A Comparative Analysis of Biowaste Management in Five European Clusters

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A COMPARATIVE ANALYSIS OF BIOWASTE MANAGEMENT IN FIVE EUROPEAN CLUSTERS

In the broad context of bio-economy, innovative concepts for the integrated management of biowaste are being developed. An example is the urban biorefinery system developed within the RES URBIS concept, where bio-plastic is produced using urban biowaste. To address the technical feasibility of the proposed concept and to provide a basis for improved design of RES URBIS biorefinery solutions in different local contexts, the current management of the organic fraction of municipal solid waste (OFMSW), garden waste and sewage sludge is mapped for five European clusters. The comparative analysis is based on mass and energy balances according to specific waste compositions, treatment technologies and socio-demographic profiles of the selected systems. In addition, socio-demographic data are included in the assessment to disclose the link between economy, society and waste management. This allows identifying key factors potentially influencing the performance of biowaste management systems. The five clusters are the Metropolitan Area of Barcelona (Spain), the Metropolitan Area of Lisbon (Portugal), South Wales (Wales), Province of Trento (Italy), and the Metropolitan Area of Copenhagen (Denmark). The clusters are selected to cover different geographical, climatic, economic and social characteristics, as well as different approaches towards the management of biowaste. This is briefly exemplified in the following table. An example of results is provided in Figure 1 for the Municipality of Copenhagen (Denmark).

<table>
<thead>
<tr>
<th>Cluster</th>
<th>Population density</th>
<th>Tourism</th>
<th>Climate</th>
<th>Terrain</th>
<th>GDP (k$)</th>
<th>Biowaste collection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Barcelona</td>
<td>High</td>
<td>High</td>
<td>Mediterranean</td>
<td>Coastal</td>
<td>&gt;35</td>
<td>Separate</td>
</tr>
<tr>
<td>Lisbon</td>
<td>High</td>
<td>High</td>
<td>Mediterranean</td>
<td>Coastal</td>
<td>&gt;17</td>
<td>Mixed</td>
</tr>
<tr>
<td>South Wales</td>
<td>Medium</td>
<td>Low</td>
<td>Oceanic</td>
<td>Mixed</td>
<td>&gt;20</td>
<td>Separate</td>
</tr>
<tr>
<td>Trento</td>
<td>Low</td>
<td>High</td>
<td>Continental/Alpine</td>
<td>Mountain</td>
<td>&gt;35</td>
<td>Separate</td>
</tr>
<tr>
<td>Copenhagen</td>
<td>Medium</td>
<td>Medium</td>
<td>Oceanic</td>
<td>Coastal</td>
<td>&gt;45</td>
<td>Mixed</td>
</tr>
</tbody>
</table>

Figure 1 – Management of urban biowaste in the Municipality of Copenhagen (Denmark).