Questions to the Draft CBA Methodology Document

Public Consultation on the draft Project Specific and Energy System-Wide CBA Methodology

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1. The issue of time horizon

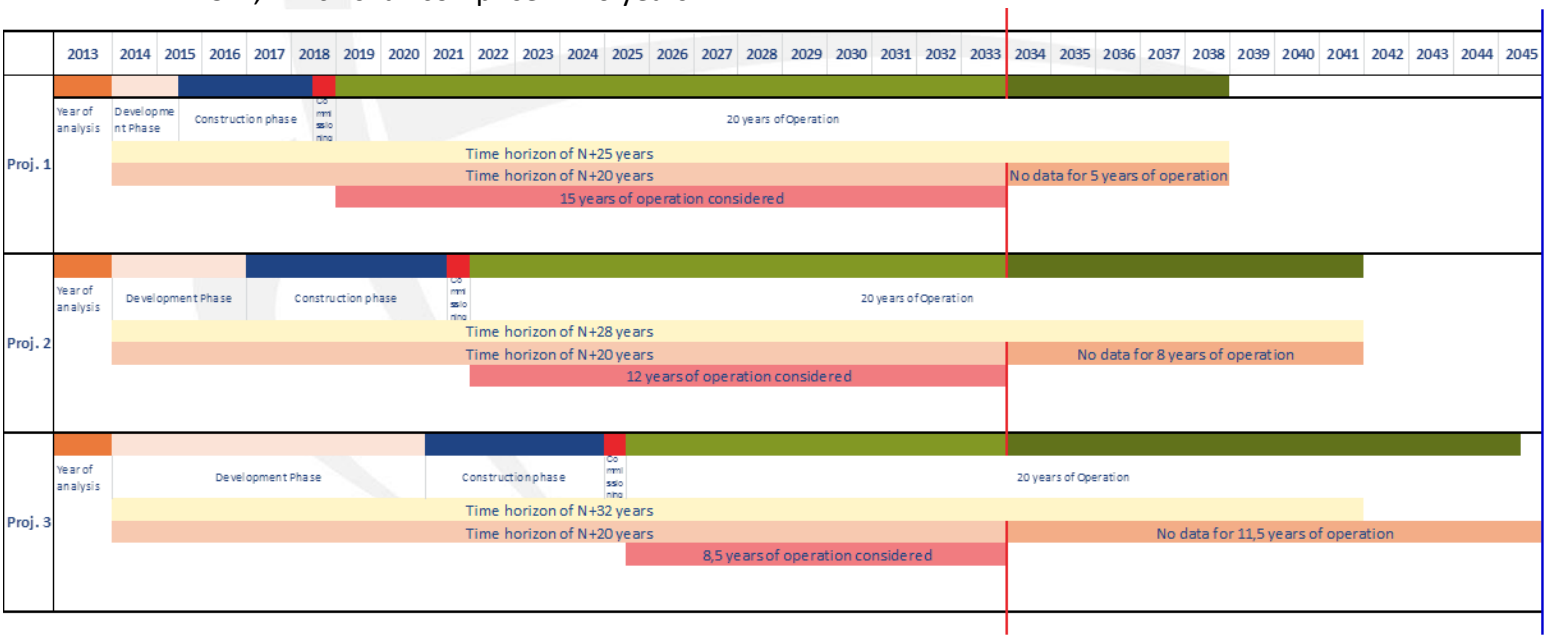
The Regulation stipulates the following in Annex V/1:

„(1) The methodology shall be based on a common input data set representing the Union's electricity and gas systems in the years n+5, n+10, n+15, and n+20, where n is the year in which the analysis is performed. This data set shall comprise at least:

(b) in gas: scenarios for demand, imports, fuel prices (including coal, gas and oil), carbon dioxide prices, the composition of the transmission network and its evolution, taking into account all new projects for which a final investment decision has been taken and that are due to be commissioned by the end of year n+5."

The above section of the Regulation defines the time horizon for the input data, but does not define the time horizon of the analysis to be conducted. From the diagram below it can be seen that in transitioning from an Energy System Wide to a Project Specific Analysis there are years for which data relevant for the operation of a proposed project would not be available beyond the 20 year horizon of the ESW analysis. There are two challenges to be met:

1) A time horizon has to be defined, which enables consistent comparison of results produced within the analysis.
2) The other challenge is the availability of input data according to the Regulation within the ESW, which shall comprise n+20 years.



For the Regional Groups this could be a significant factor when comparing projects and considering the significant impact of the value of the economic performance indicators. Where the n+20 time horizon is considered, the years of operation compared would be 15 years for

Project 1, 12 years for Project 2 and 8,5 years for Project 3 respectively. If not taken account of, this may lead to the risk of inconsistent comparison of ENPVs/EIRR/B-C ratio between different projects with different operational periods. ENTSOG would appreciate views on the applicability and preference of stakeholders to the following options.

Proposed solution for the first challenge:

- A common time horizon should be defined, which serves as a basis for comparison. It could be twenty years of operation, thus also including development phase (discounting due to elapsed time) and construction phase (costs appear). In this case however we bump into the second challenge of data availability.

Proposed alternative solutions for the second challenge:

- To consider the least, common years of operation to be evaluated based on the available data set. In the above example, it would be economic performance indicators (ENPV, EIRR, B/C ratio) calculated for 8,5 years of operation.
- To take the figures of the last year, where the data was available (2033 in the above example) and use the same figures for the remaining years of operation, until we reach 20 years of operation for each project.
- To extrapolate the input data beyond the available time horizon and calculate the results based on these data.
- To disregard the risk of inconsistence and calculate the economic performance indicators based on different number of years of operation with the available n+20 years data set.

The fact that the economic performance indicators are calculated based on discounted cash flow, already favour projects which come on-stream earlier. This way, the income flow of projects where the commissioning date is delayed or planned later, due to longer development phase or construction would be assessed based on a shorter operational period.

Q1. Based on the above issues, please provide your comments and proposal for solution.

2. The algorithm of defining the impacted countries in the PS-CBA

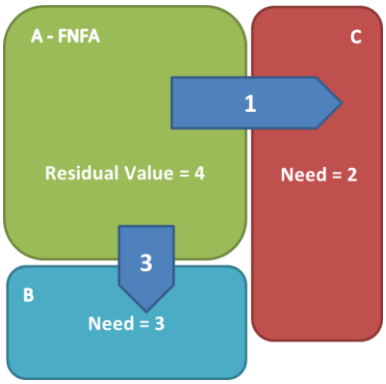
Flow patterns resulting from the Energy System-Wide modelling can provide flow distributions before the application of the incremental approach (in without the project scenario) in the PS-CBA. This defines the remaining capacity at the IPs, which will be used when assessing their capability to transit the allocated flows, defined by the allocation patterns.

Then the algorithm determining the impacted countries could use 1[1]+3[2] allocation patterns to place the residual volumes resulting from a new project for each indicator. These patterns can be checked against the remaining capacities at the IPs, determined in the first step.

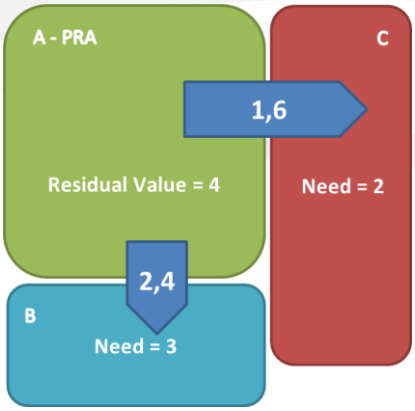
[1] 1 would be applying modelling for this step as well;

The first one would be the use of modelling to determine the flows resulting from the implementation of the project in question. However the use of a modelling tool by project promoters rises many feasibility issues.
Other three allocation patterns have been identified not requiring the use of a modelling tool but still requiring the definition of specific assumptions. Please find below their schematic representation:

- First in Need First Allocated – FNFA

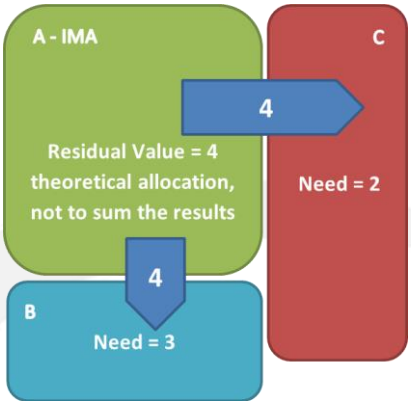


- Pro-rata Allocation – PRA



- Indicator Maximization Allocation – IMA

[2] or +3 applying the flow allocation patterns as described below



As explained within the PS-CBA, the allocated flows serve as an input for the monetization.

The different allocation patterns might be more suitable for different project types; however one allocation pattern could be defined as reference pattern to serve as a common basis for the evaluation for all the projects. The specificities can be highlighted within the sensitivity analysis.

Q.2. Considering the sensitivity of the economic performance indicator results to the patterns, do you consider that one of the patterns should be considered as a reference one and the others could be examined within the sensitivity analysis?

Q.3. Which allocation pattern do you consider the most appropriate to serve as a reference one and which allocation do you consider could be examined within the sensitivity analysis?

The algorithm defined in the PS CBA can be applied to the project specific indicators to reflect different benefits of the projects. When however applying the algorithm on different indicators, the allocated amounts will be different indicator by indicator, even when applying the same allocation pattern. As these volumes serve as a crucial input for the monetization, it is important to consider their utilization.

Possible usage of the different results:

- Those allocated amounts should be considered, which result in the highest economic performance indicators, as those patterns show the situations when the project is most valuable.
- One of the indicators could be chosen as reference indicator and the allocation patterns produced by it should serve as a comparison basis for all the projects. The allocation patterns generated by the other indicators should be considered in sensitivity analysis.
- The allocation patterns as generated by applying the algorithm on different indicators should be averaged (or otherwise aggregated) and this average pattern could serve as input for the monetisation.

Q.4. How would you decide which indicator to use to define the reference allocation pattern?

Q.5. Which of the above solutions could be used to get to a reference allocation pattern?

3. N-1 Indicator

$$N-1[\%] = \frac{EP_m + P_m + S_m + LNG_m - I_m}{D_{max}} \times 100,\ N-1 \geq 100\ \%$$

The N-1 indicator as defined in the 994/2010 Regulation, shall be calculated by Member States. In the ESW part of the methodology it is explained that N-1 would not be highlighted neither within the ESW CBA, nor within the PS CBA, unless the MSs provide this data. If it is provided, it will be presented within the ESW CBA.

Q.6. Do you agree with the interpretation of the Regulation, presented within the 2.2.3 section of the ESW-CBA, stating that N-1 indicator (national or regional, where defined by the competent authorities) will be presented in the ESW CBA, as provided by competent authorities?

Q.7. Do you agree that the project promoter shall calculate regional N-1 indicator (if defined by the competent authority) within the Project Specific part of the analysis based on the incremental approach?

Q.8. In case no regional N-1 indicator is defined, would you be in favour of optional inclusion of an indicative national N-1 indicator within the Project Specific part of the analysis by the project promoter?

Q.9. In case the answer is YES to Q.7 and Q.8, how the project promoter should extrapolate the formula across the project time horizon (especially for the identification of the single largest infrastructure), reflecting the incremental approach?

4. Price Convergence

Annex IV/3/b stipulates, that "*Market integration and interoperability shall be measured by calculating the additional value of the project to the integration of market areas and price convergence, to the overall flexibility of the system, including the capacity level offered for reverse flows under various scenarios.*".

The price convergence reflects if the margin between the prices on two different markets decrease after a new infrastructure is commissioned. We also have to note however, that the price convergence should not be seen as the aim, but rather as the measure of market integration. In most cases price convergence assists the efficient allocation of welfare; however it is not always the case. The real subject of measurement could be the price correlation between markets, as the higher the correlation between the markets is, the more efficient those markets function. Naturally in two remote markets with high price correlation (prices

move together), but relatively high margin between the prices (low convergence), the transmission costs can explain this margin. This means, that even if the price convergence is low (prices are *far* from each other), markets may still function efficiently, due to the high correlation between market prices (prices move together).

Q.10. Do you agree with the above differentiation between price convergence and price correlation or they should not be distinguished, as they represent the same phenomenon?

Q.11. Do you think that price correlation should be measured instead of price convergence?

Q.12. Do you think that the above quote from the Regulation allows the analysis of price correlation instead of price convergence?

5. Project specific data set

Without certain data, a cost-benefit analysis cannot be prepared. This includes the CAPEX, OPEX and implementation schedule of a project. Some project promoters however may consider this to be commercially sensitive data, so their utilization for the purpose of the analysis should not mean automatic publication within the ESW-TYNDP. Even in such a case the validity of the data should be checked by the respective NRA, ACER or Commission, as the data can significantly influence the results of the analysis.

Q.13. Do you agree that some project specific data, if considered commercially sensitive by the project promoter, should be applied within the analysis without actually publishing them?

6. Sensitivity Analysis

The Regulation stipulates the following regarding the sensitivity analysis necessary to be made within the CBA in Annex V/11:

"The analysis shall identify the Member States on which the project has net positive impacts (beneficiaries) and those Member States on which the project has a net negative impact (cost bearers). Each cost-benefit analysis shall include sensitivity analyses concerning the input data set, the commissioning date of different projects in the same area of analysis and other relevant parameters."

In case on all projects within an area of analysis a sensitivity analysis would be conducted on the commissioning date, would result in an unmanageable amount of combinations.

- Within the clustering however a sensitivity analysis is already implemented by default when applying the clustering. When defining the clusters (Existing, FID, Non-FID), the commissioning date is already taken into consideration indirectly, as it plays a role in the maturity of the projects, defining its FID/Non-FID status.
- The sensitivity analysis will be applied on the commissioning date of each individual project within the PS CBA.

- In case the Regional Group would request, additional, specific sensitivities could be checked within the area of analysis of an individual project.

Q.14. Do you consider, that the above interpretation fulfils the stipulation of the Regulation of including sensitivity analysis *concerning the commissioning date of different projects in the same area of analysis*?

7. Import dependence impact

During the Stakeholder Joint Working Sessions organized by ENTSOG, stakeholders have expressed their comment on modifying the Import dependence impact formula by combining the deletion of the 0.5 factor of the UGS and the use of winter demand as a basis for the calculation of shares.

Q.15. Do you agree with the above enhancement of the formula?

Q.16. Do you have other suggestions to enhance the formula?

8. Reverse flow projects and indicator

Referring to Annex II/1.7, please consider the question below:

Q.17. Do you consider that the fact that a project is a reverse flow project, adds additional benefit to a project, without regard to the impact captured by the other indicators?