Guidelines to Cost-Benefit Analysis of Grid Development projects

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Long Term Development Stakeholder Group

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Reliable Sustainable Connected

Questions around the CBA methodology

Why use cost benefit analysis for transmission projects?

What is **ENTSO-E's approach** to CBA methodology?

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Guideline to Cost Benefit Analysis of Grid Development Projects: Key issues and questions

What are the **benefits** of transmission projects?

How to ensure that **benefits outweigh costs**?

What is **a transmission project** ?

How to address **uncertainties** ?

How to assess the **environmental and social impact** of transmission projets at different stages of development?

EU objectives of CBA methodology

Transparency

- Harmonised energy system-wide CBA
- Demonstrate overall costs and benefits from a European perspective

Selection of projects of common interest

- Selection process takes into account CBA results

Cross border cost allocation

- CBA results possible input (beneficiary pays principle)

TYNDP projects

Candidate PCIs

Upon request
(Council amendment)

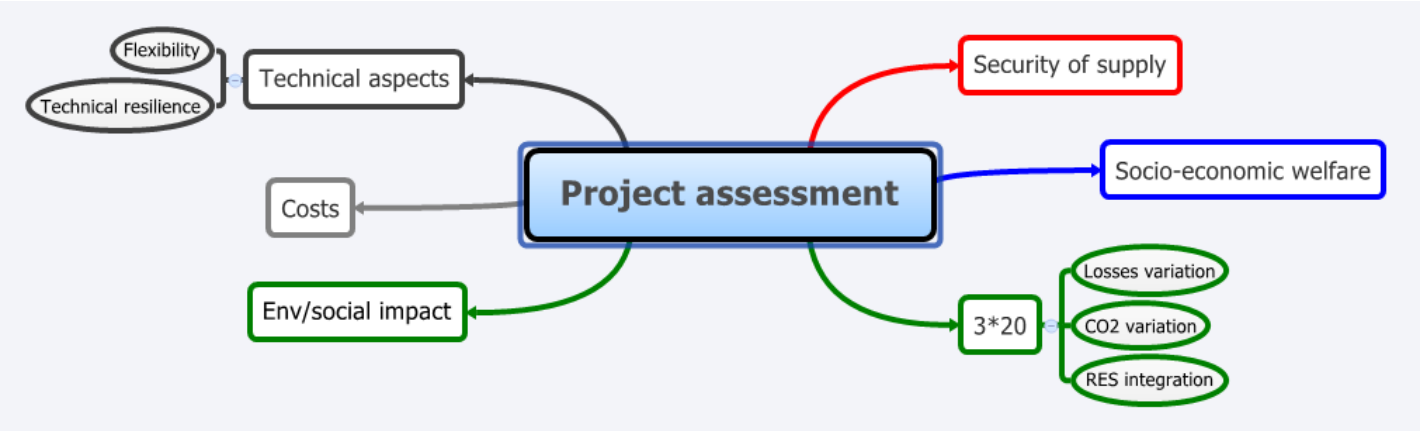
Why use pan-European CBA methodology ?

- ✓ **Adress major changes and challenges** in the electricity sector (climate change, RES, market integration, SoS…)
  - Common benefit framework reflecting today's challenges
  - Common scenarios and joint grid planning
  - Identify robust projects, taking into account uncertainties linked to future system evolution
  - Highlight projects which have a particular value in achieving certain targets, such as RES integration or completing the Internal Market

- ✓ **Enhance dialogue with stakeholders**
  - Huge investment needs
  - Need for social acceptance

General approach to CBA: scope

✓Benefit framework



Stem from European Policies + draft Regulation (=TYNDP 2012)

Quantification of all main indicators (new)

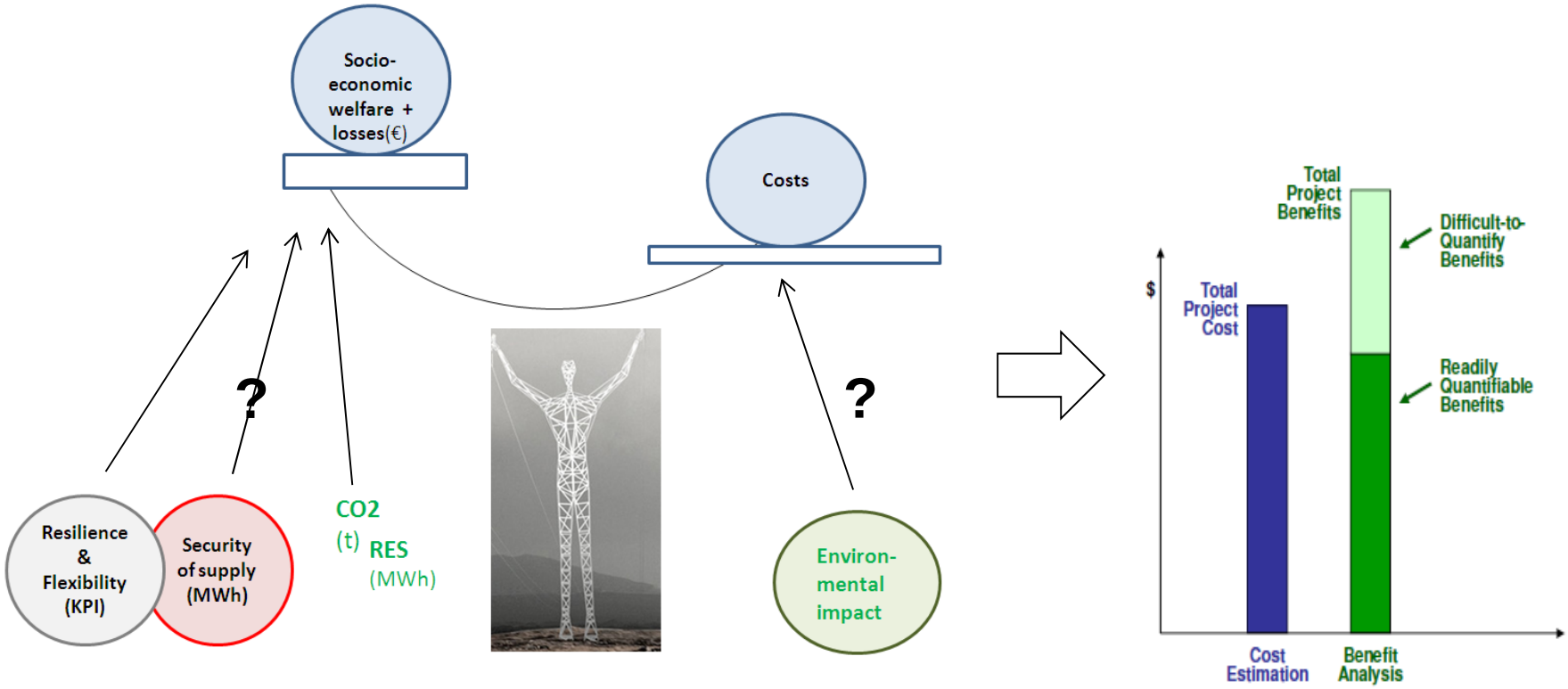
- Analysis with and without the project

✓Geographical framework

-Pan-European database

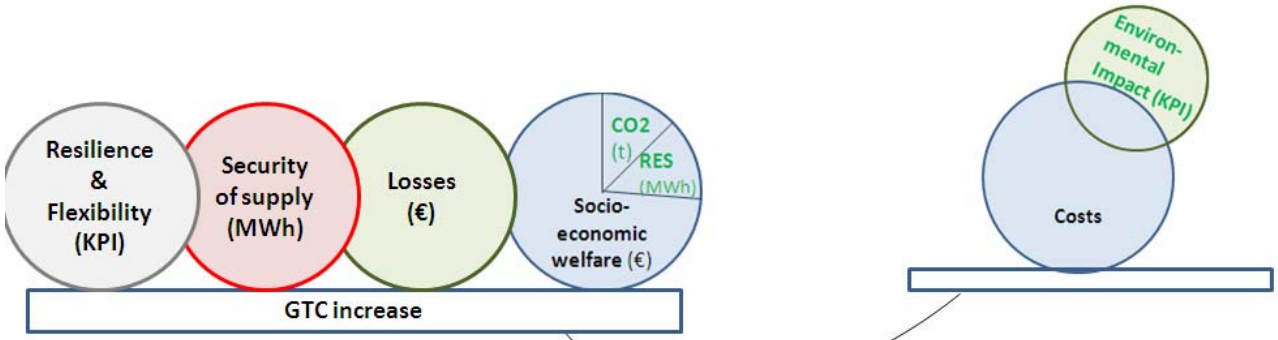
-Simulation ENTSO-E Region + neighbours

How to ensure that benefits outweigh costs: get the balance right



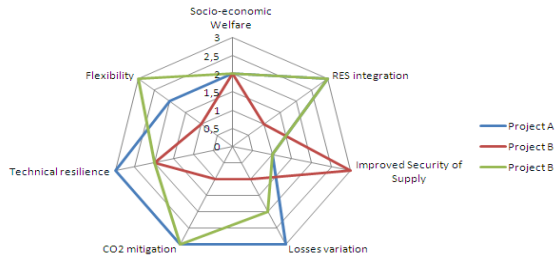
How to ensure that benefits outweigh costs ?

Computation



Presentation

Criteria	Grid Transfer Capability Increase	Socio-economic Welfare	RES integration	Improved Security of Supply	Losses variation	CO2 mitigation	Technical resilience	Flexibility	Social and environmental Impact	Project costs
	MW	M€/year	MWh/year	MWh/year	M€	Mt				M€
Project A	1000	90-150	500-550			0,5-0,8	+++	++		650-700
Project B	500	30-50		3000	20-30		++			25
Project C	800	225-30	3000-3500		10-20	1-1,5	++	+++		150



Goal : best possible information for stakeholders and decision-makers

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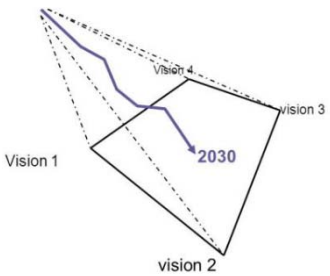
How to address uncertainties: scenarios & time horizons



Consistency

Sensitivity to scenarios

Long term benefits

Realism

Resources

Dependency on external data/policies

At least two scenarios (one reference) and two horizons
- Mid-term (e.g. 2020)
- & long-term (e.g. 2030)

Sensitivity analysis
- Range of values

CBA quality depends on quality of input assumptions !

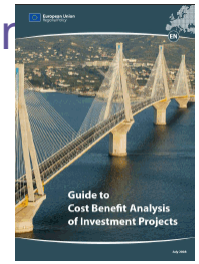
What is a cross border project ?

A **cluster of investment items** that have to be realised in total to achieve a desired effect: one investment or a set of investments.

- Clustering of a set of investments is recommended by European Commission if:

They are located in the same area or along the same transmission corridor ar belong to a general plan for that area or corridor

They achieve a common measurable goal;



Ex : an interconnector leading to constraints on the internal network

➡ CBA on interconnector only will give wrong results; risk of stranded assets

ENTSO-E's clustering rule :

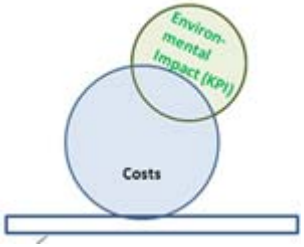
Interconnector (ΔGTC_1 = + 400 MW, nominal capacity 500 MW)

Internal project (ΔGTC_2 = +100 MW)

Clustering allowed if $\Delta GTC_2 >= 0.2\ \Delta GTC_1$: 100 > 20% of 400MW

CBA quality depends on quality of project definition

How to assess the environmental and social impact ?



Ideas welcome !

•**Internalised (avoidance costs, compensation costs):**
-Land use/human activity (avoidance, compensations)
-Soil, subsoil, water (avoidance, technical standards)
-Waste/decommissioning (life cycle costs)
-Safety (minimal distance)
-Visual impact (avoidance, compensation)
-Faune, flora, vegetation (avoidance, compensation)

Project assessment

Criteria	Grid Transfer Capability Increase	Socio-economic Welfare	RES integration	Improved Security of Supply	Losses variation	CO2 mitigation	Technical resilience	Flexibility	Social and environmental Impact	Project costs
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• **Residual impact or uncertain impact**
-Landscape
-Biodiversity
-Reduction of amenity

Dense area
Protected area
Former conflicts

Risk ?

CBA quality depends on capacity of including externalities

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Conclusions/discussion

What do you think about ENTSO-E's combination of CBA and multi-criteria assessment?

Do you think the approach is likely to provide a good balance between consistency of results and necessary freedom for project promoters and regional groups?

Do you agree with ENTSO-E's approach for clustering of investments?

Do you think ENTSO-E's approach to overall assessment provide enough information both for decision-makers and the public?