

5th CEWEP Congress on Waste-to-Energy 2010

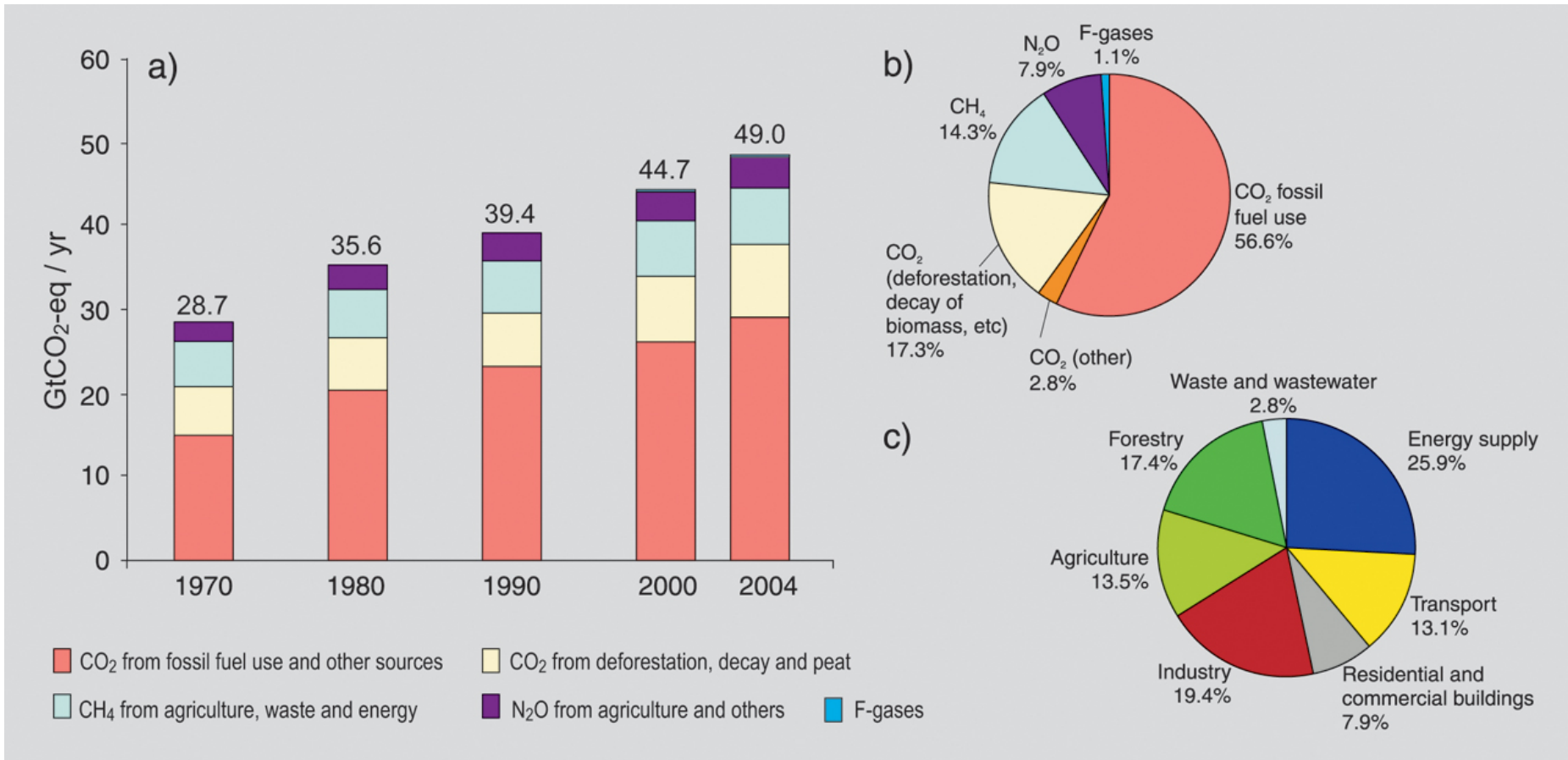
30 June to 2 July, in Antwerp

Potential for greenhouse gas mitigation from waste management within the OECD area

Dr. Andreas Jaron

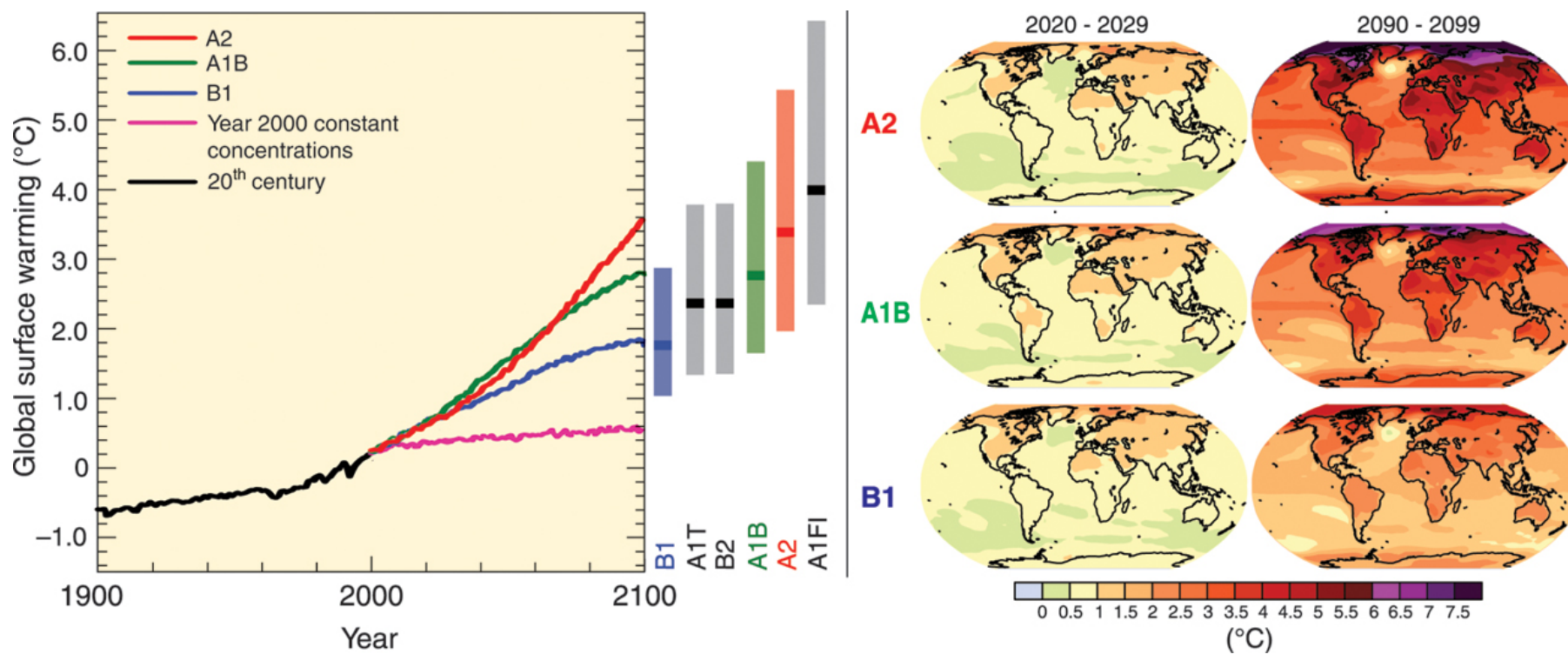
**Federal Ministry for the Environment,
Nature Protection and Nuclear Safety,
Bonn**

CO2 eq. Emissions per Year



Source: IPCC Fourth Assessment Report, Climate Change 2007

GHG and temperature



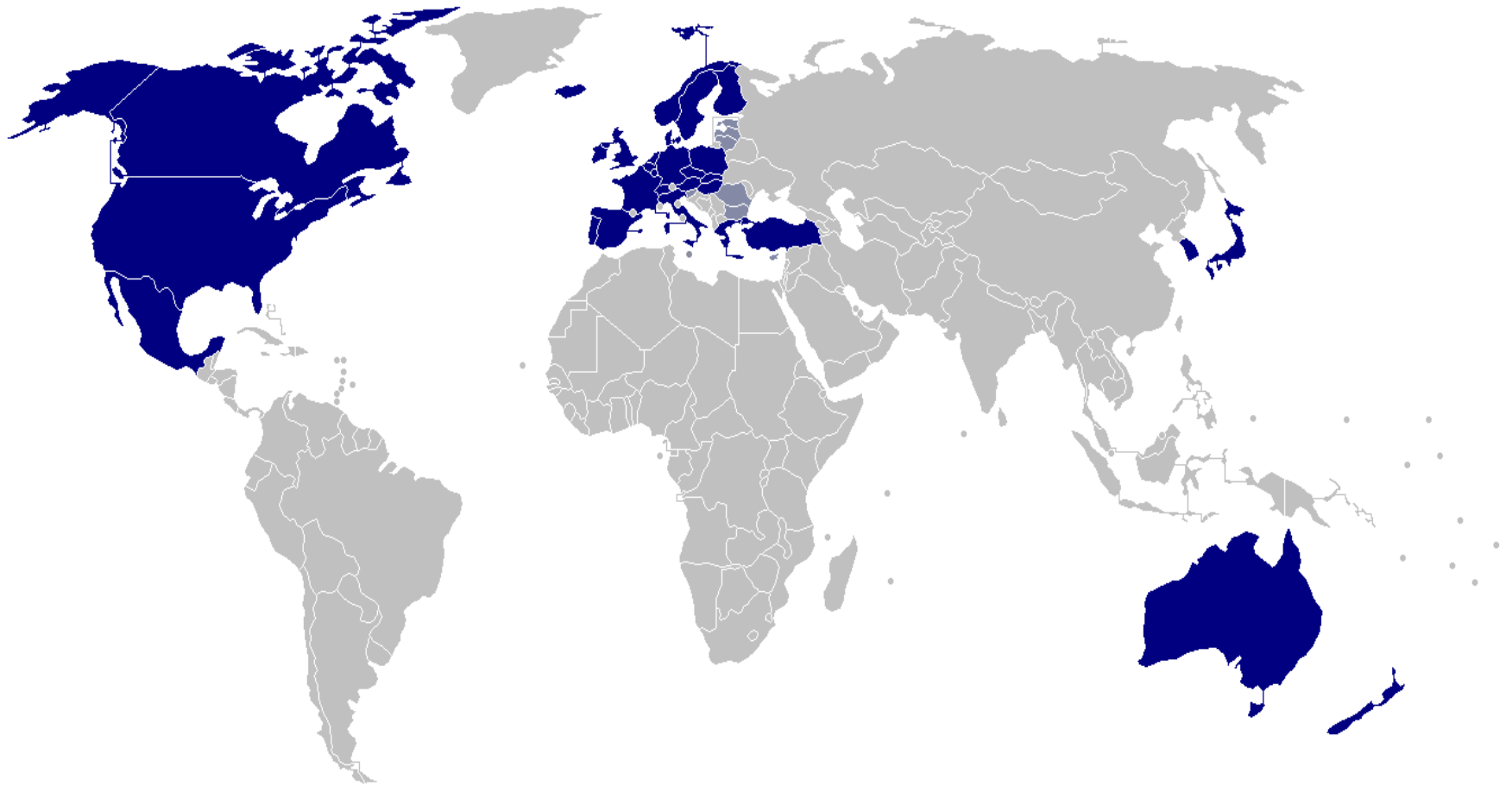
Source: IPCC Fourth Assessment Report, Climate Change 2007

OECD-Member States 2010

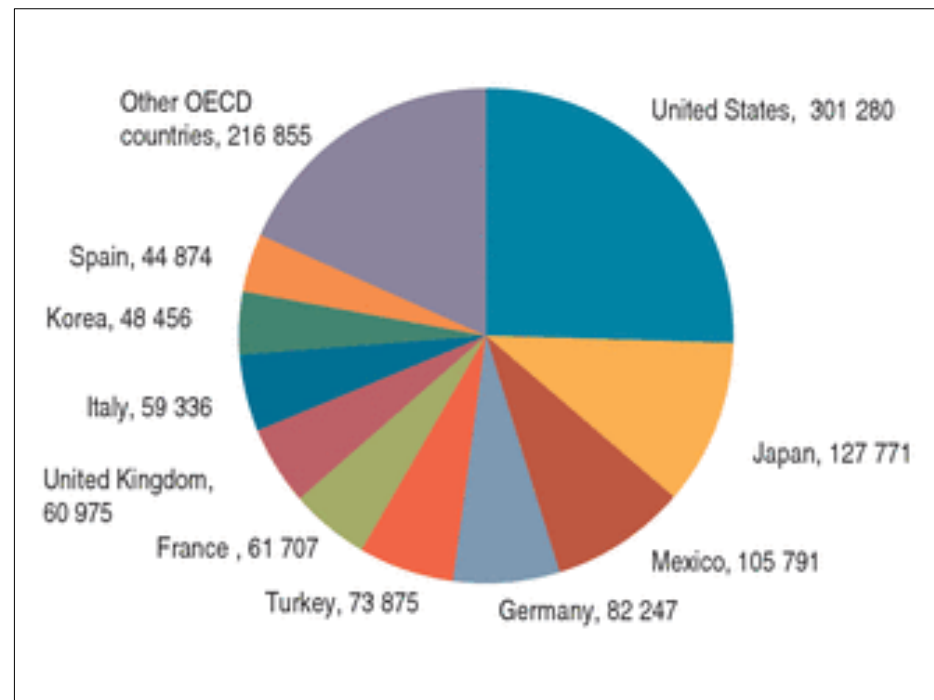
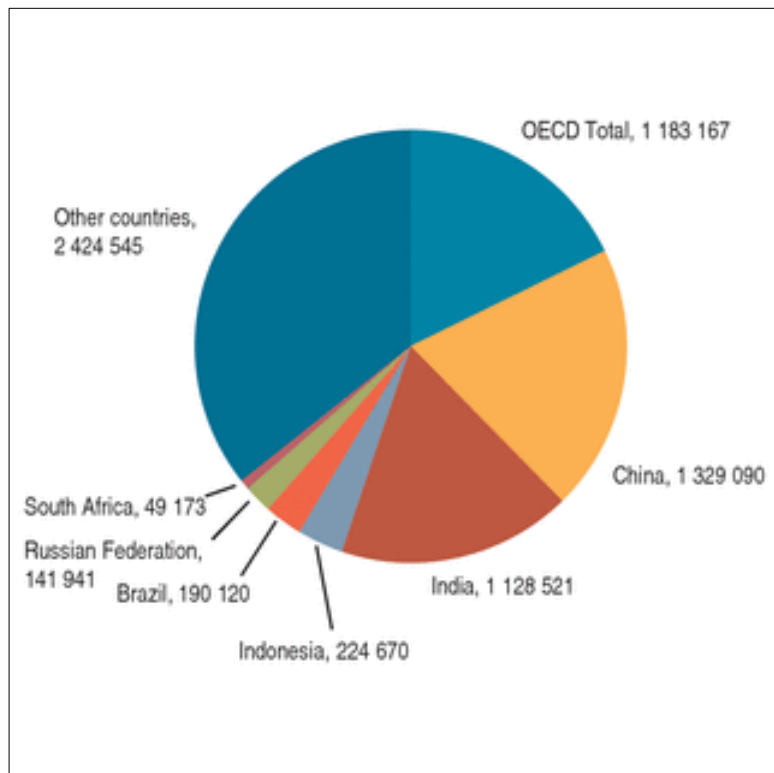


34 OECD-States

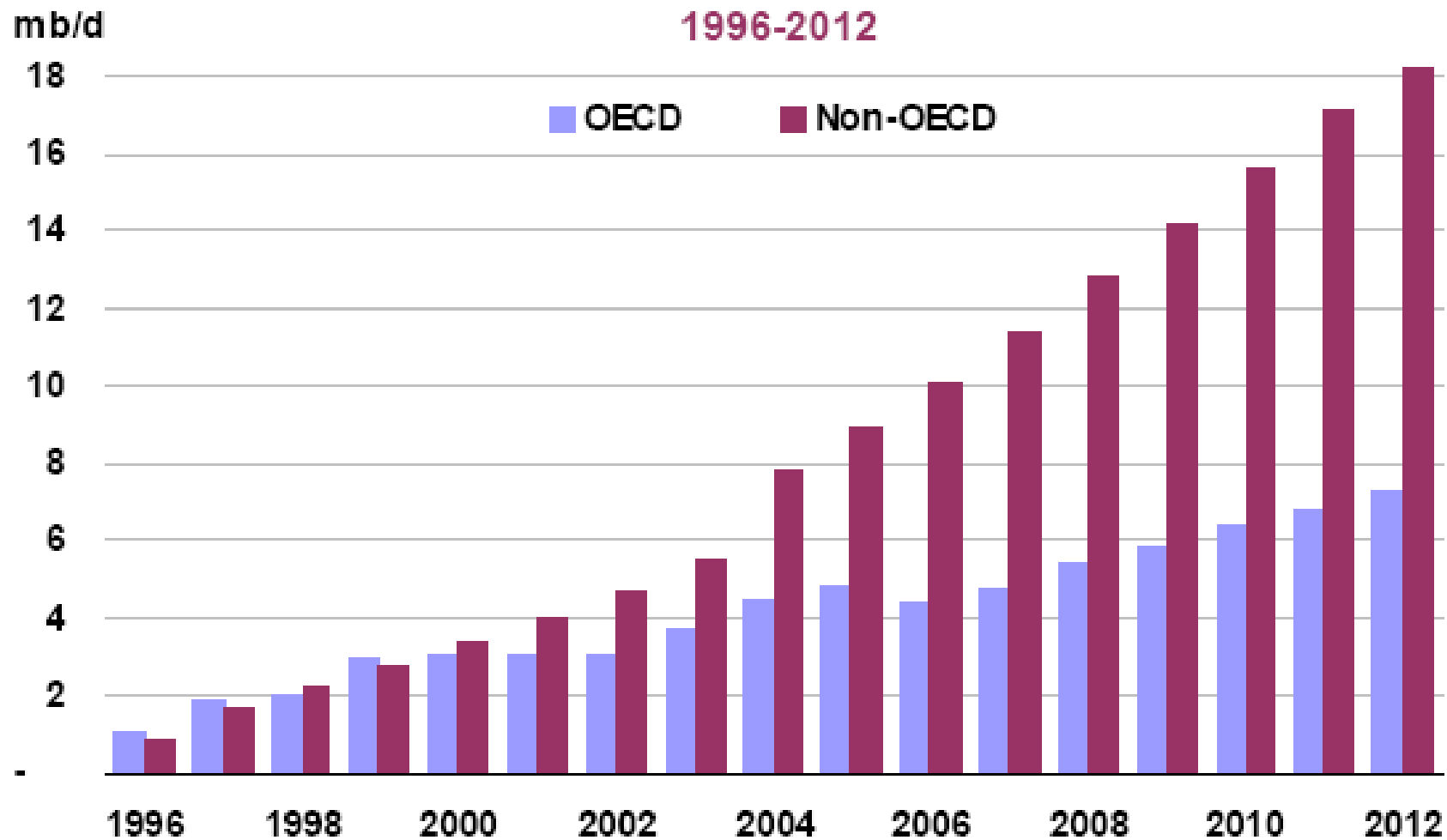
Industry States, EU States (except Lithuania, Latvia, Rumania, Bulgaria), Turkey, Mexico, Chile, Israel



World and OECD Population (2007)

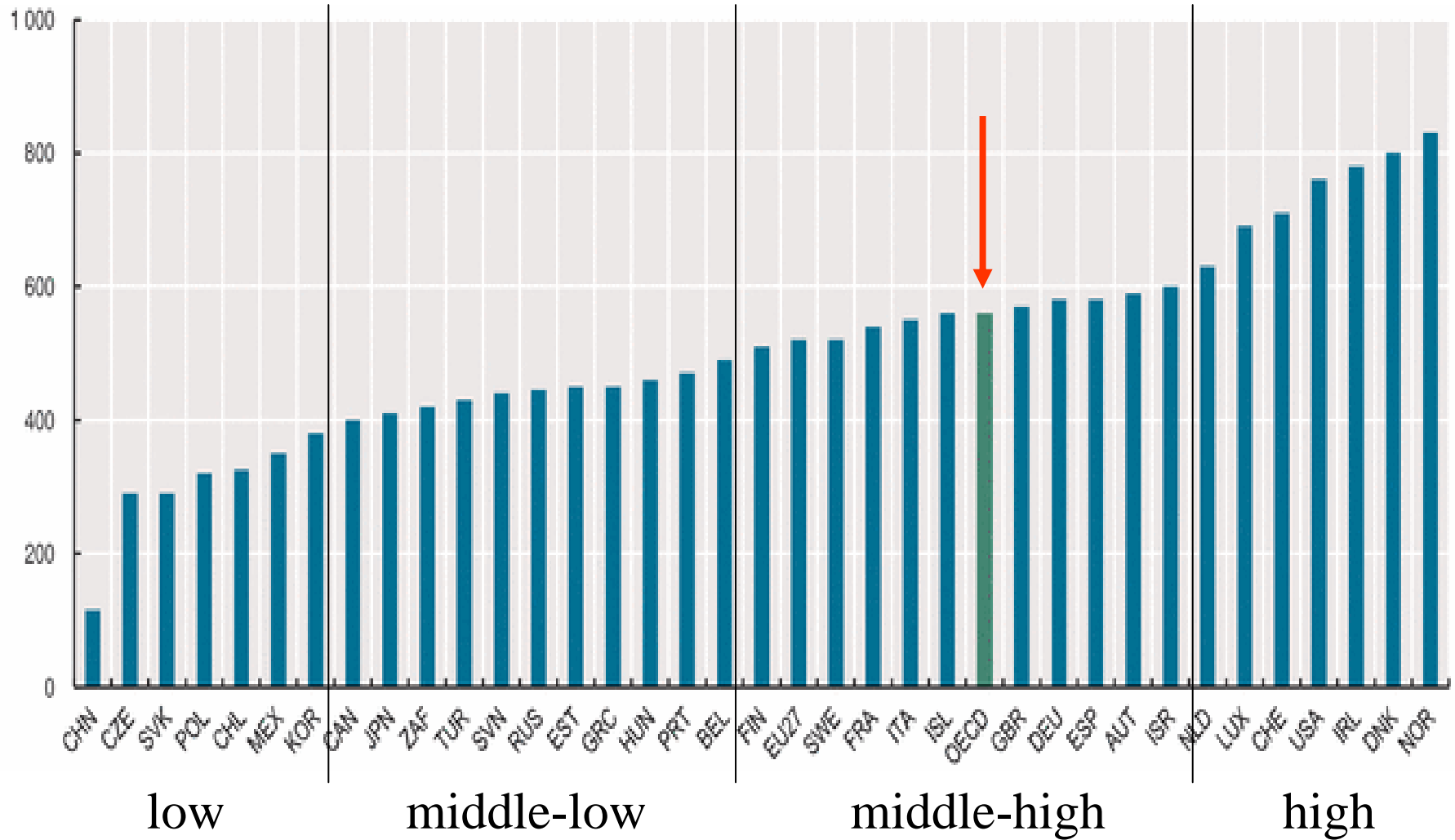


OECD vs. Non-OECD Cumulative Oil Demand Growth 1996-2012

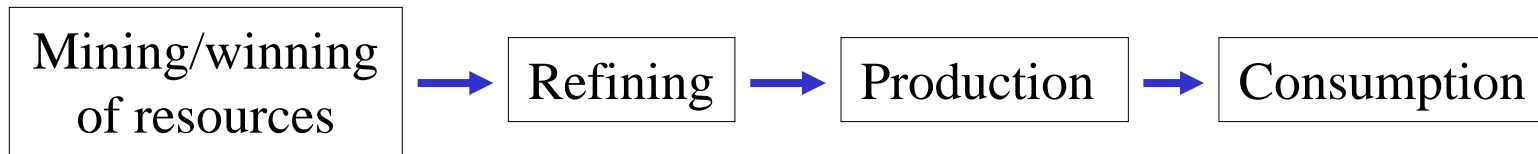


Municipal waste generation

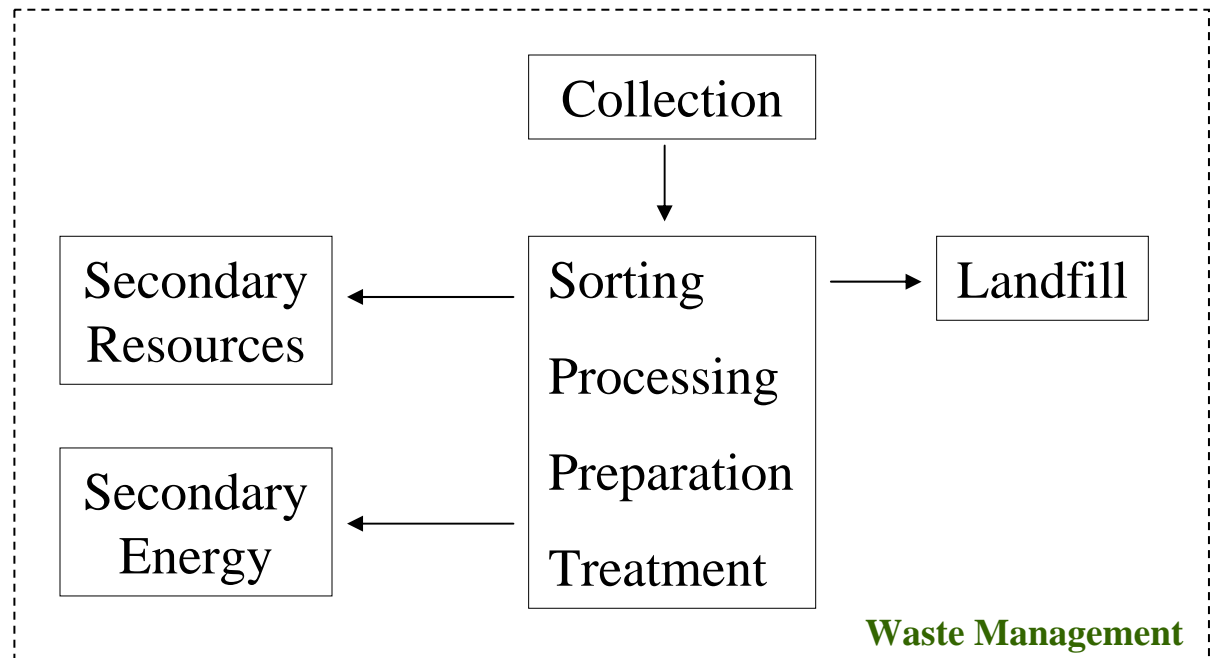
kg per capita, 2007 or latest available year



Global Material Streams

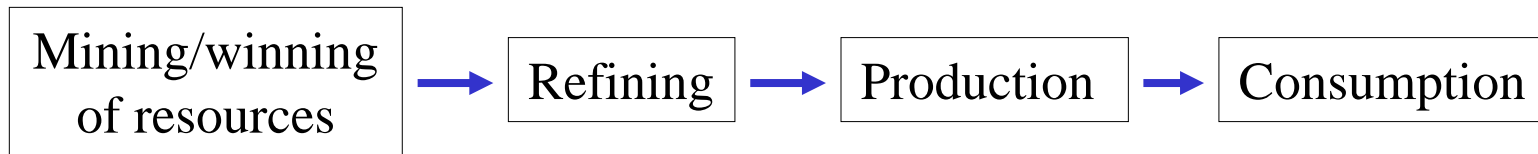


Energy

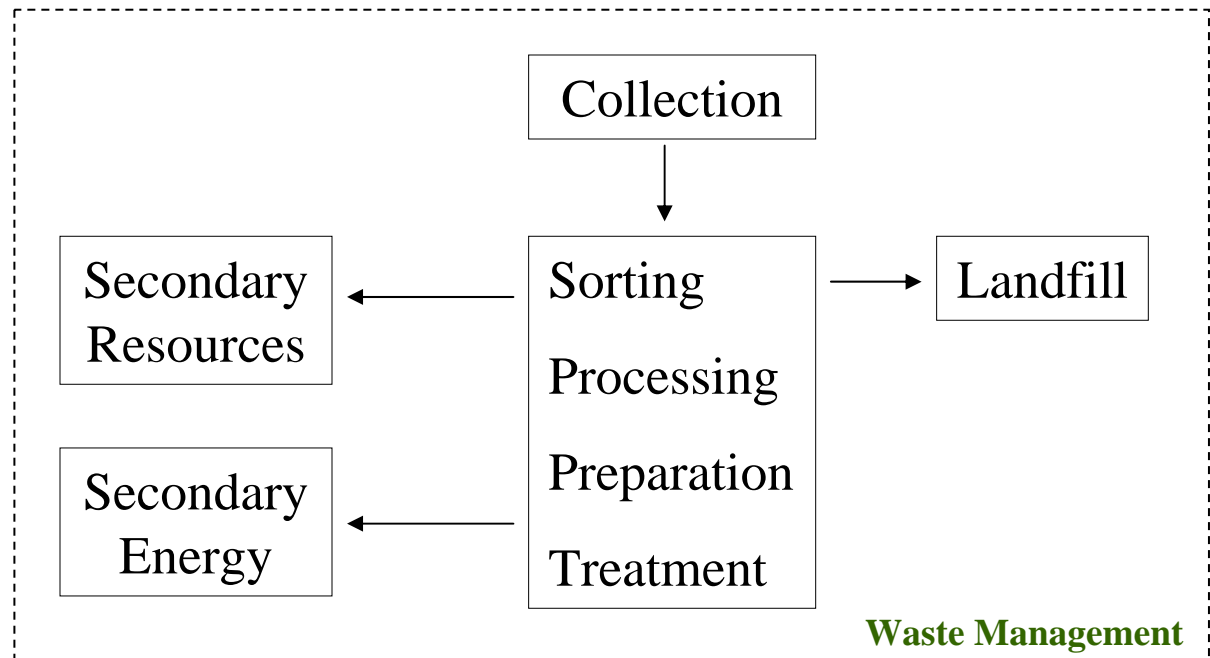




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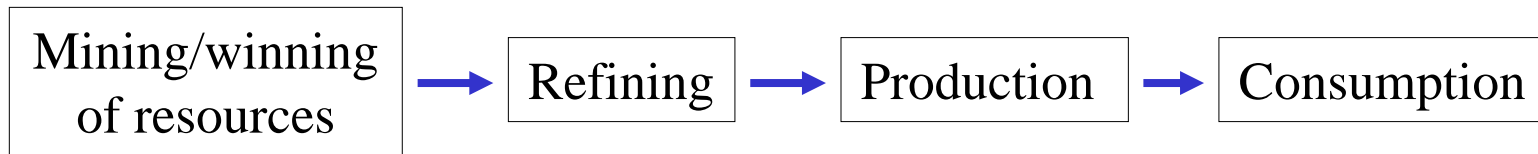


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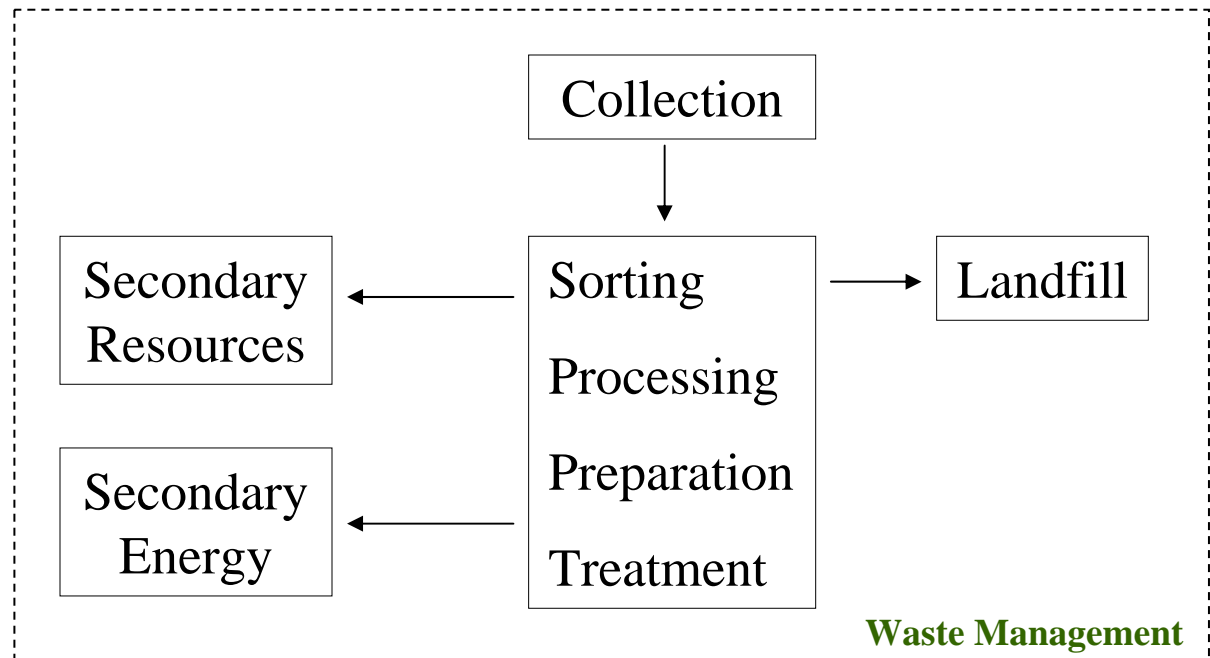


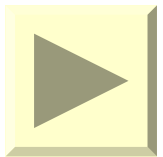


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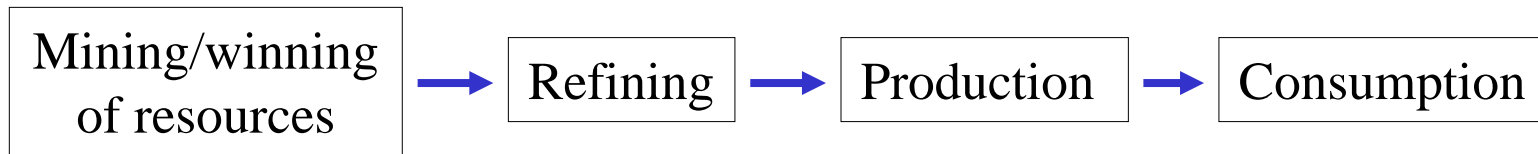


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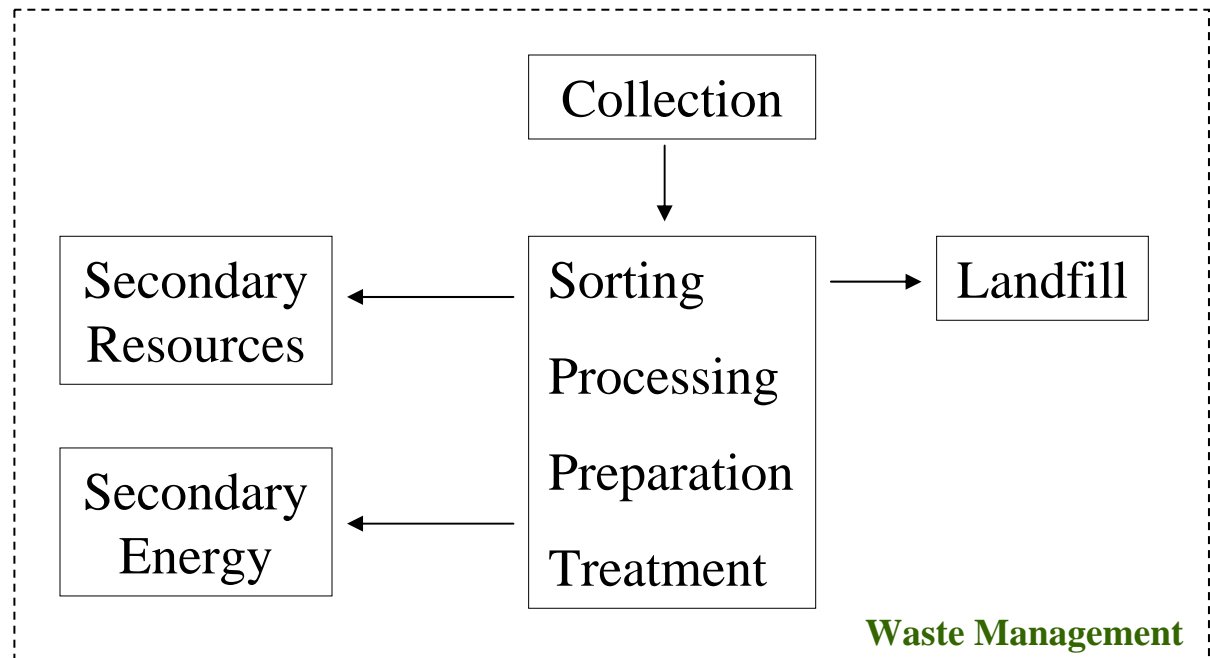


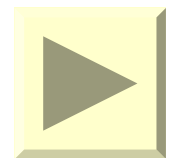


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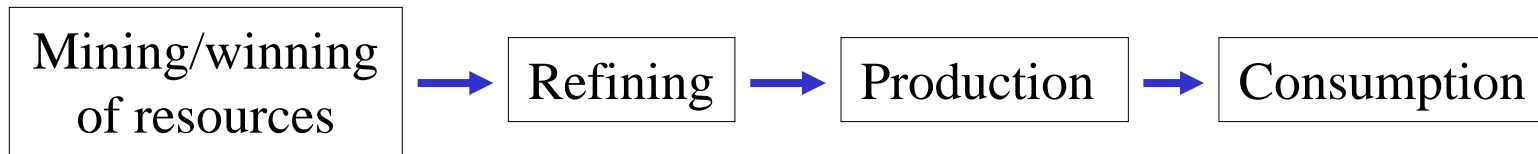


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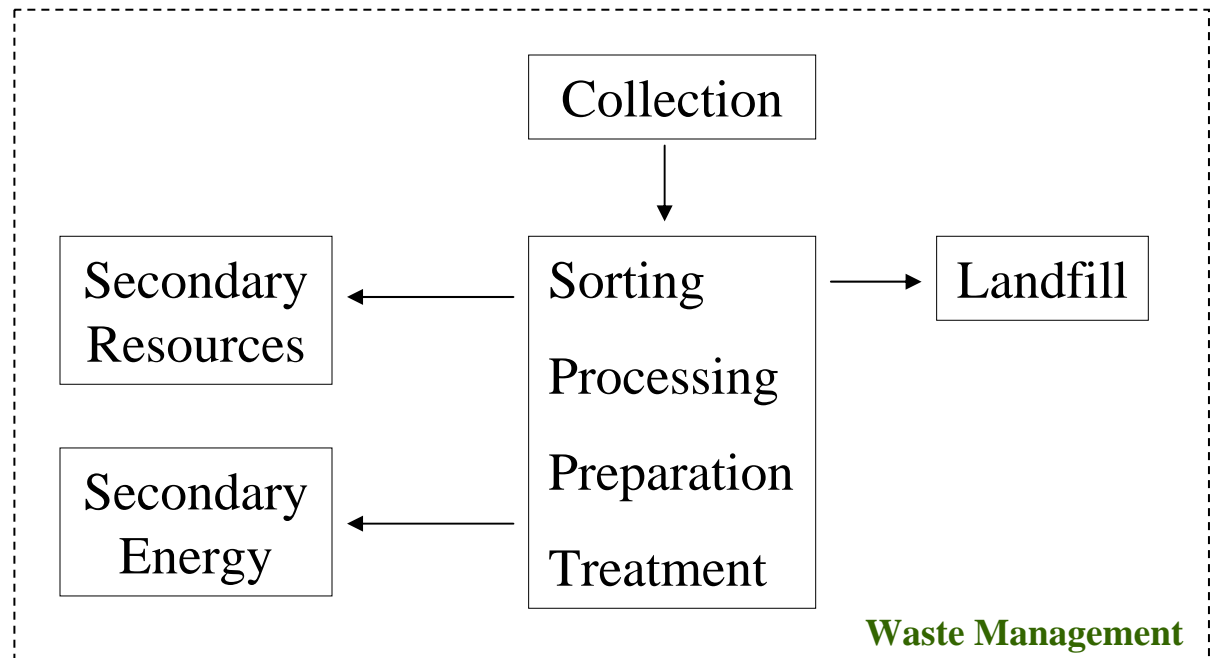


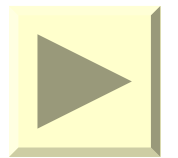


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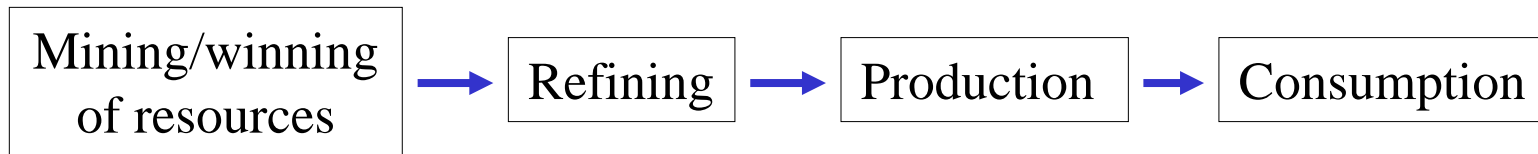


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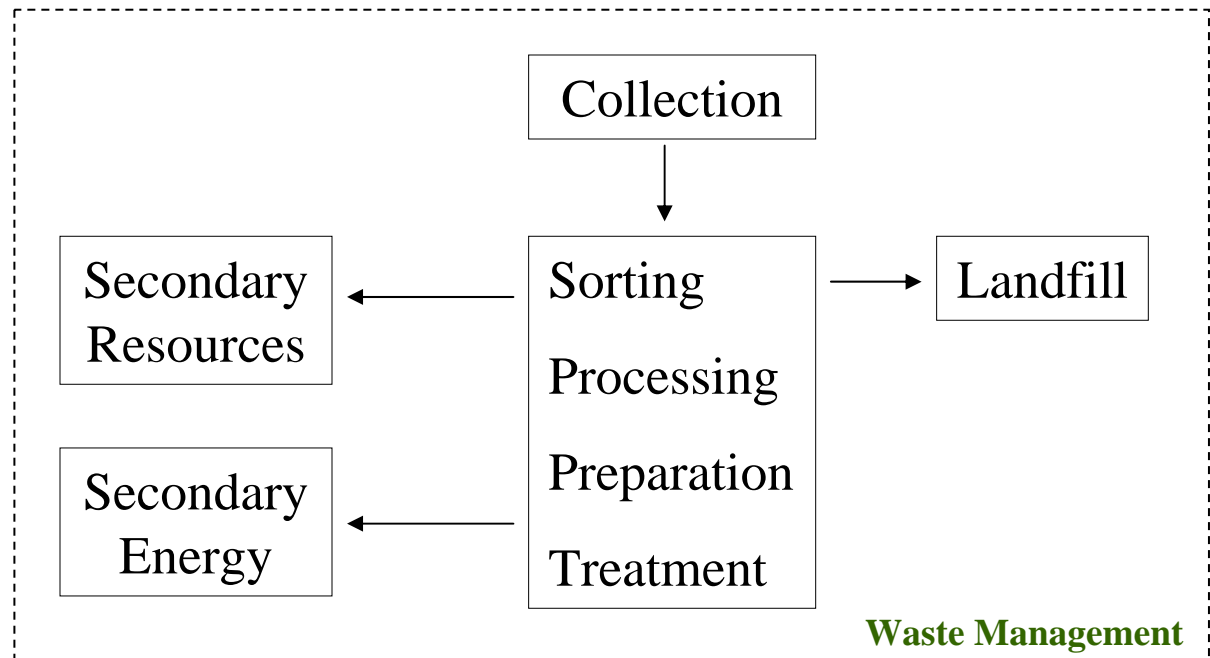


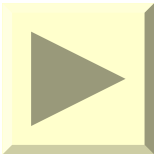


Global Material Streams

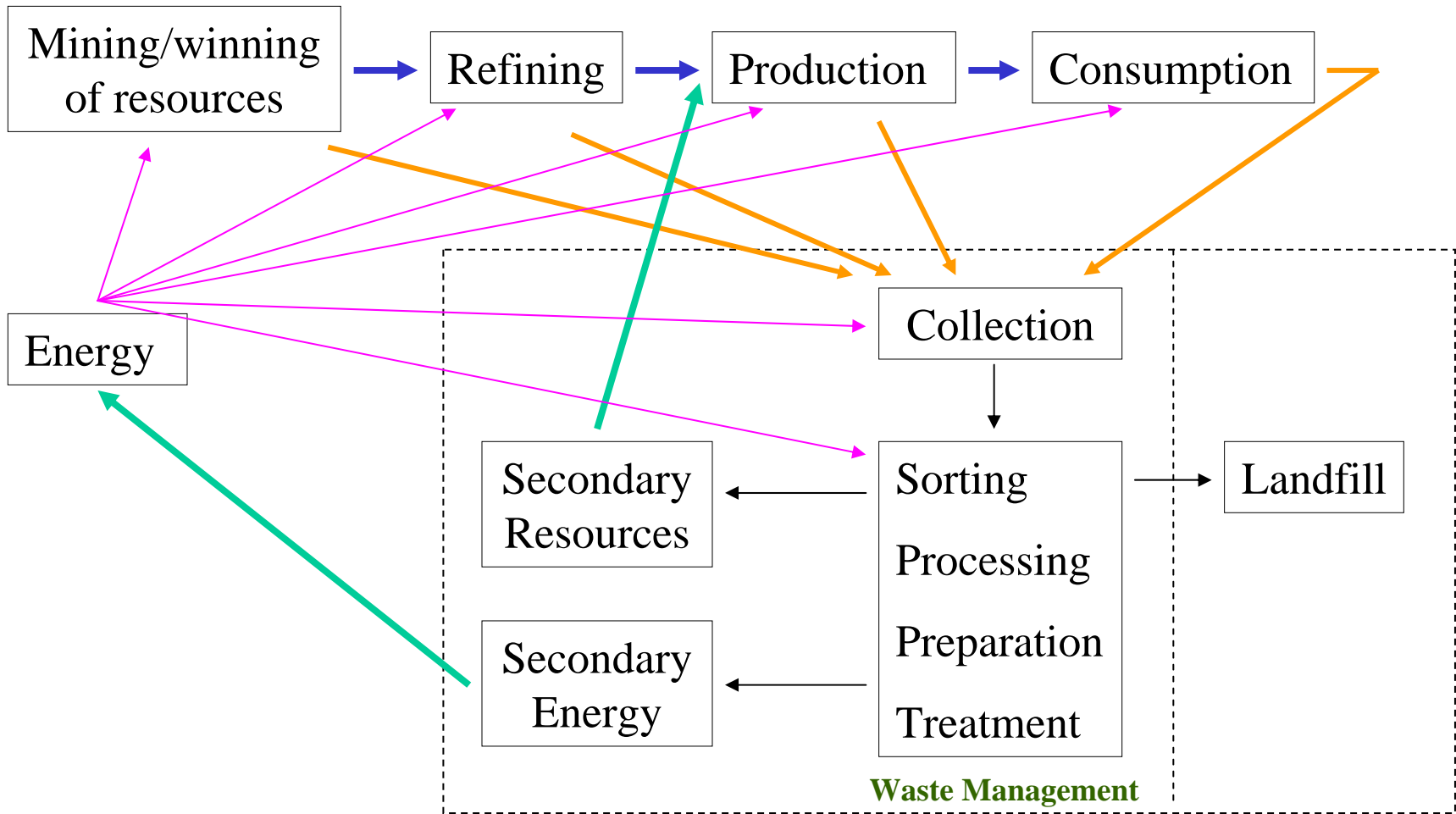


Energy





Global Material Streams



Waste Management Hierarchy

Loss

and

Savings

of

Resources

and

Energy



Prevention

Re-use

Segregation at source

Separate collection

Recycling

Energy recovery

Other recovery

Landfill

Potential GHG Reduction Measures of Waste Management

Prevention of fossile energy used for resource mining/ winning, refining, production	Recycling (aggregates, metals, glass, oil, plastics, paper ...)
Prevention of methane emissions	Use of Bio-Energy (Fuel, gas, wood pellets ...) Landfill de-gasification
Losses of fossile energy in waste	Waste incineration with high energy efficiency

Studies

Recycling stops greenhouse gases

The contribution of the recycling and water management industry to climate protection

2010

www.ifeu.de/english

CLIMATE PROTECTION POTENTIALS OF EU RECYCLING TARGETS

January 2008

Ökopol GmbH (Germany)

www.eeb.org

Status Report on the Waste Sector's Contribution to Climate Protection and Possible Potentials

2005

 **Öko-Institut e.V.**
Institut für angewandte Ökologie
Institute for Applied Ecology



BDE



**Umwelt
Bundes
Amt**
Für Mensch und Umwelt

www.bmu.de

Study

„Climate protection potentials in the waste management sector“ (2010)

**Germany and Europe (EU27)
plus Turkey, Tunisia, Mexico**

Öko-Institute and IFEU-Institute

for Federal Environment Agency, Dessau
Federation of Waste Management Industry, Berlin

First step: Germany

Second step: EU 27 plus selected countries

Third step: OECD

Study

- **Method:** Eco-balance for management of **municipal waste** and **waste wood**
- Common Reporting Format (CRF) of United Nations Framework Convention on Climate Change (UNFCCC) only **includes** for waste management:
 - GHG emissions from
 - landfills (methane),
 - MBT,
 - incineration **without** power generation
 - but **excludes** for waste management
 - GHG mitigation from
 - recycling
 - incineration **with** power generation
 - other material recovery
- **Challenges, efforts and success need an analysis of all waste management activities !**



Study

Results

Germany: 1990 Generation of **38 mio to** CO₂ equivalent
2010 Savings of **18 mio to** CO₂ equivalent
2020 Savings of **27 mio to** CO₂ equivalent

→ Reduction of **65 mio to** CO₂ equivalent

Over all goal: 40% in 2020 to 1990
= 486 mio to CO₂ equivalent

→ **Proper Waste Management could contribute with app. 13 % to over all goals for 2020**

Study

Results

EU 27:

2007 Generation of **51 to 78 mio to** CO₂ equivalent
With landfill ban for untreated waste, recycling of waste wood and 40% de-gasification of landfills:
2020 Savings of **114 mio to** CO₂ equivalent

→ Reduction of **192 mio to** CO₂ equivalent

Common reduction goal: 20% in 2020 to 1990
= 600 mio to CO₂ equivalent until 2020

→ **Proper Waste Management could contribute with app. 32 % to over all goals for 2020**



Environmental Performance and Information Division
Environment Directorate
Working Group on Environmental Information and the perspectives environnementales
Direction de l'environnement de l'OCDE
Groupe de travail sur l'information et les perspectives environnementales
(env.contact@oecd.org)

Municipal waste population Waste / person

D = 42,7 mio to
82 mio inhabitants
520 kg/person

EU₂₇ = 249 mio to
492,8 mio inhabitants
506 kg/person

OECD = 614 mio to
1191 mio inhabitants
515 kg/person

Study

Results (app.)

OECD: 2007 Generation of **130 to 190 mio to** CO₂ equivalent
With landfill ban for untreated waste, recycling of waste wood and 40% de-gasification of landfills:
2020 Savings of **280 mio to** CO₂ equivalent

→ Reduction of **470 mio to** CO₂ equivalent

No common mitigation goal

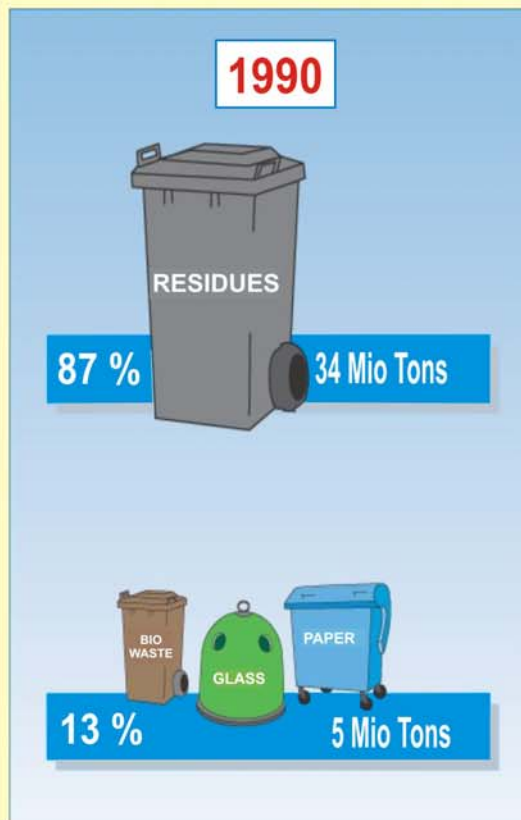
Total GHG emission (CO₂ equivalent): **14142 mio to**

→ **Proper Waste Management could reduce the total GHG emissions by 3.3 %**

→ **241 mio cars** (130 g/km and 15000 km/a)

More Recyclables than Residues in 2007

Household Waste



Source: Statistisches Bundesamt 2009

Germany

Recycling due to segregation / separation

Private Households

Bio waste
Paper
Packaging (Wertstofftonne)
Glass
[Metals]
E-waste
Batteries
Textiles
Hazardous waste
Residues

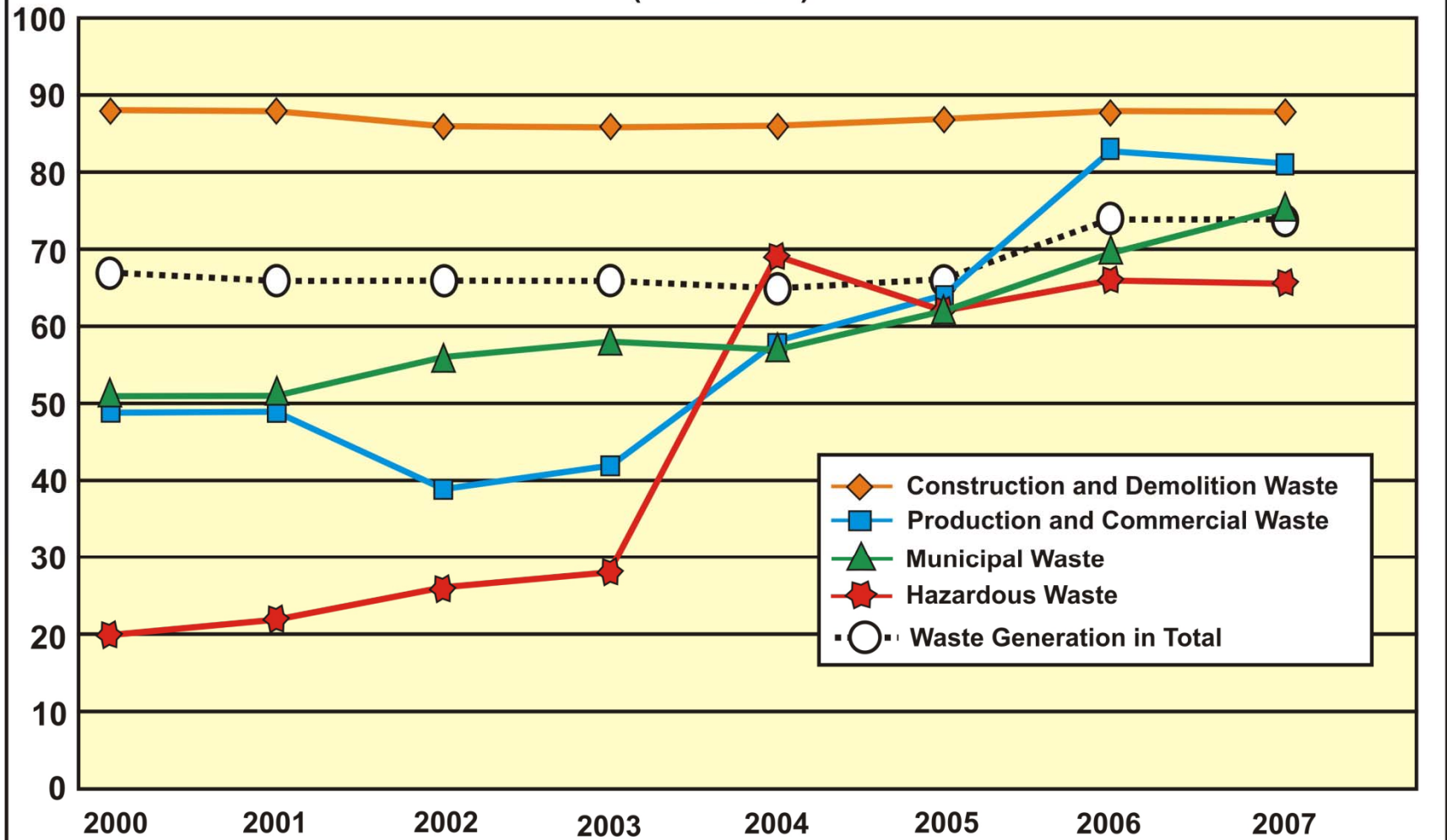
Commerce / Industry

+

Wood
Plastics
Metals
Mineral waste
other mono-charges:
 slags,
 sludges,
 RDF

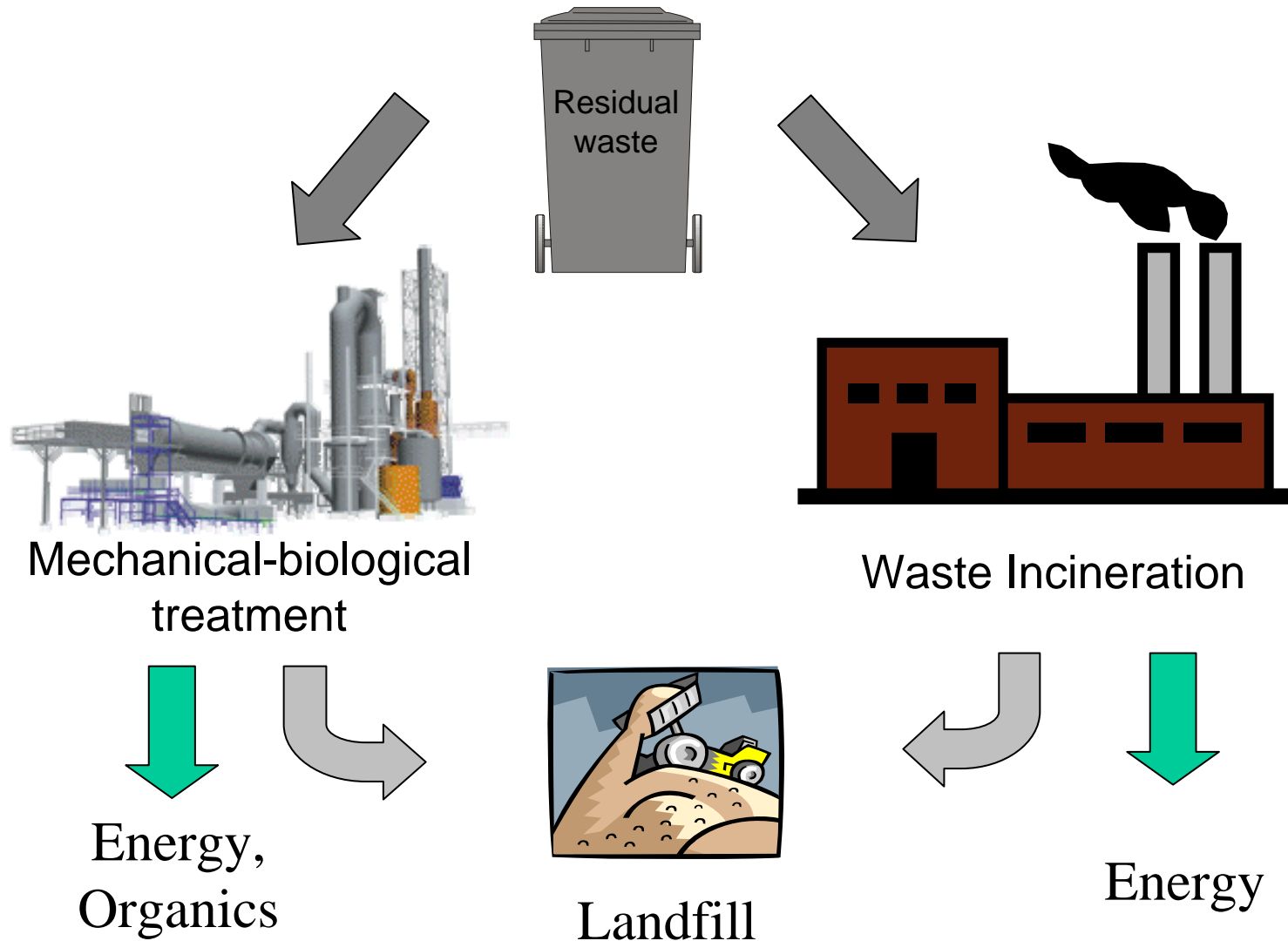
Germany

Recovery Rates of Main Waste Fractions (in Percent)

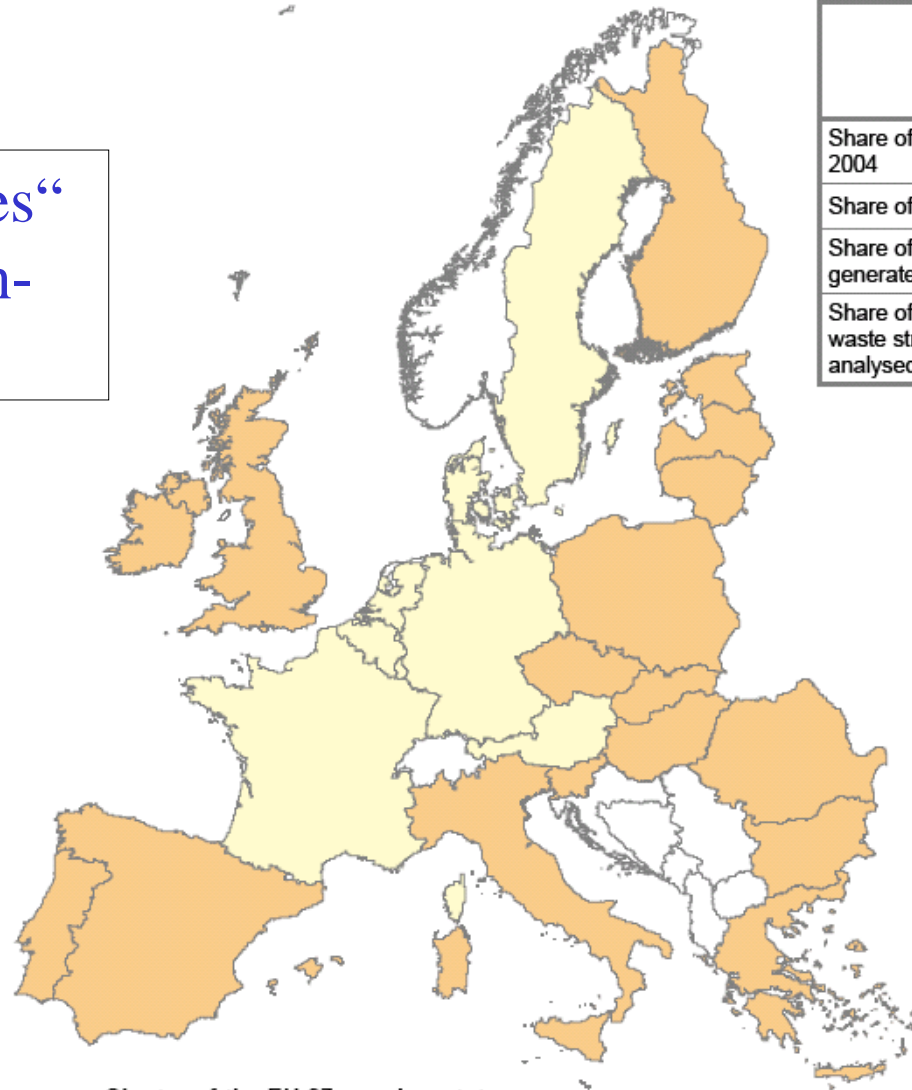


Source: Statistisches Bundesamt 2009

Pre-treatment of residual waste (obligatory since June 2005)



„Recycling-states“
are „incineration-
states“ !

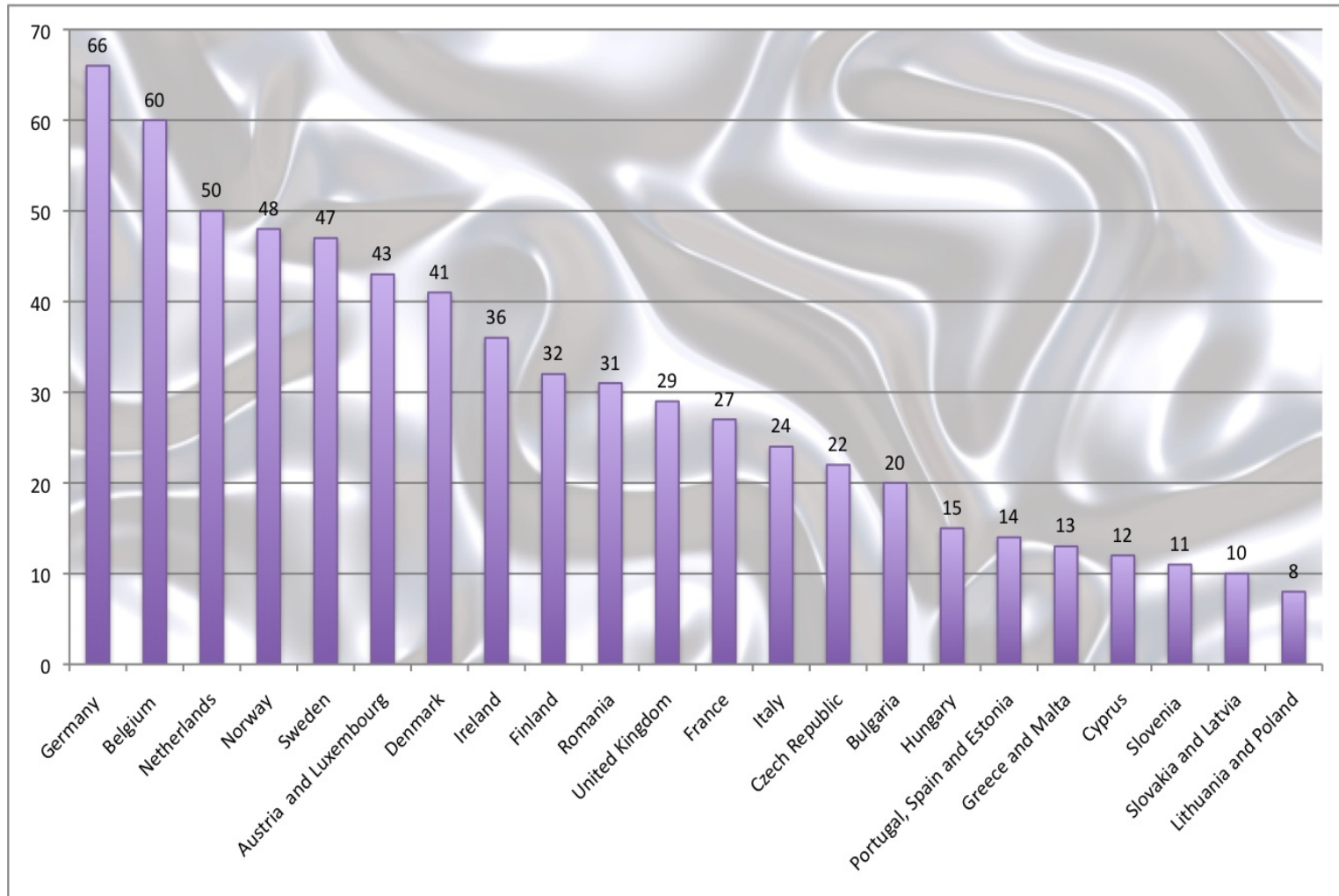


Cluster of the EU 27 member states

■ EU - "landfilling-states"
■ EU - "recycling / incineration-states"

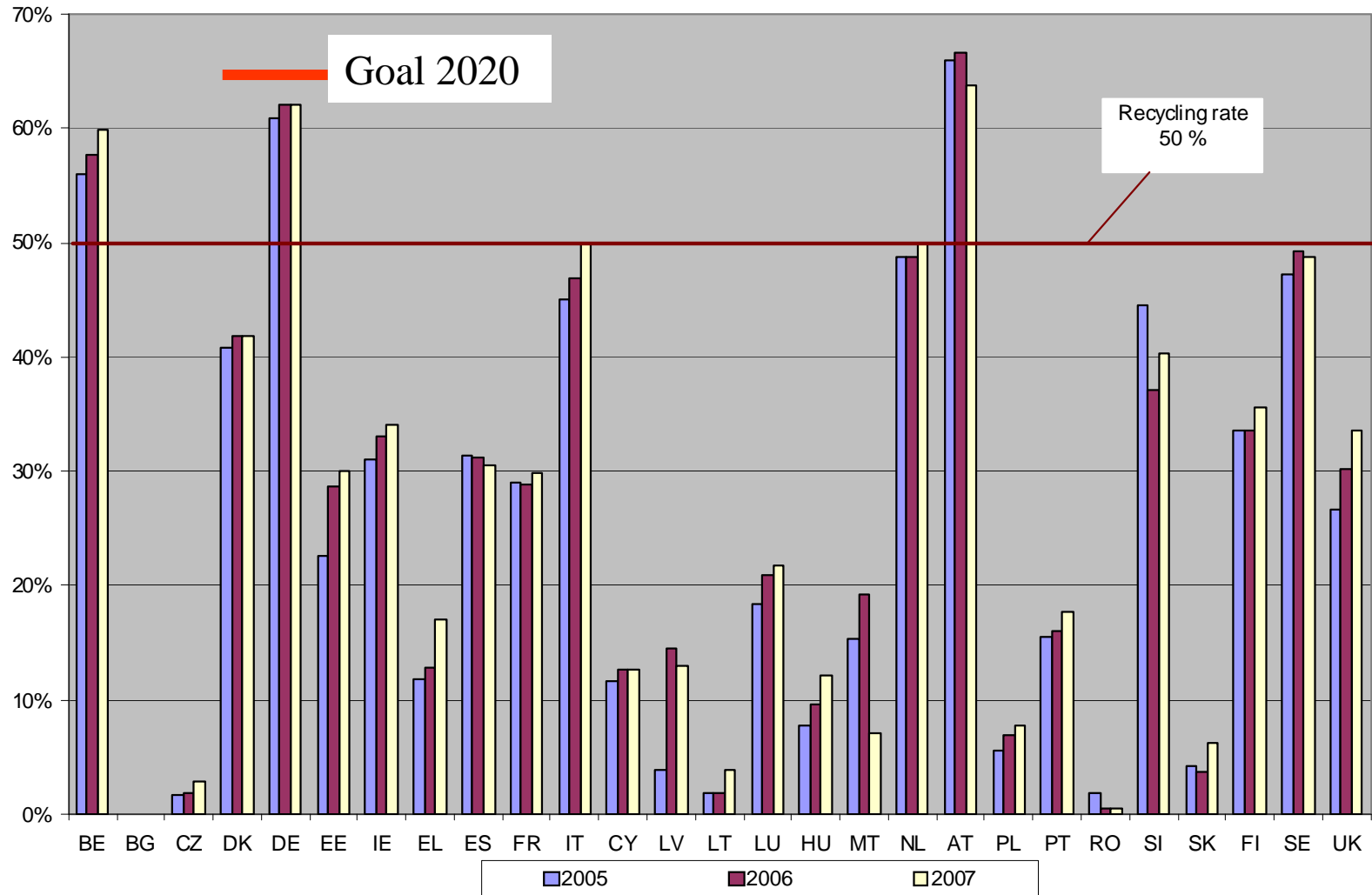
	8 EU – „recycling / incineration states“*	19 EU – „landfilling states“
Share of population 2004	40%	60%
Share of GDP	51%	49%
Share of total waste generated	41%	59%
Share of material waste streams analysed	51.5%	48.5%

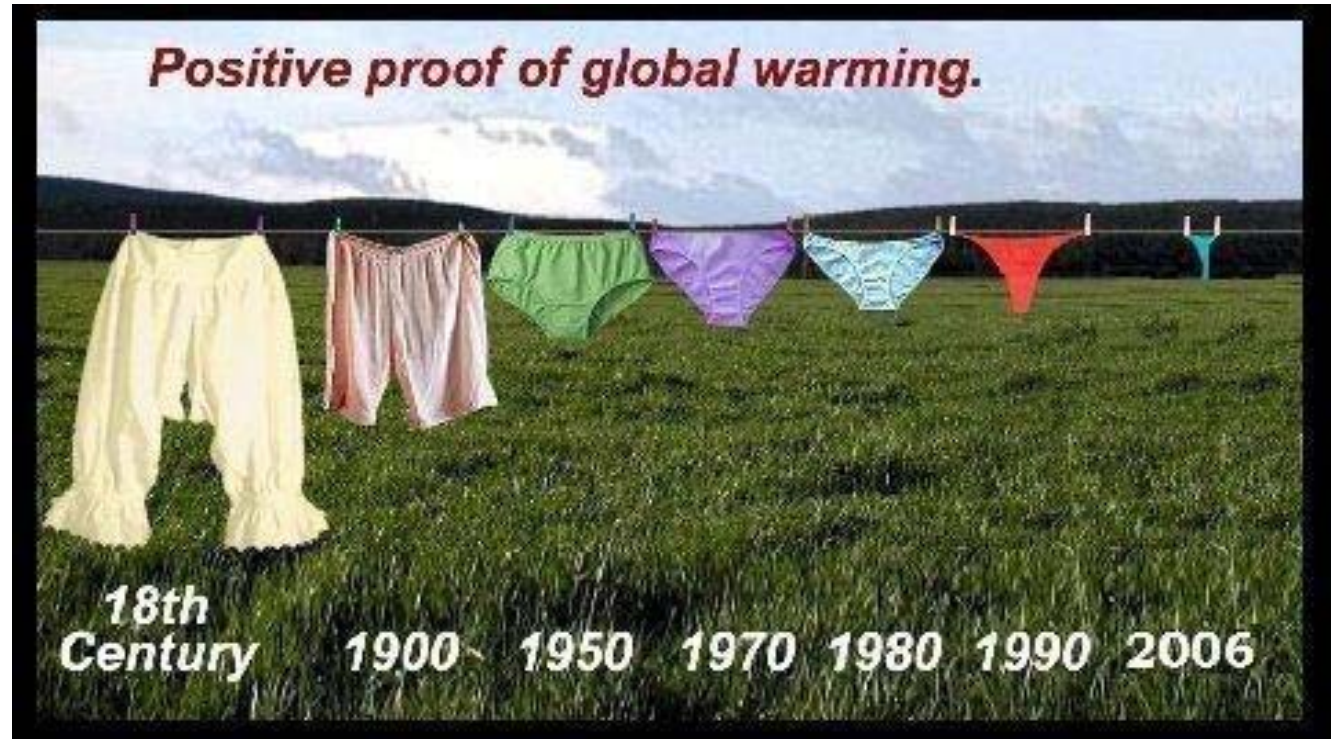
Recycling rates in Europe



Source: ACR+, 2009

Monitoring of recycling targets - municipal waste -





**Thank You
very much for
Your attention
!**

www-retech-germany.de

www.bmu.de

www.uba.de