



EVA-TREN

IMPROVED DECISION-AID METHODS AND TOOLS TO SUPPORT
EVALUATION OF INVESTMENT FOR TRANSPORT AND ENERGY
NETWORKS IN EUROPE



SIXTH FRAMEWORK PROGRAMME
PRIORITY 8.1 Policy-oriented research

D2.1

Draft Templates

For Case Studies ex post analysis



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1. Introduction

According to the Technical Offer, WP2's task is to “*collect a set of quantitative and qualitative data on field which will be processed in order to highlight pitfalls to be analysed in depth in WP3. The data collected and processed at this stage...will be the starting point for the discussion about effectiveness of tools and techniques for project appraisal, according to the main differences recorded among ex-ante and ex-post analysis*”...in order to do so...“*a template for data collection will be provided as well as methodological guidelines for data processing*¹”.

The aim of this Template is to twofold:

- “*To identify the full list of relevant quantitative and qualitative data to be collected with the field work;*
- *To ensure comparability and relevance of data collection and a standard grid for data processing*”.

The goal of the analysis on the data collected by the Template is to “*deliver a set of common mistakes and pitfalls and a set of recommendations on how to improve the methodological quality of these aspects*”.

Main references for the template are:

- European Commission, DG Regional Policy (2002) *Guide to cost-benefit analysis of investment projects in the Framework of Structural Funds, Cohesion Funds and ISPA*, Brussels; available on-line at: http://ec.europa.eu/regional_policy/sources/docgener/guides/cost/guide02_en.pdf.
- HEATCO (2005), *Current practice in project appraisal in Europe*, Brussels; available on line at: <http://heatco.ier.uni-stuttgart.de/hd1final.pdf>.
- HEATCO (2005), *State of the art in project assessment*, Brussels; available on line at: <http://heatco.ier.uni-stuttgart.de/hd2final.pdf>.

¹ Annex I – “Description of Work” in EVATREN Technical Offer, Pag. 24-25



2. Template Brief Description

The Template consists in 7 sections:

- 1 History of decision making process and general objectives
- 2 Context analysis
- 3 Demand analysis
- 4 Option analysis
- 5 Financial analysis
- 6 Economic analysis
- 7 Analysis of uncertainties

Each section is introduced by a short presentation and generally it is divided in three questions:

- result of the ex-ante analysis;
- ex-post results of the project performance;
- discussion on the main ex ante/ex post deviations and of their potential reasons.

A short description of the main issues to be addressed in the answers follows each question. This should be interpreted as an open guide of what information to gather and of what is expected from answers.

Answers of no more than 1-2 pages are welcomed; however, if needed, feel free to add any additional information you consider relevant in annex.

In all sections, with the exception of the first one, partners are called to provide their expert opinions. Sometimes the opinion is about possible causes for the deviations between ex-ante and ex-post analysis, while in other cases it is about the completeness and relevance of a methodology or a forecast. In both cases these opinions will constitute the ground for the development of WP2 deliverable.

Your opinions should be based on clear and reported evidence, both from secondary data (documents collected) and primary data (basically interviews to stakeholders and key experts).

Deadlines:

- ❑ Submission of Draft version: 30/03/2007;
- ❑ Submission of Final version: 20/04/2007.



EVA TREN

IMPROVED DECISION AID METHODS AND TOOLS TO SUPPORT EVALUATION OF
INVESTMENT FOR TRANSPORT AND ENERGY NETWORKS IN EUROPE

ANNEX 1. TRANSPORT TEMPLATE



1. History of decision making process and general objectives

This section investigates the history of the decision making process and the general objectives of the project.

Please note

- *In respect of project definition, please define the project in terms of its physical assets following what you stated in the questionnaire, section B, demand 8.*
- *In respect of the forecasted and actual starting/ending dates of the project, please refer always and respectively to the beginning and ending of the construction works included in the definition of the project, as stated above;*
- *In respect of the forecasted and actual total costs of the project, please refer always to the costs of the construction works as referred in the definition of the project, as stated above.*

1.1 What was the decision making process?

Try to illustrate the project history investigating:

- institutional and policy background;
- the stakeholders involved;
- project definition in terms of its physical boundaries;
- costs (please include forecast and actual costs);
- timing (please follow the scheme provided in the chart below, and include apart, forecast and actual starting/ending dates);
- different implementation phases;
- key issues at stake.



Tab. 1.1 Timing table (Please refer to actual years)

	Starting phase (year)	Development phase (years)	Consolidation phase (years)	Ending phase (years)
Physical Economics Legal/regulations				

1.2 Which were the general objectives of the project?

Looking at the history of the project, illustrate what were the general objectives of the project as stated in some official documents or according to your reading of documentations.

If possible describe if the original objectives underwent to any **changes** or **reformulation**, hence illustrate **reasons** for them.

1.3 What was the context in which the project was implemented?

Describe the **policy actors**, **regulatory agencies**, and any **other institutional bodies** involved in project planning. In addition analyse the **regulatory and policy framework** in which the project was implemented in order to give an overview of its complexity. State to what extent these elements could have impacted on project current performance.



2. Context analysis

This section investigates the context in which the project was implemented and its access and planning features.

2.1 What is the project dependency degree with other projects?

Describe the degree of **complementarity** to other projects or policies and to what extent the success of the process is affected by decisions that are external to the project itself.

2.2 What were the planning and access features of the project?

Illustrate if the project **was part of some network** (such as TEN or others) for transport or energy. Describe if and how, problems such as **interoperability** and **connection** with other infrastructures already existent, were addressed. In addition discuss if and how the issues regarding its **accessibility** to users within its geographical area, were addressed.



3. Demand Analysis

This section analyses how the demand for the services/products has been estimated.

Key Features of Demand Analysis

Literature² suggests that:

- 1 the analysis of demand should be carried out for each of the alternatives considered;
- 2 it consists in the sum of the existing demand, the generated demand and the diverted demand;
- 3 it should cover all the years for which the time horizon in the financial analysis is given.

3.1 Which were the results of the demand analysis, if any, carried out before project implementation?

Description of traffic/energy use flows and of the methodology used to **estimate the demand, trying to deal separately with the three components**. Specify if values for the estimation (for example elasticity of demand to time, fares, other) were taken from the literature (if so provide references), if the evaluators estimated them or if they were taken from national or supranational guidance. If possible give the values.

Explain also if and how **the competitive scenario** was evaluated.

If no demand analysis was carried out, please try to **go through the potential reasons for its omission and explain which consequences** it has on the whole ex-ante evaluation process.

Please attach in annex any relevant sheets containing data on the ex-ante demand analysis.

3.2 Which are the actual values of the demand of the implemented projects?

Describe, if possible the **latest available values** and **those recorded at the time of project completion**. In addition try to review the recorded demand for project's services/product since its operative phase started.

² European Commission, DG Regional Policy (2002) Guide to cost-benefit analysis of investment projects in the Framework of Structural Funds, Cohesion Funds and ISPA, Brussels; Belli P. et Al. (2001), "Economic Analysis of Investment Operations", The World Bank, Washington D.C.



Please note: if any re-calculation of the future demand has been carried out using different methodologies, than those applied at the forecast stage, please give an explanation of the reasons for the change and of the methodology itself.

Please submit in annex any relevant sheets containing data on the ex-post demand analysis.

3.3 Comparative analysis of the ex-ante/ex-post results.

Provide a **critical** opinion on **completeness and effectiveness** of the demand analysis.

Describe the **variations of ex-ante/actual values** for demand and try to assess the **potential causes** of the eventual deviations. Some potential causes may be³:

- methodology or values;
- omission of significant variables;
- dynamics not taken into account;
- changes in the policy framework;
- underestimation of alternative mode competitive strategies;
- unpredictable events.

³ Mackie P., Preston J., 1998, *Twenty-one sources of error and bias in transport project appraisal*, Transport Policy, 5 (1998) – 7 Elsevier Science Ltd.



4. Options Analysis

This section investigates the analysis of the feasible alternatives.

Key features of Options Analysis

The implementation of a project is always aimed at solving a need or at fulfilling a specific objective, and then the main point is to choose the best answer to address the problem.

For this reason, some feasible alternatives have to be evaluated in order to choose the best available one.

Literature⁴ on this topics calls to investigate separately three different options:

- 1 the “do-nothing”;
- 2 the “do-minimum”;
- 3 the “do-nothing”

4.1 Which were the alternatives considered in the option analysis, if any?

Please provide a description of the alternatives considered and state **the comparative advantages and/or disadvantages attached to each option**. Moreover provide the methodology and/or the criteria used to **choose** the option to implement.

If no options analysis was carried out, please try to **explain the potential reasons for its omission** and describe which **consequences** this had on the whole ex-ante evaluation process.

4.2 Critical opinion of the option analysis, in the light of the actual results of the project

Referring to the standard literature on this topic, provide a critical opinion on the effectiveness of the options analysis.

⁴ European Commission, DG Regional Policy (2002) Guide to cost-benefit analysis of investment projects in the Framework of Structural Funds, Cohesion Funds and ISPA, Brussels; Belli P. et Al. (2001), “Economic Analysis of Investment Operations”, The World Bank, Washington D.C.



Try to state to what extent this analysis contributed to enhance the solidity of the whole ex-ante evaluation process and to what extent the ex post performance of the project has been influenced by the options analysis carried out.



5. Financial Analysis

This section analyses the results of the financial analysis of the project and determines the extent of the EU contribution on total financing.

Definition

The financial analysis aims at determine the project's cash flow forecasts in order to assess the financial viability of the project through the calculations of suitable return rates and to evaluate its financial sustainability. This analysis provides the project analyst with essential information on inputs and outputs, their prices and the overall timing structure of revenues and expenditures.

In addition it contributes also to the determination of the financing gap and the extent to which revenues cover costs. The financing gap is the grounds to calculate how much of the total costs are covered by public funds (EU grants or other).

Key ingredients of Financial Analysis

Literature⁵ on financial analysis suggests to address the following topics:

1 Time horizon:

It is the maximum number of year for which forecasts are provided. It should be formulated for a period appropriate to project's economically useful life and long enough to encompass project's likely mid/long term impact;

2 Forecasts for:

- investment costs;
- running costs;
- revenues;
- source of finance.

This information should be provided along all the life time of the investment and be discounted with an appropriate discount rate. Forecasts should include all the expenses that could guarantee both the complete functionality of the project over the whole time horizon and its interoperability with other modes.

⁵ European Commission, DG Regional Policy (2002) Guide to cost-benefit analysis of investment projects in the Framework of Structural Funds, Cohesion Funds and ISPA, Brussels; Belli P. et Al. (2001), "Economic Analysis of Investment Operations", The World Bank, Washington D.C.



3 Performance indicators:

- the Financial Net Present Value of the Investment (FNPV/C);
- the Financial Rate of Return of the Investment (FRR/C);
- the Financial Net Present Value of Capital (FNPV/K);
- the Financial Rate of Return of Capital (FNPV/K);
- break even;
- other.

5.1 Which were the results of the ex-ante financial analysis, if any?

Some suggestions on the content of the answer are the following:

- regarding time horizon please give the value considered and explain how it was determined and if you think it was **consistent with the features of the concerned project**;
- regarding costs, explain how **the investment costs** (land, buildings, licenses, etc.) and the **operating costs** (personnel, raw materials, supply of energy) **were estimated**. Costs such as the following should have been included: costs to link the project to the existing network, the ordinary and extraordinary maintenance costs, renewal costs and costs to operate tolling activities properly, and so on;
- regarding revenues, explain if and following which methodological approach, **fares were determined**. Under this point, include also explication on **the residual value** of the investment (for example if its value was determined according to any specific guidance at country level). Give values of revenue forecasts trying to keep separate different revenues components;
- regarding the selection of the **discount rate**, explain how it was chosen and if any guidance for its choice is provided at national or at supranational institutional level;
- regarding **financial performances**, please explain **which indicators were calculated**. In addition explain if any rate of return of the private equity has been calculated.

Please submit in annex any relevant sheets containing data on the project financial analysis.

If no financial analysis was carried out, please try to **go through the potential reasons for its omission and explain which consequences** it has on the whole ex-ante evaluation process.



5.2 Which are the actual financial values of the project?

Provide a detailed description of the actual values of the project at financial level.

More specifically try to provide:

- actual costs;
- revenues already realized and if any, re-calculated revenues for future years;
- any relevant change in the original values of other items;
- any re-calculation of other items.

5.3 Comparative analysis of the ex-ante/ex-post analysis.

Describe and discuss **the deviations** occurred and give reasons for them.

More specifically try to investigate the **potential causes** for the **lack of consistence** of the ex-ante financial analysis, against the actual financial results. Some potential causes⁶ could be:

- omission of estimation for relevant variables;
- methodological pitfalls in the calculation of the financial variables;
- increase in total investment costs;
- time delays;
- dynamics not taken into account;
- changes in the regulatory framework;
- changes in safety requirements during the implementation phases;
- change in project technical design.

Discuss **potential motivations** for these variations.

⁶ Mackie P., Preston J., 1998, *Twenty-one sources of error and bias in transport project appraisal*, Transport Policy, 5 (1998) – 7 Elsevier Science Ltd.



6. Economic and Multicriteria Analysis

This section analyses separately, the results of the ex ante Economic and Multicriteria analysis of the project.

Economic Analysis

Definition

The economic analysis appraises the project contribution to the economic welfare of the region or country.

Key features of the Economic Analysis

Literature⁷ on Economic analysis, suggests to address the following topics:

- 1 Fiscal corrections:
it consists in the correction of market prices that include taxes or subsidies or some transfer payments, which affect their relative prices.
- 2 Shadow pricing:
it consists in the transformation of the market prices used in the financial analysis into accounting prices (that amend prices distorted by market imperfections)
- 3 Externalities and benefit or cost corrections:
it consists in the determination of the external benefits or costs generated by the project. These could be of different nature:
 - environmental (Pollution, Noise, Climate change),
 - value of time,
 - value of life (Accident, safety),
 - other.
- 4 Economic performance indicators:
 - the Economic Net Present Value (ENPV);

⁷ European Commission, DG Regional Policy (2002) *Guide to cost-benefit analysis of investment projects in the Framework of Structural Funds, Cohesion Funds and ISPA*, Brussels; Belli P. et Al. (2001), "Economic Analysis of Investment Operations", The World Bank, Washington D.C.



- the Economic Rate of Return (ERR);
- the Benefit/Cost (B/C Ratio).

6.1 Which were the results of the ex-ante economic analysis, if any?

Describe **results**, discuss **methodologies** and provide **evidence** on the inclusion of social **benefits** or **costs** in the ex ante appraisal of project.

Some suggestions on the content of the answer are the following:

- **fiscal correction** and **conversion factors** used in the analysis;
- **shadow pricing** for the most important voices of the financial analysis (Total operating costs, total investment costs, tolling, other). If any guidance on this topic was provided at national or supranational level, please give references. Alternatively please provide the methodological approach used to calculate the conversion factors;
- **externalities and social benefits**.

For each category give if possible the **evidence of the relative weight** of each external effect on the total amount of the non-monetary effects produced by the project.

In addition provide the methodology used to **monetize** its impact trying to refer as far as possible to one of the standard methodology, such as those suggested in Heatco⁸: Market prices; Replacement or restoration cost; Averting or avoidance costs; Hedonic price; Stated preference; Contingent valuation; Choice experiments.

- regarding the selection of **the discount rate** explain how it was chosen and if any guidance for its choice was provided at national or supranational institutional level. Please give references;
- regarding **economic performances**, explain which **indicators** were calculated. If possible give values.

Please submit any relevant sheets containing data on the project economic analysis and Multicriteria analysis in annex.

If no economic analysis was carried out, please try to **go through the potential reasons for its omission and explain which consequences** it has on the whole ex-ante evaluation process.

⁸ HEATCO (2005), State of the art in project assessment, Brussels.



6.2 Which are the actual economic values of the project?

Provide a description of the actual values of social costs and benefits.

More specifically try to provide:

- any **change** in the forecasted impacts generated by the externalities;
- any **re-calculation** of them.

If any **economic performance indicators** were re-calculated, please provide values.

Please note that: if any **re-calculation of economic effects** or variables has been carry out using a different methodology than the one applied at the forecast stage, please give an explication: of **the reasons for the change and of the methodology itself**; If possible provide new values.

6.3 Comparative analysis of the ex-ante/ex-post analysis.

Describe and discuss the **deviations** occurred and **give reasons** for them.

More specifically investigate the **potential causes** for the **lack of consistence** of the ex-ante economic analysis, against the actual economic results. Here some potential causes⁹ are suggested:

- Fiscal corrections;
- Shadow pricing;
- Omission in the estimation of some relevant economic variables;
- Methodological mistakes in the calculation of externalities;
- Other.

Discuss **potential motivations** for these variations.

Multicriteria analysis.

⁹ Mackie P., Preston J., 1998, *Twenty-one sources of error and bias in transport project appraisal*, Transport Policy, 5 (1998) – 7 Elsevier Science Ltd.



Definition

It consists in the identification of the effects of the investments on social objectives, assigning a weight to each objectives and calculating the final impact.

It allows to:

- consider simultaneously a variety of objectives in relation to the evaluated intervention;
- facilitate the consideration in the investment appraisal of policy maker's objectives that could not be included in other types of analysis.

Key features of the Multicriteria analysis

Literature¹⁰ suggests:

- 1 to express clearly the objectives pursued through the project and to assign them different weights reflecting the relative importance of each one for the policy maker;
- 2 to define the appraisal criteria, to carry out an impact analysis of them and to estimate the effects of project implementation in terms of the selected criteria;
- 3 to identify the stakeholders and their preference and hence to aggregate the different criteria on the basis of these preferences.

6.4 What are the main features of the Multicriteria analysis, if any, of the project?

Describe **results**, discuss **methodologies** and provide **evidence** on the Multicriteria analysis carried out.

Try to refer your answers to the standard steps mentioned above.

If no Multicriteria analysis was carried out, please try to **go through the potential reasons for its omission and explain which consequences** it has on the whole ex-ante evaluation process.

¹⁰ European Commission, DG Regional Policy (2002) Guide to cost-benefit analysis of investment projects in the Framework of Structural Funds, Cohesion Funds and ISPA, Brussels;



6.5 Critical opinion of the Multicriteria analysis, in the light of the actual results of the project

Provide a critical opinion on the effectiveness of the Multicriteria analysis.

Try to state to what extent this analysis contributed to enhance the solidity of the whole ex-ante evaluation process and to what extent the ex post performance of the project has been influenced by the option analysis carried out.



7. Sensitivity and Risk analysis

This section analyses the results of the sensitivity and risk analysis of the project.

Definition

These analyses consist in studying the likeliness that a project will achieve a satisfying performance (in terms of IRR or NPV), as well as the variability of the results compared to the best estimate previously made.

Key features of the analysis

A three steps approach is usually suggested¹¹:

1. Sensitivity analysis:
it allows the determination of the critical variables or parameters of the model. Such variables are those with the greatest impact on project's financial performance indicators. Generally the analysis is carried out by varying one element or a combination of them and by determining the effect of that change on financial and the economical performance indicators.
2. Scenario analysis:
it allows the combined consideration of certain "optimistic" and "pessimistic" values of a group of variables. In order to define the scenarios, it is necessary to choose the extreme values among the range defined by the probability distribution. Hence performance indicators are calculated for each distribution.
3. Risk analysis:
it allows the calculation of the elasticity of performance values of the project through a risk probability analysis. In order to conduct such analysis, it is necessary to associate a probability distribution to each critical variable. Hence the probability distribution of the performance indicators should be calculated.

¹¹ European Commission, DG Regional Policy (2002) *Guide to cost-benefit analysis of investment projects in the Framework of Structural Funds, Cohesion Funds and ISPA*, Brussels; Belli P. et Al. (2001), "Economic Analysis of Investment Operations", The World Bank, Washington D.C.



7.1 Which were the results of the sensitivity and risk analysis, if any?

Evaluate **the extent** to which **project uncertainty** was addressed ex-ante and go through the methodology used.

Regarding the **sensitivity analysis**, please explain how the **critical variables** were selected. In addition try to go through the whole analysis process, indicating also which variables were chosen and why.

Regarding the **scenario analysis**, please explain **how** each scenario (**optimistic and pessimistic**) **was constructed** and provide the results of the analysis.

Regarding the **risk probability analysis**, please explain **which methodology** was used to vary the distributions and provide results obtained.

If no analysis of uncertainties was carried out, please try to **go through the potential reasons for its omission and explain which consequences** it has on the whole ex-ante evaluation process.

7.2 Critical opinion of the sensitivity and risk analysis in the light of the actual results of the project

Describe the whole analysis of uncertainties trying to assess its methodological completeness and effectiveness.

More specifically try to provide the potential causes of its contingent failures. Some potential causes could be:

- weak methodologies;
- omissions of some relevant variables;
- unpredictable events;
- other.

Try to state **to what extent this analysis contributed to enhance the solidity of the whole ex-ante evaluation process** and to what extent **the ex post performance of the project has been influenced by the option analysis carried out**.

Please note that: if any re-calculation of the risk analysis was carried on new data, or with different variables or methodologies, please provide an explanation of the reasons for the change and describe briefly the new analysis, pointing out the differences with the previous one.



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ANNEX 2. ENERGY TEMPLATE



1. History of decision making process and general objectives

This section investigates the history of the decision making process and the general objectives of the project.

Please note:

- *in respect of project definition, please define the project in terms of its physical assets following what you stated in the questionnaire, section B, demand 8.*
- *in respect of the forecasted and actual starting/ending dates of the project, please refer always and respectively to the beginning and ending of the construction works included in the definition of the project, as stated above;*
- *in respect of the forecasted and actual total costs of the project, please refer always to the costs of the construction works as referred in the definition of the project, as stated above.*

1.1 What was the decision making process?

Try to illustrate the project history investigating:

- **institutional** and **policy background**;
- the **stakeholders** involved;
- project definition in terms of its **physical boundaries**;
- **costs** (please include forecast and actual costs);
- **timing** (please include forecast and actual starting/ending dates);
- different implementation **phases**;
- **key issues** at stake.



Tab. 1.2 Timing table (Please refer to actual years)

	Starting phase (year)	Development phase (years)	Consolidation phase (years)	Ending phase (years)
Physical Economics Legal/regulations				

1.2 Which were the general objectives of the project?

Looking at the history of the project, illustrate what were the general objectives of the project as stated in some official documents or according to your reading of documentations.

If possible describe if the original objectives underwent to any **changes** or **reformulation**, hence illustrate **reasons** for them.

1.3 What was the context in which the project was implemented?

Describe the **policy actors**, **regulatory agencies**, and any **other institutional bodies** involved in project planning. In addition analyse the **regulatory and policy framework** in which the project was implemented in order to give an overview of its complexity. State to what extent these elements could have impacted on project current performance.



2. Context analysis

This section investigates the context in which the project was implemented and its access and planning features.

2.1 What were the planning and access features of the project?

Illustrate if the project **was part of some network** (such as TEN or others) for transport or energy. Describe if and how, problems such as **interoperability** and **connection** with other infrastructures already existent, were addressed. In addition discuss if and how the issues regarding its **accessibility** to users within its geographical area, were addressed.



3. Demand analysis

This section analyses how the demand for the services/products has been estimated.

3.1 Which were the results of the demand analysis, if any and if available, carried out before project implementation?

Description of **electricity transmission flows** between the countries under consideration and of the methodology used to **estimate the demand**. Specify if values for the estimation (for example elasticity of demand to time, fares, other) were taken from the literature (if so provide references), if the evaluators estimated them or if they were taken from national or supranational guidance. If possible give the values.

If no demand analysis was carried out, please try to **go through the potential reasons for its omission and explain which consequences** it has on the whole ex-ante evaluation process.

Please attach in annex any relevant sheets containing data on the ex-ante demand analysis.

3.2 Which are the actual values of the demand of the implemented projects?

Describe, if possible the latest available values of electricity transmission flows between the countries considered and those recorded at the time of project completion.

Please submit in annex any relevant sheets containing data on the ex-post demand analysis.

3.3 Comparative analysis of the ex-ante/ex-post results

If the ex-ante demand analysis has been carried out and is available, please provide a critical opinion on completeness and effectiveness of the demand analysis.



4. Option analysis

This section investigates the analysis of the feasible alternatives.

4.1 Which were the alternatives considered in the option analysis, if any?

Please provide a description of the alternatives considered and state **the comparative advantages and/or disadvantages attached to each option**.

If no options analysis was carried out, please try to **explain the potential reasons for its omission** and describe which **consequences** this had on the whole ex-ante evaluation process.

4.2 Critical opinion of the option analysis, in the light of the actual results of the project

Referring to the standard literature on this topic, provide a critical opinion on the effectiveness of the options analysis.

Try to state to what extent this analysis contributed to enhance the solidity of the whole ex-ante evaluation process and to what extent the ex post performance of the project has been influenced by the options analysis carried out.



5. Financial Analysis

This section analyses the results of the financial analysis of the project and determines the extent of the EU contribution on total financing.

5.1 Which were the results of the ex-ante financial analysis, if any and if available?

If a financial analysis has been carried out and is available, please try to specify:

- which time horizon has been considered and explain how it was determined and if you think it was consistent with the features of the concerned project.
- the expected investment (land, buildings, licenses, etc.) and the operating costs (personnel, raw materials, supply of energy). If possible describe also how they were estimated.

If no financial analysis was carried out, please try to go through the potential reasons for its omission and explain which consequences it has on the whole ex-ante evaluation process.

5.2 Which are the actual financial values of the project if available?

Provide a detailed description of the actual values of the project at financial level.

5.3 Comparative analysis of the ex-ante/ex-post analysis

If the ex-ante financial analysis mentioned above is available, please describe and discuss the deviations occurred and give reasons for them.

More specifically try to investigate the potential causes for the lack of consistence of the ex-ante financial analysis, against the actual financial results. Some potential causes could be:

- omission of estimation for relevant variables;
- methodological pitfalls in the calculation of the financial variables;
- increase in total investment costs;
- time delays;
- dynamics not taken into account;



- changes in the regulatory framework;
- changes in safety requirements during the implementation phases;
- change in project technical design.

Discuss potential motivations for these variations.



6. Economic and market analysis

This section analyses the results of the economic analysis of the project.

Definition

The economic and market analysis of energy projects appraises the impact of the project on energy prices and interregional energy exchanges.

Key features of the economic and market analysis

Applied to the specific electricity transmission sector, the economic and market analysis should focus on the impact of the project on:

- 1 Electricity market prices:
these are the prices of electricity reached at the market equilibrium.
- 2 Electricity market quantities:
these comprise electricity production, consumption and exchanges of the countries considered.

6.1 Which were the results of the ex-ante economic and market analysis, if any and if available?

If the ex-ante economic and market analysis has been carried out and is available, please specify:

- the expected electricity market prices to be reached at the market equilibrium;
- the expected electricity quantities (production, consumption, interregional exchange).

If possible try to describe the methodology used to estimate prices and quantities.

6.2 Which are the actual economic and market values related to the project?

Please provide the actual electricity market prices and the actual quantities of electricity produced, consumed and exchanged for each country.



6.3 Comparative analysis of the ex-ante/ex-post analysis

If the ex-ante economic and market analysis has been carried out and is available, please describe and discuss the **deviations** occurred and **give reasons** for them.



7. Scenario analysis

This section analyses the results of an ex-post scenario analysis of the project.

Definition

The scenario analysis aims at estimating the development of the energy system structure of each region under various framework conditions.

Key features of the analysis

Applied to the specific electricity transmission sector, the scenario analysis should provide valuable information on the expected long-term evolution of the power system of each country, the electricity prices and the interregional power exchanges. Scenarios are usually calculated under different framework conditions such as fuel price variations, demand level, etc.

The objective of the scenario analysis in the present case is to analyse the impact of these various framework conditions on each country's power system in general, and on the power flows between the countries considered in particular.

7.1 Which are the actual values of the ex-post scenario analysis?

Please describe, with the help of an **energy-system model**, the long-term (e.g. until 2030) **development of both regions' electricity systems** under **various framework conditions** (e.g. varying gas price, carbon price, implications of interconnections between the countries considered).

Special emphasis will be put on the factors that influence the power flows between the two regions (e.g. the consumption in each country, expected electricity prices).

Please submit in annex any relevant sheets containing data on the scenario analysis.

7.2 Critical opinion of the scenario analysis in the light of the actual results of the project

Please discuss here the **methodology** used for the scenario analysis and, if possible, describe potential improvements.



Glossary

Accounting prices: The opportunity cost of goods, generally different from actual market prices and from regulated tariffs. They should be used in project appraisal to reflect better the real costs of inputs to society, and the real benefits of outputs. Often used as a synonym of shadow prices.

Benefit Cost Ratio (B/C Ratio): Ratio of the discounted benefits and the discounted costs. If the B/C Ratio of a project is higher than 1, the project can be recommended.

Cost-Benefit analysis (CBA): Conceptual framework applied to any systematic, quantitative appraisal of a public or private project to determine whether, or to what extent, that project is worthwhile from a public or social perspective. Cost-benefit analysis differs from a straightforward financial appraisal in that it considers all gains (benefits) and losses (costs) regardless of to whom they accrue. CBA usually implies the use of accounting prices. Results may be expressed in many ways, including internal rate of return, net present value and benefit cost ratio.

Conversion factor: A number that can be multiplied by the domestic market price or value in use of a non traded item to convert it to an accounting price. In other words, actual prices are converted in shadow prices, approximated by the use of the CBA.

Demand analysis: Analysis that allows for the accurate estimation of what will be the demand for the good/services produced by the project. More specifically regarding transport and energy project, it is better to talk of the estimation of the users. Total demand usually consists of the sum of the existing demand (the number of users of that specific service, at the time before the project has been implemented), the generated demand (the number of new users induced by the project implementation) and the diverted demand (the number of new users deviated from the use of facilities, alternatives to the one implemented)

Discount Rate: The rate at which future values are discounted to the present. Financial discount rate and economic discount rate may differ, in the same way that market prices may differ from accounting prices.

Economic analysis: Analysis undertaken using economic values, reflecting the values that society would be willing to pay for a good or service. In general, economic analysis values all items at their value in use or their opportunity cost to society (often a border price for tradable items).

Economic rate of return (ERR): an index of the socio-economic profitability of a project. It may be different from financial rate of return (FRR), because of price distortion. ERR implies the use of accounting prices and the calculation of the discount rate that makes project benefits equal to present costs, i.e. makes economic net present value (ENPV) equal to zero.



Externalities: Effect of a private action or public intervention, which is spread outside the market. In general, an externality is said to exist when the production or consumption of a good or service by one economic unit has a direct effect on the welfare of producers or consumers in another unit. By their very nature, externalities trigger private choices, which cannot be optimised through the mechanisms of market competition. Only collective and often public decisions are able to promote positive external effects and prevent negative ones.

Financial analysis: Analysis that allows for the accurate forecasting of which resources will cover future expenses. It allows to: 1) verify and guarantee cash equilibrium (verify the financial sustainability), 2) calculate the indicators of financial return of the investment project based on the net discounted cash flows, related exclusively to the economic unit that activates the project (firm, managing agency).

Financial rate of return: The internal rate of return calculated using financial values and expressing financial profitability of a project.

Financing gap: It is the current approach used to determine the Commission co-financing rate on the project total costs. This approach works as follow: C is the present value of total cost of the investment, R the present value of the net revenues generated by the project, including its residual value, E the eligible cost, (C-R) is the financing gap, we have that r is the co financing rate and G is the EU grant defined as follows: $r=(C-R)/C$ and $G=E*r$.

Incremental analysis: Comparison of the net benefit with the project compared with the net benefit without the project, in order to measure the additional benefits that can be attributed to the project.

Internal rate of return: The discount rate at which a stream of costs and benefits has a net present value of zero. Financial rate of return (FRR), when values are estimated at actual prices. Economic rate of return, (ERR) when values are estimated at accounting prices. The internal rate of return is usually compared with a benchmark in order to evaluate the performance of the proposed project.

Market price: The price at which a good or service is actually exchanged for another good or service or for money, in which case it is the price relevant for financial analysis.

Multi Criteria Analysis (MCA): Tool used to compare several interventions in relation to several criteria. Multicriteria analysis is used above all in the ex ante evaluation of major projects, for comparing between proposals. It can also be used in the ex post evaluation of an intervention, to compare the relative success of the different components of the intervention. Finally, it can be used to compare separate but similar interventions, for classification purposes. Multicriteria analysis may involve weighting, reflecting the relative importance attributed to each of the criteria. It may result in the formulation of a single judgement or synthetic classification, or in different classifications reflecting the stakeholders' different points of view. In the latter case, it is called multicriteria-multijudge analysis.



Net present value (NPV): The sum that results when the discounted value of the expected costs of an investment are deducted from the discounted value of the expected benefits. Economic net present value ENPV. Financial net present value FNPV.

Option analysis: Technique that compares actual benefit with the net benefit potentially generated by an alternative project. It aims at giving evidence that the project under exam is the best option of all feasible alternatives. Generally for each project three alternatives could be considered: the “do nothing” alternative; the “do minimum” alternative; the “do something” alternative.

Residual value: The net present value of assets at the final year of the period selected for evaluation analysis.

Risk probability analysis: Technique used to analyse a range of events or trends that could undermine the achievement of the project objectives. Risk analysis tries to assess the probability distribution of all possible expected returns corresponding to all possible deviation of the variable influencing the project out comings.

Scenario analysis: The technique to consider jointly certain “optimistic” and “pessimistic” values of a group of variables in order to demonstrate project adaptability to different scenario. To define optimistic and pessimistic scenarios it is necessary to choose for each critical value, the extreme values among the range defined by the probability distribution. Project performance indicators are calculated for each hypothesis.

Sensitivity analysis: The analytical technique to test systematically what happens to a project’s earning capacity if events differ from the estimates made about them in planning. It is carried out by varying one element or a combination of elements and determining the effect of that change on the outcome.

Shadow prices: see accounting prices.



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