



Advanced Waste Management and climate protection - Experiences in Germany

**Workshop “Waste and Climate Change”
New Delhi 7.11.2012**

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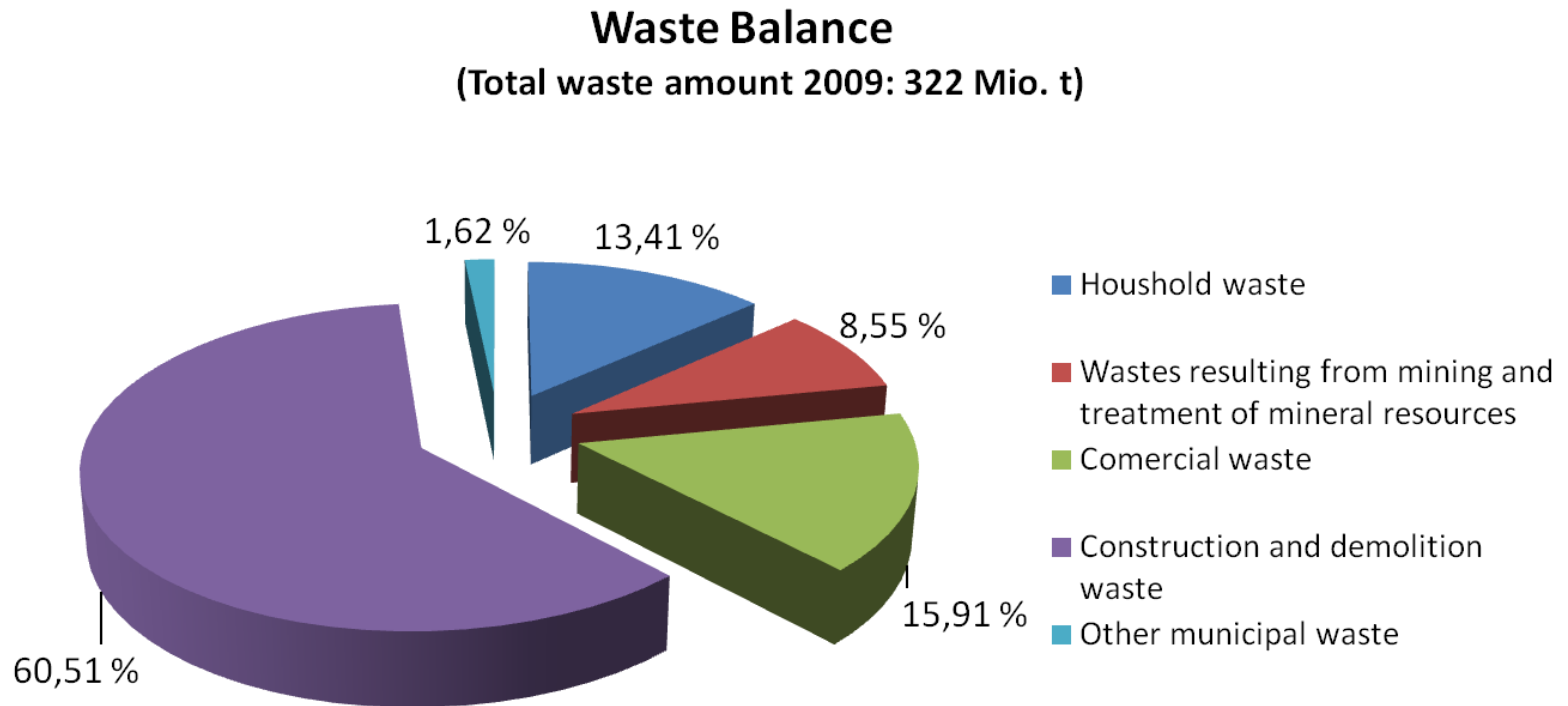
- 82 Mio. Inhabitants
- 16 Federal States
- Total GDP: 2.570 Bn. EUR



Waste arisings in Germany (2009)

- Total waste amount: **322 million tons**
- Construction and demolition waste: 195 million tons
- Mining residues: 28 million tons
- Production and Industrial Waste: 51 million tons
- Municipal solid waste: 48 million tons
- Domestic waste: 43 million tons (part of MSW)
- Hazardous Waste: 17 million tons

Waste arisings of Germany



Waste management in Germany: Legislation (1)

➤ *1986 Amendment Waste Management Act:*

- waste hierarchy
- reduction of waste volume
- reduction of harmful substances

➤ *1990 Ordinance on waste incineration plants*

- emission limits for dioxins, furans, heavy metals

➤ *1993 Technical Instructions on Waste from Human Settlements*

- to recover as much as possible
- to reduce harmful substances
- Target for landfill ban in 2005

Waste management in Germany: Legislation (2)

➤ 1996 Closed Substance Cycle and Waste Management Act

- dual waste management concept
- from waste management to resource management

➤ 2001 Waste Storage Ordinance

- Landfill ban for untreated waste after 1 June 2005
- Only Residues of MBT and waste incineration may be still landfilled

➤ 2012 Amendment of Closed Substance Cycle Act

- Implementation of EU Waste-Framework-Directive
- 5-level waste hierarchy
- Enforcing waste prevention and recycling

Sustainability in waste management

➤ Reduce

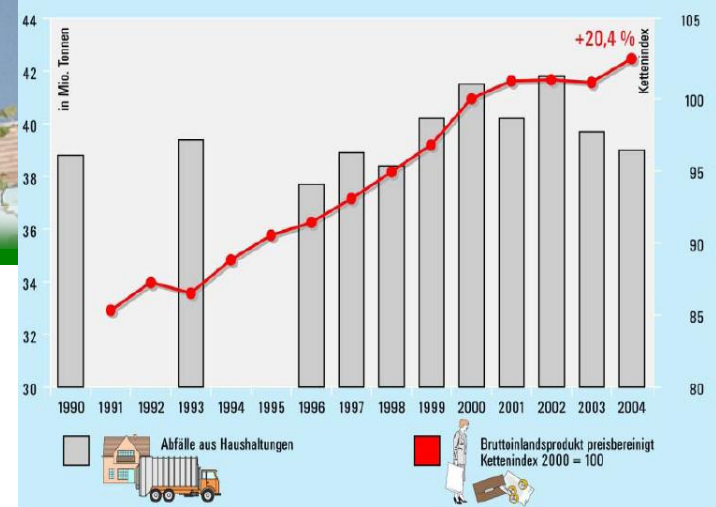
- efficient use of materials and energy
- internal recovery in production

➤ Reuse

- returnable systems

➤ Recovery

- recycling
- energy recovery



Closed substance cycle economy

- Cooperation with Stakeholder
- Legal Framework
- Clear Responsibilities: Domestic waste > Local Authorities
Other waste > Industry
- Extended Producer Responsibility
 - Voluntary Agreements
 - Waste Paper (1994)
 - Construction and Demolition Waste (1996)
 - Return and Recycling/recovery Obligations
 - Packagings (1992)
 - End-of-life Vehicles (1998)
 - Waste Batteries (1998)
 - Electrical and Electronic Scrap (2006)
- Landfill ban for untreated waste

Landfills for Household Waste

(2005 - Ban of landfilling of un-treated waste)

„Shrinkage goes on“



Source: Umweltbundesamt

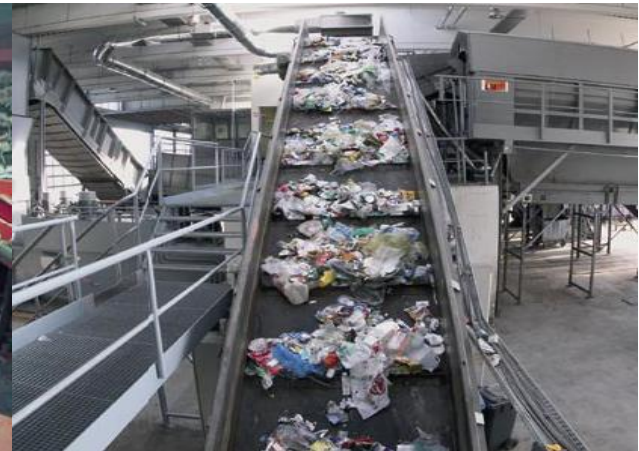
Separate collection

- Waste paper
- Glass
- Packaging waste
- Waste batteries
- Electronic waste
- Biowaste
- Waste oil



Sorting and treatment

- Modern Technologies
- High quality of secondary raw material
- Market for recycling products

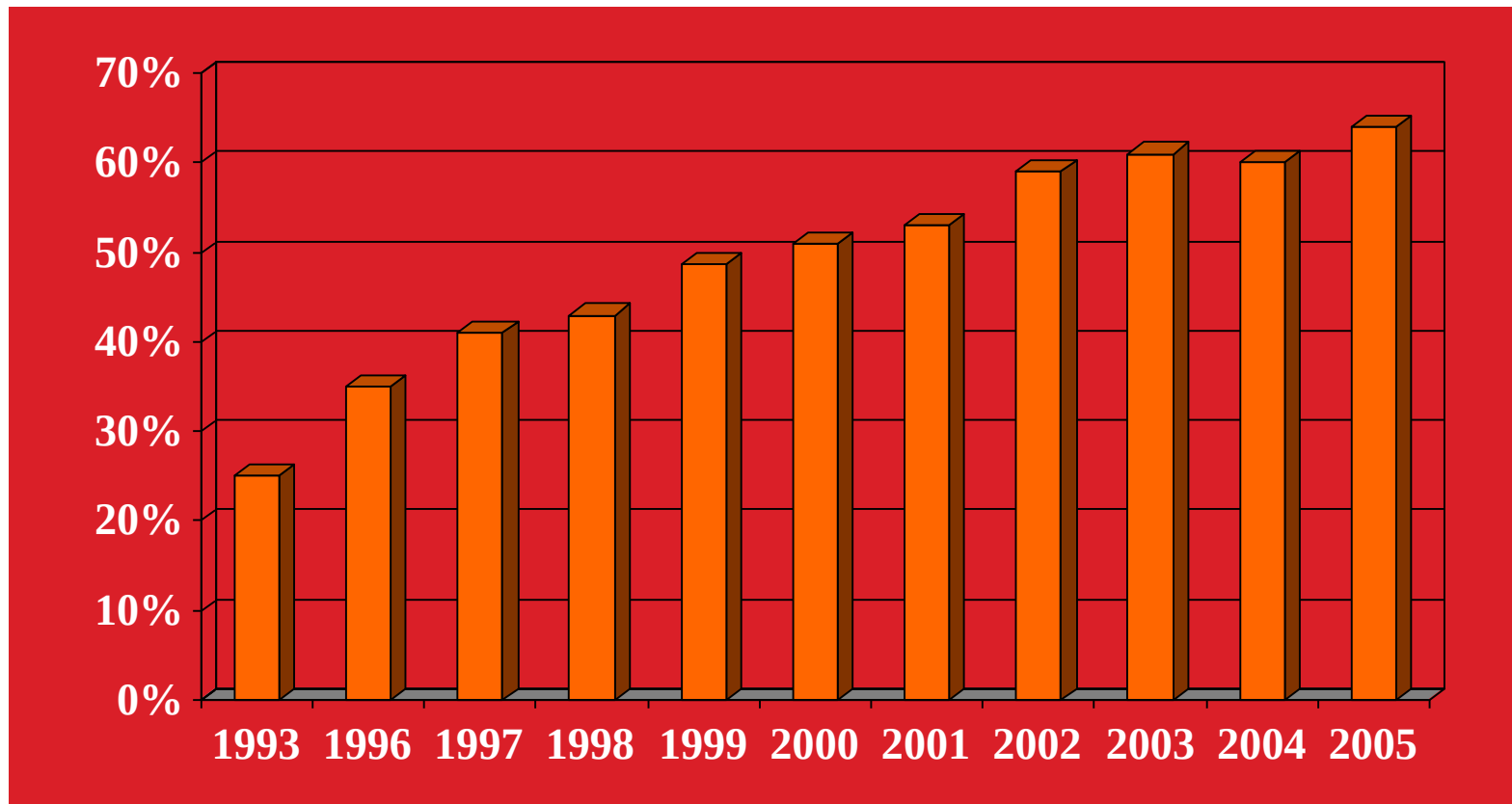


Recovery-Quotas

- ❖ Household waste – 63%
- ❖ Construction waste – 86%
- ❖ Packagings – 81%
- ❖ Waste paper – 82%
- ❖ Glass – 88%



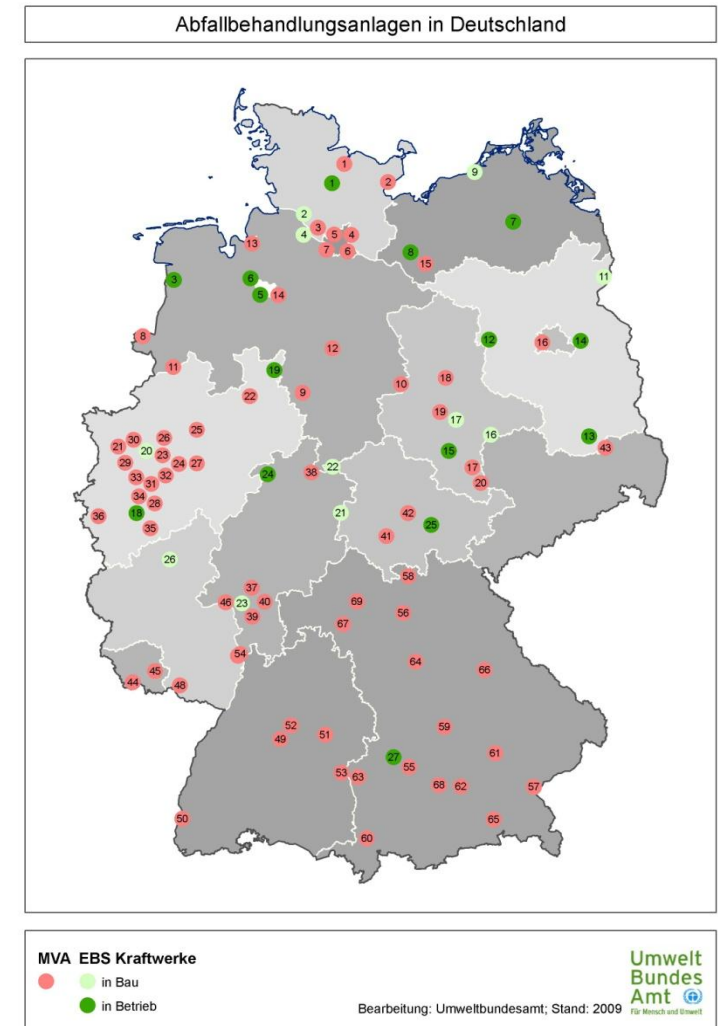
Recycling of Household Waste



Recycling is important but not sufficient!

Thermal Waste Treatment in Germany

Type of plant	Quantity	Capacity [Mio. ton]
MSW-Incineration	69	19
RDF-power plants	32	5
Hazardous waste incineration plants	30	1,2
Sewage sludge incineration plants	25	0,5 (and 0,5 in co-incineration) [dry matter]



MBT: Producer of RDF

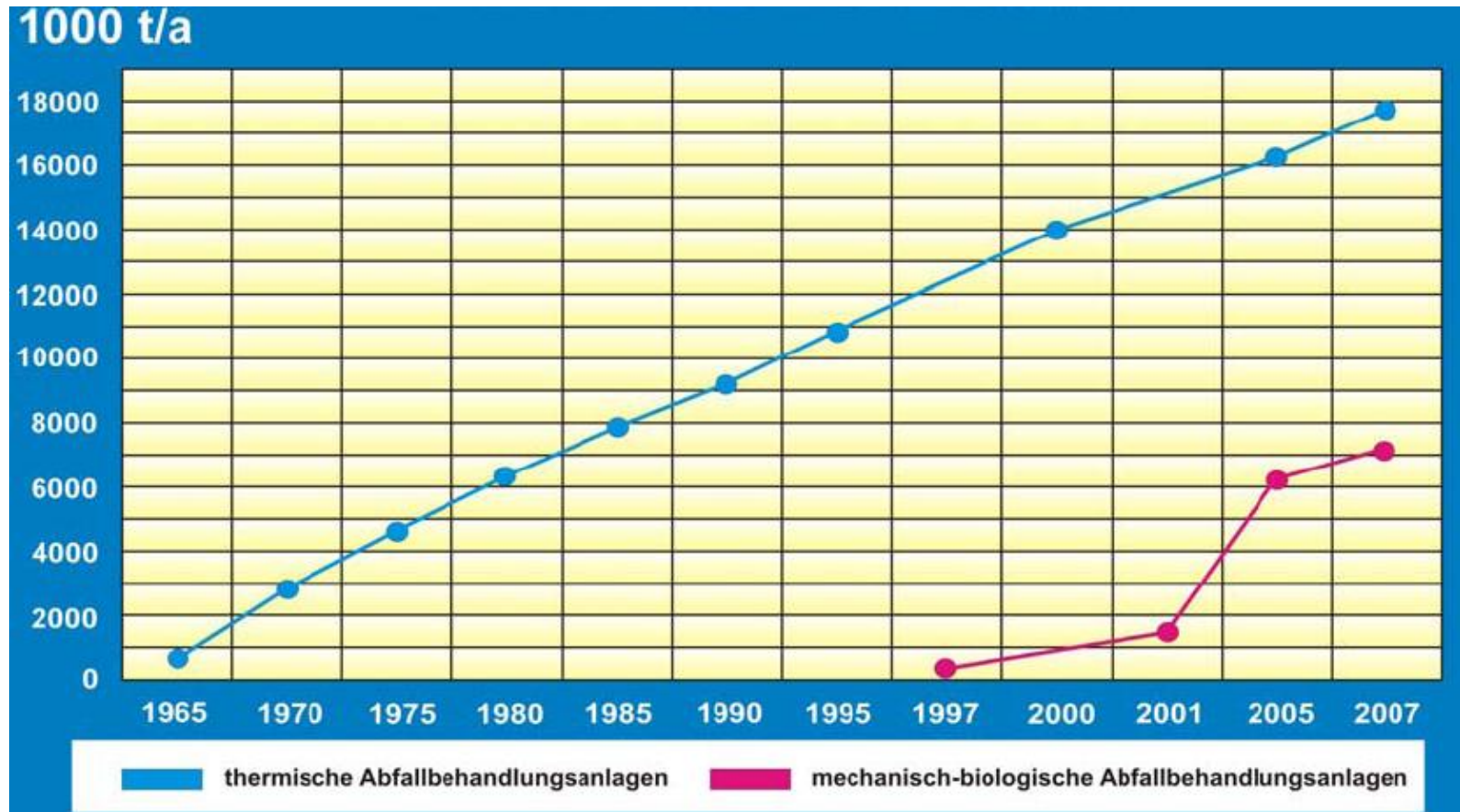
- 65 MBT plants
- Waste-Input: 7 Mio. t/a
- RDF-Output: 3 Mio. t/a
for Co-Incineration and
RDF-plants

Biological Treatment

- 800 Composting plants
- 100 Digestion plants
- Capacity: 10 Mio. t/a



Significant increase of waste treatment capacities

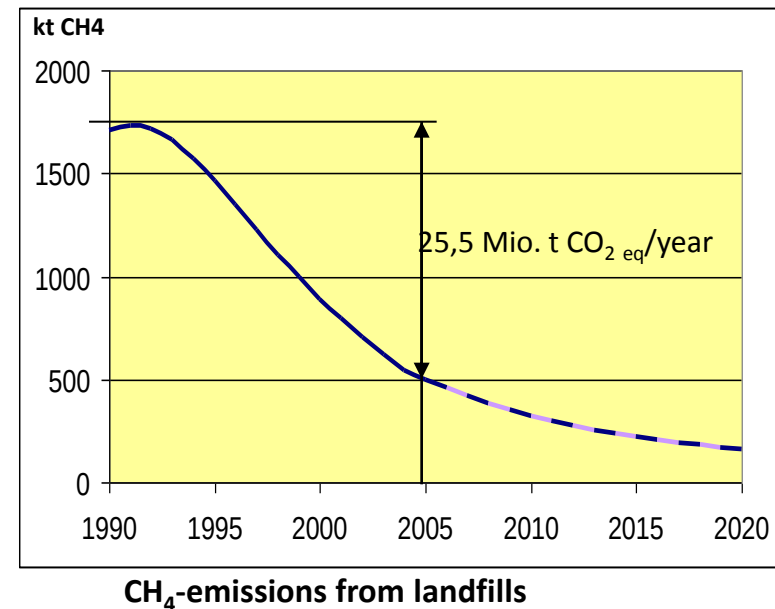


Waste sector's contribution to climate protection

1990-2006: Savings of 56 Mio. t CO₂ eq/year in Germany

Main measures:

- ❖ CH₄ – reduction from landfills: collecting and burning in cogeneration units
- ❖ Landfill ban 2005
- ❖ Enlargement of incineration capacity
- ❖ Increased energy efficiency of WtE-Plants
- ❖ Extended material recycling since 1990 by the factor 4



Outlook to Europe: Potential of the Waste Sector to contribute to Climate Protection

- Advanced waste management + Ban of landfilling untreated waste can contribute significantly to Climate Protection in EU-27
- Great Potential for mitigation of CH₄/CO₂-emissions and to meet the **EU-Kyoto target** of a 20 % emission reduction in 2020.

Outlook to OECD-Countries

- Current study commissioned by the German FEA



Good Waste management is climate protection!

**Vielen Dank!
Thank you!**

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