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Effective solid waste management at municipality level

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Introduction

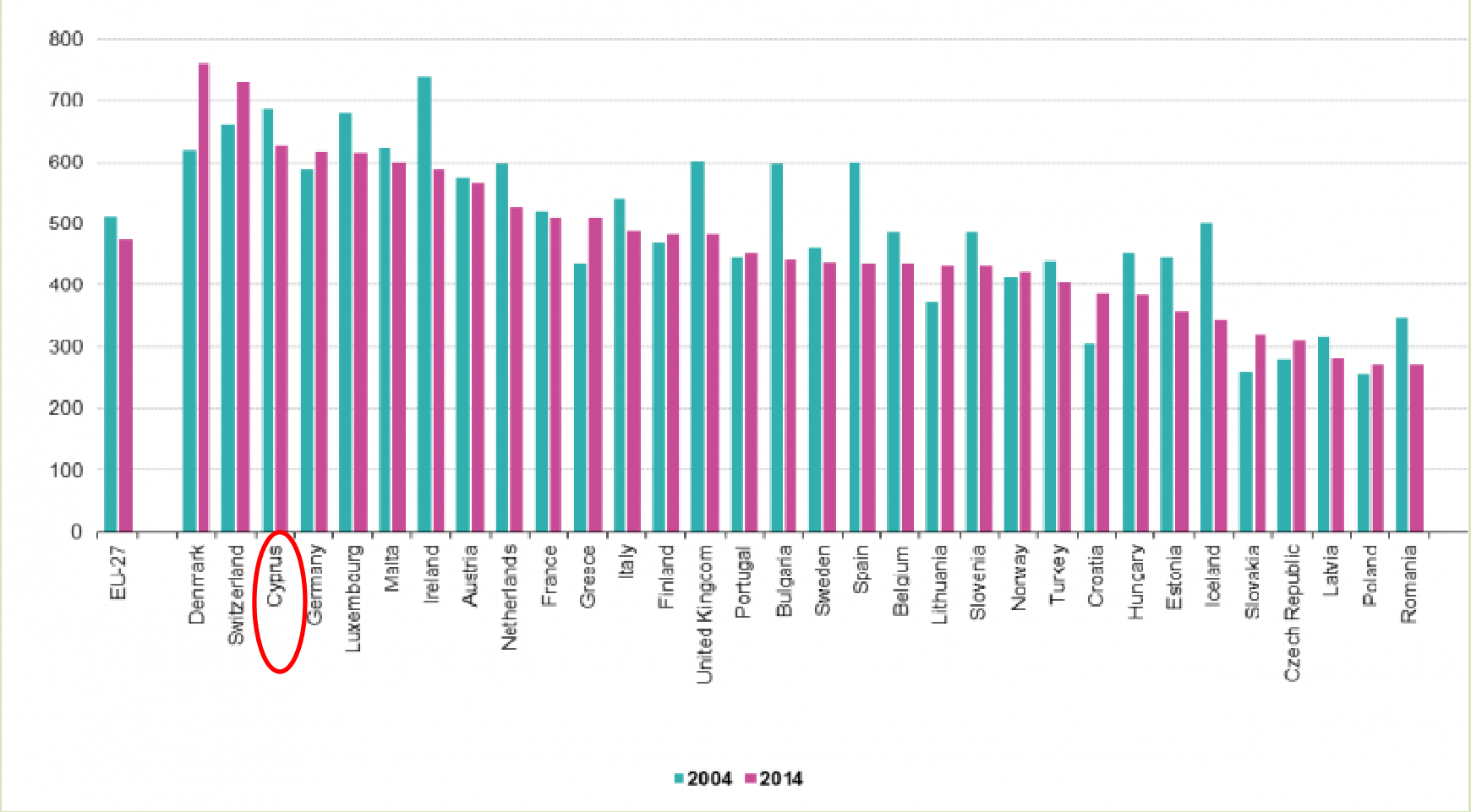
• Collection, transport, treatment / recycling and disposal of Municipal Solid Wastes (MSW), have become a relatively difficult problem to solve for those responsible for their management.

• High transfer costs and low rates of separation at source, are the main reasons for potential planning failures.

• At the same time, legislation sets every year more demanding targets.

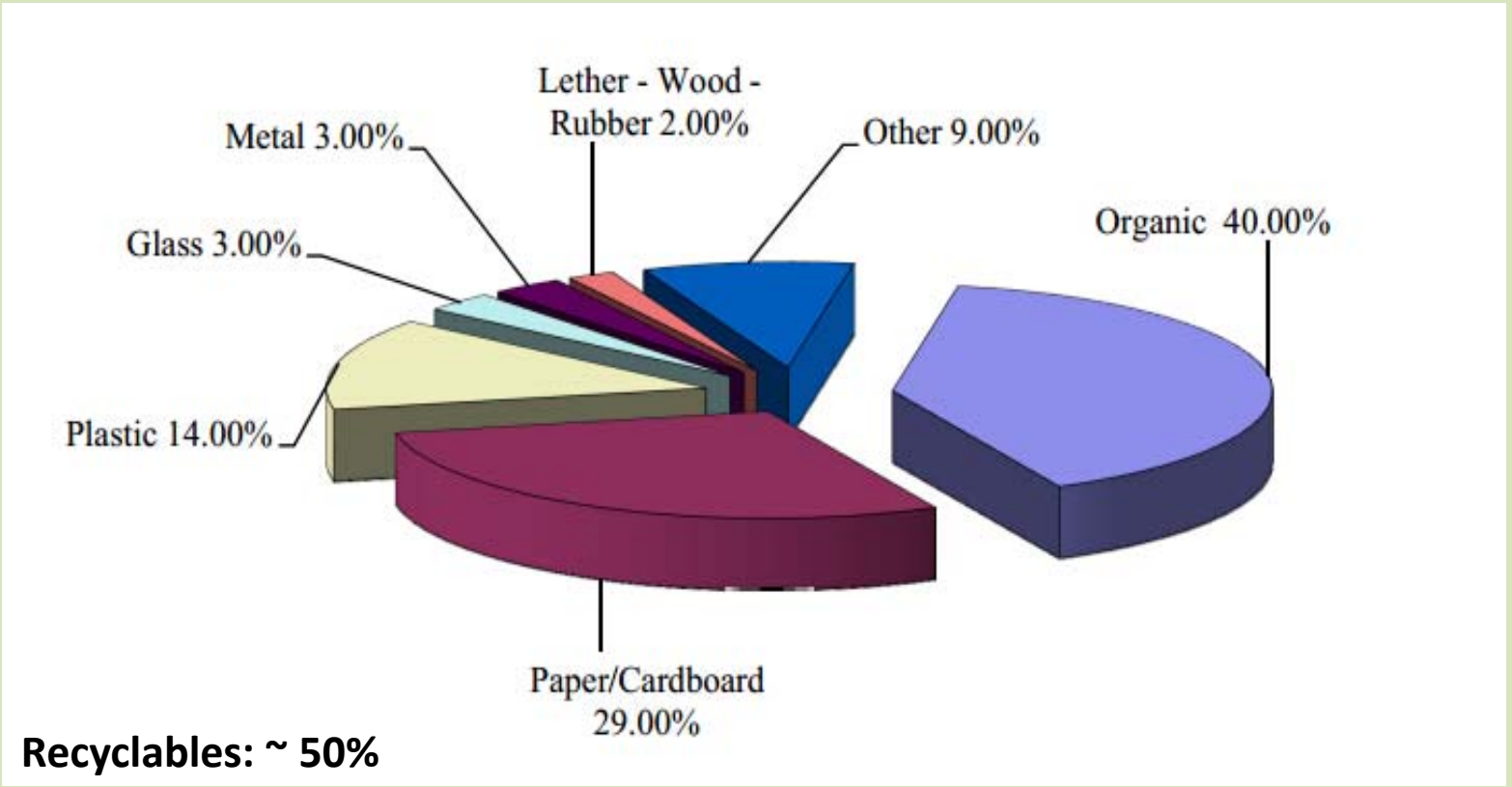
• Key objective should be the decentralization of solid waste management (municipality level).

MSW generation (2014)



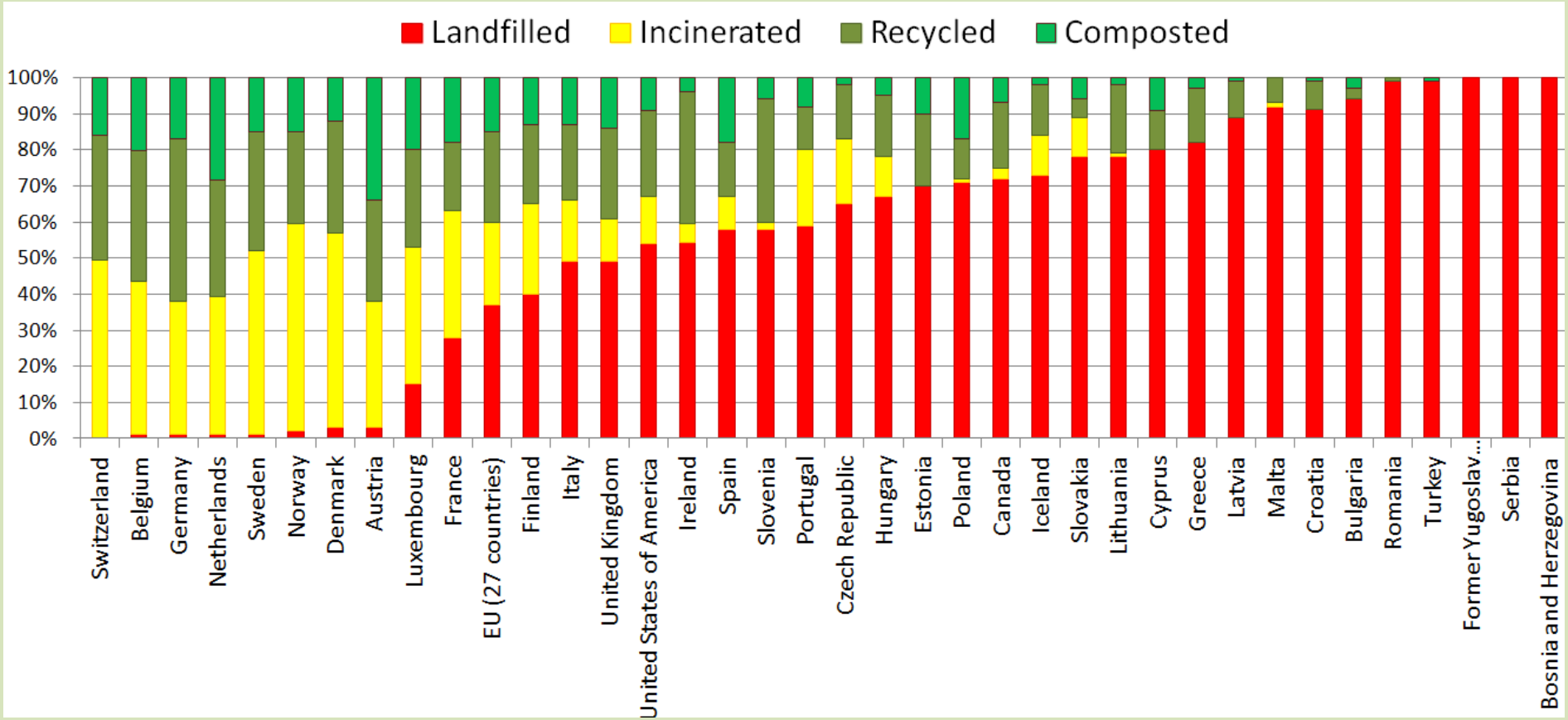
Municipal waste generated by country in 2004 and 2014, sorted by 2014 level (kg per capita)

Indicative MSW Composition



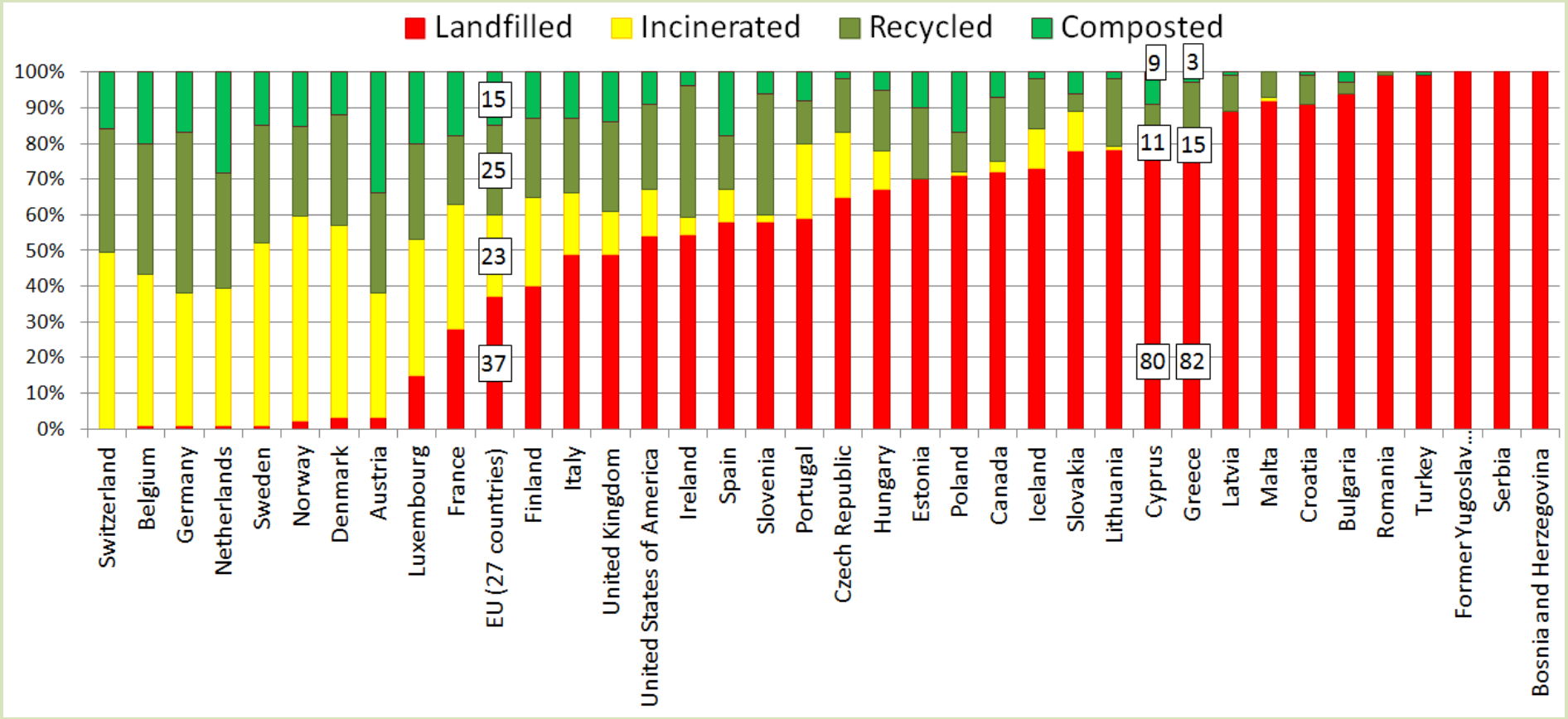
Recyclables: ~ 50%

MSW Management in EU27+ Canada & USA



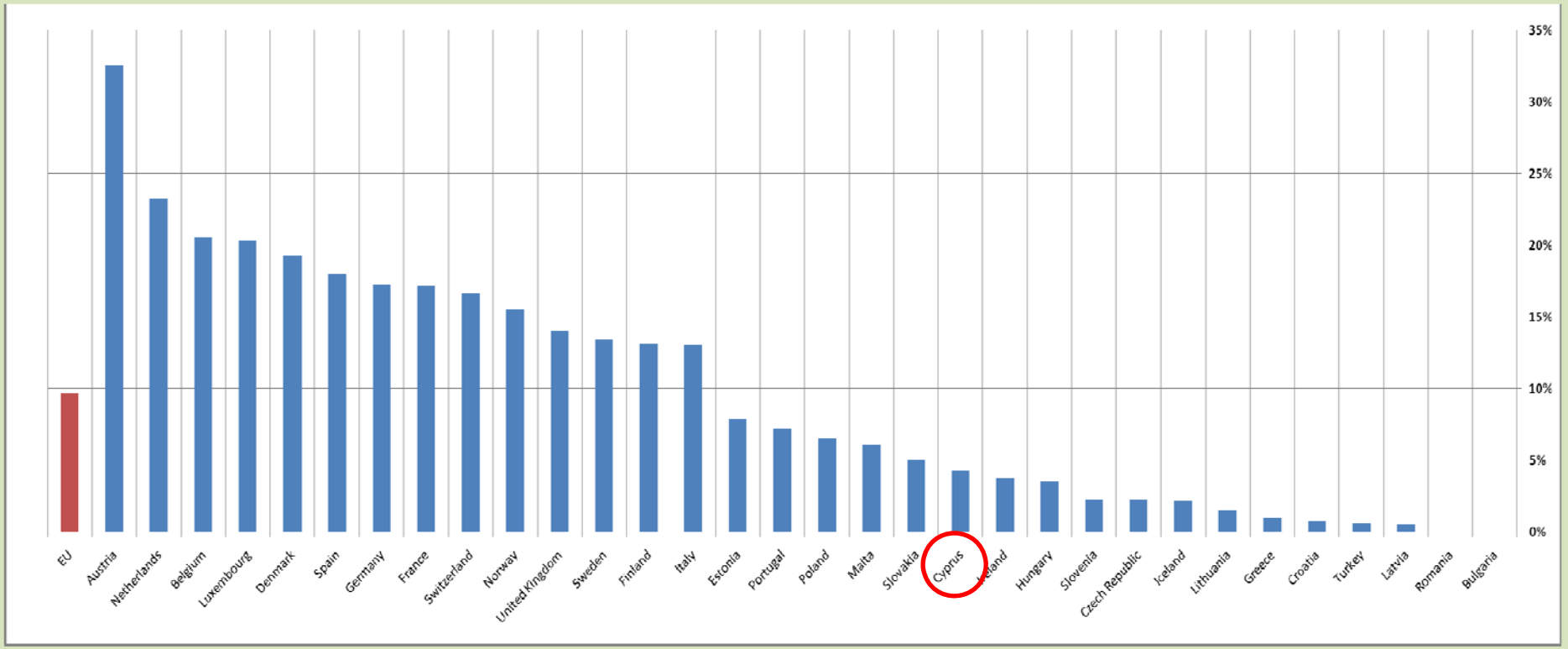
Source: *Eurostat, press release 33/2013 (March 2013)*

MSW Management in EU countries (Eurostat 2013)



In the EU during 2013, 40% of total MSW was recycled or composted

Biowaste Management in EU countries (Eurostat 2013)



Environmental policy on waste

According to Framework Directive on Waste 98/2008

Circular Economy

Basic MSW management Legislation (1/3)

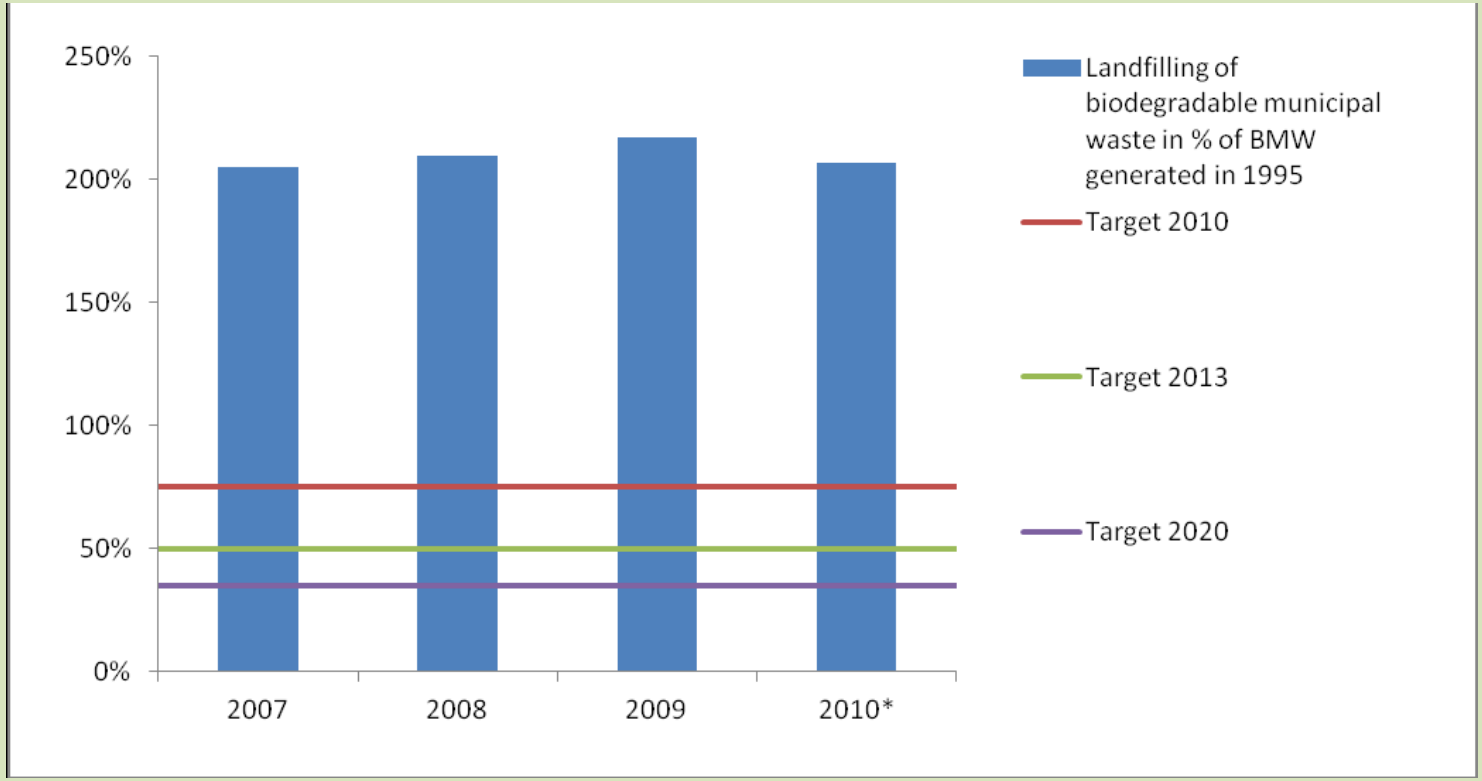
Framework Directive on Waste 98/2008

Priorities include:

- Prevention – Reduction – Separate collection of at least paper, glass, plastics and metals from 2015!
- The separate collection of organic waste is also encouraged.
- High reuse and recycling targets for materials (at least 50% for municipal solid waste until 2020), & energy recovery.

Basic MSW management Legislation (2/3)

Reduction targets for biodegradable municipal waste (1999/31/EC)



Substantial efforts will have to be undertaken for the fulfillment of the 50% and 35% targets of the EU Landfill Directive for diverting biodegradable municipal waste from landfill.

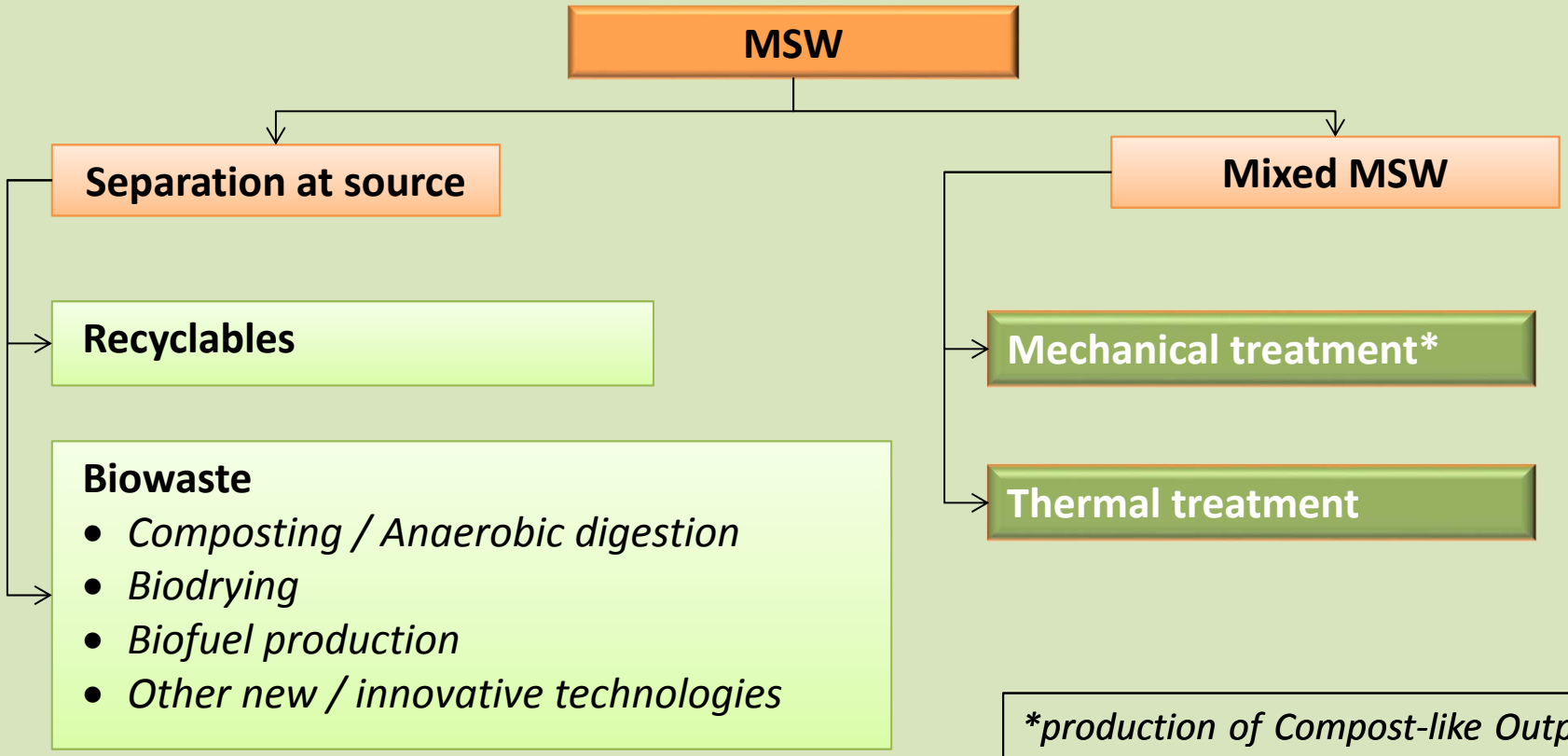
Basic MSW management Legislation (3/3)

Minimum recycling targets for materials contained in packaging waste (Packaging Directive 94/62/EC)

Minimum 55% & maximum 80% for packaging waste as a whole

- 60 % by weight for glass
- 60 % by weight for paper and board
- 50 % by weight for metals
- 22,5 % by weight for plastics, counting exclusively material that is recycled back into plastics
- 15 % by weight for wood

MSW management outline



*production of Compost-like Output is not considered as recycling

Key points & benefits of sustainable decentralized MSW management

Separation at source!

- Recyclables (constitutes ~50% of MSW)
- Biowaste (constitutes ~40% of MSW)

Local treatment of separated wastes

- Minimization of transfer costs

(MSW collection and transportation, is considered to be the most fuel-intensive step in waste management)

- Growth of local economy

The decentralisation of waste management enables the population to be actively involved in organising and financing waste management services.

- Higher recycling rates & better quality of end products

Higher prices → Less management costs

Outline of a Sustainable decentralized MSW management plan

1. The special characteristics of the region (seasonal variations of the generated quantities, availability of land for waste management facilities, size of the served areas, need for cooperation with neighboring municipalities, etc.)

2. Adoption of the priorities of environmental policy and legislation

3. The current progress in the methods, practices and technologies for the treatment of municipal solid waste

4. Assessment of alternative waste management scenarios for separation at source, based on specific criteria (e.g. population density, costs etc).

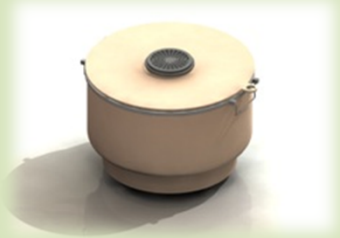
5. Planning awareness raising campaign (*informative campaigns, distribution of printed informative material, organization of workshops and other informative events*)

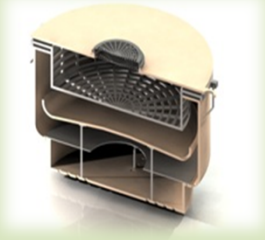
Separation at source

New biowaste treatment technologies (1/2)

Household biowaste drying

- Significant reduction of biowaste mass & volume at source (70 to 90% reduction)
- Significant reduction of waste collection & transportation cost → **Cost minimization: ~ 60%**
- Absence of nuisance
- Production of high added value biomass





Biofuel (bioethanol**) production from biowaste**

Setup WM scheme for biowaste

BIOWASTE

Indoor

- Biodegradable bag
- Small bin (10 or 40 L)

Outdoor

Wheelie bin 120L

Collection & Transportation

Treatment

Compost

Fuels

Conclusions

- Key objective should be the **decentralization of solid waste management (municipality level) & public awareness raising and involvement.**

- Focus should be given on **separation at source** of **Biowaste** (*which constitute around 40% of MSW*) and **Recyclables** (*around 50% of MSW*).

- Benefits include:

1. Minimization of transfer costs (up to 60%!)
2. High rates of separation at source / better quality of end products / higher selling prices
3. Growth of local economy

Thank you for your attention!

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