Policy, concept and strategy on biowaste management – Bulgarian approach

European Experience
Transfer into Eastern Europe Conditions

- Poznan, 08 October 2013
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The project

- The logic of the project STAGES representing key elements of the envisaged Bulgarian Biowaste Strategy and its implementation
  - Legislation
  - Accompanying technical standards and guidelines
  - Adapting policy instruments and reporting schemes
  - Training & support
Biowaste Strategy

● **The Model**
  ● Scenarios and options how establish a mandatory scheme for separate collection:
    ● full obligation vs. (regional targets)
    ● Household +/- commercial sources; municipal green waste; Industrial waste; Quality certified sewage sludge
  ● Door to door collection and bring systems (*recycling centres*)
  ● Capacity planning and building
  ● Decentralized biowaste treatment infrastructure
  ● Responsibilities of local and regional authorities
  ● Biowaste Ordinance: QAS & NQAS
  ● Awareness raising + Public Relation
Implementing Directive 99/31 and art. 11 + 22 of WFD

- Bans on biodegradables to landfills (e.g. BR, US)
  - Most stringent provisions
  - May lack flexibility
  - Requires codified thresholds for acceptance at landfills

- Obligation on separate collection
  - On Municipalities (e.g. NL) – may be deceived with poor performing / low participation systems
  - On households (e.g. AT) – very effective, if stringent control possible
  - May require phased implementation

- Targets for sep. collection / composting / recycling
  - Specific biowaste processing targets (e.g. Sweden)
  - General recycling + composting targets (IT & UK)
  - Result-oriented + flexible
Sep. Collection and recycling targets for biowaste – Italian model for Bulgaria

25% of biowaste by year 2016
50% of biowaste by year 2020
70% of biowaste by year 2025

- Relative to the quantity of municipal biowaste as generated in year 2014 (base-line year)

- Recycling = composting or anaerobic digestion

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Obligations of local authorities

- **The Mayors** of the single municipalities included in a WMR **jointly ensure** the provision conditions for performing recovery operations of separately collected bio-waste.

- Municipalities of a WMA can develop a **joint regional waste management program**.

- **Each Municipality** (i.e. mayor) **shall include in their waste management programme a plan for separate collection** of biowaste including at least:
  1. phased implementation plan for introduction of separate collection of biowaste from households and similar institutions
  2. program for the phased implementation of separate collection of biowaste from other sources than municipal
  3. plan for the location and installation of biowaste treatment plants in the territory of WMR
Biowaste management in waste management regions/associations

Options for single municipalities

- Separate Collection from households and similar sources
- Home composting (i.e. no or only partly separate collection)
- Sep. Collection for large producers only

WMR

- 35,000 inh.
- 7000 inh.
- 5700 inh.
- 3500 inh.
- 500 inh.
- 1700 inh.
- 1000 inh.
- 500 inh.
Biowaste management in waste management regions

Options for single municipalities

Separate Collection from households and similar sources

Home composting (i.e. no or only partly separate collection)

Sep. Collection for shops, restaurants only

WMR

35,000 inh.

7000 inh.

1000i inh.

500 inh.

1700 inh.

500 inh.

5700 inh.

3500 inh.

500 inh.
Biowaste management: targets for single municipalities:

**Options for single municipalities**

- **Sep. Collection** = 7400 ton
- **Home composting** for 2 municipalities
- **Sep. Collection** for large producers in 2 municipalities

**WMR**

- 3000 t/yr biowaste
- 1500 t/yr
- 1200 t/yr
- 100 t/yr
- 500 t/yr

**Biowaste management targets**:

- 1700 inhaled (HC)
- 1500 t/yr
- 3000 t/yr
Stage I – Decentralised composting
Austrian model for Bulgaria (2)

<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>Number</td>
<td>454</td>
<td>292 (64%)</td>
<td>89 (20%)</td>
<td>73 (16%)</td>
</tr>
<tr>
<td>Total treatment yr⁻¹</td>
<td>976,000 t</td>
<td>308,000 t (32%)</td>
<td>237,300 t (24%)</td>
<td>431,000 t (44%)</td>
</tr>
<tr>
<td>Average capacity yr⁻¹</td>
<td>2,800 t</td>
<td>1,100 t</td>
<td>2,700</td>
<td>5,900 t</td>
</tr>
</tbody>
</table>
## Capacity building – a model for decentralised composting

<table>
<thead>
<tr>
<th></th>
<th>Nr. Comp. plants</th>
<th>Biowaste treated</th>
<th>Served population</th>
<th>Produced compost</th>
<th>Agricultural land needed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Decentralise plants</td>
<td>321</td>
<td>385,000 t</td>
<td>2,750,000</td>
<td>154,000 t</td>
<td>10,000 ha</td>
</tr>
<tr>
<td>All plants incl. OPE projects</td>
<td>374</td>
<td>1,031,140 t</td>
<td>7,365,286</td>
<td>412,500 t</td>
<td>27,000</td>
</tr>
<tr>
<td>% decentralise plants (incl. OPE projects)</td>
<td>86%</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

37% of total potential treated in agriculture comp. plants
Draft Ordinance

**BASIC CONCEPT**

- Specified Clean Organic Waste
- Precautionary Quality Criteria
- Fit for Purpose Parameter N, P, K, pH, org. Matter
- Process Requirements / Record Keeping & Documentation

**External Approval Compliance Testing**

**WASTE**

**PRODUCT**

**Compost Declaration & Labelling**

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Draft Ordinance – Quality Concept I

- Compost may be produced from source separated Biowaste (<10% impurities) and/or quality certified Sewage Sludge and may include Additives and shall meet strict limits for heavy metals and impurities.

- Organic Soil Amendment may be produced from source separated Biowaste (<10% impurities) and/or quality certified Sewage Sludge and may include Additives and shall meet less strict limits for heavy metals and impurities.

- Stabilised MBT Output may be produced from Mixed Municipal Waste Fractions, Biowaste (>10% impurities) Sewage Sludge (Decree No. 339).

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**Precautionary Quality Criteria – Heavy Metals**

<table>
<thead>
<tr>
<th></th>
<th>Multi-Functional Agricultural Use – Food Production --- PRODUCT</th>
<th>Restricted Use WASTE</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Proposal End of Waste</strong></td>
<td><strong>Compost</strong> “Digestate” <strong>7 YEARS Transition</strong></td>
<td><strong>Organic Soil Conditioner &amp; Stabilised MBT Output</strong></td>
</tr>
<tr>
<td><strong>Cadmium (Cd)</strong></td>
<td>1.5</td>
<td>1.3</td>
</tr>
<tr>
<td><strong>Chromium (Cr)</strong></td>
<td>100</td>
<td>60</td>
</tr>
<tr>
<td><strong>Copper (Cu)</strong></td>
<td>100/200</td>
<td>100/200 *</td>
</tr>
<tr>
<td><strong>Mercury (Hg)</strong></td>
<td>1</td>
<td>0.45</td>
</tr>
<tr>
<td><strong>Nickel (Ni)</strong></td>
<td>50</td>
<td>40</td>
</tr>
<tr>
<td><strong>Lead (Pb)</strong></td>
<td>120</td>
<td>130</td>
</tr>
<tr>
<td><strong>Zinc (Zn)</strong></td>
<td>400/600</td>
<td>400/600 *</td>
</tr>
</tbody>
</table>

*COPPER and ZINC are classified as essential nutrients. Values above the first values shall be declared.*
Quality Criteria for **COMPOST**

- **Additional requirements for composts related to the specified use areas**
  - ANNEX 2 ‘Quality Criteria’: **USE related QUALITY REQUIREMENTS**
    - Organic Matter ... > 15%
    - Electrical Conductivity → **growing media, private gardening** ... < 3 mS/cm
    - Max. particle size ... < 40 mm
    - Impurities – plastics, metals, glass
      → **agriculture, private gardening, sports fields** ... < 0.5% (transitional: 1.0%)
      → **land reclamation** ... < 1.0%
    - Plant response / Germination Test
      → **growing media, private gardening** ... 80 – 90% of standard substrate
    - Viable seeds / weeds → **growing media, private gardening** ... < 2 per Litre
    - Pathogenic indicators → **ALL products** ... no Salmonella in 25 g
      → + ABP + ... E. coli < 1000 CFU/ g

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Time – Temperature Regime … flexible … well experienced and investigated!

<table>
<thead>
<tr>
<th>Composting system</th>
<th>°C</th>
<th>Time</th>
<th>Further conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td>OPEN windrows</td>
<td>&gt; 55 °C</td>
<td>10 days</td>
<td>• At least 3 to 5 times of physical agitation (turning)</td>
</tr>
<tr>
<td></td>
<td>65 °C</td>
<td>3 days</td>
<td></td>
</tr>
<tr>
<td>CLOSED Systems</td>
<td>60 °C</td>
<td>3 days</td>
<td>• &gt; 40 to 55% moisture</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Min 6 – 8 weeks composting</td>
</tr>
<tr>
<td>ANAEROBIC Digestion</td>
<td>&gt; 55 °C</td>
<td>24 h</td>
<td>• Followed by composting</td>
</tr>
<tr>
<td>thermophile</td>
<td></td>
<td>20 days</td>
<td>• see above</td>
</tr>
<tr>
<td>ANAEROBIC Digestion</td>
<td>&lt; 40 °</td>
<td>28 days</td>
<td>• Followed by composting</td>
</tr>
<tr>
<td>mesophile</td>
<td></td>
<td></td>
<td>• see above</td>
</tr>
</tbody>
</table>
Quality Assurance
Elements for National Implementation

Legislation & Standards

- Ordinance on Separate Collection
  Input material
- Compost Ordinance
  Quality & control criteria
- Permits
  Waste / ABPR / Environment …
- State of the Art of Composting
  Techn. & Operation

Quality Assurance

National Standard
QUALITY ASSURANCE System for Compost (QAS)
= Criteria & Operation

National Quality Assurance Organisation
for Compost (NQAO)
= Bodies & Administration

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QM: the principle of a traceably documented process

Storage
Mixing
Conditioning

Received Control

Registered Composting Plant

INPUT

Residues

Batch composition...

batch monitoring...

°C, turning, watering...

Compost = Product

C1

C2

C3
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