Cost-benefit analysis in the context of EU Cohesion funding - tools, methodology and available support

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IPA Conference "Impact Assessment – What can we do better?"

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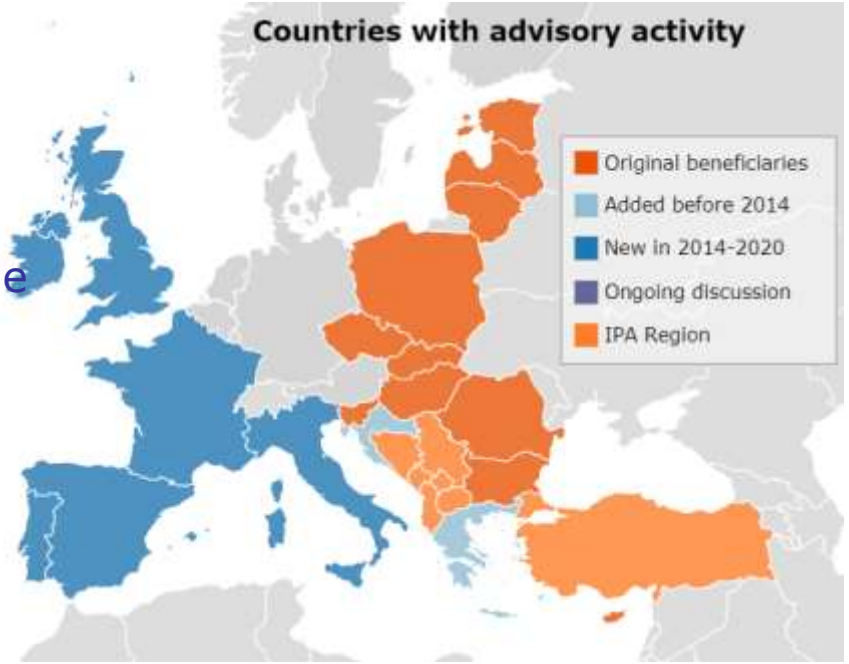
Project "We work for the people" strengthening the capacity of institutions to meet the challenges of modern public policies" funded under Operational Programme "Good Governance", co-financed by the European Union through the European Social Fund.

JASPERS

- 'Joint Assistance to Support Projects in European Regions'
- A technical assistance partnership between Commission's DG Regional and Urban Policy, and EIB started in 2005.

Provides independent advice and capacity building support to beneficiary countries to help prepare and assess high quality major projects to be co-financed by EU Structural and Cohesion Funds.

- JASPERS assistance is free of charge
- Available to EU 28 + IPA region
- Main focus on major projects with total eligible cost exceeding EUR 50m (EUR 75m for sustainable transport and networks)
- Supports also smaller projects, grouping of investments, knowledge sharing and public administrations' strengthening



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JASPERS Priorities

- Our main objectives:
  - Improve the capacity of beneficiary countries to make best use of EU funding
  - Improve projects quality and sustainability
  - Increase actual disbursement of funds (absorption)

- Other key objectives
  - Strategic planning and upstream support to solve bottlenecks relevant for more than one country/sector
  - Knowledge sharing, training, capacity building and institutional strengthening
  - Support MSs and EC in project appraisals (2014-2020)
  - Support beneficiaries in preparing for project implementation

JASPERS Support

Support to strategic planning and to address sectoral issues

Project concepts and TORs for project preparation studies

Methodological support to beneficiaries and advice during project preparation

Capacity building and knowledge sharing

Review of intermediate and final project documentation and related studies (Guidance Notes)

Final project assessment (Completion report)

Independent Quality Review (art 102.1 CPR)

JASPERS Capacity Building

- Networking Platform multi-country capacity building, training, knowledge sharing, dissemination of good practice (in Brussels and at regional level)
  - Focus on key competencies for cohesion policy, good practice for project preparation and other relevant horizontal/ sectoral topics
- In-country capacity building actions
  - requested by MSs for targeted capacity building assignments (including train-the-trainers)
  - follow-up of multi-country and contribution to other JASPERS actions
- Advisory on horizontal issues - State aid, climate change, PPPs, **Cost-benefit Analysis**, environmental issues, etc.
- Videos and e-learning (blended training)
- Publications and guidance documents
- Web portal: www.jaspersnetwork.org

Major Projects – info required

1. Body responsible and its capacity
2. Description of investment and objectives
3. Total costs and eligible costs
4. Feasibility Studies (incl. Option Analysis)
5. **Cost-Benefit Analysis**
6. Analysis of Environmental Impact and Climate change considerations
7. Financing Plan
8. Timetable
9. Involvement of JASPERS
10. Endorsement of Competent Authority

Annexes

- *Declaration of ENV authorities*
- *Feasibility and Environmental Studies*
- ***CBA and other Economic Studies***
- *Other Documentation*

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Cost-benefit Analysis

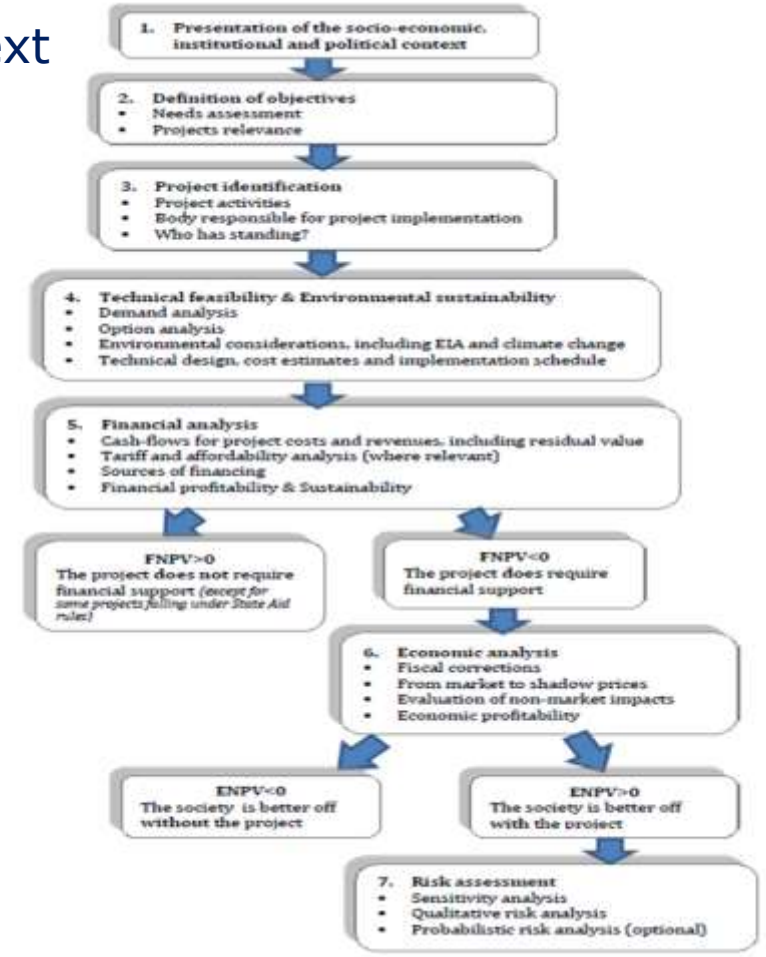
- CBA is an analytical tool which is used to estimate the socio-economic impact (welfare changes) in term of benefits and costs related to the implementation of policy actions and/or projects.
- (incremental) impact must be assessed against specific objectives and the analysis is usually made from the point of view of society
- The objective of CBA is to identify and monetise (i.e. attach a monetary value to) all possible impacts of the action or project under scrutiny, in order to determine the related costs and benefits.
- In principle, all impacts should be assessed: financial, economic, social, environmental

CBA goals for EC funding

- ✓ **Demonstrate project needs co-financing and is sustainable**
  - ✧ *Projects may also be financially profitable without EU assistance…*
  - ✧ *How much funding is needed to make the project financially feasible?*
  - ✧ *Is the project going to be financially sustainable after EU financing?*
  - ☞ Financial analysis and Financial sustainability
- ✓ **Demonstrate project is desirable in socio-economic terms**
  - ✧ *Does it contribute to the goals of EU regional policy?*
  - ✧ *Does it foster growth and boost employment?*
  - ✧ *Is Society better off with the project (benefits exceed its costs)?*
  - ☞ Economic analysis
- ✓ **How to deal with uncertainties and making sure the project achieves its intended objectives**
  - ☞ Risk Assessment

7 steps of CBA analysis

1. Description and Analysis of the context
2. Definition of objectives
3. Identification of the project
4. Technical feasibility (incl. Option Analysis) and Environmental sustainability
5. Financial analysis
6. Economic analysis
7. Risk Assessment



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Step 1 - Analysis of the context

- The **socio-economic conditions** of the country/region that are relevant for the project
- The **political and institutional aspects**, including existing economic policies and development plans
- The **current infrastructure endowment** and service provision bottlenecks!!
- The **expectations of the population**, e.g. any existence of environmental instances
- Other info and/or **statistics relevant to understand the context**

Step 2 - Objectives definition

- The definition of the objectives should result from the **assessment of the regional and/or sectorial need.**
- Project objectives should be defined in explicit relation to the needs that can be addressed.
- As far as possible, **the objectives should be quantified though indicators and targeted**.

Step 3 - Objectives definition

A project is clearly identified when:

- the physical elements and related activities (goods, services) that will be implemented consist of a **self-sufficient unit of analysis**;

- the **body responsible** for implementation has been identified, and its financial, technical and institutional capacity verified;

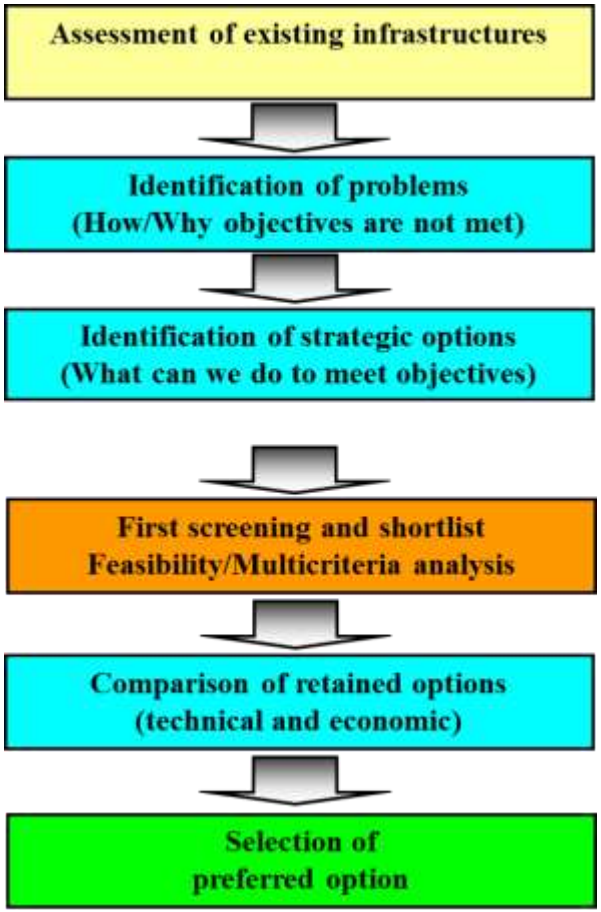
- the impact area, the final beneficiaries and all relevant stakeholders are duly identified ("**who has standing?**").

Step 4 - Technical feasibility

- Although engineering design and environmental appraisal are not formally part of the CBA, their results must be concisely reported and used as **main data source within the CBA** .

- Information on designed capacity, cost estimates and implementation schedule are used as basis for Financial and Economic Analyses!

Option analysis and selection



The aim is to **identify the alternative that achieves the intended objectives at the minimum overall cost to society** and that will be assessed in the framework of the CBA.

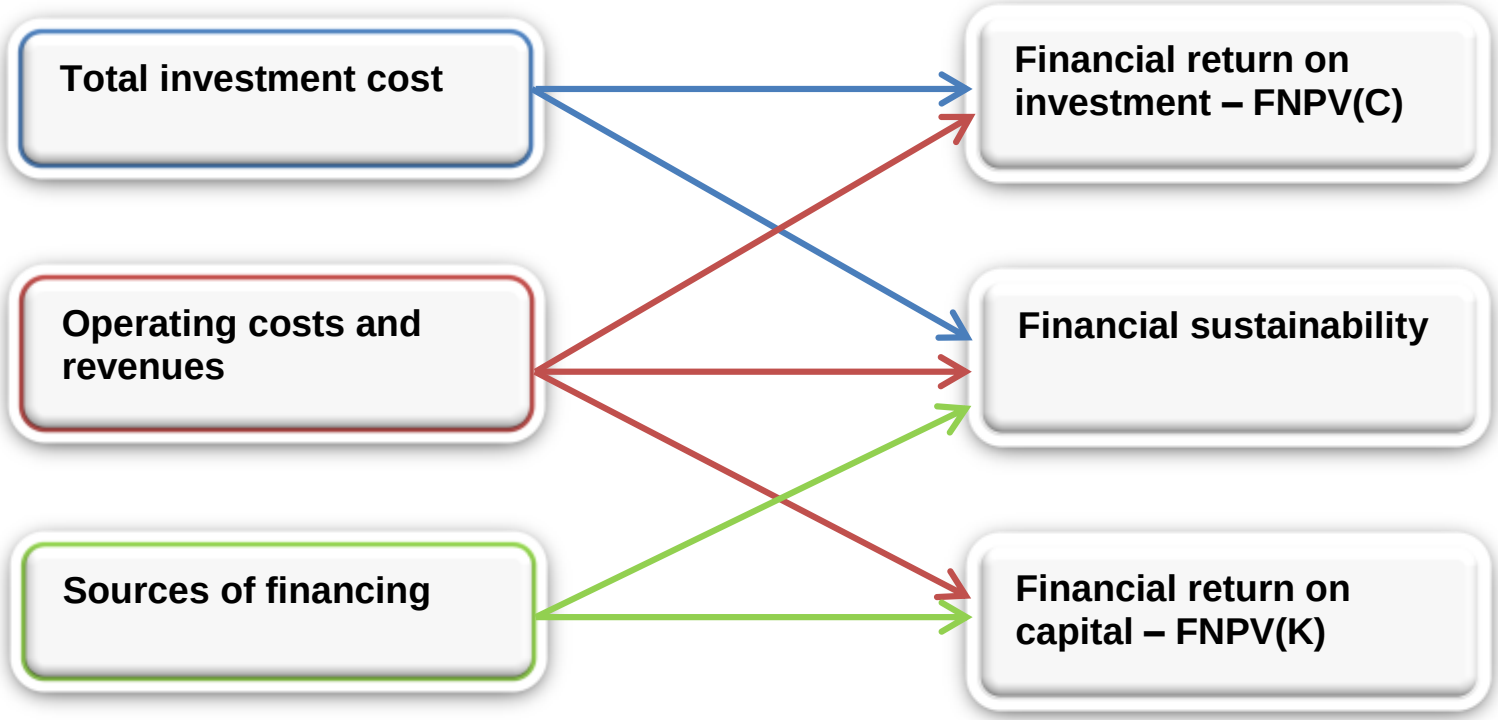
Recommended:

1) establish a **long list of alternative strategies/actions** to achieve the intended objectives;

2) **screen the long list** against some qualitative criteria (overall policy orientations and/or technical considerations **and establish a short list of suitable alternatives** (by eliminating unsuitable options);

3) **establish option rankings** and select preferred options based on their net present values in financial and economic terms (achieving the intended objectives at the lower, long-term cost)

Step 5 – Financial Analysis



- Assess project capacity to self-finance
- Assess profitability for project's owner and other stakeholders
- Establish needed EU co-financing levels (where relevant)
- Verify project sustainability

DCF methodology

- **Discounted Cash Flow** Methodology:
- Only cash inflows and outflows are considered
- An appropriate **time horizon** is selected (reference period) and a **residual value** considered at the end of the period.
- An appropriate **Financial Discount Rate** is adopted
- **Constant prices** are used (no inflation)
- The analysis is **net of VAT** (if this is recoverable)
- Analysis done on an **incremental basis (counterfactual and project scenarios)**

Sector	Reference period (years)
Railways	30
Roads	25-30
Ports and airports	25
Urban transport	25-30
Water supply/sanitation	30
Waste management	25-30
Energy	15-25
Broadband	15-20
Research and Innovation	15-25
Business infrastructure	10-15
Other sectors	10-15

Financial Sustainability

The Financial Analysis include an assessment of the project **financial sustainability**, to answer:

- Is the project financially sustainable?
- If not, how temporary liquidity problems will be tackled?

A project is financially sustainable when it does not run the risk of running out of cash in the future.

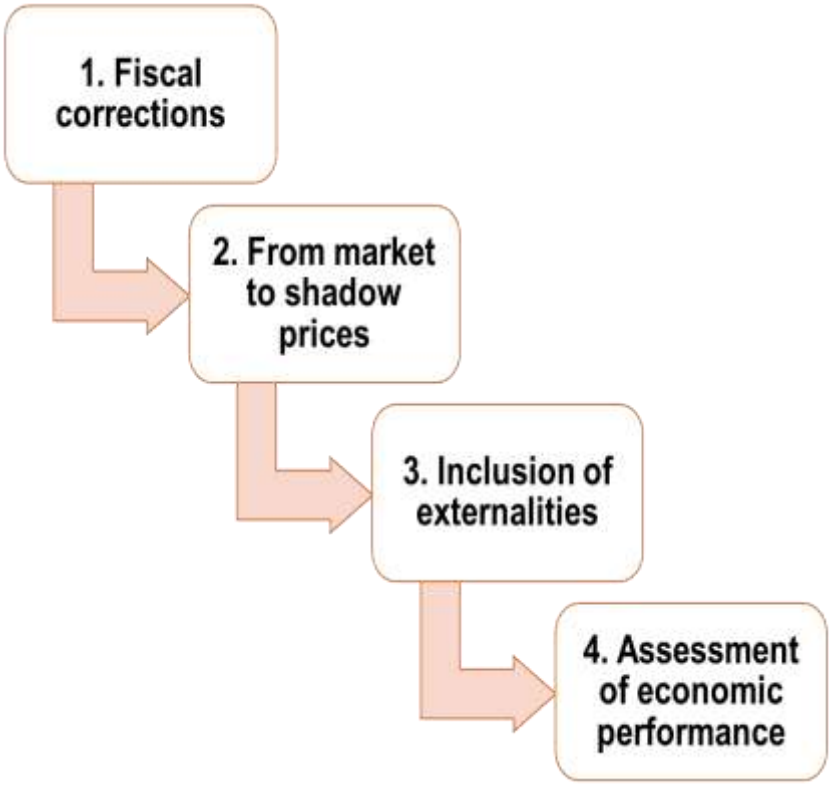
Financial sustainability implies having a cumulative positive cash flow for each year of projections (in simple words, enough cash to run all its operations, present and proposed smoothly in each given year).

When for specific reasons financial **sustainability cannot be confirmed** (for example in the case of non revenue generating activities, like non toll roads), a clear **indication of the potential sources to cover the cash-flow shortages (subsidies)** shall be included as part of the analysis.

It requires a formal confirmation of the identified sources!!

Step 6 – Economic Analysis

- The purpose of the Economic Analysis is to prove that the project has a **positive net contribution to society and is therefore, worth being co-financed** by EU funds.
- For the selected alternative, the **project's benefits should exceed the project's costs** and, more specifically, the present value of the project's economic benefits should exceed the present value of the project's economic costs.
- In practical terms, this is expressed as **a positive ENPV**, **a Benefit/Cost (B/C) ratio higher than 1**, or a project ERR exceeding the discount rate used for calculating the ENPV.
- **Social Discount Rate: 5%** in Cohesion countries (**3% in other MSs**)
- Economic Analysis is to provide an answer to the question: **is the project worth co-financing?**



Benefits and externalities

Economic benefits can be measured as:

- the **costs avoided** as a result of implementing the project, or
- in terms of **external benefits** that are the result of the implementation of the project and that are not captured by the financial analysis.

Examples:

Environmental project: Quality of life improvements due to could be improved health in the area (as a result of reduction in pollution), or improvement in the attractiveness of the area subject to the intervention (for example cleaner sea).

Transport projects: Time saved for commuting (due to a new road or improvement of the existing conditions) or a reduction in the risk and number of accidents.

Energy sector: reduction of harmful emissions (CO2, SO2, NOx, dust)

- Time savings
- Safety improvements
- Increased air pollution

- Recovery of recyclable materials
- Increased odors
- Energy recovery

- Reduced GHG emissions
- Security of supply
- Increased energy reliability

- Knowledge creation
- Human capital development
- Start-ups

Step 7 – Risk Assessment

Risk Assessment = sensitivity and risk analysis

A "risk assessment" shall be included in the CBA.

The goal is to **deal with the uncertainty** related to the implementation of investment projects and to **test the robustness of the result** obtained in the financial and economic analysis.

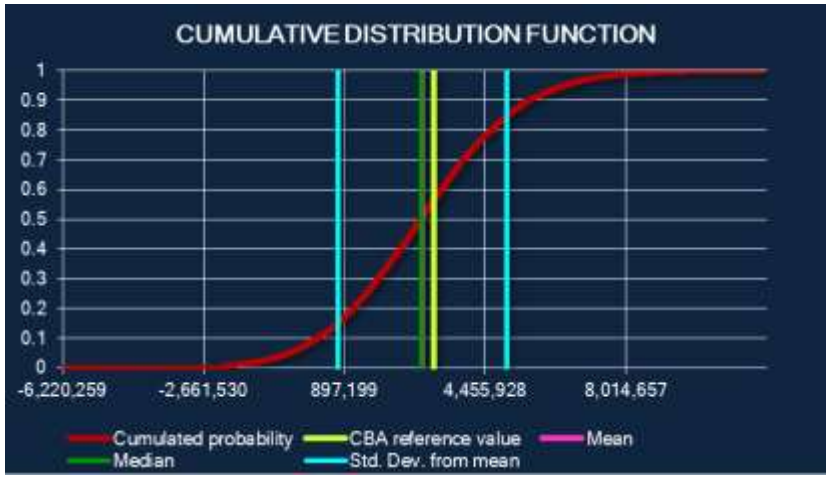
Sensitivity analysis: aims at identifying the **critical variables and their potential impact** in terms of changes in the profitability indicators.

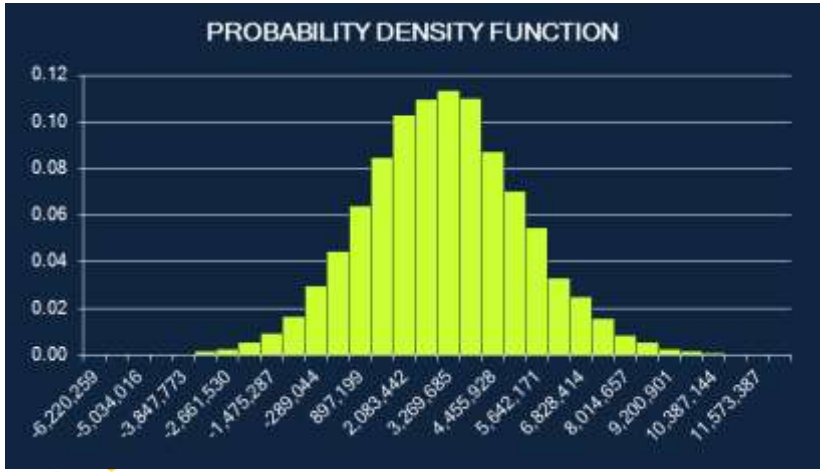
Risk analysis: aims at estimating the **probability of these changes** actually taking place, with the results expressed either in qualitative or quantitative terms

Qualitative Risk Assessment

Risk description	Probability * (P)	Sever-ity (S)	Risk level* (=P*S)	Risk prevention / mitigation measures	Residual risk after prevention/mitigation measures
Demand side risks					
Volumes of water consumed fall below level forecast	B	III	Low	Household demand (at 120 l/c/d) is already at the low end of expectations and is expected to decrease a further small amount to 115 l/c/d as a result of price elasticity. Changes in consumption will be compensated through adjustment to the tariff, which can be done with limited impact on affordability. Follow up: Municipality in coordination with project beneficiary	Low
Financial risks					
Tariffs will not be approved at the level required for sustainability	B	IV	Moderate	The immediate tariff rise required is only around 9 % and should not result in political opposition when the project benefits are taken into account. Follow up: Municipality in coordination with project beneficiary	Low
Users will not pay the tariffs required	B	III	Low	Current revenue collection levels exceed 99 % and revenue collection discipline among the population is good. Follow up: Project beneficiary	Low
Investment cost overrun	C	III	Moderate	Investment cost estimates compare well with costs experienced with similar projects. Close monitoring of cost relative to budget should be performed to mitigate the risk of any over-runs should such occur. Follow up: Project beneficiary.	Low
Implementation risks					
Problems with land purchase	B	II	Low	Land for the new WWTP is owned by the Municipality Follow up: Project beneficiary.	Low
Delays related to extension of tender procedures	C	III	Moderate	Promoter's procurement division to be supported by specialised technical assistance. Procurement and implementation schedule appears feasible and has adequate contingency. Follow up: Project beneficiary.	Low

Quantitative Risk Assessment





Probability distribution of the Economic NPV – example

ESTIMATED PARAMETERS OF DISTRIBUTION	
Mean	2,855,528
Median	2,825,860
Standard deviation	2,134,763
Minimum	-6,220,259
Maximun	11,573,387
ESTIMATED PROBABILITIES	
Pr. ENPV ≤ 0	**0.086**

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CBA Guide and Forum meetings

JASPERS was Advisor for 2008 and 2014 EC CBA guide editions

"establish regular CBA forums for exchanging best practices and experience in carrying out CBAs so that we can continue to improve stakeholders' knowledge and its effective application to specific investment projects"

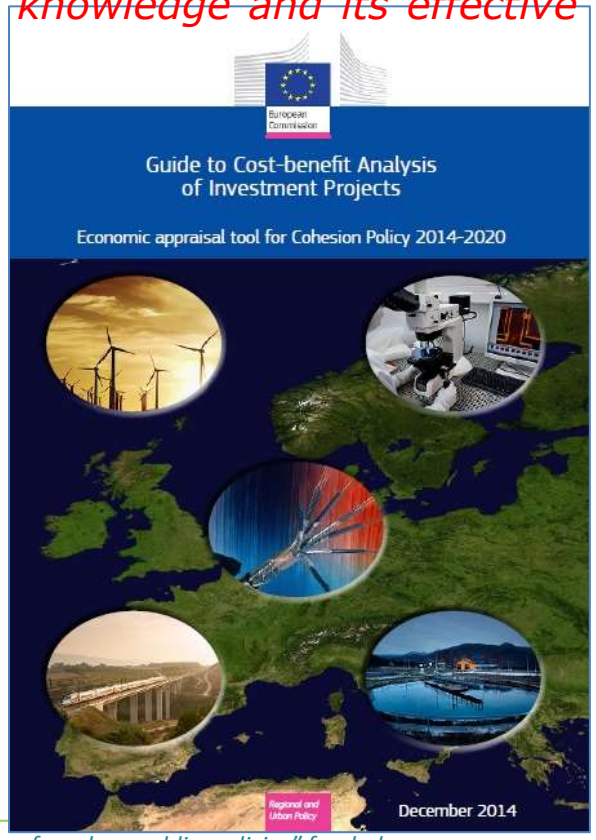
Objectives of CBA Forums:

- Present sectoral methodologies and key developments since 2007-2013
- Look at practical applications and related challenges
- Exchange experiences and discuss questions/clarification requests

✓ 3 CBA Forum meetings already implemented (Transport, RDI, Environment) – materials on www.jaspersnetwork.org

✓ 2 more in 2018:

- Energy sector: May 2018 in Brussels
- Broadband: Q4 2018, date TBC



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European Union
European Social Fund

INSTITUTE OF PUBLIC ADMINISTRATION

OPERATIONAL PROGRAMME GOOD GOVERNANCE

Train the trainers modules

Jaspers
Joint Assistance to Support Projects in European Regions

JASPERS NCC is increasing efforts to build the capacity of JASPERS counterparts by supporting them in developing and implementing their own capacity building programs

ToTs are typically implemented in close partnership with the requesting authority, who take ownership of the exercise and commit to its sustainable implementation

This approach allows for maximising value added delivered with available resources while creating the potential for lasting increase of administrative capacity at the local level

NCC remains available to provide ad-hoc advice, perform reviews and updates, but the responsibility for further implementing the capacity building activity is transferred to the counterpart authority.

Current ToT support on CBA: BG (with IPA), MT, HU, GR

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JASPERS Papers on CBA matters

- ✓ Guidance on appraising the economic impacts of Rail Freight Measures (forthcoming)
- ✓ Economic Analysis of Research Infrastructure projects
- ✓ Guidance notes on transport demand analysis and traffic modelling
- ✓ Evaluation of economic benefits of polluted sites remediation projects
- ✓ Application of the polluter-pays-principle in the waste management sector
- ✓ Calculation of GHG emissions in waste and waste-to-energy projects
- ✓ Economic Analysis of Gas Pipeline projects
- ✓ Project preparation and CBA for RDI infrastructure
- ✓ CBA for broadband infrastructure
- ✓ Project Preparation and CBA for cultural infrastructure
- ✓ Simplified probabilistic risk analysis based on Montecarlo simulations
- ✓ Combining EU grant funding with PPP for infrastructure

Available at www.jaspersnetwork.org

More to come in the future…

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Other Advisory support on CBA

- ✓ Continued support on CBA matters to MAs and beneficiaries during project preparation assignments
- ✓ Support to MS in preparation of general or sectorial frameworks:
  - ✓ Advising national institutions on adapting existing CBA requirements/tools to current regulatory framework and best practices in project appraisal.
  - ✓ Support the development of CBA national guidelines upon mandate by national institutions (mostly sectorial).
  - ✓ Supporting in selection of TA providers for CBA guidelines and related supporting studies (e.g. ToR)
- ✓ Support to DG REGIO on CBA methodologies and their specific application to projects:
  - ✓ Advisory to the Steering Groups of 2008 and 2014 CBA guide editions
  - ✓ Technical support on specific issues (JASPERS CBA Working Group)

Contacts and More info

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