ASPHALT RECYCLING IN THE NETHERLANDS

The road to success

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the Netherlands
Favourable circumstances

- technique
- economy
- policy
Circumstances in the Netherlands

Technique

- available technique
- support by the client
- Dutch standard specifications
Environmental Circumstances

- global environmental awareness
- scarcity of quarry material
- alternative construction materials
Economic Circumstances

- oil crisis
- high bitumen prices
- return on investment
Summarising

- accepted technology
- co-operation client - industry
- environmental policy
- scarcity of natural aggregates
- waste reduction
- oil crises
Today's incentives

- dumping not allowed
- max 50% reclaimed asphalt in specs
- min % in tender specs
- mixing plants equipped
ENVIRON-MENTALITY
Facts and figures

- production 7 - 8 million tns/yr
- 50 asphalt mixing plants equipped for recycling
- reclaimed asphalt 3.5 million tns/yr
<table>
<thead>
<tr>
<th>Year</th>
<th>RA</th>
<th>prod [ million tonnes]</th>
<th>%RA</th>
</tr>
</thead>
<tbody>
<tr>
<td>1987</td>
<td>0.3</td>
<td>7.4</td>
<td>4</td>
</tr>
<tr>
<td>1990</td>
<td>0.5</td>
<td>7.5</td>
<td>7</td>
</tr>
<tr>
<td>1993</td>
<td>1.0</td>
<td>6.5</td>
<td>15</td>
</tr>
<tr>
<td>1997</td>
<td>1.8</td>
<td>8.1</td>
<td>22</td>
</tr>
<tr>
<td>1999</td>
<td>2.2</td>
<td>8.4</td>
<td>26</td>
</tr>
<tr>
<td>2000</td>
<td>2.0</td>
<td>7.6</td>
<td>26</td>
</tr>
</tbody>
</table>
Product Life Cycle: Different phase of development

- No interest
- Growth: 1987
- Development: 1990-1997
- Maturity: 1999-2000
- Decrease

Amount:
- No interest: 4
- Growth: 7
- Development: 22
- Maturity: 26

Time:
- 1987: Growth
- 1990-1997: Development
- 1999-2000: Maturity
- Decrease
<table>
<thead>
<tr>
<th>Category</th>
<th>Target</th>
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</thead>
<tbody>
<tr>
<td>Total reclaimed asphalt</td>
<td>3.5</td>
</tr>
<tr>
<td>Tar containing</td>
<td>0.5</td>
</tr>
<tr>
<td>Hot mix recycling</td>
<td>2.0</td>
</tr>
<tr>
<td>Target</td>
<td>1.0</td>
</tr>
</tbody>
</table>
Availability

- right place
- right time
- right quantity
- right quality
Requirements for RA

- reclaimed bitumen quality
- aggregate size
- aggregate shape
- no pollution
- no tar
- homogeneity
Requirements for hot mix with reclaimed asphalt = hot mix with 100% new materials
Possible solution

Recipe approach

Performance based requirements
Quality!

Pavement demolition

= 

Preparing valuable material
Conclusions

Success-factors

- acceptance of technique
- environ-mentality
- co-operation
- return on investment
- market
Asfalt 100% hergebruik recycling