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Biogas from Poultry Waste – a case

Presented by Theo Bijman, Dorset symposium June 2014

Nijhuis Water Technology BV

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WHAT WE DO

WHY WE DO IT

Realizing the value of waste & water

Waste water

Oil

Fats

Proteins

Nitrogen

Starch

Phosphorus

Waste

Manure

Process water

Animal feed

Fertilizers

Biofuels

Green gas

Ingredients

Heat

Energy

Algea

Water Treatment | **Recycling** | **Waste to Valuable**

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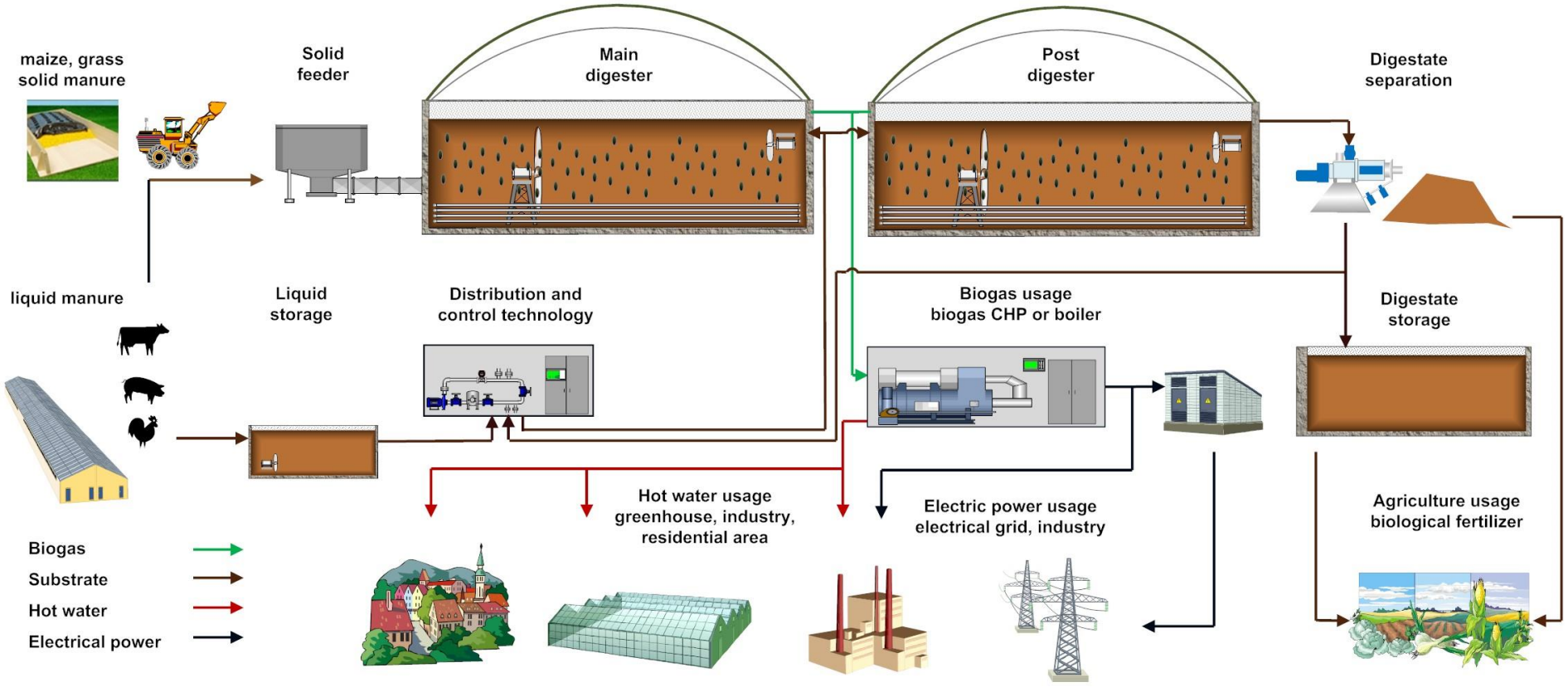
Anaerobic Digestion concepts



Basics of chicken litter digestion

- Every kg of organic matter will yield 0,5 m3 of biogas.
- Biogas contains between 50 – 60% CH4 and has a heating value of 5 to 6 kW.
- For comparison: 1 litre of diesel has a heating value of 10.4 kW.
- 1 m3 of Natural Gas has a heating value of 9.3 kW.

- 1000 kg of Chicken litter (55% DM , containing 42% OM) will yield approx. 200 m3 biogas

Basics of chicken litter digestion

- 1000 kg of Chicken litter (50% DM) contains approx 27 kg of Nitrogen
- with 10 kg in soluble form NH3-N.
- NH3-N inhibits the anaerobic digestion when >4kg/m3.
- Solution: -Dilution with 5 m3 water
    - - Removal of ammonia through stripping.

- Biogas from chicken litter will produce biogas with high H2S levels (>2000 ppm).
- This is corrosive and needs to be removed in a scrubber.

- It takes about 30 days for complete digestion of chicken litter.

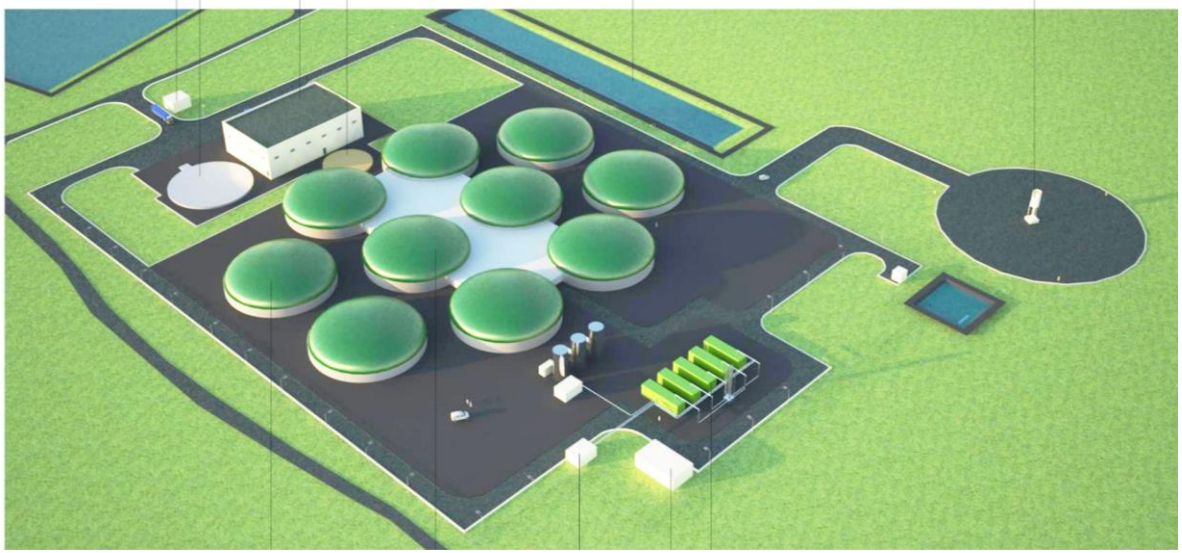
- A digester tank of 2000 m3 can handle approx. 17 ton of chicken litter/day.
- This would give you 3400 m3 biogas.

- 1 m3 of biogas in a biogas engine can produce approx. 2.1 kWhe of electricity and 2.5 kWth heat

Basics of chicken litter digestion

- Project :

- Ukraine: - 134 ton of chicken litter
  - - 107 ton of Sorghum
  - - 100 ton of sludge and waste streams
  - from poultry slaughterhouse
  - - 450 ton of waste water for dilution.



Basics of chicken litter digestion

Production: 2200 m3 biogas/hr.

5 MWe CHP +
Biogas towards boiler room

Heating for chicken Barns

Investment: - € 13 million
Revenues: - € 3.6 million/yr
- Heating
- 5000 ha of improved crop yields

Basics of chicken litter digestion

- The advantages of anaerobic digestion are:
-
- Generation of “green power”.
- Improved manure composition and less odour
- No acidification of the soil as digistate has a pH of 8
- Higher availability of nutrients, higher crop yields
- Reduction in the emission of greenhouse gases
- Contribution to a sustainable agricultural sector



Questions ?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SOLID SOLUTIONS IN A FLUID WORLD