

Bio-waste technologies – challenges imposed by EU regulations

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From strategies to activities – good practice examples of regional bioenergy promotion

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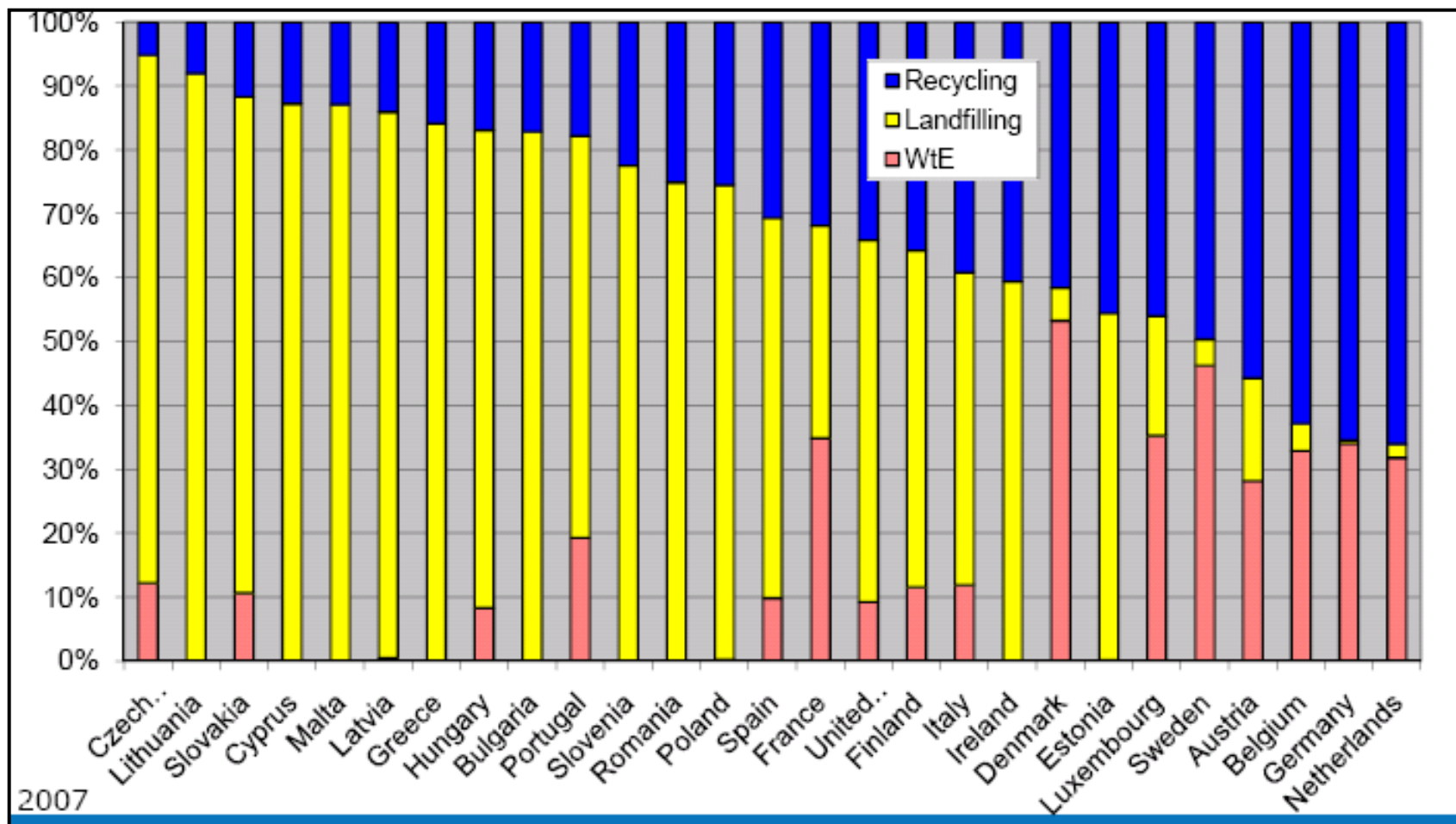


**Bałtycki Klaster
Ekoenergetyczny**



Methods for management of municipal waste in UE countries (2007)

Source: Eurostat



2007



Bioenergy Promotion



Baltic Sea Region
Programme 2007-2013

Local strategies

Various local strategies



Local authorities concentrate on various models of waste treatment:

- Zero – waste policy
- Detailed sorting of waste materials:
 - high cost but
 - effective implementation of sustainability criteria
 - high efficiency of materials recovery
 - preferred by EU legislation
- General treatment of all waste with minimal sorting:
 - low price,
 - mainly WtE policy,
 - low level of material recovery.



Technologies for organic substrates

Combustible (organic waste) could not be landfilled in near future

Biodegradable municipal waste going to landfills must be reduced to **75% in 2010**, **50% in 2013** and **35% in 2018** of the total amount of biodegradable waste produced in 1995

Technologies for organic waste utilisation :

- dry organic waste: combustion, gasification,
- wet organic waste: anaerobic fermentation (biogas)
 - composting
 - methanol or ethanol fermentation (lignocellulose)

Combustion – no sorting



Technologies – no sorting

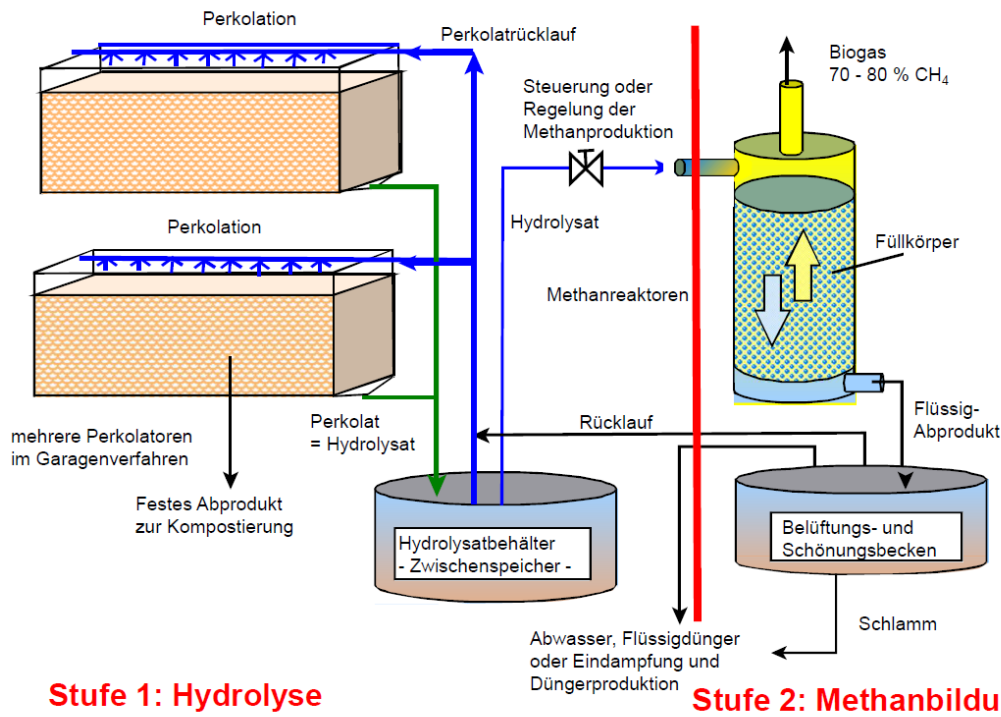


Perkolator in Containerbauweise



GICON-Biogas-Verfahren Fließbild

GICON



Two-stage
dry fermentation
GICON – Cottbus

poferment combusted

Technologies – no sorting

The technology of pressure extrusion (Vmpress- Italy)

The pressure extrusion process consists in the high-pressure (600–1000 bar) treatment of Municipal Solid Waste.

- the waste is squeezed in special extrusion chambers fitted with holes in the external surface.



- the organic part of the waste is extracted through the holes and physically separated from the dry one.

- dry fraction as it exits from the extruder press can be utilized in grid burning plants or can be used for production of high quality fuel (RDF)

- wet fraction is suitable to be utilized into anaerobic digestion plants for the production of biogas considerable reduction of waste volume (1→1/3), **energy efficiency ~40%**

Technologies – sorting



Linköping - Szwecja

Technologies – sorting

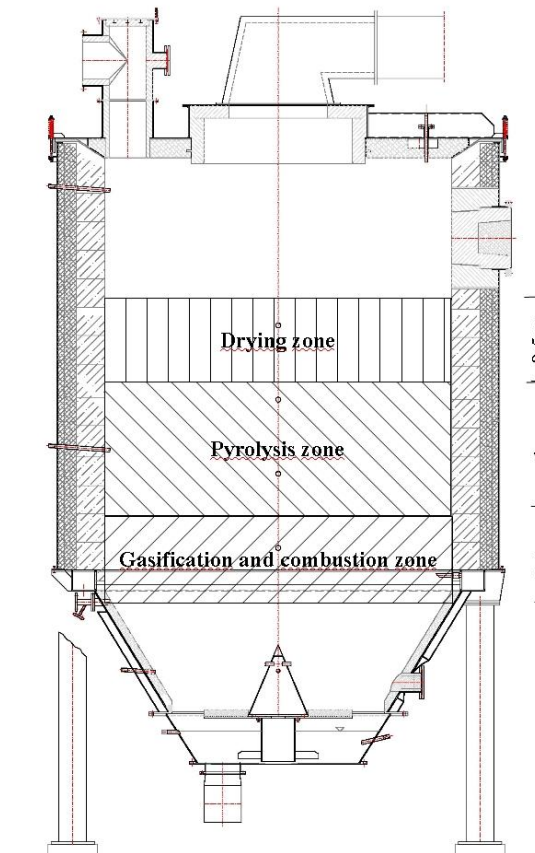
Gasification installation in Indykpol Olsztyn (Poland)



fader and turkey waste



fader and chicken waste





Gasification installation 1,5 MW_t



Paruszowice - Poland



Bioenergy Promotion 2



**SEKAB Domsjö
first biorafinery working
on wood waste**

Technologies – sorting

Products:

Textiles

Pharmaceuticals

Foodstuffs

Paints

Fuel

Construction materials

Hygiene Products



SEKAB pilot biorafinery

substrates



Industrial symbiosis

EU STRATEGY ON WASTE

European policy on waste is described by

- Directive 2008/98/EC of the European Parliament and of the Council of 19 November 2008 on waste and repealing certain Directives

and 4 interpretation documents:

- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions tackling the challenges in commodity markets and on raw materials (COM (2011) 25 Final)
- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions (COM(2011) 21 Final)
- Commission decision (draft): rules and calculation methods, November 2011.
- Guidelines on the interpretation of key provisions of Directive 2008/98/EC on waste, 2012

EU STRATEGY ON WASTE

Part-financed by the European Union (European Regional Development Fund)

EU STRATEGY ON WASTE

Framework Directive on Waste: *2008/98/EC*

defines hierarchy of waste treatment

1. Prevention and reduction of waste generation
2. Reuse
3. Recycling
4. Materials and Energy Recovery
5. Landfilling

Framework Directive on Waste: 2008/98/EC

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Framework Directive on Waste: 2008/98/EC describes also **goals** to be achieved by partner countries till 2020:

- art. 11 defines minimal recycling level by 2020 of household waste (50%) and of construction and demolition waste (70%);
- art. 22: where appropriate, encourage separate collection of bio-waste for composting and digestion of bio-waste;
- Appendix II: Demands compliance with an energy efficiency ratio of 0.65 for new incineration plant, if the combustion must be charged as recovery (not recycling, but recovery).

Poferment treatment

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It is mentioned in Article 11 that recycling should at least include waste streams of »... paper, metal, plastic and glass from household«

‘**Commission decision (draft): rules and calculation methods**’, Nov. 2011 states:

‘Where the **target calculation (50%)** is applied to the aerobic or anaerobic digestion of biodegradable waste, the input to the aerobic or anaerobic treatment may be counted as recycled where that treatment generates compost or digestate which, following any further necessary reprocessing, **is used as a recycled product, material or substance for land treatment resulting in benefit to agriculture or ecological improvement**’

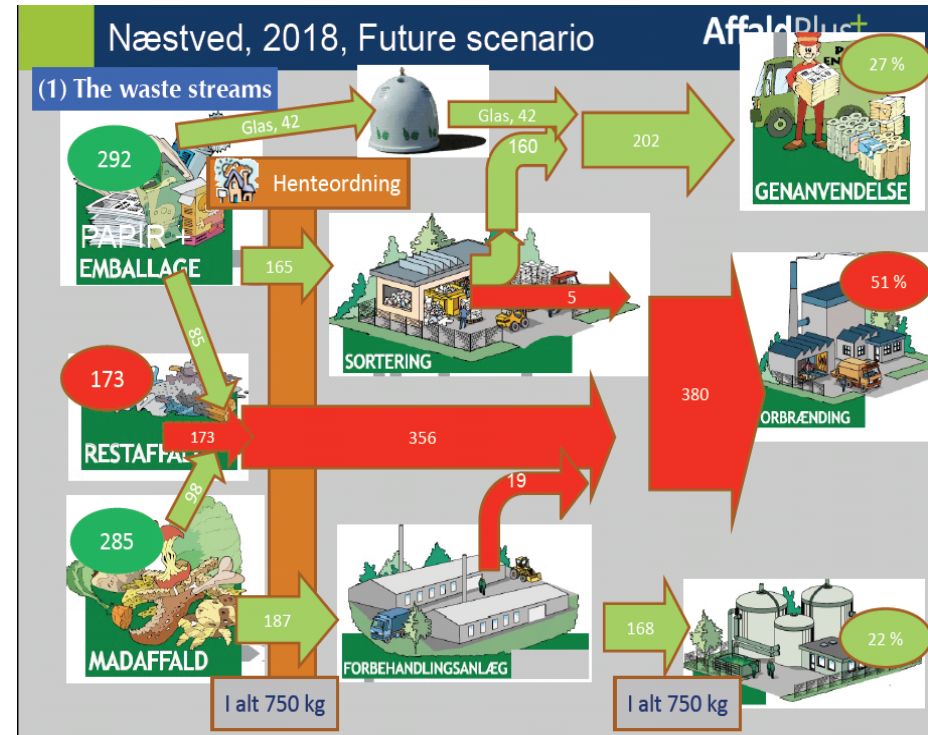
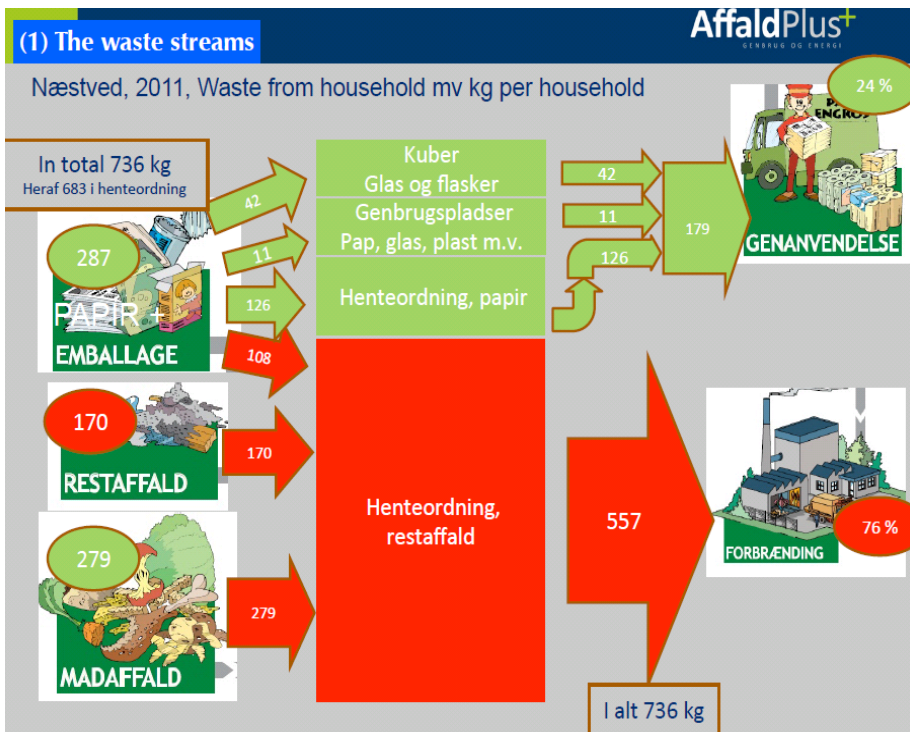
– see Art. 2, p. 6 .

So, poferment utilisation in thermal installations (combustion, gasification, etc.) precludes the whole fermentation or omposting proces from beeing classified as recycling; it moves to lower level in hierarchy of waste managment i.e. **Materials and Energy Recovery**

Consequencies (Denmark)

From thermal

to biological process



Changes of waste fluxes in Næstved, Denmark planned for 2018 r. in relation to 2011

Combusted - 380 kg/557 kg per household
biogas fermentation - 168 kg

Conclusions

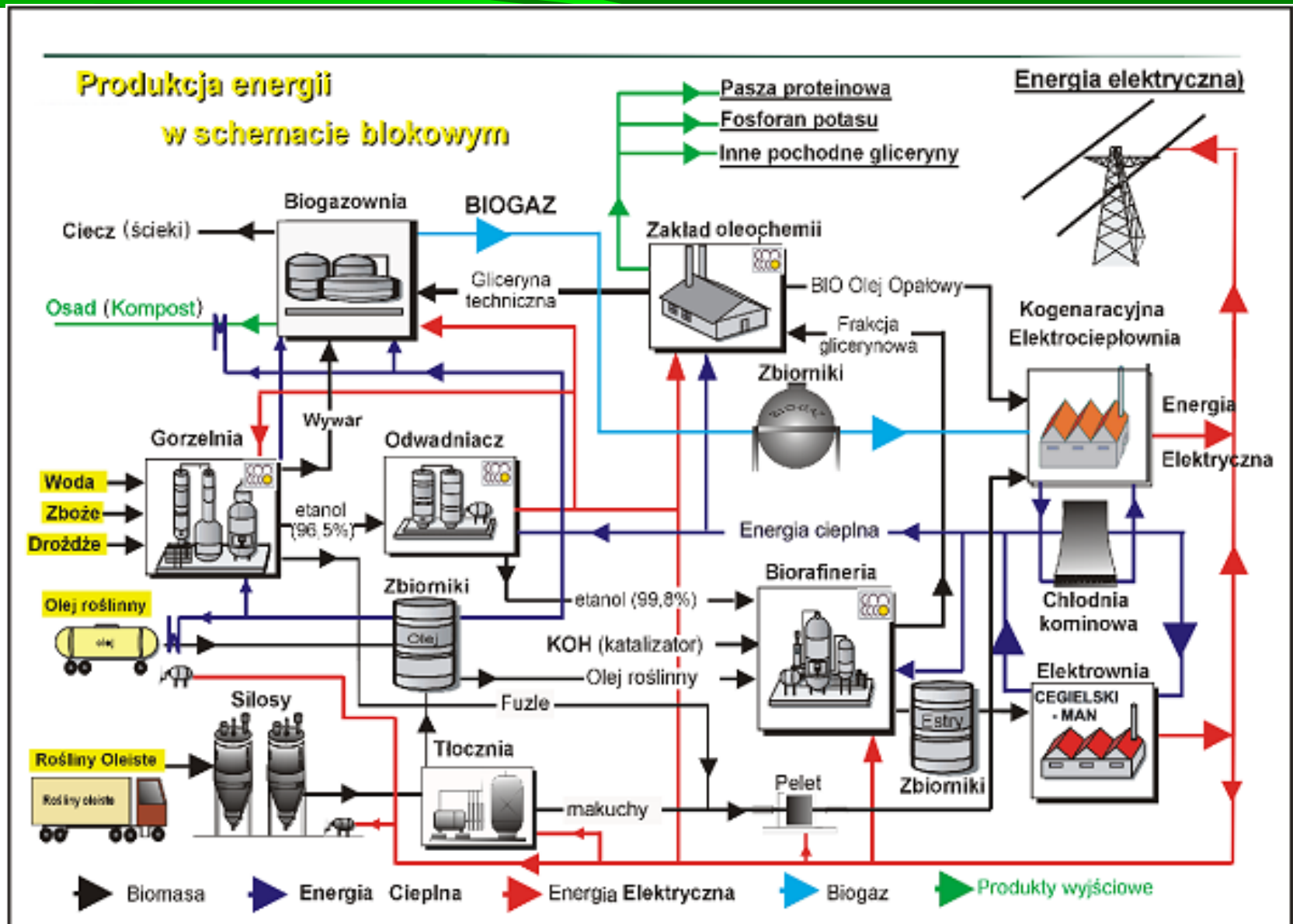


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- preferred (if not required) separation of bio-waste at source for biological (composting and digestion) processes
- zero-waste systems (including poferment post-processing in the case of unseparated waste-streams)
- when building an installation of waste incineration one should take into consideration possible streams of wet biowaste for composting/fermentation process in order not to overestimate the size of the installation
- waste incineration/gasification (in possible CHP systems) of pre RDF should be encouraged

Integrated, zero - waste system

(TU Wrocław)



Bioenergy Promotion 2

Thank you for attention

