

Refinery & Biodiesel production at

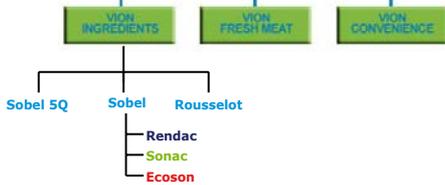


Producing Biofuel from processed animal fats

Chris Rietveld
15.11.2007

Contents

- Introduction
- Process
- Sustainability & Feasibility
- Experiences



Ecoson fits perfectly in Vion's goal of creating value in a sustainable way

- High valuation of animal fats (by-product from meat production)
- Produce biodiesel from in house available raw materials
- Long term perspective in growing green energy market

ecoson =

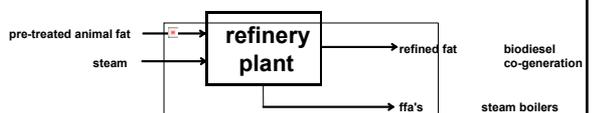
	Refinery	Bio diesel	Biogas plant
Input:			
C3 fat (t)	50.000		
Refined fat (t)		4.600	
Methanol (t)		450	
Raw materials (t)			50.000
Output:			
Refined fat (t)	43.750		
Fatty acids (t)	6.250		
Bio diesel (t)*		4.500	
Glycerin (t)		450	
Electricity (MWh)			9.000
Therm. energy (MWh)			8.000

*Equals 5.000.000 liters

Start-up plant: September 2007
Construction time: 9 months
Total investment: € 10 million

The refining of animal fat

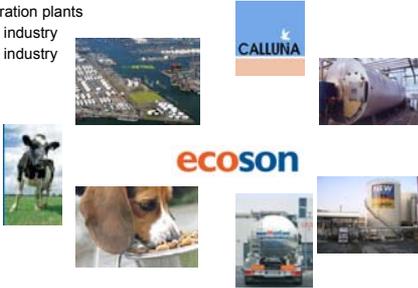
Principle: steam distillation



- Points for attention:
- variation in type and composition of animal fat
 - phosphorous content input refinery < 10 ppm
 - ffa content refined fat < 2%

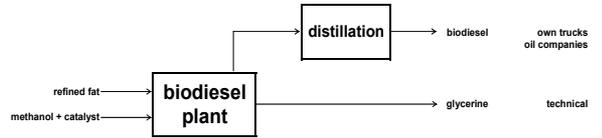
Possible market outlets for refined fats are:

- biodiesel producers
- co-generation plants
- calf milk industry
- pet food industry



Biodiesel process

Principle: esterification



- Points for attention:
- NEN 14214 designed for rapeseed oil
 - unique recipe for each type of animal fat
 - melting point animal fat (CFPP)

Possible market outlets for biodiesel are:

- use in own truck fleet (B20 or B100 biodiesel)
- transportation companies (B20 or B100)
- oil producers / traders (mix with RME)
- oil companies (B2-B5)



Animal fats are a very **sustainable** biodiesel alternative

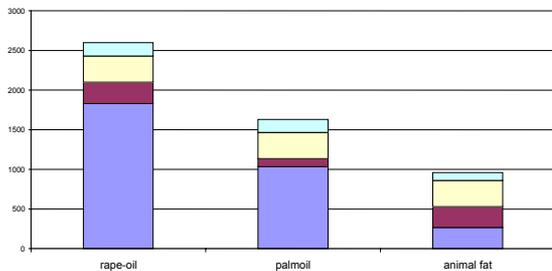
For social- and environmental reasons the production of biodiesel from animal fats (and other animal by-products) should be regarded as more sustainable than vegetable alternatives:

- Structural available raw materials
 - No need to newly produce raw materials purely for biofuel purposes
 - No transport of raw materials over long distances
 - No social and economical impact on countries of origin (cutting of woods)
- CO2 emission much more reduced (already a second generation biofuel)

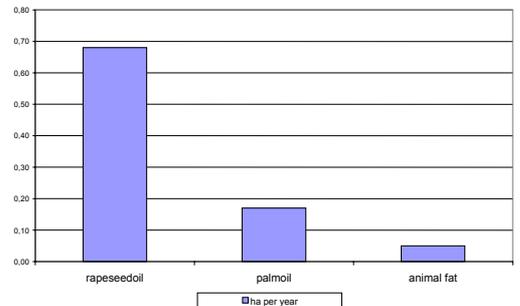


CO2 Emission by the production of 1000 kg biodiesel

- arable farming (kg CO2-eq/ton biodiesel)
- production refined oil (kg CO2-eq/ton biodiesel)
- biodiesel production (kg CO2-eq/ton biodiesel)
- transport (kg CO2-eq/ton biodiesel)



Land use for the production of 1.000 kg biodiesel



Animal fats and cooking oils are valuable and feasible biodiesel alternatives

- 400.000 tons of processed animal fats and other 'waste' fats are available:**
- enough for a 5% mixing obligation
 - only 0,75% needed from other less sustainable sources (2010 situation)

Experience and issues so far in processing animal fat to biodiesel

- Building experience in processing a biodiesel plant based on animal fat
- Getting trucks ready for B100 use
- Governmental decisions (Germany, Netherlands) / Market changes
 - B100 use in principle not attractive
 - B2-B5 sales (oil companies)
 - B20 use
- Specification DIN EN 14214 is based on rapeseed oil

Thank you for your attention

