Integrated Waste Management in Vienna

DI Rainer KRONBERGER
Main tasks of MD 48

- collection of residual waste and recyclables (municipal waste)
- waste treatment
- street cleaning
- winter service
- vehicle fleet

about 3,500 employees
Vienna in figures

<table>
<thead>
<tr>
<th>Vienna (capital of Austria)</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Area</td>
<td>[km²]</td>
</tr>
<tr>
<td>Inhabitants</td>
<td></td>
</tr>
<tr>
<td>Population Density</td>
<td>[Inh/km²]</td>
</tr>
<tr>
<td>Number of houses</td>
<td></td>
</tr>
<tr>
<td>Number of households</td>
<td></td>
</tr>
</tbody>
</table>
MSW in Vienna: 1,1 Mio. t/a

waste collected by MD 48 (2014): 1,079,000 tons

- MSW recycled: 22%
- MSW composted: 9%
- MSW to Waste to Energy: 62%
- MSW landfilled: 7%
MSW in Vienna: 1912 - 2014

- recyclables, biowaste, haz. waste
- residues from sorting
- residual waste
- waste incineration

mass in tons

year
Waste incinerator Spittelau

May 15, 1987: incinerator on fire
Approaches in waste management

- separate collection of recyclables
- thermal treatment of residual waste with energy recovery
Waste Collection
### Collection Schemes in Vienna

<table>
<thead>
<tr>
<th>Waste Category</th>
<th>Collection Schemes</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>backyard collection</td>
</tr>
<tr>
<td></td>
<td>(pick up system)</td>
</tr>
<tr>
<td>residual waste</td>
<td>XXX</td>
</tr>
<tr>
<td>organics</td>
<td>XXX</td>
</tr>
<tr>
<td>paper</td>
<td>XX</td>
</tr>
<tr>
<td>glass</td>
<td>X</td>
</tr>
<tr>
<td>metal</td>
<td>X</td>
</tr>
<tr>
<td>plastics</td>
<td>X</td>
</tr>
<tr>
<td>other recyclables</td>
<td>XXX</td>
</tr>
<tr>
<td>WEEE</td>
<td>XXX</td>
</tr>
<tr>
<td>hazardous waste</td>
<td>XXX</td>
</tr>
</tbody>
</table>
Residual Waste

- Containers from 120 l up to 2.2 m³
- full service

- Difficulty:
  in old houses containers often situated in the basement (stairs)

=> new buildings must have dedicated areas for waste containers near the street on street level

299 kg/inh.

56%
Waste Glass

16 kg/inh.

- since 1977
- separate containers for clear and coloured glass
- collection truck with two-chamber compartments
- since 2004: hook-lift containers (3 m³) (lower noise emission, reduced collection costs)
Paper & Cardboard

71 kg/inh.

- since 1986
- containers in use:
  - 240 l: old buildings (space, stairs)
  - 770 l: new buildings, kerbside collection
Bio Waste

- since 1987
- containers in use:
  - 240 l: houses (with garden)
  - 770 l: kerbside collection
- only "green waste", no food waste!
  => composting, anaerobic digestion
- since 2007 additionally collection of kitchen waste/food waste (120 l)
  => anaerobic digestion

43 kg/inh.

8%
Metal Waste

- since 1988
- combined collection of packaging and scrap metal
- Containers in use: 770 l
- metals collected with residual waste separated after incineration (equiv. 8.0 kg/inh.a)
Plastic Waste

- since 1988
  - high share of impurities (~ 40%), low recycling rates

- since 2005 new collection system: only plastic bottles:
  - Gaining best material for recycling
  - Reduce impurities

- 8,000 containers were replaced by so-called “Kermit” containers (770 l)

Results:
- Share of impurities < 10%

4 kg/inh.

0.7%
“Bulky” Recyclables/ Other Waste

collection via 18 recycling centers

- since 1988
- opening hours:
  Mo – Sa; 7:00 – 18:00
  (1 recycling center opens on sundays)
- free of charge
Waste treatment
Treatment of residual waste

- **ca. 650,000 t/a** residual waste, bulky waste etc.
  - incineration plant Flötzersteig
  - incineration plant Spittelau
  - incineration plant Pfaffenau
  - fluidized bed incinerator 4

- **approx. 200,000 t/a** residuals from incineration (ashes/slags)

- **approx. 240,000 t/a** stabilized ash-/slag concrete
  - treatment of slags with separation of metals

- **storage**
  - landfill site Rautenweg
## Waste Incinerators

<table>
<thead>
<tr>
<th></th>
<th>Flötzersteig</th>
<th>Spittelau</th>
<th>WSO4</th>
<th>Pfaffenau</th>
</tr>
</thead>
<tbody>
<tr>
<td>in operation since</td>
<td>1963</td>
<td>1971</td>
<td>2004</td>
<td>2008</td>
</tr>
<tr>
<td>type</td>
<td>grate</td>
<td>grate</td>
<td>fluidised bed</td>
<td>grate</td>
</tr>
<tr>
<td>lines</td>
<td>3</td>
<td>2</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>capacity</td>
<td>200,000 t/a</td>
<td>250,000 t/a</td>
<td>80,000 t/a</td>
<td>250,000 t/a</td>
</tr>
<tr>
<td>waste fuel capacity</td>
<td>66 MW</td>
<td>89 MW*</td>
<td>38 MW</td>
<td>80 MW</td>
</tr>
</tbody>
</table>

* after plant optimisation
(2012 – 2015)
Waste to Energy – District Heating

pipeline length: 1,200 km

flats: 350,000 (of 862,700)

major customers: 9,300

district heat: ~6,000 GWh/a

~20 % by incineration of waste, sewage sludge and biomass

DI Rainer Kronberger
MA 48, waste management, street cleaning & vehicle fleet
Treatment of slag
Landfill site Rautenweg

since 1961
60 ha; 23 Mio. m³
(thereof 13,5 Mio. m³ available)

landfill gas collection (2014)
3,1 Mio. m³/a (5,4 Mio. kWh/a)

since 2008
only landfillsing of slag/ash
Landfill site Rautenweg
Landfill gas collection

landfill gas generation in m³

power generation in kWh

[Bar chart and line graph showing landfill gas generation and power generation from 1994 to 2014]
Treatment of Biowaste

- **Biowaste (outer districts)**: 115,000 t/a
  - Composting plant (since 1991)
  - High quality compost (A+)
    - Offer to take at recycling centers free of charge
    - Organic agriculture
    - Potting soil (free of peat)

- **Kitchen waste, Biowaste (inner districts)**: 17,000 t/a
  - AD plant (since 2007)
  - 11,200 MWh/a
  - District heating
Waste treatment plants

• situated in Vienna

• operated by the City of Vienna

=> high level of self-sufficiency and short distances
Financing
Financing

- Residual waste
- Biowaste
- Recyclables (non-packaging)
- Hazardous waste

\[\implies\] waste fee
- revenues for recyclables

shared producer responsibility:
- WEEE
- Batteries

\[\implies\] waste fee
\[\implies\] 4 collection and recovery systems

full producer responsibility:
- Packaging waste

\[\implies\] 4 collection and recovery systems
Waste fee

- **since 1934:**
  - charge for **residual waste**
  - (depending on emptying interval & bin seize)

**example:**

- landlord pays for residual waste
- City of Vienna
- residual waste
- waste call-center 546 48
- biowaste
- fee covers
- collection for hazardous waste
- paper + metals (no packaging)
- recycling center

- residual waste
- € 4,41/emptying times 52 weeks
- 229,32 €/a per household

- 120 l
Contact

Magistratsabteilung 48
Abfallwirtschaft, Straßenreinigung und Fuhrpark
Einsiedlergasse 2
A-1050 Wien

phone:  +43 1 58817 0
fax:    +43 1 58817 99480037
e-mail: post@ma48.wien.gv.at

www.abfall.wien.at
www.facebook.com/die48er