Turning old into new – the environmental benefit of preventing waste at a municipal recycling park

Maria Ljunggren Söderman and David Palm

17th SETAC Europe LCA Case Studies Symposium, 2011
OVER-ALL CONCLUSIONS

• Re-usable and re-salable goods are unnecessarily discarded as waste

• Clear potential of environmental benefits when moving up the waste hierarchy: from energy recovery to material recovery to re-use

• Promoting re-use through a recycling park is a good example of a municipality-driven waste prevention initiative
Products donated for second-hand sales in 2010

Total: 28 000 visitors
~500 tonnes

- Construction mtrls (wooden): 22%
- Construction mtrls (other): 3%
- Large electric appliances: 23%
- Small electric appliances: 6%
- Furniture: 14%
- Textile: 9%
- Metal products: 16%
- Plastic products: 8%
- Sanitary wares: 10%
- Books: 3%

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## Recycling park vs. drop-off center

<table>
<thead>
<tr>
<th></th>
<th>Recycling park</th>
<th>Drop-off center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total [tonnes/year]</td>
<td>494</td>
<td>494</td>
</tr>
<tr>
<td>Re-use</td>
<td>72 %</td>
<td>11 %</td>
</tr>
<tr>
<td>Material recovery</td>
<td>17 %</td>
<td>27 %</td>
</tr>
<tr>
<td>Energy recovery</td>
<td>10 %</td>
<td>48 %</td>
</tr>
<tr>
<td>Landfill construction</td>
<td>1 %</td>
<td>14 %</td>
</tr>
</tbody>
</table>
Recycling park compared to drop-off center

Change in greenhouse gas emissions [tonnes CO₂-eq]
Share of product categories in climate effect reduction [%]

- Construction mtrls (wooden): 10%
- Construction mtrls (other): 3%
- Large electric appliances: 2%
- Small electric appliances: 0%
- Furniture: 3%
- Textile: 39%
- Metal products: 8%
- Plastic products: 5%
- Sanitary wares: 1%
- Books: ~0%
SENSITIVITY ANALYSES

Net climate effect benefit [tonnes CO₂-eq]

-1500 -1400 -1300 -1200 -1100 -1000 -900 -800 -700 -600 -500 -400 -300 -200 0

Base case Coal power District heat (coal-powered) District heat (natural gas) District heat (heat pump) Lower energy efficiency of white goods Lifetime support of waste appliances Import of waste recovery
Clear environmental benefit of re-use:
climate effect, primary energy use, eutrophication, acidification, (toxic substances)

Climate effect benefit ranges from large to very small:
from textile, electric appliances and metal products to books

Estimated potential on a national level:
Re-use: 80,000 tonnes of products
Reduction potential: 300 ktonnes CO₂-equivalents
• Re-usable and re-salable goods are unnecessarily discarded as waste

• Clear potential of environmental benefit when moving up the waste hierarchy: from energy recovery to material recovery to re-use

• Promoting re-use through a recycling park is a good example of a municipality-driven waste prevention initiative
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Report available in Swedish:

Financial support:
Swedish Waste Management
The City of Gothenburg
The Foundation for the Swedish Environmental Research Institute
Net climate effect benefit per product category

Net climate effect benefit of a recycling park compared to a drop-off central [kg CO2e/kg product]