatively simple, however any proposals to change the GB charging arrangements need to be robust to future changes in flows and to accommodate additional interconnectors.

The ITC mechanism deals with costs (compensation and contribution) differently depending on whether they are linked to infrastructure or losses.

Infrastructure compensation (gets paid) and contribution (pays) is expected to be calculated on hourly 'reference exchanges'; multiplied by a network cost and a 'sensitivity factor'. These are explained below.

Sensitivity factors are based on a number of representative scenarios, 'snapshots' – likely to be 72 annually. The factors are calculated by adding 1MW across generation in country A and subtracting it across load in country C, the effect on B is taken as the sensitivity of AB on C in MWkm. Sensitivity factors are calculated for all combination of flows e.g. GB will have a sensitivity factor for each combination of flows between all other parties (approximately 500 factors for each snapshot).

Reference exchanges are based on ex-post flows, they indicate the most likely or deemed relationship between imports and exports (actual physical flows are not known). They are calculated for all countries simultaneously. Every country's net reference exchanges are capped by its net import or export. Each export is associated with an import based on closest electrical association (those with the highest sensitivity factors). For example, if France was exporting 3000 (net export) this is then allocated to several countries, France - Ireland 200, France - Spain 1000, etc.

Losses compensation will be based on 72 snapshots of the real system and the contribution will either be based on the same 72 snapshots, or on hourly net import and export figures. For each snapshot total losses are calculated by load flow analysis, the transits are then removed and the losses recalculated, the difference represents the losses due to transit (WWT - With and Without Transits). The losses caused by transits for each country are multiplied by a country-specific energy reference price to determine the cost of transits. Each country's cost is summed to establish the fund value. The fund value is divided by the sum of net imports and net exports to establish a cost per MW import or export. Settlement will be based on ex-post data. As transit from south to north reduce losses the GB compensation is expected to be negative. In addition to the negative compensation National Grid will need to contribute to the fund for a net import or export.

### **Possible changes to GB arrangements**

Below we consider changes to GB charging arrangements to comply with Article 4 of the regulation and how any net payment would be passed through the GB charging arrangements.

#### ***What needs to be considered to comply with Article 4, all cross border flows or just transits?***

The ITC mechanism does not deal with cost of all cross border flows, but only transits. Cross border flows can be split in to those which are for 'national' use and those which associated with transits (external use). In line with the ITC National Grid would propose that amendments to TNUoS to cover Article 4 only involves those flows which can be considered as transits i.e. covered by the ITC mechanism. Cross border flows that are for national use, will still be subject to the same charging arrangements as host demand and generation.

Removing charges for transits avoids double accounting with the ITC mechanism, whilst charging the import for national use avoids discrimination with other users on the GB system.

#### ***How are transits defined?***

The ITC mechanism determines transits to be the lower of the net export and net import at any particular time.

In considering the GB charging arrangements, National Grid considers adoption of the same definition appropriate. This ensures that any changes to GB arrangements are consistent with the ITC mechanism.

#### ***How should the transits be determined?***

In terms of the GB methodology generation charges are annual, based on TEC (or three generation peaks separated by 10 days in negative generation zones); demand charges are based on the average demand taken over the triad (or for NHH daily between 1600 and 1900).

This is very different to the arrangements for the ITC where transits are generally calculated on at least 72 snapshots, and in some circumstances, hourly.

We have considered three options to determine transit for GB charging purposes:

- i. Calculate at triad,
- ii. Calculate on a number of snapshots,
- iii. Calculate on an hourly basis.

In all of the above options the figure used for charging purposes would be an average, or a weighted average.

i) Calculating on triad would involve metering the export (demand) and the import (generation) at triad. The transit on each triad period would be the lower of the sum (if more than 2 interconnectors) of either import or export. This would then be summed taking account of direction and divided by three (the number of legs). This approach is more closely related to the current GB charging arrangements which are largely capacity rather than usage based. Under this proposal there could be a transit most of the time but no allowance made unless transit occurs on peak. Investment in the GB system is generally peak driven so peak based charging would be most cost reflective.

ii) Much of the ITC mechanism is based around a number of representative snapshots. Historically ETSO has used 72 snapshots, representing weekdays, weekends, daytime, night time etc. This approach is expected to be adopted in the guidelines for the calculation of compensation and possibly contribution for losses and the sensitivity factors for infrastructure. Adoption of this process to determine transits takes us away from peak-based arrangements, but it would align more closely with the ITC mechanism and also, in the case of losses, be more cost reflective. The calculation would be similar to that above for triad, but averaged over a greater number of scenarios. If weighting factors are used in the ITC mechanism the same factors would be adopted in GB.

iii) Hourly import and export (and hence transit flow) will need to be recorded and submitted to the ITC data administrator. It would be possible to use these figures to calculate the transit for the purposes of GB charging i.e. on an hourly basis. Although this would be more accurate in the case of losses, for infrastructure it would be less accurate (but more cost reflective in terms of ITC net payment). In order to meet the charging timetable, the actual period would be 11 months, April to February (8016 periods). The calculation of transit for charging would be the same as for triad above, the averaged transit over the periods recorded, taking account of direction. Given that we need to manage this volume of data anyway, there is no real increase in workload between using 72 snapshots and the 8000 hour periods.

### ***What adjustments should be made to the GB charging arrangements?***

This covers the changes to the GB arrangements that result from the fact that the ITC mechanism exists. Given that the ITC deals with the compensation for transits, the GB charging arrangements should avoid charging separately for transit via national tariffs. This relates back to Article 4 of the regulation.

There have been various debates about whether transits should be exposed to the locational, residual elements, or both, within the GB arrangements. The ITC mechanism is intended to compensate for transits and efficient locational signals are to be provided through separate congestion management guidelines. In this sense, the ITC is most analogous to the residual

element of the tariff – a non-locational tariff used to ensure revenue recovery. This would suggest transits should not be exposed the residual element of the tariff.

Having excluded the residual element for transit, this leaves the locational element of the TNUoS tariff. There is some logic in charging the locational element to ensure that a theoretical discontinuity in locational signals does not occur across borders. However, when considered in the context of negative locational charges (as would be the case for both Moyle and Sellindge) the result would be a payment.

This payment would be significantly 'more' than a host users (the host is also paying the residual element which makes the charge more positive). In such a scenario a benefit would be paid through the ITC mechanism and through TNUoS, which would be double accounting. In addition, the individual national charging arrangements differ so vastly that inappropriate incentives could arise.

The most appropriate solution in order to avoid double accounting, discrimination and inappropriate signals, appears to be to remove all the TNUoS charges for transits (not all TNUoS charges for interconnectors).

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The proposed approach would involve:

- Determine 'transit' on the basis of hourly imports and exports, averaged over the year, taking account of direction.
- For import (treated as generation), for charge calculation reduce TEC by transit.
- For export, (treated as demand), for charge calculation reduce the chargeable demand (triad demand) by the 'transit'.
- The adjustment could not go native for charging purposes, i.e. turn an importing interconnector in to an exporting interconnector or vice versa.
- Transit, a single figure, would be determined ex-ante on the same assumption as the ITC scheme.
- Ex-post adjustment based on averaged annual transit (as in the ITC scheme).

Where there are more than two interconnectors the adjustment would be pro-rata based on contribution to 'transit through the half hour flows. This is likely to require some detailed rules.

Where the generation charge is negative the adjustment would be done to the average chargeable generation figure (three peaks, separated by 10 days) rather than TEC.

For example,

1. For an average transit of 200MW from Sellindge to Moyle, the charge for Sellindge would be  $(TEC - 200) \times \text{zonal tariff}$ , and the charge for Moyle would be  $(\text{triad demand} - \text{transit})$ . In this example, any TEC charge for Moyle or demand charge for Sellindge would not be affected as they are in the opposite direction to the transit. In both cases, the reduced chargeable volume would be collared at zero.
2. If there were three interconnectors and the third interconnector had a zero sum net import and export, the adjustment for transit would only apply to the other two, if two were

importing and one exporting the transit adjustment for import would be pro-rata on their contribution to 'transit'.

***Should funding for losses be treated separately?***

Certain industry parties have expressed a view that the recovery of the losses element of the ITC should not be dealt with through TNUoS. Note, the issue of how net payments are funded is a subtly different issue to what adjustments need to be made to the charging mechanism to avoid charging for transits. The guidelines treat the net payment and fund as a single figure rather than two completely separate elements.

It is fairly clear that the infrastructure charge should be funded through TNUoS even though it is determined on ex-post MWh exchanges. However, given that losses are dealt with through the BSC and are MWh based, it may be more appropriate to deal with these through the BSC. It has also been suggested funding could be dealt with through BSUoS.

Settlement for losses in the ITC scheme is fundamentally different than in GB market arrangements. Whereas most European TSOs deal with losses directly and this is reflected in the ITC, in GB, losses are dealt with through an adjustment to metered positions, so they are not 'cashed out'. Consequentially, there is not a clear mechanism for funding losses in GB.

We have considered 3 options for funding the net losses payment:

1. Passing through TNUoS with the infrastructure payment.
2. Funding through the BSC.
3. Funding through BSUoS.

Given that losses are dealt with through the BSC, ITC payment for losses could also be channelled through the BSC. However, no money currently flows for losses in the BSC. Given that this is a theoretical position it is inconsistent to then fund the losses through the 'beer fund' just because it is there. Noting this, a new BSC charge and fund could be required to finance ITC payments. Clearly the contractual changes and the IS development required are disproportionate given the annual payment, particularly when there are more efficient options available. In addition the regulation clearly addresses charges for network access, not settlement arrangements.

The net payment for ITC losses could be included in the BSUoS target. BSUoS is a MWh charge similar to how the ITC payment is calculated. The ITC settlement process is yet to be fully determined, however it is unlikely to align with the GB BSUoS process. Other than being largely MWh based there is little other correlation between ITC and BSUoS. BSUoS does not deal with payments for losses and is not considered as a charge for network access. Payments in the ITC scheme **explicitly** exclude all system operation costs such as control room, despatching and balancing costs. Noting that ITC specifically excludes charges that are covered under BSUoS, there is little justification for passing losses funding through BSUoS (presuming it can be separated from the net ITC payment).

The remaining option is to fund ITC losses along with the infrastructure through an adjustment to the allowable revenue in TNUoS. This aligns with the net fund treatment in the guidelines and dealing with payments and receipts through charges for network access in the regulation.

Based on the above, National Grid would propose that ITC net payment is recovered through an adjustment to the TNUoS target.