



Sustainable small-scale biogas production from agro-food waste for energy self-sufficiency

FABIOGAS workshop

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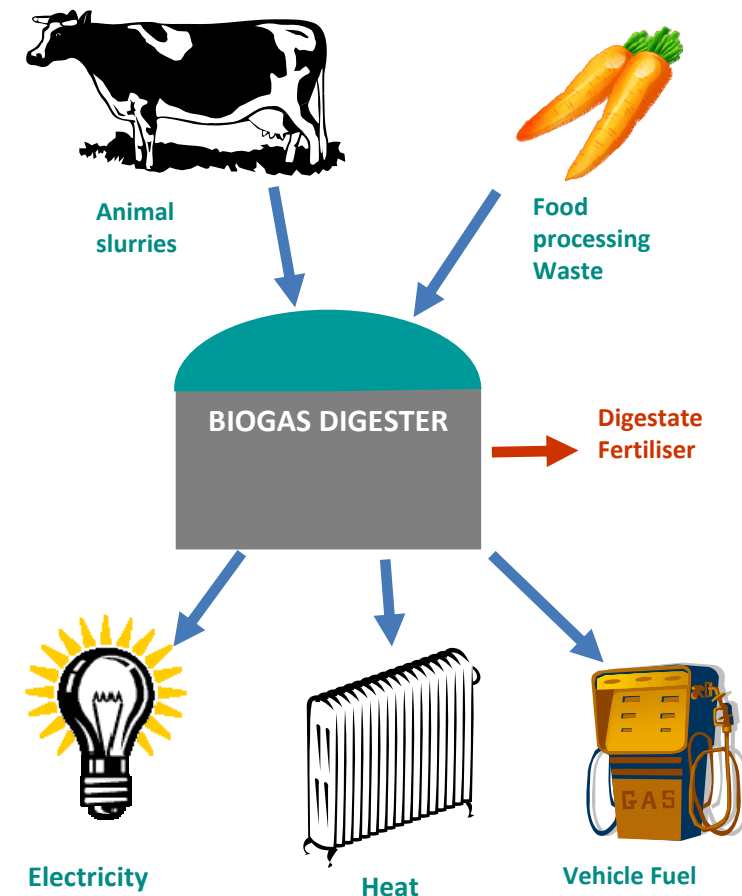
About BIOGAS³

- European project aiming to promote small scale biogas plants in agro-food industries for self-consumption
 - SMALL SCALE BIOGAS PLANTS
 - AGRICULTURAL WASTE
 - FOOD PROCESSING WASTE
 - ENERGY SELF-CONSUMPTION



What is biogas?

- It is a fuel gas (similar to natural gas) obtained from microbial degradation of organic matter in absence of oxygen.
- It can be used to produce **heat, electricity** or be used as **vehicle fuel** after purification.



Which materials can produce biogas?

- **Agricultural waste**
 - Animal slurries
 - Harvest residues
 - Grass
- **Food processing waste**
 - Meat/fish processing waste
 - Dairy waste
 - Brewery spent grains
 - Vegetable waste
 - Waste from prepared food factories
 - Sludge from waste water treatment plants



Example of a farm small-scale biogas plant

Fahringer farm, Rettenschöss (Austria)



Small-scale biogas plant (self-built, low-cost).

Feedstocks: cattle slurry

Energy use: heat for the housing and the cheese plant.

Digester: 150m³ concrete tank

Biogas valorisation unit: 50kW boiler.

Gas production : 150-180m³ biogas/day

Investment: 35,000€

$150 \text{ m}^3\text{biogas/day} \times 5 \text{ kWh/m}^3\text{biogas} \times 365 \text{ day/year} \times 0.03 \text{ €/kWht} \times 0.8 \text{ (boiler yield)} = 6,570 \text{ €/year}$

Assuming O&M costs equivalent to 5% of investment per year: 1,750 €/year

Benefit = 6,570 – 1,750 = 4,820 €

Estimated payback period = 7 years

Data obtained from a report of BIOREGIONS project (www.bioregions.eu)

Example of a food waste small-scale biogas plant

University of Southampton Science Park (UK)

Data from SEAB energy (seabenergy.com)



Small-scale biogas plant, containerized, by SEab Energy Ltd (Model Muckbuster®)

Feedstocks: 410 L/day of kitchen food waste, cooking oil and spent alcoholic drinks.

Energy use: electricity and heat used in the business park offices and research labs.

Biogas valorisation unit: 8kW CHP engine.

Biogas production: 46m³/day

Electricity production: 35MWh/year

Investment: 120,000 €

Annual operation and maintenance costs: 6,000 €

Energy savings: 3,380 €

Heat savings: 1,810 €

Waste management savings: 12,470 €

Digestate value: 1,170 €

Payback period: 4 years (with feed-in tariffs). Estimated in 9 years without feed-in tariffs.

In this case, the power of the biogas plant is under-used. The plant has the capacity to produce 64MWh/year and it is only producing 35MWh/year. At full load, the payback period without feed-in tariffs would be reduced to 7 years.

What can BIOGAS³ afford me?

- Free training courses & workshops
 - On-line and face-to-face
 - Choice of basic courses, specialised workshops, webinars...
- Personalised feasibility studies
 - With the software smallBIOGAS, to check if your feedstock and site are suitable for a small-scale biogas plant.
- Networking and one-to-one activities
 - Contact to specialised biogas plant technologists and technology centres that will help you to outline the best project
- Implementation of new small-scale biogas plants



I'm interested, how can I take part?

- Contact your local partner!

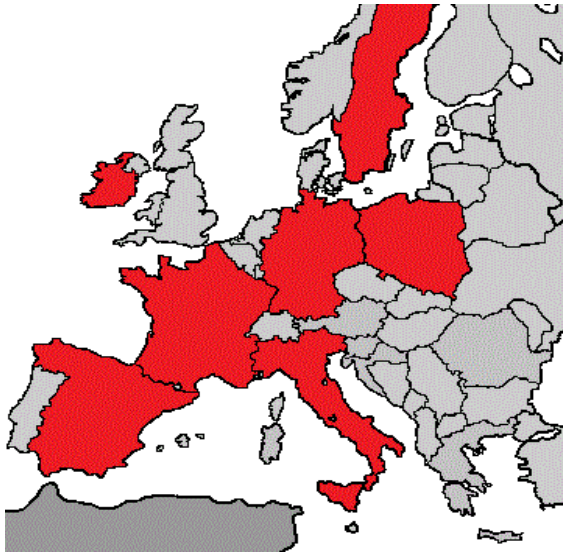
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The team of BIOGAS³



Partner Organisations:

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- ACTIA, IFIP (France)
- TCA, DEIAFA (Italy)
- RENAC (Germany)
- FUNDEKO (Poland)
- JTI (Sweden)
- IrBEA (Ireland)

