

The concept of centralised co-digestion

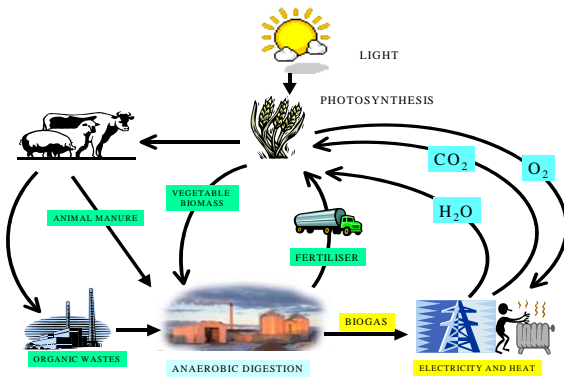
The concept of centralised co-digestion is based on producing biogas by anaerobic co-digestion of animal manure and slurries and a variety of suitable organic wastes from agriculture, food processing industries, households etc. The centralised co-digestion plants are located in the areas with a high concentration of manure, in order to minimise the transportation costs.

Animal slurries are collected from the pre-storage tanks of several farms in special vacuum container trucks and transported to the biogas plant, where they are mixed with organic wastes, homogenised and pumped in the digester tank. The digestion process takes place at mesophilic (30-40 °C) or thermophilic temperatures (50-55 °C). A controlled sanitation process takes place as well, where pathogens are effectively reduced, and the contamination cycles are broken.

The digested slurry -now called digestate- is pumped from the digesters to the gas proof storage tanks, where the remaining gas production (up to 15% of total) is recovered and joins the gas produced in the digesters. The produced biogas is used for combined heat and power generation. The digestate is transported at the storage tanks of the farmers, placed out in the fields and applied on the crops as an integrated part of the fertilisation plan of each farm, replacing mineral fertilisers. The excess of digestate is sold to the crop farms in the neighbourhood. This way, a redistribution of the excess of nutrients takes place in the area. Some plants are equipped with installations for liquid and fibre separation of digestate. These technologies are under development.

The centralised co-digestion cycle represents an integrated system of manure and organic waste treatment and renewable energy production, generating some intertwined environmental and economic benefits:

- Production of renewable energy
- Cheap and safe recycling of organic waste
- Less emission of greenhouse gases
- Pathogen reduction through sanitation
- Improved fertilisation efficiency and redistribution of the excess of nutrients
- Reduced nuisance from odours and flies
- Savings for farmers



List of project partners and key persons

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Further information about the PROBIOGAS project is available at www.sdu.dk/bio, or by contacting the project co-ordinator:

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PROBIOGAS

**Promotion of Biogas
for Electricity and Heat Production
in EU Countries**

**Economic and Environmental Benefits
of Biogas
from Centralised Co-digestion**

Project period. 01.01.2005-30.06.2007

Project co-ordinator:

University of Southern Denmark
Bioenergy Department
Esbjerg, Denmark

Premises

Over the last 30 years, cost efficient biogas production systems were developed in Denmark, supported by governmental RD&D programmes. The results from Denmark prove that biogas from centralised co-digestion is a multifunctional technology, providing quantifiable environmental and economic benefits for agriculture, industry, energy and the overall society and is a very competitive tool in reduction of emission greenhouse gasses.

Aims and objectives

The PROBIOGAS project aims to transfer experience of the best practice of utilising RES and by this to promote the production of biogas for electricity and heat in EU countries. The project aims to raise awareness by proving that biogas is economically and environmentally beneficial to local communities and to the society as a whole and can contribute to achieving national climate and environmental protection objectives. The main objective is to transfer and apply existing knowledge to selected case studies in partner countries and to disseminate the obtained results to the project target groups and to a broad European level.

Short-term objectives:

- To assess and quantify a range of environmental and economic costs and benefits for the selected biogas case studies.
- To give a clear picture of the specific incentives and non-technical barriers for the development of biogas in the respective area
- To disseminate, transfer and implement and at European level knowledge, positive results and experience in the area of biogas.

Long-term objectives:

- To provide a platform of documentation and to offer incentives for the decision makers and the biogas investors to initiate and develop biogas projects
- To create platforms for the development of new policy initiatives
- To motivate decision and policy makers to initiate necessary legal changes to remove non-technical barriers
- To enable the Target Group Networks to form the organisational structure necessary for initiating specific biogas projects.
- To further develop the European biogas market and the market for biogas based electricity and heat
- To accelerate the development of biogas systems all over Europe

Method

The project will assess and quantify the environmental and economic potential of biogas from anaerobic digestion in some selected case studies. The environmental and economic costs and benefits will be assessed based on a welfare-economic methodology, in which derived advantages and drawbacks are quantified and monetised.

The work

The assessment work will involve six case studies in partner countries, where biogas technologies are not very developed. The assessment work is carried out by the experts of the Assessment Core Group, in collaboration with the National Partners. The members of the project target groups will be interactively involved from early stages in the data collection and continuous dissemination processes. The final project results will be concretised in assessment reports and will be disseminated by a European seminar. A continuous dissemination will be provided by the means of web page (www.sdu.dk/bio), newsletters, conference papers, overall networking and collaboration with other networks and organisations etc.

Expected results

It is expected that the assessment reports will clarify the incentives and the barriers for each national target group and will establish a platform for the initiation of new future policy initiatives for the development of biogas. It is further expected that policy makers will subsequently initiate necessary legal changes to remove the identified non-technical barriers and to create favourable conditions for the development of biogas. The national target group networks will form the organisational structure necessary for initiating specific biogas projects. National authorities and policy makers will become aware of biogas as a multifunctional and cost efficient tool for RES implementation and GHG mitigation.

Target groups and key actors

The accomplishment of large biogas projects is very complex and involves a variety of main actors, persons, organisations and authorities, defined by this project as the Target Group Networks (TGN). The Target Group Networks form the organisational structures applicable for the future biogas project initiatives. From the early stage of the project, the networks interact with the national partners, contributing to the data procurement process and they also represent the main target for dissemination.

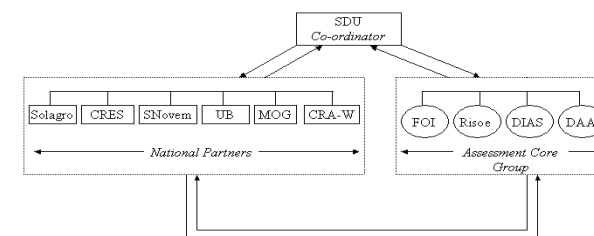
The aimed structure of Target Group Networks (TGN):

1. Policy makers from the selected regions.
2. Local, regional and national authorities
3. Energy and energy trade companies
4. Energy and environmental agencies
5. Farmers and farmers associations and organisations
6. Local food processing industries
7. Veterinary services and control authorities
8. Energy and environment planning authorities.
9. Financing institutes

Policy makers are an important target group, especially in countries where removal of non-technical barriers and legal changes are crucial for the development of biogas.

The project partnership and management

PROBIOGAS: Management diagram



The National Partners are the key actors in the national activities, establishing and maintaining the Target Group Networks, procuring necessary data, analysing non-technical barriers and elaborating the national assessment reports, in close collaboration with the Assessment Core Group.

The Assessment Core Group is an experienced team of Danish researchers, who in co-operation with the National Partners will assess the potential of biogas in each selected case study, with respect to environmental benefits, cost efficiency and externalities related to biogas production.

The Coordinator is providing the technical and financial management of the whole project activity, the overall collaboration and networking and the dissemination of results.