ACER
European Union Agency for the Cooperation of Energy Regulators

[PUBLIC]

AGENCY`S POSITION PAPER

TOWARDS GREATER CONSISTENCY OF COST BENEFIT ANALYSIS METHODOLOGIES

1. PURPOSE OF THE PAPER

The updated TEN-E Regulation (Regulation (EU) 2022/869) introduced the task of the development of separate Cost Benefit Analysis Methodologies (herein CBA methodologies) for the various energy infrastructure categories set out in Annex II of the Regulation and by various entities: ENTSO-E for electricity transmission, including offshore grids, ENTSOG for hydrogen and European Commission for energy storage, electricity smart grids, gas smart grids, electrolysers and carbon dioxide networks and facilities.

The Agency is responsible to provide opinions on the ENTSO-E and ENTSOG methodologies for cost benefit analysis and to provide regular opinions on the draft lists of projects of common interest (PCIs), whose selection is based on the application of the CBA methodologies. According to the TEN-E Regulation, the Agency's opinion on PCIs includes a focus on the consistent application of the criteria and the cost-benefit analysis across regions.

Also, the Regulation assigned to the Agency the task to promote the consistency of the methodologies developed by the European Commission with the methodologies elaborated by ENTSO for Electricity and the ENTSO for Gas.

For this purpose, the Agency presents in this document its considerations on the topics where consistency should be promoted among all CBA methodologies by all the parties involved.

The Agency will continue promoting consistency of CBAs in its future Agency's Opinions on the ENTSOs CBA methodologies and other deliverables which are based on the CBA methodologies.

The Agency may update this document as necessary in the future, especially after first application cycles of the CBA methodologies.

2. LEGAL BACKGROUND

According to article 11(1) of Regulation (EU) 2022/869, "The ENTSO for Electricity and the ENTSO for Gas shall draft ***consistent single sector draft methodologies***, […], for a harmonised energy system-wide cost-benefit analysis at Union level for projects on the Union list falling under the energy infrastructure categories set out in point (1)(a), (b), (d) and (f) and point (3) of Annex II."

Pursuant to article 11(1), ENTSO-E and ENTSOG shall publish the respective single sector draft methodologies by 24th April 2023.

According to article 11(8) of Regulation (EU) 2022/869, "For projects falling under the energy infrastructure categories set out in point (1)(c) and (e) and in points (2), (4) and (5) of Annex II, the Commission shall ensure the development of methodologies for a harmonised energy system-wide cost-benefit analysis at Union level. Those ***methodologies shall be compatible***

in terms of benefits and costs with the methodologies developed by the ENTSO for Electricity and the ENTSO for Gas."

Pursuant to article 11(8), on 7th October 2022 and 15th November 2022, the European Commission published for consultation six methodologies for the following project categories: electrolysers; smart gas grids; smart electricity grids; carbon dioxide; energy storages; hydrogen. For the latter project category, the methodology published by the European Commission is a temporary instrument before the ENTSOG H2 Methodology enters into force.

Article 11(8) also states that "The Agency, with the support of national regulatory authorities, ***shall promote the consistency of those methodologies with the methodologies elaborated by ENTSO for Electricity and the ENTSO for Gas***. The methodologies shall be developed in a transparent manner, including extensive consultation of Member States and of all relevant stakeholders."

According to Annex V of Regulation (EU) 2022/869, "The methodologies for cost-benefit analyses developed by the ENTSO for Electricity and the ENTSO for Gas ***shall be consistent with each other, taking into account sectorial specificities***. The methodologies for a harmonised and transparent energy system-wide cost-benefit analysis for projects on the Union list shall be uniform for all infrastructure categories, unless specific divergences are justified."

Lastly, article 11(10) states that "By 24 June 2025, […], the ENTSO for Electricity and the ENTSO for Gas shall jointly submit to the Commission and the Agency ***a consistent and progressively integrated model that will provide consistency between single sector methodologies*** […]".

3. POINTS OF REQUIRED CONSISTENCY OF CBA METHODOLOGIES

In the Agency's view, the legal stipulations presented in the previous section call for consistency in all CBA methodologies to be developed. The Agency deems that consistency should be promoted when developing the methodologies at least regarding the elements presented in this section. This is without prejudice to further elements, which could be identified after the complete development of the CBA methodologies and their first applications.

3.1 Common input data set and assumptions

To ensure a consistent and comparable assessment of the project categories included in Annex II of Regulation (EU) 2022/869, it should be defined in all CBA methodologies that the scenarios to be used for the benefits calculations should include all the joint scenarios developed by ENTSOs.

Assumptions which affect the economic results of CBAs and are not defined within the scope of the joint ENTSOs scenarios should be consistent as much as possible. For this purpose, common guidance on the adoption of non-scenario parameters should be provided in each CBA methodology, at least regarding:

- Valuation of the cost of carbon;

- Valuation of non-greenhouse-gas emissions (e.g. nitrogen oxides, sulfur oxides, particulate matter);
- Value of lost load (electricity);
- Valuation of the cost of disruption of gas supply.

3.2 Selection and use of scenarios and ways to deal with uncertainty

All CBA methodologies should stipulate that the benefits of projects should be calculated at least according to all the joint scenarios developed by ENTSOs, and for all relevant time horizons: short term (indicatively up to year 7), mid-term (approximately up to 10 years ahead) and long term (approximately 15 years ahead)[1].

3.3 Length of assessment period, residual value of projects, and social discount rate

All the CBA methodologies should consider an assessment period (i.e. 25 years) for all projects with a technical lifetime of at least 25 years. If the technical lifetime of a project is shorter than 25 years, the assessment period should be aligned with the technical lifetime of the project.

In the same way, all the CBA methodologies should apply the same social discount rate. The Agency recommends using the same social discount rate of 4%, already used by both ENTSO-E and ENTSOG CBA Methodologies.

Also, in all CBA methodologies the residual value of projects (for the purpose of socio-economic CBA) should be 0, for the reasons listed in Section 2.4 of the Agency's Opinion 01/2014.

3.4 Definition of reference case networks

The 'reference network' should represent the level of infrastructure expected to be in place under prudent assumptions at the time horizon analysed in the CBA, and it has a grave impact on the project-specific assessment.

For the construction of the reference case networks, the CBA methodologies should include consistent and clear rules for the short-term horizon and consistent criteria for the mid-term and long-term horizons for which scenarios are developed according to the Agency's TYNDP Scenarios Framework Guidelines.

[1] As also explained in the Agency's TYNDP Scenarios Framework Guidelines, while acknowledging the importance of considering trajectories up to year 2050 in the definition of the appropriate assumptions for the intermediate years, very long-term ("n+25") assumptions are of limited usability for the purpose of network planning and project assessment. In addition, huge uncertainties affect the period between the long term, approximately 15 years from the TYNDP year, and the very long term up to 2050.

The reference network should therefore consist only of those projects, whose timely commissioning is reasonably certain by the year for which a simulation is performed, i.e. the already existing grid, and the projects that have a strong chance of being implemented by those dates.

3.5 Treatment of interdependency with other projects

Where the construction of the reference case networks is required, and the Take-Out-One-at-the-Time or Put-IN-one-at-the-Time methodologies2 are used for the benefit calculations, the CBA methodologies should clarify how interdependent projects (i.e. enablers[3], complementary[4] and competing projects[5]) are to be handled.

Also, the criteria to identify enabling projects, complementary (or enhancing) projects and competing projects should be clearly described.

3.6 Project implementation status

In order to ensure comparability in terms of project maturity (for the purpose of Annex III, Part 2, point (1)(d) of the TEN-E Regulation) and to help an appropriate clustering of investments, where this is applicable, all CBA Methodologies should consider the same project implementation stages. In its PCI Monitoring Reports[6], the Agency recommends the following ones: (1) Under consideration, (2) Planned but not yet in permitting, (3) Permitting, (4) Under construction.

3.7 Clustering rules

When more than one investment is clustered / grouped together in one project, it must be clearly demonstrated why this is necessary. Investments should only be clustered together if an investment contributes to the realisation of the full potential of another (main) investment (i.e. investments that contribute only marginally to the full potential of the main investment should not be clustered together).

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[2] As defined in the ENTSO-E and ENTSOG CBA methodologies approved in 2018 and 2019, respectively.

[3] An enabler project is a project which is indispensable for the realisation of the main project in order for the latter to start operating and show any benefit.

[4] A complementary project is a project that is not strictly required for the realisation of the main project but it can allow the "main project" to bring additional benefits, for example by operating at a higher rate or creating synergies.

[5] Competing projects are the projects that address the same needs.

[6] https://acer.europa.eu/sites/default/files/documents/Publications/2022_ACER%20Report%20on%20progress%20of%20PCIs.pdf
Also, the definition of implementation statuses ENTSO-E provides in page 9 of its TYNDP 2022 guidance to the applicants (https://eepublicdownloads.blob.core.windows.net/public-cdn-container/tyndp-documents/TYNDP2022/210818_TYNDP2022_GuidanceforPromoters_final.pdf) is aligned to the ACER recommendation.

Common clustering rules should be stipulated for all CBA methodologies:

- Excessive clustering of investments should be avoided. For this reason, investments can only be clustered if they are at maximum of one project implementation stage apart from each other, and their commissioning dates do not differ by more than a certain number of years, which should be defined in the methodology[7].
- For the project categories that have to be included in the TYNDPs developed by ENTSOs, if an investment is included in the existing TYNDP and is significantly delayed compared to the timeline included in the TYNDP, it should no longer be clustered within this project.
- Investments in "under consideration" status should not be clustered together with planned investments items.
- Competing projects should never be clustered together.

3.8 Criteria to assess the plausibility of projects' commissioning dates

The CBA methodologies should include consistent and effective criteria to assess if the commissioning dates indicated by project promoters are realistic. These criteria should be implemented only in case where a single entity applies the CBA methodology on behalf of project promoters.

For enabling projects, the commissioning date should be earlier than the one of the enabled project.

3.9 Implementation Guidelines

As a CBA Methodology is a guidance document for the assessment of projects, expected to be valid for more than one cycle of assessment (e.g. for several TYNDPs or several PCI lists), it is not practical to include implementation details of the methodologies, parameters, or specific assumptions for the calculation of each benefit, which may vary for each cycle of assessment.

This is particularly relevant for project categories (1)(c), (1)(e), (2), (4) and (5) of Annex II for which the development of a CBA is set in article 11(8) and no regular update is foreseen (unlike for the ENTSOs CBA methodologies for which an update at least every 5 years from approval is required by Article 11(13).

Therefore, each CBA Methodology needs to be complemented by "Implementation Guidelines", which shall include additional detailed information to be published in each assessment cycle, including how the simulations are to be performed, and specifying which method is to be used (in case the CBA Methodology allows for more than one possibility), the values of the parameters and the assumptions used.

[7] As a reasonable approach, project with more than 5-years difference within their respective commissioning years should not be clustered together.

All CBA methodologies should foresee issuing Implementation Guidelines before the CBA study is conducted and must define any additional parameters, which will be defined in the Implementation Guidelines.

Also, the CBA methodologies should stipulate that the main elements of the Implementation Guidelines must be publicly consulted before they are decided.

3.10 Definition and handling of capital and operational expenditures

All methodologies should include consistent definitions of at least the following elements of the reported capital expenditures (CAPEX) and operational expenditures (OPEX):

- a definition of which elements CAPEX and OPEX should include;
- how costs that take place at different points in time are considered to calculate the project CAPEX, including the treatment of incurred costs before and during construction period, and especially where projects are comprised of several investments taking place at different years;
- in case of CAPEX expected to be spent after the project is commissioned, the split of CAPEX into two parts: the capital costs incurred before the project entering in operation, and the capital expenditure incurred later in the project life-cycle and for which elements;
- the year of reference of the reported CAPEX, which should be the year of performing the CBA;
- in which cases the reported CAPEX is based on promoters' calculation or is based on standard investment costs;
- in case of standard investment costs, their structure (e.g. applied complexity factors).

3.11 Consideration of the impact of the future extreme weather events on infrastructure resilience

As requested in point 3(c) of Annex IV of the Regulation, as well as in Article 48(1) of Regulation (EU) 2019/943 regarding the ENTSO-E Ten Year Network Development Plan (TYNDP), and considering also that climate change is a factor with a potentially significant impact on infrastructure resilience, it is necessary that all CBA methodologies factor in (or extend current indicators by including) the impact of future extreme weather events in existing or new Security of Supply indicators.

The SoS indicators of the CBA methodologies should not be limited to the historical occurrence and impact of past events, but incorporate in the analysis - to the extent possible- also future extreme events, in terms of higher expected probability of occurrence and impact area.

3.12 Approach to calculate social and environmental impacts of projects

Consistency on the considered environmental benefits in all CBA methodologies should be in place, by aligning the indicators used to capture these benefits.

Regarding the residual social[8] and environmental impacts of the projects under assessment (currently not captured by monetised benefit indicators), a common methodological framework for the assessment should be described in all CBA methodologies.

Social impact characterises the project impact on the local population, as assessed through preliminary studies (e.g. by providing the number of kilometres that an overhead line may run through socially sensitive areas).

Environmental impact characterises the project local impact on nature and biodiversity, as assessed through preliminary studies (e.g. by providing the number of kilometres that an overhead line or underground/submarine cable may run through environmentally sensitive areas).

3.13 Methodology to calculate the benefit-to-cost ratio and Net Present Value of projects

All CBA methodologies should define in the same way how the benefit-to-cost ratio, and the Net Present Value of projects are calculated. The description should include all the necessary information for the replication of the calculations.

3.14 Sensitivities

Given the uncertainty involved in the future projections of the CBA results, all CBA methodologies should include sensitivity analysis on critical parameters, and a framework for identifying these critical parameters. While the elements subject to sensitivity analysis may differ by project category and may be implemented only for a subgroup of projects, the sensitivity approach (e.g. how to select the sensitivity elements, and the projects on which to implement them) should be aligned in all CBA methodologies.

3.15 Modelling interlinkages of CBA methodologies

Regulation (EU) 2022/869, articles 11(1) and 11(8) refers to single-sector methodologies.

However, an accurate assessment of certain indicators (e.g. Social Economic Welfare, CO2 and other Greenhouse Gas emissions reduction, integration of Renewable Energy Sources)

[8] The term “social” here refers to local impacts on populations affected by an infrastructure, and not on socio-economic impacts.

would require a detailed modelling beyond the single sector approach, considering at least gas, hydrogen and the electricity sectors.

Such approach would allow to capture interactions among projects which are not captured by common input data and common assumptions as well as limit the risk of double counting the benefits (while it could happen when applying the single methodologies in two sectors).

Therefore, the CBA methodologies should identify for which indicator an “interlinked” approach is more appropriate and provide guidelines on the elements required to be performed for this assessment.

3.16 Presentation of CBA results

All CBA methodologies should ensure that the costs, benefits and outcomes of CBAs are presented in a consistent way for all projects and for all scenarios.