

Public Consultation on ENTSOG's Energy System-Wide Cost-Benefit Analysis Methodology Update (Supporting Document)

The Energy System-Wide Cost-Benefit Analysis (ESW CBA) methodology (hereafter only CBA methodology) currently in force is the one approved by the European Commission (hereafter EC) in February 2015. This methodology has been applied to develop the Ten Year Network Development Plan 2015 (TYNDP 2015) as well as TYNDP 2017. For this latest TYNDP edition, ENTSOG has complemented the CBA methodology with additional elements on a voluntary basis.

ENTSOG's development of the CBA methodology in 2015 was largely based on stakeholders' support in order to provide a robust framework to the second Projects of Common Interest (PCI) selection. The CBA methodology responds to requirements from Regulation (EU) 347/2013 and it is especially used for the selection of PCIs.

Based on the experience of TYNDP 2015 and 2017 and the 2nd and 3rd PCI selection processes, ENTSOG sees benefits in updating and improving the CBA methodology to be applied for the preparation of its TYNDP 2018, as foreseen in Article 11(6) of Regulation (EU) 347/2013. Regulation (EU) 347/2013 defines also the different steps to be followed by ENTSOG in the process of updating the CBA methodology. These steps include *“an extensive consultation process involving at least the organisations representing all relevant stakeholders — and, if deemed appropriate, the stakeholders themselves — national regulatory authorities and other national authorities”*.

ENTSOG with the support of its TSOs prepared this public consultation document formulating the identified possible paths to update the current CBA methodology. ENTSOG has taken into consideration the Opinions of ACER in particular on TYNDP 2015 and TYNDP 2017 as well as the recent findings of the study mandated by the EC, whose draft recommendations were released in March 2017.

In early 2017, ENTSOG has organised meetings with 'Prime Movers' to identify what are the most expected improvements in the CBA methodology. ENTSOG has taken these proposals into consideration in the preparation of this consultation.

Today, ENTSOG would like to receive stakeholders' feedback and concrete proposals as regards possible evolutions for its CBA methodology.

Please provide us with your feedback for all covered items no later than 16 June 2017.

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1. Introduction

Why is ENTSOG triggering the ESW CBA methodology update?

ENTSOG sees benefits in a CBA methodology update with the intention to apply it in the next TYNDP 2018. This new version of the methodology will be a cornerstone for the preparation of the next editions of TYNDP, Project of Common Interest (PCI) List and preparation of Cross-Border Cost Allocation (CBCA) analyses.

What does Regulation (EU) 347/2013 require?

Role of CBA methodology

- Article 11(1): “[...] the European Network of Transmission System Operators (ENTSO) for Electricity and the ENTSO for Gas shall publish [...] their respective methodologies, including on network and market modelling, for a harmonised energy system-wide cost-benefit analysis at **Union level for projects of common interest** [...]. Those methodologies shall be applied for the preparation of each subsequent **10-year network development plan** developed by the ENTSO for Electricity or the ENTSO for Gas [...]”;
- Annex III (2): “Promoters of a project [...] **wanting to obtain the status of projects of common interest** shall submit an application for selection [...] that includes: [...] for projects having reached a sufficient degree of maturity, a project-specific cost-benefit analysis [...] based on the methodologies developed by the ENTSO for electricity or the ENTSO for gas [...]”;
- Art. 12, in the context of investment request and cross-border cost allocation (CBCA), “[...] project promoters [...] shall submit an **investment request**. That investment request shall include a request for a **cross-border cost allocation** [...] accompanied by [...] a project-specific cost-benefit analysis consistent with the methodology drawn up pursuant to Article 11 [...]”;
- Art. 14 (2): “[...] projects of common interest are also eligible for Union financial assistance in the form of **grants for works** if they fulfil [...]: (a) the project specific cost-benefit analysis [...that] provides evidence concerning the existence of significant positive externalities, such as security of supply, solidarity or innovation;

Article 11(6) of Regulation (EU) 347/2013 states that ‘The [CBA] methodologies shall be updated and improved regularly [...]’.

Framework of the identified possible changes to CBA methodology

The following identified areas of improvement reflect the feedback already received from Institutions, Prime Movers and other stakeholders, together with ENTSOG's experience gained over developing TYNDP 2015 and 2017 and supporting the 2nd and 3rd PCI selection processes:

- Simplification in terms of readability and user-friendliness, and focus on a limited number of results;
- Integration of Project-specific CBA (PS-CBA) in the TYNDP for PCI, ensuring transparency on relevant project information, and ensuring further usability of the CBA methodology for the PCI selection process;
- Reinforcement of the monetisation of benefits from projects and reinforced market modelling to further support project assessment;
- Improve usability of CBA methodology for investment requests;

Note: the questions number starts from Q10 in order to correspond to the one in the questionnaire.

2. Simplification

2.1. Simplification of the document

The CBA methodology is intended to be streamlined and to focus on methodological aspects. Assumptions and input which evolve over time are intended to be examined principle-wise in CBA methodology and content-wise as part of the TYNDP process.

For example the current CBA methodology describes quite meticulously the two demand scenarios (Grey and Green scenarios) specifically developed for TYNDP 2015. Demand scenarios, as well as assumptions on supply potentials, are updated for every new TYNDP edition, with the involvement of all concerned stakeholders, and allowing to take into consideration the change over time of the context assumptions affecting demand (e.g. macroeconomics trend, regulatory background). The CBA methodology would therefore describe the general principles and process in terms of scenario development, in line with the provision of the interlinked model, leaving the actual scenario development process to take part as part of the TYNDP process.

The CBA methodology is intended to cover the different fields of application of the CBA methodology as foreseen by Regulation (EU) 347/2013.

ENTSOG has also received the feedback that the terminology used in the CBA methodology should be clear and precise.

Q10: Do you have further proposals for simplification of the CBA methodology document?

2.2. Infrastructure needs identification and role of TYNDP

TYNDP has a role in the identification of infrastructure gaps in areas where additional infrastructure may be needed.

This TYNDP analysis can be used to ensure a focused project assessment. Therefore ENTSOG suggests to use the TYNDP analysis to set the frame for the project specific assessment (the PS-CBA). The TYNDP infrastructure needs assessment has been a key input to the Regional Groups (RGs) discussion on the gas corridor problems and related infrastructure needs in the context of the 3rd Project of Common Interest (PCI) selection. The comparable basis is kept since all projects will be assessed against the same identified infrastructure needs defined by the TYNDP.

E.g. TYNDP 2017 indicates that some countries show irreducible dependence from Russian gas or LNG. As a consequence projects should be assessed against the need to reduce the dependence to those sources.

The proposed approach will be always complemented by promoters' *qualitative assessment*.

Q11: Do you agree that the approach of using the TYNDP assessment of infrastructure needs performed for each new TYNDP edition to set the frame for the project specific assessment would ensure a focused and pragmatic approach?

2.3. Indicators

ENTSOG current CBA methodology considers different indicators¹.

- “Capacity based” indicators which reflect the direct impact of infrastructures on a given country as their formulas are limited to capacity and demand of a country:
 - Import route diversification (IRD), that measures the diversification of paths that gas can flow through to reach a zone;
 - N-1 for ESW-CBA, to assess the resilience of a country in case of high demand condition and disruption of the main infrastructure;
 - Bi-Directional Project indicator: measures the balance in the firm technical capacity offered in both direction of an interconnection;
- “Modelling-based” indicators which reflect in addition the indirect cross-border impact of infrastructure as their formulas also consider the availability and nature of flows resulting from the modelling of the European gas system:
 - Remaining Flexibility (RF), measuring the resilience of a country as the additional share of demand each country is able to cover before no longer being able to fulfil its demand without creating new demand curtailment in other Zones;
 - Disrupted Demand (DD), to identify the amount of disrupted demand in case of high demand condition and/or infrastructure disruption;
 - Uncooperative Supply Source Dependence (USSD), to identify countries whose physical supply and demand balance depends strongly on a single supply source when each country tries to minimize its own dependence;

¹ For more detail please refer to §5 of current CBA methodology.

- Cooperative Supply Source Dependence (CSSD), to identify countries whose physical supply and demand balance depends strongly on a single supply source when all countries together try to minimize the relative impact;
- Supply Source Price Diversification (SSPD_i), to measure the ability of each country to take benefits from an alternative decrease of the price of each supply source;
- Supply Source Price Dependence (SSPD_e), to measure the price exposure of each country to the alternative increase of the price of each supply source;
- Price Convergence (PC), to measure the difference between the marginal prices of gas supply of each country.

Q12: Would you see some indicators as having limited additional value for CBA analysis? Which ones and for which reason?

2.4. Infrastructure levels

The infrastructure levels (called ‘infrastructure scenarios’ in the current ESW CBA methodology²) are used in the TYNDP for the assessment of the European gas network system. Based on the existing infrastructure and the advancement status of the proposed projects, the infrastructure levels correspond to different potential levels of development of the European gas network system. The current CBA methodology considers three infrastructure levels: Low, High and PCI.

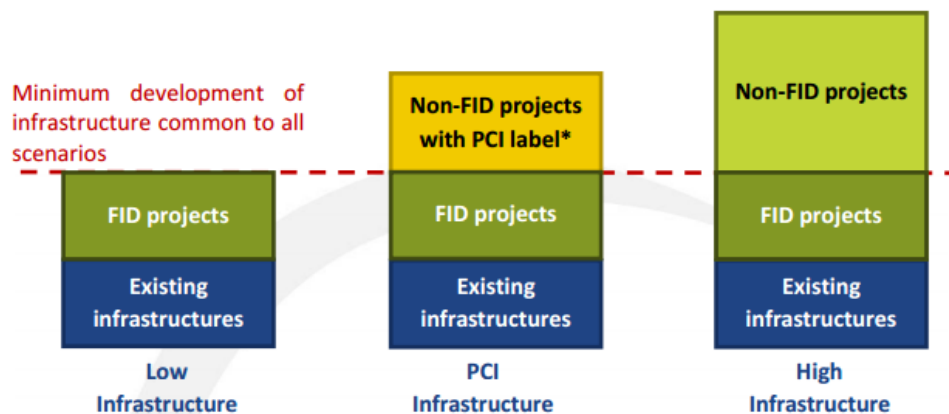


Figure 1 - Infrastructure levels (scenarios) as per current ESW CBA Methodology

The LOW infrastructure level is used as basis for the assessment of the infrastructure needs. The PCI infrastructure level represents the assessment of the prevailing PCI List. The LOW and the HIGH infrastructure levels are used as a common basis for the project-specific CBA for each PCI candidate (§7.9.1 of current CBA methodology). In the PS-CBA the project is evaluated on

² In TYNDP 2017 ENTSG introduced changes in terminology in order to better distinguish between the elements of analysis.

the basis of the differences between the situation with the project and the situation without the project (“*incremental approach*”).

2.4.1. Inclusion of the ‘ADVANCED’ level.

Following ACER Opinion on TYNDP 2015 on a better and more realistic handling of projects, and following discussions with stakeholders, in order to better reflect different project maturity, ENTSOG has considered for TYNDP 2017 a new ADVANCED status for projects³, used to define the ADVANCED infrastructure level⁴. This has proved to be relevant for the assessing projects able to mitigate the identified infrastructure gaps. Stakeholders in their response to TYNDP 2017 public consultation and ACER in its opinion on the draft of TYNDP 2017 ([link](#)) have welcomed the inclusion of such infrastructure level.

The ADVANCED level is in practice already used as basis for the project-specific CBA as part of the ongoing 3rd PCI selection process.

ENTSOG considers that the newly added ADVANCED infrastructure level shall be therefore included in the ESW CBA methodology update.

Q13: Would you agree on the relevance of the ADVANCED infrastructure level?

2.4.2. Removal of the ‘HIGH Infrastructure’ level

Based on the experience of TYNDP 2015 and 2nd PCI selection process, ENTSOG identified that the High Infrastructure level, due to the elevated number of competing and non-mature initiatives included, had limited added value, for both the TYNDP Energy System Wide assessment and the Project Specific cost-benefit analysis of projects. ACER expressed similar views, in particular as part of the opinion on TYNDP 2017. ENTSOG therefore proposes that the High infrastructure level would cease to be considered in the ESW CBA methodology as it does not represent any added value to the project assessment. This means that the TYNDP assessment would not be performed for the HIGH Infrastructure level, and that it would not be used as basis for project-specific CBA. This approach will not prevent less-advanced projects neither to be submitted to TYNDP nor to receive their PS-CBA, but based on the other infrastructure levels (FID and ADVANCED).

Q14: Do you agree with the proposal that the updated CBA methodology should discard the HIGH infrastructure level?

2.4.3. ‘PCI Infrastructure’ level

³ In TYNDP 2017 the ADVANCED status was defined for projects expected to be commissioned by the 31st December 2022 and whose permitting phase to start before the 1st April 2016 or whose FEED to start (or the project to be selected for receiving CEF grants for feed) before the 1st of April 2016.

⁴ The ADVANCED infrastructure level is composed of existing infrastructure + FID projects + ADVANCED projects.

The current ESW CBA methodology considers also the 'PCI infrastructure' level. As already mentioned, it provides in the TYNDP an assessment of the prevailing PCI List, assessing the impact of all the projects belonging to the prevailing PCI List against the identified infrastructure gaps. The PCI infrastructure level is not used as basis for the project-specific CBA. The PCI infrastructure level offers a feedback on the projects part of the approved PCI List. In the past ENTSG has received contrasting opinion on the added value of the PCI infrastructure level.

Q15: Do you think the CBA methodology should keep considering the PCI infrastructure level for the TYNDP assessment?

3. A CBA Methodology with an increased focus on Project-specific CBA

This section focuses on PS-CBA, and its inclusion in the TYNDP process, and will touch on:

3.1. Project grouping: ENTSG proposes that CBA Methodology includes guidance on project grouping. This is a prerequisite for PS-CBA. It makes sense for all types of PS-CBA uses, independently of PS-CBA performed in TYNDP or not.

3.2. Project fiche template: ENTSG proposes that the CBA Methodology includes a format/template to present PS-CBA results. Such template would ensure consistency in the presentation of results and provide support to all parties involved in the PS-CBA assessment in the different contexts to which PS-CBA can be applied.

3.3. Application of CBA Methodology to TYNDP covering performance of PS-CBA in TYNDP. Today the CBA methodology focuses on two distinct steps ("TYNDP step" and "PS-CBA step") with the PS-CBA run only after the TYNDP publication and the call from the EC for the PCI projects selection. The integration of the PS-CBA performance in TYNDP would ensure consistency and transparency on PS-CBA of concerned projects.

3.1. Grouping of projects

Performance of PS-CBA frequently requires that functionally-related project items would be considered jointly, so that the benefit would materialise.

Currently, projects submitted to TYNDP are intended as "investment items". For example in case of an interconnector connecting two countries, two different promoters are usually involved, each project promoter endorsing the responsibility to submit in fact its own section, resulting in two investment items for a single "interconnection" function. Similarly a new LNG terminal or storage may need a new evacuation pipeline to connect them to the gas network, and again those elements would be submitted as two investment items. There are then cases where projects connecting the EU to new supply sources are actually composed by different

projects whose full realisation is a prerequisite to connect the new source. In such cases those projects need therefore to be grouped together to perform their cost-benefit analysis⁵.

For the ongoing 3rd PCI selection process ENTSOG has proposed a guidance on project grouping. Actual projects groups on which the PS-CBA is run have been proposed by the EC, with ENTSOG technical support, and approved by Regional Groups, following a pragmatic approach.

ENTSOG proposes that the CBA methodology would define a guidance for grouping projects in relation to their expected functionality and coordinated development.

Q16: Do you support that CBA methodology would include guidance on project grouping?

Q17: Would you have any view on criteria to be retained for grouping?

3.2. Project fiche

ENTSOG proposes to include in the CBA Methodology the principle for a Project Fiche template.

For the 3rd PCI selection process ENTSOG has developed the “project fiche” including all relevant project information collected from promoters during the TYNDP data collection and the PS-CBA results. Please find at the following [link](#) the version of the project fiche used for the 3rd PCI selection process.

ENTSOG considers that such template allows for a standardised approach to all the projects in providing relevant information and the results of the conducted PS-CBAs. The project fiche also simplifies assessment of projects.

Q18: Do you support the proposal of a Project Fiche template (in terms of content, please refer to the version for the project fiche as defined for the 3rd PCI selection process)?

Q19: Based on the example provided, is there any additional information the project fiche should cover?

3.3. Project-specific assessment in the TYNDP

In the current CBA Methodology, the PS-CBA (PS-step) takes place after the TYNDP report is released (TYNDP-step) and the call for PCI candidates. For both the 2nd and the 3rd PCI selection

⁵ The final version of the project groups defined by the EC and the RGs in the context of the 3rd PCI selection process is available on the CIRCABC platform ([link](#)).

processes⁶, ENTSOG has performed the benefit-related part of PS-CBAs, on behalf of PCI applicants, as it is project promoters' responsibility, and upon formal invitation by the Commission. These PS-CBAs are performed for projects applying for the PCI label using the TYNDP framework as a basis.

In line with the ACER Opinion on the Draft TYNDP 2017 ([link](#)) and Prime Movers feedback, ENTSOG proposes to update the CBA Methodology so that its application to TYNDP would cover the performance on project-specific CBAs, for those project promoters that have signalled their intention to participate in the PCI selection process, and in line with the project grouping guidance.

The PS-CBA for each group of projects should be presented in line with the project fiche template (as defined in 3.2 of this document). The project fiche will summarise the results of the PS-CBA.

ENTSOG will share PS-CBA with promoters. If project promoters confirm their intention to apply, PS-CBA results will be published under the Project Fiche format.

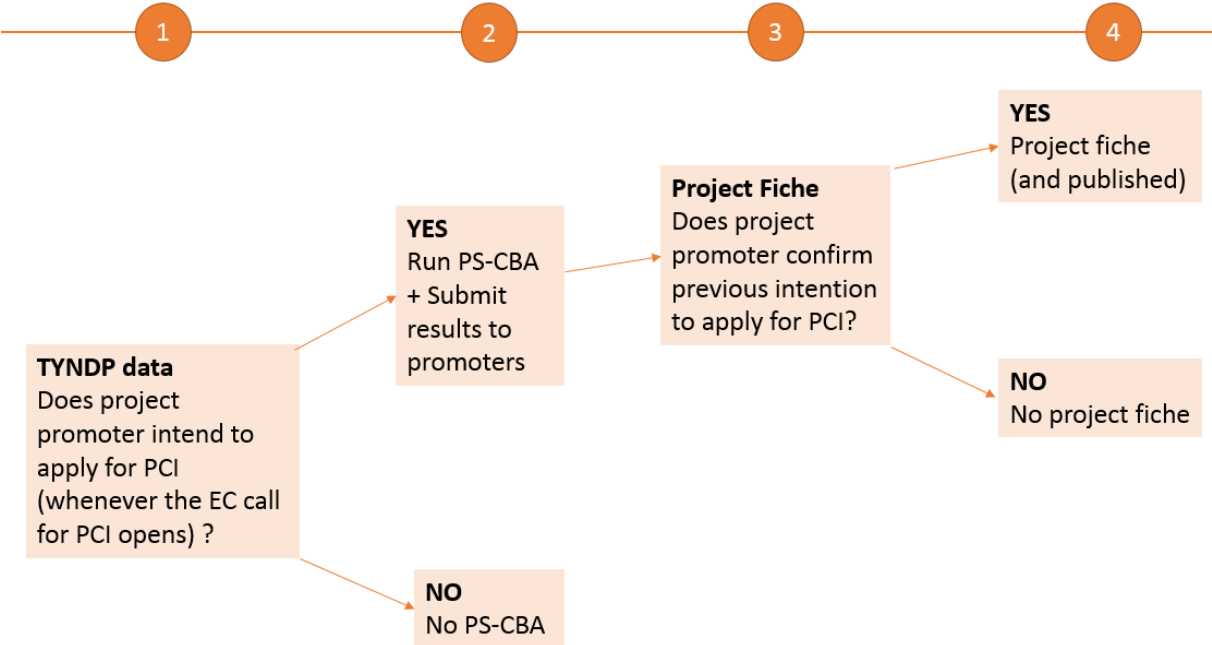


Figure 2 - Representation of foreseen CBA process in TYNDP

The publication of a project fiche represents a useful step ahead necessary for projects which currently apply for the PCI label. It also guarantees sufficient transparency in the PCI process. At the same time the project fiche shall preserve confidentiality when indicated as such by project promoters.

The content of the Project Fiche should cover

⁶ As ENTSOG CBA was not approved until 2015, it was not used in the 1st PCI selection process.

- technical information about the group of projects and all the individual projects composing the group
- the benefits arising from the PS-CBA (information on benefits is not confidential)
- the cost information, when not declared confidential by the promoters

The TYNDP process timeline will be impacted by the inclusion of the project-specific assessment.

Q20: Do you support that application of CBA to TYNDP covers performance of PS-CBA?

Q21: Do you agree with the publication of PS-CBA results and relevant project information in the TYNDP through a Project Fiche?

Q22: Do you agree that the Project Fiche scope identified by ENTSOG should have PS-CBA results published (only for projects confirming their previous application for the PCI label as described in step 3 of graph above)?

Q23: Do you have any comments on the PS-CBA elements proposed for publication as part of TYNDP – please justify your response

4. A CBA building on complementary monetised and quantified benefits

CBA intends to analyse costs and benefits of projects.

Benefits expressed in monetary terms appear attractive for comparison with costs. Still a number of benefits are not easy to monetise, especially in terms of benefits for society. In this regard, when looking at the infrastructure gaps as identified from TYNDP 2017, it appears that a number of those relate to what missing infrastructure would bring in terms of social benefits, such as increased security of supply or system flexibility, access to more diversified supply sources or enhanced market integration. In cases monetisation is not straightforward, quantified benefits are an alternative that fully have their place in a cost-benefit analysis, in the frame of a multi-criteria analysis.

For those benefits that can be monetised, CBA potentially allows for two types of monetisation: monetised benefits calculated as a direct outcome of the network and market modelling on one hand (e.g. EU Bill), and ex-post monetisation of quantified modelling outcomes on the other hand (e.g. monetisation of disrupted demand).

The present section will look into:

- Multi-criteria analysis as a pragmatic approach to complementary monetised and quantified benefits

- Perspectives in terms of further monetisation of quantified benefits
- Perspectives in terms of further market modelling

4.1. Multi-Criteria Analysis

CBA is considered as a synonym for monetisation. Analysing the costs and benefits of projects requires some monetary assessment of both. Under some circumstances though, monetisation may not be so straightforward, especially when assessing benefits for society. This brings the risk to underestimate benefits, while costs, on the other hand, are easier to determine.

Even if monetisation represents a key element, there will always be limits and imperfections of monetisation and assigning a monetary value to all indicators is not possible. Based also on the concrete experience of the last two PCI selections, not considering non-monetised benefits would prevent stakeholders from an effective and complete analysis of the impact of projects. This is even more the case when assessing projects in increasingly mature gas markets.

In such cases, alternatives to monetisation exist, such as a quantified approach without monetary assessment or a simple qualitative approach.

ENTSOG's current CBA methodology combines monetised as well as non-monetised elements. This approach corresponds to the state of the art of CBA methodologies and is comparable with the methodologies developed by ENTSO-E for the assessment of electricity projects applying for PCI, and by REKK to support the selection of the Projects of Energy Community Interest (PECI).

For this reason, ENTSOG considers that a Multi-Criteria Analysis (MCA) that explores also benefits that cannot be fully measured in monetary terms represents an adequate approach. This means that the monetary assessments would be still considered, but alongside with non-monetary elements. This should also be complemented by qualitative assessment from promoters, in particular covering any specific project impact beyond what is captured by the CBA methodology indicators.

Comparison of projects based on monetary and non-monetary indicators is possible, as confirmed also by ENTSO-E and Energy Community experience.

The CBA methodology should also provide a clear view of which indicators are monetised and which are not.

Q24: Do you agree that the ESW CBA methodology should maintain a Multi-Criteria Analysis (MCA) approach where the monetary analysis is complemented by non-monetary and qualitative assessment?

4.2. Ex-post monetisation

Even in the context of the application of a Multi-Criteria Analysis, ENTSOG considers that a cost-benefit analysis should still strive for monetisation of benefits whenever possible and significant.

Also based on the feedback received by ACER in its opinions and the draft recommendations from the consultants mandated by the EC, this chapter tackles the following topics in relation with ex-post monetisation:

- monetisation of avoided demand curtailment
- monetisation of CO₂ emissions reduction
- supply source diversification

4.2.1. Value of Lost Load under risk of demand curtailment

A monetary value is currently ascribed by ENTSOG to assess the cost of disrupted gas demand.

This topic relates to security of supply (SoS). In the current CBA methodology the security of supply is embedded in the model, and consists in assessing which countries would face demand curtailment under a number of security of supply events. Quantification of demand curtailment, and of its mitigation thanks to infrastructure, is the core information of the assessment. With TYNDP 2017 the approach has been to assume a uniform Value of Lost Load (VoLL) across Europe to be applied to the avoided disrupted demand. Following a standardised approach, a value of 600 EUR/MWh⁷ has been defined and based on the same formula: total EU28 GDP/Gross inland consumption.

This approach, in spite of its apparent simplicity, allows to use the same comparable basis and to assess different projects on a level-playing field.

Different values for VoLL for different Member States (or regions) and for different consumers may be a way to avoid one-and-the-same assessments that may oversimplify project assessment.

For example a “more realistic” VoLL may be considered per country. This would probably lead to different values of disrupted demand considering specific situations (i.e. the financial impact of 1 GWh of curtailed demand is not the same in all European countries). The impact of such a differentiated VoLL on the benefits that would be attached to different projects mitigating demand curtailment in different countries should be therefore carefully considered.

An improvement in SoS monetisation probably requires a detailed impact assessment study. Given the complexity of this topic, going that way may prove not to be possible if the updated CBA Methodology should be finalised ahead of TYNDP 2018.

⁷ Please refer to TYNDP 2017 Stakeholder Joint Working Session ([link](#)) and TYNDP 2017 Report ([link](#)).

ENTSOG welcomes any suggestion for the improvement of the calculation of the monetary value for SoS benefits and VoLL.

Q25: What are your views on the current European-wide approach for security of supply (SoS) monetisation followed by ENTSOG?

Q26: Would you see benefits in considering a more “country/consumer-based” approach instead of the above mentioned European-wide approach, and if yes, please precise?

Q27: Is there any data source that ENTSOG could consider using for Value of Lost Load (VoLL) and security of supply (SoS) monetisation in the updated CBA methodology and if yes, which ones?

4.2.2. Monetisation of avoided CO₂ emissions

According to Regulation (EU) 347/2013 sustainability is one of the criteria against which gas project benefits should be assessed. Gas infrastructure projects may contribute to CO₂ reduction favouring the integration of renewable energy (included biomethane and other synthetic gases), supporting gas demand substitution for higher-carbon energy sources (like coal in power generation), and allowing flexibility between the interlinked electricity and gas systems (e.g. power-to-gas, hereafter P2G).

The demand scenarios considered for TYNDP and PS-CBA reflect different energy mix evolutions with the corresponding CO₂ emissions. Such scenarios already take into account the role of natural gas and renewable gas (e.g. P2G and biomethane) in the reduction of CO₂ emissions.

While P2G is for example one of the elements of ENTSOs interlinked model between gas and electricity. As such it will be reflected in ENTSOs TYNDP 2018 scenarios.

In consequence, while it may be relatively easy to identify the environmental effects of gas projects connecting a Member State (MS) or areas previously without access to gas, it is more complicated to assess how an additional project in a “mature” gas market will drive such effects on top of existing infrastructure. In this second case the TYNDP assessment indicates that countries have already the adequate infrastructure of EU relevance to cover the gas demand required to supply power generation and to substitute for more higher-carbon energy sources.

ENTSOG’s opinion is that it is generally not straightforward to isolate exactly the specific impact of an infrastructure project in a Member State where the gas market is considered as ‘mature’, but possible to approach it under transparent assumptions. Still, it is realistic to

assess CO₂ emissions reduction prompted by a project enabling the so-called 'gasification' of the MS or a project bringing gas as an alternative fuel (e.g. LNG in the maritime sector).

Q28: Do you agree with ENTSOG's view that a specific monetisation of CO₂ emissions should be done when the capacity brought by projects can be clearly linked to an increase in gas consumption and a consequent reduction of CO₂ emissions?

Q29: Would you have any suggestion on how to better measure CO₂ reductions in mature markets in relation to existing and/or new infrastructure?

Additionally ENTSOG received the suggestion to use the Social Cost of Carbon (SCC) instead of the CO₂ market price, in order to include the full social cost of emitting one further tonne of CO₂, once external effects are also integrated. The Social Cost of Carbon should be universally the same but countries may attribute different values to it. A single reference price would also guarantee a comparable basis for the assessment of projects.

ENTSOG has lack of clarity on what should be the value for the Social Cost of Carbon (SCC).

Q30: Do you support monetisation of CO₂ reduction to be based on a Social Cost of Carbon (SCC) rather than on the CO₂ market prices?

Q31: [If YES in the above question] Would you recommend any specific information source on Social Cost of Carbon (SCC)?

4.2.3. Supply source diversification and others

One important CBA indicator consists in measuring the number of supply sources available for a country (diversification of supply sources). This specific indicator offers a valuable and interesting information to promoters and stakeholders and it has been used by the EC in the identification of infrastructure needs for the 3rd PCI selection process. It is a quantified indicator for which ENTSOG welcomes any contribution regarding proposals on how to complement the approach by attributing a monetary value to it.

Any additional contribution on monetisation of other quantified indicators is equally welcome.

Q32: Would you have any specific suggestion on a methodology or proxy for the monetisation of the supply source diversification assessment?

Q33: Is there any other element or CBA indicator for which you would have monetisation suggestions?

4.3. Market layer and modelling assumptions

The current CBA methodology brings together network and market considerations.

In the current approach ENTSOG has defined the infrastructure-related market integration by considering the interconnected network operating under optimal system conditions in terms of flexibility and different market situations. The current methodology assumes the well-functioning commercial layer (e.g. full implementation of Network Codes) under a perfect market approach (see §4.2 in the current methodology).

To define the flows at the European level, the CBA methodology considers as modelling assumptions both the commodity price and the costs of transmission, storages and LNG terminals, which correspond to the weight of infrastructure.

Assumptions for supply prices draw on the IEA World Energy Outlook, which is a public source, as the reference for commodity prices, including gas import prices.

Those elements represent the basis for the identification of the technical capability of the gas system and the assessment of future infrastructures.

Some stakeholders have pointed out that as part of its approach, ENTSOG could further develop its market approach. A more detailed market approach would involve a consideration of several elements all together:

- Infrastructure tariffs for TSOs, SSOs and LSOs for the existing infrastructure
- Estimation of infrastructure tariffs for the different infrastructure projects
- Supply prices

Omitting infrastructure costs for network users is deemed by some stakeholders as not realistically reflecting gas flows.

On the other hand, a market layer may create needs or trigger benefits for infrastructure projects that could be avoided by removing barriers related to tariffs or contracts. It must also be noted that market and tariffs assumptions could only be accurate for a short period of time compared to the 20-year period required to assess benefits for infrastructure projects.

Implementing a developed market approach would also raise several issues to have a complete and validated data set, especially in cases of negotiated tariffs or exempted infrastructure, and the existence of non-regulated gas infrastructure.

In the case of project infrastructure it is not straightforward to separate tariffs from project costs since the two elements are interlinked (tariffs evolution includes project costs) a lot of elements could have an impact (including cost allocation between countries, possible funding, regulatory decisions for each country bearing costs which would be partly socialised or supported by infrastructure).

Finally, doing market modelling with only partial market inputs would strongly distort the assessment.

ENTSOG's position is that it should first be clarified what would be the role of detailed market modelling in the framework of performing infrastructure assessment on a long-term time

horizon. If deemed relevant, a market approach is consistent if it addresses all infrastructures, not just facilities where tariffs are available, and takes into account also several other factors, such as realistic prices for supply sources. When using a market-based approach pros and cons should be considered cautiously: the CBA methodology should cover either all tariffs- and equally deducing costs from PS-CBA- or no tariffs so as to avoid any distorted view of the European gas market.

Given the current lack of shared understanding on the role of a market approach, and the complexity on both the implementation of further improvement of market modelling and the availability of the required input to build the underlying modelling assumptions, ENTSOG considers the topic will require to be further investigated, in close relation with EC and ACER. ENTSOG will refine the position on further market modelling in the coming months, and assess at this point with institutions what could be incorporated in this CBA update, in view of TYNDP18.

Q34: Do you have any specific view regarding whether and how market modelling is relevant in the framework of infrastructure assessment?

Q35: Could you indicate any source for input data required for the implementation of a market model (such as tariffs, supply prices, etc.)?

4.3.1. Import price spread configuration

ENTSOG introduced a specific price configuration⁸ on a voluntary basis in TYNDP 2017, building on observed gas import prices, and additionally intended to monetise how infrastructure may reduce monopolistic behaviour in supply, by a mitigation of price effects among different import routes.

Starting from a situation where the gas import prices differ per route (based on public information⁹) this specific import price configuration is built on the criteria that a supplier, if challenged by a new project, will maintain its import route pricing policy, up to a given point of losing volumes. Beyond this point, the supplier, adopting a volume priority strategy, will align its price to the competing source.

This approach relies on the inputs in terms of actual import prices and volume threshold from which suppliers would adapt their strategy.

This approach was supported by ACER in their TYNDP Opinion, as well as by stakeholders as part of the TYNDP public consultation. ENTSOG therefore sees this approach as an

⁸ Import price spread configuration. For a more detailed explanation of the import price spread configuration please refer to TYNDP 2017 Annex F.

⁹ The EC Quarterly Report has been used for TYNDP 2017.

improvement that should be reflected in the CBA Methodology and is keen to receive feedback on relevant input to be used for this approach.

Q36: Would you have any specific views regarding information sources for import prices for the various supply sources and regarding the minimum volumes used to assess market behaviour?

Q37: How do you think that import price spread configuration could be further improved?

4.3.2. Information sources for supply prices

The inputs used in the modelling assumption represent one of the key prerequisites for an effective and realistic monetisation. In TYNDP, ENTSOG refers to public information sources, and has to make assumptions on the appropriate references to select.

The ENTSOs, as part of their Interlinked Model¹⁰ and related joint TYNDP scenarios development process, consider the IEA World Energy Outlook as the information reference for commodity prices, including gas import price. This is in line with the practice for the last TYNDP editions.

The current practice is to investigate different standardised supply configurations, considering a given import price per supply source, with standardised price difference between supply sources, or to investigate how infrastructure may reduce monopolistic behaviour in supply, by a mitigation of price effects among different import routes (see above 4.3.1).

ENTSOG shares the idea of some stakeholders that the inclusion of different prices per supply source may improve the overall assessment. At the same time ENTSOG acknowledges that difficulties related to this improvement lie on the availability of reliable information on price for the supply sources, especially for all the time-horizon (at least 20 years) considered for the assessment.

According to ENTSOG understanding of Regulation (EU) 347/2013, together with other inputs (such as tariffs), information may be even provided to ENTSOG by other institutions. In fact, Regulation (EU) 347/2013, Annex V (2) states that “[...] *The Commission and the Agency shall ensure access to the required commercial data from third parties when applicable*”.

Q38: Consistently with your reply to question Q27, what should be the information source for the different supply source prices?

4.3.3. LNG diversification

¹⁰ Link [here](#).

The TYNDP supply potentials and modelling up to now considers LNG as one source having one single price. LNG is in fact a global market and is affected by price oscillation at a global level. ENTSOG, however, recognises the diversification that the LNG provides in terms of security of supply. In the TYNDP 2017 Report ENTSOG reflected on a qualitative basis the GLE expertise in terms of LNG diversification. In the context of further investigating the market layer, ENTSOG considers to explore the possibility of embedding LNG diversification in the modelling assumptions.

Q39: How do you think that LNG diversification could be further improved?

5. CBA for investment request and CBCA

Art. 12 of Regulation (EU) 347/2013 states that project promoters whose PCI projects have reached sufficient maturity shall submit an investment request including a request for cross-border cost allocation (CBCA) alongside a PS-CBA **consistent** with the methodology developed by ENTSOG. Art. 12 states that, apart from the PS-CBA, promoters shall also provide a business plan evaluating the financial viability of the project (including the result of market testing) and a proposal for a cross-border cost allocation (if all project promoters agree on that).

CBCA deals with distribution of costs among all the countries which are affected positively and/or negatively by a gas infrastructure project having international effects. Whereas CBA is performed for projects applying for a PCI label, CBCA involves redistributive effects among a limited number of MSs affected by a project and it is heavily influenced by policy decisions agreed on by the NRAs of neighbouring MSs.

ENTSOG develops the CBA methodology which can be thereafter applied by project promoters for CBCA.

Above ENTSOG has presented proposals for the update of the CBA Methodology that would overall support CBA for investment requests. Indeed the proposals cover for the inclusion in the CBA Methodology of a Project Fiche template, as well as the performance and publication in the TYNDP of PS-CBA for projects intending to apply as PCI candidates. This last proposal would provide adequate input (in terms of demand scenarios, etc.) and adequate country detail outputs that could give indication to promoters regarding the cross-border impact of their projects in terms of benefits (from Regulation (EU) 347/2013: “...and taking into account benefits beyond the borders of the Member State concerned...”) when submitting to the involved counterparts the PS-CBA, for which they are responsible, as a part of the investment request. Promoters should always be able to complement ENTSOG’s PS-CBA results.

The CBCA part of the investment requests would remain a separate process from the project-specific assessment for the PCI selection in the CBA methodology.

Q40: Do you agree that CBA methodology as proposed would support promoters by providing them with common input framework to be used (e.g. demands scenarios, etc.) and

outputs indicating detailed at country-level benefits as input to promoters` own project-specific CBAs?

6. Others

Q41: Do you have any additional comment or suggestion that has not been covered in previous questions?