Methane to Markets

The Kindersley Centre, Berkshire

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Department for Environment
Food and Rural Affairs

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Dry AD systems: A UK - Swiss Perspective

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Active Compost Ltd and Kompogas AG

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Switzerland: Population 7.52m 41.3k sq km

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Swiss Biogas Plants

Source: Swiss Biogas Forum

	Agricultural	O.F. MSW	WWTP (+ co-digest)
Number (Kompogas >30 ww)	17	12 KG = 10 2006	19+2
Average reactor Volume((cum)	270	603	838
MWh/a Total 2218	203	747	1268

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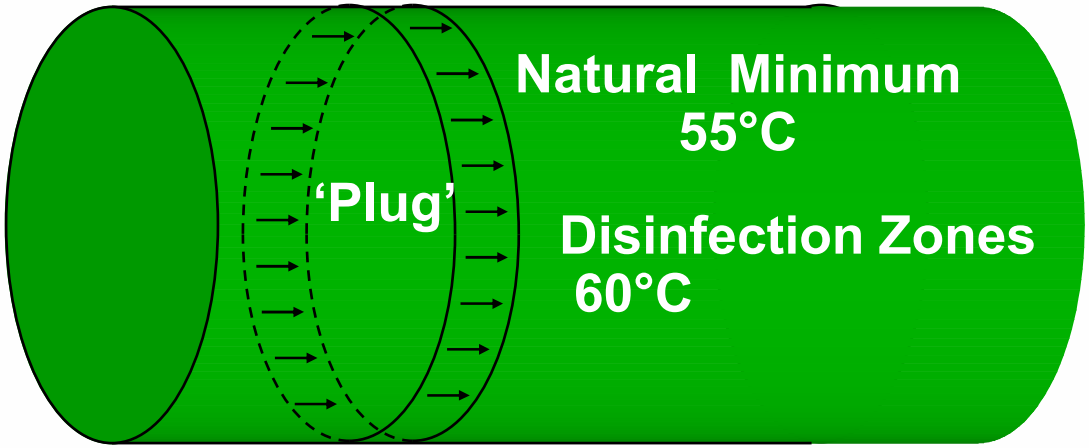
Dry system, Plug flow, Thermophilic process

- Defined retention time
- All conditions under control (acid profile)
- Defined order of biological process stages
- No short circuits
- Disinfection within the Plugflow or higher spec' input / output treatment zones (EU Standard)

Active Compost



Advantages over mesophilic systems:

- Hygienic
- High gas yield

Controlled, Hygienic. Minimal or nil water addition.

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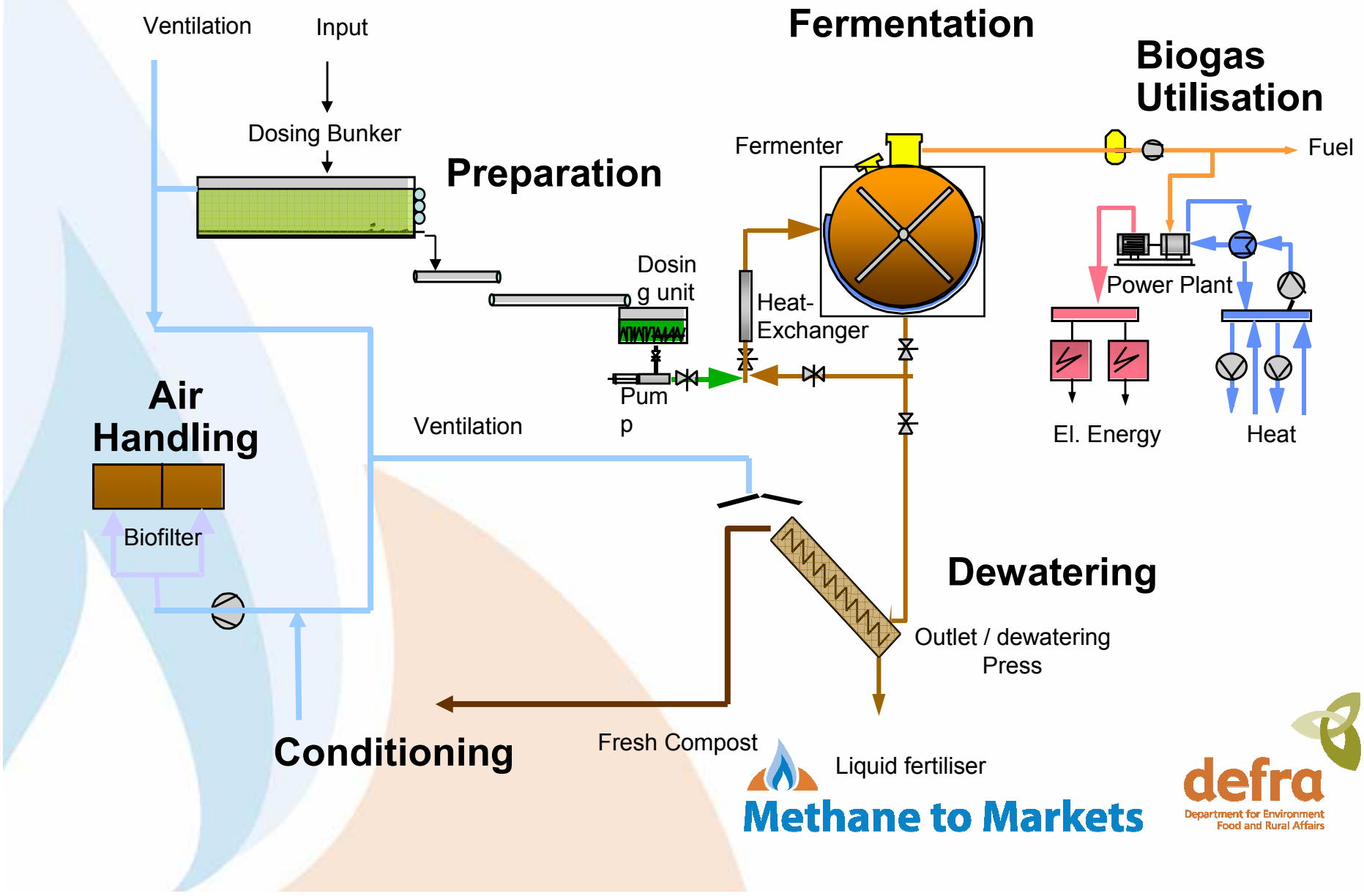
Ventilation
Input
Fermentation
Biogas Utilisation
Dosing Bunker
Preparation
Fermenter
Fuel
Dosin g unit
Heat-Exchanger
Power Plant
Air Handling
Pum p
Ventilation
El. Energy
Heat
Biofilter
Dewatering
Outlet / dewatering Press
Conditioning
Fresh Compost
Liquid fertiliser
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Kompogas Global: *Far East > Europe > Caribbean*

Examples for
Local Solutions
/ Communities

5 > 100k tpa

Food and Fish

Agri-business

Urban

Biofuel business

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Products: Digestate / Compost

	Finished compost post-AD process
pH	7.5-8.0
Total solids %	50 – 60
Organic Matter %	40 – 55
Total-N kgt^{-1}TS	9 – 15
Available-N kgt^{-1}TS	1- 1.5 **
Phosphate (P_2O_5) kgt^{-1}TS	7 - 9
Potassium (K_20) kgt^{-1}TS	7 - 12
Calcium kgt^{-1}TS	12 – 132
Magnesium kgt^{-1}TS	5 – 6

** NOTE AVAILABILITY

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Products:

liquid fertiliser

Components	Presswater after press
DS %	ca. 12 - 15%
VS % TS	45 – 55%
Nitrogen mgN/l	4`000 – 5`500
Ammonium N mg/l	2`000 – 3´000
BOD mg/l	7´500 – 10´000
COD mg/l	90´000 – 120´000
pH	7,5 – 8,5

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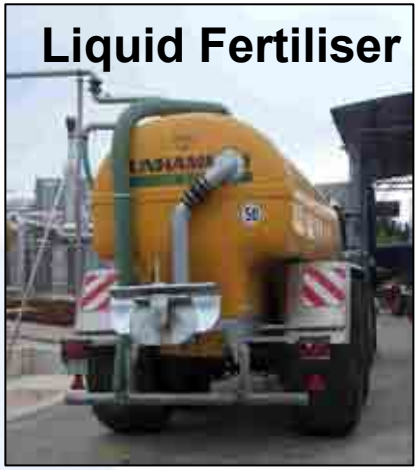
End-products from fermentation

Active Compost



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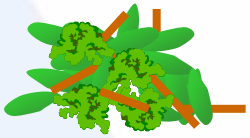
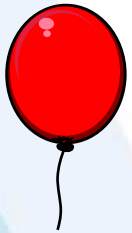
How much energy does biogenous waste contain?



10,000 t biogenic waste produces



1,150,000Nm³ KOMPOGAS (Biogas) (O.F. municipal)

Energy production of gas driven Block Type CHP:

2,200,000 kWh electrical energy and

3,800,000 kWh thermal energy.

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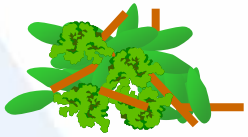
How much energy does biogenous waste contain?



10,000 t biogenic waste typically produces

1,150,000 Nm^3 KOMPOGAS which contains

6,670,000 kWh total energy which is equivalent to

693,000 l diesel fuel with which one can drive

10,000,000 km in a car (CO_2-neutral) (1kg = 1 km)

Agri-wastes may be double the energy source of town wastes! (*Source: Swiss Biogas Forum*)

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New Opportunities

- Diversification
- Fuels
- Vehicles
- Micro-CHP
- Hydrogen Economy

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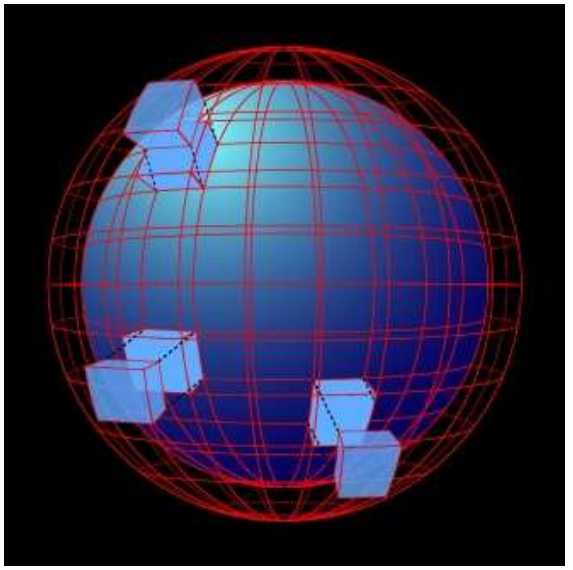
Money Makes the World go Round

Business model can be waste + energy or bioenergy



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- **Now: Gate fee = 40 – 50 € (27-35 GBP) depending on financing**
- **Energy = 30% of income (OF MSW)**
- **Expectation by 2012: OF MSW Energy = 70% of income**
- **High gate fees result in low-tech systems, quick profit to investors and high environmental costs**
- **Agri-projects >>>>> 100%?**

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Barriers or Opportunities?

Dry Anaerobic Digestion is a proven technical solution but there are barriers to overcome:

- **Awareness of options**
- **Risk aversion despite global evidence that it works**
- **Regulation as a waste process or processes rather than as an energy / manufacturing business**
- **Short-term low cost solutions *vs.* whole-life cycle gain**

Leading the world in high-solids AD

KOMPOGAS

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License partners, worldwide