ACP - EU Energy Facility
Monitoring

Feasibility studies

What does a good feasibility study contain?

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Feasibility studies – a kind of definition…

- A **feasibility study** is a process that defines exactly what a project is and what strategic issues need to be considered to assess its feasibility, or likelihood of succeeding.
- A management-oriented activity:

  - After a feasibility study, management makes a “go/no-go” decision.

  BUT also a tool to be used and updated during the implementation me

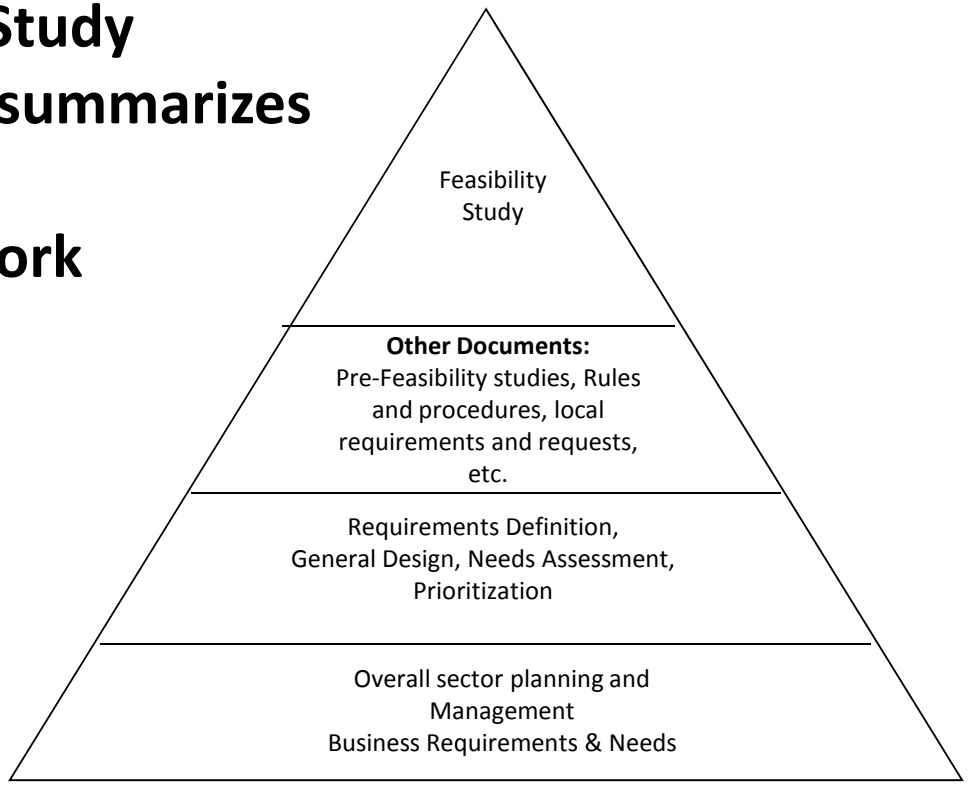
The goals of the Feasibility Study

The goals of the Energy Feasibility Study are to:

- Streamline and add value to the decision-making process based on the results of the planning and design efforts.
- Recognize the role of the feasibility study in supporting resource requests for proposed energy investments.
- Introduce the concept of time value of money by incorporating Net Present Value, Internal Rate of Return, and Breakeven Analysis and financial measures in the financial analysis.
- Provide formats for clear and concise cost and benefit rationale to assist in the investment evaluation process.
- Analysing environmental impact and social consequences of the project

Building a Feasibility Study

The Feasibility Study references and summarizes previous design planning and work



Why an energy feasibility study?

Objectives:

- To find out if the energy project can be done:
  ...is it possible?
  ...is it justified?
- To suggest possible alternative solutions and at least describe a baseline
- To provide management with enough information to know:
  - Whether the project can be done
  - Whether the energy project will benefit its intended users
  - What the alternatives are (so that a selection can be made in subsequent phases)
  - Whether there is a preferred alternative

What to study and conclude?

Types of feasibility

- Technical
- Economic
- Time Schedule
- Operational

Quantifying benefits and costs

- Payback analysis
- Net Present Value Analysis
- Return on Investment Analysis

Comparing alternatives

Technical feasibility

Is the project possible with current technology?

- Availability of the technology:
  - Is it available locally?
  - Can it be obtained?
  - Will it be compatible with other systems?

Technical Feasibility

Is the proposed technology or solution practical?

- Do we currently possess the necessary technology?
- Do we possess the necessary technical expertise
  - …and is the schedule reasonable for this team?
- Is relevant technology mature enough to be easily applied to our problem?
- What kinds of technology will we need?

Some organizations like to use state-of-the-art technology

- …but most prefer to use mature and proven technology.
- A mature technology has a larger customer base for obtaining advice concerning problems and improvements.
- Is the required technology available “in house”?
- If the technology is available:
  - …does it have the capacity to handle the solution?
- If the technology is not available:
  - …can it be acquired

Financial feasibility

Is the project possible, given resource constraints?

What are the benefits?

- Both tangible and intangible
- Quantify them!

Energy prices and Energy demand

What are the development and operational costs?

Will the project result in reasonable tariffs?

Are the benefits worth the costs?

Financial Feasibility

Can the bottom line be quantified yet?

- Very early in the project…
  - a judgment of whether solving the problem is worthwhile.
- Once specific requirements and solutions have been identified…
  - …the costs and benefits of each alternative can be calculated in Cost-benefit analysis

Answer questions such as:

- Is the project justified (i.e. will benefits outweigh costs)?
- What is the minimal cost to attain a certain technical solution?
- How soon will the benefits accrue?
- Which alternative offers the best return on investment?

Analyzing Costs vs. Benefits

Identify costs and benefits:

- Tangible and intangible, one-time and recurring
- Assign values to costs and benefits
- Energy demand, energy prices, etc.

Determine Cash Flow:

- Project the costs and benefits over time, e.g. 3 - 5 – 15 years
- Calculate Net Present Value for all future costs/benefits

  - determines future costs/benefits of the project in terms of today's euro values

  - A euro earned today is worth more than a (potential) euro earned next year!

Do cost/benefit analysis:

- Calculate Return on Investment:

  - Allows comparison of lifetime profitability of alternative solutions.

Consider and decide upon:

- the numbers of consumers of various social backgrounds and service levels,
- the level of consumption per consumer, demand development per category of consumer (e.g. connection rates, metering rate, energy consumption, etc.),
- the tariff evolution and ability to pay of clients,
- the access fee (or connection fee) applied to various type/classes of consumers,
- O&M requirements including management and administration,
- renewals and repairs
- taxes
- financial charges (interests and principal) on existing loans and credits (i.e. contracted before the start of the Project).

Time Schedule feasibility

Is it possible to build a solution in time to be useful?

- What are the consequences of delay?
- Any constraints on the schedule?
- Can these constraints be met?

Time Schedule Feasibility

How long will it take to get the technical expertise?

- We may have the technology, but that doesn't mean we have the skills required to properly apply that technology.
- May need to hire new people Or re-train existing systems staff

  Whether hiring or training, it will impact the schedule.

Assess the schedule risk:

- Given our technical expertise, are the project deadlines reasonable?
- If there are specific deadlines, are they mandatory or desirable?
- If the deadlines are not mandatory, the analyst can propose several alternative schedules.
- What are the real constraints on project deadlines?
- If the project overruns, what are the consequences?
- Deliver a properly functioning energy system two months late…

  …or deliver an error-prone, useless system on time?

  Missed schedules are bad, but inadequate systems are worse !

Operational Feasibility

If the system is developed, will it be used?

How do end-users and managers feel about…
…the problem you identified?
…the alternative solutions you are exploring?
You must evaluate:

- Not just whether a system can work…
  … but also whether a system will work.

Any solution might meet with resistance:

- Does management support the project?
- How do the end users feel about their role in the new system?
- Which users or managers may resist (or not use) the system?
- Remember people tend to resist change.
- Can this problem be overcome? If so, how?
- How will the working environment of the end users change?
- Can or will end users and management adapt to the change?

Human and social issues…

Potential labour objections?

- Manager resistance?
- Organizational conflicts and policies?
- Social acceptability?
- Legal aspects and government regulations?

Risk and Sensitivity Analysis

- Consider three scenarios:
  - Optimistic
  - Realistic
  - Pessimistic
- in energy costs
- operational costs
- investment cost
- interest rates
- tax rates

Energy Feasibility Project – outline example of an Inventory

Summary and Conclusions

Background information – description of the project area

Analysis of:

- current energy supply
- demand forecasts
- energy options analysis

Outline of the energy project:

- Cost estimate
- Project implementation

Economic and financial analysis

Environmental and social analysis

Finally

- Please remember to be involved in the preparation and understand the feasibility study – it is NOT only for project applications – it is also to be used under and after the implementation
- Updating of feasibility studies (demand, prises etc.) have to be expected
- Differences between feasibility and pre-feasibility studies - Degree of certainty
- Be careful not to be biased towards a specifically technology