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Interreg Europe

European Union
European Regional
Development Fund

Landfill management in the Netherlands

Fons van de Sande

Rijkswaterstaat

Antwerp, 26/02/2018

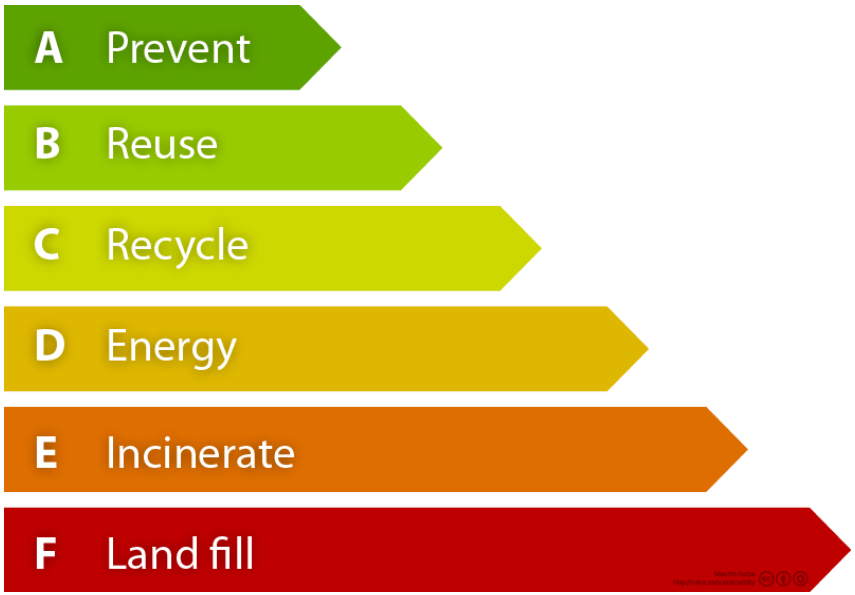
Policy focused on decreasing landfilling →regulatory interventions:

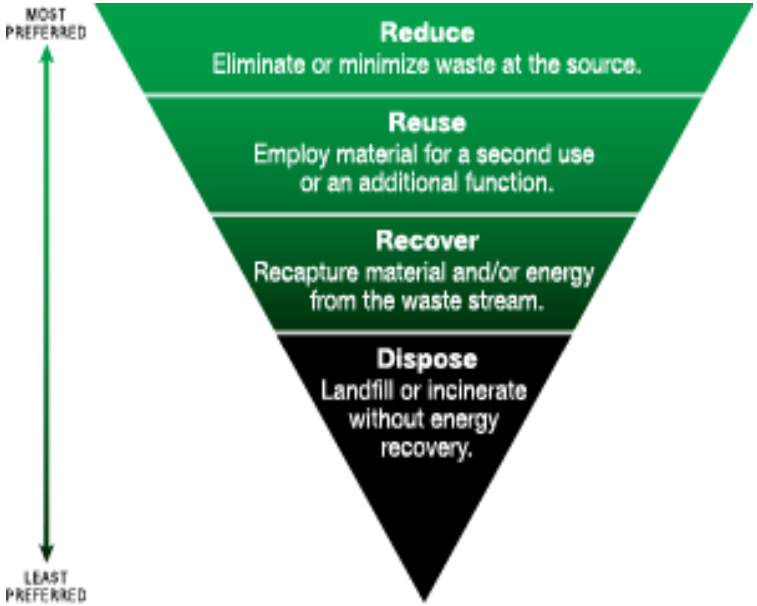
-Stringent waste treatment standards (landfill bans)

-Various (economic) instruments to stimulate prevention of waste and stimulate recycling: local municipal waste taxes (fixed and variable part), differentiated taxes on municipal waste ('pay as you throw away'), landfill tax, tax on incineration waste

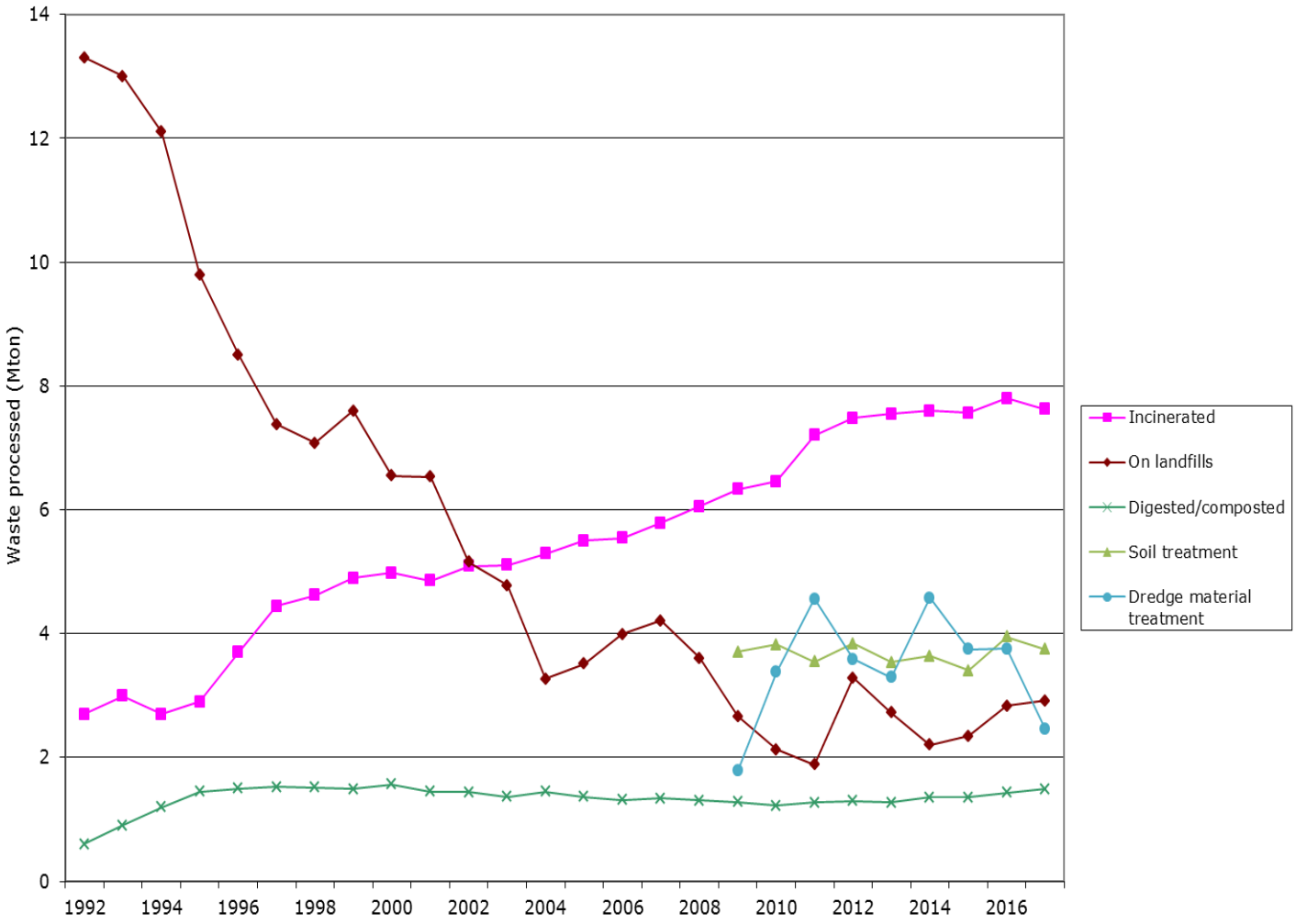
-Producer responsibility (WEEE, batteries, car wrecks, car tyres, packaging)

-Order of preference waste management hierarchy





Amount of waste processed (1992-2017)



Operational landfills in the Netherlands

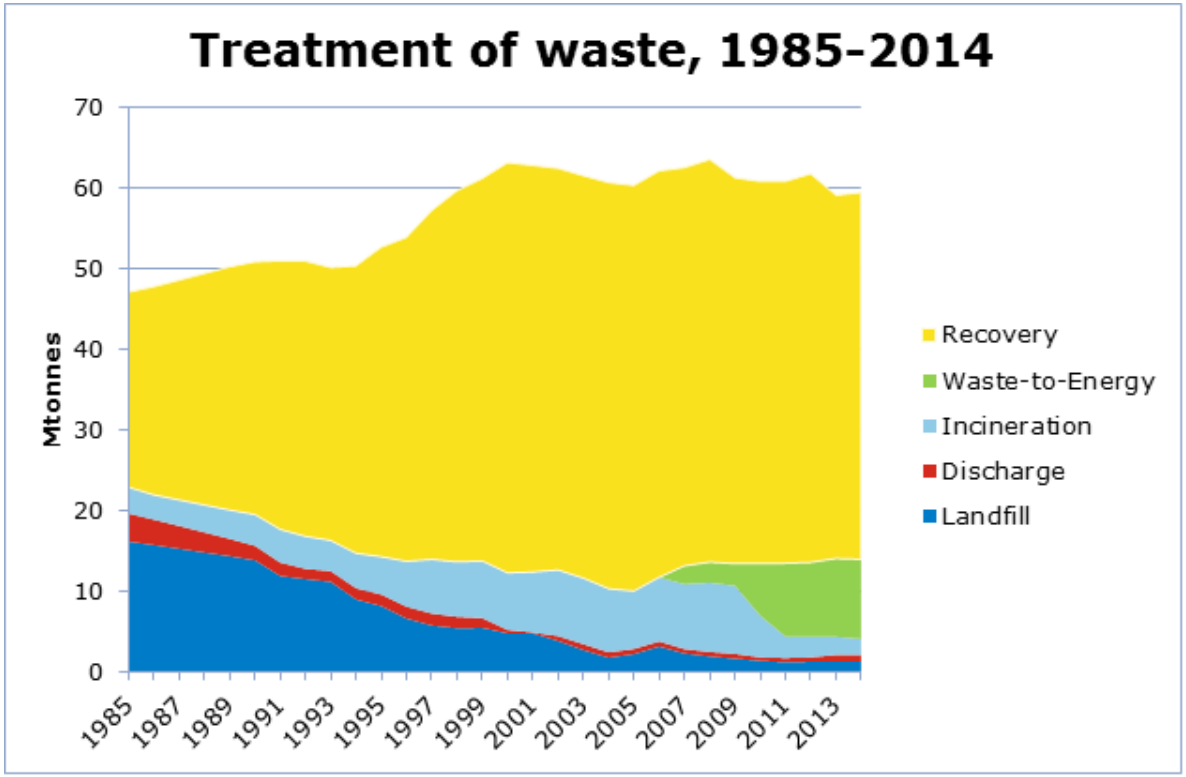
1970: over 1.600

1980: 200

1992: 80

2019: 19

https://www.interregeurope.eu/cocoon/news/news-article/3676/evaluation-of-the-dutch-landfill-management-policy/



…….. 2% landfilling, 81% recycling, 17% waste to energy

Landfills in the Netherlands

Two types of landfills

1. Former landfills (4.000-6.000): of operation before 01-09-1996

2. Sanitary landfills (80): have to comply with the Dutch Environmental Management Act

Former landfills (non-sanitary landfills)

NAVOS (national overview of potential risks)

Results:

-in 90% an insufficient thickness of top-covering, but in most cases posed no risks (many already in use as nature, agricultural, leisure or redeveloped)

-at 60-80 sites (remediation) measures were taken to prevent spread of contamination and to mitigate human and/or ecological risks →remediation measures executed under the Soil Protection Act

Implementation and enforcement of policy around former landfills is decentralized to provinces (and a number of municipalities) on the basis of the remediation section of the Soil Protection Act

Developments:

1. New legislation (Environment and Planning Act) under construction:

-Municipalities become (sole) authority for soil protection: responsible for risk management leaching and monitoring

-At present investigation how to manage efficiently former landfills

2. Competent authorities Soil Protection Act investigate possibilities to reduce/optimize aftercare for contaminated sites (including former landfill sites)

Sanitary landfills (80)

-Landfills in operation after 1980: have to meet stringent regulations and reconstructed as a sanitary landfill

-Aftercare mandatory for landfills in operation after 01-09-1996:

- **Site operator responsible (during operation) → compliance regulations listed in Environmental Management Act**
- **Province responsible for aftercare**
- **Currently 19 operational sanitary landfills**
- **Dedicated fund needed to finance the aftercare (established and managed by province, funded by landfill operator)**

Policy landfill management

1. **Investigation financial situation landfill operators (reservations for aftercare):**

   -Report and recommendations in 2017

2. **‘Everlasting’ aftercare is expensive and drops ‘duty of care’ to next generations:**

   -Sustainable Landfill Management: stimulating biodegradation processes →adding water and air to landfill

   -Green Deal (2015): at 3 landfills experiments during 10 year

Green Deal Sustainable Landfill Management

Green Deal Sustainable Landfill Management

Expected benefits:

- **No transfer of problems to future generations**
- **Active aftercare ended within 30 years after end of operation**
- **Stabilize the waste body so that its undisturbed contents no longer create a risk to human health and the environment**
- **Enable high value development of the stabilized site**
- **Risks to human health and the environment assessed for any threatened object in soil, groundwater or surface water**

-To prove that long term emission behavior will no longer be a problem, TU Delft will be taken measurements inside the waste body

-Positive results? 15 other landfills to be preserved

-Expected benefit: saving 66 mln aftercare costs

Examples interim use landfills

Leisure/recreation

‘VAM’ mountain:

Transformation of a sanitary landfill towards a cycling paradise

Amsterdam Volgermeerpolder (100 ha)

Heavily contaminated, remediated and transformed to nature

Dordrecht Derde Merwedehaven

-Landfill operational between 1993-2013
-After closure measurements: transition to a playground Merwedeheuvel

Renewable energy

Breda Bavelse Berg:

Exploitation of over 80.000 solar panels (electricity for 10.000 households). Starting in 2019, operational in 2020

Dordrecht Transberg: 25.000 solar panels. Initiated in 2017. First panels 2018

Renewable energy

Ambt Delden ‘Rikkerink:

30.000 solar panels (electricity for 3000 households). Start exploitation 2020

Mining

Veenendaal:

Complete removal of two landfills (54.000 m3) for urban planning. Waste and excavated soil largely reused. Project partly financed by the increase in land prices.

Mining

Amersfoort: Vathorst area (2006-2007)

-Two former landfill sites (461.000 m3 of household waste, industrial waste and sludge) completely excavated in order to develop the Vathorst area

-Where possible the construction waste was excavated separately

-Majority of the waste (including 160.000 m3 excavated soil) was transported to a sanitary landfill.

-Top cover could be reused almost completely

Stakeholders:

- **Municipality of Amersfoort**
- **Province of Utrecht**
- **Smink Afvalverwerking BV (contracting firm, now part of Renewi)**
- **Vathorst C.V. (development company/customer; cooperation between municipality and several contractors)**

Project funded by Vathorst C.V.

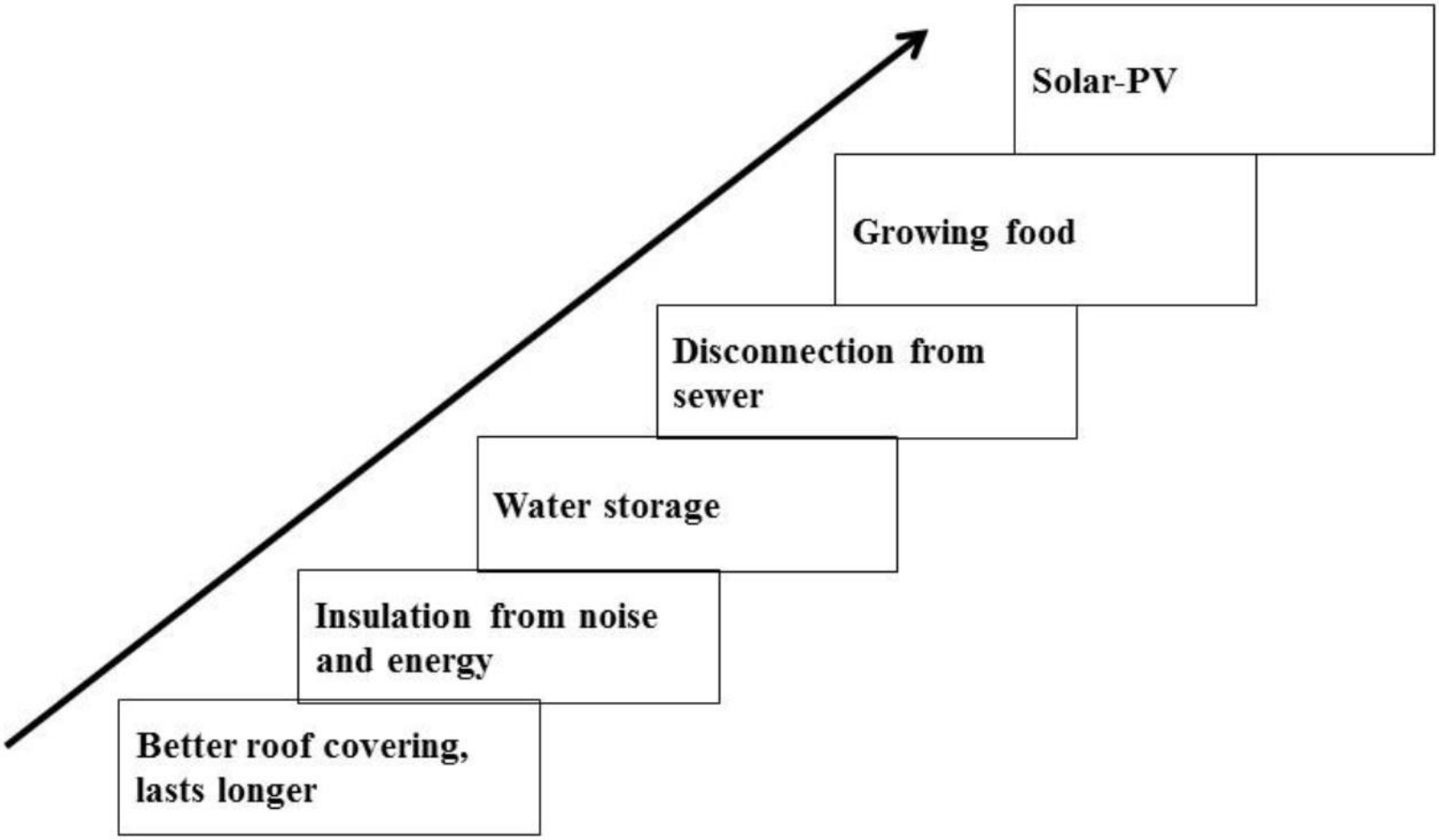
Future values: share costs and generate extra yields!

COllective REgeneration of former Landfills (COREL):

A method for governments and financiers to take responsibility for the multifunctional regeneration of former landfills

The challenge: creating a business model for a former landfill when various functions (e.g. developing clean energy, a park, agriculture, housing, industry) share the costs and enhance one another.

Future value ladder: Green roof




thank you
danke
謝謝
gracias
merci
obrigado
bedankt
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ngiyabonga
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