The Decentralised On-Farm Cooperation Model for Biowaste Management and Composting

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Impressive growth of recycling quota (1991-2011)

1 Municipal Waste Association in Austria

Source: BAV Freistadt, Austria
Reduction of Biowaste in Residual Waste

- Garden waste: 207 kg in 1993, 42 kg in 1994 (39% reduction)
- Kitchen waste: 162 kg in 1993, 56 kg in 1994 (73% reduction)
- Residual waste: 580 kg in 1993, 328 kg in 1994 (23% reduction)

Introducing source separation of organic household waste.
The hierarchy of decentral biowaste management
= the logical follow-up of the 5 step waste hierarchy

**Priority I**
As much home composting as possible (= PREVENTION)

**Priority II**
Separate collection only complimentary

**Priority III**
Favouring Agricultural Composting

= 55%

~300 plants
The decentralised integrated approach in Austria

8.35 mio inhabitants

<table>
<thead>
<tr>
<th></th>
<th>Total composting plants</th>
<th>On-farm / agricultural plants</th>
<th>Municipal plants</th>
<th>Industrial plants</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Number</strong></td>
<td>454</td>
<td>292 (64%)</td>
<td>89 (20%)</td>
<td>73 (16%)</td>
</tr>
<tr>
<td><strong>Total treatment yr⁻¹</strong></td>
<td>976,000 t</td>
<td>308,000 t (32%)</td>
<td>237,300 t (24%)</td>
<td>431,000 t (44%)</td>
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<tr>
<td><strong>Average capacity yr⁻¹</strong></td>
<td>2,800 t</td>
<td>1,100 t</td>
<td>2,700</td>
<td>5,900 t</td>
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</table>

16,000 Inh per composting plant
Development of Separately Collected Biowaste ...„„Brown Bin“
Farmers Services & Cooperation Models

Collection campaigns from priv. gardens

G&P waste from CA-Sites

Food waste (Brown-Bin) collection

*Municipality*

1 Compost farm per municipality

2 to 3 farmers run 1 composting plant

Several farmers distributed over the county

Several farmers mature pre-composted biowaste from a city

Several farmers compost pre-mixed biowaste from a CITY

*County*
Cooperative Investment & Financing

Loader

Turner

Shredder

Engineering & Construction

Municipality
County
Farmer
State

Containers

Screen; wind sifter, magnetic separator

Collection truck
USER-FRIENDLY collections system at household

- 15 Litre Paper/Bio-Plastic Bag
- 110 Litre Garden Bag
- 46 Litre Bio-Bucket (Restaurants)

Fotos: Waste Management Association Rohrbach, Austria
Foto: Waste Management Association Rohrbach, Austria
Simple collection trucks also for bio-bins
Seasonal fluctuations – garden waste

Monthly Collection Trends - Green and Kitchen Biowaste

Monthly quantities collected (aggregate PD1)

© Favoino
Collection of **GARDEN WASTE**

LEAVES

€ 1,10
Green waste delivery at the RECYCLING CENTRE
Mixing the „Ingredients“

Fotos: Hildebrandt, Amlinger
OPEN WINDROW composting
The Compost Heap

Fotos: Hildebrandt
**Optimum Temperature Ranges for Different Requirements of the Composting Process**

<table>
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<tr>
<th>Process Optimum for</th>
<th>Temperatur Range</th>
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<tbody>
<tr>
<td>Hygienisation ... [e.g. 3 to 10 days]</td>
<td>$&gt; 55 - 65 , ^\circ C$</td>
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</table>
| **Maximum Decomposition**
Start of Formation of Humic Substances | 45 - 55 °C |
| **Max. Biodiversity** + Decomposition of Microbial Biomass; Max. Formation of Humic Substances | 35 - 40 °C |
Managing - Adding Water

- Add water during turning
- Add water slowly
- Ideal 50 – 60%
- Squeeze test
- Too wet = anaerobic/leachate/odour/GHG
- Too dry = no decomposition
2 to 5% slope

Fotos: Hildebrandt, Amlinger
The Key = **Biodiversity**!
On-Farm Composting Scheme

Why decentralised ON-FARM Composting

- Creates rural income, strengthens family farm structures
- Guarantees high agricultural recycling rate
- Reduces costs and efforts for marketing
- Guarantees short distance carbon sequestration in soil
- Farmer = educated in organic material handling
- Opens the door to organic farming
- Own use of compost drives quality management
- Strengthen traceability & confidence
800 t biowaste or 1 800 households create 1 full working place !!!

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Thank you!