

5. DEVELOPING A PLAN FOR A BIOGAS POWER PLANT

This chapter provides guidelines about the layout of a biogas plant and the planning and building process of a biogas power plant.

5.1. Setting up a biogas plant project

The aim of establishing a biogas plant can vary from environmental protection and waste reduction to renewable energy production, and can include financial and non-financial incentives. Local farmers and farmer's organisations, organic waste producers and collectors, municipalities, energy producers and other involved actors are the usual initiators of biogas projects. From the vital spark of a biogas project idea to the end of its life-time, the process undergoes the following steps:

1. Project idea
2. Pre feasibility study
3. Feasibility study
4. Detailed planning of the biogas plant
5. Permission procedure
6. Construction of the biogas plant
7. Operation and maintenance
8. Re-investment, renewal and replacement of components
9. Demolition or refurbishment

In order to define a concrete biogas project idea, following questions must be answered.

- (i). The aim of the biogas project.
- (ii). The capacity of the investor to realise the project.
- (iii). How can continuous and uniform supply of feedstock be secured.
- (iv). The place where biogas plant can be located.

The central premises for the implementation of a biogas project are the existence and availability of the feedstock supply. Furthermore, the possibility of selling or using the end products of the biogas plant, namely biogas/ biomethane, electricity, heat and digestate, has to be ensured. The next step is to assess if the project is feasible in

local conditions. Thereby the following issues must to be considered:

- (i). Defining and evaluating a business plan and a financing strategy
- (ii). Involving an experienced planning company
- (iii). Involving, from early stages of the project, other key actors (local authorities, municipalities, feedstock suppliers, financing companies and the general public)

Each project is individual and needs unique approaches (site specific projects), although some generic steps are similar for all biogas projects (Figure 8.1).

The process starts with the project idea and the first feasibility check (which can be done by using the Big East calculation model in the attached CD). If the project initiator and the investor arrive to the point of making a decision, an experienced biogas consulting company should be involved at this stage. The assistance of an engineering company (e.g. general contractor) could be necessary as well.

In parallel to these project steps, the financing scheme has to be developed. The concrete financial situation determines the steps to be taken. The usual practice is to self-finance the project up to the point of ready-made preliminary planning, without any involvement of banks or external financiers. If this is not possible, doubts could occur about the project itself, or about the reliability of the investor. Anticipating advantages and risks of the investment is also a consideration which has to be made by the investor.

The preliminary planning sum up all boundary conditions (technological aspects and investment budget), which are important for an external financier. A preliminary planning report should be handed out to potential financiers. The potential financiers could be banks, institutional investors, private persons, groups of private persons, etc. A non disclosure agreement (NDA) is recommended to be signed with those who receive the preliminary planning report.

The financing options depend to a great extent on local conditions and on the situation of the project initiator, so there are no universal guidelines for this.

5.2. Schematic Diagram of a Biogas Power Plant



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Figure 5.1- Schematic diagram of a power generating system using biogas from garbage

