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**OPINION OF THE AGENCY FOR THE COOPERATION OF ENERGY
REGULATORS No 04/2014**

of 13 February 2014

ON THE ENTSOG COST-BENEFIT ANALYSIS METHODOLOGY

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 715/2009,¹ and, in particular, Article 11 (2) thereof,

WHEREAS:

- (1) On 15 November 2013, pursuant to Article 11(1) of Regulation (EU) No 347/2013, the European Network of Transmission System Operators for Gas (“ENTSOG”) published and submitted to the Agency for the Cooperation of Energy Regulators (“Agency”) its cost-benefit analysis (“CBA”) methodology in two separate documents, one entitled “Energy System-Wide CBA Methodology” (“ESW-CBA”)² and the other one entitled “Project Specific CBA Methodology” (“PS-CBA”)³.
- (2) The CBA methodology shall be drawn up in line with the principles laid down in Annex V of Regulation (EU) No 347/2013 regarding energy system-wide CBA and be consistent with the rules and indicators concerning criteria for projects of common interest (“PCIs”) set out in Annex IV of Regulation (EU) No 347/2013. The methodology is to be applied for the preparation of each subsequent ten-year network development plan (“TYNDP”) developed by ENTSOG. Furthermore, pursuant to Article 12(3) of Regulation (EU) No 347/2013, promoters of PCIs can submit an investment request to National Regulatory Authorities (“NRAs”), including a project-specific cost-benefit analysis consistent with the CBA methodology and taking into account benefits beyond the borders of the Member State concerned. Therefore, the Agency has verified the suitability of ENTSOG’s CBA methodology for its upcoming applications as well as its compliance with the requirements under Article 11(1) of Regulation (EU) No 347/2013. More

¹ OJ L 115, 25.4.2013, p. 39.

² Downloadable from

http://www.entsog.eu/public/uploads/files/publications/CBA/2013/methodology/INV0154_131115_CBA_Methodology_ESW.pdf as of 4 February 2014.

³ Downloadable from

http://www.entsog.eu/public/uploads/files/publications/CBA/2013/methodology/INV0154_131115_CBA_Methodology_PS.pdf as of 4 February 2014.

material, beyond the two documents published and submitted on 15 November 2013, is available from ENTSOG regarding the methodology, for example presentations delivered during workshops held in Brussels on 20 November 2013 and 22 January 2014⁴. The Agency notes that such material contains clarifications and examples which explain the methodologies and their use, and should therefore also be considered.

- (3) Pursuant to Article 11(6) of Regulation (EU) No 347/2013, the CBA methodology shall be updated and improved regularly and the Agency may request such updates and improvements with due justification and timescales. The Agency deems appropriate to take this provision into account for the present Opinion,

HAS ADOPTED THIS OPINION:

ENTSOG's proposed CBA methodology is a constructive effort in pursuit of delivering on the specific mandate of Regulation (EU) No 347/2013, more specifically by offering suitable approaches to data sets, qualitative, quantitative and monetary analysis procedures which are an integral part of the overall suggested analytical framework. The current ENTSOG CBA methodology complies with a number of the requirements of Regulation (EU) No 347/2013.

The Agency acknowledges that ENTSOG has fulfilled its obligation under the first sentence of Article 11(1) of Regulation (EU) No 347/2013 to publish and submit to Member States, the Commission and the Agency its methodology, including on network and market modelling, for a harmonised energy system-wide CBA at Union level for PCIs falling under the categories set out in Annex II.2 of the Regulation. The Agency believes that ENTSOG's proposed methodology may serve as a basis for the development of the adapted methodology under Article 11(4) of the Regulation.

The Agency notes that ENTSOG's proposed CBA methodology in its current version may not adequately cover all requirements of Regulation (EU) No 347/2013, in particular, entirely or partially:

- The requirement of Article 11(1) to prepare one CBA methodology rather than an ESW-CBA methodology and a PS-CBA methodology, as applicable for the preparation of each subsequent TYNDP;
- The requirement of Annex V(1) regarding time points (years) of input data sets;
- The requirement of Annex V(4) that the methodology is to be based on a harmonised evaluation of costs;
- The requirement of Annex V(5) that the cost-benefit analysis shall at least take into account the costs of capital expenditure, operational and maintenance expenditure

⁴ Cf., for example, *Cost-Benefit Analysis Methodology: General presentation of published methodologies*, 6 November 2013, and *CBA methodology: toward (sic) an adapted methodology*, 22 January 2014.

over the technical lifecycle of the project and decommissioning and waste management costs, where relevant;

- The requirement of Annex V(10) that the ESW-CBA methodology shall define the analysis to be carried out by determining the impacts with and without each project⁵; and
- The requirement of Annex V(11) that 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).

The Agency believes that ENTSOG's CBA methodology needs to:

- Deliver more credible analyses of projects for the purposes of the TYNDP, PCI selection, cross-border cost allocation (“CBCA”), and in respect to the Connecting Europe Facility (“CEF”), by taking into full consideration both costs and benefits;
- Be better able to provide consistent results of impacts of individual projects by country, area of analysis, and type of project;
- Be better able to identify and assess complementary and competing projects;
- Be more practical from the viewpoint of project promoters.

The Agency recommends the adaptation of the CBA methodology under the procedure of Article 11(4) of Regulation (EU) No 347/2013 in order to provide a methodology which convincingly addresses the requirements of the Regulation. For the purpose of adapting the CBA methodology, the Agency recommends to give priority to the adaptations listed in Section B(1) of this Opinion. Further improvements are indicated in Section B(2) and Annexes I and II to this Opinion. The Agency believes that the recommended priority adaptations can be implemented by ENTSOG pursuant to Article 11(4) of Regulation (EU) 347/2013. The improvements included in Section B(2) and Annexes I and II to this Opinion can be introduced as part of the regular updating and improvement process laid down in Article 11(6) of the Regulation.

A. ON THE PROCESS FOR PREPARING ENTSOG’S CBA METHODOLOGY

ENTSOG activities and consultation of stakeholders

The development of the CBA methodologies by ENTSOG started before the entry into force of Regulation (EU) No 347/2013. On 20 March 2013, ENTSOG launched a preliminary informal consultation on the basic concepts presented in a scoping document, in order to allow for early input from all stakeholders concerned. On 15 May

⁵ In the proposed methodology, the impacts with and without each project are dealt with mainly in the PS-CBA via the “incremental approach”, but not in the ESW-CBA. For example, in Section 5.2.2 of the PS-CBA (p. 17) ENTSOG indicates that the difference “between the two values of certain indicators (with and without the project) shall <...> be reported in the PS-CBA output table of indicators”. ENTSOG notes that “the process between November 2013 and the publication in summer 2014 will provide the opportunity to fine-tune the formula of these indicators based on formal opinion process and feedback from stakeholders”.

2013, ENTSOG published the responses received from stakeholders. ENTSOG launched a formal public consultation on 25 June 2013, which lasted until 2 September 2013, by publishing a Draft Cost-Benefit Analysis Methodology and Related Questions for Consultation.

ENTSOG also convened two Stakeholder Joint Working Sessions on the CBA methodology development, which took place on 6 June and 2 July 2013. A Consultation Workshop for Member States and Relevant Stakeholders related to the CBA data sets was held on 9 October 2013.

The publication of ENTSOG's ESW-CBA and PS-CBA methodologies took place on 15 November 2013 and was followed by a Workshop on the EU TYNDP and CBA held by ENTSOG on 20 November 2013 and a Workshop on CBA Methodology (Towards an Adapted Methodology) held by ENTSOG on 22 January 2014. The consultation process of ENTSOG regarding TYNDP/CBA which started with the Stakeholder Joint Working Session on 22 January 2014 will continue until May 2014.

Conclusions regarding the preparatory phase of the CBA methodology development

The Agency appreciates the efforts of ENTSOG to involve stakeholders and provide transparency, including the extensive consultation process conducted in line with Article 11(1) of Regulation (EU) No 347/2013. The Agency recommends continued effort on broad stakeholder involvement and the provision of adequate transparency in the upcoming applications of the CBA Methodology (ENTSOG TYNDP 2015-2024 and the preparation of an updated European PCI list in 2015), as well as for future adaptation and updates of the CBA methodology.

However, the Agency notes that the comments and proposals of stakeholders provided during the CBA development process have not been summarised and it is difficult to identify in the documents how ENTSOG dealt with these comments and proposals. The Agency notes that it would be useful for stakeholders to know how their views have been taken into consideration, and invites ENTSOG to publish an evaluation of the responses received during the public consultation.

B. MAIN RECOMMENDATIONS REGARDING THE CBA METHODOLOGY IN VIEW OF ARTICLES 11(4) AND 11(6) OF REGULATION (EU) NO 347/2013

1. The Agency sees the main thrusts of the adaptations of the methodology needed before the elaboration of TYNDP 2015-2024 and the selection of PCIs in 2015, and implemented pursuant to Article 11(4) of Regulation (EU) No 347/2013 (priority adaptations) as directed at improving:
 - The methodology's relevance to its overall purpose, by clearly integrating ESW-CBA and PS-CBA in line with Article 11(1) of Regulation (EU) 347/2013;

- The ability of the CBA methodology to support the analysis for the purpose of the TYNDP, by assessing individual projects in line with Annex V(10) of Regulation (EU) 347/2013;
- The utility of the methodology for the prime users of its results who comprise, among others, the regional groups during the October 2014 / 2015 PCI selection process - including the European Commission and Member States, project promoters, the Agency, NRAs, and the European Investment Bank (EIB). This should be achieved by providing more guidance on the CBA as an input to CBCA and by the disaggregation of project costs and benefits by country and by time horizons (years);
- The provision to project promoters of a toolbox/manual, a template in which quantitative information and estimates are converted into values to deliver an economic benefits/cost (B/C) ratio of the project together with a breakdown across the impacted countries. The Agency believes that a standard set of parameters, values, and scenarios is needed to help project promoters carry out analyses and guarantee consistency. For reasons of transparency and standardisation of the CBA throughout Europe, and to achieve maximum consistency with the methodology proposed by ENTSO-E, the Agency recommends a particular early focus on this task. Practical examples of calculations which use specific cases and projects would be helpful. This should also aim at facilitating investment requests and the related decision-making process by NRAs, along with other decision-making processes, such as the development of the TYNDP 2015-2024, the selection of PCIs in 2015, and the identification of positive externalities in analyses related to incentives;
- Elucidating in the text of the methodology to a sufficient extent the relationship between the degree of maturity of the projects and the application of the CBA.

In order to adapt the CBA methodology under Article 11(4) of Regulation (EU) 347/2013, the Agency encourages ENTSO-G to get in contact with project promoters who already applied the proposed methodology for preparation of investment requests submitted to NRAs. For these reasons, the Agency also recommends conducting special training sessions for stakeholders, beginning already in late spring 2014, and taking note of the input provided by stakeholders in the meantime.

2. Subsequent to the implementation of the priority adaptations, work should continue in pursuit of further improvements, in broad consultation with stakeholders and in view of the tasks to be performed in 2015 and thereafter. The Agency sees the main thrusts for further update and improvement of the methodology under Article 11(6) of Regulation (EU) No 347/2013, needed before the end of 2015, as directed at:
 - Developing a robust gas market model, to be used in conjunction with the network model, and providing a formal description of the models;

- Developing the capabilities for the simulation of the marginal impact of projects, including PCI candidates, as a major element in the PCI selection process;
- Better addressing the issue of dealing with complementary or competitive projects, including greater clarity about the ways in which the interaction between electricity and gas sector projects could be addressed;
- Including in the methodology procedures and tools for identifying non-physical constraints which could be resolved by other means and approaches than investing in new infrastructure, and thus help minimise project risks;
- Achieving full clarity regarding the monetary and the quantitative analytical procedures, with full monetisation of costs and benefits whenever monetisation is possible, and making sure that double counting of project effects is avoided;
- Incorporating in the CBA methodology analytical tools and procedures which would allow the comparison of projects located in different corridors and regions, which would imply comparing different supply sources and routes for Europe;
- Continuing the work related to using common data sets for all analytical procedures, in particular by making the data complete and more detailed, including regarding costs and data sources;
- Discontinuing, to the maximum extent possible, the concurrent use in the methodology of both modelling and algorithmic procedures, and the use of modelling only, whenever feasible, for economic analyses.

C. RECOMMENDED SOLUTIONS

For a high-level listing of the Agency's concerns and the proposed solutions suggested to be applied for the adaptation of the CBA methodology under Article 11(4) of Regulation (EU) No 347/2013 and further updates and improvements in line with Article 11(6), please refer to Table 1. The Agency suggests that ENTSOG considers achieving, by 2015, the architecture of the CBA methodology illustrated in Figure 1 and the work flow associated with it described in Table 2, with an indication of the tasks which would be assigned to the parties involved in the CBA.

The Agency believes that the main principles of the architecture of the CBA methodology should be that the methodology allows for identifying the project-specific impacts on the system and the compliance with the criteria of Article 4 and Annex IV(3) of Regulation (EU) No 347/2013. This identification should be performed by project promoters according to the methodology and the results should be submitted to ENTSOG to aggregate, verify and use in the development of the TYNDP (including project clustering or competitive projects' effects from the TYNDP perspective). The Agency believes that such an architecture would adequately integrate ESW-CBA with PS-CBA and system (capacity) modelling with market modelling (prices and supply

effects), and would also allow for monetisation of results at all levels to the maximum possible extent⁶.

The Agency welcomes ENTSOG's planned activities for further adaptation and improvement of the current CBA methodology document in the context of the TYNDP 2015-2024 consultation. The Agency would like to emphasise the importance of further discussion on the following issues:

- Input data;
- Supply mix assumptions underlying definition of flow patterns;
- Supply stress situations;
- Fine-tuning of the calculation of different indicators, by achieving the maximum possible degree of monetisation;
- Prices per source and/or per import route (for price convergence and monetisation of benefits).

⁶ Cf., for example, Brooks, Robert E: Modelling of the North American Market for Natural Gas Liquids, *USAAE*, 2013. In Figure 1, the red loop indicates work flow by project promoters and the green loop refers to work by ENTSOG. The red loop should be completed first, on the condition, however, that the databases and scenario data to be used by all project promoters and consistently with ENTSO-E is already made available by ENTSOG. Solid arrows indicate a work step which must be completed and dotted arrows indicate *ad-hoc* use of results available at the end of a step.

Table 1: Key Concerns and Proposed Solutions Regarding the CBA Methodology

	Finding	Problem	Recommended Solution
1	Structural weakness between ESW and PS methodology (ESW uses modeling without cost and monetisation of benefits based on avoided cost).	ESW-CBA does not include cost and the analysis only produces information about system-wide benefits. ESW-CBA seems to be only a framework for PS-CBA, in which instance the analysis of system-wide costs and benefits would not be sufficiently addressed.	<ul style="list-style-type: none"> • Integrate ESW and PS work flows in a single methodology, which should enable an analysis of a project's impact system-wide as per Article 11(1) and Annex V(10) of Regulation (EU) 347/2013, rather than focus on the system development scenarios or consider potential benefits only, and make sure that proper handling of cost is possible when applying the methodology; • Monetise whenever possible; • More precisely define the relationship between the algorithmic approach and modelling, and specify more clearly the algorithmic approach in order to provide sufficient guidance to project promoters.
2	Scenarios used for modeling only distinguish between projects on which final investment decision is taken (FID projects) or not taken (non-FID projects).	PCIs include both FID and non-FID projects. The FID/non-FID approach is unable to address probable PCIs appropriately. The utility of using the non-FID scenario is questionable as it represents the most unlikely outcome.	<ul style="list-style-type: none"> • Clearly define a baseline scenario (FID projects only) and provide datasets for it; • For the purpose of the TYNDP development, run network modelling by adding non-FID PCIs compare results against the baseline scenario.
3	Modeling tool not validated with actual data runs.	Modeling results are not validated.	<ul style="list-style-type: none"> • Validate the tool by running "test case" analyses with actual (historic) data and calibrating the tool to enable good fit of results.
4	One tool is used for network modelling and market analyses.	The network modeling tool ("NeMo") is apparently capacity use optimisation-oriented and at the same time is used to produce market-related analyses (e.g. price convergence assessments). However, market conditions depend on many factors beyond the network	<ul style="list-style-type: none"> • Clearly state the capabilities of the modeling tool by providing a distinction between market modelling procedures and network modelling procedures; • Explain more clearly how consumer and producer surplus and welfare gains are assessed, including their breakdown by impacted area/country;

		<p>optimum (for example, gas supply and demand, cross-elasticity of demand for different kinds of energy, etc.). Consequently, market conditions (equilibria) may not always be adequately captured by the linear programming model now used in the methodology, which makes the assessment of consumer and producer surplus and total welfare gains difficult.</p>	<ul style="list-style-type: none"> Formally describe the market and the network models (the “core engine” of the methodology, equations, etc.) in the methodology.
5	<p>The methodology repeats many of the shortcomings revealed during the 1st PCI selection round regarding divergent levels of available information about projects and their impacts.</p>	<p>Area of impact identification, information needed for ranking of projects, distribution of costs and benefits (cost-bearers and beneficiaries), monetisation, and other key outputs needed for subsequent decision-making are not sufficiently covered.</p>	<ul style="list-style-type: none"> Define minimum required set of information to be provided by project promoters, including already for the purposes of the TYNDP in 2014; Use clear standardised input-output format and make the forms available to stakeholders; Provide sample spreadsheet calculations.
6	<p>The data sets are incomplete The relationship between classes of input data (project-specific, EU-wide database, scenarios) is not sufficiently clear.</p>	<p>The data set does not specify all relevant data sources and the breakdown of costs, and no cost information is considered at all for the ESW-CBA. As costs are not considered in the ESW-CBA, the designation of ESW-CBA as a “cost-benefit” analysis is questionable.</p>	<ul style="list-style-type: none"> Identify the promoters’ obligation to provide a minimum level of project cost information as a necessary condition, including for the purposes of the TYNDP; Provide and use detailed and complete standard data sets; Clarify in a manual the relationship and the sourcing of classes of data and provide examples; Make sure cost information is properly used for ESW-CBA.
7	<p>The dependency between the ESW-CBA and PS-CBA is procedures unclear, especially regarding economic analyses.</p>	<p>It is unclear whether the ESW-CBA is just a framework for the PS-CBA (and in that case how financial and economic analyses should be performed), or a separate methodology.</p>	<ul style="list-style-type: none"> Clearly integrate the ESW-CBA and the PS-CBA into a single methodology; Provide clear guidance on assuring consistency (discount rates, time granularity, etc.) of outputs between projects.
8	<p>Needs to be more user friendly from the viewpoint of the entities which will actually perform CBA</p>	<p>It is difficult for a user (say a project promoter) to understand where to begin and where to go to next in terms of data and procedures of the CBA,</p>	<ul style="list-style-type: none"> Provide a high-level workflow chart with short and clear “how to” comments (<i>cf.</i> suggested flow chart on Figure 1); Provide specific examples of the methodology application

	analyses (“user-oriented”).	as well as what should the attention be on procedure-wise, input-wise, and result-wise.	with actual (“real life”) data, preferably in a spreadsheet format, and publish the file.
9	Needs to be more practical from the viewpoint of the users of the CBA results (“client-oriented”).	May not provide the information needed for practical purposes by decision-makers. The level of detail and the interpretation of the results of the analysis are left somewhat unclear.	<ul style="list-style-type: none"> • Make sure the methodology is fully able to support Regional Groups, NRAs, the European Commission, the EIB in their work and cover all outputs required by Annex V; • Clearly integrate ESW-CBA and PS-CBA into a single methodology; • Monetise whenever possible; • Specify in a “manual” how results should be interpreted.

Figure 1: Suggested CBA Methodology Work Flow

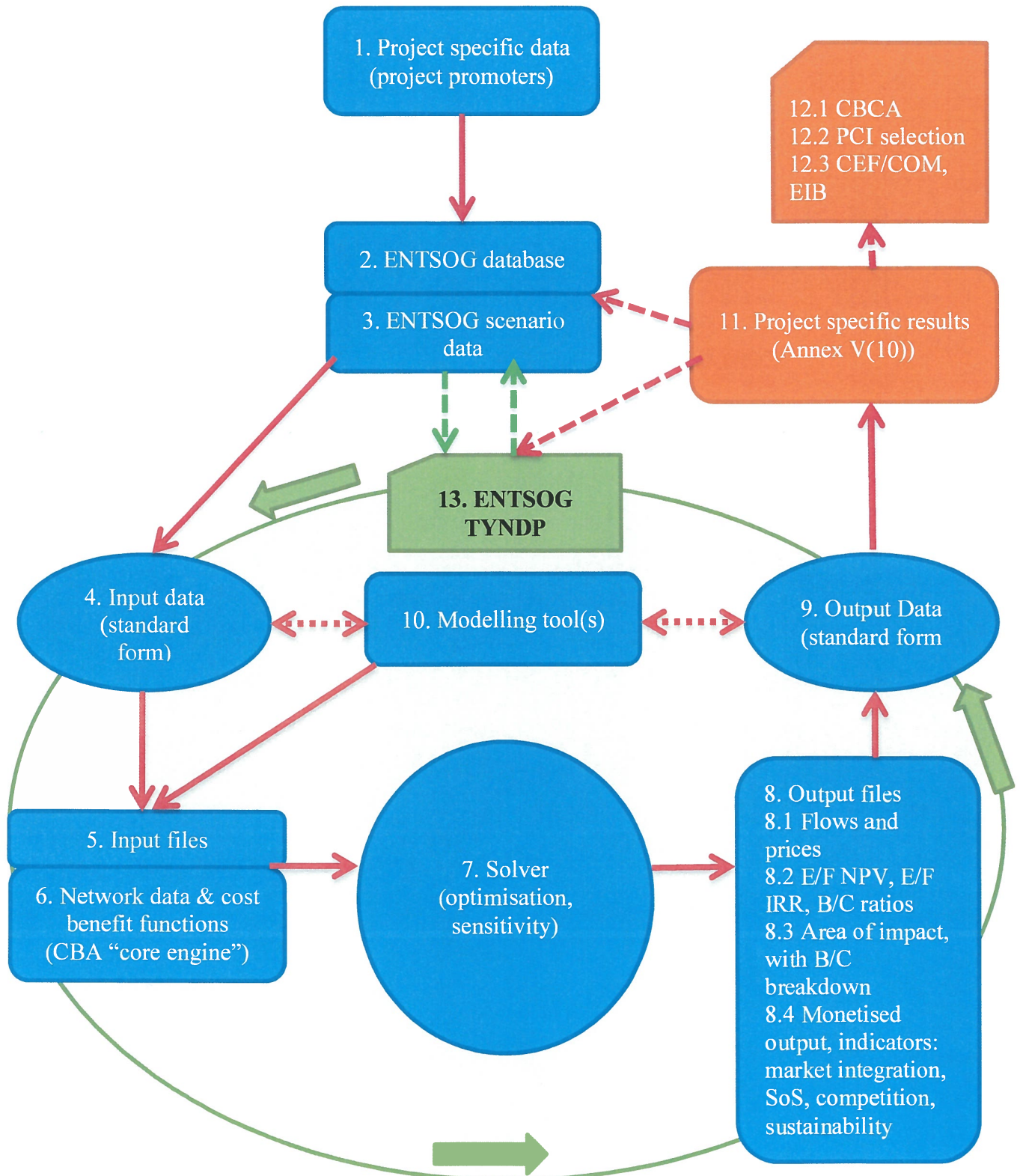


Table 2: Suggested step-wise work flow for CBA analyses according to the CBA methodology

	Project promoter steps	ENTSOG / Decision makers steps
1	Project promoter prepares project-specific data	
2 and 3	Project promoter collects standardised data (to be used by all project promoters) according to the data specification provided by ENTSOG	
4	Project promoter inputs data to standard CBA interface (form)	
5 and 6	Project promoter prepares input files for running the network modelling and the market modelling (calculation procedures and solver programmed in a spreadsheet or equivalent)	
7	Project promoter runs analyses including optimisation and sensitivity	
8	Project promoter collects output files	
9	Project promoter fills out standard CBA output report (forms)	
10	Project promoter checks results against capacity constraints of the network modelling tool (“reality check”)	
11	In case of successful “reality check”, project promoter hands over results for the intended use (TYNDP, PCI selection, CBCA, etc.)	
12		ENTSOG collects CBA results from project promoters, uses them to prepare TYNDP. In cases where reasoned concerns exist, ENTSOG runs the CBA analysis to verify CBA results (green loop)
13		Decision makers use the CBA results

Detailed recommendations in light of the main findings and the adaptations of the CBA methodology proposed above, as well as suggestions for the next steps are contained in Annex I. Detailed recommendations and suggestions for the required data to be provided by project promoters, the building of the database to be used by all project promoters, and the common scenario data are contained in Annex II.

The Agency appreciates ENTSOG’s attempt to start and implement a comprehensive CBA methodology at the earliest moment and to strive for its adaptation under Article

11(4) of Regulation (EU) No 347/2013. The Agency appreciates ENTSOG's work and suggestions and expects the timely implementation of the priority steps in the adaptation of the CBA methodology, as well as its further improvement.

Done at Ljubljana on 13 February 2014.

For the Agency:


Alberto Pototschnig
Director

ANNEX I: DETAILED RECOMMENDATIONS

The Agency recommends that ENTSOG considers better incorporating in the CBA methodology procedures about costs, monetisation of benefits, identification of beneficiaries, and sensitivity analyses as related to risk and supply patterns (sources and routes) analyses. Specific recommendations are provided below.

1. On Cost

- The Agency strongly recommends improving the general approach of ENTSOG to cost analysis, as well as to the fact that both costs and benefits need to be broken down per investment project and per impacted area (country). The Agency recommends the use of the cost nomenclature listed in Annex II to this Opinion, or a similar approach, as well as - whenever possible - the full monetisation of all costs (financial and economic).
- From the current methodology it is not clear how the cost of capital is considered in the model. Clear guidance should be given.
- The methodology should contain an absolute minimum requirement for cost data, independent from the project's level of maturity (see also Annex V(5) of Regulation (EU) No 347/2013). For sufficiently mature projects, for which investment requests are submitted to NRAs, the information listed in Annex II to this Opinion should be requested and should also be included into the methodology, depending on the type of project.
- Cost projections should be based on finalised solutions for routing and, where available, technologies. Where there are no final solutions on technologies, proper justified cost estimates may be used.

2. On Scenarios and Sensitivity

- The methodology should be in line with its functions as a forward-looking analytical tool. Guidance should be provided in the CBA methodology about its capabilities and limitations as a way to assess possible future outcomes.
- The Agency invites ENTSOG to consider including in the CBA methodology simple procedures that would allow the sensitivity of outcomes to specific factors (inputs or variables to the analysis) to be assessed, along with the ranges of these factors, and the use of scenarios, as well as the relationship between sensitivity analysis and the use of scenarios.
- Regarding scenarios, the Agency notes that ENTSOG suggests using the framework of the ESW-CBA methodology as the source of input to PS-CBA (individual projects are to be analysed by using scenarios developed by ESW-CBA which assesses benefits). In the Agency's view, the proper procedure is likely to be exactly the opposite: PS-CBA, which includes financial cost and benefits assessments, should precede the subsequent system-wide analysis which should take into account the scenarios and the externalities and "discover" the economic costs and benefits (along with their ranges) of individual projects.
- The Agency recommends the use of scenarios primarily in relation to macroeconomic factors beyond the control of any one party, such as energy prices,

price of CO₂ emissions, and other macroeconomic parameters, with respect to which a project should be assessed. Scenarios should be used to show results and their ranges in different possible “futures”. In contrast, standard sensitivity analysis should be used to demonstrate how the result (for example, a project’s net present value) changes if a single variable, such as a commissioning date or investment cost, changes.

- The Agency recommends the inclusion in the methodology of a base case scenario for network development pattern that uses FID projects by year n+5 only, to be considered for consistency’s sake by all parties carrying out a CBA, and sample scenarios or references to scenario data from reputable sources for other scenario-based data. The Agency recommends this scenario approach to be applied to the data listed in Section 3.2.3 (first six bullet points) and 3.2.4 (first bullet point) of Annex II to this Opinion.
- The Agency recommends sensitivity to be primarily assessed concerning the project-specific input data set, the commissioning date of different projects in the same area of analysis and other relevant parameters (as requested by Annex V(11) of Regulation (EU) No 347/2013). The Agency believes that the current approach, which apparently applies sensitivity analysis as a kind of multi-scenario investigation, with stress on the variability of scenarios and not on the variability of competing projects and of project-specific parameters, may not provide all the necessary results needed for a proper assessment of individual projects. The methodology should also state that findings on sensitivities by project promoters should be accompanied by information on identified risks (if any) and the risk mitigation measures foreseen by the promoters.
- The term “scenario” is used to describe the Low Infrastructure, High Infrastructure and PCI scenarios in section 4.2 of the ESW-CBA methodology. In addition, the term is used in section 3.2 with respect to “Supply Potential Scenarios”. However, there is no comment in the methodology on whether the various scenarios should be considered in “permutations”, resulting *de facto* in 3x3=9 scenarios, or in another way. The Agency believes that guidance needs to be included on how to interpret the outcomes based on different scenarios, i.e. guidance on the “selection” of values, an appropriate “weighting” of values, or at least a detailed description of the scenarios to enable NRAs to build an opinion on the probability of individual outcomes.
- Regarding uncertainty and sensitivity analysis, in case of probabilistic and/or scenario-based evaluations, the estimated margins of variations have to be provided to reflect uncertainties. The Agency notes that according to Annex V of Regulation (EU) No 347/2013, each CBA 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. These sensitivity analyses need to be provided for the different scenarios, i.e. scenarios per se should not be regarded as sensitivity analysis. A closer collaboration with ENTSO-E is recommended in this perspective as well, for example where both for electricity and gas certain data may be used, such as CO₂ prices.
- The assumed network and market scenario is of paramount importance to estimate the costs and benefits of a project over the lifecycle. It is necessary to get more insights and transparency on the underlying network and market assumptions on

which the methodology is based. For example, some investment projects may only be beneficial under specific network and market condition (e.g. 10% of the year) while other projects may generate benefits more intensively (e.g. 70% of the year). Obviously, such features impact the CBA outcome and the methodology should be able to pinpoint the link between a given scenario and the outputs of the CBA.

3. On Consistency

- In the view of the Agency, the “user friendliness” of the proposed methodology has to be given more attention. The Agency recommends the inclusion in the revised version of the CBA methodology of a comprehensive listing of all input and output parameters (complete input-output nomenclature), clear indications to project promoters where data on the parameters can be found⁷, guidance on how to estimate the required inputs, a formal description of the models used complemented by a user manual and a sample spreadsheet calculation, and a spreadsheet template that can be used. It is also recommended to provide to project promoters examples of the methodology’s application to specific projects, since such examples could be helpful in order to understand how the methodology “works”.
- The Agency notes that even where ENTSOG does not actually have to supply data beyond its area of responsibility, for example prices of CO₂, the methodology should specify the complete set of data to be used (data nomenclature) and indicate the sources and the responsibilities for data provision.
- It may be helpful to integrate into the methodology a process flow-chart showing and summarising the provision of data (list of all data and assignment of responsibility for its provision), processing of data as part of the CBA and output of the CBA (for example, a table summarising all results of the CBA), and clearly illustrate dependencies and sequencing to be followed by project promoters. An example of such a chart is provided in the Opinion (*cf.* Figure 1 above).

4. CBA Time Horizon

- The Agency appreciates the suggested time frames of analysis in footnote 8 on page 7 of the PS-CBA, but notes that ENTSOG should more carefully comply with the principle of Annex V(1) of Regulation (EU) No 347/2013 regarding the n+5, n+10, n+15 and n+20 data set. Additionally, Annex V(13) of Regulation (EU) No 347/2013 may be considered⁸.
- An identical time horizon should be used in the determination of different outputs of the CBA, unless comprehensible reasoning is given for a deviating approach. For example, financial net present value (FNPV), financial internal rate of return (FIRR)

⁷ Cf., for example, the listings provided in Annex II to this Opinion.

⁸ For avoiding doubt, the ESW-CBA and PS-CBA for gas shall also use the data for the common electricity and gas market and network model set out in paragraph 8 of Article 11. The input data set referred to in point (1) of Article V shall cover the years n+10, n+20 and n+30 and the model shall allow for a full assessment of economic, social and environmental impacts, notably including external costs such as those related to greenhouse gas and conventional air pollutant emissions or security of supply.

and the financial benefit / cost / (FB/C) ratio should use an identical time frame. This requirement should be stated clearly in the methodology.

5. Fair Treatment of Different Types of Projects

- Differentiation of the methodology may be considered for different types of projects (for example, pipeline, LNG, or storage).
- However, some classes of projects seem to completely escape from ENTSOG's radar: flexibility (within day, storage) and reverse flow projects may not always be detected as possible relief solutions for a bottleneck, while these projects can be welcome for market integration (and not only security of supply). Projects which are only beneficial for market integration and price convergence (NeMo uses no local or hub prices) appear to be beyond the scope of the current approach, even though these projects may be beneficial. It is important to guarantee an appropriate level-playing field between investment projects serving different purposes, in order to overcome market barriers as well as physical barriers. The Agency acknowledges the fact that ENTSOG may lack information needed to set commercial constraints for example at interconnection points. However, for the purpose of the CBA methodology, the Agency believes that ENTSOG should at least specify the need for such data and, as a minimum, use tools and models which allow the use of such data when available, possibly only with dummy values if not available.
- The methodology should not be Member States dependent, i.e. whether a given project is considered in country A or country B should not lead to differences in the methodology itself, for example by using divergent social discount rate or CO₂ prices. The same methodology should be applied throughout Europe. The Agency acknowledges that some parameters and values may depend on the project location (i.e., be country specific), but any such differences should be explained and should be reasonable.

6. Treatment of Complementary or Competing Projects

- Regarding competing and complementary projects, in consideration of the effort needed for calculations, the use of Low Infrastructure and High Infrastructure Scenarios appears to be reasonable. In order to achieve comparability and for illustrative purposes, it is important to apply this approach identically to projects promoted by transmission system operators (TSOs) and third-party projects.
- Due consideration should be given also to the ability of the methodology to assess competing and complementary projects on a PCI list. The calculation of benefits in the CBA (based on the NeMo modelling tool) delivers results about the benefits for each country when all projects are realised, both those on which final investment decision (FID) has been taken and those on which no FID exists. Consequently, the ESW-CBA methodology does not deliver information on how a country can benefit from a single project, and it remains unclear how in the PS-CBA project-specific benefits could be calculated in the light of point 11 of Annex V to Regulation (EU) No 347/2013. Furthermore, the approach for the evaluation of complementary projects needs to be specified, as a stand-alone evaluation of complementary projects may also deliver distorted results.

7. Treatment of Projects with Differing Level of Maturity

- The relationship between the degree of maturity of the projects and the application of the CBA is not sufficiently elucidated in the context of the methodology. The methodology should more clearly suggest how non-mature PCIs would be assessed, as compared to mature projects. The CBA methodology may have some special features related to the treatment of potentially viable non-mature projects, and such features should be more clearly shown.

8. The Use of Modelling

- ENTSOG has opted to integrate an ESW-CBA methodology within the existing TYNDP network modelling approach. This approach may be obvious from ENTSOG's point of view, but it is not straightforward in the context of Regulation (EU) No 347/2013, since the existing TYNDP framework, in terms of purpose as well as methodology (the NeMo tool), requires a considerable revision in order to meet the needs of the CBA as well⁹. The existing TYNDP model is focussed on simulating the network capabilities and flows throughout Europe mainly based on physical network data. Investment proposals received from project promoters are simulated according to different network and flow scenarios in order to identify the performance of the network (capacity and flow-wise) within Europe and to identify possible remaining physical bottlenecks. In the existing TYNDP, the necessity of the submitted individual projects is not revealed, nor is any information that could be useful for ranking projects in terms of capability for problem-solving in the network provided. The Agency recommends the adaptation of the CBA methodology in order to achieve full compliance with the requirements of Article 11(1) of Regulation (EU) No 347/2013.
- The NeMo modelling tool plays a crucial role in identifying the impacted countries and calculating the benefits accruing to these countries. It is therefore important that the model is validated by demonstrating that it correctly handles actual cases. The Agency recommends "test runs" of the NeMo tool with actual (historic) data and the calibration of the tool to enable good fit of results, including test runs with projects from the first PCI list.
- The CBA needs – apart from network modelling - an adequate market modelling to be able to simulate the impacts of investment projects on the market as well. If market impacts are not simulated in an equilibrium model together with the network physics, but calculated outside the model according to an indicator formula, there is a significant risk for over- or underestimating the impacts. Furthermore, there is a risk of double counting since model iterations do not take account of the calculations of indicators outside the model (dynamic effects are lost), and the problem of a proper allocation of impacts to individual investment projects will be

⁹ The lack of maturity of the TYNDP methodology to meet the requirements of e.g. Article 11(1) of Regulation (EU) No 347/2013 was already discussed in the Agency's Opinion No 18/2013 of 10 September 2013 on ENTSOG's Draft Community-wide TYNDP 2013-2022 (downloadable from http://www.Agency.europa.eu/official_documents/acts_of_the_agency/opinions/opinions/Agency%20opinion%2018-2013.pdf).

difficult to come up with. The Agency points out that an approach of integrated technical (capacity / flow) and market modelling has already been considered by the Energy Community on a regional scale¹⁰, and invites ENTSOG to consult stakeholders regarding the use of improved market modelling tools capable of delivering credible analytical results. The Agency recommends that ENTSOG seeks additional support in market modelling in order to meet the objectives of Article 11(1) and Article 11(8) of Regulation (EU) No 347/2013.

- The Agency recommends the use of market modelling in which the gas price is endogenously determined, or, if not possible, then an explanation on how market price dynamics will be handled separately for each Member State or entry-exit zone.

9. Discount Rate

- The Agency has already recommended the use of preferably one social discount rate (SDR) of 4% for all countries, in contrast to ENTSOG's proposal of 4.5%. In addition, the use of an identical SDR for gas and electricity projects should be pursued.

10. Project Impact Assessment, Including Monetisation

- The internalisation of externalities is explicitly requested by Regulation (EU) No 347/2013. The assessment of the economic, social and environmental impact as per Annex V(13) and Annex IV is one of the greatest challenges for the CBA. The proposed methodology does not present an analytical framework for elaborating economic welfare contributions and monetisation to a full extent. The Agency believes that there is a need for a list of externalities (positive as well as negative) that will be considered, and an indication of how these externalities are measured and monetised and of how they will be considered in the CBA, together with an approach to avoid double counting. The proposed methodology delivers only a partial attempt in this respect.
- If monetisation is not applied to the maximum extent possible, the output of the CBA will provide a range of scores which cannot be reduced to a common denominator, including the financial B/C ratio along with a list of scores for indicators which will not be monetised. As long as there is no methodology to evaluate all the benefits and costs of a project in pecuniary terms, it will not be possible to define the societal merit order of the projects, and any socialisation of costs will be arguably arbitrary. In addition to the insufficient monetisation, at this time it is not clear from the methodology that information will be provided to enable ranking, especially with respect to the projects' ability to solve existing network problems, or to guarantee consistency in this exercise over time, over varying ranges of externalities and over various locations (countries).

¹⁰ Cf., for example, Kaderják, Péter: Market modelling based CBA to support the PECEI selection process in the Energy Community. Presentation delivered during the ENTSO-G Workshop, 20 November 2013, Brussels.

- Moreover, the way in which the methodology will address how new projects in a given exit-entry zone/country may impact the use of existing infrastructure in another zone/country, including possible negative impacts in that zone or country, could be improved. It seems inappropriate to compensate TSOs for loss of revenue because of reduced volumes (representing a negative externality) due to new projects, but the issue deserves appropriate attention in the methodology, as such externalities should at least be made visible for decision-making. In addition, there are countries with several TSOs. The investment of a TSO may have a negative impact on a neighbouring TSO in the same country. The methodology provides no clear answer on how these cross-TSO impacts within countries are to be considered in the CBA.
- The valuation of market integration and price convergence should also be carefully considered. A country with lower gas price will “lose out”, at least in gas price terms (i.e., pay higher prices) after improving the coupling to a country with a higher price. The Agency recommends the inclusion in the methodology of clear guidance regarding welfare change analysis and welfare change measurement in all impacted countries in order to enable the assessment of the correct impact of a given project on market integration and price convergence.
- The precise way in which financial and economic costs and benefits (in the case of financial “benefits” here in fact revenues are meant) are dealt with is a relevant element which should be given additional attention. A project where the benefits are 60% economic and the economic B/C-ratio is 1.3 is likely to differ from a project with the same financial B/C-ratio, but where the economic benefits are just 20% and hence the other benefits are purely financial (e.g., revenues from capacity sales). The Agency notes that the distinction between financial and economic cost and benefits / revenues is of key importance, and that the assumption that the costs of a project which delivers economic benefits will be compensated by socialisation of costs has its limits. For these reasons, the Agency recommends the inclusion in the CBA methodology of procedures that allow B/C ratios to be evaluated alongside with the evaluation of the B/C structure for both the financial and the economic benefits and costs.
- Regarding impacts, it is not sufficient to simulate absolute impacts only, for example to be able to identify that a project leads to an improvement of the “N-1” indicator by 20%, but also in relative terms (e.g., an increase of the “N-1” by 25% from 80% to 100%). The Agency notes that an impact leading to the increase of the “N-1” index from 80% to 100% would have a higher beneficial value than a gain from 150% to 170%, although in both instances the absolute increase is 20%, and invites ENTSOG to consider the inclusion of relevant guidance in the methodology.
- The results of the CBA (comparing cost and benefit of a project) need to be provided per cluster¹¹ and per project, where reasonable or appropriate due to the nature of the projects. In such instances, the indicators need to be determined per

¹¹ For the purpose of clarity, “cluster” is understood here as two or more projects which a) are mutually dependent in such a way that the putting into operation of one of them is conditional on the putting in operation of the other one, or b) the operation of one of them is greatly enhanced by the operation of the other one.

project, per scenario and where applicable, per country. This is especially important for competing projects and alternative supply sources and routes. More specifically, the methodology needs to allow the identification of the so-called impact zone, i.e. the Member State(s) with positive or negative impacts, since it is a major consideration in ranking PCI-candidates and the respective net benefits.

- The lack of monetisation, beyond qualitative assessments, of diversification, particularly regarding diversification of supply by supplier and by source, which, coupled with the way the cost of disruption of supply is treated (as “political cost” and/or as “the cost of lacking energy”), makes the CBA analysis (in the sense of comparing monetised costs and monetised benefits) of projects related to diversifying supply nearly impossible. The Agency strongly recommends the use of clear procedures allowing for the maximum possible monetisation of all impacts (including diversification of supply) of a project.

ANNEX II: DATABASE AND SCENARIO DATA RECOMMENDATIONS

1. Project cost specification (nomenclature) for the CBA

The Agency recommends foreseeing in the CBA methodology more details about costs. It should be indicated that the costs data shall be provided by project promoters for publication in the TYNDP¹². A single figure for capital cost (or a range of estimated capital costs) may be sufficient for publication in TYNDP 2015-2024. However, as a minimum, the CBA methodology should unbundle costs, in line with Annex V(5) of Regulation (EU) No 347/2013, to:

- Capital expenditure (capex);
- operational and maintenance expenditure (on an annual basis);
- decommissioning and waste management cost (when relevant).

Please also note that the Agency's Recommendation on CBCA¹³ indicates costs in six categories:

- Materials and assembly cost;
- Temporary solutions;
- Environmental costs;
- Consenting/social costs;
- Operating costs; and
- Decommissioning costs.

All data listed in this section is expected to be provided by the project promoters and are variables for the purposes of the CBA. The CBA methodology should instruct project promoters to provide itemised data cost in data tables, to enable the verification of costs, which is within the responsibilities of NRAs.

2. Additional data accompanying CBA, responsibilities

In addition, to enable a proper evaluation of projects especially during the PCI-selection process and for CBCA the following information should be provided by the TSO/project promoter for every project¹⁴, but not necessarily within the TYNDP:

- The clear identification of the project;
- A presentation and discussion of the socio-economic context and the objectives;

¹² As in the TYNDP for electricity.

¹³ Cf. Recommendation of the Agency for the Cooperation of Energy Regulators No 07/2013 of 25 September 2013 regarding the cross-border cost allocation requests submitted in the framework of the first Union list of electricity and gas projects of common interest, p. 20. Downloadable from http://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Recommendations/ACER%20Recommendation%2007-2013.pdf.

¹⁴ See "Guide to Cost Benefit Analysis of Investment Projects", European Commission, Directorate General Regional Policy, July 2008, page 15, Section 6.

- An evaluation of the feasibility of the project and of alternative options;
- A sensitivity analysis compliant with Annex V of Regulation (EU) No 347/2013 as well as a discussion of any identified risks and the ways to mitigate these risks.

3. Recommended data sets and data-related procedures for carrying out cost-benefit analyses and the preparation of Union-wide lists of PCIs

3.1 CBA input data-related procedures and data specifications

3.1.1 CBA data set requirements

The main CBA data set requirements are specified in Annex V of Regulation (EU) 347/2013, namely:

- Time points of analysis (Annex V, Points 1 and 13);
- Minimum data set content for gas (Annex V, Point 1(b));
- Compatible data items between gas and electricity, especially for prices and volumes on each market (Annex V, Point 2);
- Minimum set of costs to be taken into account in the CBA (Annex V, Point 5)
- Discount rates (*ibid.*);
- Results of market testing (Annex V, Point 7);
- Disaster and climate resilience, and system security, notably for critical infrastructure as defined in Directive 2008/114/EC (Annex V, point 7(a));
- Congestion in the gas network (Annex V, Point 7(b)) - physical as well as contractual congestion and other congestion related to market barriers or constraints;
- Area of analysis (Annex V, Point 10);
- Commissioning date of different projects in the same area of analysis (Annex V, Point 11);
- Other relevant parameters (*ibid.*);
- Economic, social and environmental impacts, notably including costs such as those related to greenhouse gas and conventional air pollutant emissions or security of supply (Annex V, Point 13).

3.1.2 Special data processing requirements

In addition to specifying the data set requirements, Annex V of Regulation (EU) 347/2013 mandates the following data set processing requirements:

- Elaborating the data set after formal consultations with Member States and the organisations representing all relevant stakeholders (Annex V, Point 2);
- Assurance of access to third party data by the Commission and the Agency, when applicable (*ibid.*);
- Compatibility of data sets for gas and electricity (*ibid.*);
- Carrying out analysis by determining the impacts with and without each project (Annex V, Point 10);

- Carrying out sensitivity analysis concerning the input data set, the commissioning date of different projects in the same area of analysis and other relevant parameters (Annex V, Point 11).

Furthermore, the analysis must be able to identify the following data as output of the analysis, which means that for the same types of data pre-project information must exist in the data set, in order to enable the assessment of the impacts:

- Impact on disaster and climate resilience, and system security, notably for European critical infrastructure as defined in Directive 2008/114/EC (Annex V, Point 7(a));
- Congestion in the gas network (Annex V, Point 7(b)) - physical and any other;
- Member States on which the project has net positive impacts (beneficiaries) and net negative impact (cost bearers) (Annex V, Point 11);
- Economic, social and environmental impacts, notably costs such as those related to greenhouse gas and conventional air pollutant emissions or security of supply (Annex V, Point 13).

3.2 CBA data provision and sourcing procedures

One of the most important aspects of the CBA methodology is the distribution of responsibilities regarding the provision of various data. In this section, along with specifying the types of data (inputs) required for the proper carrying out of CBA analyses, an attempt is made to identify the parties which will be responsible for sourcing the data (input) for analyses under the CBA methodology, as well as the procedures required to support the data collection, checking, storage and provision for the purposes of CBA analyses. The identification effort is based on two criteria; (a) direct mandate as listed in the Regulation (EU) No 347/2013 and (b) inferred mandate based on overall functions and responsibilities of the parties involved in building up the methodological framework for CBA analyses. In a nutshell, these parties are:

- Project promoters;
- Concerned TSOs;
- ENTSOG;
- European Union, Member States, and NRAs.

In the following sections, the input parameters (variables and benchmarks or constants) are sorted according to this classification of parties for the purposes of data sourcing and building up the common data set for the application of the CBA methodology as required by the Regulation (EU) No 347/2013:

- Constants or benchmarks are considered to be those parameters which do not depend on any given project, such as for example, parameters describing pre-project system status or general scenarios for supply, demand and other factors at national, regional or higher level.
- Variables are specific project-dependent parameters.

It is believed that a model built with this approach to variables and constants will allow all projects to be “tested” against a coherent background, as only project-specific features will differ between the runs of CBA analyses. In such a manner, the results of the analyses will allow each project to be clearly characterised on a comparable basis to other projects, an outcome in line with the expected high-level functions of the CBA methodology.

In any case, the methodology should be based on a common set of referenced information and scenarios from recognised sources. As far as possible common data, referring to identical data sources, should be used. The data sources which shall be used should be specified in detail as far as possible upfront.

3.2.1 Data sourced from project promoters

The following input data is strictly project-specific and consequently should be supplied by the project promoter. The listing below is believed to be the minimum required data, i.e. in its absence a proper CBA analysis will not be possible. For this reason, it is advisable to explicitly require in the methodology the provision of this minimum set of data by project promoters, and clarify that projects for which the minimum set of data is not provided by the promoter(s) will not be considered for listing in the TYNDP and PCI lists as “sufficiently mature” projects. Generally, this minimum set of data should include (the grounds for including the type of data on the list of minimum required data are indicated in brackets after each item):

- Project type (pipeline, UGS, LNG/CNG or equipment) (eligibility test subject to Annex II, Point 2)
- Project capacity (Annex IV, Point 1(c) and (d));
- Project greenhouse gas emissions during the operation over the technical lifetime of project (Annex V, Point 13);
- Project conventional pollutants emissions during operation over lifetime of project (*ibid.*);
- Project capacity to act as back-up for renewable electricity generation (Annex IV, Point 3(d);
- Project capacity as power-to-gas (*ibid.*);
- Project capacity for biogas transportation (*ibid.*);
- Project reverse flow capacities (Annex IV, Point 3(a) *et passim*);
- Capital expenditure (cf. details in Section 1 above) (Annex V, Point 5);
- Operational and maintenance expenditure (cf. details in Section 1 above) (*ibid.*);
- Project technical lifecycle duration (*ibid.*);
- Decommissioning cost (*ibid.*);
- Waste management cost (*ibid.*);
- Other relevant parameters (cf. details below) (Annex V, Point 11);
- Area of analysis as defined in point 10 of Annex V (i.e. the Member State where the project is located, all directly neighbouring Member States and all other possible Member States significantly impacted by the project).

For the purposes of the CBA, the above set of data consists of variables to be used as input for carrying out analyses under methods common for all projects.

3.2.2 Data sourced from ENTSOG

The following list specifies types of data which are generally available with ENTSOG as part of its work on the development of the transparency platform, the TYNDP models, and seasonal supply and demand outlooks. Regarding analyses of specific projects, this set of data should be regarded as constants, to be used for all projects:

- Pre-project reverse flow capacities (Annex V, Point 10 and Annex IV, Point 3(a));
- Pre-project capacity to transmit gas across the borders of the concerned Member States (Annex V, Point 10 and Annex IV, Point 3(b) and 1(c)); ;
- Pre-project access to indigenous sources of gas supply (*ibid.*);
- Pre-project diversification by source, counterparts, and routes (*ibid.*);
- Pre-project Herfindahl-Hirschmann Index (HHI) for relevant market(s) (*ibid.*);
- Pre-project short and long-term resilience of the Union's gas system (Annex V, Point 10 and Annex IV, Point 3(c));
- Pre-project system flexibility (*ibid.*);
- Pre-project remaining flexibility of the system to cope with supply disruptions (*ibid.*);
- Pre-project N-1 capacity rule at regional level, regions being defined in compliance to the Regulation (EU) No 347/2013 (*ibid.*);
- Pre-project market areas integration (Annex V, Point 10 and Annex IV, Point 3(a));
- Pre-project price convergence between hub prices or, where hubs are not available, between entry-exit zones (*ibid.*);
- Transmission system composition and its evolution based on the TYNDP (Annex V, Points 10 and 1(b));
- All other new projects relevant for the area of analysis, for which FID has been taken and which are due for commissioning by year n+5 (*ibid.*);
- Pre-project congestion in the gas network (Annex V, Points 10 and 7(b));
- Commissioning dates of different projects in the same area of analysis (Annex V, Points 10 and 11).

The proposal of ENTSOG envisages the use of data from internationally recognised sources. This proposal is highly appreciated. Furthermore, the Agency would like to encourage ENTSOG to further expand this list as far as possible and to specify in detail the data sources which shall be used.

3.2.3 Data sourced by ENTSOG and project promoters from European Union and Member States official data

The data sourced from EU and Member States should be considered as constants for the purposes of the CBA. This type of data also contains “benchmark” values (scenarios), i.e. alternative series of data, all of which should also be identical for the analyses of various projects. Such data should include:

- Expected changes in climatic conditions (Annex IV, Point 3(d));
- Scenarios for gas demand (Annex V, Point 1(b));
- Scenarios for gas imports (*ibid.*);
- Scenarios for fuel prices, including coal, gas, and oil (*ibid.*);
- Scenarios for CO₂ prices (*ibid.*);
- Prices and volumes in each market (coherent with electricity) (Annex V, Point 2);
- Results of market testing for the project, or, if not available for the project, then for other TYNDP projects in the area of analysis of the project, if available (Annex V, Point 7);
- Pre-project conventional air pollutant emissions (Annex V, Point 13).

3.2.4 Other data

In this category of input data for the CBA, the methodology should only contain a listing of the data types and guidance on how data values should be arrived at. Calculable data types should include:

- Data under Annex V, Point 12;
- Discount rates (Annex V, Point 5).

3.3 Agency contribution to consistency and harmonisation of data

3.3.1 Common data set

The common data set to be used in the CBA relates to all constants and benchmarks listed above and sourced as indicated. Variables must be supplied by project promoters.

The platform for the common data set should be online, downloadable in a format that can readily be used for analyses. However, neither ENTSOG, nor the Agency shall be responsible for the consequences of the use of the data by project promoters or other entities.

The common data set for CBA analyses should be constructed, populated and posted online, as soon as possible, preferably already in 2014, after review by the Agency, NRAs, and other stakeholders focusing on data nomenclature, dimensions, pre-defined scenarios, and user accessibility / ease of use.

3.3.2 Standardisation of data submission by project promoters

An online standardised form of data submission (variables, parameters) from project promoters should preferably be used, along with a descriptive part regarding the model used by the project promoters for CBA analyses and its outputs. The data submissions from project promoters must comply with the minimum standards set (data nomenclature, dimensions, timing, values range, and other general and specific data requirements). For the purposes of the PCI selection process, only projects compliant to

the data submission procedures should be considered sufficiently mature as per Annex III, point 2.1 of Regulation (EU) No 347/2013.



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