# State of the Nation Report

Landfilling Practices and Regulation in Austria

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1. Summary of Solid Waste Management Sector

<table>
<thead>
<tr>
<th>landfill class</th>
<th>number of landfills 2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>excavation residues</td>
<td>462</td>
</tr>
<tr>
<td>inert waste</td>
<td>13</td>
</tr>
<tr>
<td>non-hazardous waste</td>
<td>construction waste</td>
</tr>
<tr>
<td>(sustainable landfills)</td>
<td>incineration residue</td>
</tr>
<tr>
<td></td>
<td>other pre-treated waste</td>
</tr>
<tr>
<td>other</td>
<td>not yet assigned</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td><strong>666</strong></td>
</tr>
</tbody>
</table>

Taken from: [www.bundesabfallwirtschaftsplan.at](http://www.bundesabfallwirtschaftsplan.at) (Band 1)

In the nine years from 1999 to 2008, total waste accumulation increased from 48.6 million tons to 56.3 million tons (+16%). Part of the increase can be explained by the higher generation of secondary waste due to increased waste treatment activities. Therefore, 2 million tons of the waste generated in 2008 can be allocated to secondary waste. The accumulation of excavated soils - by far the biggest waste fraction - increased from 20 to 25.6 million tons.

From 1999 to 2008, the accumulation of waste from households and similar establishments increased from 3.1 million tons in 1999 to **3.8 million tons** in 2008 (+22%). However, due to an increase in the separate collection of waste, residual household waste accumulation increased only by 5%.


<table>
<thead>
<tr>
<th>landfill class</th>
<th>open landfill volume 2008 (in mio. m³)</th>
</tr>
</thead>
<tbody>
<tr>
<td>excavation residues</td>
<td>39,5</td>
</tr>
<tr>
<td>inert waste</td>
<td>1,8</td>
</tr>
<tr>
<td>non-hazardous waste</td>
<td>construction waste</td>
</tr>
<tr>
<td>(sustainable landfills)</td>
<td>incineration residue</td>
</tr>
<tr>
<td></td>
<td>other pre-treated waste (MBA Material)</td>
</tr>
<tr>
<td>other</td>
<td>not yet assigned</td>
</tr>
<tr>
<td><strong>total</strong></td>
<td><strong>77,3</strong></td>
</tr>
</tbody>
</table>
2. Overview of Landfill Practices

**Waste scales** for landfills of non-hazardous waste and inert wastes mandatory, Landfills for excavation residues (estimation, evaluation)  
**Base drainage** for landfills of non-hazardous waste mandatory (filter layer, leachate drains, storage basin), treatment in sewage-plant  
**Waste compaction** in layers common, eventually stabilization of incineration residue  
**Daily compaction** state of the art  

**Geological barrier** for landfills of non-hazardous waste  
1. thickness 5m; \( k_f \) coefficient of permeability < 10\(-7\) m/s  
2. thickness 3m; \( k_f \) < 10\(-8\) m/s  
3. thickness 1m; \( k_f \) < 10\(-9\) m/s  
4. thickness \( \frac{1}{2} \) m; \( k_f \) < 5x10\(-10\) m/s  

if not present → **Artificial barrier** mandatory with equal security  
thickness > 0.5m; compaction in layers  
- Site investigation (Austrian Standards Norm S 2074-1) → long term stability of bedrock  
- Landfill raw formation for landfills of non-hazardous waste (follow appendix 3 of the Austrian landfill ordinance)  
- Base sealing for landfills of inert and construction waste  
  1. Two-part, mineral layer (20-27cm/layer), total > 50cm  
  2. alternate base sealing with equal security > 20cm permitted  
  3. longitudinal slope > 2%, transverse slope > 3%  
- Base sealing for landfills of incineration residue and pre-treated waste  
  1. Three-part, mineral layer (20-27cm/layer), total > 75cm  
  2. alternate base sealing with equal security > 40cm permitted  
  3. special design with equal security permitted, if side-slope > 1:2 (e.g. Viennese “Dichtwandkammersystem”)  
  4. longitudinal slope > 2%, transverse slope > 3%  
- Landfill surface coverage after operational phase (recultivation, erosion protection);  
- Surface sealing for landfills of inert waste and non-hazardous waste (incl. surface water drainage) → Appendix 3 of the Landfill Ordinance  
- Temporary surface sealing for landfills/compartment of highly biodegradable waste for at least 20 years  
- Plan to intensify the biodegradation (e.g. aeration) latest 12 months after operational phase) → Appendix 3 of the Landfill Ordinance  
- Gas collection mandatory  
  1. Passive for pre-treated waste (e.g. gas flaire, oxidation window)  
  2. Active for highly biodegradable waste
3. **Key Stakeholders in the solid waste disposal sector relating to Landfill**

- Public and private landfill owners
- Environment Agency Austria (Umweltbundesamt)
- Austrian Ministry of Environment (Lebensministerium)
- Austrian Water and Waste Management association (OEWAV)
- Consultants

4. **Legal and Policy Frameworks for Landfill**

- Deponieverordnung 2008 (Landfill Ordinance 2008)

**Climate change position**

Kyoto objectives - 13 percent less emissions compared to 1990


**Policies or mandates that may affect waste streams**

1992: Verordnung getrennte Sammlung biogener Abfälle (mandatory separate collection of biowaste)
1996: Verpackungsverordnung (separate collection of packaging waste)
1996: Deponieverordnung (mandatory pre-treatment of household waste prior to disposal from 2004)
2001: Kompostverordnung (End of waste criteria for biowaste)
2005: Elektroaltgeräteverordnung (separate collection of e-waste)
2011?: Baustoff-Recyclingverordnung (End of waste criteria for construction waste)
2011?: Recyclingholzverordnung (End of waste criteria for scrap wood)

5. **Domestic Country Strategy**

With the mandatory pre-treatment of household waste in 2004, a substantial shift from landfiling to thermal treatment (and MBA) took place. In 2009 the exceptional rule for the direct disposal of household waste in Tirol, Vienna and Carinthia expired. With the implementation of the new EU waste hierarchy (Novelle AWG 2010) and new regulations on end of waste, Austria is reaching for the goals of recycling according to the waste framework directive.

**Waste Prevention:** Apart from the reduction of landfilled waste (Austrian Waste Prevention Program 2011 – see [www.bundesabfallwirtschaftsplan.at](http://www.bundesabfallwirtschaftsplan.at)), the mandatory pre-treatment of household waste leads to the avoidance of water- and soil-polluting contaminated sites, the reduction of greenhouse gases, careful resource management, and is an investment into the environment for future generations.

**Re-Use of waste** – prior to its production – is another important section of the Austrian Waste Prevention Plan, which has set a medium-term goal to build up,
support and establish a re-use network in Austria.

**Public Relations** is the most important task when it comes to “waste separation”, in particular concerning plastic packaging. The website [www.richtigsammeln.at](http://www.richtigsammeln.at) (Collect correctly), established by the Ministry of Environment, offers further information on this subject. The main goals of public relation are also defined in the Austrian Waste Management Plan ([www.bundesabfallwirtschaftsplan.at](http://www.bundesabfallwirtschaftsplan.at))

6. **References and Sources**

Austrian Waste Management Plan ([www.bundesabfallwirtschaftsplan.at](http://www.bundesabfallwirtschaftsplan.at))
Environment Agency Austria ([www.umweltbundesamt.at](http://www.umweltbundesamt.at))
Austrian Ministry of Environment ([www.umweltnet.at](http://www.umweltnet.at))
Austrian Water and Waste Management association ([www.oewav.at](http://www.oewav.at))