

# Municipal Waste

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Municipal Waste:  
Municipal solid waste (MSW), commonly known as trash or garbage in the United States and as refuse or rubbish in Britain, is a waste type consisting of everyday items that are discarded by the public. (Oxford Dictionary)



# Agenda

- Global Overview
- EU Situation
- Trends
- Cyprus
- Switzerland
- Austria
- Questions

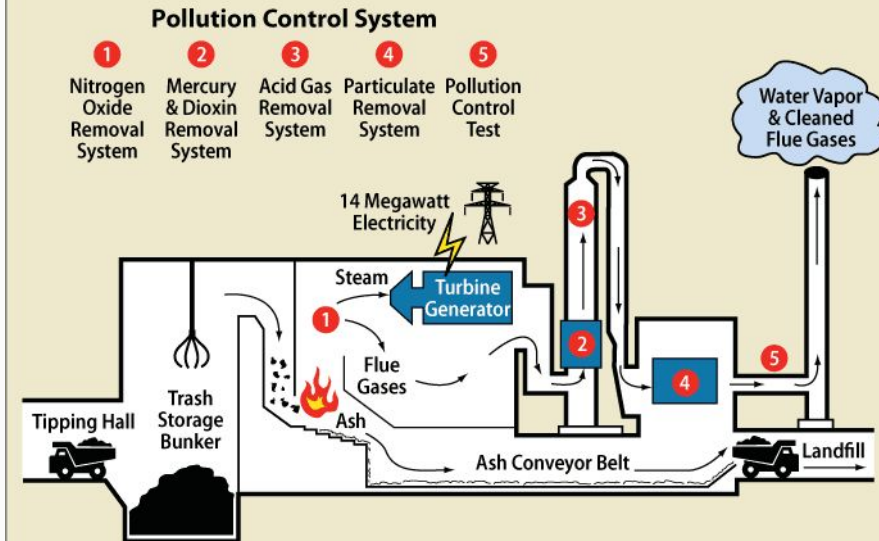
# Environmental Impacts of MSW

- Landfills
  - Ground Water
  - Decomposition → Greenhouse Gasses
- Transportation
  - Garbage trucks
  - Infrastructure
- Environmental externalities become public health issues

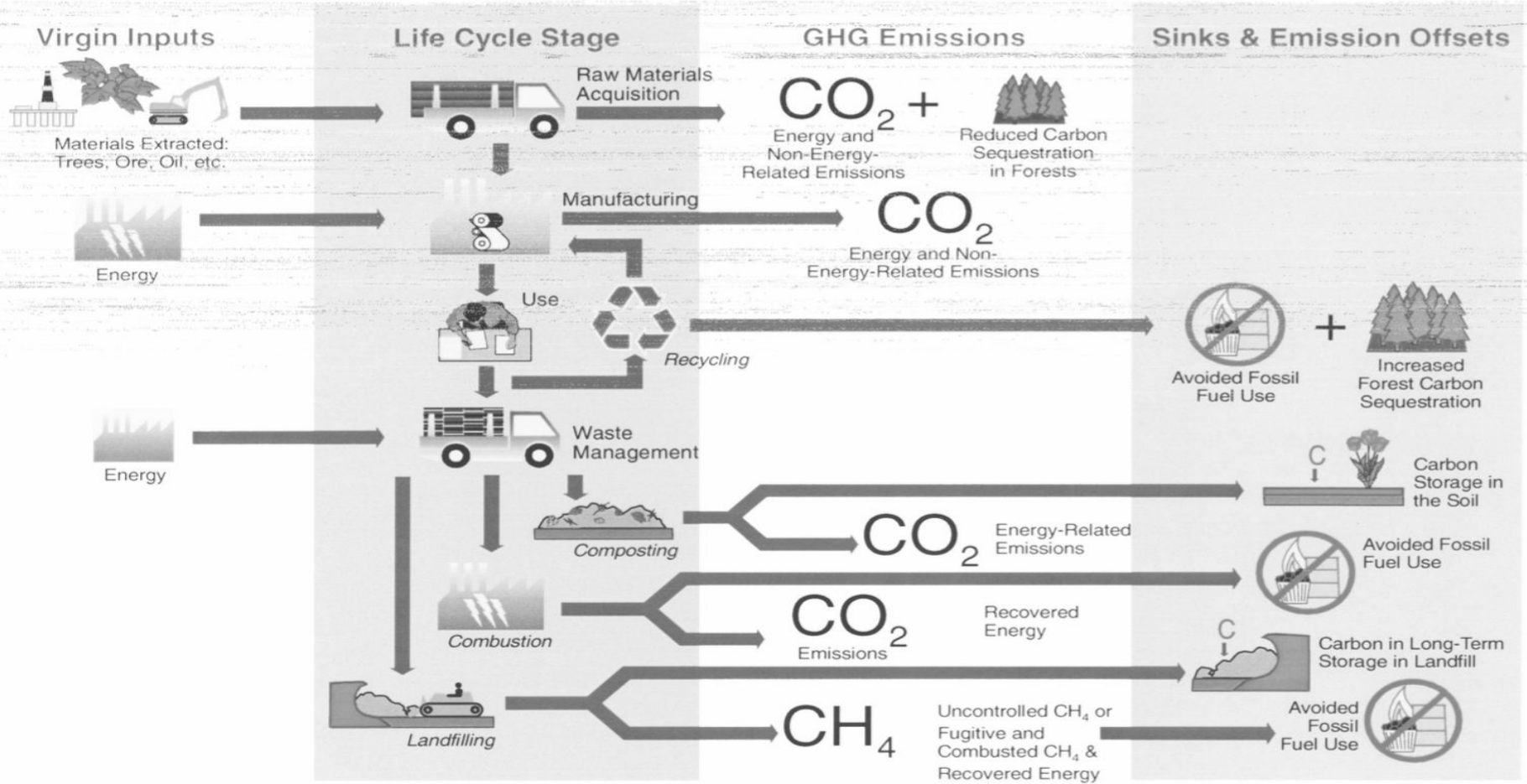
# Combatting MSW

- Reduce
  - Consumption associated with well-being
  - Less packaging
- Reuse
- Recycle
- Compost
- Combustion
  - Harness electricity

## Waste to Energy Plant Diagram



Source: ecomaine.



# EU and MSW

- Europeans currently consume 16 tons of goods per person per year, per EU Webpage
  - 6 tons becomes municipal waste
  - ½ ton per person of household waste alone
- Severely curb landfill usage
- Subsidize greener products
- Various waste systems
  - Industrial, Packaging, Food, Technological

# EU Action

- Aim for 65% recyclable waste by 2030
  - Currently below 35%
- Reduce consumption, waste
- Less waste generated at source
- 2008 Waste Framework Directive
- 7th Environment Action Program
  - Live sustainably by 2050
- Will they reach it?



# Global and European Trends

- Global increases in recycling
- Effective Policies
- Landfill Taxes
- Europe as the leader
- Technology
- All necessary to reduce global warming



# The Future and the EU

- Need to ramp up recycling
- Reduce consumption
- Smarter packaging
- Climate agreements
- America, China and India
- EU as leader





# Waste Management Issues

- Municipal waste produced in Cyprus is significantly higher than the EU Average (624/kg/y/inhabitant versus 481/kg/y/inhabitant)
- Landfill rates are at 79% and recycling rates are at 21%
- Cyprus is not following the EU Waste Framework Directive which states that member states should reach 50% for recycling rates by 2020

# What is causing these issues?

- Waste management is not incentivized
- No innovation in infrastructure of collection systems to redirect biodegradable waste from disposal
- Lack of cooperation between various administrative levels
- High levels tourism
- Inefficient collection of waste

## Tax Policy

- In 2013, a waste tax was implemented because of an increase in waste volume in the Limassol municipality
- Taxation on waste is assessed on the size of the household units and industrial units
- In 2015, there was a reduction in subsidies from the state to the municipalities
- In the Nicosia Municipality, there was an increase in the tax rates
- The highest amount a household is charged is 170 Euros annually
- If a household is small that 250 sq meter then the tax is 159 Euros

# Improvements

- A treatment facility is currently underway in Limassol and it is projected to be completed within the next 2 years
- The project aims to serve the waste management needs of the 235,000 people who live in the Limassol district
- Cyprus is also developing selective collection systems for paper and organic waste
- Officials held a conference in Limassol that focused on a set of waste management objectives for the following year

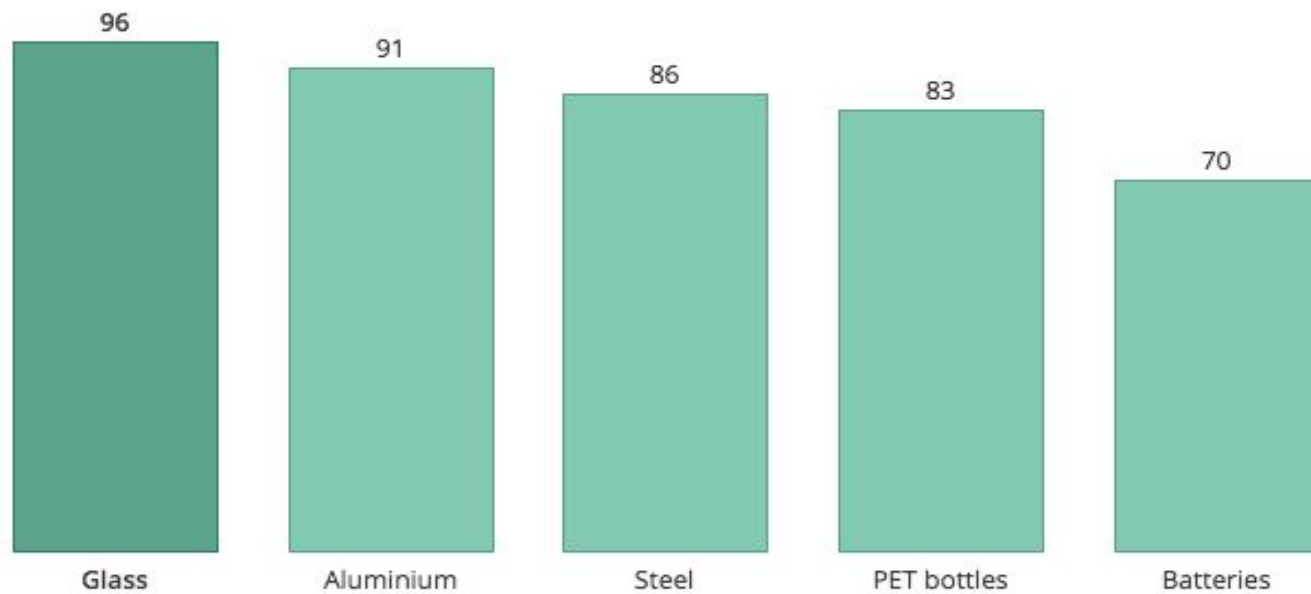
# Switzerland



# Waste Management in Switzerland

- Switzerland is one of the largest producers of waste in the European Union (712 kg per capita)
- Although they are large generators of waste, Switzerland is one of the best waste managers
- The total amount of municipal waste generated in Switzerland increased by 16% between 2001 and 2011, the percentage of recycling has remained constant at a high level of 50%

## Percentage of materials recycled in Switzerland



# How does Switzerland handle municipal waste?

- In 2000, Switzerland banned landfilling of combustible waste and expanded incineration capacity
- Bin bags to collect waste are taxed with pay-per-bag fees and the recycling rate doubled in 20 years
- Recycling stations have been placed in schools, parks, and grocery stores



# PET Recycling and Plastic



- Switzerland is a leader in glass, PET, and aluminum recycling, but the country struggles with managing ordinary plastic waste
- Pet bottles are composed of polyethylene terephthalate and they are extremely easy to recycle
- [http://www.swissinfo.ch/eng/weak-point\\_switzerland-s-plastic-bottle-mountain/41392488](http://www.swissinfo.ch/eng/weak-point_switzerland-s-plastic-bottle-mountain/41392488)

# Future Plans for Municipal Waste Management

- Switzerland is planning on reforming waste management policy in the coming years
- The country will work towards improving recycling techniques and product design that will contribute to the protection of primary resources
- Switzerland is working to develop industrial products to better the recycling process

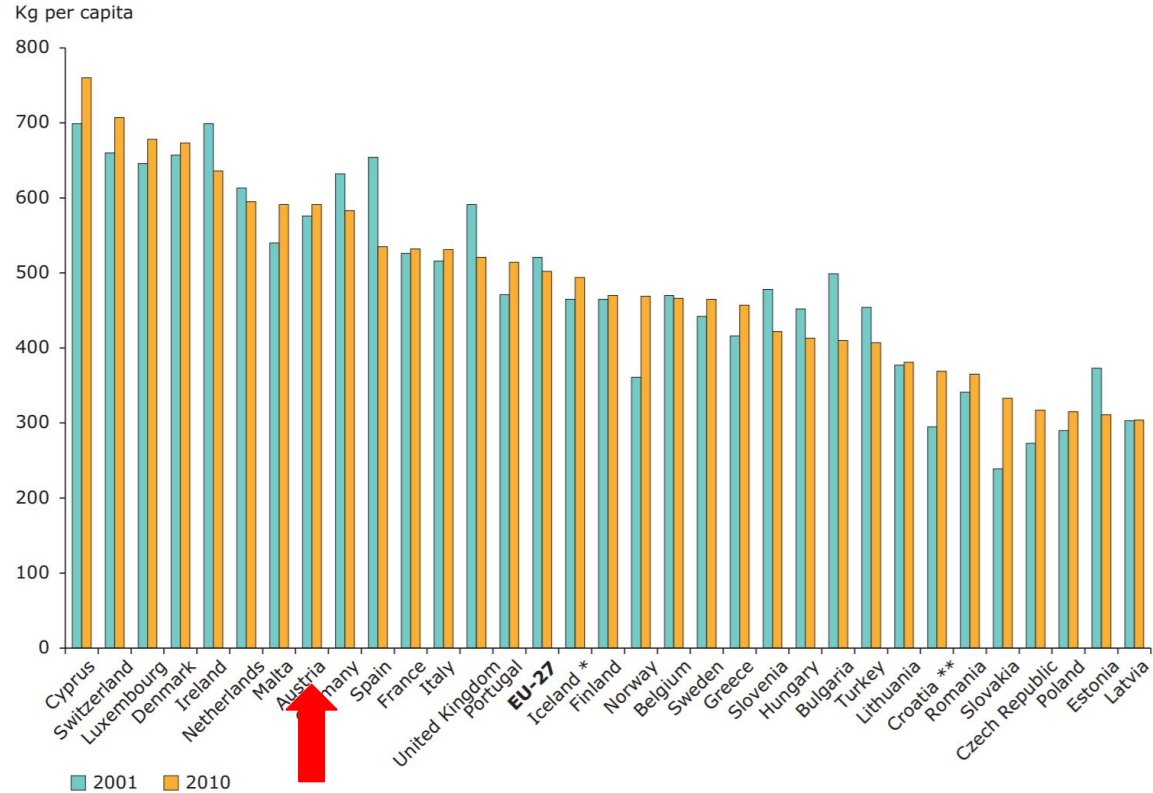


# Austria

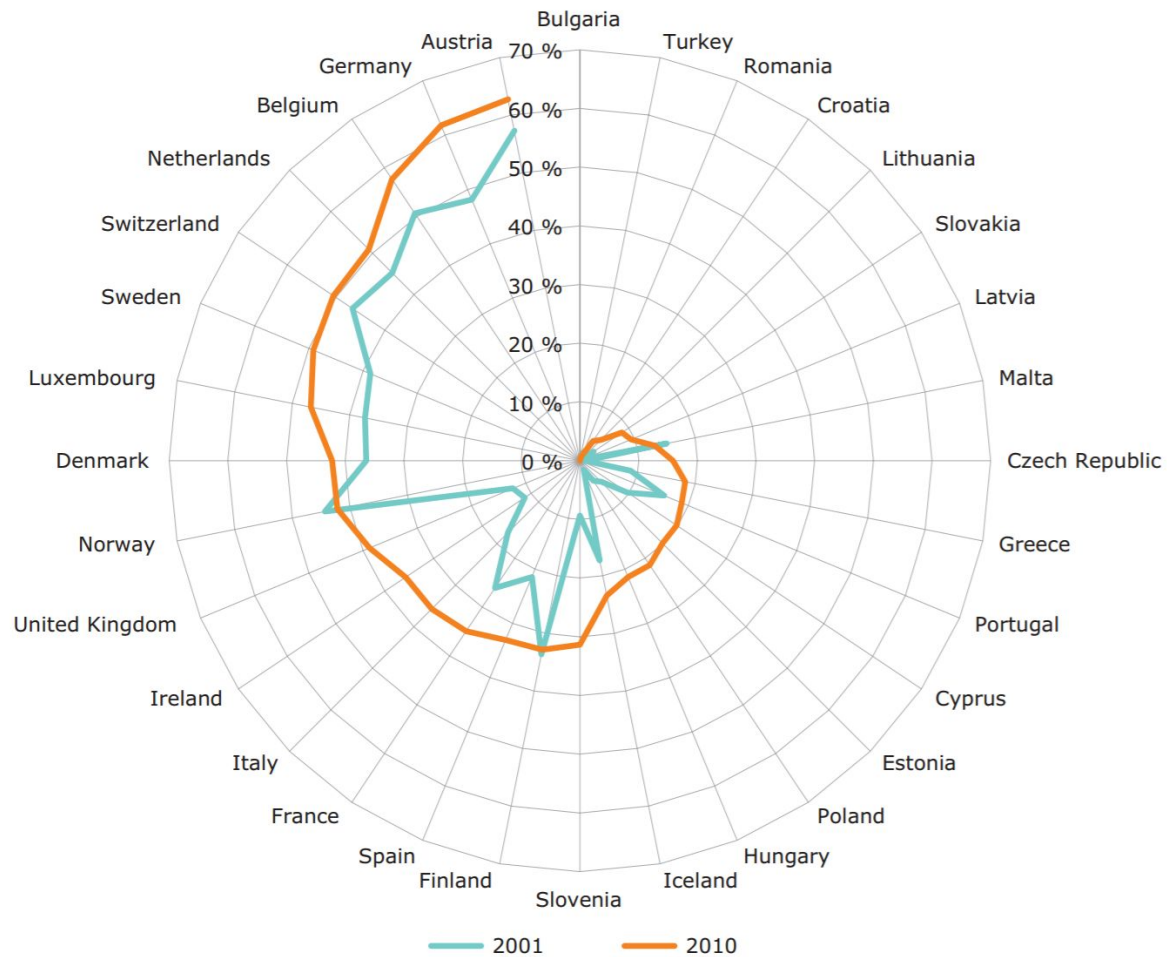


# Why Austria?

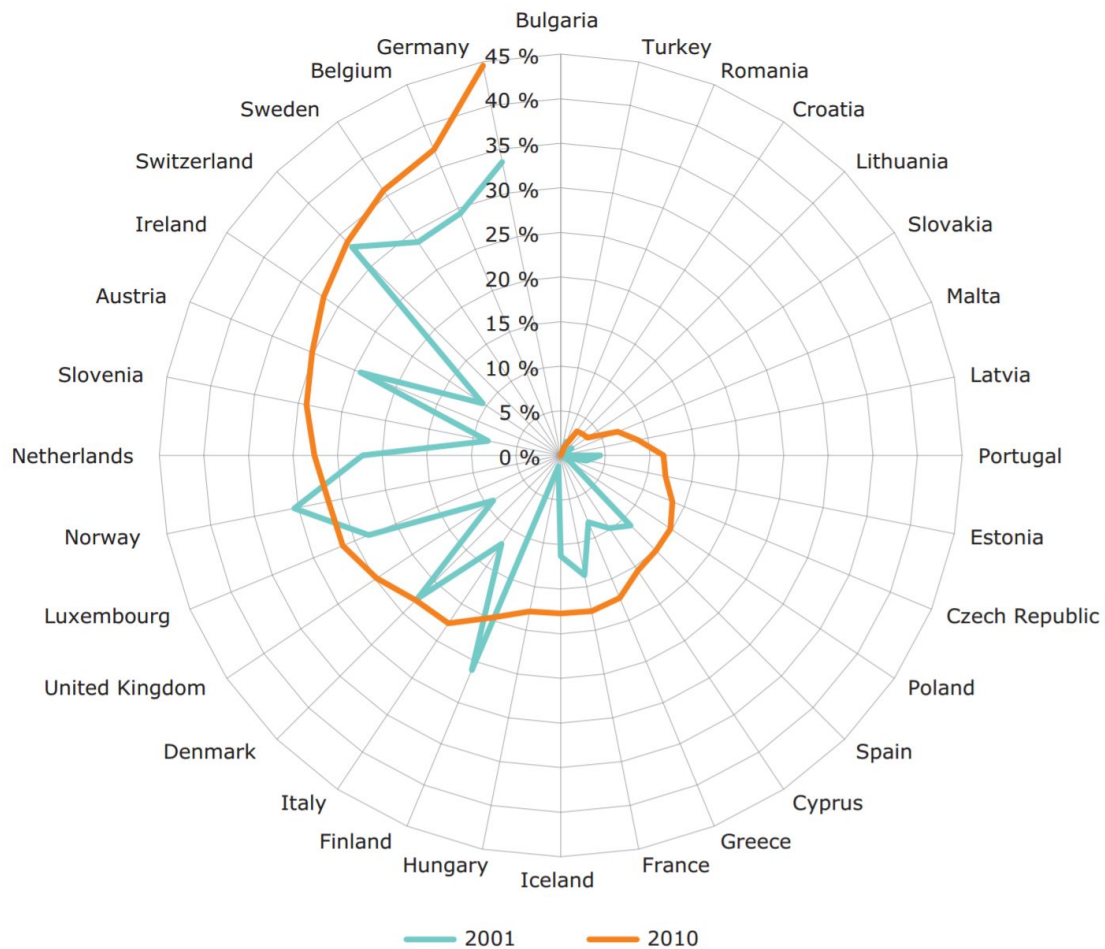
Figure 2.2 Municipal waste generated per capita, 2001 and 2010



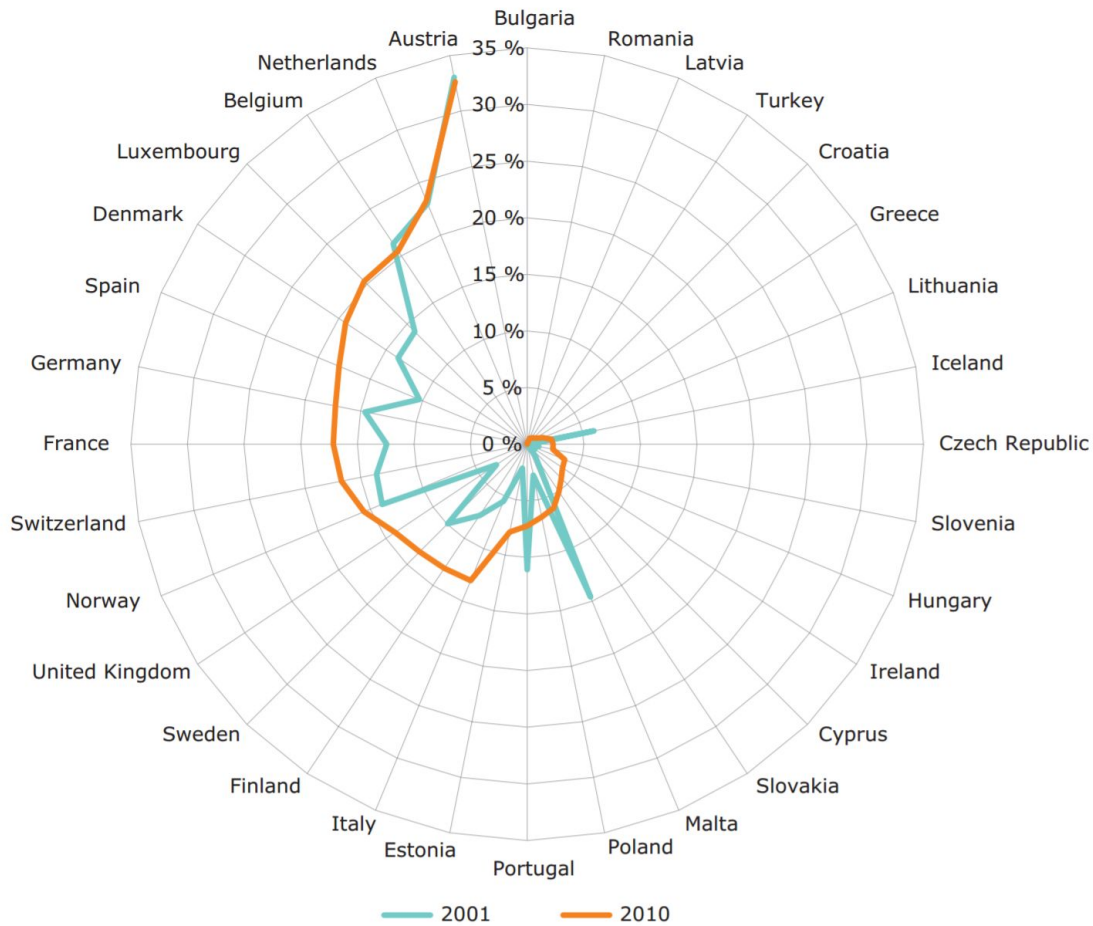
**Figure 2.5 Municipal waste recycling rates in 32 European countries, 2001 and 2010**



**Figure 2.8 Material recycling as a percentage of municipal waste generation in 32 European countries, 2001 and 2010**



**Figure 2.10 Bio-waste recycling as a percentage of municipal waste generation in 32 European countries, 2001 and 2010**



# History of Recycling in Austria before EU Legislation

1989 - The Act on the Remediation of Contaminated Sites (ALSAG) introduced the Austrian landfill tax ('Altlastenbeitrag' or ALSAG-tax)

- Taxation on unit weight or volume of landfill, which in this case was intended to raise revenues to help clean contaminated sites

1995 - Collection policy on biogenic waste (recycling biogenic substances such as coal for energy)

1996 - first Landfill Ordinance in Austria

1996 - Ordinance on landfilling and incineration (incineration of landfill used as district heating)

# Changes in 2000s after EU landfill directive of 1999

Main legislation passed in 2002 in Austria: Waste Management Act of 2002, Abfallwirtschaftsgesetz (AWG 2002)

- States the Federal Minister of Agriculture, Forestry, Environment and Water Management must draft Federal Waste Management Plan
- And the creation of the provincial waste management plan
  - The nine provinces responsible for **waste collection** for households






*The split responsibility of federal and provincial policies is helping enact national “big-picture” MSW policy while the provincial laws required households to recycle*

# Provincial level Policy: Waste collection policy on households

AWG 2002: “From 1st January 2018 at least one separate collection option for each collection category has to be provided in every municipal territory”

Also, separate collection for at least the following: paper, metal, plastic and glass

Table 4: Overview of main separate collection systems in Austria

Collection type	Paper	Glass	Plastic	Metal	Bio-waste
<b>Door-to-door collection</b> 	Primary	Secondary	Primary		Primary
<b>Co-mingled (door-to-door)</b> 			<b>Rare</b> (co-mingled: in some municipalities metal packaging and plastic packaging are collected together)		
<b>Bring points</b> 	Rare	Primary	Secondary	Primary	<b>Very Rare</b> (i.e. in Vienna 2 % of bins/containers for separate collection of bio-waste are provided for bring points )
<b>Civic amenities</b> 	Separate collection of all waste streams				
<b>Producer/retail take-back</b> 			compulsory deposit of € 0.29 for refillable plastic beverage containers		

# Main national policy - The Altlastenbeitrag

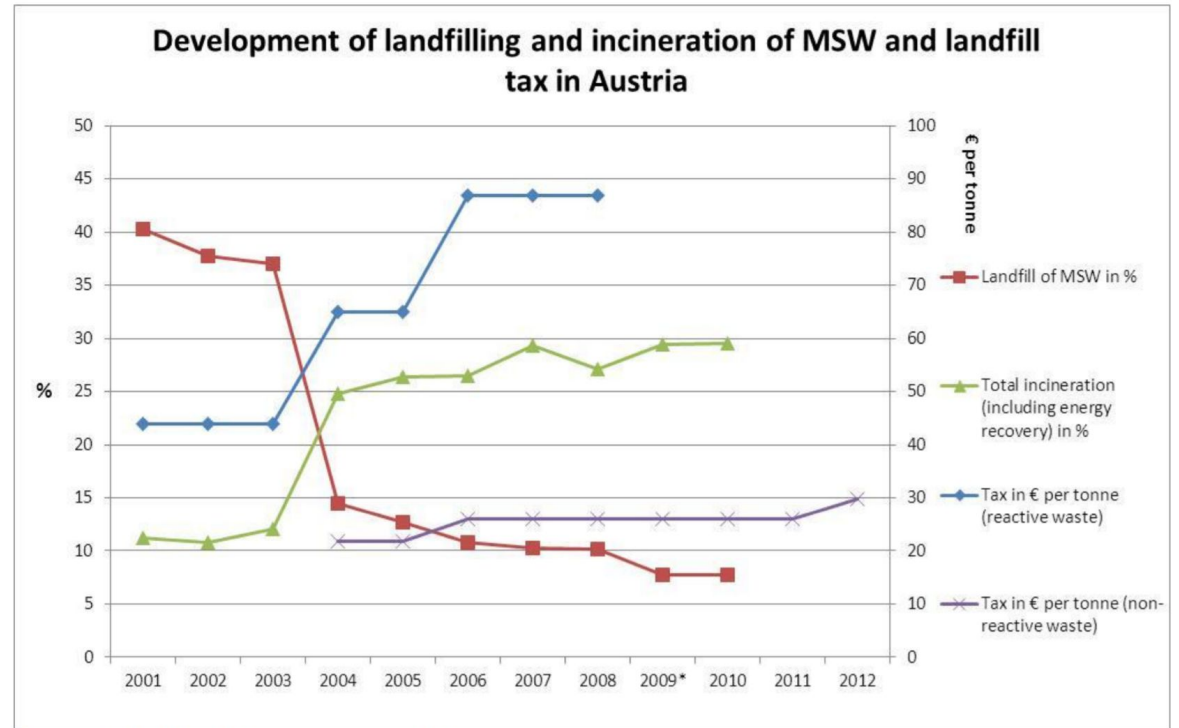
The Austrian landfill tax ('Altlastenbeitrag' or ALSAG-tax)

- Introduced in 1989 but rates have changed over time
- Introduction of tax incentivised landfills to modernize (i.e. spill prevention plans)
- Tax on incineration also created on 2006
- Landfill tax was increased from 2001 to 2008

## Trends following the tax policy

- Increasing tax -> drop in municipal solid waste
- Austrian Federal Environment Agency reported that 28 % of MSW dropped from 2003 to 2010
- Also reported to have encouraged recycling and recovery of waste

**Figure 2.5** Development of landfilling and incineration of MSW and landfill tax in Austria



Source: ETC/SCP, 2012 and Eurostat, 2012.

# Looking into the future

- European Environmental Agency reported that Austria will probably not have any problems in reaching MSW recycling goal of 50% by 2020 since it reached that goal already by 2010.
- Plans to target other sectors in waste management such as the construction sector, food sectors

**Table 2.2 Municipal solid waste (MSW) management and selected policy instruments in European countries, 2001–2010**

Country	Percentage of MSW recycled per MSW generated, 2010	Two or more national waste management plans developed between 2001 and 2010	Only regional waste management plans	Landfill tax increased more than 50 % from 2001 to 2010	Landfill tax at least 30 EUR/tonne MSW, 2010	Incineration tax	Landfill ban on organic waste or non-pretreated MSW	Mandatory separate collection of non-packaging waste	Mandatory separate collection of bio-waste fractions	Economic incentives for recycling of MSW (PAYT etc.) (°)	Selected innovative policies
Austria	63 %	X		X	X	X	X	X	X	X	Separate collection of waste paper
Germany	62 %		X				X			X	Introduction of a 'recycling bin' for plastics and metals
Belgium	58 %		X	X	X	X	X	X		X	High household fines for non-compliance in source separation, maximum generation of residual MSW per capita, recycling quality standards
Netherlands	51 %	X		X (abandoned in 2012)	X	X (but zero)	X		X	X	
Switzerland	51 %		X			X	X	X		X	
Sweden	49 %			X	X	Until 2010	X	X		X	Separate collection of waste paper
Luxembourg	47 %	X					X		X	X	Design standards for separate collection in new households, one container park per 10 000 inhabitants, 100 % of population covered by separate collection
Denmark	42 %	X			X	X	X	X		X	Separate collection of waste paper
Norway	42 %				X	Until 2010	X	X		X	
United Kingdom	39 %		X	X	X						Landfill allowance trading schemes, where allowances were allocated to each waste disposal authority. To be scrapped in 2013 in England
Ireland	36 %		X	X	X	X			X (retailers, restaurants)	X	
Italy	36 %		X					X	X	X	Maximum generation of residual MSW per capita
France	35 %			X		X	X			X	National extended producer responsibility introduced, e.g. on non-packaging paper, textile and furniture

Table 2.2 Municipal solid waste (MSW) management and selected policy instruments in European countries, 2001–2010 (cont.)

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Spain	33 %	X							X in Catalonia		
Finland	33 %	X		X	X		X	X		X	Separate collection of waste paper
Slovenia	31 %						X			X	
Iceland	26 %										
Hungary	21 %						X			X	
Poland	21 %	X		X			X <sup>(b)</sup>		X <sup>(c)</sup>	X	Government fund co-financing recycling activities
Estonia	20 %	X		X			X			X	
Cyprus	20 %										
Portugal	19 %	X		X		X					
Greece	18 %										
Czech Republic	16 %			X						X	Quality standards on composted bio-waste
Malta	13 %	X									
Latvia	9 %	X		X							
Slovakia	9 %	X								X	
Lithuania	5 %	X								X	
Croatia	4 %										Government fund co-financing recycling activities
Romania	1 %										
Turkey	1 %										
Bulgaria	0 %	X									

**Note:** <sup>(a)</sup> Considers economic incentives for households to recycle their waste (for example Pay-as-you throw schemes such as fees after weight, size, collection frequency other than just paying collection fee on the basis of property value, area of the property, household size or similar).

<sup>(b)</sup> Into force on 1 January 2013 and covers bio-waste collected separately.

<sup>(c)</sup> Into force on 1 January 2012.

**Source:** Country reports (<http://www.eea.europa.eu/publications/managing-municipal-solid-waste>).

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Map of Austria image: <http://www.operationworld.org/files/ow/maps/lgmap/autr-MMAP-md.png>

Figure 2.2, Figure 2.5, Figure 2.9, Figure 2.10: European Environmental Agency, “EEA Report: Managing municipal solid waste - a review of achievements in 32 European countries” no.2, 2013

Table 4: Overview of main separate collection systems in Austria: European Commission, “National factsheet - Austria: Assessment of separate collection schemes in the 28 capitals of the EU” 2014

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Table 2.2, 2.3 Municipal solid waste (MSW) management and the selected policy instruments in European countries, 2001-2010: “EEA Report: Managing municipal solid waste - a review of achievements in 32 European countries” no.2, 2013

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