SenterNovem

Ecobalance of Energy from Waste

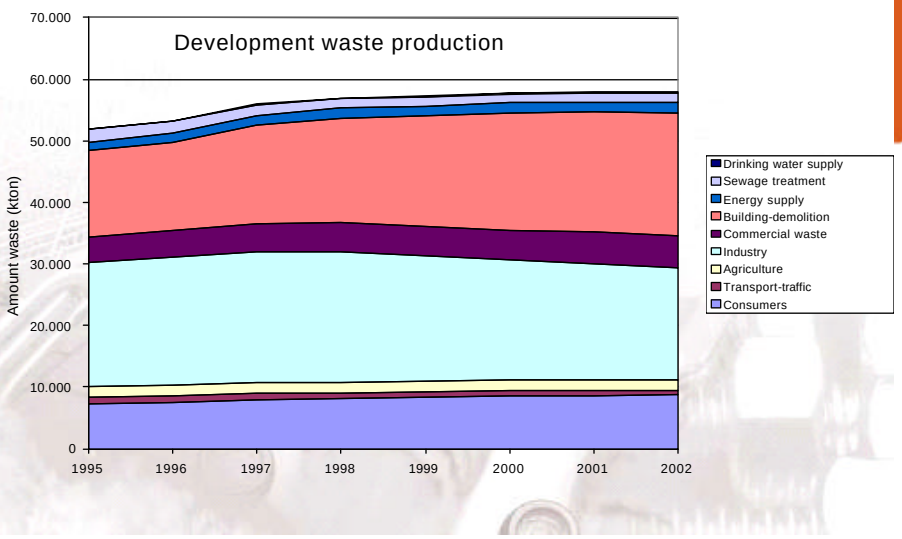
Dublin, IEA BioEnergy ExCo56
October 12 2005

Timo Gerlagh
Waste management administration

VROM

Role SenterNovem in Waste policy

- 1992: Waste Management Council
- 1992,1995: Ten year plans, prognoses for waste managing
- 2003: Waste Management Plan,
- Policy Support and Monitoring by WMC
- 1-1-2005: Transfer to SenterNovem



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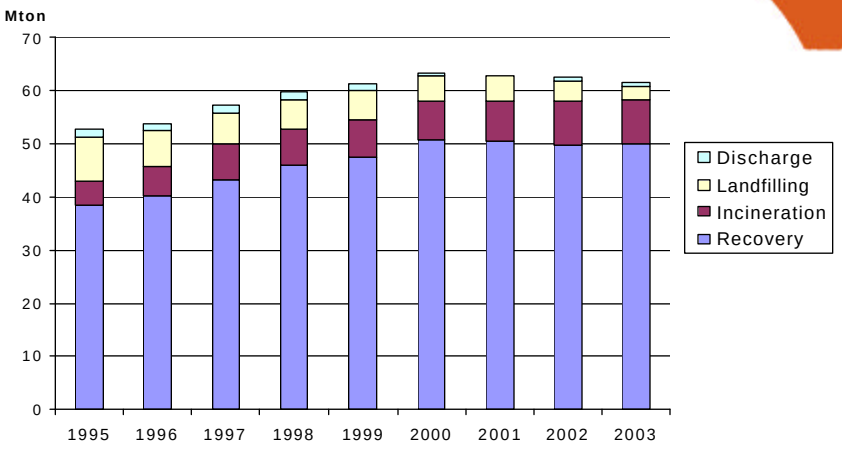
Development Waste Management



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Combustible waste (excl. recovery)

	[Mton]	[Mton]
Waste	2000	2012
Domestic Waste (inc. bulky)	4,8	5,5
Trade, Services and government	1,8	1,7
Industrial Waste (paper/plastic 60-70%)	1,0	1,1
Construction and demolition waste (50% wood)	0,5	0,6
Total	8,1	8,9

Hazardous waste and sludge excluded

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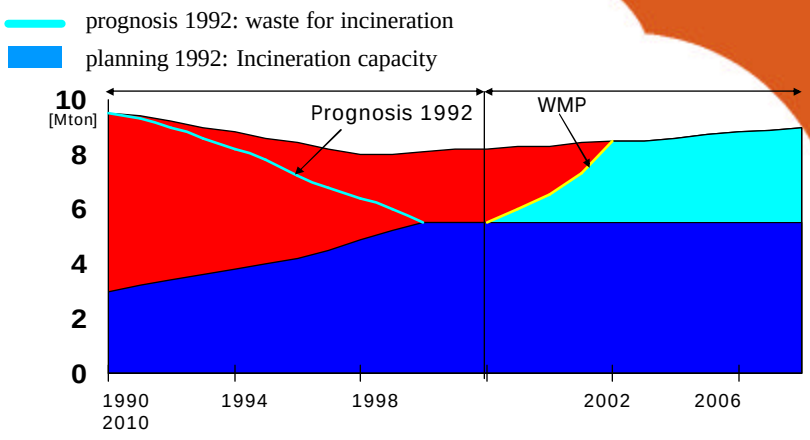
Managing combustible Waste



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Waste Management Plan (2003-2012)

- Policy for the treatment of waste
- An environmental impact assessment was made (based on LCA)
- 4 scenarios for the future of combustible waste

1. Increase waste incineration capacity
2. Composting and separation (RDF)
3. Separation of the high caloric fraction (PPF, Paper Plastic Fraction)
4. Landfilling the surplus (Status Quo)

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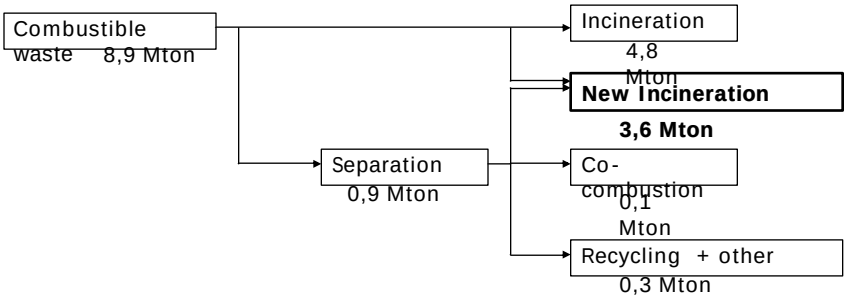
1. New Incineration Scenario



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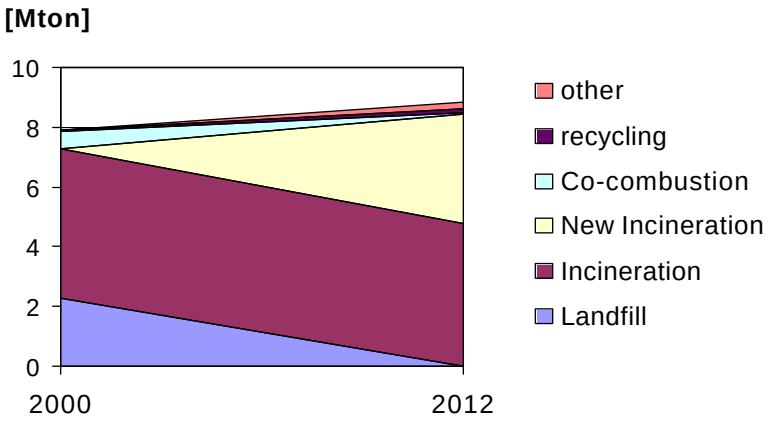
1. Increase incineration capacity



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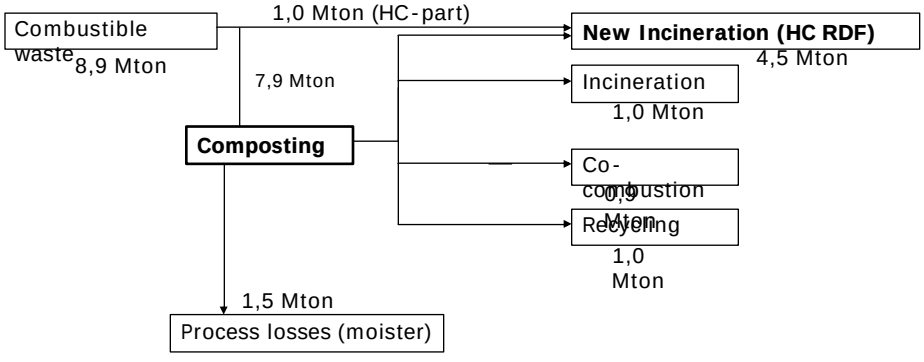
2. Composting and separation (RDF)



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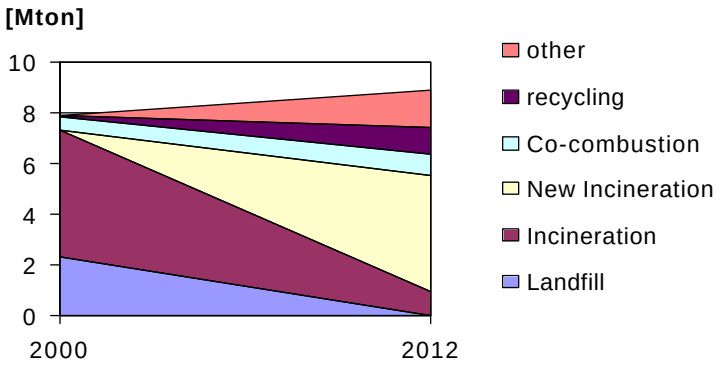

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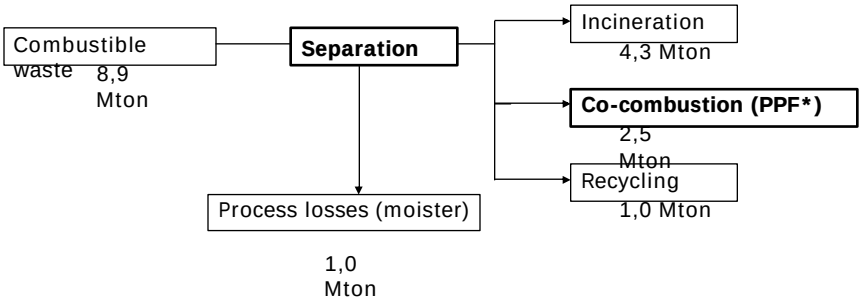
3.Separation of Paper/plastic (PPF)



*) Also other high caloric materials such as wood are co-combusted

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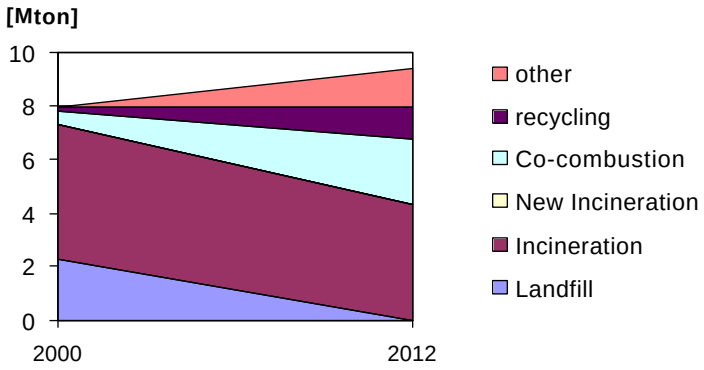

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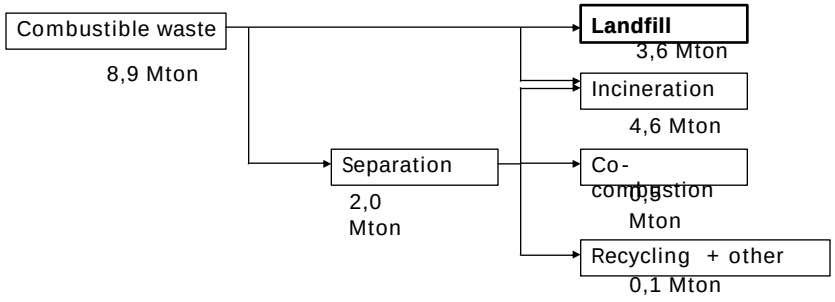
4. Status Quo Scenario (more landfill)



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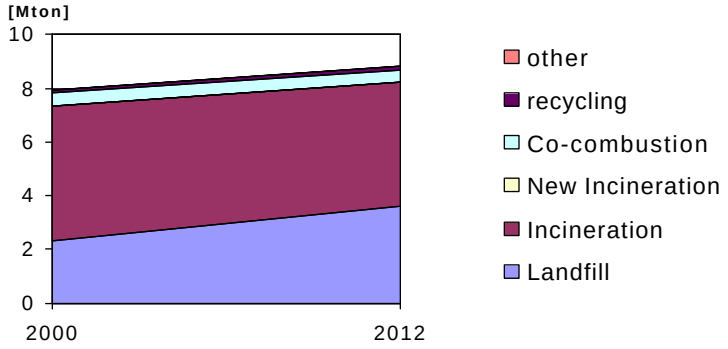

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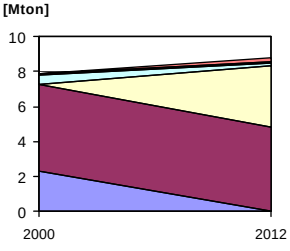
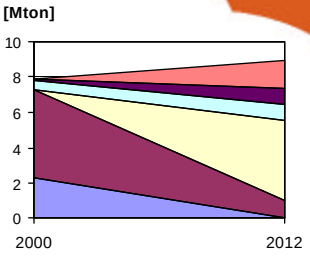
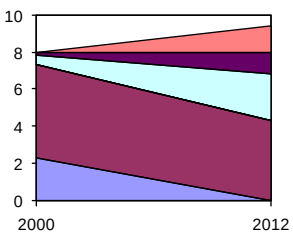
1. More Incineration



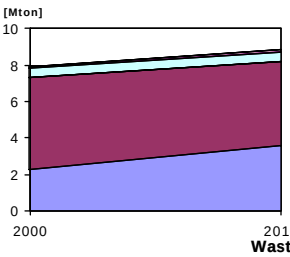
2. RDF



3. PPF



4. Status Quo



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LCA-analyses

- Complete managing 8,9 Mton combustible waste
- Including separation, transport and replaced fuels
- Dutch electricity and heat production as reference
- Specific references for coal replaced in power plants and in cement kilns

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Energy characteristics

	Electricity	heat
Waste Incineration	20%	5,5%
New Waste Incineration	25%	50%
Pulverised Coal	40%	
Co-combustion	1GJ replaces 1 GJ coal	

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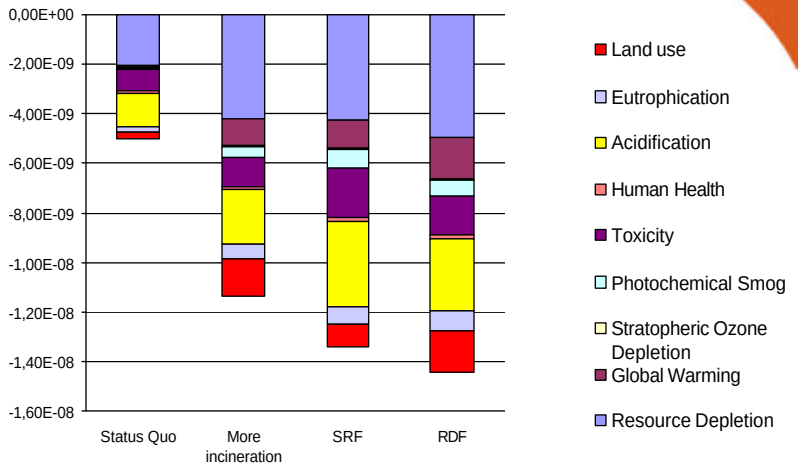
Result of analyses



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Energy efficiency characteristics

	Electricity	heat
Waste Incineration	20%	5,5%
New Waste Incineration (fluidized bed gasification)	30%	
Cement kiln	1GJ replaces 1,05 GJ coal	

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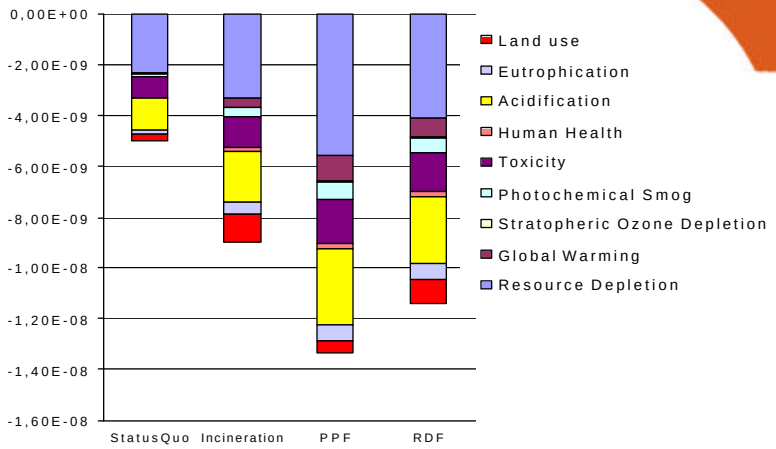
Results LCA-analyses



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Energy score of the different Scenarios

(negative GJ are *replaced* fossil fuel)

New Waste Incineration	Electricity (30%)	CHP (25% e + 50% h)
Co-firing	Cement kiln	Power plant
	GJ / ton waste (av.)	
Status Quo	-6,0	-5,4
More Incineration	-9,0	-11,9
RDF (composting/sep.)	-10,7	**-13,8**
PPF (direct separation)	**-13,0**	-10,3

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Conclusions Environmental Impact Assessment

- Landfill is worst option
- Separation of mixed waste is best scenario
- Energy efficiency dominates the total impact
- Incineration with high efficiency can compete with separation

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Waste Management plan (Energy part)

- Stop landfill of combustible waste
- Develop new separation capacity
- Encourage the production of fuels from waste
- Stimulate increase incineration capacity with high efficiency
- PPF-scenario requires less changes in waste management infrastructure than RDF-scenario

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Developments 2002/2003

- Decrease in landfill
- New initiatives for waste incineration
- More separation (mainly commercial and bulky MSW)
- Increase in export, especially for high caloric waste
- Recovery grows, but abroad

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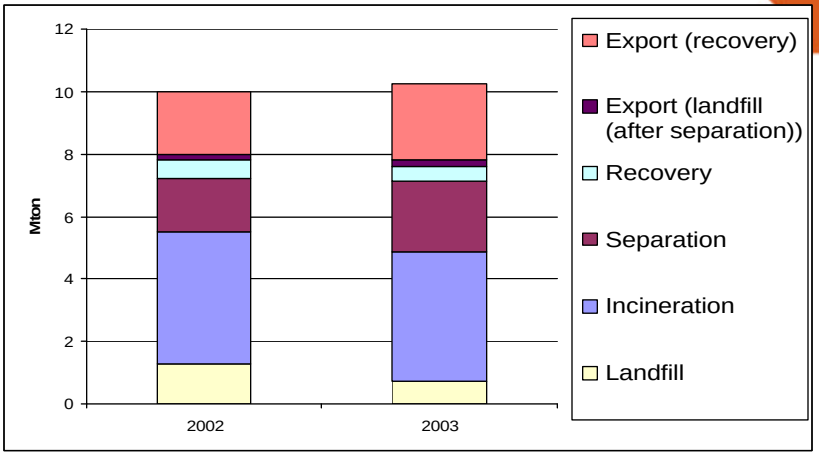
Management combustible waste



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Market developments 2004/2005

- Landfill ban in Germany (June 2005) leads to pressure on available capacity for separation and incineration
- Dutch export declines
- Use of PPF in power plants remains limited (too difficult fuel)
- Dutch Waste incineration capacity increases, but increase in energy efficiency is limited

Discussion / Conclusions

- The energy efficiency in the scenarios is better than most modern waste incineration plants in Europe
- PPF has difficulties competing on the fuel market

- PPF/RDF production leads to less environmental impact
- Waste Incineration with high energy efficiency is as good as separation for energy production.
- Stop landfill !