



Brussels, 1 September 2004

## GUIDELINES ON INTER TSO COMPENSATION

### EXPLANATORY NOTE

#### 1 Introduction

The Regulation on cross border exchanges in electricity<sup>1</sup> allows for binding guidelines on inter TSO compensation to be adopted by a regulatory Comitology process. This procedure requires the Commission to make a proposal for guidelines to be considered by the Committee referred to in Article 13 of the Regulation.

The attached document accordingly puts forward a proposal for Guidelines on the following subjects;

- details of the determination and payment procedure for compensation between TSOs relating to cross border flows; Article 8(2) (a) – (d)
- treatment, in the context of the inter-TSO compensation mechanism, of electricity flows originating or ending in countries outside the EEA; Article 8(2) (e)
- the participation of national systems which are interconnected through direct current lines; Article 8(2) (f)

The main principles adopted by the Commission in its proposal for the detailed guidelines, which are taken from the Articles of the Regulation are set out and explained below. It is expected that these guidelines will apply from 1 January 2005. Further improvements to the guidelines may be made in time for a revised procedure to be in place for 1 January 2006.

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<sup>1</sup> Regulation 1228/03

## 2 Participating Entities

Once the Regulation is in force, there will be ten new Member States. After excluding non-connected islands (Malta and Cyprus), there will be 24 participating countries of the EEA (including Norway). When making calculations, the participating countries may be split into small “entities” for geographical or other reasons (e.g. E. and W. Denmark, Great Britain and Northern Ireland).

Considering that the Baltic countries are currently not connected to any other part of the EU network, the guidelines envisage a separate compensation mechanism between the TSOs of the three countries concerned until such time as they become connected. TSOs in all other Member States will be part of the same compensation mechanism.

Other countries (outside the EU-EEA) may be, de-facto, included in the mechanism on the basis of a private contract between themselves and the participating entities. Such a contract may have certain conditions relating to the implementation, by non EU\EEA countries, of this and other guidelines adopted under the Regulation.

## 3 Approach Taken in the Guidelines

### 3.1 Flows to be taken into account

**Transmission system operators shall receive compensation for costs incurred as a result of hosting cross-border flows of electricity on their networks (i.e. a flow attributed in part or whole to either a generator or consumer outside the Member State concerned) [Article 3(1)].**

**The amounts of cross-border flows hosted and the amounts of cross-border flows designated as originating and/or ending in national transmission systems shall be determined on the basis of the physical flows of electricity actually measured in a given period of time [Article 3(5)].**

The Regulation sets out the principle that Member States should receive compensation for any cross border flows that will imply additional costs to the TSO concerned.

The proposed guidelines for 2005 set out a continuation of the mechanism based on an assessment of “transit” flows. Compensation will, therefore only be paid to the extent that third countries are affected by flows originating and terminating in other Member States. This approach makes a simplifying assumption such that the impact on the networks of the importing country and the exporting country implies the same level of costs.

“Transit” flows are defined on the basis of actual physical flows of electricity with the TSOs hosting these transit flows having the right to claim for the costs incurred as a result.

### 3.2 Designation of responsibility for transit flows

**The compensation referred to in paragraph 1 shall be paid by the operators of national transmission systems from which cross-border flows originate and the systems where those flows end [Article 3(2)].**

In this set of guidelines for 2005, the designation of responsibility is made on the basis of a general assumption that each net inflow or outflow of electricity during a given period bears equal responsibility for the aggregate quantity of “transits” caused in the affected networks. Hence the aggregate amount claimed by the host TSOs under the methodology is shared out among the other participating entities in proportion to the net inflow or outflow to/from of the participating entities in the period concerned. Responsibility for the flows is divided equally between inflow countries and outflow countries. This will be determined on an hourly basis.

An exception is made for countries/TSOs which have inflows or outflows from countries or entities which do not participate in the compensation mechanism. In this case, their contribution is calculated on the basis of a hypothetical flows pattern with the flows from non-participating countries removed. This is because outflows from the participating countries may be affected by inflows for non-participating countries for which some payment has already been collected.

### 3.3 Basis for calculating to the costs incurred by “host countries”

**The costs incurred as a result of hosting cross-border flows shall be established on the basis of the forward looking long-run average incremental costs, taking into account losses, investment in new infrastructure, and an appropriate proportion of the cost of existing infrastructure, as far as existing infrastructure is used to transmit cross-border flows. When establishing the costs incurred, standard-costing methodologies shall be used. Benefits that a network incurs as a result of hosting cross-border flows shall be taken into account [Article 3(6)].**

In the guidelines for 2005 a simplifying cost rule is adopted. This assumes that “transit” flows on the host country network imply a cost to the host network, related to both network investment costs and losses, in proportion to the share of transits in the total level of flows on that network in the time period being considered.

Regarding the last sentence in Article 3(6) quoted above, the definition of “transit” used in the guidelines, since it is based on actual physical flows rather than a definition based on contract path, specifically rules out the possibility of benefits accruing to host TSO in terms of a reduction in overall physical flow and implied losses. The guidelines also include a methodology for delimiting the extent of the network affected by the transits flows, “the horizontal network” based on the extent to which the network is affected by a hypothetical degree of transit flows.

#### Network costs

From 2005 the total network costs to be taken into account are to be based in the principle of forward looking long-run average costs. **This applies only to the compensation mechanism and national tariffs will continue to be based on the valuation of the asset base agreed between regulator and the TSO.**

[These guidelines require Regulators to submit their estimates of forward looking LRAIC according to a standard interpretation and methodology based on the estimated forward looking investment requirements on the basis of current price levels and technology. The standardised methodology includes the following steps

- country specific assessment of projected future investment to be taken into account in LRAIC,
- common financial and operating cost assumptions.

Given the fact that money is being transferred between Member States it is important for the values concerned to be consistent, even if the parameters used for determining regulatory revenues in individual Member States is different.

#### Losses

For losses, the guidelines make the assumption that transit flows contribute to total network losses according to the proportion of transits compared to total network flows. However a maximum contribution from transits corresponding to 15% of total losses has been imposed

### **3.5 Determination of first period of time**

Under Article 3(3), the guidelines should include the first period of time during which compensation payments shall be made under the Regulation. This will be 1 January 2005 – 31 December 2005.

### **3.6 Payment procedure**

This is also referred to in Article 3(3). These guidelines propose the approach contained in the Annex A to the guidelines which replicates the current arrangements within ETSO.

## **4. Treatment of flows starting/ending in non-EEA countries**

Under the regulation, it remains possible for Member States to make transaction based charges for flows to or from countries outside the EEA. This allows those Member States to recover any costs on their own network associated with imports and exports from third countries.

In addition, under the ETSO agreement, network users importing electricity from non-participating perimeter countries are required to contribute 1 Euro/MWh to the compensation fund for each declared physical inflow. This charge is to recognise the potential effect of these flows on other participating TSOs. This charge is usually applied to those importing or exporting electricity on a transaction basis. The guidelines propose that this practice should continue.

However, in these guidelines, it is envisaged that the 1 Euro charge should not be collected (nor passed on to the network users on a transaction basis), if it can be shown that such inflows (outflows) do not lead to significant further physical flows in the network<sup>2</sup>, beyond the participating country into which the physical flows enter the EU (“edge” country).

## **5. Systems interconnected through DC interconnectors**

### **5.1 DC interconnectors that form part of the general regulated asset base**

Article 8(2) states that the guidelines shall specify the participation of national system which are interconnected through direct current lines, in accordance with Article 3.

The guidelines take the view that, in general, participation in the inter TSO compensation mechanism, and the removal of charges relating to cross border transactions will not be affected by whether Member States are connected by AC or DC lines. Therefore DC lines, where they form part of the regulated asset base of the participant concerned will be included in the network in that Member State. To the extent that, on aggregate, the Member State concerned was a host of transit flows, DC lines would be included in the horizontal network for which compensation would be due. These compensation amounts would entirely replace any fixed charges on interconnector use.

### **5.2 DC interconnectors that are legally separate entities from the TSO and do not form part of the general regulated network**

Interconnectors which are separate from the general regulated asset base of the TSO and do not form part of the general regulated network, including those with exemptions from third party access, are excluded from the horizontal network for the purpose of inter-TSO compensation. The owners of these lines will neither contribute nor receive from the compensation fund. Nevertheless, the flows in these lines will be treated as any other physical flow in the mechanism of computation of inter-TSO compensations and charges.

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<sup>2</sup> above a de-minimus level

## **GUIDELINES ON INTER TSO COMPENSATION**

### **1 List of Participants**

#### **Scheme A**

The following entities shall participate in the compensation mechanism as a single payee and recipient of inter TSO compensation

- Stattnett
- Svenska Kraftnät
- Fingrid
- Eltra
- Elkraft
- Collectively: E.ON Netz, RWE Net, Vattenfall Transmission Germany, ENBW Network, TIR AG, VKW-UNG
- Tennet
- Elia
- RTE
- Collectively: National Grid, SP Transmission, Scottish Hydro Transmission
- SONI
- ESB National Grid (Eirgrid)
- REE (Red Eléctrica de España)
- Rede Electrical Nacional

- GRTN
- Verbund Austrian Power Grid
- HTSO
- PSE
- CEPS
- SEPS
- MVM
- ELES

[list to be finalised with full titles of participants]

Other entities, for example, Swiss TSOs or TSOs of countries of the future SEE REM when third party access is effectively implemented in these countries, may also participate in the compensation mechanism on the basis of a binding legal agreement between that entity and, collectively, the transmission system operators listed above.

Luxembourg's TSOs shall participate in compensation mechanism individually or collectively according to actual network configuration with neighbouring TSOs.

## **Scheme B**

Estii Energia

Latvernego

Lithuania

[list to be finalised with full titles of participants]

No payments shall be made between participants in scheme A and in scheme B.

## 2 Determination of receipts of compensation

2.1 For each of the entities referred to in paragraph 1, including those participating by private contract (“participants”), compensation will be paid in relation to the quantity of “transit flows” in the annual period under consideration which shall be determined according to the following formula:

$$T_i = \text{Min}(X(t)_i, M(t)_i)$$

where:

X(t) = measured flow on interconnections in export direction during hour t

M(t) = measured flow on interconnections in import direction during hour t<sup>3</sup>

2.2 The amount of compensation to be paid will be relative to the amount of defined transit flows relative to the total flow on the network of the participant as defined by the coefficient “ξ” below:

$$\xi = \frac{1}{8760} \sum_{i=1}^{8760} \left( \frac{T_i}{T_i + \max(L_i, G_i)} \right)$$

where:

T<sub>i</sub> is transit in entity “i”

L<sub>i</sub> is the load in entity “i”

G<sub>i</sub> is the generation in entity “i”

[All expressed in GWh]<sup>4</sup>

2.3 The first component of the amount of compensation will then be given by

$$c_i = \xi_i \times \text{LRAIC}_i$$

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<sup>3</sup> “Transit is therefore defined on the basis of actual physical flows during the hourly period. It is not based on any transaction based concept. For example: if flows in a given period consist of 200MW of import flows, and 100 MW of export flows, 100MW would be deemed to be transits. If export flows increased to 300MW, this would mean transit, as defined, would be 200MW.

<sup>4</sup> This formula gives the transit key to be used for the compensation mechanism. It calculates the average level of transit flow over the year as a proportion of total flows.

- 2.4 The second component of the amount of compensation will cover losses and then be given by

$$l_i = \text{MIN} (\xi_i, 0.15) \times (\text{“total annual losses recorded in the horizontal network multiplied by market based average yearly price for energy”})_i^5$$

- 2.5 The total amount to be received by each participant shall be given by the formula:

$$r_i = c_i + l_i$$

### 3 Determination of the horizontal network and forward looking LRAIC

- 3.1 The horizontal network is defined as that part of the participant’s total network where a difference in flow in excess of 1 MW is registered in a scenario with no transit flows compared to a situation where a reference amount of transit flows of 100 MW is assumed. Annex B presents the procedure for definition. On request, participants shall provide to the Commission information on the assets forming part of the horizontal network in terms of km of 380 kV and 220 kV transmission lines and cables (both alternating current and direct current cables) as well as the number of 380/220 kV substations and direct current converter stations.
- 3.2 Infrastructures at lower voltages than 220 kV are, in principle, excluded from the horizontal network although transmission lines and cable at 110 kV may be included subject to the conditions set out in Annex C.
- 3.3 The horizontal network shall include all alternating current lines. The calculation shall include all direct current lines of participants which form part of the general regulated asset base of the participant. Interconnectors that are legally separate from TSOs and are not included in regulated asset base are excluded from the asset base used for the evaluation of the LRAIC of the horizontal network, although the physical flows in these lines are considered in the calculation of the receipts and payments of compensations as any other flow.
- 3.4 An assessment of the **annual** revenue required to cover forward looking long run average incremental costs for the horizontal network (LRAIC<sub>i</sub>) shall be submitted for each participant by the regulatory authority in the Member State(s) concerned. The assessment shall be based on the following assumptions:

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<sup>5</sup> This should refer to a price reference in an appropriate wholesale market in the Member States concerned

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- i. LRAIC should include annual capital costs relating to future investment requirements corresponding to a uniform progressive renewal of all of the existing physical assets over a forty year period from the date of the assessment;
  - a. the cost of land purchase, access arrangements and obtaining permits should be excluded;
  - b. the existing configuration of the network would be maintained; i.e. there would be no network optimisation;
  - c. capital costs relating to future investment requirements would be discounted to present value terms using an appropriate discount rate
- ii. the assessment should be updated annually and take account of new additions to the network as and when they are carried out.
- iii. To convert the above capital cost estimates to annualised amounts an annuity shall be calculated based on the following parameters :
  - rate of return on capital per annum: 6 % nominal pre tax,
  - depreciation period: 40 years.
- iv. An amount relating to operating costs shall be added which should not exceed 2,0% p.a. of total asset value

3.5 On request, the regulator shall provide to the Commission the assumptions used in assessing the value of forward looking LRAIC according to the steps in 3.3 above. These details will be made available to all other regulators.

#### **4 Flows from non-participants**

4.1 Participating entities shall, where they are connected to other non participant networks, contribute to the compensation fund to the extent that they record declared net imports .

4.2 TSOs affected shall contribute €/MWh to the fund for each unit of declared imports from non participating countries. This amount shall be termed X(t)<sub>i</sub>

4.3 The participants affected may charge this amount to the network users, which hold contracts to import or export the electricity concerned. They may also make charges to those importing\ exporting from non-participants to reflect the use made of their national network.

4.4 An exception to 4.2 shall be made on a month-by-month basis to the extent that a participating entity which imports from a non-participant was, for more than 90% of the hourly periods in the previous calendar month, also a net importer from the other participants. In this event, no contribution shall be made under Article 4.2. and no charge shall be made to network users in relation to the €/MWh contribution for that period

4.5 The total contribution relating to flows with non participants under 4.2 for each country shall be termed “ $x_i$ ” and will be given by the formula

$$x_i = \sum_j \sum_{t=1}^{8760} X(t)_i$$

## 5 Determination of payments of compensation

5.1 Compensation from Member States shall be collected in relation to the cumulative absolute net flow “CANF” of electricity during the annual period in question according to the following formula;

$$CANF_i = \sum_{t=1}^{8760} \text{Absolute value}[(X(t)_i - M(t)_i)]$$

For participants paying contributions relating to non-participating countries under section 3 above, the calculation of CANF shall exclude net flows recorded at borders with non participants.

5.2 The compensation to be paid by each Member State will be determined by the formula

$$\frac{CANF_i}{\sum CANF_i} (\sum r_i - \sum x_i) \quad ^6$$

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<sup>6</sup> Thus each participant contributes to the total fund depending on the magnitude of its total cumulative absolute net flow in relation to those coming from the other participants.

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5.3 Participants shall not make specific charges to individual network users in order to collect the contributions required to the fund. Final charges to network users required to collect the contributions to the inter-TSO compensation mechanism shall not be transaction based.

**6 Payment procedure**

6.1 Annex A to these guidelines set out the payments procedure to be followed.

## ANNEX A

### **Details of the payment procedure to be followed in the context of the Inter-TSO compensation mechanism (Article 3 of the Regulation)**

#### **Pursuant to Article 8, paragraph 2(b) of the Regulation on conditions for access to the network for cross-border exchanges in electricity**

1. Compensations payments shall be made per calendar year (year N).
2. In November of the year N-1 the European Transmission Operators shall submit to the Commission the following data and information, on a MS per MS basis:
  - a) The forecasted total cost of the horizontal network (=those parts of the network used for cross-border flows) for the year N,
  - b) The cross-border flows hosted forecasted for the year N, as well as details of its calculation
  - c) The cross-border flows caused forecasted for the year N, as well as details of its calculation
  - d) On the basis of a), b) and c): the compensations payable forecasted for the year N

Prior to its submission to the Commission, the above data and information shall be agreed between all TSOs and the individual data per MS approved by the national regulators concerned.

3. The Commission, by letter, shall agree to the operation of the system in the course of the year N, subject to final end-year clearing, on the basis of the submitted information and data. Where appropriate, the Commission shall require modifications
4. Provisional payments of compensations shall be made between TSOs on a monthly basis in the course of the year N, on the basis of the above forecasts but taking into account physical flows actually measured for the month concerned.
5. In January of the year N+1 the TSOs shall submit to the Commission, after agreement of all TSOs concerned and the national regulators concerned, the final calculation of compensations payable for the year N.

The compensations shall then be definitively determined by the Commission in a Commission decision, pursuant to Article 3(3) of the Regulation.

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## **ANNEX B**

[more detailed horizontal network definition to be inserted]

## ANNEX C

### Conditions for including lower voltage levels than 200 kV as exceptions in the Horizontal Network

#### *1. Background*

It has been decided as a general rule within ETSO, that the horizontal network to be considered for transit compensation shall only include transmission voltage levels of 220 kV and above.

Despite the fact that the networks of several TSOs include a substantial amount of lines of voltage than 220 kV, inclusion of them generally in the calculation of the horizontal network would create many practical difficulties. In most countries these voltage levels are regarded as distribution.

However, a few countries – usually with smaller transmission systems – still use lines of voltage 110 – 190 kV significantly for transmission. Therefore it is permitted to make well-founded exceptions for these voltage levels. Applications for such exceptions must be made to the ERCB Task Force and approved by the Steering Committee.

#### **2. Physical or economic inclusion in the horizontal network**

The question of inclusion or not in the horizontal network can concern physical inclusion in the network model and/or economic inclusion in the cost claim.

##### 2.1 Physical inclusion

As in the case of merchant HVDC links the flows through certain 110 kV lines will have to be included in the physical representation, in order that the flows through the rest of the horizontal network will be correct. Examples of such exceptions are 100 – 190 kV lines which interconnect two CBT countries, or between CBT countries and other countries, and make energy exchange or transit possible.

##### 2.2 Economic inclusion

100 – 190 kV transmission networks can be included in their entirety in the calculation of the horizontal network when the following conditions are satisfied:

- when there is not (and never has been) any significant transmission system at a voltage level between 100 and 400 kV. “Significant” in this context is taken to mean more than 20 % (line length or MW.km).
- when transit in the 110 kV network represents a significant part (say more than 10%) of the total flow in the 110 kV network.

Calculation of which part of such networks actually are included in the horizontal network is then performed in the same way as for the 400 and 220 kV networks.