

**OPINION OF THE AGENCY FOR THE COOPERATION OF ENERGY
REGULATORS No 05/2017**

of 6 March 2017

**ON THE DRAFT ENTSO-E GUIDELINE FOR COST BENEFIT ANALYSIS
OF GRID DEVELOPMENT PROJECTS**

THE AGENCY FOR THE COOPERATION OF ENERGY REGULATORS,

HAVING REGARD to Regulation (EU) No 347/2013 of the European Parliament and of the Council of 17 April 2013 on guidelines for trans-European energy infrastructure and repealing Decision No 1364/2006/EC and amending Regulations (EC) No 713/2009, (EC) No 714/2009 and (EC) No 715/2009¹, and, in particular, Article 11(6) in conjunction with Article 11(2) thereof,

WHEREAS:

- (1) The ENTSO-E cost-benefit analysis (“CBA”) methodology shall be applied for the preparation of each subsequent ten-year network development plan (“TYNDP”) developed by the European Network of Transmission System Operators for Electricity (“ENTSO-E”). It shall be drawn up in line with the principles laid down in Annex V of Regulation (EU) No 347/2013 and be consistent with the rules and indicators set out in Annex IV of Regulation (EU) No 347/2013. In addition, it is relevant for establishing regional lists of projects of common interest (“PCIs”), for the submission of investment requests by PCI promoters to National Regulatory Authorities (“NRAs”), for decisions of NRAs on granting incentives to PCIs and for providing evidence on significant positive externalities for the purpose of Union financial assistance to PCIs.
- (2) On 5 February 2015, the European Commission adopted Decision C(2015)533/F1 “Commission Decision on the cost-benefit analysis methodologies concerning trans-European energy networks”².
- (3) On 13 February 2015, ENTSO-E published the “ENTSO-E Guideline for Cost Benefit Analysis of Grid Development Projects FINAL- Approved by the European Commission” (“CBA Methodology 1.0”) ³. The document indicates that *“this is a continuously evolving process, so this document will be reviewed periodically, in line with prudent planning practice and further editions of the TYNDP or upon request (as foreseen by Article 11 of the EU Regulation 347/2013)”*⁴ and that *“System development tools are continuingly evolving, and it is the*

¹ OJ L 115, 25.4.2013, p.39.

² <http://ec.europa.eu/transparency/regdoc/?fuseaction=list&n=10&adv=0&coteId=3&year=2015&number=533>

³ <https://www.entsoe.eu/Documents/SDC%20documents/TYNDP/ENTSO-E%20cost%20benefit%20analysis%20approved%20by%20the%20European%20Commission%20on%204%20February%202015.pdf>

⁴ CBA Methodology 1.0, p.8.

intention that this document will be reviewed periodically pursuant to Regulation (EU) n.347/2013, Art.11 §6, and in line with prudent planning practice and further editions of the TYNDP document of ENTSO-E”⁵.

- (4) Pursuant to Article 11(6) of Regulation (EU) No 347/2013 and in accordance with paragraphs 1 to 5 of the same Article, the ENTSO-E CBA methodology shall be updated and improved regularly.
- (5) Before the publication of the CBA Methodology 1.0, the Agency for the Cooperation of Energy Regulators (“the Agency”) issued its “Position on the ENTSO-E Guideline to Cost Benefit Analysis of Grid Development Projects - 30 January 2013”⁶ and its Opinion No. 01/2014 on the ENTSO-E Guideline for Cost Benefit Analysis of Grid Development Projects⁷.
- (6) The Agency’s and Commission’s Opinions included lists of necessary adaptations to prepare the CBA Methodology 1.0, as well as requests for further updates and improvements of the ENTSO-E CBA methodology to be implemented after the approval of the CBA Methodology 1.0.
- (7) Taking into account that the CBA Methodology 1.0 did not include the necessary adaptations to define the project-specific CBAs to be carried out in the context of investment requests pursuant to Article 12 of Regulation (EU) No 347/2013, the Agency issued, on 18 December 2015, its Recommendation No 05/2015⁸, providing specific suggestions for project-specific CBA in the context of investment requests. As this Recommendation already covers the topic of CBA for investment requests, the Agency does not provide in this opinion recommendations regarding the application of the ENTSO-E CBA methodology specifically for the purpose of investment requests, for which it refers all interested parties directly to Recommendation No 05/2015.
- (8) ENTSO-E conducted a public consultation on a draft version of an updated CBA methodology⁹ from 25 April 2016 till 31 May 2016. According to information received from ENTSO-E, a number of stakeholders provided feedback¹⁰. Taking into account the ENTSO-E’s consultation on the updated CBA methodology, in order to avoid a duplication of consultation efforts, time and resources, the Agency decided to hold a public workshop on 10 May 2016 to inform

⁵ CBA Methodology 1.0, p.53.

⁶ http://www.acer.europa.eu/official_documents/position_papers/position%20papers/acer%20position%20entso-e%20cba.pdf

⁷ http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER%20Opinion%2001-2014.pdf

⁸ Agency’s Recommendation No 5/2015 regarding good practices for the treatment of investment requests including cross-border cost allocation (CBCA) requests
http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Recommendations/ACER%20Recommendation%2005-2015.pdf

⁹ https://consultations.entsoe.eu/system-development/cba-2-0/consult_view

¹⁰ For instance EASE Storage (http://ease-storage.eu/wp-content/uploads/2016/05/2016.05.30_CBA-2.0-Public-Consultation-Questionnaire_for-website.pdf) and EURELECTRIC (http://www.eurelectric.org/media/278464/entso_benefit_analysis-2016-2210-0011-01-e.pdf)

stakeholders and consult them on recommendations for an improved CBA methodology for the purpose of TYNDP and PCIs¹¹.

- (9) On 29 July 2016, ENTSO-E submitted to the Agency the document “ENTSO-E Guideline for Cost Benefit Analysis of Grid Development Projects - 29 July 2016 - Version for ACER official opinion” (“draft CBA Methodology of 29 July 2016”)¹², accompanied by a document (“Going from CBA 1.0 to 2.0”)¹³ explaining the details of the main changes with respect to the CBA Methodology 1.0.
- (10) On 14 September 2016, ENTSO-E sent a letter to the Agency, as a complement to ENTSO-E’s submission of the draft CBA Methodology of 29 July 2016, including improvements that ENTSO-E committed to implement in an updated version of the CBA Methodology.
- (11) On 21 September 2016, the Agency sent a letter to ENTSO-E, taking note of the addition to ENTSO-E’s submission of the draft CBA Methodology of 29 July 2016, and invited ENTSO-E to submit a new, complete version of the draft CBA Methodology which implements all the foreseen improvements. Further, in its letter the Agency underlined that it considers the draft CBA Methodology of 29 July 2016 as obsolete and as such not eligible for an Agency’s opinion pursuant to Article 11 of Regulation (EU) No 347/2013.
- (12) On 6 December 2016, ENTSO-E sent a letter to the Agency stating that, in line with the Agency’s letter of 21 September 2016, ENTSO-E has withdrawn the draft CBA Methodology of 29 July 2016 and submitted an updated draft CBA Methodology (“draft CBA Methodology 2.0”) without any other accompanying document.
- (13) In preparing this Opinion, the Agency took into account the ENTSO-E’s implementation of comments provided by the Agency before the adoption of the CBA Methodology 1.0, the draft CBA Methodology 2.0, the Agency’s Recommendation No 05/2015 and ENTSO-E’s actions and inactions regarding the previous requests for updates and improvements of the CBA methodology, as well as the outcome of the aforementioned stakeholders’ consultations,

HAS ADOPTED THIS OPINION:

1. General Remarks

The draft CBA Methodology 2.0 defines rules and indicators whose objectives are consistent with the objectives of Annex IV.2 of Regulation (EU) No 347/2013¹⁴. Some indicators have been updated

¹¹ <http://www.acer.europa.eu/Events/ACER-workshop-on-scenarios-and-cost-benefit-analysis-methodology-for-assessing-cross-border-infrastructure-projects/default.aspx>

¹² <https://www.entsoe.eu/news-events/announcements/announcements-archive/Pages/News/ENTSO-E-submits-to-ACER-new-methodology-for-the-costbenefit-analysis-of-infrastructure-projects.aspx>

¹³ Going from CBA 1.0 to CBA 2.0. Main improvements and why did ENTSO-E do this, 8 July 2016, (p.3-6) https://www.entsoe.eu/Documents/TYNDP%20documents/Cost%20Benefit%20Analysis/160708_CBA%202.0%20improvements%20explained_PDF.pdf#search=Going%20from%20CBA%201%2E0%20to%202%2E0

¹⁴ The objectives of the indicators are to measure the specific criteria in Article 4(2)(a) of Regulation (EU) No 347/2013:

by ENTSO-E¹⁵.

The draft CBA Methodology 2.0 is, to a large extent, in line with the principles in Annex V of Regulation (EU) No 347/2013, even if, formally, the principles of Annex V.1, 2, 3, 6 and 11 (years of input data set, compatibility of data sets used for electricity and gas, guidance for use of network and market modelling, impacts to be taken into account, identification of beneficiaries and cost bearers) seem not to be fully reflected in the draft CBA Methodology 2.0.

Therefore, ENTSO-E should delete the following statements in the draft CBA Methodology 2.0, before its submission for approval:

- (p. 23) the assessment framework is “*complying with (...) Annexes IV and V of Regulation (EU) 347/2013*”;
- (p. 27) “*this methodology includes all the elements described in (...) Annexes IV and V of the Regulation*”.

Overall, the draft CBA Methodology 2.0 provides for some improvements compared to the CBA Methodology 1.0 in various aspects as listed in Section 2 of this Opinion.

On the other hand, the draft CBA Methodology 2.0 also misses to implement various previous recommendations and includes some backward steps when compared to the CBA Methodology 1.0, as indicated in the rest of this Opinion.

The Agency therefore encourages ENTSO-E to adapt the draft CBA Methodology 2.0, in accordance with the Agency’s considerations in Section 5 of this Opinion, before submitting it to the European Commission for approval, pursuant to Article 11(6) in conjunction with Article 11(4) of Regulation (EU) No 347/2013.

2. The process for preparing the draft CBA Methodology 2.0

The ENTSO-E preparatory activities for the draft CBA Methodology 2.0 included:

- the application of some provisions of the CBA Methodology 1.0 for the preparation of the TYNDP 2014;
- a consultation with the Network Development Stakeholder Group (on 15 October 2015)¹⁶;
- a stakeholder workshop on 16 March 2016¹⁷;

(i) market integration, competition and system flexibility, (ii) sustainability and (iii) security of supply.

¹⁵ In its Position Paper on the Energy Infrastructure Package of 22 June 2016

(http://www.acer.europa.eu/Official_documents/Position_Papers/Position%20papers/ACER%20Position%20on%20EIP.pdf), the Agency observed that the detailed list of indicators to be used for the CBA methodologies provided in annexes IV(2) and IV(3) of Regulation (EU) No 347/2013 presents unnecessary legal limitations. The Agency noted that “the validity of these annexes should be reassessed”.

¹⁶ https://www.entsoe.eu/Documents/TYNDP%20documents/Long-Term%20Development%20Group/151015_ND%20SG%20material.zip

¹⁷ <https://www.entsoe.eu/news-events/events/Pages/Events/Join-us-to-improve-the-pan-European-Cost-Benefit-Analysis-methodology-.aspx?EventWorkshopId=227>

- the publication of a draft version for consultation (on 25 April 2016) and the organisation of a public consultation (from 25 April to 31 May 2016), with the support of questions provided in the document “*Shape the next European Cost Benefit Analysis Methodology (CBA 2.0)*”¹⁸;
- a stakeholder webinar on 11 July 2016¹⁹; and
- informal discussions and meetings with the European Commission’s and Agency’s experts especially during the second semester of 2016.

The Agency welcomes the preparatory workshop on 16 March 2016 which provided an opportunity to collect a first feedback from stakeholders. However, ENTSO-E did not indicate how the feedback was taken into account in the draft CBA Methodology 2.0. ENTSO-E should have prepared the public consultation with further accompanying document(s) to facilitate stakeholder consultation (as already done for the CBA Methodology 1.0). Further, ENTSO-E could have explored additional instruments to facilitate active stakeholder involvement during the consultation period, for example a public workshop.

The Agency notes that ENTSO-E could have been more open to accept some useful comments provided by the respondents to the public consultation. For a list of the proposals included in these comments please see Annex I to this Opinion.

The ENTSO-E document “Going from CBA 1.0 to 2.0” states (p. 3) that it summarises “*in a very concise way what we have improved in the methodology and the reason behind the changes. These changes cover also the implemented changes due to the stakeholders’ feedback. For a full view on all stakeholders feedback (from the consultation) and the ENTSO-E answer to each of them please read the report on comments (this will be made available by the end of July)*”.

The Agency regrets that the aforementioned ENTSO-E report on stakeholders’ comments was not submitted to the Agency and is apparently not publicly available. The Agency recommends ENTSO-E swiftly to publish this report, in order duly to complete the information set and submit it to the European Commission and Member States who should provide their opinion on the draft CBA Methodology 2.0 within three months of the receipt of this Opinion.

The Agency recommends ENTSO-E to increase its efforts on stakeholder involvement and the provision of adequate transparency in the forthcoming adaptations of the draft CBA Methodology 2.0 in line with the recommendations provided in this Opinion, as well as for its application in subsequent TYNDPs.

3. Improvements introduced in the draft CBA Methodology 2.0

The Agency welcomes the improvements introduced in the draft CBA Methodology 2.0. The following are the main aspects where improvements have been introduced:

¹⁸ https://consultations.entsoe.eu/system-development/cba-2-0/supporting_documents/consultation%20questions_CBA_2_0_25%20April_31%20May.pdf

¹⁹ https://www.entsoe.eu/Documents/Events/2016/160711_CBA%202.0%20public%20webinar_ENTSO-E%20presentation.pptx

- introduction of the Net Transfer Capacity calculation (NTC) in addition to the Grid Transfer Capability (GTC) and its presentation as the sole measure of the contribution of a project to the cross-border capacities, which seems to imply shifting from GTC to NTC for the assessment of projects with cross-border impact²⁰;
- clarification of processes and terms used:
 - inclusion of schematic overview of the process of the TYNDP and PCI processes²¹;
 - inclusion of “general definitions” for some key terms used in the document²²;
 - more details on the sequence of projects for the “multiple Take Out One at the Time” approach²³;
 - inclusion of additional clarifications regarding the double counting of benefits B2 “RES integration” and B3 “variation in “CO2 emissions” indicators with benefit indicator B1 “Socio-Economic Welfare”²⁴;
- expansion of the scenarios, based on which the assessment of the projects is conducted, to cover at least two study years for the mid-term horizon (instead of “study two horizons” in the CBA Methodology 1.0) and fixed study years, i.e. rounded to full 5 years²⁵;
- a proposal for the classification of the status of a transmission project (under consideration, etc.)²⁶;
- improved transparency of cost reporting, by splitting indicator C1 of capital expenditure and indicator C2 of operating expenditure²⁷;
- further developments of some aspects of benefits:
 - removal of subjective key performance indicators B6 “Technical resilience/system safety” and B7 “flexibility”, which were included in the CBA Methodology 1.0;
 - disaggregation and better presentation of benefits related to security of supply: B5 “adequacy to meet demand”, B6 “system flexibility” and B7 “system stability”;
 - an initial step (although not quantified) for classifying the project impacts on power system stability.

4. ENTSO-E’s consideration of previous requests for improvement of the CBA methodology for transmission projects

Despite the improvements introduced in the draft CBA Methodology 2.0, ENTSO-E failed to handle important remarks and recommendations suggested by the Agency in its Opinion No 01/2014 and in its document “Agency position on the ENTSO-E ‘Guideline to Cost Benefit Analysis of Grid Development Projects’”. The most important of these shortages (and the related Agency’s recommendations) are the following:

²⁰ Draft CBA Methodology 2.0, page 20.

²¹ Draft CBA Methodology 2.0, page 8.

²² Draft CBA Methodology 2.0, page 4.

²³ Draft CBA Methodology 2.0, page 14.

²⁴ Draft CBA Methodology 2.0, pages 32 and 33.

²⁵ Draft CBA Methodology 2.0, page 11.

²⁶ Draft CBA Methodology 2.0, page 18.

²⁷ Draft CBA Methodology 2.0, page 46.

- (1) although the draft CBA Methodology 2.0 (p.10) may provide for an extension of the number of the study years (from two horizons in CBA Methodology 1.0 to “at least two study years for the midterm horizon”), it does not state whether any year(s) after the mid-term horizon should be subject to assessment;
- (2) regarding the common discounting method, a real discount rate of 4%, 25 years of operation and 0 residual value is “*to be used for PCI and TYNDP projects assessment*” (p. 22). However, reference to other applications of the CBA methodology, as indicated in recital (1) of this Opinion, is missing and should be included;
- (3) the phrase “*in addition to the 25 years that might be seen as a ‘stress test’, a common life-cycle for the transmission investments of 40 year can be applied for the NPV [Net Present Value] calculation*” creates confusion regarding the obligation of project promoters to implement the common discounting method. The draft CBA Methodology 2.0 should be amended to explain that economic lifetimes different than 25 years are applicable solely for the purpose of sensitivity analysis;
- (4) the draft CBA Methodology 2.0 does not include reference to indicators such as “benefit over cost ratio”, which, as suggested by the Agency, would draw more attention on the monetisation of costs and benefits. Furthermore, it is not indicated when the Net Present Value indicator described in Section 3.2.4 of the draft CBA Methodology 2.0 should be applied and for which purposes;
- (5) the draft CBA Methodology 2.0 includes a new Annex 2 on internal projects, which may have cross-border impact and internal benefits. However, although the Agency already called for more clarity and transparency by means of clear differentiation of the SEW benefit components (i.e. by defining at least three distinct categories of benefit depending on whether the benefit is related to cross-border boundaries, internal boundaries or very local constraints and by which tool the benefit is identified), no significant improvement is noted in the draft CBA Methodology 2.0, which does not clearly distinguish the nature of the impacts;
- (6) the Agency’s recommendation to disaggregate cost components by presenting separately the costs incurred for mitigating environmental or social impact of the project in order to ensure full transparency on investment-endogenous environmental costs is not included in the draft CBA Methodology 2.0;
- (7) while the construction of baseline/reference network for the TOOT (Take Out One at the Time) and PINT (Put IN one at the Time) methods is carefully described, there is no explanation about the actual construction of the reference network and the capacities used on each boundary for the CBA applications. The Agency reaffirms the remark in its Opinion No 12/2016 that a strict TOOT approach, accounting for all projects in the “baseline network”, may result in underestimations or overestimations of the economic profitability of the assessed projects (depending on the quantity of the capacity increase provided by the proposed projects). Also, there is no elaboration on how the “baseline network” evolves across the various study horizons and scenarios, in particular regarding the impact of internal reinforcements;
- (8) despite the inclusion of some definitions in some sections of the draft CBA Methodology 2.0, a systematic inclusion of definitions of important terms is still missing. Also, in some cases, like the definition of “investment”, the definition provided misses some of the important aspects which are provided in the CBA Methodology 1.0;

- (9) regarding the monetisation of the security of supply benefits, the monetisation of expected energy not supplied (EENS) is not mandatory (“only if the project promoter agrees”²⁸). The monetisation of EENS should be mandatory;
- (10) regarding the calculation of the Value of Lost Load (VOLL), which is necessary for the monetisation of the EENS, a step backwards is noted as the information on country-specific VOLL values included in Annex 4 of the November 2013 draft version of the CBA methodology is not present in the submitted draft CBA Methodology 2.0. ENTSO-E should expand the VOLL table and reinsert it in Annex 7 to the CBA methodology, before its submission for approval;
- (11) the proposed clustering rules and the new approach based on promoters’ justification are welcome. However, the definitions of “under consideration” and “planned, but not yet in permitting” statuses should be improved better to reflect the conditions under which projects should be included under these labels (please see section 2.12. of Annex II to this Opinion). Also, the phrasing should be amended accordingly so that investments which contribute only marginally to the full potential of the main investment are not allowed to be clustered together. Also, the proposed rules do not prevent cases of clustering an investment delayed for a long time together with other (on-time) investments of the same cluster, resulting into non delivery of the full benefits of the cluster;
- (12) the provisions of the CBA Methodology 1.0 that the transfer capacity increase “*must be reported for each project [i.e. investment] embedded in the cluster*”²⁹ and that “*the GTC is oriented, which means that values might be different per direction*”³⁰ are eliminated in the draft CBA Methodology 2.0. Instead the transfer capacity increase is proposed to be displayed at a cluster level and as a non-scenario specific result. ENTSO-E should return back to the provisions of the CBA Methodology 1.0;
- (13) furthermore, transfer capacities should be clearly labelled as “cross-border” or “internal”. The Agency recommends that, where appropriate, the calculation of NTC increases should be accompanied with sensitivity analyses on the level of capacity created. Such approach could also help to reflect the uncertainties associated with the evolutions of capacity calculation rules. Also, the main factors that could affect the NTC increase created by the project, as well as a qualitative assessment of their impact on the calculated benefits of the project should be included;
- (14) the Agency already suggested a list of 11 benefit components and a proposal for their treatment in future TYNDPs. Furthermore, the Agency called on ENTSO-E to quantify and monetise benefits, in particular concerning the reduction of future costs for new (avoided/deferred) generation investments and for ancillary services, before the preparation of the TYNDP 2016. The draft CBA Methodology 2.0 suggests a new approach for the security of supply benefits as follows:
 - a new adequacy indicator (B5), for the calculation of the additional adequacy margin;
 - a system flexibility indicator (B6) which does not consider ancillary services, but is based on the cross-border contribution of a project to ramping;
 - a system stability indicator (B7), which is not quantified.
 No further quantification is examined or proposed in the draft CBA Methodology 2.0, e.g. external costs of thermal electricity generation.

²⁸ Draft CBA Methodology 2.0, page 40.

²⁹ CBA Methodology 1.0, page 23.

³⁰ CBA Methodology 1.0, page 27.

A more elaborated analysis of the Agency's recommendations and the proposed approach can be found in Annex II to this Opinion.

5. ENTSO-E's proposals for CBA of storage projects

Regarding the separate assessment of storage projects (Chapter 4 of the draft CBA Methodology 2.0), which was previously recommended by the Agency, the following shortages are noted:

- (1) the draft CBA Methodology 2.0 (p. 47) states that "*storage plants (...) are already modelled*". However, it does not indicate how, and whether the power exchange profile of storage plants is an input or an output of the market simulations;
- (2) the storage plants assumptions to be used in market studies affect significantly the benefits calculations, and, therefore, for transparency reasons they should be described and made public when applying the CBA methodology. A clear reference to the simulation data and assumptions that will have to be made public in the TYNDP is missing in the draft CBA Methodology 2.0;
- (3) no analysis is foreseen for the identification of cases where a storage plant may be competing with a transmission project, and it is not clarified how the TOOT methodology would be applied in the case of storage plants;
- (4) the assessment of the flexibility benefits of storage projects is only qualitative, based on performance indicators and expert views on future operational characteristics of the plants; a quantified - and possibly monetised - approach is missing.

6. Agency's proposals for improvements of the draft CBA Methodology 2.0

The Agency calls ENTSO-E to consider the improvements proposed in this Opinion and submit for approval to the Commission an amended version of the draft CBA Methodology 2.0. In particular, the Agency recommends ENTSO-E:

- (1) clearly to indicate the proposed study years after the mid-term horizon;
- (2) clearly to state that the 25-years common discounting approach will be used for all the CBA applications and that any discounting method using a longer period than the one provided by the common discounting method can only be used for sensitivity analysis;
- (3) to include in the draft CBA Methodology 2.0 indicators such as "benefit over cost ratio" to draw more attention on the monetisation of costs and benefits;
- (4) to use separate indicators:
 - for the benefit B2 "RES integration" (economic effects already internalised in generation cost savings) and a new benefit category related to a possible societal extra-value of RES integration³¹, which may be subject to separate monetisation;
 - for the benefit B3 "variation in CO₂ emissions" (economic effects related to CO₂ emission trading schemes, already internalised in generation cost savings) and a new

³¹ Draft CBA methodology 2.0, page 32.

benefit category related to additional CO₂ impacts on society³², which may be subject to separate monetisation;

- (5) after introducing the above mentioned split of B2 and B3 indicators, to modify the graph presenting the main categories of the project assessment methodology³³ to show that the B2 (RES integration) and B3 (variation in CO₂ emissions) are included in the B1 (SEW) category;
- (6) to provide more clarity and transparency in the calculation of SEW benefit to distinguish the following three components for indicator B1:
 - B1.A (SEW on cross-border boundaries);
 - B1.B (SEW on internal boundaries via market studies);
 - B1.C (use of probabilistic network studies to assess re-dispatch or generation curtailments beyond those captured by the market studies).

As the SEW benefit is in many instances the most relevant benefit of a project, the amended CBA methodology could include additional indications and results for the TYNDP and in other CBA applications, in order to facilitate the understanding of the SEW results (e.g. the variation of yearly energy exchanges and the variation of congestion hours across one or more relevant boundary “with” and “without” the investment under analysis);

- (7) to clarify the parameters mentioned in Table 1 “*Reporting sheet of this indicator in the TYNDP*” of section 3.4.1;
- (8) to disaggregate cost components by presenting separately the costs incurred for mitigating the environmental or social impact of the project in order to ensure full transparency on investment-endogenous environmental costs;
- (9) to apply the new procedure to estimate the Capital Expenditure for non-mature investments³⁴ in all cases (i.e. to remove the words “*when detailed project costs are not available yet*”);
- (10) regarding the construction of the reference network and the target capacities used on each boundary, to build the reference market model by considering the minimum value between the target capacity and the reference capacity at each boundary; to provide explanations about the actual construction of the reference network and the capacities used on each boundary for the CBA applications and to elaborate on how the baseline network evolves across the various study horizons and scenarios, in particular regarding the impact of internal reinforcements;
- (11) to include a requirement for the user of the CBA Methodology to explicitly define and identify the generation costs that are considered in each market modelling tool (e.g. variable fuel costs, internalised cost of CO₂ emissions, variable operation and maintenance costs, start-up and shut-down costs);
- (12) regarding the calculation of transfer capacities:
 - clearly to label the calculated increases as either “cross-border” or “internal”;
 - where appropriate, to accompany the calculation of NTC increase with sensitivity analyses;
 - to present the main factors that could affect the NTC increase created by a project, as well as a qualitative assessment of their impact on the calculated benefits of the project;

³² Draft CBA methodology 2.0, page 33.

³³ Draft CBA methodology 2.0, page 24.

³⁴ Draft CBA Methodology 2.0, page 46.

- (13) to include in a systematic way all the definitions of important terms in the section at the beginning of the CBA methodology:
 - regarding the definition of “investment”, to reintroduce in the CBA methodology a clear and substantiated definition of “investment”, with due treatment of completely interdependent investment items;
 - regarding the definition of the generation power shift, as it is mentioned that it “can have a significant impact on the results”, to provide both the definition and the generation power shift itself;
- (14) to make the monetisation of the expected energy not supplied (EENS) compulsory and to come up, in cooperation with its TSO members, the Agency and NRAs, with a methodology to calculate the Value of Lost Load (VOLL) and the specific values in due time to be used for the TYNDP 2018 project assessment;
- (15) regarding the further quantification and monetisation of benefits:
 - further to address the value of “ancillary services / flexibility” impacts, with a target to quantify and monetise as far as possible. ENTSO-E should at least evaluate the option of monetising by means of avoided costs (e.g. avoided installations of reactive compensation devices, avoided costs for voltage control from generating units);
 - to suggest options of indicators for quantifying the benefit B7 “system stability”. ENTSO-E should provide more examples for investigation of extreme cases;
 - to suggest options for quantifying those other measures which ENTSO-E claims difficult to be monetised, or, when ENTSO-E considers impossible to do so, thoroughly justify why (e.g. environmental impact and impact on competitiveness);
 - to evaluate the following recommendation in Exergia report *“The external cost of thermal electricity generation comprises two main components: cost from greenhouse gases, and cost from the impact on population health of other emissions. The monetisation of the above costs (which are avoided in the case of avoided thermal generation) is different and likely higher than the cost of CO₂ as currently considered by the CBA methodology”*;
 - for the B5 indicator (“adequacy to meet demand”), to use the same approach for the adequacy margin than the one used for the EENS: if the adequacy margin (potentially different between countries) is already sufficient without the new transmission project, the additional adequacy margin brought by the project should not lead to monetisation;
 - for the B6 indicator (“system flexibility”), to clarify the scope of the flexibility study (both sides of the boundary should be assessed separately);
 - also, to take more into account the (lack of) complementarity of the generation mixes across boundaries when assessing the benefits of a transmission line (the security of supply benefits are only existing if at least one of the two areas can share unused resources at a given moment, and no security of supply benefit can be brought by an interconnector if the latter only results in sharing scarcity across the boundary). In particular for indicator B6, the probability that the two sides of the boundary face the same ramping issue at the same time should be assessed and taken into account;
- (16) to improve the classification of investments into statuses (“under consideration” and “planned, but not yet in permitting”) in order better to reflect the conditions under which projects should be included under these labels (please see Section 2.12. of Annex II to this Opinion);
- (17) to amend the proposed clustering rules so that investments which contribute only marginally to the full potential of the main investment are not allowed to be clustered together. Also, the proposed rules should be amended so that cases where an investment is delayed for a

long time compared to other investments of the same cluster, are not allowed. A way to do so is to maintain the “5-years-apart” rule for these cases. In addition, the provision of the current CBA methodology that the transfer capacity increase “*must be reported for each project* [i.e. investment] *embedded in the cluster*” and that “*the NTC is oriented*”, should be maintained in the CBA methodology, at least for the first study horizon on which the cluster is being assessed;

(18) regarding the assessment of storage projects:

- clearly to indicate how storage projects are modelled;
- to include a clear reference in the adapted CBA Methodology 2.0 to the storage plants simulation data and profile assumptions that will have to be made public in the TYNDP;
- to clarify cases where a storage plant may be competing with a transmission project, and how the TOOT methodology would be applied to the storage plants;
- to provide a more concrete, quantified and possibly monetised approach on benefits related to flexibility and to ancillary services, also in light of the recommendation in the Exergia report³⁵ that “*an additional benefit indicator reflecting the benefits related to ancillary services could potentially [be] added in the CBA methodology*”.

Furthermore, the improved CBA methodology should maintain the following elements which were present in the CBA Methodology 1.0:

- i. explanation about the content of scenarios and their use for the purpose of CBA application (section 2.2 of the CBA Methodology 1.0);
- ii. lists and explanations of technical and economic key parameters for the preparation of scenarios (section 2.3);
- iii. suggestions for additional sensitivity analyses in order to tackle uncertainties (section 3.8.2);
- iv. 5-year-apart rule for clustering of investments (section 3.2);
- v. requirement to display Transfer Capacity per investment and per direction (section 3.2);
- vi. conservative assumption mostly to use a TOOT approach or a multiple TOOT approach where needed (section 3.6.4) for planned projects;
- vii. indications on good practices for the valuation of lost load (section 3.7.1).

Done at Ljubljana on 6 March 2017.

For the Agency:



Alberto Pototschnig
Director

³⁵ <http://www.acer.europa.eu/Events/ACER-workshop-on-scenarios-and-cost-benefit-analysis-methodology-for-assessing-cross-border-infrastructure-projects/Documents/Final%20Report%20-%20CBA%20and%20scenarios.pdf>

Annex I – List of useful comments provided in the public consultation

The Agency notes that ENTSO-E could have been more open to accept some useful comments provided by the respondents to the public consultation. Such comments include the following proposals:

- a clear complementary role of a (monetary) cost benefit analysis and of a broader multi-criteria assessment (EASE);
- a monetisation of as many benefits as possible (FOSG - Friends of the Supergrid, RSE) or as far as possible (Copperleaf, EDF);
- an adequate measure of costs and benefits of projects in terms of non-monetary elements (DEME);
- a flexible approach to allow deviations from the common approach when important benefits and costs are not adequately reflected in the assessment of a project (DEME);
- an improved explanation of the meaning of CBA results (DEME, FOSG, RSE);
- a support to the definition of those projects which bring the most benefits (Climate Action Network Europe).

Annex II - ENTSO-E's consideration of previous requests for improvement of the CBA Methodology

This Annex summarises the proposals included in the draft CBA Methodology 2.0 reflecting (or not) the previous Agency's points for adaptations and requests for improvements. It is important to observe that the Commission in its Opinion *"also agrees with the points raised by the Agency on the necessary adaptation of the ENTSO-E CBA methodology"*.

2.1 Description of the overall TYNDP-PCI processes

As recommended in its Opinion No 01/2014 (p.5), the Agency expected ENTSO-E to include an overall introduction to the whole process defined by Regulation (EC) No 714/2009³⁶ and by Regulation (EU) No 347/2013 (scenario building - TYNDP - PCI selection - cross border cost allocation) and the role of the CBA methodology for each step³⁷ as it would greatly improve the clarity and readability of the CBA Methodology.

The addition of Figure 1 "Overview of the assessment process inside the TYNDP and for identifying PCIs" is acknowledged as an improvement, but the contribution of CBA to the CBCA process and an overall introduction to the whole process providing more clarity are still missing.

³⁶ O.J. L 211, 14.8.2009, p.15.

³⁷ In addition to the aforementioned steps, the CBA results shall be considered for incentives (Article 13 of Regulation (EU) No 347/2013) and for Union financial assistance in the form of grants for works (Article 14 of Regulation (EU) No 347/2013).

2.2 Inclusion of the “CBCA objective” in the CBA methodology

In its Opinion No 01/2014, the Agency suggested ENTSO-E to provide in the CBA Methodology 1.0 much more guidance on CBA as an input to CBCA (including on disaggregation of project costs by country, on time horizons, on discounting method) in order to facilitate the preparation of investment request by promoters of PCIs and the related decision-making process by NRAs.

The Agency notes that the draft CBA Methodology 2.0 (p. 7) “*is recommended to be used as the standard guideline for project specific CBA as required by Regulation (EU) No 347/2013 (...) for the CBCA process*” and “*can also be used to perform calculations as needed for the ACER approach for CBCA*”. The draft CBA Methodology 2.0, however, does not include sufficient guidance to project promoters in particular regarding the disaggregation of project costs, benefits and other monetary impacts by country, taking into account the Agency’s Recommendation No 05/2015.

2.3 Input data sets and granularity of study horizons

The Agency expected ENTSO-E to evaluate, in the CBA methodology, the appropriateness (complexity vs. added value) of the n+5, n+10, n+15 and n+20 data set principle and to identify a pattern for future inclusion of this principle in the CBA methodology as the approach taken by ENTSO-E seemed not to fully reflect the principle in Annex V(1) of Regulation (EU) No 347/2013 about years of input data sets³⁸.

It is positively acknowledged that the scenarios, on which to conduct the assessment of the projects, will have to cover at least two study years for the mid-term horizon (instead of “study two horizons” in the CBA Methodology 1.0) and will be fixed, i.e. rounded to full 5 years. However, the Agency maintains its position that ENTSO-E should evaluate the appropriateness (and potential drawbacks) of fully implementing the provision of Annex V(1) of Regulation (EU) No 347/2013 about the n+5, n+10, n+15, n+20 years of input data sets.

2.4 Common discounting methodology

The Agency welcomes the acceptance by ENTSO-E of the common pan-European discounting approach proposed in the Agency’s Opinion No 01/2014 (4% real discount rate, 25 year time horizon and no residual value).

However, the phrase “*in addition to the 25 years that might be seen as a ‘stress test’, a common life-cycle for the transmission investments of 40 year can be applied for the NPV calculation*” creates confusion regarding the obligation of promoters to implement the common pan-European discounting approach. It is noted that extension of the life-cycle period of a project to 40 years fails to account for the growing uncertainties on project benefits over very long term horizons.

The Agency recommends that ENTSO-E a) clearly states that the common pan-European discounting approach will be also used for the purposes of the CBCA process, and b) clarifies that project promoters may present the benefits of their projects over a longer period than the one provided by the common pan-European discounting approach only for communication purposes and sensitivity

³⁸ Agency’s Opinion No 01/2014, p.2.

analyses, but that these additional calculations will not be accounted for in the decision making process at European level.

2.5 More emphasis on the monetised cost-benefit indicators

The Agency called ENTSO-E to put more attention on the monetisation of costs and benefits. In particular, ENTSO-E was expected to provide, for each project, the project benefit-cost ratio and the project net benefit (also referred to as the “net present value”).

Furthermore, the Agency proposed ENTSO-E to provide concrete examples for the calculation of cost-benefit indicators, including the use of interpolation and extrapolation for all years, similarly to the example provided by the European Network of Transmission System Operators for Gas (“ENTSOG”) in its CBA methodology³⁹.

No reference to the suggested indicators is included in the draft CBA Methodology 2.0 and no explanatory examples have been provided by ENTSO-E.

Further, ENTSO-E should recommend multi-benefit analyses (i.e. composed as far as possible by category-per-category monetised benefits and complemented by quantitative analyses and justifications for other impacts and benefits, for which monetisation is not appropriate).

2.6 Clarifications on socio-economic welfare benefits

The Agency called for more clarity and transparency from ENTSO-E regarding the various components of SEW benefits (or, in other terms, reduced short-term generation costs). In particular, ENTSO-E was requested to clearly differentiate these benefits:

- (1) Socio-economic welfare (calculated by a European market study);
- (2) Relieving national constraints / Internal dispatch costs (SEW variation calculated by local market studies, while avoiding double counting effects with other SEW figures);
- (3) Variation in generation curtailments (SEW variation calculated by network studies, while avoiding double counting effects with other SEW figures).

The Agency notes that the draft CBA Methodology 2.0 explains that some internal costs (“redispatch costs”) can be calculated both via market studies and via network studies⁴⁰, while the CBA Methodology 1.0 calculated them only via network studies. Also, it is not clear what the difference between the following parameters mentioned in the Table 1 is: “*Reduced generation costs/additional overall welfare for the virtual bidding areas methodology*” and “*Reduced generation costs/additional overall welfare*”.

³⁹ ENTSOG, “ENTSOG Cost-Benefit Analysis Methodology Project Specific CBA Methodology”, 15 November 2013, p. 43,
http://www.entsog.eu/public/uploads/files/publications/CBA/2013/methodology/INV0154_131115_CBA_Methodology_PS.pdf

⁴⁰ Draft CBA Methodology 2.0, section 3.4.1, page 31.

For more clarity and transparency on the content of each indicator, ENTSO-E should better distinguish B1.A (“SEW on cross-border boundaries”), B1.B (“SEW on internal boundaries via market studies”) and B1.C (“use of probabilistic network studies to assess redispatch or generation curtailments beyond those captured by the market studies”).

Finally, as the SEW benefit is in many instances the most relevant benefit from a project, the CBA methodology could promote the inclusion of additional indications and results in the TYNDP and in other CBA applications, in order to facilitate the understanding of the SEW results (e.g. the variation of yearly energy exchanges and the variation of congestion hours across one or more relevant boundary “with” and “without” the investment under analysis).

2.7 Appropriate categorisation and disaggregation of cost components

The Agency welcomes the requirement of the draft CBA Methodology 2.0 for cost reporting per investment item and the clarification that costs values should be reported with reference to the study year. Furthermore, the Agency favourably notes the disaggregation of investment cost from lifecycle costs (OPEX).

However, the Agency notes that its recommendation, that the costs incurred for mitigating environmental or social impact of the project should be presented separately, was not reflected in the draft CBA Methodology 2.0. Such recommendation aimed at ensuring full transparency on investment-endogenous environmental costs (such as longer routes, design with lower visual impacts, etc.) and on social/congestion costs (such as community payments in line with existing legal provisions⁴¹).

2.8 Equal treatment of TSOs’ and third parties’ projects and adoption of target capacities

The Agency expected ENTSO-E to include in the CBA Methodology its statement that “*the reference network will represent the target capacity, taking into account the investment needs identified through market studies. Hence, the TOOT approach will be adapted on each border in order to take into account both the maturity of the future projects and potentially competitive projects*” and to continue ensuring equal treatment of all projects.

The draft CBA Methodology 2.0 provides in Section 2.3 an implicit definition of the reference network and the target capacities used on each boundary when describing the TOOT methodology⁴². However, as mentioned also in the Agency’s Opinion No 12/2016⁴³, ENTSO-E’s proposed approach of assessing projects based on the sum of capacity increase of all proposed projects may result in underestimations or overestimations of the economic profitability of the assessed projects, depending on the quantity of the capacity increase provided by the proposed projects. To eliminate this problem,

⁴¹ The Renewables Grid Initiative report “Community payments - Case studies from across Europe”, May 2016, provides case studies and insights on compensation costs. http://renewables-grid.eu/fileadmin/user_upload/Files_RGI/RGI_Publications/Brochure_community_payments.pdf

⁴² “TOOT [...] method, where the reference case reflects a future target grid situation in which all additional network capacity is presumed to be realised (compared to the starting situation)”.

⁴³ Agency’s Opinion No 12/2016 on the ENTSO-E draft TYNDP 2016 scenario development report.

the Agency suggests that ENTSO-E builds the reference market model by considering the minimum value between the target capacity and the reference capacity at each boundary.

It is also positively noted that draft CBA Methodology 2.0 provides more details on the “multiple TOOT” approach. However, the ENTSO-E sentence referring to competing projects of CBA Frequently Asked Questions June 2013⁴⁴ “*the reference network will represent the target capacity, taking into account the investment needs identified through market studies*” is missing. The implementation of the intended ENTSO-E approach would be one of the options to avoid underestimations or overestimations of the “reference network” and consequently of the calculated benefits.

In addition, ENTSO-E should further detail how the “baseline network model”⁴⁵ is defined, and how it evolves across the various study horizons and scenarios, in particular regarding the modelling of internal reinforcements.

2.9 Definition of key terms, including network capacities, and definition of investments

The Agency recommended ENTSO-E to include definitions of key terms and to use a consistent terminology in the CBA Methodology.

The Agency positively notes the inclusion of a “general definitions” section at the beginning of the document, as well as the inclusion of section 5.1.1 “definitions” in Annex 1 to the Draft CBA Methodology 2.0. However, not all of the terms used in the document are included in the definitions sections and various definitions are located in various other sections of the document. In the future adapted CBA Methodology 2.0, a more systematic inclusion of definitions of important terms needs to be done.

The Agency notes that the definition of “investment” is less clear as it misses details provided in CBA Methodology 1.0. The CBA Methodology 1.0 included a detailed list of transmission reinforcements:

- construction of new circuits (overhead lines and cables);
- reinforcement of overhead circuits;
- duplication of cables;
- extension and construction of substations;
- reinforcement of substations (e.g. short-circuit rating);
- installation of reactive-power compensation equipment;
- addition of network equipment to control the active power flow (e.g. phase shifters);
- additional transformer capacities.

The CBA Methodology 1.0 (p. 23) also indicated that some investments “*are partly or completely dependent on each other (one is a precondition of the other)*”. For instance, a reactive shunt device

⁴⁴https://www.entsoe.eu/fileadmin/user_upload/library/events/Workshops/CBA/130612_CBA_Methodology_FAQ.pdf

⁴⁵ The term may have the same meaning of “reference network model” in ENTSO-E Draft CBA 2.0, but may reduce possible misunderstandings with the “reference capacities”.

that is needed to avoid voltage upper limit violations due to the addition of a new line, or a converter station and an HVDC cable”.

The Agency expects ENTSO-E to reintroduce in the adapted CBA Methodology 2.0 a clear and substantiated definition of “investment”, with due treatment of completely dependent investment items.

2.10 CBA guideline to identify specific benefits of storage projects (e.g. ancillary services)

The Agency recommended ENTSO-E to prepare a separate CBA guideline to be finalised by the end of 2014, aiming at identifying (after consultation with interested stakeholders) specific benefits which can be obtained from storage projects (e.g. the provision of ancillary services).

Also, the European Commission indicated that further development of the methodology was needed taking into account all the specificities of the storage projects (e.g. benefits of the provision of ancillary services).

Building on the principles described in Annex 10 of the CBA Methodology 1.0, ENTSO-E introduced a new section 4 in the draft CBA Methodology 2.0.

It is mentioned that *“Storage plants can be very easily introduced in market studies [...] Business models for storage are often categorised by the nature of the main target service, distinguishing between a deregulated-driven business model (income from activities in electricity markets), and a regulated-driven business model (income from regulated services).”* Since the draft CBA Methodology 2.0 provides no information on the simulation assumptions that will be used for the modelling of the storage plans (e.g. the time and the level of production during the storage and generation phases of their operation, the capacity reserved for ancillary services, and specific operational parameters like water resources management for hydro-storage plants), it is assumed that they will be case specific and provided by the plant promoters. Since the profile assumptions to be used affect significantly the benefits calculations, a clear reference of the simulation data and assumptions that will have to be made public in the TYNDP will have to be included in the adapted CBA Methodology 2.0.

Furthermore, no analysis is foreseen for the identification of cases where a storage plant may be competitive to a transmission project and it is not clarified how the TOOT methodology is applied regarding the storage plants.

Also, the Agency regrets that the draft CBA Methodology 2.0 only provides a qualitative approach (based on key performance indicators and expert views on future operational characteristics) to assess the flexibility benefits of storage. The Agency expects more concrete, quantified and possibly monetised developments on benefits related to flexibility and to ancillary services, also in light of the recommendation in a recent study⁴⁶ that *“an additional benefit indicator reflecting the benefits related to ancillary services could potentially [be] added in the CBA methodology”*.

⁴⁶ <http://www.acer.europa.eu/Events/ACER-workshop-on-scenarios-and-cost-benefit-analysis-methodology-for-assessing-cross-border-infrastructure-projects/Documents/Final%20Report%20-%20CBA%20and%20scenarios.pdf>

2.11 Developments regarding the Value of Lost Load

The Agency recommended that ENTSO-E, in cooperation with its TSO members, the Agency and NRAs, extends the mapping of country-specific VOLL values in Annex 4 [of the November 2013 draft version of the CBA methodology] to all European countries before the PCI selection in 2015.

Regrettably, ENTSO-E removed the information on country-specific VOLL values from the draft CBA Methodology 2.0. In the Agency's view, such information, which is also available in p. 38 of the aforementioned Exergica's report, would foster further developments in monetising security of supply benefits.

The draft CBA Methodology 2.0 indicates that *“if the project promoters agree, it is possible to monetise EENS [expected energy not supplied] by multiplying it with the Value Of Lost Load (VOLL) [€/MWh] and present this value (in [€/yr]) alongside the value in MWh. In this case, the VOLL that was used must be clearly displayed in the assessment table and project promoters must explain their choice”*⁴⁷. The Agency regrets that this provision is left to a voluntary basis.

2.12 Clustering of investments

The Agency stated its expectation for ENTSO-E to collect feedbacks on the applications of the CBA Methodology 2013, in particular on the rules regarding clustering of investments.

The European Commission indicated that the CBA needs to be carried out on the project (i.e. investment) level. A robust approach allowing the assessment on investment level was considered as crucial for the TYNDPs following the TYNDP 2014, in order to facilitate the assessment carried out by the Regional Groups established by Regulation (EU) No 347/2013.

In the draft CBA Methodology 2.0, ENTSO-E did not provide evidence about the use of clustering rules of the CBA Methodology 1.0, neither proposed the application of CBA at investment level. The “20%-GTC-contribution” rule and the “5-years-apart” rule are not anymore present in the draft CBA Methodology 2.0. The draft CBA Methodology 2.0 proposes a new clustering rule based on statuses of investments (for which definition is proposed). Furthermore, the “20%-GTC-contribution” rule is replaced by the rule that “investments should only be clustered together if an investment contributes to the realisation of the full potential of another (main) investment” and the need for clustering must be clearly demonstrated.

The Agency considers that the rule for clustering investments with different statuses must be amended before the approval of the CBA Methodology, in order to avoid that investments “under consideration” are clustered together with other investments which are “planned, but not yet in permitting”. The reason is the fundamental difference between these two statuses: the “under consideration” status is related to studies, conceptual projects and other potential options which did not receive yet a planning approval decision⁴⁸ and are in the phase of initial planning studies. The

⁴⁷ Draft CBA Methodology 2.0, section 3.7.5, page 33.

⁴⁸ For sake of clarity, the “planning approval” relates to the approval of network development plans. It does not relate to other activities, like e.g. spatial planning.

“planned” investments are going to start the permitting phase but already received a planning approval decision and, consequently, have significantly higher perspectives to be implemented.

The inclusion of a clear definition of statuses would be an improvement. However, an improvement of the definitions of “under consideration” and “planned, but not yet in permitting” statuses should be provided, in order to align the “under consideration” definition with the considerations above.

Further, the “planned and not yet in permitting” definition should read *“projects that have been included in the national development plan and [instead of “or”] completed the phase of initial studies (e.g. completed pre-feasibility or feasibility study), but have not initiated the permitting application yet”*.

The new rule and the new approach based on promoters’ justification are welcome. However, the phrasing should be amended so that to prevent cases where an investment contributes only marginally to the full potential of the main investment.

ENTSO-E should also maintain the “5-years-apart” rule in cases where, in a cluster of complementary investments, one investment is delayed and another investment (which has a positive benefit/cost balance on a stand-alone basis) is on time, thus causing an increase of the time span beyond 5 years.

Finally, the CBA Methodology 1.0 (p. 23), implementing a recommendation from the European Commission, included a requirement that the Transfer Capacity increase *“must be reported for each project [i.e. investment] embedded in the cluster”*.

ENTSO-E deleted the requirement to display Transfer Capacity per investment item in the draft CBA Methodology 2.0, rather proposing to display Transfer Capacity at cluster level and as a non-scenario specific result.

The Agency requests ENTSO-E to reinsert the requirement, at least for the first study horizon on which the cluster is being assessed.

2.13 Further quantification and monetisation of benefits

On the basis of the draft versions of Regulation (EU) No 347/2013, of the THINK report and the Frontier study, the Agency already suggested a list of 11 benefit components and a proposal for their treatment in future TYNDPs⁴⁹. The Agency confirms this position.

Clear, transparent, quantified and monetised criteria for the CBA methodology and for the subsequent selection of PCIs from the TYNDP list are crucial requirements from the regulatory perspective. The Agency therefore called on ENTSO-E further to quantify and monetise benefits, in particular concerning the reduction of future costs for new (avoided/deferred) generation investments and for ancillary services, before the TYNDP 2016 is prepared.

⁴⁹ Agency position on the ENTSO-E “Guideline to Cost Benefit Analysis of Grid Development Projects”, Table 2.

The European Commission also urged ENTSO-E to further monetise cost-benefit indicators before the TYNDP 2016.

The draft CBA Methodology 2.0 suggests a new adequacy benefit B5, which “*can be conservatively monetised on the basis of investment costs of peaking units*”⁵⁰.

In the Agency’s view, ENTSO-E should:

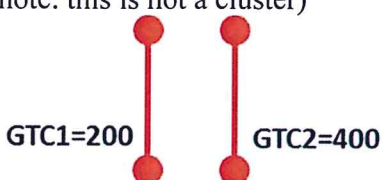
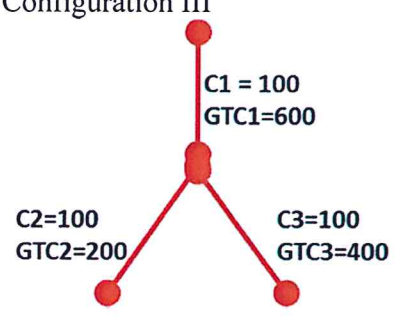
- (1) carefully evaluate the applicability of B5 adequacy benefit. While avoidance of double counting with EENS is positive, the use of the indicator likely requires the use of a threshold (which could lead to limit the use of this indicator to external areas, e.g. islands or “electrical peninsulas”). The approach to define such threshold, which would likely reflect national standards, would need to be defined by ENTSO-E or its Regional Groups;
- (2) further address the value of “ancillary services / flexibility” impacts, with a target to quantify and monetise as far as possible. ENTSO-E should at least evaluate the option of monetising by means of avoided costs (e.g. avoided installations of reactive compensation devices, avoided costs for voltage control from generating units);
- (3) suggest options of indicators for quantifying the benefit B7 system stability. ENTSO-E should provide more examples for investigation of extreme cases. As approaches may differ among ENTSO-E Regional Groups, ENTSO-E should promote consistent assessments of projects addressing the same boundaries but falling under the responsibility of different Regional Groups;
- (4) suggest options for quantifying those benefits which ENTSO-E claims difficult to be monetised (e.g. environmental impact and impact on competitiveness), including due evaluation of the following recommendation in Exergia report “*The external cost of thermal electricity generation comprises two main components: cost from greenhouse gases, and cost from the impact on health population of other emissions. The monetisation of the above costs (which are avoided in the case of avoided thermal generation) is different and likely higher than the cost of CO₂ as currently considered by the CBA methodology*”.

Annex III - Specific proposals for improvements of the CBA methodology

Beyond the introduction of identification of benefits per investment in the CBA methodology and significantly smaller and more consistent clusters in future TYNDPs, the Agency sees a possible need for simplified rules for “de-clustering” benefits calculated at cluster level.

The Agency considers that each cluster could be simplified by using two simple and basic configurations (see configurations I and III below). Then, each cluster should be treated as suggested in the table below, where B is SEW benefit, C is cost and GTC is Grid Transfer Capability.

⁵⁰ Draft CBA Methodology 2.0, section 3.7.5, page 33.

Configuration of cluster	Consideration	Treatment of benefits
Configuration I (“convoy lines”) 	Each investment of the convoy line determines the same SEW benefit	SEW benefits of each investment are proportional to the cost of that investment If $C1 = 100$, $C2 = 200$ and $B_{cluster}=900$, then $B1 = 300$ and $B2 = 600$
Example II, “parallel” investments (note: this is not a cluster) 	Each investment (which is assumed to be realised simultaneously to the other) determines a benefit in relation to its GTC increase.	For sake of simplicity, it can be assumed that the SEW benefits of each investment are proportional to the GTC increase of that investment If $GTC1 = 200$, $GTC2 = 400$ and $B_{cluster} = 900$, then $B1 = 300$ and $B2 = 600$
Configuration III 	First, the “convoy line” effect is to be addressed (line 1 and set of lines 2 +3). Then, “parallel” investments 2 and 3 have to be assessed.	Applying the treatment described above: If $C1 = 100$, $C2+C3 = 200$ and $B_{cluster}=900$, Then $B1=300$ and $B2+B3=600$ If $GTC2 = 200$ and $GTC3 = 400$, then $B2 = 200$ and $B3 = 400$.

The proposal above refers solely to the de-clustering of SEW benefits and would represent a very simplified approach, particularly because it is assumed that the benefit increase for parallel investments is proportional to the GTC increase. The impact of this assumption may need to be checked on a case-by-case basis.

Further, the disaggregation of benefits related to losses variation should be calculated on the basis of the variation of losses in each investment, which can be easily obtained via network studies.

Annex IV – draft CBA Methodology 2.0 submitted by ENTSO-E on 6 December 2016
See separate file.