

Biowaste management in Vienna

***Implementation of Organic Waste Management in Europe
EU policy strategies and national developments
ECN/PIGO Seminar Poznań, Poland
8th October 2013***

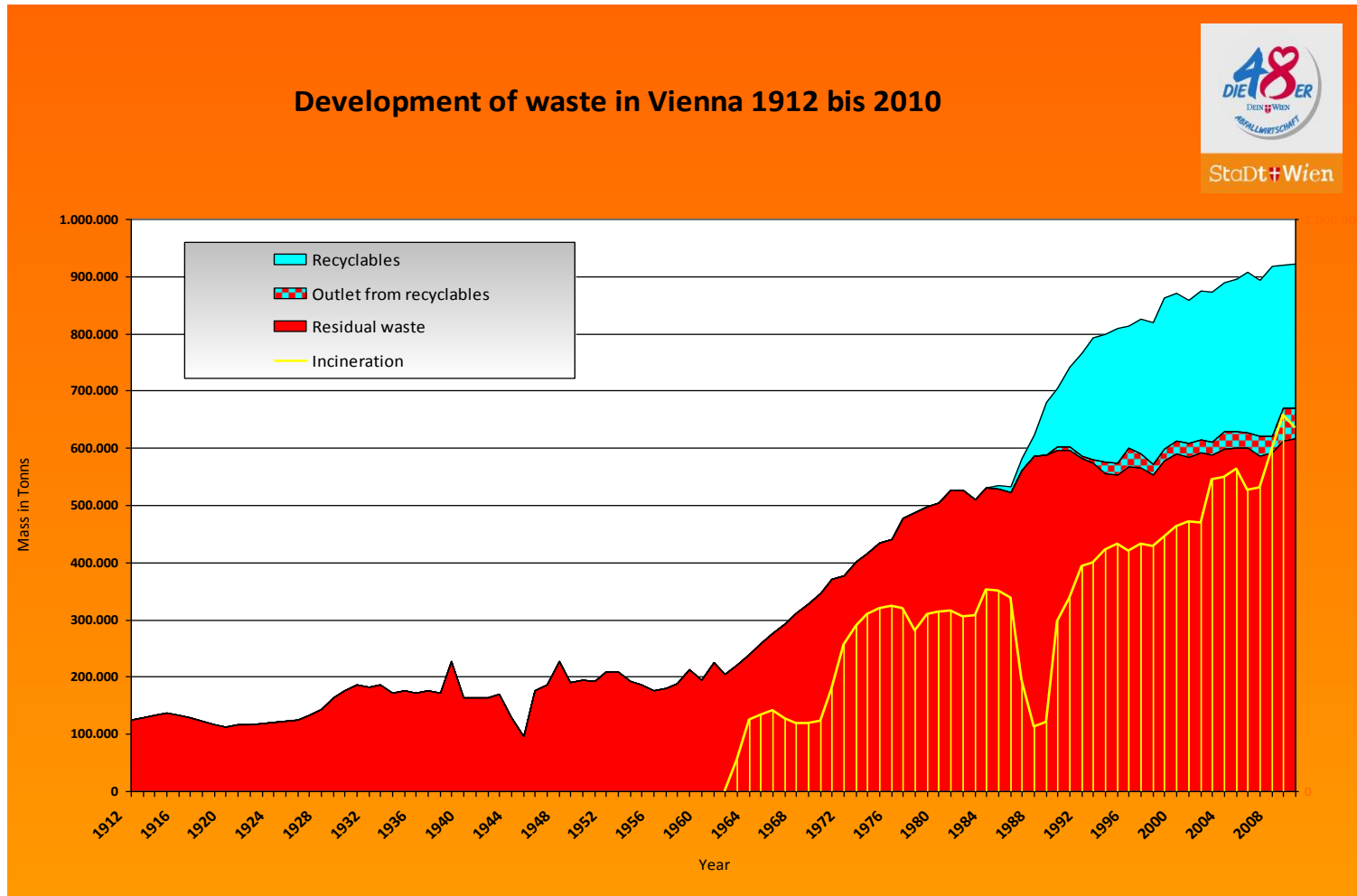
***Strategic vision and 25 years experiences of the City of Vienna
Waste management Department of the City of Vienna
Senatsrat Dipl.-Ing. Wojciech Rogalski***



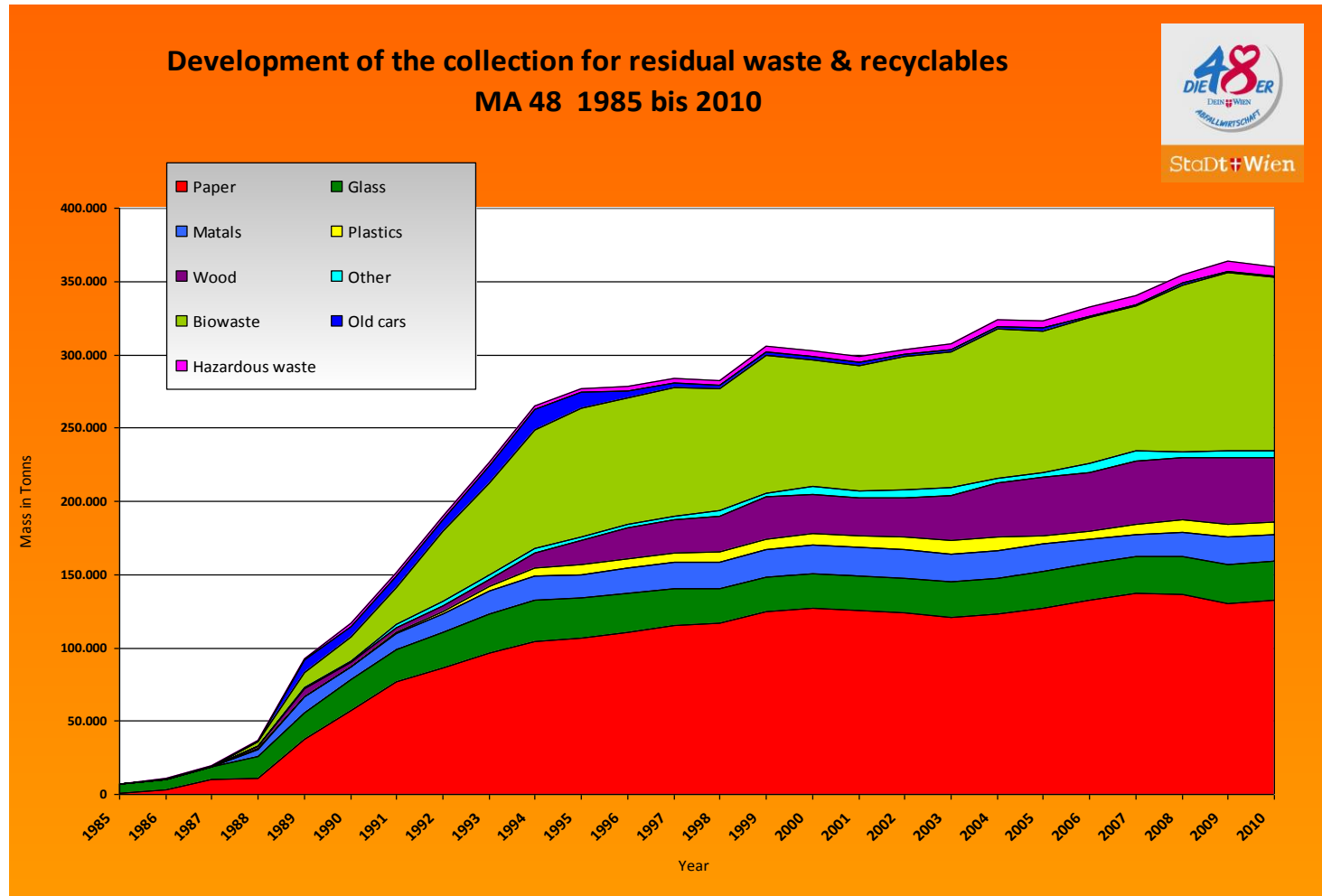
Austria / Vienna in figures

<i>Austria</i>		
<i>Area</i>	<i>[km²]</i>	<i>83.858,68</i>
<i>Inhabitants</i>		<i>8.206.500</i>
<i>federal states</i>		<i>9</i>
<i>Vienna</i>		
<i>Area</i>	<i>[km²]</i>	<i>414,95</i>
<i>Inhabitants</i>		<i>1.663.892</i>
<i>Density</i>	<i>[Inh/km²]</i>	<i>4.010</i>
<i>number of houses</i>		<i>167.554</i>
<i>number of flats</i>		<i>928.479</i>
<i>number of households</i>		<i>ca. 780.000</i>
<i>commuter</i>		<i>ca. 140.000</i>

Development of the collection of waste in Vienna



Development of recyclables in Vienna



Closed loop with composting in Vienna

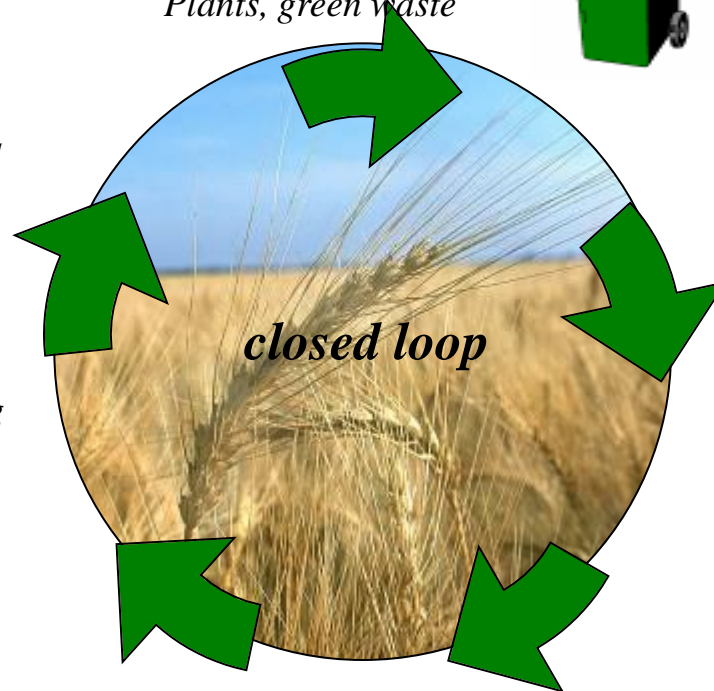


production of healthy food

*soil improvement
(marketing: 50.000 t/a)
agriculture,
horticulture, private gardening
potting soil production*



*Collection
(ca.100.000 t/a)
Biobin,
Plants, green waste*




treatment

*Sieve, metall-separation,
plastic separation*

*composting
(Input: ca.100.000 t)
conditioning*

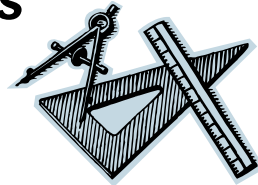


Biowaste management Vienna - review

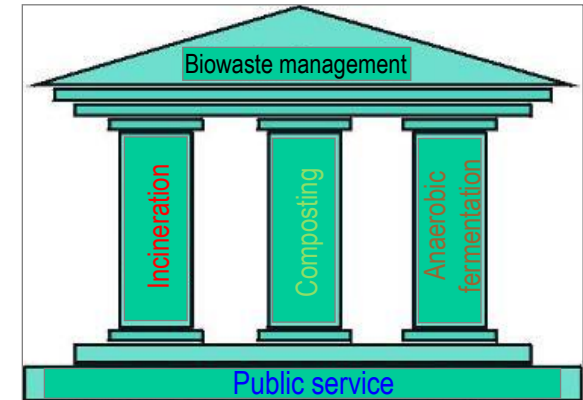
- **1986** Beginning of trial operation of biowaste collection & composting
- **1990** Beginning of comprehensive biowaste collection
- **1991** Opening of the Composting Plant Lobau
- **2006** Opening of the Biomass Inceneration Plant Simmering
- **2007** Opening of the Biogas Plant Pfaffenu
- **2009** Introduction of the Viennese compost garden soil „Guter Grund“
- **2011:** Opening of the soil production in Vienna (Terrasan) 

The Vienna Biowaste Management Concept

**Recovery rests on three pillars
(area bounded by 3 points,
guaranteed stability)**



- Composting
 - Garden waste, green waste from private households, digestate
- Anaerobic digestion
 - Kitchen and food wastes from commercial producers
- Biomass incineration
 - Wood waste



The systems do not compete, but complement each other

**Unrecoverable organic matter remains in the residual waste stream,
waste is being incinerated**

The Vienna Biowaste Management Concept

- *Wastes produced in Vienna shall be recovered in Vienna*
- *Organic wastes must not be landfilled*
- *No biowaste collection without guarantee of compost utilisation (mainly in agriculture/farming, soil production)*
- *No collection of kitchen waste without guarantee of 100 % energy recovery (biogas)*
- *Wood shall primarily be combusted for energy recovery, but not composted*
- *Other organic fractions shall remain in the residual waste stream and serve as raw material for eco-friendly energy recovery.*
- *Biowaste management is of relevance for climate protection only in conjunction with energy recovery and agricultural use*

The Vienna Biowaste Concept

- *Biowaste collection in Vienna is no “waste disposal pathway” - materials not needed for producing compost are not source-separated (not all biodegradable materials are supposed to be composted).*
- *Only organic wastes suited for the production of high-quality compost are source-separated.*
- *Source-separated biowaste shall not be related to EC Regulation 1774/1069 (animal by-products) – **only vegetable wastes are collected.***
- *Organic wastes not suitable for composting are used for energy recovery (fermentation – biogas, biomass combustion, incineration – residual waste incineration).*
- *Final product is humus-rich compost with high quality.*

The Vienna Kitchen Waste Concept

- *Kitchen waste collection is offered to restaurants, canteens and other catering establishments (in keeping with market economy principles).*
- *Applicable laws: EC Regulation 1774/1069*
- *Private households place their kitchen waste in the residual waste bin.*
- *All commercial kitchen & food waste producers are required to partake in kitchen waste collection – only very small businesses are exempted.*
- *Biowaste collection in Vienna is not suited for the disposal of food leftovers.*
- *Kitchen waste produced by catering industry must not be disposed of via the sewer system.*
- *In Vienna, source-separated kitchen & food waste is anaerobically digested for optimal energy value. Digestate is dewatered and incinerated.*
- *Disposal of kitchen waste through the sewer system is forbidden (waste of energy and nutrients).*

The Vienna Biowaste Management Concept

Biowaste collection

- Suburban districts: approx. 60,000 containers on private property (pick-up system)
- Other districts: approx. 10,000 containers on public premises (drop-off system)
- (nearly) no biowaste bins in the inner city (historic centre)



Garden waste

- 19 recyclables collection sites
- Private deliveries to the city's waste treatment plant

Kitchen waste collection

- Currently approx. 500 containers.
Future programme: pick-up from all establishments producing more than 80 l of food waste per week, or with a residual waste bin of 770 l min. capacity (emptied at least once a week)
- No kitchen waste collection for private households



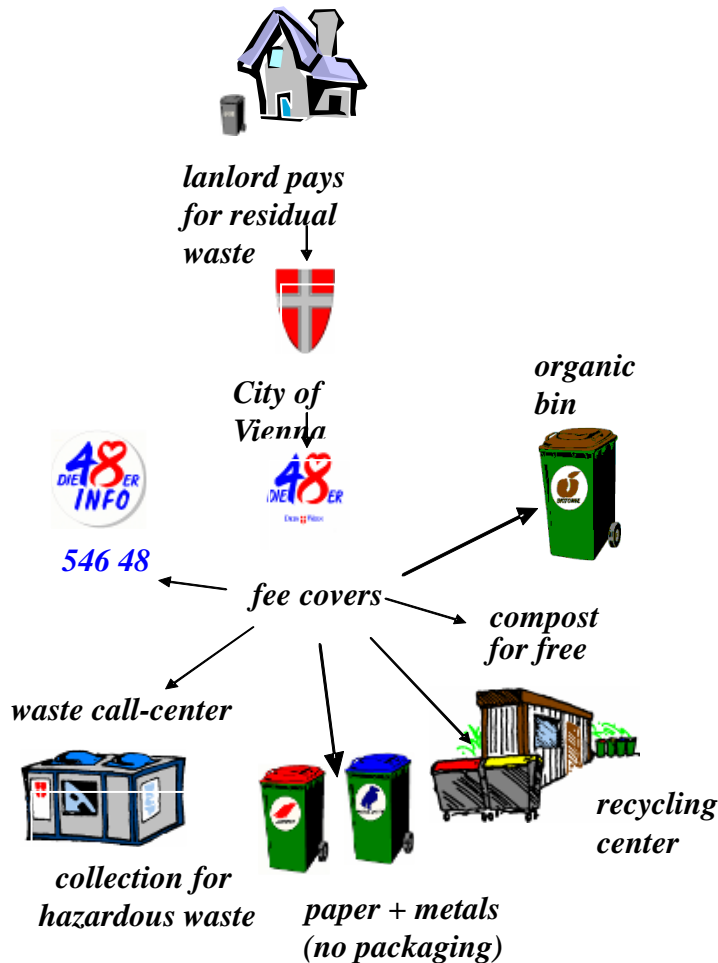
Residual waste collection

- All organic wastes whose collection is neither ecologically nor economically worthwhile

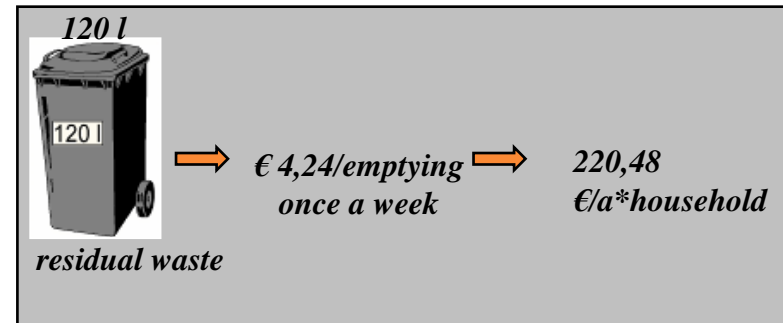
What is not to be collected



Fee for waste management in Vienna



- charge for residual waste (depending on emptying interval & bin seize)
- City of Vienna gets the money
- landlord has to pay the bill every three months



Composting

Three-pillar recovery scheme – pillar 1: **composting**

– *Composting plant Lobau*

- *Start of operation: 1991*
- *Open air composting*
- *Surface 5,2 ha*
- *Treatment capacity: 150.000 t/a*
- *Compost production: 50.000 t/a*
- *Convenient location*
- *Close to the farmers*
- *High economical efficiency*



Anaerobic digestion

Three-pillar recovery scheme – pillar 2:

anaerobic digestion

– Vienna biogas facility

- *Start of operation: 2007*
- *Treatment capacity: 34,000 t/a
(2nd extension phase)*
- *Wet digestion, mesophilic*
- *Solid and liquid wastes, category 3 material*
- *Aerobic after-treatment of digestate*
- *District heat production
(2 hot water boilers, 3,400 KW capacity)*
- *Savings of approx. 6,000 t
of CO₂ equivalents p.a.*



Biomass incineration

Three-pillar recovery scheme –pillar 3:

biomass incineration

- *Biomass incineration plant Vienna - Simmering*
 - *Start of operation: 2006*
 - *Treatment capacity: 620,000 m³/a*
 - *Synergies with biowaste collection*
 - *approx. 30,000 m³/a from biowaste collection feasible, e.g. Christmas trees*
 - *Electricity and district heat production*
 - *Savings of approx. 7,200 t of CO₂ equivalents p.a. (related to biowaste)*



What happens with the products?

Compost

- Agriculture/farming (approx. 20.000 t/a)
- Hand-out to Viennese population (approx. 10.000 t/a)
- Soil/humus production (approx. 20.000 t/a)



Biogas

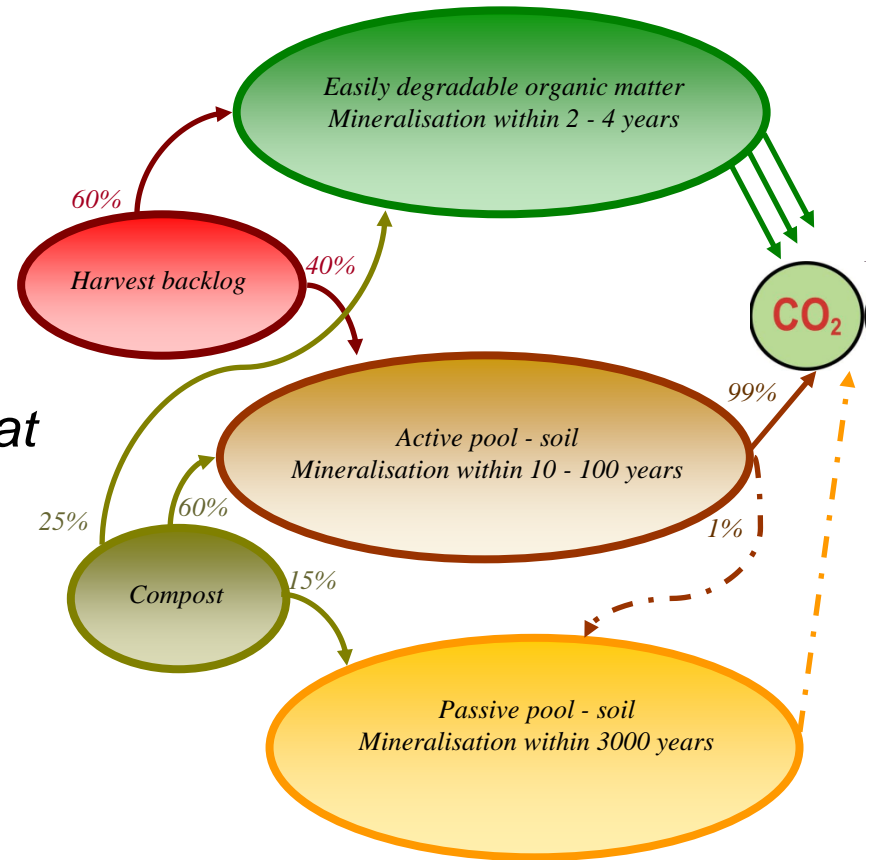
- Full capacity: 2.25 million m³ of methane, 22 GWh of energy, hot water production, district heat for 600 – 1000 Viennese households
- Digestate: Aerobic stabilisation (composting) or incinerated if low quality



Climate relevance of biowaste management

Direct CO₂ emission reduction

- creates carbon sinks through formation of humus (compost)
- use of compost fertilizer (organic farming) reduces N₂O emission
- use of peat-free soils reduces peat depletion



Quelle: Amlinger

Climate relevance of biowaste management

Indirect CO₂ emission reduction

- *Compost instead of mineral fertilizers (replacement), no use of chemical pesticides (organic farming) – prevents adequate CO₂ emissions resulting from their production (previous chains)*
- *Replacement of fossil fuels by burning biomass (biogas and wood/hay) – these CO₂ emissions are regarded as climate neutral*
- *Reduction of CH₄ emissions by separating organic waste at source instead of landfilling it (recovery instead of disposal)*
- *Replacement of fossil fuels by burning non-recoverable organics in the residual waste stream (waste incineration instead of landfill)*
- *Plants take up additional CO₂ when organic fertilizer is applied*

Climate relevance of biowaste management

Increasing of water receptivity of farmland by using compost



Farmland without compost
after a heavy rain



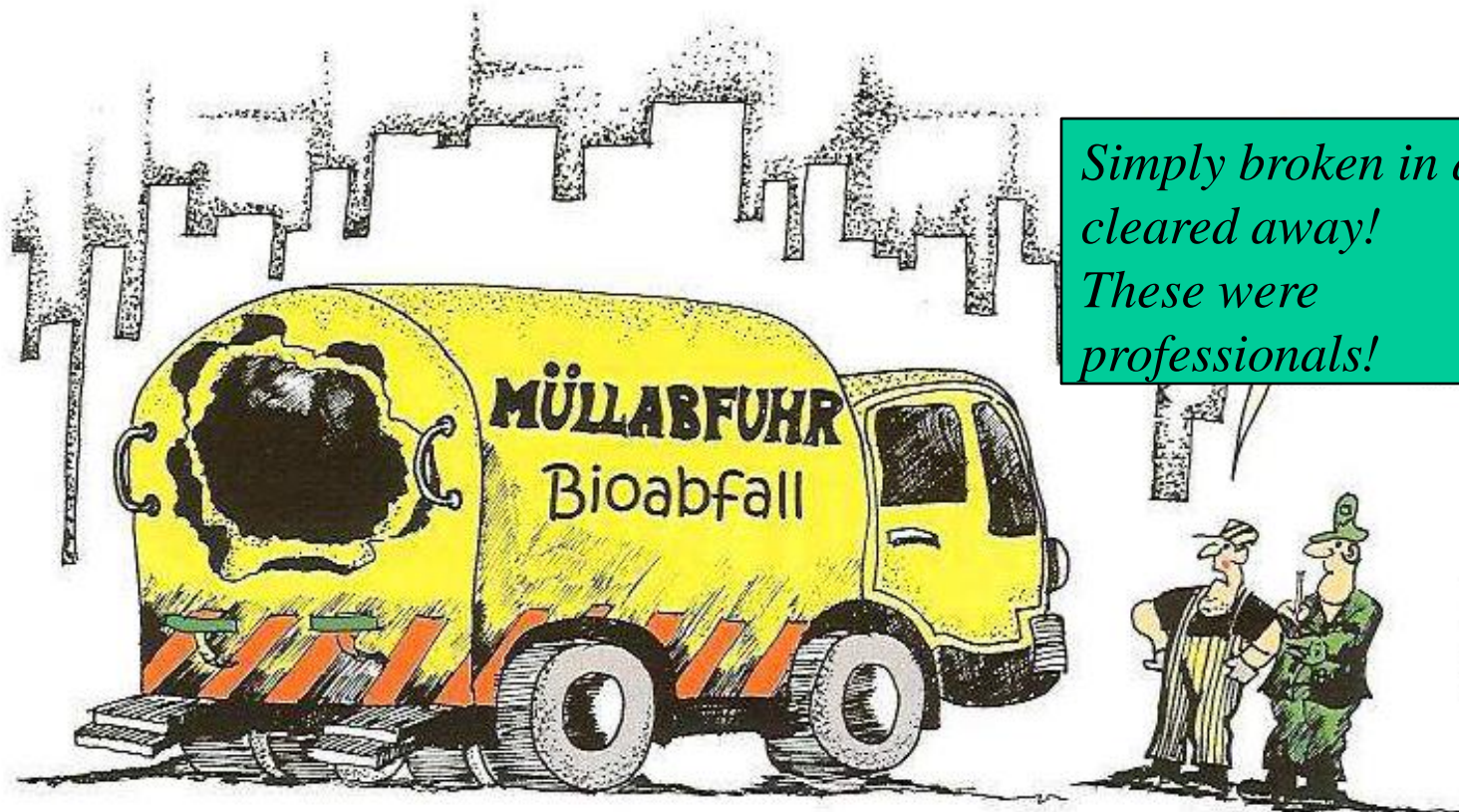
Farmland with compost
after a heavy rain

Quelle: Bioforschung Austria

Conclusions

- **Biowaste management will become more important in the future**
- **The EU's strategy seems to be aimed at an introduction of obligatory separate biowaste collection**
- **Only high quality of compost should be produced**
- **Composting of household waste has no future**
- **Landfilling of (bio) waste has no future**
- **Collect separately what you need for composting (recycling), not only because of it's biodegradability (disposal)**
- **Biodegradable plastics should not be collected with biowaste**
- **Biowaste management relies on both: resource recovery (composting) and thermal recovery (biogas, biomass)**
- **It is no used to compost wood or leaves, it is better to incinerate it**
- **Anaerobic digestion prior to composting appears not to be advantageous (high costs, low benefits, CO₂-certificate can be purchased more cheaper)**
- **Open composting belongs to *Best Available Techniques (BREF-BAT-Sevilla)***

„Value” of biowaste management



Thank you for your attention!

Contact

Dipl.-Ing. Wojciech Rogalski
Senatsrat

Einsiedlergasse 2 1050 Wien

Tel.: +43 1 58817 48271

Mobil: +43 676 8118 48271

E-Mail: wojciech.rogalski@wien.gv.at



<http://www.abfall.wien.at>

<http://www.wenigermist.natuerlichwien.wien.at>

<http://www.facebook.com/die48er>