Valorisation of Sewage Sludge

Biomass for Energy: ARBOR lessons learned

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Partners

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Special legal status administration union of the Saarland’s 52 municipalities, responsible for waste processing and wastewater treatment

Ministry for the Economy, Employment, Energy and Traffic of the German federal state Saarland
Saarland

~ 1 million inhabitants
Area of 2,570 km²
140 wastewater treatment plants:
- 44 central plants
- 96 unmanned satellite plants

Points of dewatering – origins of sludge utilisation
**Status Quo**

Ways of sewage sludge utilisation in the Saarland in 2014

**Total amount: 19,414 t DS**

- Agriculture dewatered: 4,452 t DS (22.9%)
- Thermal utilisation: 7,556 t DS (38.9%)
- Landscaping/reclamation: 3,792 t DS (19.5%)
- Agriculture wet: 3,614 t DS (18.6%)

**2005 – 2014**

Total amount of sewage sludge nearly constant

**Transport: ~ 14 billion km per year**

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**New solutions are needed**

- In Germany, there is a political commitment to abandon the direct use of sewage sludge in agriculture.
  - fertilizing ordinance
  - sewage sludge ordinance
- Combustion combined with phosphorus recovery
- Regional solutions preferred
  - minimising transport effort
Scenarios

<table>
<thead>
<tr>
<th>Status quo</th>
<th>Central mono incineration -Saarland-</th>
<th>Central mono incineration -Export-</th>
<th>Thermal conversion -decentral-</th>
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<tbody>
<tr>
<td>Present utilisation</td>
<td>Mono-landfill of incineration residues</td>
<td>Phosphorus recovery</td>
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- Status quo:
  - Central mono incineration -Saarland-
  - Central mono incineration -Export-
  - Thermal conversion -decentral-
  - Mono-landfill of incineration residues

### Scenarios

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<tr>
<th>Scenario</th>
<th>Agriculture</th>
<th>Co-incineration</th>
<th>Mono-incineration</th>
<th>Thermal conversion</th>
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- Scenario 1:
  - Wet and dewatered
  - Saarland
  - Mineralisation in Homburg
  - Export
  - Number of decentral plants

- Scenario 2:
  - Wet and dewatered
  - Saarland
  - Mineralisation in Homburg
  - Export
  - Number of decentral plants

- Scenario 3:
  - Wet and dewatered
  - Saarland
  - Mineralisation in Homburg
  - Export
  - Number of decentral plants
Decentral sewage sludge mineralisation
Pilot at the wastewater treatment plant Homburg

Goal: agricultural utilisation
Core tasks: compliance with fertilizer and sewage sludge regulations (DüMV/AbfKlärV)
- elimination of polymers
- elimination of heavy metals

Decentral sewage sludge mineralisation
Process scheme
Economy

![Graph showing economic scenarios]

- Status Quo 2010
- Scenario 1
- Scenario 2
- Scenario 3

- Agriculture
- Agriculture dewatered
- Incineration/Landscape
- Transport
- Export
- Mono-Incineration
- Thermal conversion