Revision of Directive 86/278/EEC
Cost Benefit analysis

Sewage sludge Conference, Brussels

October 31st, 2001
Two main objectives

- Assess the economic impact of the main disposal and recycling routes for sewage sludge
- Perform an economic cost-benefit analysis of the revision of directive 86/278/EEC
Results: Sludge routes
## Costs definition

<table>
<thead>
<tr>
<th>Costs</th>
<th>Internal</th>
<th>External</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>- Investment costs</td>
<td>- Impacts on climate change, on ecosystems, on human health</td>
<td>Global = internal + external</td>
</tr>
<tr>
<td></td>
<td>- Operational costs (labor, energy,...)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Benefits</td>
<td>- Savings of fertilizer</td>
<td>- Impacts avoided thanks to:</td>
<td></td>
</tr>
<tr>
<td></td>
<td>- Energy recovery</td>
<td>- fertilizer substitution</td>
<td></td>
</tr>
<tr>
<td>Net</td>
<td></td>
<td>- energy recovery</td>
<td></td>
</tr>
</tbody>
</table>
Global costs of routes (average EU 15)

- Global costs of routes range from (Euro / tDM)
  - Mini : 110 €/ tDM for landspreading of semi-solid sewage sludge
  - Max : 350 €/ tDM for mono-incineration
### Three groups of routes (average EU 15)

<table>
<thead>
<tr>
<th>Global cost (Euro / tDM)</th>
<th>Routes</th>
</tr>
</thead>
<tbody>
<tr>
<td>- 110-160</td>
<td>- landspreading of semisolid or solid sludge in agriculture</td>
</tr>
<tr>
<td>- 210-240</td>
<td>- silviculture,</td>
</tr>
<tr>
<td></td>
<td>- landspreading of composted sludge</td>
</tr>
<tr>
<td></td>
<td>- land reclamation,</td>
</tr>
<tr>
<td>- 260-350</td>
<td>- Landfilling</td>
</tr>
<tr>
<td></td>
<td>- Co-incineration</td>
</tr>
<tr>
<td></td>
<td>- Mono- Incineration</td>
</tr>
</tbody>
</table>
Importance of internal vs. external costs

• Global costs are composed mainly of **internal** costs and benefits (more than 85%)

• Example: landspreading of composted sludge
  – net internal cost: 235 Euro / tDM
  – net external cost: 6 Euro / tDM
Importance of agricultural value

- **Internal net costs** are composed mainly of internal costs (more than 66%)

- However benefits from compounds of agricultural value can make the difference for some routes
  - While internal costs of landspreading and land reclamation of composted sludge are similar to incineration, savings of nutrients and organic amendments (internal benefit) make recycling routes less expensive.
Results:

Scenarios
### Scenarios definition

- **Scenarios** = projections in 2015 and after

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Business as usuall</td>
<td>- Existing national legislation and practices</td>
</tr>
<tr>
<td>- PPP</td>
<td>- Implementation of a revised directive (3rd draft) with an efficient pollution prevention policy (PPP)</td>
</tr>
<tr>
<td>- No PPP</td>
<td>- Implementation of a revised directive (3rd draft) without PPP</td>
</tr>
<tr>
<td>- Worst case</td>
<td>- No landspreading possible</td>
</tr>
</tbody>
</table>
Global costs of scenarios (15 Member States)

- Similar costs between “PPP” and “No PPP” scenarios
- Medium estimate of those scenarios: 400 millions Euro/ year for the 15 Member States
- Worst case scenario presents the highest cost: around 1,2 billion Euro/ year for the 15 Member States
Which stakeholders pay?

![Cost per stakeholder diagram](chart)

- **Scenario 1 (PPP)**
  - Citizens: 14%
  - Farmers: 86%

- **Scenario 2 (no PPP)**
  - Water and sludge management operators: 8%
  - Local authorities: 55%
  - Industries: 20%
Which Member States pay?

- The scenario has no significant impact on the repartition of costs among Member States.
- 4 Member States (UK, Germany, France, Spain) support more than 80% of the cost.
- 3 key factors explaining differences among MS:
  - big producers bear higher costs
  - big recyclers bear higher costs
  - larger gap between actual legislation and scenario generates higher costs.
4 Member States support more than 80% of the cost
Split between the type of costs is different
Sludge costs are low compared to overall water management costs

- Sludge management costs represent 3 to 5% of total water management internal costs
- Still it should be minimized in the context of increasing water bills
Industrial sludge

• Similar quantities
• Higher quality than urban sludge
• Lower scenario costs: from 0 (short term) to 210 (long term) million Euro/year
• Higher uncertainties
Accession countries

- Sludge production is expected to be 10 times less than MS
- Sludge quality similar to MS
- Lower scenario costs in absolute value, although the gap between current and future situation is larger than for MS
- Impact of proposed limits on HM ranges from 13 to 26 million Euro/ year
- Higher uncertainties
Uncertainties

- Percentage of sludge not meeting requirements
- Pollution prevention costs
- Sludge production and forecast
- Units costs of routes and switching of routes
- Nutrients concentration in sludge
- External cost coefficients
Follow up

- From average composition to percentile repartition
- From categories of routes to detailed sludge routes
- Defining the content of an efficient PPP and evaluating costs
- Quantifying unknown external costs: human health, ecosystem degradation...