CBA Forum meeting on Environment sectors

Focus: Selected topics of discussion in waste sector

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Planning waste treatment facilities

- Existing situation assessment
- Definition of objectives, needs assessment and demand analysis
- Options analysis
- Financial and economic analysis
- Risks analysis

The primary aim is to meet existing demand for waste management through the preparation of the affordable, sustainable and quality project.

EU grant contributes to solving potential affordability issue, however it cannot be regarded as a driving force for the initiation of the project.

Demand analysis (I)

The determination of the demand, in terms of quantity and quality is a key factor in the identification of the type and capacity of the facilities.

- Factors affecting waste management demand:
  - Demographic and economic growth;
  - Waste generation dynamics;
  - Variation in waste composition.
  - Targets for the municipal waste management (EU and national legislation, waste management strategies and plans)

Demand analysis (II)

Good practice

- Market analysis: analysis of supply / existing & planned competing alternatives
- Thorough assessment of demand risk and related prevention / mitigating measures, for example:
  - correct “optimism bias”;
  - availability of complementary products/infrastructure;
  - pricing strategy.

Options analysis (I)

The options analysis is performed to assess and compare different alternative options which are found generally feasible to meet the existing and future demand for the project.

Two-step approach

1. Strategic options
2. Short-listed options at the technological level

Options analysis (II)

Strategic options analysis refers to the overall waste management system configuration and the general types of technology to be applied for waste treatment.

At this level the rationale for the economy of scale of the relevant types of waste treatment facilities shall be considered.

Options analysis (III)

Having the general structure of the project, next steps are:

1. Identification of a number of possible sites for the project facilities.

2. Screening of the suitability of the possible locations and technologies based on different criteria, for example the following:

- Potential capacity (i.e. in the case of a landfill site, estimated economic life after all the cells have been filled in).
- Hydro-geology conditions
- Accessibility conditions (e.g., proximity and quality of access roads).
- Connection conditions (electricty grid, heat network, water, wastewater)
- Public acceptance (i.e. chances of rejection by local communities and/or NGOs).
- Other factors (e.g., negative impact on economic activities in surrounding areas).

Options analysis (IV)

3. Definition of a number of alternatives for the project (self-sufficient to achieve the project objectives).

4. For each of the identified alternatives, quantification of all investment and operation and maintenance costs.

In practice, the selection of the most suitable alternative involves the verification of whether the overall impact expected from each one of the alternatives considered is the same:

- a. If this is the case, the most suitable alternative is the one that delivers the expected impact in a cost effective way.
- b. In those few cases in which the expected impact of the alternatives is significantly different then the economic analysis will be necessary to rank the different alternatives according to their economic return.

The selected alternative will be subject to detailed financial and economic analysis. If the minimum requirements of these analysis cannot be met (e.g., financial sustainability, affordability, adequate profitability), then the analysis of alternatives may have to be revisited.

Options analysis (V)

The comparison of the specific technological solutions covers comparison of different technological options for the individual components of the Project facility, its pros and cons, possible issues during the operation:

- Comparison of different options for the overall configuration of the facility, in particular the number of parallel treatment lines and their impact on land take-up, availability hours and down times for maintenance, investment cost, storage capacity, etc.);
- In case of WtE: selection of firing, steam boiler, flue gas treatment, slag, bottom and fly ash treatment technology, type of turbine applied for energy recovery and their impact on overall energy efficiency.

Options analysis (VI)

Good practice (1/2)

- Selection of options: ensure proper screening of options at the initial stage to make sure that no feasible option is left out
- Multi-Criteria Analysis: ensure selection of relevant criteria and an appropriate scoring and weighting system that does not automatically favor a certain solution
- Before technological comparison establish general requirements for the system.
- Quantitative analysis: Least cost analysis where benefits/externalities are similar for all options compared, otherwise a “simplified CBA”
- Also rely on risk assessment results where options have similar ENPVs

Options analysis (VII)

Good practice (2/2) Waste sector specific

Options analysis

- shall include only alternatives that are able to meet targets;
- shall take into account proven technologies;
- shall be based on realistic mass and energy balances;
- shall take into account final waste treatment solution;
- shall provide options for site selection;
- shall provide institutional options (i.e. PPP/non PPP);
- In case of collection/transfer components logistic optimization and cost analysis shall be provided to justify the need of investment.

Risk assessment (I)

„Risk assessment enables the project promoter to better understand the way the estimated impacts are likely to change if some key project variables turn out to be different from those expected. A thorough risk analysis constitutes the basis for a sound risk-management strategy, which in turn feeds back into the project design. Particular attention should be paid to climate change and environmental aspects."

What are risks to which municipal waste management projects are exposed ???

What are risk prevention and mitigation measures to manage, eliminate, or reduce risk to an acceptable level?

Risk assessment (II)

The list of mandatory risks for waste management project to be included in the risks assessment – Annex III of the implementing Regulation 2015/207

Examples of risks for municipal waste management projects:

Risk description	Risk prevention /mitigation measures
Waste flow significantly lower than predicted (lower generation, lack of waste stream control)	• Conservative assumptions on waste generation, • Strong institutional set-up (agreements with municipalities covered by the project, creation of association of municipalities)
Composition and calorific value of the actual input waste are outside of the range used to design the plant	• Waste composition based on tests • Changes in waste composition assumed in the demand forecast
Delays in: - Public procurement, - Internal approval - Obtaining permits	• Appropriate planning (time contingencies included in the project schedule) • Capacity of project implementation unit

Risk assessment (III)

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Examples of risks for municipal waste management projects:

Risk description	Risk prevention /mitigation measures
Inadequate surveys and investigation e.g. inaccurate hydrological predictions	• Hydrological, geological surveys should be carried out at the early stage (preferably at the level of options analysis)
Tariff (gate fees) increases slower than predicted Tariff (gate fees) collection lower than predicted	• Compensation agreement with the municipalities
Changes of environmental requirements, economic and regulatory instruments (i.e. introduction of landfill taxes, bans on landfilling)	• Evaluation of current and planned changes in legislation at national and EU level • Sensitivity analysis

Sustainability of the project results

- The overall institutional set up is stable and well established
- The beneficiary's /operator's has adequate capacity (technical, legal, financial and administrative)
- Financial sustainability at the level of the project and the beneficiary/operator
- Solid bases for assumptions on costs and revenues
- Waste stream control guaranteed
- Take off the project's outputs guaranteed (i.e. recyclables, electricity, heat, RDF, compost)
- Stable tariff policy
- Relevant mitigation measures are considered, taking into account identified risks to the sustainability of the project




Thank you!

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