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

<table>
<thead>
<tr>
<th>Austria</th>
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<tbody>
<tr>
<td>Area [km²]</td>
<td></td>
<td>83.858,68</td>
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<tr>
<td>Inhabitants</td>
<td></td>
<td>8.206.500</td>
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<td>federal states</td>
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<table>
<thead>
<tr>
<th>Vienna</th>
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<tbody>
<tr>
<td>Area [km²]</td>
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<td>414,95</td>
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<tr>
<td>Inhabitants</td>
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<td>Density [Inh/km²]</td>
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<tr>
<td>number of houses</td>
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<td>167.554</td>
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<tr>
<td>number of flats</td>
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<td>928.479</td>
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<tr>
<td>number of households</td>
<td></td>
<td>ca. 780.000</td>
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<td>commuter</td>
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<td>ca. 140.000</td>
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Development of the collection of waste in Vienna

Development of waste in Vienna 1912 bis 2010

Year
Recyclables
Outlet from recyclables
Residual waste
Incineration
Development of recyclables in Vienna

Development of the collection for residual waste & recyclables
MA 48  1985 bis 2010

Year
Mass in Tonns
Paper Glass
Materials Plastics
Wood Other
Biowaste Old cars
Hazardous waste
Closed loop with composting in Vienna

Collection
(ca. 100,000 t/a)
Biobin,
Plants, green waste

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

Closed loop

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)
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).
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

kompostierbar

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08.10.2013
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

City of Vienna

546 48

organic bin

landlord pays for residual waste

fee covers

residual waste

€ 4,24/emptying once a week

220,48 €/a*household

546 48

organic bin

residual waste

fee covers

City of Vienna

recycling center

paper + metals (no packaging)

collection for hazardous waste

waste call-center
Composting

Three-piller 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.
Three-piller recovery scheme – pillar 3: \textit{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
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 its 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)**
Simply broken in and cleared away! These were professionals!

Thank you for your attention!
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