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## Comments on the draft report on the “Assessment of the annual cross-border infrastructure compensation sum”

NVE welcomes the opportunity to communicate our comments to the report.

Calculating LRAIC has proven to be one of many difficult tasks regarding the creation of a ITC-methodology that is consistent and creates soundness in the technical, legal and economic aspects. NVE welcomes Consentec’s efforts in this process.

In our view it is crucial in the discussion of the future ITC fund and its size that both method and principles applied are consistent with the overall market design and the wider objectives of the internal electricity market. In order to achieve the ambitious goals within the energy sector, it is important not to create disincentives for investments and inefficient price signals that may hamper further cross-border exchanges. The effects on the proposed infrastructure sums must therefore be reconsidered and the suitability of using long-run average incremental cost must be assessed in the context of reaching an efficient European market for electricity.

Cross-border trade is to a large extent organized through implicit auctions throughout Europe, where the bidding zone borders are aligned with national boundaries. The forthcoming network code on capacity allocation and congestion management will help to ensure a more optimal use of the transmission network capacity in a coordinated way. When assessing the cost and benefits of cross-border trade it is important to evaluate the interaction between ITC and congestion management. The pricing of capacity in cases where capacity is scarce, will create income for the TSO(s) that in turn may be used for investing in new infrastructure, to relieve future congestions. An effective market based congestion management will therefore reduce the need for infrastructure compensation for transit flows.

We would like to emphasize that transit flows already contribute in funding infrastructure through a substantial amount of congestion revenues stemming from cross-border flows. Transit flows through a price zone will generate revenues for the TSO, in the transit country if the network is congested, which it may reinvest in the development of its internal network. Thus, the TSOs hosting transit flows may receive a double compensation for developing networks.

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The ITC mechanism does not seem to be the most appropriate framework to encourage the TSOs to invest and develop their networks. The current ITC-model might lead to disincentives for countries that have or might get net imports or net export pr hour. The need for efficiently using flexibe generation recourses and to efficiently utilize differences in availability in resources (wing, solar, hydro) will be crucial in order to achieve the targets in the sector. Hence, any mechanism that increases the cost of not being in balance (net export or net imports) within an hour will increase the costs of new cross-border capacity and thereby decrease the investments in new interconnections or grid reinforcements between countries.

In order to enhance investments in new network capacity it is important that the link between who causes the “transit costs” and the TSO who pays are clear and reflect actual costs. The methodology used to calculate contributions into the fund and compensation payments are not connected to the actual incremental cost in the network caused by cross-border flows. This may lead to incorrect incentives for grid investments and hamper further integration of the internal energy market.

Please find detailed comments to the 8 questions from the consultation document:

- 1. Has Consentec’s study considered a sufficient range of potentially suitable options for assessing the ITC infrastructure fund? What other options do you believe should be included in the assessment?**

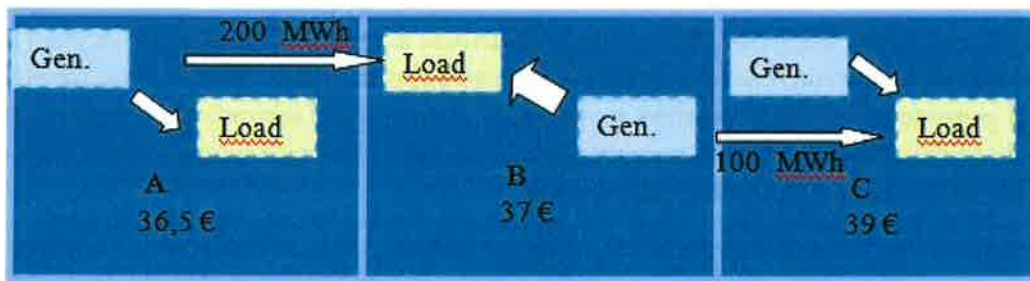
*Assessment of the infrastructure associated with facilitating cross-border flows*

The assessment of which infrastructure is used for cross-border flows is of vital importance before making any assessments of the cost that these flows may create. In our view the assessment should constitute an evaluation of which network elements are used for transit and to what extent.

Consentec has in our view made a too narrow assessment on witch infrastructure elements within the European grid that is used for cross-border flow purposes. The infrastructure assessment based on total asset data from ENTSO-E and is calculated by multiplying ca. 300,000 km of AC lines and cables >300, >200 kV and DC cables of any voltage level, and 340,000 MVA of transformer capacity with a “Global transit share” (GTS).

The GTS is obtained by dividing “transit flows” (minimum of net import and export) with the sum of “transit” and load. Cross-border flows, as calculated in the Consentec report, is considered as residual flows where countries by default produces and uses its own energy first, and where all other flows by definition creates costs that needs to be compensated. As shown in figure 1 the transit calculations conducted in the Consentec report will systematically overestimate the share of transit in the network.

The model used for compensation in current ITC framework as well as used by Consentec in order to obtain the costs of cross-border flows, does not reflect actual flows in the power system, nor does it constitute an assessment of the infrastructure used by cross-border flows.



In our view this is an incorrect simplification of the actual flows within the network. The model used for compensation in current ITC framework as well as used by Consentec in order to obtain the costs of cross-border flows, does not reflect actual flows in the power system, nor does it constitute an assessment of the infrastructure used by cross-border flows.

Hence, NVE are concerned with some of the legal, technical or economic assumptions that are stated in the report such as: *“It is important to note that the GTS contributes to the ITC mechanism fulfilling the prerequisite of Regulation 714/2009 demanding that “benefits that a network incurs as a result of hosting cross-border flows shall be taken into account to reduce the compensation received”.* There are concerns that using such assumptions, without more clearly stating their uncertainty and uncertain fundament, will not create the soundness and justification that are needed in order to reach a common understanding of the problems.

With regards to the assumptions made for estimation of km of network and MVA of transformer capacities please refer to question 4.

***An assessment on forward looking long run average incremental costs of making infrastructure available for cross-border flows of electricity***

LRAIC is normally considered to reflect the long run additional cost incurred – on average - for a given expansion in demand. In this case it would be the long run costs of an incremental increase in cross-border flows of electricity. Hence, the question Consentec in our view should answer is: *“What are the average additional costs in the long run of making infrastructure available for an incremental change in cross-border flows of electricity?”.*

Consentec however have defined incremental as *“The term “incremental” points out that the cost assessment shall assume a situation where additional transmission capacity is added to the grid, regardless of whether a new or an existing piece of infrastructure is being assessed.”*

The increment (change in demand) is thereby considered to be additional transmission capacity, not additional cross-border flows of electricity. The approach Consentec adapts will lead to an average cost of infrastructure (average annual replacement values), not an incremental cost of hosting cross-border flows. Estimates on long-run average cost of providing additional lengths of a new transmission line or additional capacity of new transformers, respectively, will differ from LRAIC of making infrastructure available for cross-border flows.

In addition, there is a question of whether it is possible or meaningful to estimate LRAIC when the pricing mechanism (the model to collect the revenues) is not based on any LRAIC principles. The ways that the income is collected are not based on “transit” flows or “cause to transit flows” but on net import and net export.

The ITC-fund as it is today will imply that the fewer net exchanges there are between countries of Europe, the more expensive they will be. Hence basing the ITC-costs on average annual replacement values while the contributions are based on net export and imports will create a climate for European trade not sustainable for the future.

***Suitability of LRAIC to determine the ITC infrastructure fund***

The issue of determining the suitability of the LRAIC principle can not be separated from the issue of the consequences that the principle may lead to.

The cross-border tariff does already at present reduce the profitability of new and existing infrastructure projects. Any increase in the fund size will provide clear disincentives for investment in new

interconnections and lead to reduced integration in the European market. The report does not explain how and why cross border tariffs in the range of 5 €/MWh on net import/export are suitable for the European market nor how it will benefit future market integration.

The issue of suitability of using the LRAIC costing principle should in our view not be seen separately from the consequences of using such a principle, or the overall long term costs of implementing such a regime on European trade.

In our view the methods to derive to LRAIC has deviated from the theoretical considerations behind the concept. Some of the elements used to calculate LRAIC have been derived from the development of the European regulations of the telecommunications sector. The differences between these sectors and the purpose of the mechanisms should be discussed, and the uncertainty of using the principle for ITC calculations should be highlighted.

In our view the sectors and the difference in purpose is fundamental of the methodology for assessing LRAIC can not be assessed in a similar matter.

**2. Are the criteria adopted to assess these options and their application to the identified options appropriate? What additional or alternative criteria do you think should be applied?**

Following the consultation document from the Commission regarding ITC<sup>1</sup> amongst others the following specific objectives for the ITC mechanism should be met:

- *Should accurately reflect the physical flows of electricity actually measured in given periods of time derived from cross-border flows.*

As stated in question 1, we do not believe that the GTS accurately reflects the physical flow. If the GTS is used to determine cross-border flows the uncertainty towards using this and the possible bias towards the resulting figures should be discussed and communicated.

- *Should capture both costs imposed on host networks and benefits realised as a result of cross-border flows including the commercial flows related to physical flows*

See Q5

- *Should take account of congestion rents and the income they generate for TSOs in a way that furthers the objectives of the internal energy market*

See Q5

**3. Of the options identified by Consentec, do you have any preferences? If so, please provide reasons for your preferences.**

We do not have any preferences for the models proposed by Consentec. As we understand the options calculated by Consentec will converge in the long run, because of the use of replacement values for new infrastructure.

An adaptation of the conceptual consideration used for calculating LRAIC in the telecom sector for ITC-purposes should be reevaluated and reconsidered in the report.

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<sup>1</sup> CONSULTATION DOCUMENT ON THE INTER-TSO COMPENSATION MECHANISM AND ON HARMONISATION OF TRANSMISSION TARIFICATION, EC-DGTREN, 9 Desember 2008

**4. Are the assumptions adopted for the illustrative numerical analysis appropriate? Considering the practical limitations of availability, what other data or assumption do you believe should be used in such analysis?**

The practical limitations and lack of availability of data in our view limit the value of the assessment. There is fundamental lack of data, which contains lack of sufficient cost data, lack of data of power flow computations, lack of data with respect to the network elements used to facilitate cross-border flow, as well as lack of empirical and academic evaluation of the principles used in electricity markets.

There is a need for more transparency on how calculations have been made. As the European network is a mature system one would assume that a fair portion of new investments are replacements or upgrades to a higher voltage level. There will be differences in both costs and km network from a situation where all new investments are considered as additional km of network. In our view assumptions such as: *“In practice, it would be difficult and onerous to try and properly decide for each investment project whether it constitutes an extension of the grid or a replacement of existing infrastructure. Therefore, we propose a simpler process to implement the above ideas: Every investment leads to “new” infrastructure ...”* needs to be described better, the uncertainty needs to be highlighted, and the bias toward the results in the analysis needs to be explained.

Further, there is a need for better explanation on the assumptions made for calculating the annual LRAIC. Especially the missing depreciation of the asset base may lead to an overestimation of the LRAIC. There should be included a transparent description on how the annualized unit costs are calculated, how the initial network elements are depreciated, and the bias towards the resulting figures need to be explained.

In addition, there is a need to explain which network components that are included in the calculations. If all network elements are included for the specific voltage levels, this would result in an overestimation of the fund size, and should thereby be stated in the report. A discussion on whether or not radial transmission network connecting producers or consumers should be deducted, and to what extent multiple voltage layers and transformation between them will represent “transitted” transmission networks, and a possible bias towards the resulting figures should be included in the report.

**5. How do you believe the different parts of the congestion revenues should be treated in calculating the ITC infrastructure fund and why?**

As stated in the impact assessment prepared by the Commission<sup>2</sup> of the current ITC-mechanism the following specific objectives for the ITC mechanism should be met:

- *Should capture both costs imposed on host networks and benefits realised as a result of cross-border flows including the commercial flows related to physical flows*
- *Should take account of congestion rents and the income they generate for TSOs in a way that furthers the objectives of the internal energy market*

Cross-border trade is today organised through implicit auction. This implies that the allocation of the capacities at the borders is based on the market participants' bids on the power exchange. Congestion rents and remuneration from ITC is generated from internal and external market participant and grid users.

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<sup>2</sup> CONSULTATION DOCUMENT ON THE INTER-TSO COMPENSATION MECHANISM AND ON HARMONISATION OF TRANSMISSION TARIFICATION, EC-DGTREN, 9 Desember 2008

In our view the assessments in the report does not properly capture the “*benefits realised as a result of cross-border flows including the commercial flows related to physical flows*”, i.e the congestion revenues stemming from cross border flows.

As we understand it the report only take into account part of the congestion revenues. The narrow interpretation only subtracts the revenues used for network investment in order to maintain or increase inter-connection capacity, not taking into account the revenues if they are used for other purposes. In our view the benefits that congestion income represents are present for the TSO or the network users, no matter what they are being used for. If they are used to reduce tariffs, they will offset the tariff increases that otherwise would incur as a result of any future investments. The fact that tariffs in some cases finance more than infrastructure cost, does not change the fact that congestion revenues are a benefit due to cross-border flows, and hence should be offset against the cost of cross-border flows.

The other issue is whether to subtract the benefits from the European annual replacement costs, or to subtract them from the annual replacement cost related to cross-border flows. We believe that the annual benefits of cross-border flows (congestion revenues), should be subtracted from the annual costs of cross-border flows (the ITC-Fund).

Consentec states in the report that “*It is important to recall that in the current legal framework only the ITC infrastructure fund size is open for reassessment, while the method for determining the relative compensations and contributions is fixed. By including the congestion revenues into the determination of the ITC infrastructure fund, one would effectively define the method for determining the relative compensations and contributions as European sharing key for at least a part of the congestion revenues.*” We would like to emphasize that the cost and benefits should be treated in the same matter. The fact that the ITC-mechanism is fixed is the case for both the costs and the benefits. This is in our view not an argument to include all costs while leaving out the benefits.

Although we support Consentec’s view that the key for determining the relative compensations and contributions to the ITC-fund might not be appropriate for sharing congestion revenues, this is also true regarding the costs. If costs are to be socialized and shared through the ITC-mechanism, so then should the benefits. The report should put emphasis on obtaining consistency between the assessment of costs and benefits regarding cross-border flows.

**6. Do you agree with Consentec’s assessment and the preliminary conclusions on the options for determining the ITC infrastructure fund?**

**7. What are your views regarding the suitability of using LRAIC to determine the ITC infrastructure fund? Do you consider the LRAIC proposed by Consentec appropriate?**

Consentec/Frontier prior ITC<sup>3</sup> report states that there are to important objectives regarding ITC:

**Facilitation of economic efficiency:** by facing network users with charges which reflect the economic costs witch use imposes on the network.

**Recovery of costs:** By ensuring that, in aggregate, the payments by users total the cost incurred by the network operators, the ongoing operation

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<sup>3</sup> Study on further issues relating to the inter-TSO compensation mechanism, Consentec/Frontier, 13 February 2006

With regards to the second objective we agree with Consentec that “*in conjunction with the purpose of ITC to compensate cost actually incurred this would let the regulated (historic) cost base appear more appropriate.*” This is also consistent with other reports stating that LRAIC is not suitable for cost recovery.<sup>4</sup>

With regards to the first objective, the methodology to determine the infrastructure fund needs to be consistent with the model for determining the relative compensations from and contributions to the ITC-fund. Economic efficiency is not obtained by the size of the fund but by the prices that the TSO and their customers meet. To use average annual replacement costs in order to derive to a sum that needs to be compensated, without checking the consistency to the method for which the relative compensations and contributions to the ITC-fund are derived, will clearly lead to an inconsistency with the objectives of using LRAIC.

The issue of suitability of using the LRAIC costing principle should in our view not be seen separately from the consequences of using such a principle, or the overall long term costs of implementing such a regime on European trade.

The legal, economical and technical assumptions made in the report, in order to obtain an estimate on LRAIC in our view highlight the conceptual difficulties to obtain a mechanism for sharing cost and benefits based on LRAIC. The range of highly uncertain assumptions is in it self an example of why LRAIC as a costing principle in the electricity sector is not robust, especially when the model for bearing and sharing the costs (the pricing principles) are given through the regulation.

For further discussion on the LRAIC please refer to question 1.

**8. Are there any other issues that you believe should be taken into account in this review? In particular, how do you believe the on-going wider developments in the European energy market and regulatory arrangements should impact the Agency’s proposal on the infrastructure fund?**

The forthcoming development of European legislation should try to single out the compensation issues that need to be solved and establish regional solutions to any regional problems that may exist. In that regard the Energy Infrastructure Package which aims to create a mechanism for regional sharing of network investments that benefit multiple countries, and the possible regional cost-sharing arrangements on re-dispatching costs stemming from unplanned/unscheduled flows, may constitute a solution to the compensation issues that exist.

The cross-border tariff does already at present reduce the profitability of new and existing infrastructure projects. Any increase in the fund size will provide clear disincentives for investment in new interconnections and lead to reduced integration in the European market. The report does not explain how and why cross border tariffs in the range of 5 €/MWh on net import/export are suitable for the European market nor how it will benefit future market integration.

Norway has a flexible production system with a large potential for exchanges with other less flexible electricity systems in Europe. With a large share of Europe’s hydro reservoir there is potential for increases in production capacity and pumped storage that offer flexibility to other countries. This means that the system is suitable to provide resources when less flexible systems request it and receive power when this is favorable. The demand for flexible generation resources is likely to increase with the introduction of more intermittent generation in the European market. Such an exchange between

different production systems will provide flexibility for the market and a more efficient use of energy resources throughout the European electricity system.

With the present mechanism Norwegian network users will pay ITC-charges of approximately 0,3 €/MWh of import (to “charge the battery”/pump water into the reservoirs) and 0,3 €/MWh to export the energy (“uncharge the battery”). The present tariffs on cross-border net exchanges create a clear disincentive on any investments that enhance such trades. Any increases in these tariffs will put a barrier to further investments in infrastructure needed for exchange of power to help to balance different production systems within Europe. A future European market should facilitate such exchanges and not build up under arrangements which are a clear obstacle to achieve further integration.

Yours sincerely

A handwritten signature in blue ink, appearing to read 'Torfinn Jonassen'.

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Head of section

A handwritten signature in blue ink, appearing to read 'Lars Ekern'.

Lars Ekern  
advisor