



Digestion and Composting in the Netherlands

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Dutch Waste Management Association / Attero



Corporate social responsibility through organic waste

- Attero
- Attero Compost
- Cornerstone Green energy
- Cornerstone Soil fertility
- Cornerstone CO₂ footprint
- Digestion & Composting, Venlo
- Biogas



Attero



- Corporate core values
 - Sustainable
 - Innovative
 - Reliable
 - Customer-focussed
- Optimum balance between sustainability and economics



Organic waste: Attero in the Netherlands

 Composting

 Green composting

 Digestion





Attero compost

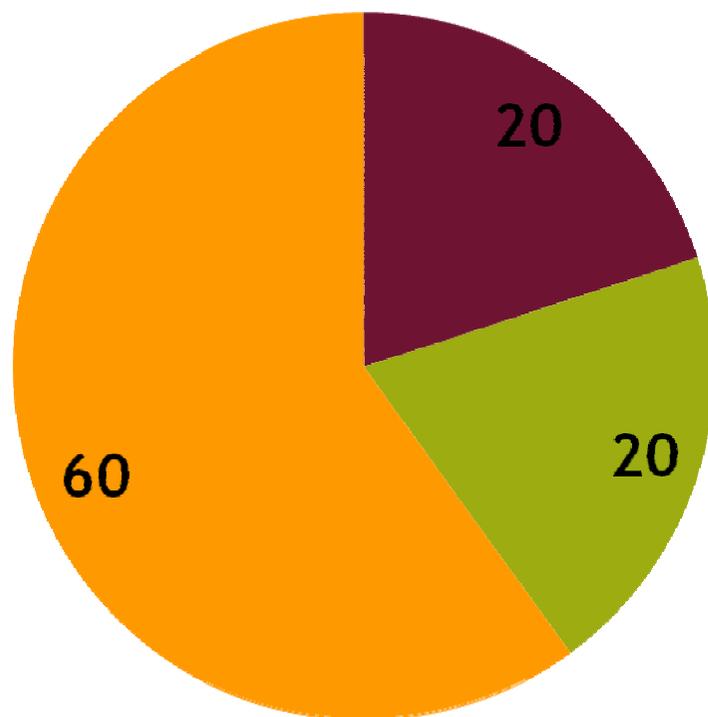
- Reliable vegetable, fruit and garden waste processing network
- First class compost
- Biomass Torch® developer and market leader
- Developer of CO₂ calculation tool
- Digestion developer, Venlo



Vegetable, garden and fruit waste



Weighted average composition of VGF waste

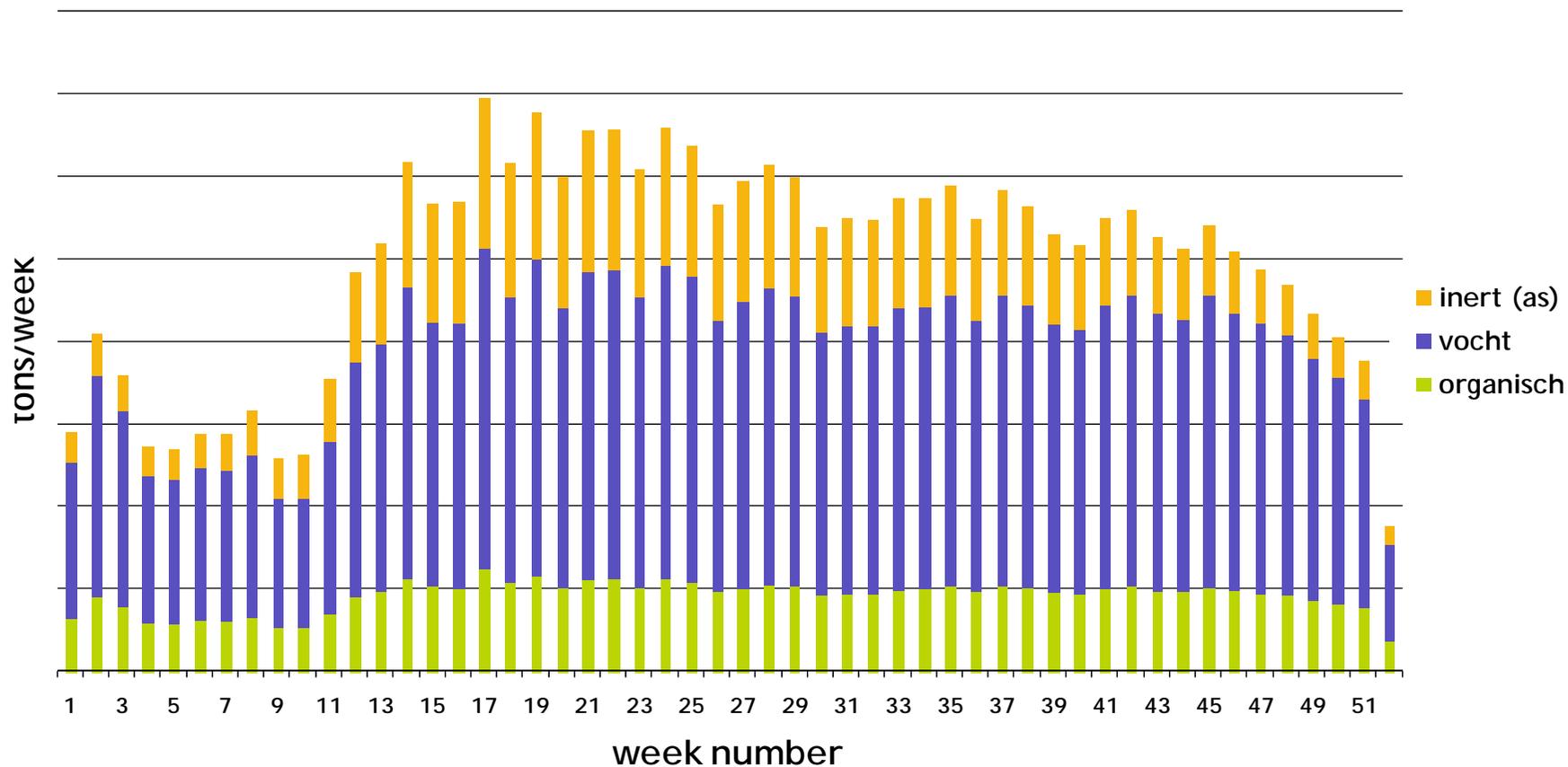


- inert (ash)
- organic
- moisture

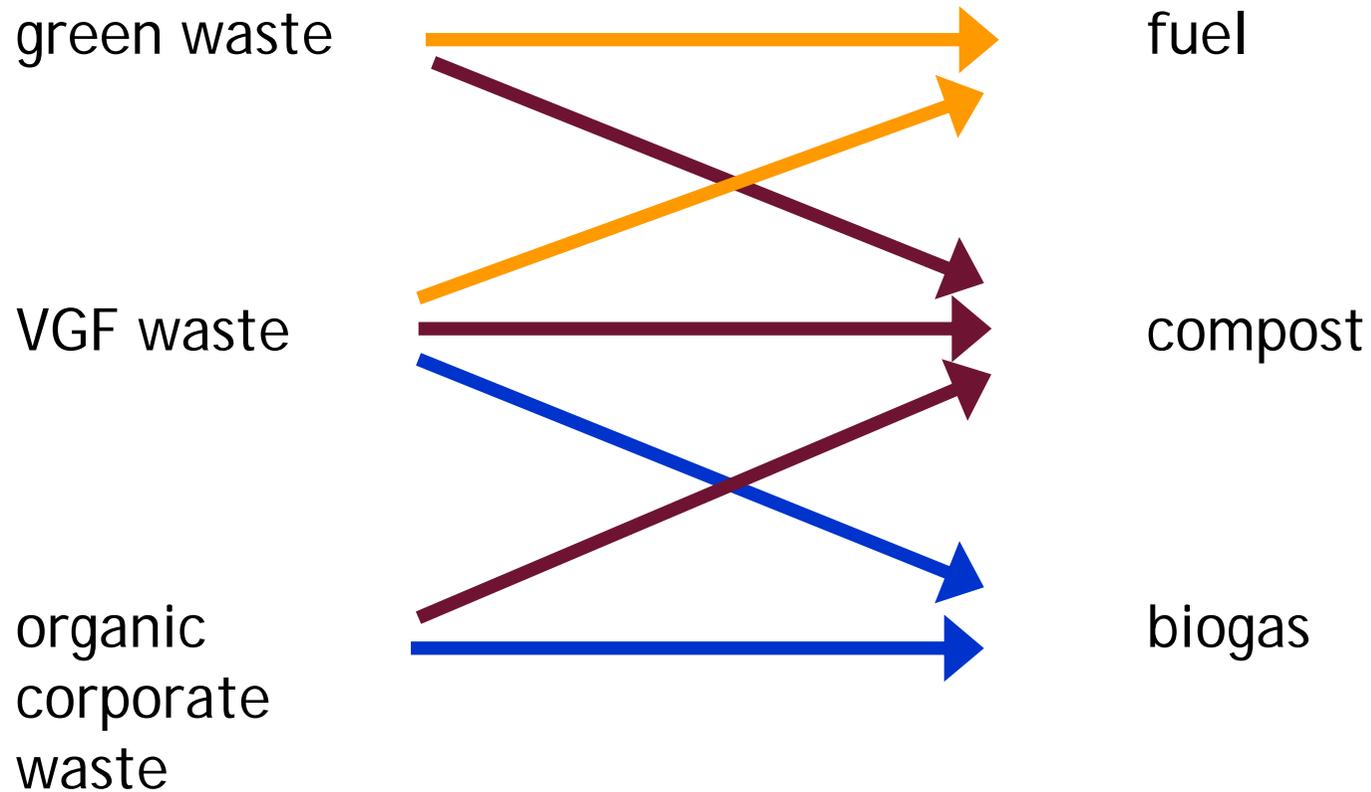


VGF waste composition

(annual pattern for average supply of 100 metric tons/week)



Products from waste flows



Cornerstone Green Energy

- Biomass Torch[®] 10 MJ/ton
- Excellent biogas composition.
 - CH₄ > 60 %
 - H₂S < 100 ppm
- 2010: Attero Compost is a producer instead of a consumer of energy
- Compost from the combination of digestion and composting has a better quality.



Torch[®]: bio fuel from VFG waste



Cornerstone Soil fertility: 10 advantages of compost

- More organic matter / better soil quality
- Fewer nutrients are washed out
- Soil structure improvement by better moisture balance and improved tilling qualities
- Prevention of damage due to frost
- Soil life improvement, more active soil bugs
- Higher crop yield and better crop quality
- Less erosion
- Higher disease resistance, better soil health
- Reduced greenhouse effect because carbon is bound
- Peat replacement, compost in potting soil



Soil fertility

Wat is het nut van GFT-compost?

Organische stof: voedsel voor het bodemleven



Regenworm



Miljoenpoot



Pissebed



Duizendpoot



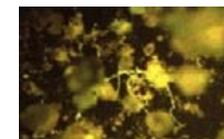
Bron: Lijbert Brussaard



Aaltjes



Bacteriën



Schimmels



Cornerstone CO₂ emission reduction (Source: CE, IVAM, Senter Novem)

- 1 ton of VFG waste
 - 50 kg of CO₂ emission reduction
 - standard quality compost
 - standard applications
- CO₂ savings in the Netherlands
 - 1.6 million metric tons = 80,000 metric tons of CO₂ (ref. 2007)

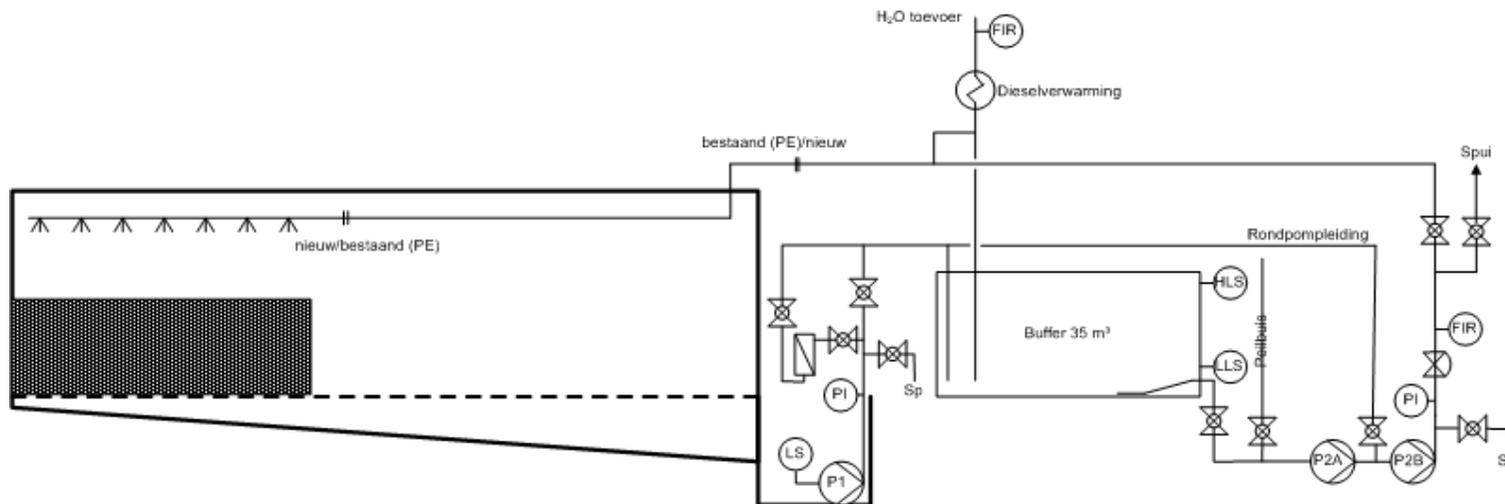


CO₂ saving potential

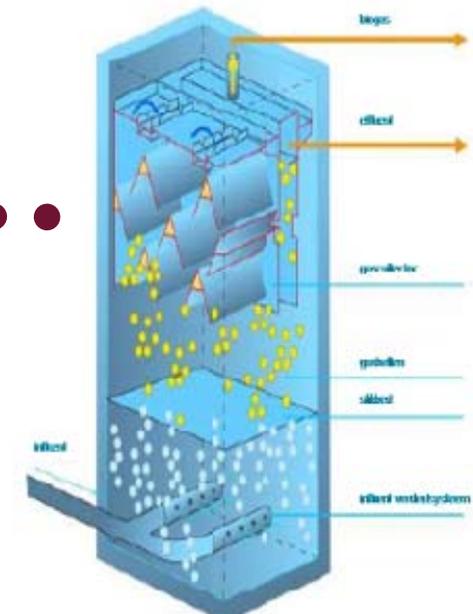
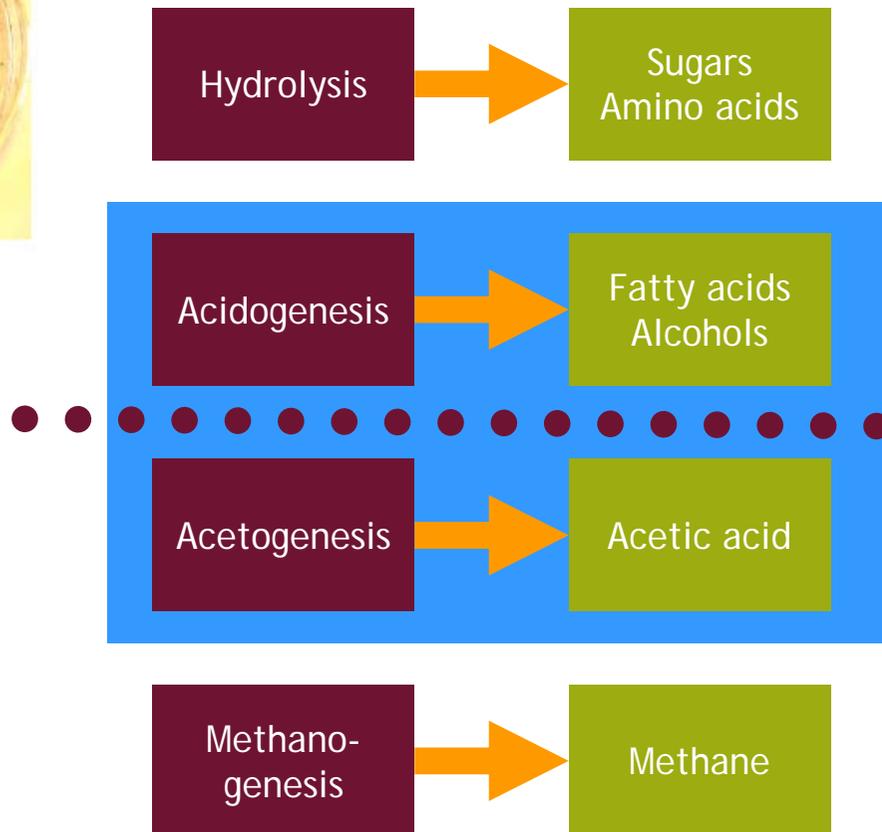
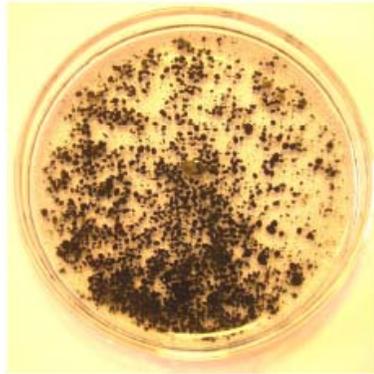
<i>Measure</i>	<i>CO₂ saving</i>
Composting (traditional)	50 kg of CO ₂ eq
<i>Additional</i>	
Bio fuel (Torch®)	up to 30 kg of CO ₂ eq extra
Digestion (electric power)	up to 100 kg of CO ₂ eq extra
Peat replacement	up to 120 kg of CO ₂ eq extra
Heat utilization	optional
Transport fuel	optional



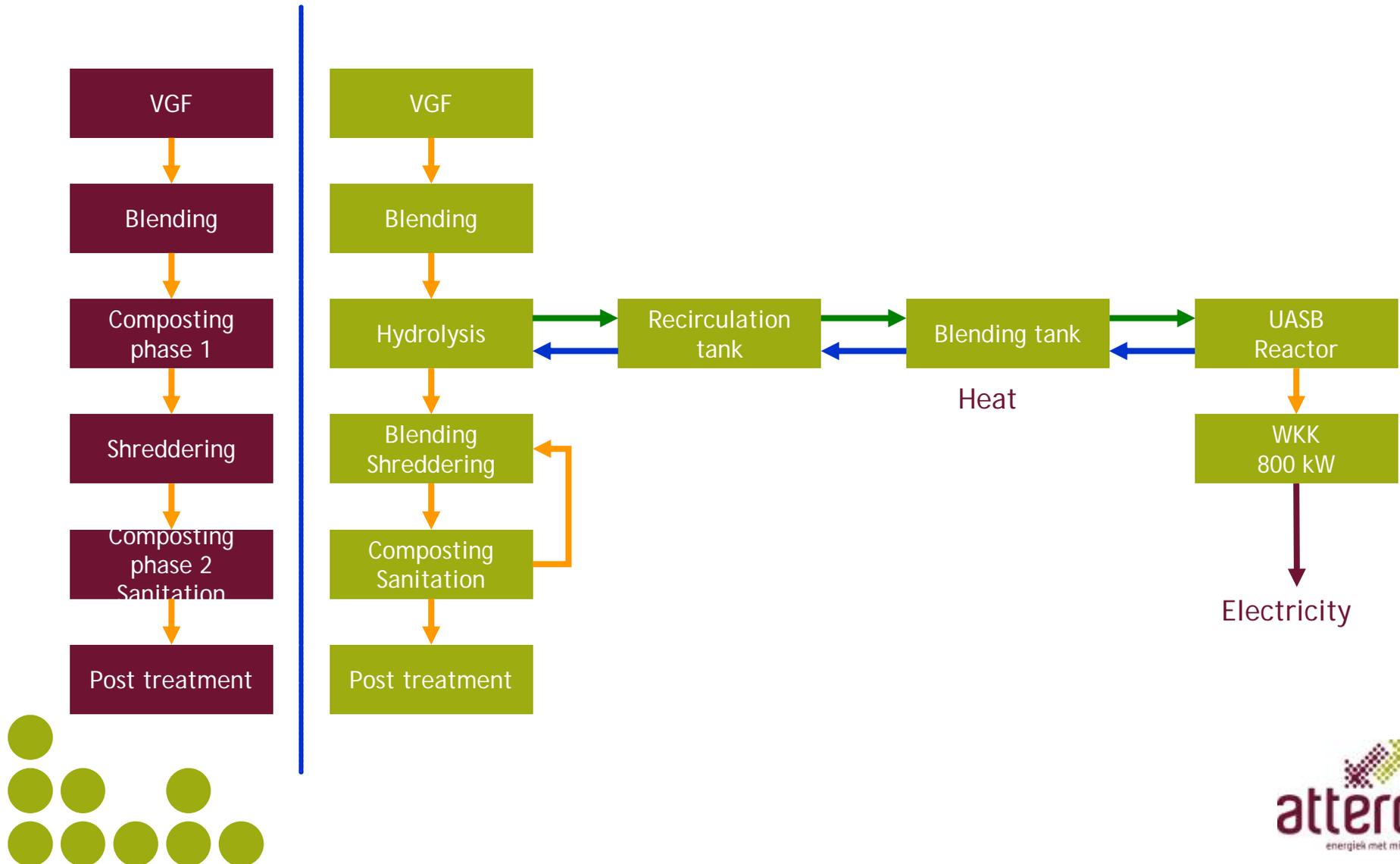
Digestion / composting pilot plant, Venlo



Biological basics of digestion / composting Venlo

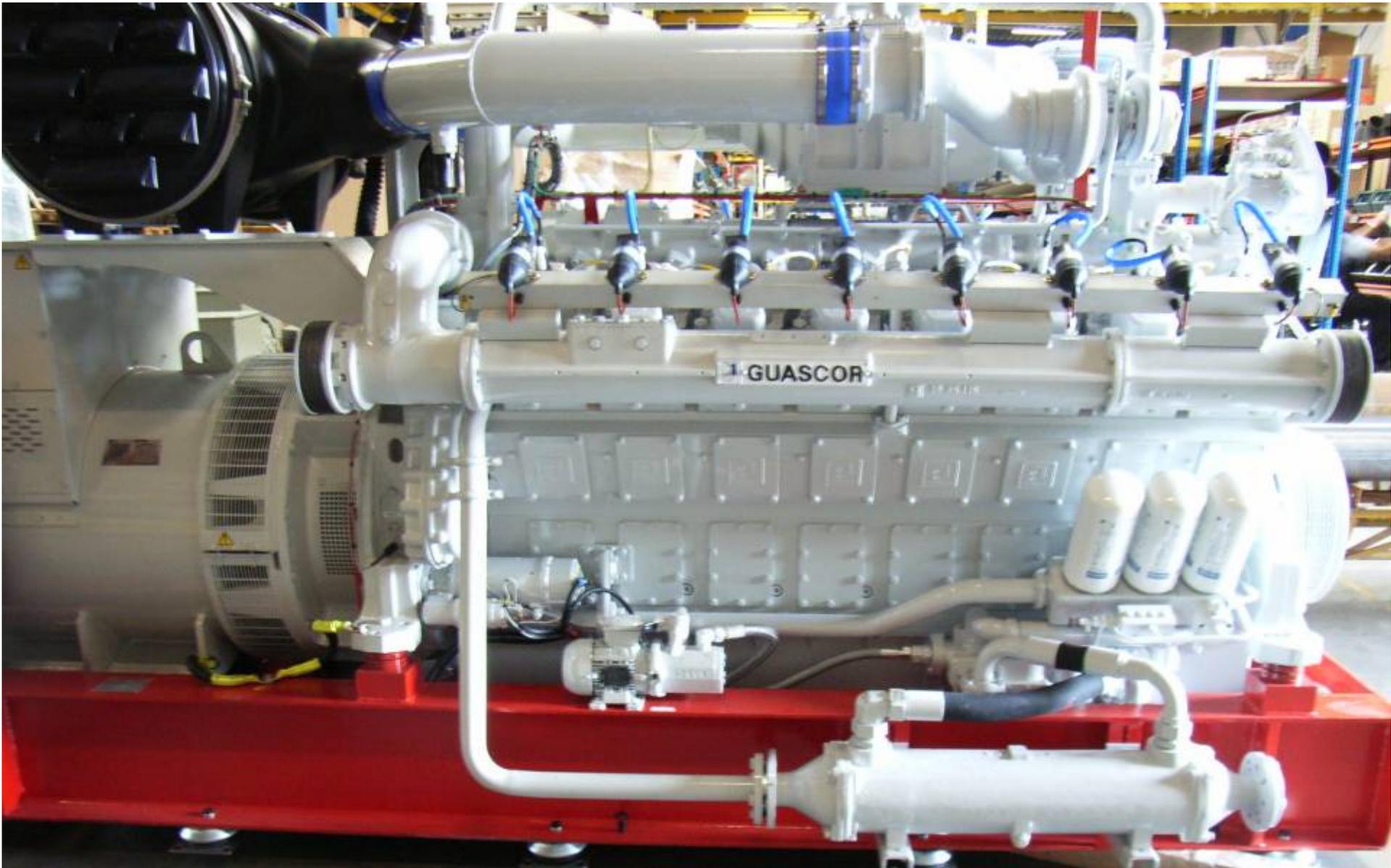


Digestion / Composting Venlo











Development of biogas

- Roll-out of local green electricity / gas sites supplied with local municipal organic waste
- Roll-out of green electricity / gas certificates for municipalities to fulfil municipal sustainability ambitions
- Roll-out of network of digesters in the Netherlands
 - Trend to convert composting plants into combined digestion / composting plants.



Certification

- Green Gas certificates
- Instruments to assign waste flows per municipality to their sustainability performance



Conclusions

- The combination of digesting and composting is both technologically and economically feasible
 - Biogas of a fine quality
 - Green energy reinforces C2C
 - Biogas and compost are complementary
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- The need for Bio Waste and Soil Directives is and remains evident.

