Serbia, a crossroad in Europe planning for sustainable waste management

Doc. Dr Goran Vujic
1. Introduction

2. Current waste management in Serbia

3. Main EU demands

4. Landfill – MBT – WTE plants solution?
1. introduction
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2. Current waste management in Serbia

- **3209 landfills site, 178 (big) (10%/60%/30%)**

- **195.402 citizens are cover by collecting company in Vojvodine + 168.167 no data 17,9% from 2.031.992**

- **Novi Sad 631 employed cover 400.000 citizen 11,6 miliona EUR tournouver**

- **Less than 3 euro per house about 30 euro per house per year**
## 2. Current waste management in Serbia

<table>
<thead>
<tr>
<th>Municipality</th>
<th>Generated waste (t/week)</th>
<th>Generated waste (kg/inhabitant/daily)</th>
<th>Generated waste (kg/inhabitant/year)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inđija 49,258</td>
<td>363 t</td>
<td>1.05 kg</td>
<td>383 kg</td>
</tr>
<tr>
<td>Sombor 56,734</td>
<td>269 t</td>
<td>0.67 kg</td>
<td>246 kg</td>
</tr>
<tr>
<td>Novi Kneževac 9,648</td>
<td>40 t</td>
<td>0.59 kg</td>
<td>214 kg</td>
</tr>
<tr>
<td>Šabac 123,155</td>
<td>463 t</td>
<td>0.59 kg</td>
<td>209 kg</td>
</tr>
<tr>
<td>Topola 25,292</td>
<td>51 t</td>
<td>0.29 kg</td>
<td>105 kg</td>
</tr>
<tr>
<td>Kragujevac 185,000</td>
<td>897 t</td>
<td>0.70 kg</td>
<td>252 kg</td>
</tr>
<tr>
<td>Bor 85,817</td>
<td>125 t</td>
<td>0.32 kg</td>
<td>116 kg</td>
</tr>
<tr>
<td>Niš 239,596</td>
<td>1230 t</td>
<td>0.73 kg</td>
<td>266 kg</td>
</tr>
<tr>
<td>Novi Sad 314,192</td>
<td>2560 t</td>
<td>1.16 kg</td>
<td>424 kg</td>
</tr>
<tr>
<td>Beograd 1,392,691</td>
<td>10382 t</td>
<td>1.08 kg</td>
<td>394 kg</td>
</tr>
</tbody>
</table>
# 2. Current waste management in Serbia

<table>
<thead>
<tr>
<th>Republic of Serbia</th>
<th>Summer analysis</th>
<th>Winter analysis</th>
<th>Spring analysis</th>
<th>Average</th>
<th>Generated waste (kg/inhabitant/day)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>2.226.427 t/year</td>
<td>1.857.598 t/year</td>
<td>2.086.212 t/year</td>
<td>2.056.746 t/year</td>
<td><strong>0.76 kg</strong></td>
</tr>
</tbody>
</table>

**Generated waste (kg/inhabitant/day)**

![Bar chart showing generated waste in various cities.](chart.png)
2. Current waste management in Serbia

A dialogue between countries on the path towards sustainable waste practices Rimini Fiera, 11/4/2010
3. Main EU demands
3. Main EU demands
4. Solution

• 4. solution?
4. Solution

- 12 regional landfill with separation facility or MBT
- Improve system for medical waste collection and sterilization (autoclave)
- **Make system for special streams, Animal, waste oils ...**
- Between 2015 and 2019
- Build more 12 regional landfill
- Increase recycling to 25%
- Cover 100 %
- ---
4. Solution

- Kikinda 2.0%
- Lapovo 1.6%
- Leskovac 2.4%
- Vranje 2.1%
- Pančevo 2.3%
- Užice 3.9%
- Pirot 0.9%
- S. Mitrovica 3.6%
- Inđija 3.1%
- Zaječar 1.3%
- Subotica 3.3%
- Kragujevac 3.7%
- Zrenjanin 2.6%
- Kruševac 2.3%
- Smederevo 2.7%
- Ostalo 10.2%
- Beograd 33.5%
- Novi Sad 8.1%

- Region % kg of waste

- Beograd 33.5% / 55.4%
- Novi Sad 8.1% / 63.5%
- Kikinda 2.7%
- Lapovo 2.4%
- Leskovac 3.1%
- Vranje 3.1%
- Pančevo 1.9%
- Užice 5.1%
- Pirot 1.3%
- S. Mitrovica 5.3%
- Inđija 2.8%
- Zaječar 1.3%
- Subotica 3.3%
- Kragujevac 4.3%
- Zrenjanin 2.6%
- Kruševac 3.5%
- Smederevo 3.4%
- Ostalo 11.3%
- Beograd 19.1% / 46.8%
- Novi Sad 6.9% / 53.7%

- Region % citizens

- 4.4.11.2010
- A dialogue between countries on the path towards sustainable waste practices
- Rimini Fiera, 11/4/2010
4. Solution

A dialogue between countries on the path towards sustainable waste practices

Rimini Fiera, 11/4/2010

Landfilling of biodegradable municipal waste in 2006, in % of 1995 levels

- Target 2006
- Target 2009
- Target 2016

* country with derogation periods of up to 4 years to achieve the target
4. Solution

A dialogue between countries on the path towards sustainable waste practices
Rimini Fiera, 11/4/2010
4. Solution

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Rimini Fiera, 11/4/2010
4. Waste to Energy as one solution

Processing costs (per 1000 kg, taxes not included)
Erik de Baedts NVRD, ISWA...

- Landfilling € 20
- Composting € 20
- Digestate € 30
- Incineration € 60-130 → down to....
- Recycling € 80 → market value secondary product
Conclusion

• Some special streams good
• Landfill network ?!!
• Strong EU support for developing country not only money regulation and clear and open policy
• Belgrade !