WASTE MANAGEMENT & BIO-ENERGY PRODUCTION

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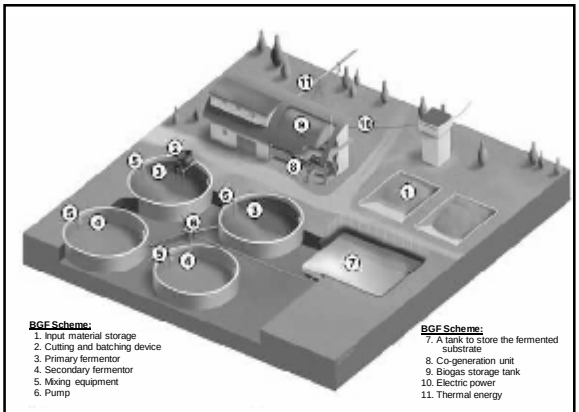
Primary farming Has Very Favorable Conditions for Operating Biogas Generating Facilities (BGF)

- Has sufficient acreage of prime agricultural land to allow biomass production and to apply fermented substrates made from BGF,
- Has animal waste available (dung-water, muck, manure, liquid manure) suitable for the production of biogas in biogas generating facilities,
- Has the technological equipment suitable for the production of biomass,
- Has storage facilities for the biomass produced,
- Can utilize the heat energy generated in BGFs.

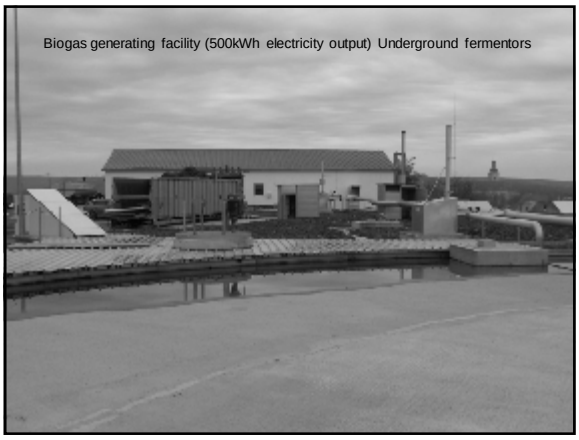
A Biogas Generating Facility's Goal

- Positive economical effect for a farming business (the sales of electricity to retail electricity consumers and the ability to cover a company's own electricity consumption) For a farming business, the building of field dung holes, manure pits and other such storage tanks is a non-profit investment, compared to establishing a BGF.
- High quality organic manure (liquid manure hygienization, liquid manure's caustic effect reduction, reduction in the germinative capacity of weed seeds, reduction of nutrient losses, particularly that of nitrogen)
- Positive environmental effect – water and air protection
- The possibility of utilizing food processing industries' waste and slaughterhouse waste, the disposal of biological household waste and general municipal waste (the fees paid for the disposal of such substances in the EU Member Countries usually amount from €20 to €70 per metric ton).
- Subsidies to energy-intensive crops producers in the EU Member Countries (€45 per hectare)

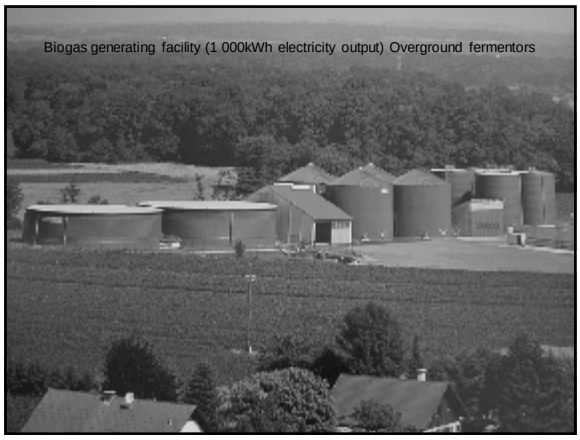


BGF Scheme:
1. Input material storage
2. Cutting and batching device
3. Primary fermentor
4. Secondary fermentor
5. Mixing equipment
6. Pump

BGF Scheme:
7. A tank to store the fermented substrate
8. Co-generation unit
9. Biogas storage tank
10. Electric power
11. Thermal energy



Biogas generating facility (500kWh electricity output) Underground fermentors



Biogas generating facility (1.000kWh electricity output) Overground fermentors

Factors Critical for the Effectiveness of a Biogas Generating Facility:

- The amount and quality of the input material entering the BGF (biogas yield per liquid manure metric ton only reaches 20 to 30 cubic meters, for corn this value goes up to 200 cubic meters of biogas per ton),
- Profitability of non-agricultural materials processing (meat and bone meal, food processing industrial waste, slaughterhouse waste, biological household waste and general municipal waste)
- Transportation distances to be traveled to deliver biomass to a BGF and fermented substrate application,
- Technology needed for the harvesting and storage of biomass,

- Co-generation unit's effectiveness, costs required for maintenance and servicing,
- Heat utilization (especially during summer seasons) is a particularly important aspect affecting the economy of a BGF; for instance, the heat generated by a BGF can be used year-round for drying wood or for bioethanol production,
- Fermentor types: Underground fermentors have a lower heat consumption to heat the mass being fermented and the filling of such (underground) fermentors is easier and simpler in terms of technology and less demanding in terms of energy consumption, compared to overground fermentors.
- An important factor is also the energy consumption of pumps, BGF stirrers, and costs required for their servicing and maintenance,