



# Waste Management in Styria

12th February 2014 – Graz

**DI Dr. Illitsch Günther**

Styrian Regional Government – Austria

**Division A14 Water Management, Resources and Sustainability**

**Subdivision Waste Management and Sustainability**

A-8010 Graz, Bürgergasse 5a

[guenther.illitsch@stmk.gv.at](mailto:guenther.illitsch@stmk.gv.at) - [www.abfallwirtschaft.steiermark.at](http://www.abfallwirtschaft.steiermark.at)



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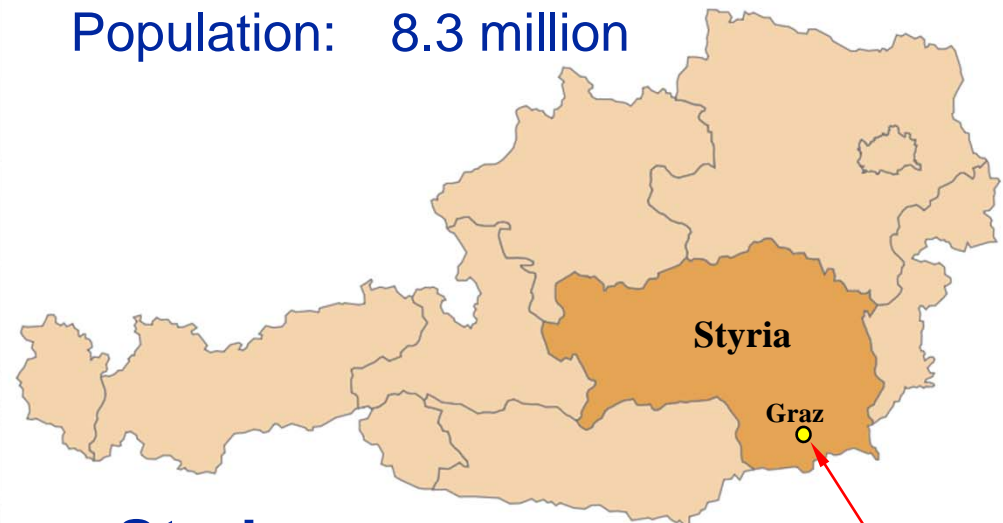
# Austria and the Province Styria



## Republic of Austria

Area: 83,879 km<sup>2</sup>

Population: 8.3 million



## Styria

Area: 16,401 km<sup>2</sup>

Population: 1.2 million

Source of maps: Wikipedia



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# Department for Waste Management & Resource Efficiency (FA19D)



- Part of Styrian Regional Government
- Founded 1991
- Employees ~23
- Subdivision of A14 (2012-08-01) FA19D reorganized  
[abfallwirtschaft@stmk.gv.at](mailto:abfallwirtschaft@stmk.gv.at)



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# Legislation



- **European Union**  
<http://europa.eu.int/eur-lex/en/index.html>
- **Federal government**  
[www.lebensministerium.at](http://www.lebensministerium.at)
- **Styrian government**  
[www.verwaltung.steiermark.at](http://www.verwaltung.steiermark.at)  
[www.abfallwirtschaft.steiermark.at](http://www.abfallwirtschaft.steiermark.at)



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# Legislation / Federal government



## - Federal waste management act 2002

P. b. b. Verlagspostamt 1030 Wien GZ 02Z034232 M

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# BUNDESGESETZBLATT

## FÜR DIE REPUBLIK ÖSTERREICH

Jahrgang 2002

Ausgegeben am 16. Juli 2002

Teil I

102. Bundesgesetz: Abfallwirtschaftsgesetz 2002 – AWG 2002 und Änderung des Kraftfahrzeuggesetzes 1967 und des Immissionsschutzgesetzes – Luft  
(NR: GP XXI RV 984 AB 1008 S. 94. BR: 6576 AB 6584 S. 685.)  
[CELEX-Nr.: 375L0442, 391L0156, 391L0689, 394L0031, 375L0439, 300L0076, 391L0157, 398L0101, 393L0086, 391L0157, 378L0176, 391L0692, 396L0059, 394L0062, 300L0053, 396L0061, 396L0082, 300L0076 und 399L0031]

102. Bundesgesetz, mit dem ein Bundesgesetz über eine nachhaltige Abfallwirtschaft (Abfallwirtschaftsgesetz 2002 – AWG 2002) erlassen und das Kraftfahrzeuggesetz 1967 und das Immissionsschutzgesetz – Luft geändert werden



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# Legislation



➤ **styrian government**

**- styrian waste management act 2004**

P. b. b. – GZ. 02Z032441 M



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# Landesgesetzblatt

Jahrgang 2004

Ausgegeben und versendet am 28. Oktober 2004

24. Stück

65. Gesetz vom 6. Juli 2004 über eine nachhaltige Abfall- und Stoffflusswirtschaft in der Steiermark (Steiermärkisches Abfallwirtschaftsgesetz 2004 – StAWG 2004).

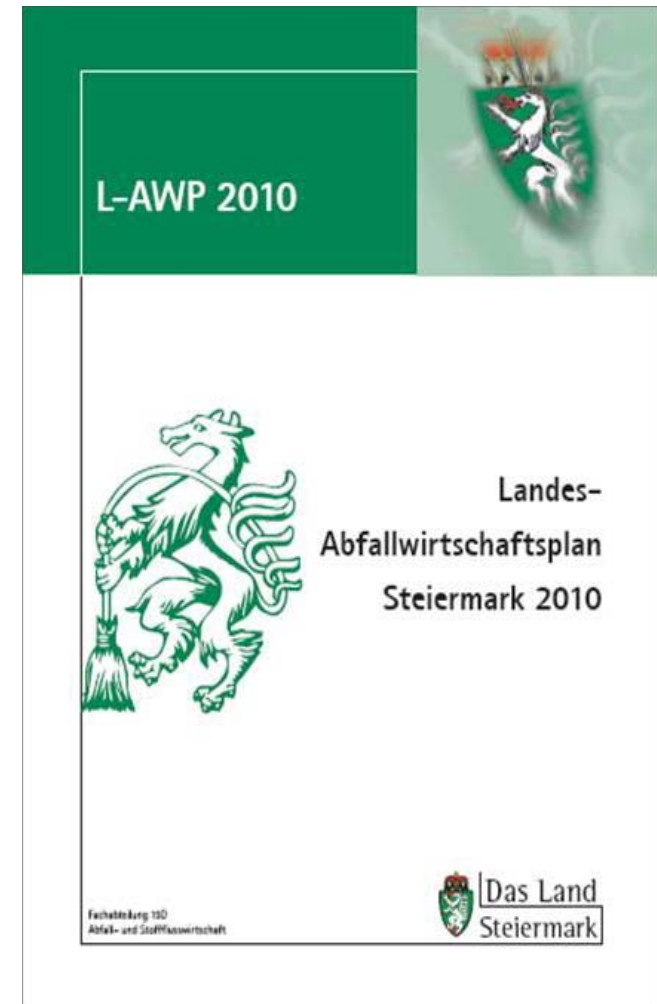


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# Styrian Provincial Waste Management Plan 2010



- **Core issue:**  
**Implementation of improved resource efficiency**
- **Aspects**
  - waste prevention
  - reuse of waste
  - recycling
  - climate protection
  - awareness-raising
  - public participation
  - resource efficiency in enterprises
  - sustainability



<http://www.umwelt.steiermark.at/cms/beitrag/11380838/6392227>

# From waste management to sustainability



**Sustainability action**

**Sustainability**

ecological – economical – social

**Waste**

**Management**

Waste Avoidance

Waste Separation



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# Development of Waste Management Intention / Partners



- ➔ **main aim is:**  
**tourism and industry – in a clean environment**
  
- ➔ **Partners are representatives of**
  - **policy**
  - **population (citizens)**
  - **industry**
  - **trade & commerce**



# Clean Environment - the Base for Tourism



## Mountains in the north...



## Gentle hills in the south...



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# Clean Water, Renowned Wines and Delicious Regional Food



Foto: BMLFUW/Rita Newman



# Current Municipal Waste Collection and Treatment



- **Organisation of municipal waste management:**

- **542 municipalities:**  
municipal waste collection

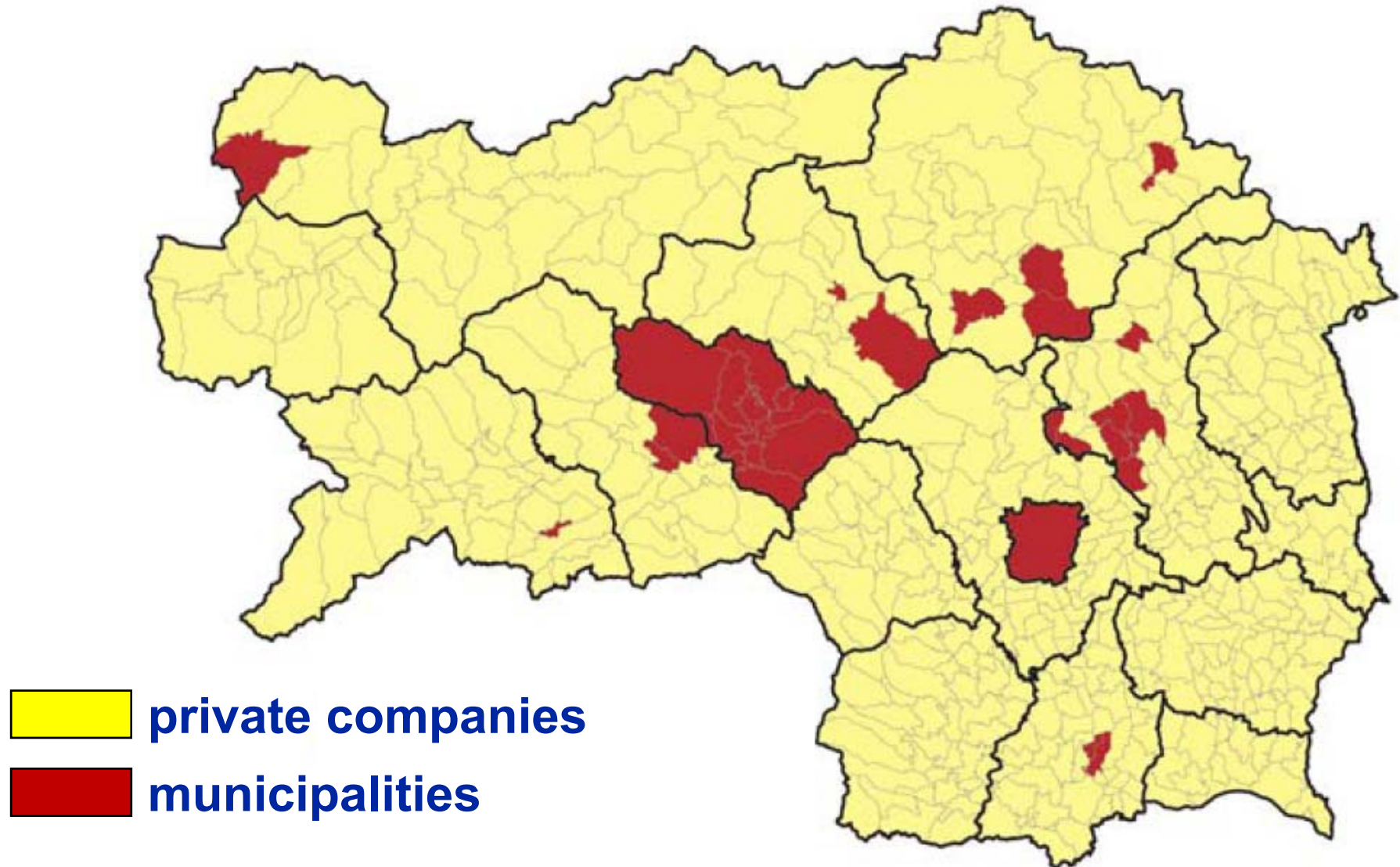


- **17 waste management associations**  
municipal waste treatment



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# Municipal Waste Collection and Transport



# Municipal Waste Fractions Collected in 2010



<http://www.abfallwirtschaft.steiermark.at/cms/ziel/4336290/DE/>

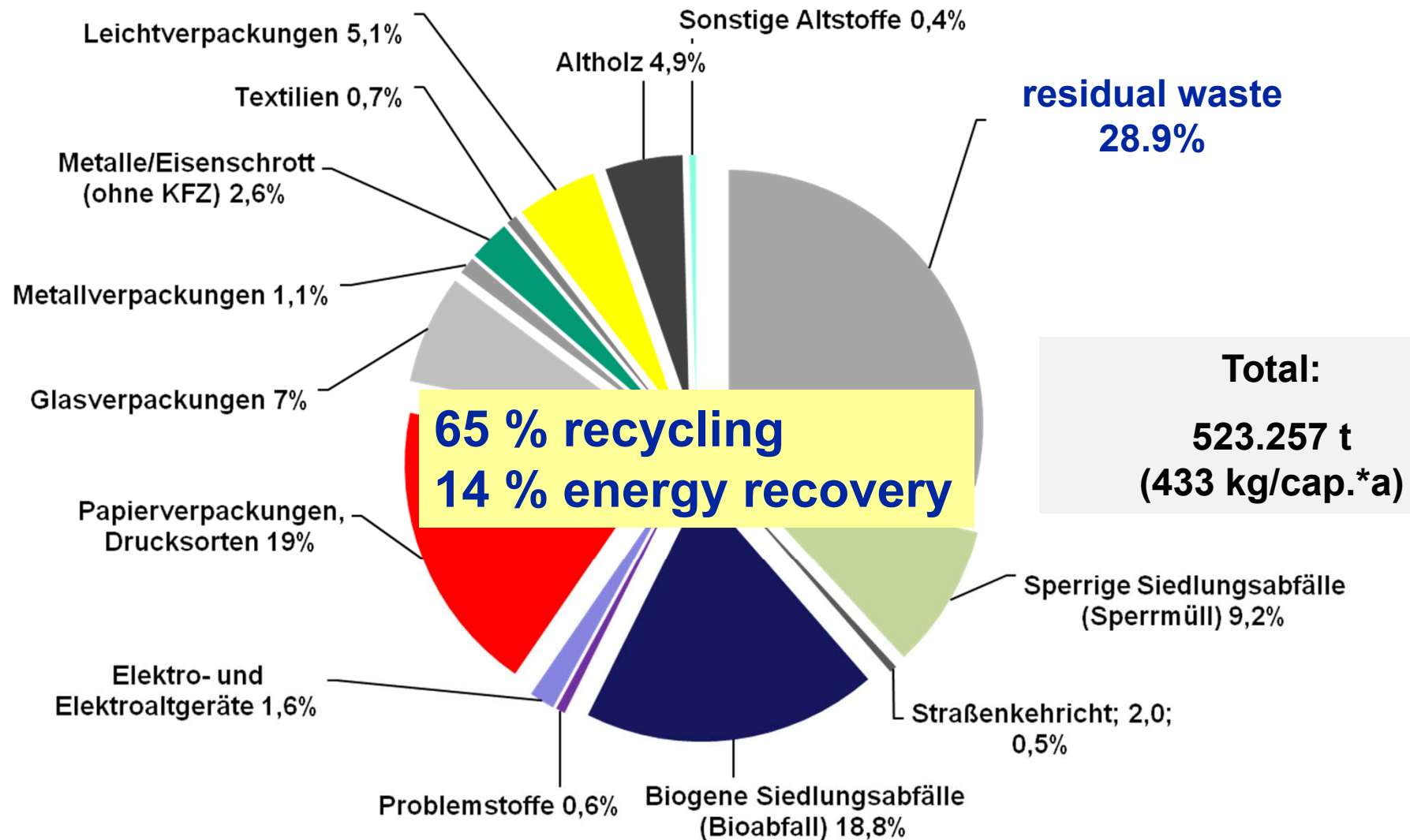


**Total:**  
**520.488 t**  
**(430 kg/cap.\*a)**

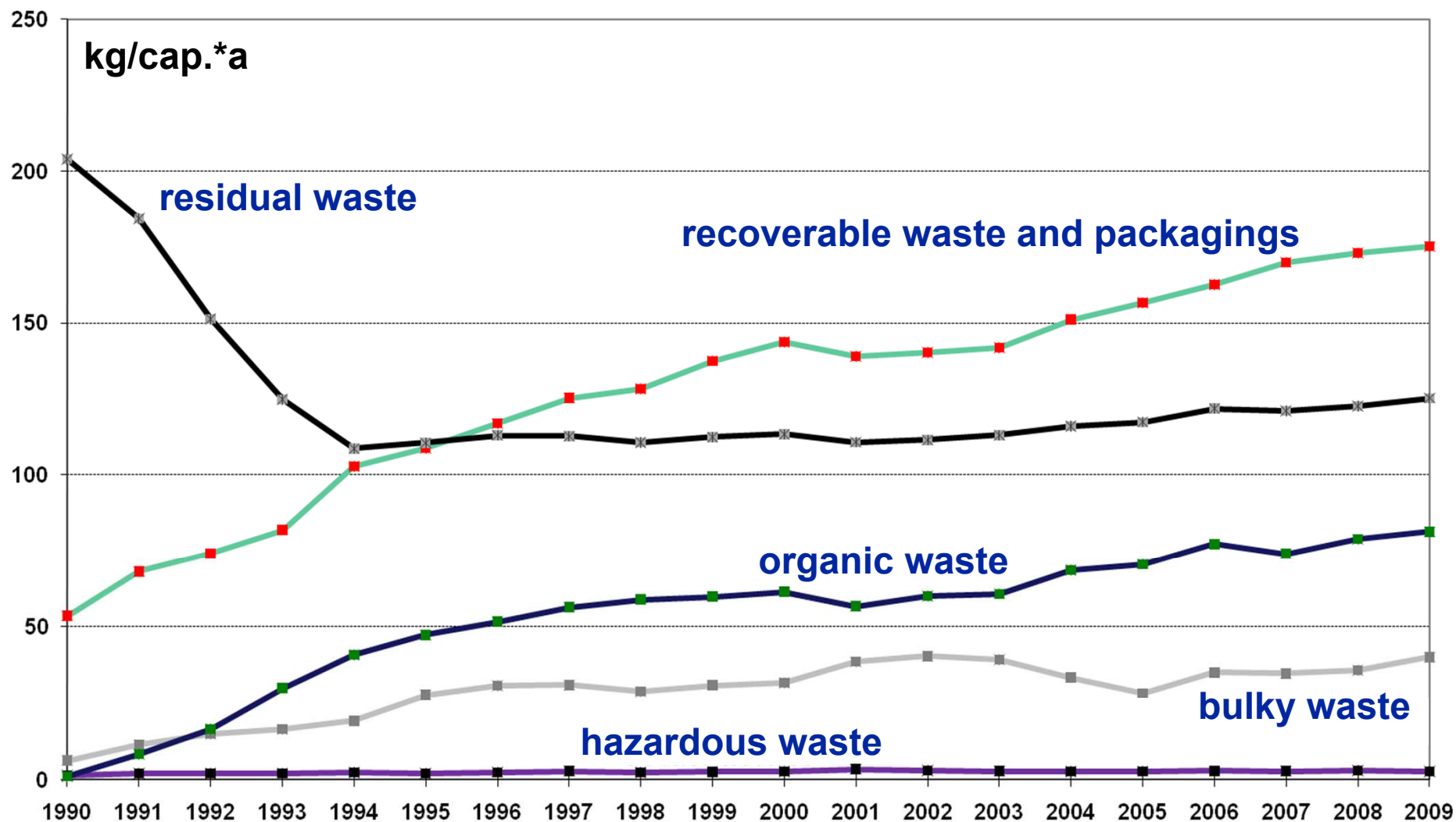


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# Municipal Waste Fractions Collected in 2009



# Municipal Waste Volume Trends





# Legislation



## ➤ Federal government

- **Federal Ordinances for packaging waste 1992 & 1993**

(came in force on 1.10.1993)

Collection and recycling of packaging waste



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# Packaging collection

[www.ara.at](http://www.ara.at)



# Separate Waste Collection



**Ca. 300 private waste management enterprises (~3.000 employees) in Styria**

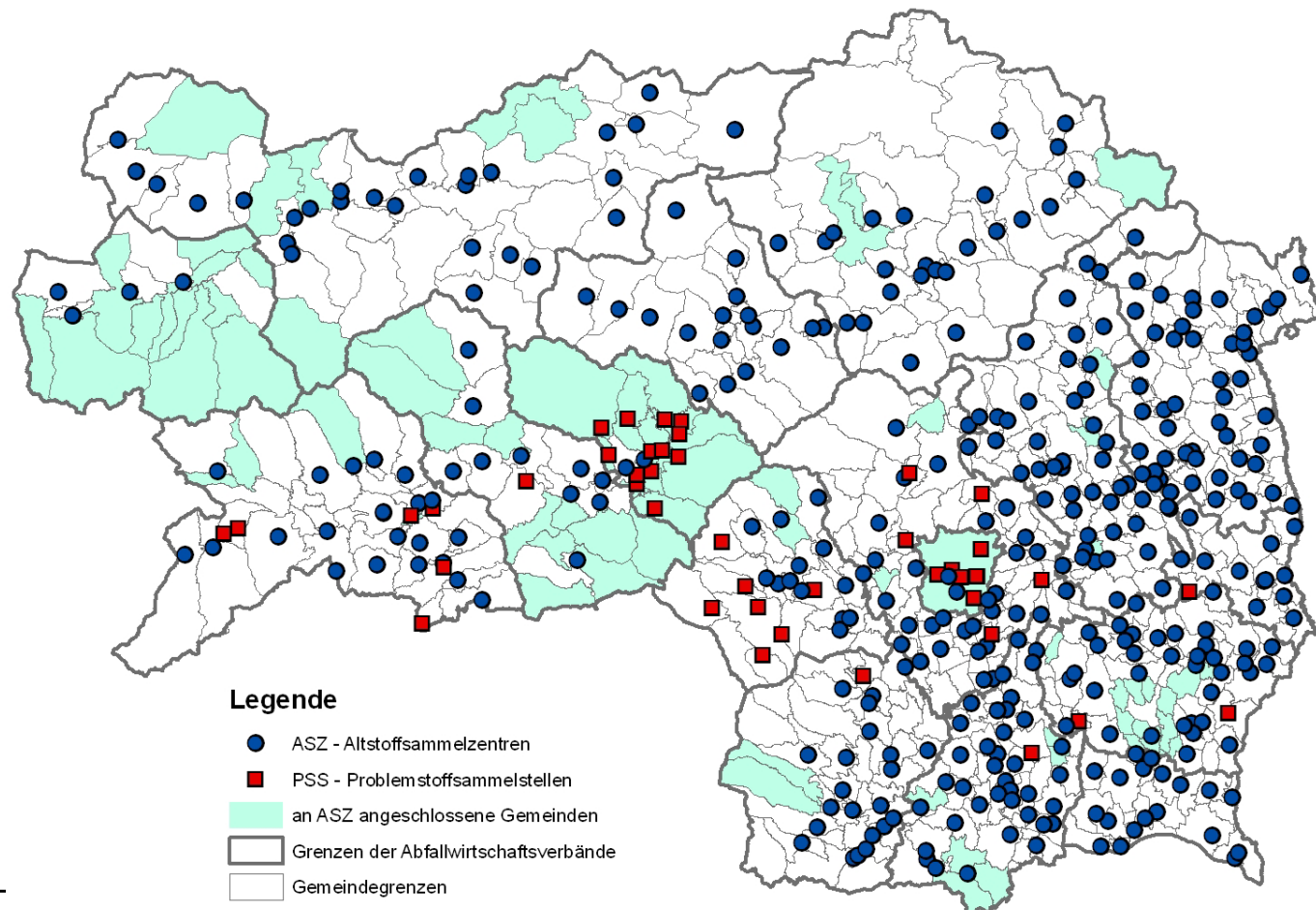


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# Municipal Waste Collection centres



- 383 waste collection centres
- 44 collection centres for hazardous substances



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# Waste Collection Centre



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# Waste Fractions (Collection centres) Hazardous Household Wastes



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# Waste Fractions (Collection centres) Bulky Waste



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# Waste Fractions (Collection centres) Waste Wood



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# Waste Fractions (Collection centres) CDW



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# Waste Fractions (Collection centres) Garden Waste and Organic Waste



- **Since 1990: separate collection of organic waste has been regulated by law in Styria**



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# Organic Waste Treatment



## Composting



### Compost Ordinance (2001):

- quality requirements
- end of waste criteria

## Fermentation



### 45 biogas plants in Styria

- nominal capacity: ca. 17 Mwe
- input materials:
  - $\frac{1}{3}$  manure,  $\frac{1}{3}$  energy crops,
  - $\frac{1}{3}$  organic waste

# Styrian Composting Technology



URL: <http://www.komptech.com>

# Styrian Technology for Biogas Plants



**biogas storage systems**

**high load hybrid reactor**



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# Waste Fractions (Collection centres) Waste Paper and Cardboard



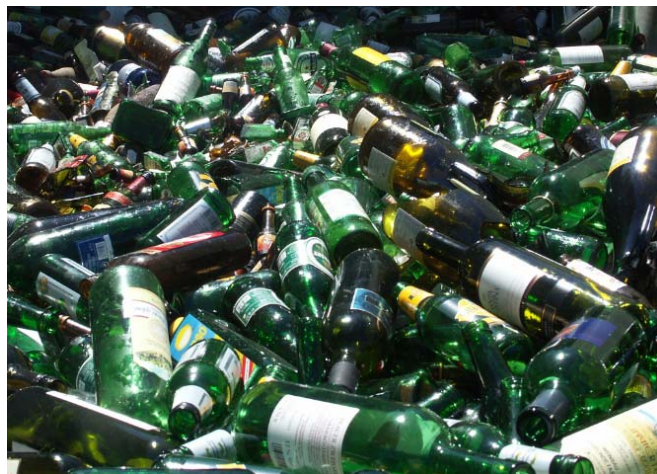
+



# Waste Fractions (Collection centres) Waste Glass



**clear glass**



**stained glass**

+

for glass  
packagings



**flat glass**



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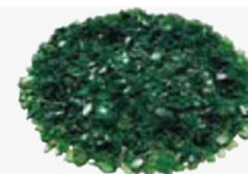
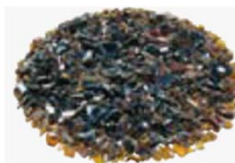
# Styrian Glass-Sorting Technology



**binder+co**

Umwelttechnik

- world's first optical glass-sorting system
- world's first industrial solution for sorting special heat-resistant types of glass





# Waste Fractions (Collection centres) Lightweight Fraction and Plastics



+

for lightweight  
fraction

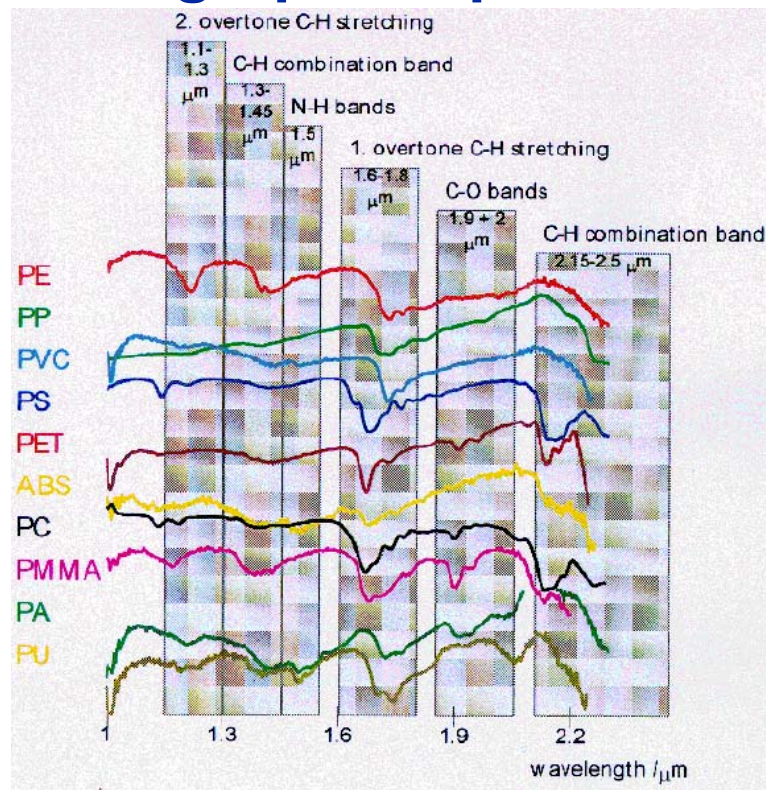


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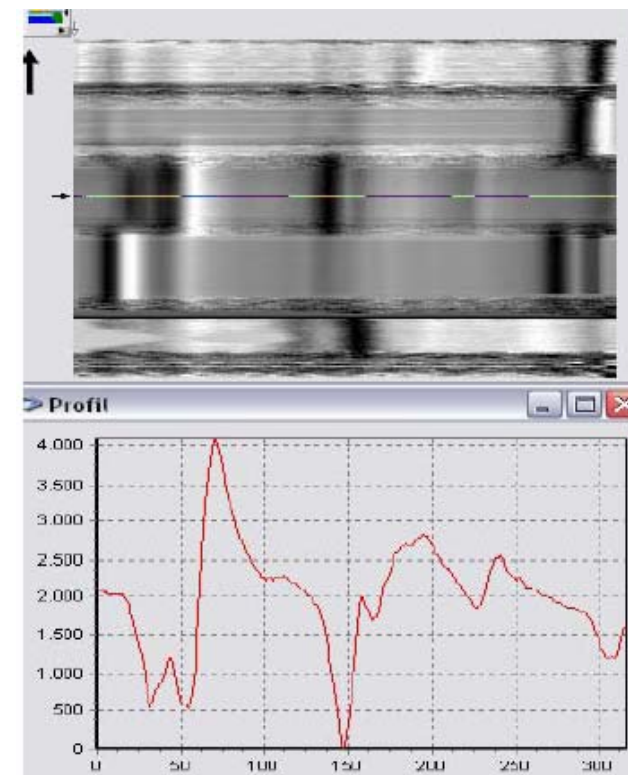
# Styrian Plastics-Sorting Technology



## ● Opto-electronic sorting with NIR fingerprint spectra



## in-line classification



W. Fließner (1998): Studie der technologischen Alternativen in der spektroskopischen Identifikation und Klassifikation von Kunststoffabfällen aus Hausmüll und hausmüllähnlichen Gewerbeabfällen.

EVK DI Kerschhaggl GmbH , URL: <http://www.evk.biz>.



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# Styrian Plastics-Sorting Technology



**REDWAVE**



REDWAVE for plastics recycling



**REDWAVE**



REDWAVE for waste paper recycling



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# Plastic Fractions



foils



PET clear

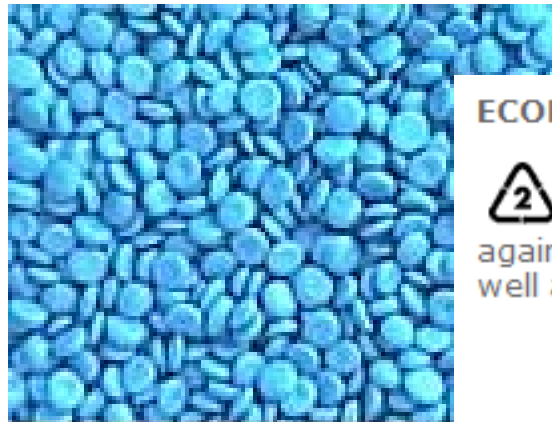


PET green




substitute fuel

# Recycling of Plastic Scraps



## ECOPLAST - Recyclables for tube manufacturers

 **HDPE (high-density polyethylene)** is harder and stiffer than LDPE (low-density polyethylene). Withstanding higher temperatures and highly resistant against chemicals, it is used for all kinds of bottles (shampoo, detergents, etc.) as well as for cans, buckets and beverage boxes.



**ecoplast**

HDPE packaging is used for

- Shampoo, cleansing agents, detergents and fertiliser bottles
- Plates
- Tubes
- Cans, buckets, rubbish containers



# Waste Fractions (Collection centres) Scrap Iron



+  
for metal  
packagings



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# Waste Fractions (Collection centres) WEEE



# Waste Fractions (treatment) WEEE



<http://www.eak-austria.at/>

<http://www.saubermacher.at/web/at/mitarbeiter-17-unterpremstaetten.php>

## Ihr Kontakt am Saubermacher Standort

### Unterpremstätten

UNTERPREMSTÄTTEN  
A-8141 Unterpremstätten  
Am Damm 50

☎ **Tel.:** 059 800 DW 2300

☎ **Fax:** 059 800 DW 2397

✉ **E-Mail:** [→ unterpremstaetten@saubermacher.at](mailto:unterpremstaetten@saubermacher.at)

🕒 **Öffnungszeiten:**  
07:00 - 17:00 Uhr

[→ Anfahrtsplan](#)

<http://www.chamaeleon-muehldorf.at/geschaeftsfelder/eschrottrecycling/index.htm>

[www.gbl.at](http://www.gbl.at)



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# Waste Fractions (Collection centres) Waste Wires/Cables



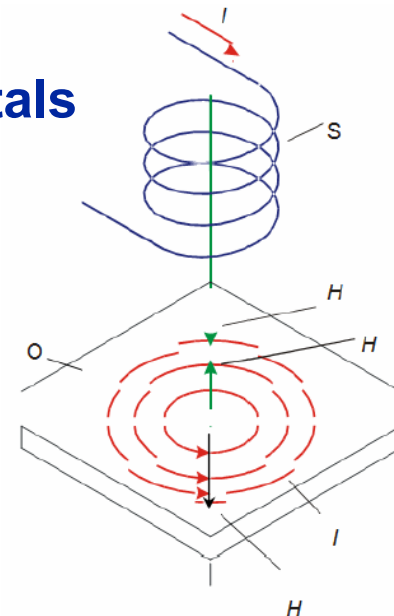
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# Styrian Metal-Sorting Technology

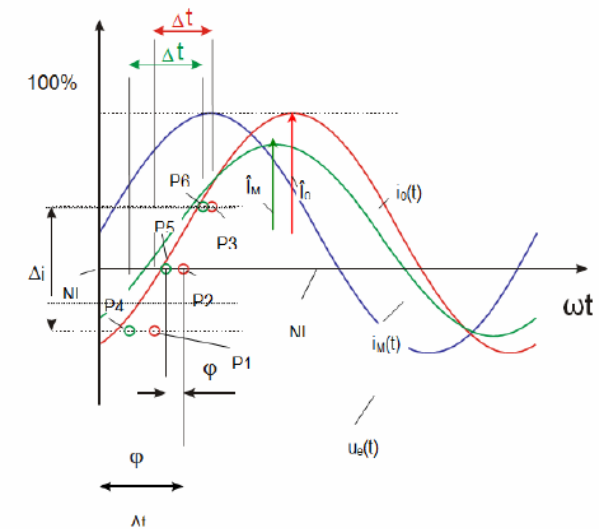


## ● Metal detectors

- ferrous/non-ferrous metals
- stainless steel
- sorting of WEE
- separation of PCB's



electromagnetic field  
of the sensor



changes of the local field  
are detected and evaluated



elektronisch visualisieren klassifizieren



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# Waste Fractions (Collection centres) Waste Cooking Oils and Fats



- Separate collection started in 1992



**1994: world's first biodiesel filling station in Mureck**

# Biodiesel



- **Project Ökodrive: Biodiesel for the public bus fleet in Graz**



- **Styrian expertise in biodiesel technology:**

- **Biodiesel production (transesterification), characterization, and utilization:**

University of Graz,  
Institute of Chemistry (Prof. Martin Mittelbach)



- **Biodiesel production plants:**  
BDI - BioDiesel International AG



# Legislation



## ➤ Federal government

### Federal Landfill Ordinance

(came in force 1. January 1997,  
technical adaptation for landfill sites up to 2004)

!!! If TOC of waste > 5 M% then treatment is mandatory before  
landfill !!!



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# Residual Waste



- Since 01/01/2004: direct disposal of untreated waste has been prohibited in Styria
  - mechanical-biological or thermal pretreatment required

**Reduction of GHG:  
-90 %**

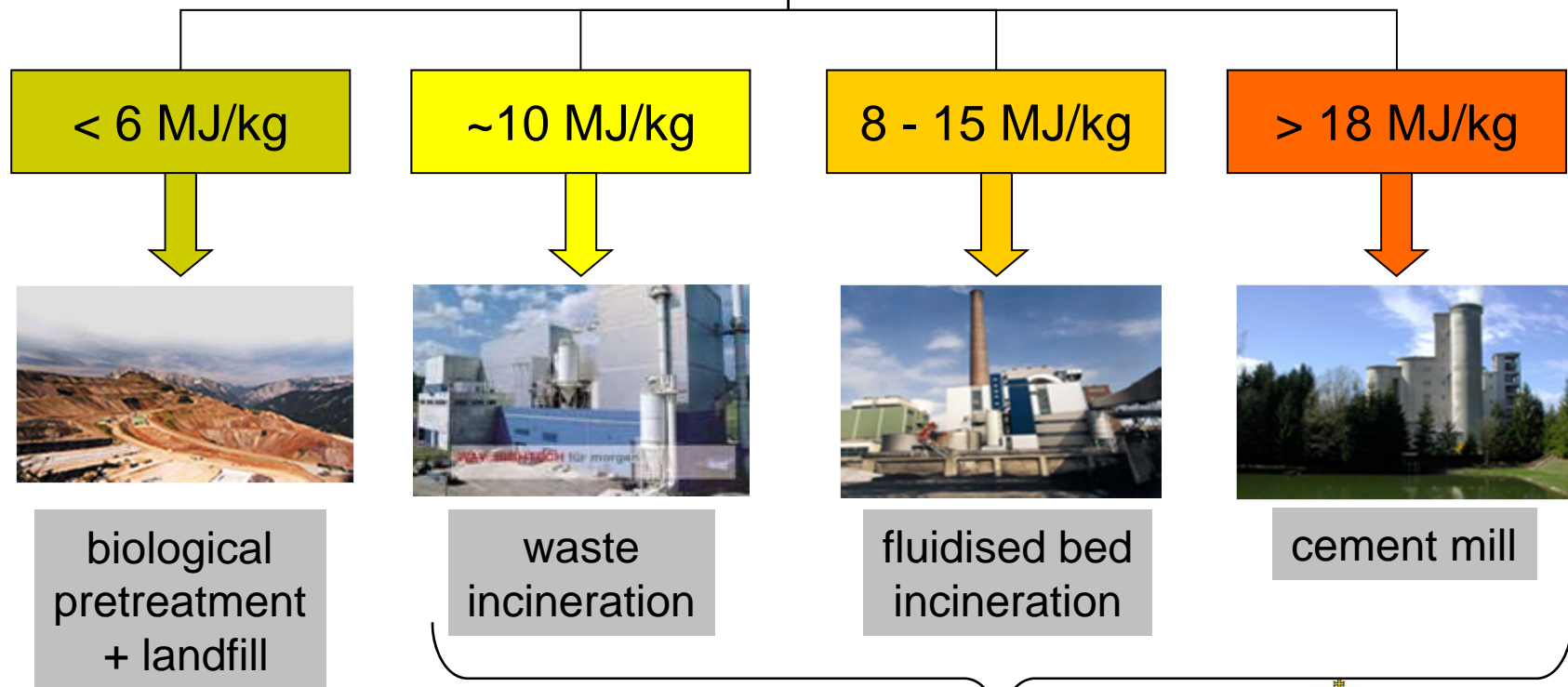


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# Residual Waste Splitting



mechanical splitting:  
calorific values of residual waste fractions



**energy recovery**



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# Residual Waste Treatment



## Biological Treatment



## Modern Landfill Site



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# Thermal Recovery of Residual Waste



## Waste Incineration Niklasdorf (ENAGES)



**level of efficiency: 80 %**

URL: <http://www.e-steiermark.com>

## Cement Mill Retznei (Lafarge Perlmöser)



**level of efficiency: 90 %**

URL: <http://www.lafarge.at>



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# Substitute Fuel from Residual Waste



## Quality Assured Substitute Fuel



## Substitute Fuel Plant in Retznei



# 1990: Start of Separated Waste Collection



## ● 1991: 1<sup>st</sup> Awareness-raising Campaign



City limit sign:  
„Caution – Waste Separation“



„Separated Waste – Happy End“



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# Waste Prevention



## ● Waste Prevention at Festivals



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# Waste Prevention



## ● Waste Prevention at Running Events 2010



**Please throw in!**  
**Thanks!**



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# Anti-Littering Campaign



## ● Big Styrian Spring Cleaning



**51.201**  
voluntarily  
Participants 2012



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Abfall- und  
Stoffflusswirtschaft



Sie sind hier: **Abfallwirtschaft**

Grundlagen

Abfallströme

Akteure & Partner

Aktuelles

Online Dienste

Projekte & Studien

Publikationen

Termine

Umweltlinks

Service

Zahlen, Daten & Fakten

INFO-WEB-SHOP

# Thank you for your attention!

29. Okt. Europäische Woche zur  
"Abfallvermeidung"

25. Okt. Vollzug der "Abfallbilanzverordnung" in  
der Gemeinde

22. Okt. ARD Themenwoche "Essen ist Leben"

15. Sep: TransWaste - EU-Projekt gegen  
unkontrollierten Müllhandel

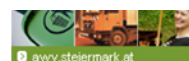
10. Sep: Trennungsprämie für Kühl- und  
Gefriergeräte

## Termine

11. Nov. ÖWAV-Workshop "Eintragung von  
Anlagengenehmigungen im EDM"

## Stoffflusswirtschaft

Die österreichische Abfallwirtschaft hat sich in den letzten Jahren zu einer nachhaltigen Abfall- und Stoffflusswirtschaft entwickelt. Sie orientiert sich zunehmend am Konzept der "Nachhaltigen Entwicklung", bei dem die Bewahrung der Ressourcen, die Leistungsfähigkeit der Wirtschaft und die soziale Ausgestaltung der Gesellschaft in einem dynamischen Gleichgewicht gehalten werden sollen.



## Kontakt

Amt der Steiermärkischen  
Landesregierung, FA19D  
Abfall- und  
Stoffflusswirtschaft  
Bürgergasse 5a, 8010  
Graz



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