

**Agency position on the ENTSO-E  
“Guideline to Cost Benefit Analysis of Grid Development Projects”**

**30 January 2013**

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**Executive summary**

The recently agreed Regulation on guidelines for trans-European energy infrastructure introduces methodologies for a system-wide cost-benefit analysis (CBA) at Union-wide level for projects of common interest (PCIs) and for the preparation of future Ten Year Network Development Plans (TYNDP).

ENTSO-E is currently developing the methodology for assessing costs and benefits - and the related indicators - of electricity network developments. It published a discussion note, including consultation questions, on draft guidelines for the CBA of grid development projects and held a public workshop on 19 November 2012.

Following a request from the European Commission, the THINK consortium launched a consultation on its report on CBA in the context of the Energy Infrastructure Package.

The Agency appreciates the development of the draft methodology by ENTSO-E and the preparation of comments and recommendations by the THINK consortium. They form an excellent basis for further improvements of CBA for network development.

The Agency welcomes the action taken by ENTSO-E and their commitment towards improving the earlier methodology presented in the TYNDP 2012, following recommendations provided in the Agency's respective opinion. Such actions and commitment include the overall development of CBA, clarity on avoiding the double counting of economic effects, new quantified criteria aiming towards a consistent clustering approach and widely different future scenarios for the electricity system.

The Agency considers that the development of an improved CBA methodology is necessary and is it indeed one of its responsibilities, in cooperation with other involved parties. In this regard, the Agency has already cooperated with the European Commission, ENTSOs and THINK researchers, contributing to the development of draft methodologies. The Agency will continue contributing to a proper detailed methodology for CBA to be applied in the TYNDP and in the selection of PCIs. To this end, the Agency is also making a consultancy study conducted by Frontier Economics on the selection process for PCIs in the electricity sector publicly available. The study includes an insight into the role CBA plays in such a selection process.

In this position paper, the Agency identifies eight main messages for the development of an improved CBA methodology, including the need for further improved TYNDP assumptions and modelling as a proper data base for consistent project assessment, with the involvement of stakeholders, in order to ensure the quality and consistency of data inputs. A consistent clustering approach has to be applied throughout Europe, detailing the importance of each investment item for the materialisation of the expected benefits of the cluster to which this investment item belongs.

In addition, clear, transparent and quantified/monetised criteria for the CBA methodology and for the subsequent selection of PCIs from the TYNDP list are crucial requirements from a regulatory perspective. A clear formula for performing the CBA shall be introduced and transparency shall be enhanced.

Finally, the methodology for the calculation of project benefits (and the simulation tools which are used for applying the methodology) shall allow for the disaggregation of benefits at national level, in order to provide quantitative input for cross-border cost allocation decisions.

## 1. Background

The recently agreed “Regulation of the European Parliament and of the Council on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 714/2009 and 715/2009”<sup>1</sup> (“Regulation”) is expected to enter into force in early 2013.

This Regulation (Art. 12) introduces methodologies for a system-wide cost-benefit analysis (CBA) at Union-wide level for projects of common interest (PCIs). Furthermore, the (electricity) methodology shall be applied for the preparation of each subsequent TYNDP developed by ENTSO-E.

The Regulation (Art. 13) also introduces project-specific CBA consistent with the methodology, which takes into account benefits beyond the borders of the Member State concerned. Project-specific CBAs are an element accompanying requests for cross-border cost allocation (CBCA) from promoters of transmission infrastructure investments with cross-border impacts and are submitted to the concerned national regulatory authorities (NRAs).

The Agency shall provide (and publish) an opinion to the European Commission and Member States on the ENTSO-E methodology for CBA, within three months of the day of receipt of its final version.

ENTSO-E is currently developing the methodology for CBA. ENTSO-E published:

- A discussion note “Guideline to Cost Benefit Analysis of Grid Development Projects: Key Issues and Questions”<sup>2</sup>;
- Draft “Guideline to Cost Benefit Analysis of Grid Development Projects” (version September 2012<sup>3</sup> and version December 2012<sup>4</sup>).

In November 2012, the 23<sup>rd</sup> Florence Forum concluded<sup>5</sup> that ‘The Forum emphasises the importance of the TYNDP process to get a broader and consistent picture and to provide a robust basis for the selection of PCIs, based on a quantified CBA’.

The Agency welcomes the agreement on the Regulation, the actions taken by ENTSO-E and the conclusion drawn at the Florence Forum. Further improvements are, however, needed on the CBA and its implementation has to be appropriately monitored after its first application on the TYNDP. Furthermore, the Agency recognises the need for a coherent and consistent cost-benefit framework to be applied in the subsequent selection of PCIs.

In addition, the European Commission has initiated an *ad hoc* PCI selection process, pending the entry into force of the Regulation. During this process, the Agency and NRAs are requested to participate according to their respective roles in the draft Regulation, which mostly relates to the formation of opinions on the consistent application of the criteria and CBA methodology, and an evaluation of cross-border relevance of proposed PCIs, inside and across regions. The Agency and NRAs are and will continue contributing to the project evaluation.

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<sup>1</sup> Council of the European Union “Proposal for a Regulation of the European Parliament and of the Council on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 714/2009 and 715/2009 - Approval of the final compromise text”, 17108/12 ADD 1, 3 December 2012. <http://register.consilium.europa.eu/pdf/en/12/st17/st17108-ad01.en12.pdf>

<sup>2</sup> ENTSO-E, “Guideline to Cost Benefit Analysis of Grid Development Projects: Key Issues and Questions”, [https://www.entsoe.eu/fileadmin/user\\_upload/library/events/Workshops/CBA/121119\\_CBA\\_introduction.pdf](https://www.entsoe.eu/fileadmin/user_upload/library/events/Workshops/CBA/121119_CBA_introduction.pdf)

<sup>3</sup> ENTSO-E, “Guideline to Cost Benefit Analysis of Grid Development Projects”, Draft September 2012.

<sup>4</sup> ENTSO-E, “Guideline to Cost Benefit Analysis of Grid Development Projects”, Draft December 2012, [https://www.entsoe.eu/fileadmin/user\\_upload/library/events/Workshops/CBA/121204\\_ENTSO-E\\_Draft\\_CBA\\_methodology-V0.4.zip](https://www.entsoe.eu/fileadmin/user_upload/library/events/Workshops/CBA/121204_ENTSO-E_Draft_CBA_methodology-V0.4.zip).

<sup>5</sup> 23rd Florence Forum Conclusions, November 2012.

[http://ec.europa.eu/energy/gas\\_electricity/doc/forum\\_florence\\_electricity/meeting\\_023\\_conclusions.pdf](http://ec.europa.eu/energy/gas_electricity/doc/forum_florence_electricity/meeting_023_conclusions.pdf)

In this context, this document presents the Agency’s main messages on CBA for network development (Section 2) and outlines next steps and the timeline for reviewing the implementation of CBA (Section 3). The Agency’s position takes into account:

- a consultancy study conducted by Frontier Economics on the selection process for PCIs in the electricity sector (including insight into the role of CBA for such selection) whose key results are made publicly available for further open discussion<sup>6</sup>;
- the draft document “Cost-benefit analysis in the context of the energy infrastructure package” prepared by the THINK consortium<sup>7</sup>.

## 2. Main messages on cost benefit analysis for network development

The Agency welcomes the action taken by ENTSO-E and their commitment towards improving the methodology, following recommendations provided in the Agency’s opinion<sup>8</sup> on TYNDP 2012. Such improvements are summarised in Table 1.

Table 1 – Elements from the Agency’s opinion on ENTSO-E’s TYNDP 2012 and ENTSO-E’s current actions and commitments

| <b>Agency’s opinion on TYNDP 2012</b>   | <b>ENTSO-E’s actions and commitments</b>   |
|---|--|
| <p>The Agency acknowledges the proposed multi-criteria approach as the first step in the development of the expected methodology for a cost-benefit analysis.</p> <p>The Agency expects ENTSO-E to integrate the on-going efforts in improving the methodology for the cost-benefit analysis in the next TYNDP, especially in the light of the development of the PCI selection methodology within the EIP.</p> | <p>ENTSO-E is proposing improvements to the CBA methodology, based on the previous multi criteria approach.</p>  |
| <p>Special attention should therefore be paid to avoid possible double counting of economic effects when developing a cost-benefit analysis</p>   | <p>ENTSO-E explained that the economic effect of variation of CO<sub>2</sub> emissions is already included (internalised) within the generation costs. Therefore, ENTSO-E benefit B5, CO<sub>2</sub>, is accounted for in benefit B2, socio-economic welfare. ENTSO-E Benefit B3, integration of renewable energy sources (RES), is also already internalised in socio-economic welfare.</p> |

<sup>6</sup> Frontier Economics, “Electricity: Project of Common Interest - Selection process - A Report for NRAs - Executive Summary”, October 2012,

<http://www.acer.europa.eu/Electricity/Documents/Transmission%20project%20evaluation%20and%20selection.pdf>.

<sup>7</sup> THINK, “Cost benefit analysis in the context of the energy infrastructure package, THINK Topic 10, Draft report version V2”, 21 November 2012, <http://think.eui.eu>.

<sup>8</sup> Agency for the Cooperation of Energy Regulators, “ACER opinion on the ENTSO-E Ten-Year Network Development Plan 2012”, 5 September 2012.

[http://www.acer.europa.eu/Official\\_documents/Acts\\_of\\_the\\_Agency/Opinions/Opinions/ACER%20Opinion%2006-2012.pdf](http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER%20Opinion%2006-2012.pdf)

| Agency's opinion on TYNDP 2012  | ENTSO-E's actions and commitments   |
|---|---|
| <p>The Agency regards the further development of the clustering methodology as essential for the provision of a consistent clustering approach throughout Europe.</p> <p>The Agency expects ENTSO-E to provide further details on the importance of an investment item and its possible impacts on the whole cluster.</p> | <p>ENTSO-E is introducing new (quantified) criteria aiming towards a consistent clustering approach: the influence of investment on the increase of grid transfer capability must be substantial, otherwise it should not be a part of the cluster.</p>           |
| <p>The Agency regards as essential the use of a wider span across scenarios</p>   | <p>ENTSO-E states that the objective of the scenarios is to construct contrasting future developments that differ enough from each other, in order to capture a realistic range of possible future pathways that result in different challenges for the grid.</p> |

This initially positive evaluation will be reviewed by the Agency after the delivery of the CBA methodology and, most importantly, after the first application of the improved methodology on ENTSO-E's TYNDP 2014.

Taking into account the importance of i) identifying investment needs and a corresponding EU-wide plan (TYNDP) and ii) prioritising a set of PCIs from the plan, further improvement of the CBA for network development is also necessary along the following lines:

1. A consistent project assessment needs a proper data base. The TYNDP assumptions and modelling shall therefore be further improved, with the involvement of stakeholders, in order to ensure the quality and consistency of data inputs, featuring consistency in electricity and gas scenarios. The robustness of the assessment shall be supported by sensitivity analyses, for which the assumptions and results are presented in a transparent manner.
2. A regular update of the CBA methodology every second year, in advance of the subsequent TYNDP, accompanied by concrete proposals for future necessary updates of the CBA formula seems an appropriate way forward.
3. A consistent clustering approach has to be applied throughout Europe, with details on the importance of each investment item for the materialisation of the expected benefits of the cluster to which this investment item belongs.
4. Clear, transparent and quantified/monetised criteria for the CBA methodology and for the subsequent selection of PCIs from the TYNDP list are crucial requirements from the regulatory perspective.
5. Guidance for a common discounting method shall be given by the CBA methodology, to enable a fair comparison of PCIs.
6. Improved communication of CBA results promoting a guarantee of value for money for citizens is needed in order to facilitate the realisation of cost-efficient, secure and sustainable transmission infrastructure investments.
7. Further development of the application of the Take Out One at the Time (TOOT) methodology is needed to ensure equal treatment of TSOs' and third party projects.

Furthermore, the potential input from CBA towards CBCA decisions should not be disregarded. Therefore:

8. The methodology for the calculation of project benefits (and the simulation tools which are used for applying the methodology) shall allow for the disaggregation of benefits at national level, so as to provide quantitative input for CBCA decisions.

Messages 4 and 5 in the box above are at the heart of the CBA and shall contribute towards defining its concrete formula. Two simple formulas are commonly used: i) the benefit-cost ratio and ii) the net benefit<sup>9</sup>. The Agency recommends that both figures are presented in a fully monetised CBA. With the aim of achieving a manageable number of PCIs on the Union list, the Regulation (Art. 3) indicates that the "PCI label" is a limited resource. Due to this limitation, the Agency suggests that the net benefit figure is used in the selection of PCIs. This approach would allow for achieving a greater net benefit from the PCI selection process, compared to the possible alternative of using benefit-cost ratio.

After choosing the basic formula, a discussion (and stakeholder consultation) held by ENTSO-E seems appropriate for further definition of the cost components and of the benefit components.

The draft guideline clearly states that the costs are displayed in euros and lists six different cost items to be taken into account for deriving the total project expenditures (materials and assembly, temporary solutions during construction, approval procedure, replacement of devices, dismantling, maintenance and other life-cycle costs). In addition, the Agency supports the THINK recommendation that "costs incurred for mitigating environmental or social impact of the project should also be presented separately and included in the total project expenditure".

While all cost components have to be included in the CBA, a pragmatic approach could be considered for implementing the monetisation of benefits, focusing on the most relevant effects.

Table 2 displays a list of 11 benefit components and a proposal for their treatment in future TYNDPs. The benefit components could be aggregated as follows:

- A first group of benefits (socio-economic welfare, variation in losses, security of supply) which are already monetised or close to monetisation;
- A second group of benefits (avoided generation curtailments, reduced national constraints, avoided or delayed investments, optimised ancillary services), for which the implementation of monetisation could be prioritised, taking into account the relevance of each effect;
- A third group of benefits (technical resilience / system safety margin, social and environmental sensibility, effects on competition and market power) whose monetisation is acknowledged to be difficult and could be investigated in the long term, taking into account the relevance of each effect.

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<sup>9</sup> The benefit-cost ratio can be expressed as  $B/C$  where  $B$  is the net present value of total benefits and  $C$  is the net present value of total costs. The net benefit is  $B-C$ , with same meaning of terms.

Table 2 – A proposal for future CBA updates (Source: Agency’s evaluations based on inputs from Frontier’s study)

| <b>Benefit</b>  | <b>TYNDP 2012</b>  | <b>TYNDP 2014</b>   | <b>Post TYNDP 2014</b>                                |
|---|--------------------|---|---|
| Socio-economic welfare <sup>10</sup>                            | Monetary value     | Monetise  | Monetise  |
| Variation in losses   | Non-monetary value | Monetise  | Monetise  |
| Security of supply (load)                                       | Non-monetary value | Quantify EENS in MWh and provide national VOLLs           | Monetise  |
| Variation in generation curtailments <sup>11</sup>              | Initial analysis   | Analyse options to monetise and monetise (if possible)    | Monetise  |
| Releasing national constraints <sup>12</sup>                    | Not included       | Monetise (if possible)                                    | Monetise  |
| Future costs for new (avoided/delayed) generation investments   | Not included       | Monetise (if possible)                                    | Monetise  |
| Future costs for new (avoided/delayed) transmission investments | Not included       | Analyse options to monetise (evaluate project by project) | Monetise  |
| Optimisation of regulating power and ancillary services         | Not included       | Analyse options to monetise (evaluate project by project) | Monetise  |
| Technical resilience (system safety margin)                     | Non-monetary value | Include as monetary value “insurance value” (if possible) | Monetise (if possible)                                |
| Social and environmental sensibility                            | KPI value          | Analyse further options to quantify                       | Quantify and analyse options to monetise              |
| Effects on competition and market power                         | Not included       | Analyse importance of the effect                          | Evaluate project by project and monetise if important |

<sup>10</sup> Internalising variation in CO<sub>2</sub> emissions and some effects of RES integration.

<sup>11</sup> Only effects of generation curtailment calculated on the basis of network studies (which are not accounted for in the variation of socio-economic welfare calculated via market studies).

<sup>12</sup> This is the term adopted in the Frontier Economics study to indicate the variation of national congestion costs (which is not accounted for in the variation of socio-economic welfare calculated via market studies with one-state-one-node model). It can be calculated via market studies with specific national features. The ENTSO-E draft guideline includes the monetisation of “internal dispatch costs” in socio-economic welfare.



### 3. Next steps and review of CBA implementation

With regards the continued process, future steps for the CBA methodology are as follows:

- ENTSO-E shall publish the CBA methodology after an extensive public consultation process and shall submit it to the Agency, the Commission and Member States. The Agency shall provide and publish its opinion on the methodology.
- ENTSO-E will develop and submit the TYNDP 2014 to the Agency. The CBA methodology shall be applied for the preparation of the TYNDP. The Agency will provide its opinion on the TYNDP, including on the implementation of the CBA methodology as basis for the assessment of TYNDP projects.
- The CBA methodology, its principles laid down in Annex V and its rules and indicators set out in Annex IV, will subsequently be applied at Union-wide level for PCIs. The Agency will provide its opinion on the consistent application and implementation of the CBA methodology for the purpose of selection of PCIs.

Table 3 summarises the Agency's main messages and indicates milestones for reviewing their implementation.

Table 3 – Main messages and indication of when the Agency will review their implementation (Source: Agency)

| Main messages  | Occasion for implementation by ENTSO-E and for opinion by the Agency |
|--|--|
| Quality and consistency of data input  | SO&AF 2013, TYNDP 2014 and subsequent PCI selection process          |
| Concrete proposals for future necessary CBA updates  | CBA formal public consultation                                       |
| Consistent clustering approach throughout Europe, with details on the importance of each investment item | TYNDP 2014 and subsequent PCI selection process                      |
| Clear, transparent, quantified and monetised criteria  | CBA formal public consultation and future CBA updates                |
| Guidance for a common discounting method   | CBA formal public consultation                                       |
| Communication of CBA results as citizens' guarantee to get value for money                               | TYNDP 2014   |
| Application of the TOOT methodology to ensure equal treatment of TSOs' and third parties' projects       | TYNDP 2014 and subsequent PCI selection process                      |
| Allow for provision of quantitative inputs for cross-border cost allocation decisions                    | CBA formal public consultation                                       |