

Waste Management in the City of Munich

A Practice Example from the City of Munich



Legal Regulations: Waste Management is a Service of General Economic Interest (SGEI)

- EU-Legislation:
Waste Framework Directive
Treaty of Lisbon
- German Legislation:
Closed Cycle Management Act
(Paragraph 20)
- Bavarian State Law:
Bayerisches Abfallgesetz
(Article 3)

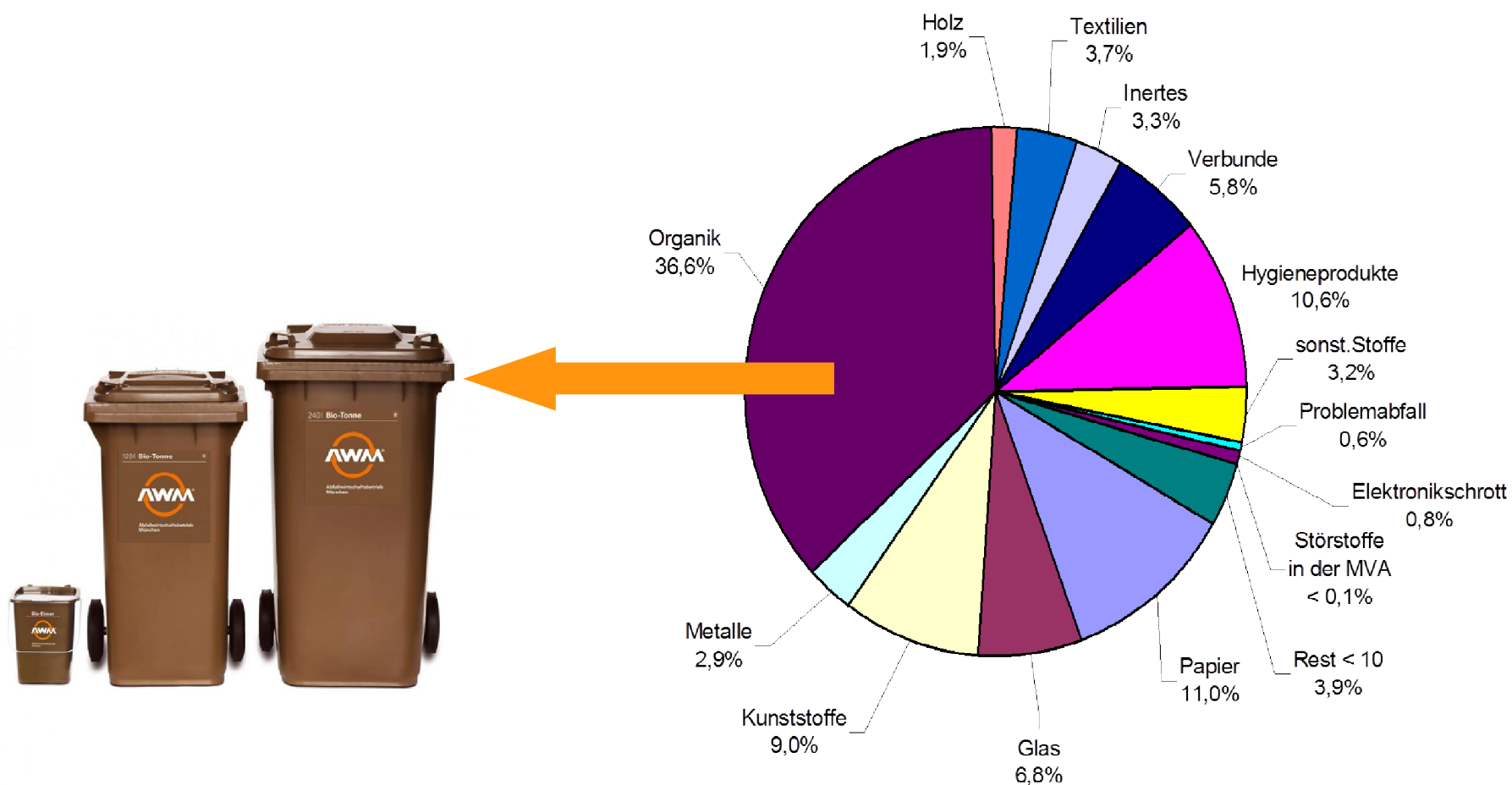


Waste Management Corporation Munich: facts & figures 2015

- Public service corporation run by the City of Munich
- 1,500 employees from 25 nations
- 146 collection crews with 703 collectors
- 177 trucks with waste compactors suitable for all types of waste
- Annual turnover: 204 million €
- 3 operating sites and 12 recycling centres
- Combined heat and power waste incinerator
- Waste disposal site (closed landfill) with biowaste treatment facility

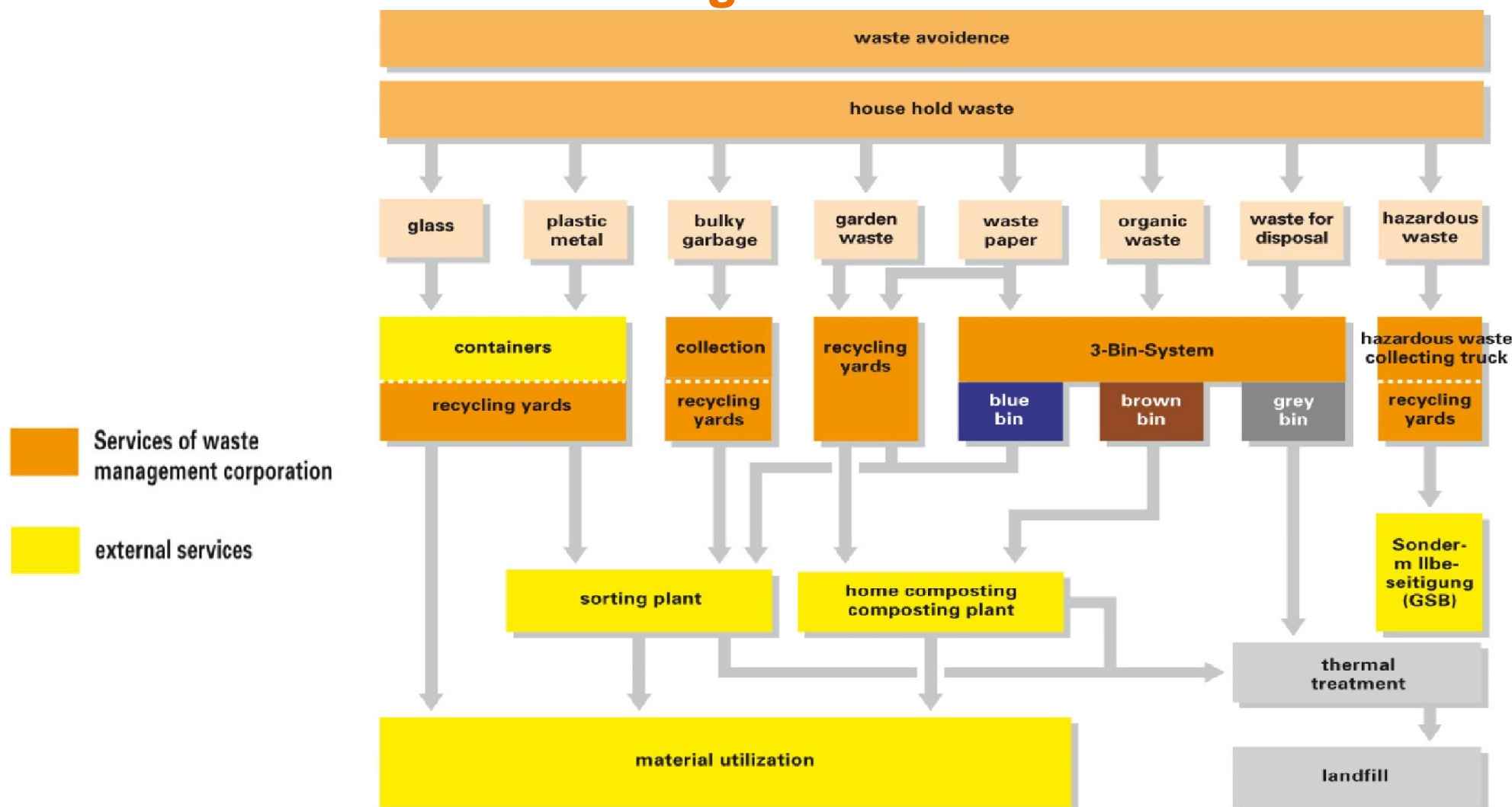


Increasing the amount of organic waste











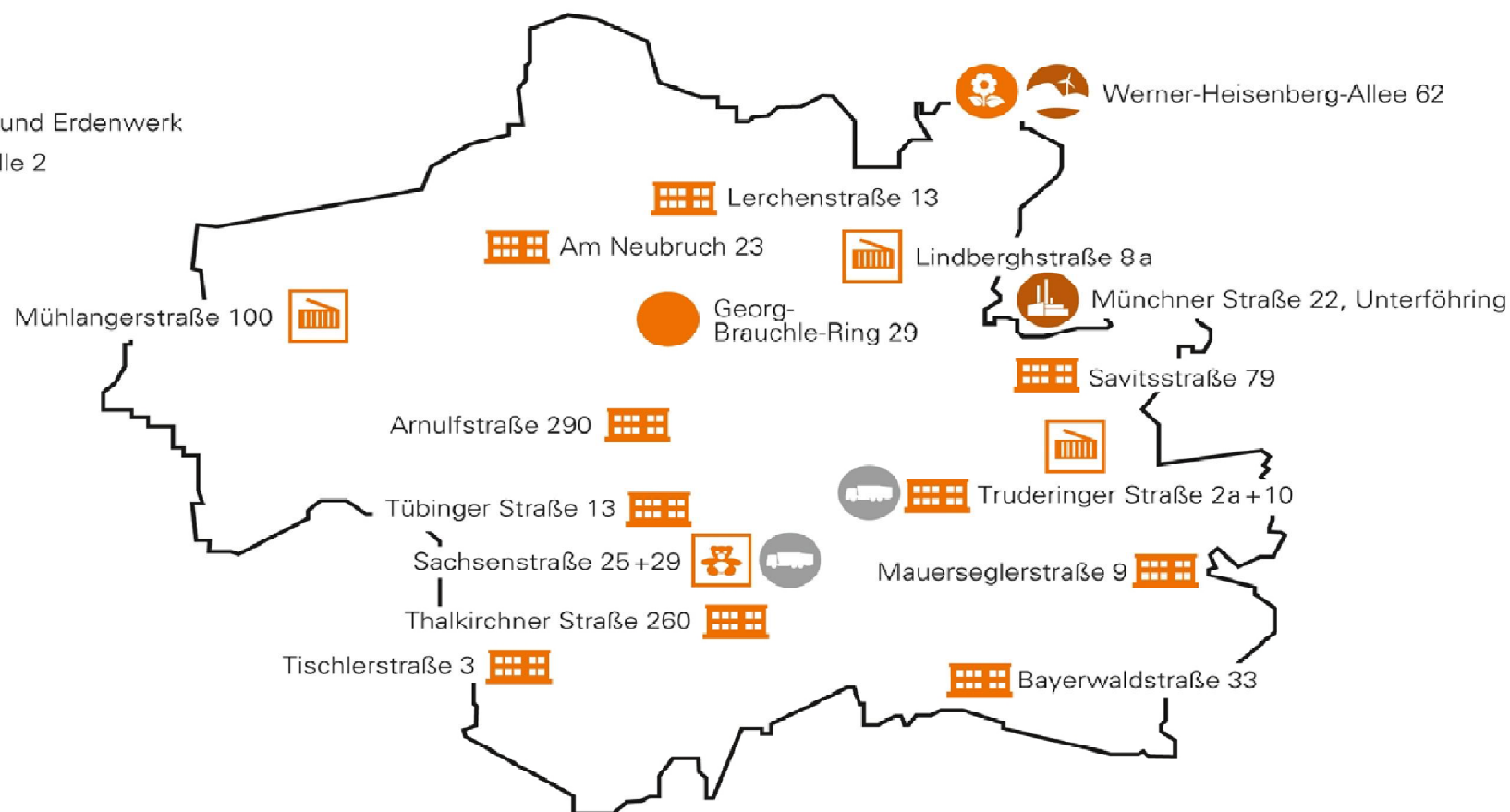
Munich's waste analysis 2007

Household Waste Management Plan



Facilities of the AWM

-  AWM Zentrale mit zwei Betriebshöfen und Kfz-Werkstatt
-  Wertstoffhof
-  Wertstoffhof plus
-  Betriebshof
-  Trockenfermentationsanlage und Erdenwerk
-  Gebrauchtwarenkaufhaus Halle 2
-  Heizkraftwerk Nord
-  Entsorgungspark Freimann

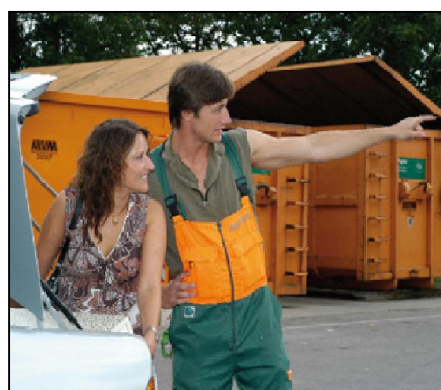


Seperate Collection in Munich 2015

795,000 Properties



12 Recycling Centers



750 Containers



950 Packaging-Cont



Residual waste:
311,375 tons

Paper: 92,920 tons

Organic: 42,117 tons

Bulky waste,
hazardous waste,
recyclables
75,114 tons

Used clothing,
used shoes
3,480 tons
(since July 2013)

Glass,
lightweight packagin
35,664 tons

Offers for Separate Collection in Munich

1,5 Mio.
inhabitans in
823,000
households

950 container
(Duales System
Deutschland)

52 stops of the
hazardous
waste collection
truck, every 4
weeks for 1
hour

12 recycling
yards,
open 60 hours
per week

1 waste-to-
energy-plant
in Unterföhring
with combined
heat and power
generation

1 waste
disposal area
(closed)

Biowaste
treatment

Interim storage



curbside
collection -
residual waste
-paper waste -
organic waste -
bulky waste -
refrigerators
per order



in the street
about 200 m -
glass -
metal -
plastic



in the street
about 2000 m -
hazardous
waste



Enclosure
about 3000 m -
hazardous
waste -
recyclable
material -
bulky waste -
garden waste



-waste for
energy
recovery



-asbestos
and mineral
fibres

Munichs Paper-Cycle



Munich's Organic Waste Circle



Biowaste separation list

What goes into the bio bin?

- Fruit and vegetable scraps
- Potato peels, egg shells
- Coffee filter, teabags
- Bunches of withered flowers
- Pot plants (without pots)
- Garden wastes (such as foliage, grass, weeds, trimmings, flowersoil)
- Paper towels, paper napkins, kitchen paper
- Crumpled newspaper to absorb moisture



Collection in 2015

Brown Bio-Bin:

42,117 tons

Recyclings Centers:

13,014 tons



Recovery (bio bin):

11,582 t treated in AWM's dry fermenter (TFA)

30,535 t treated in composting plants run by private contractors (awarded by tender)

Recovery (garden waste):

12,143 t treated in composting plants run by private contractors

871 t used as auxiliary material for composting of TFA digestate

TFA AWM München – Expansion 2008



Dry fermentation plant: facts & figures

- **Number of fermenters:** 4 fermenters at previous pilot facility and 6 fermenters at new facility (built in 2007)
- **Capacity:** rated capacity: 25,000 tons/year
capacity utilisation: 22,500 tons/year
- **Digestion time:** 4 to 5 weeks at a temperature of 34 to 37 Celsius
- **Amount of digestate:**
approx. 17,000 tons/year
- **Energy output:**
2,600 MWh electricity per year plus
process heat (utilisation heat for
drying boxes and plant heating)
- **Compost output:**
7,000 – 8,000 tons/year



Gas-proof hydraulic gates with overhead opening equipped with inflatable seal



Compost products 2015

- **Compost recovery (4,164 t):** Compost from TFA goes to a soil processing plant, where different types of soil for gardening and landscaping, plant soil etc. are produced. In September 2012 the AWM opened the new soil processing plant on the landfill site.
- **Direct marketing:** compost is mixed with special substrates and slow-release fertilisers and sold as “Münchner Blumenerde” (flower soil from Munich)
- **45/20 litres of medium-priced flower soil: 7.43 €**
Selected recycling centres of AWM and hardware stores sold about 1,400 sacks in 2015

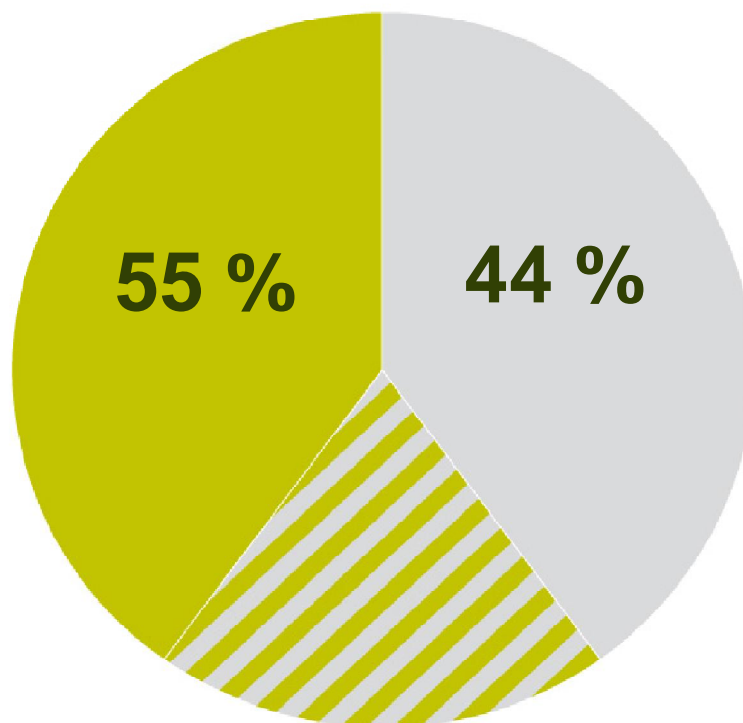


Recycling Rate in Munich

Recycling

- Organic
- Garden Waste
- Paper/ Cardboard
- Glass/ Metal
- Packaging
- WEE
- Used Textile
- Slag

1% Landfill



Energy Utilisation

- Residual Waste
- Bulky Waste
- Mixed Waste from Construction Sites
- Treated Wood

Waste Incineration Plant at Munich North - Using Combined Heat and Power Generation

- **690,000 t** waste incineration capacity
- **685,468 t** of waste incinerated in 2015
- **62,088 MWh** production of electrical power
- **1,026,087 MWh** production of heat for district heating



The Waste Fee Provides the Following Services

- Collection of the bins for residual, paper and organic waste
- Using the Recyclig Centers for 30 different waste fractions
- Collection of hazardous waste
- Collection of christmas trees
- Information material
- Consulting and awareness campaigns
- Providing the waste collection bins
- (13 different sizes)
- Rearrangement of waste bins
- Call-Center



Contract Design of the Waste Fee is one Step on the Road to Success

- Under German Legislation the municipalities are commissioned and authorised to rise a waste fee
- AWM invoices directly from the ground landlord
- AWM demands the fee for the grey bin only
- All other services of the AWM are free of charge and included in the grey bins fee
- The amount of the fee depends on the size of the bin
- If people separate waste correctly, they can use a smaller grey bin to spare money



**Vielen Dank.
Thank You Very Much.**

