Decision Support Toolkit for WEF Innovations

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Elements of the Toolkit

• Catalogue of Sustainability Indicators for Nexus innovation
• Games for Awareness raising of Nexus Innovations & Sustainability
• Combined ABM and MOO for AD planning (DST)
User Research for DST Requirements

User Research
Interviews/Workshops with Stakeholders

Analysis
Coding themes from interviews

Modelling
Personas & Scenarios

Requirements
Specification of User’s needs

1. The user shall be able to create a username and password to log into STEPPING UP DST
2. The user shall be able to customise their profile page
3. The user shall be able to select the feedstock type etc
<table>
<thead>
<tr>
<th>Potential SI: (Cost/Feedstock/Knowledge)</th>
</tr>
</thead>
</table>

### Barriers to AD innovation:
- High Cost
- Regulations
- Lack of/ Quality of Feedstock Supply
- Dependency on Incentives
- Uncertainty
- Complexity (technical and knowledge)

### Drivers of AD innovation:
- Financial incentives
- Revenue from electricity / Biogas
- Accessible Feedstock Supply
- Heat use
- Waste Policy Regulations (Scotland & Wales)
- Transport (RTFO)
- Public perception
Barriers & Drivers of AD
Main components of the DST:

- A system model of AD innovation
  - ABM
- A set of criteria to assess its viability in terms of sustainability and nexus assessment
- Multi objective optimization and a structured way to interact with the system model
  - MCA (TOPSIS)
<table>
<thead>
<tr>
<th>Criteria</th>
<th>Parameter/Variable</th>
<th>ABM Input Variables</th>
<th>ABM Output Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Environmental</strong></td>
<td>Minimize (fresh) water consumed</td>
<td>AD Type, Technology, Business Model</td>
<td>Type and net amount of water used by AD plants (lt)</td>
</tr>
<tr>
<td></td>
<td>Maximise digestate</td>
<td>AD Type, Technology, Business Model</td>
<td>Produced digestate (lt)</td>
</tr>
<tr>
<td></td>
<td>Minimise food waste to landfill</td>
<td>Recycle rate (kg/kg)</td>
<td>Food waste to landfill (ton)</td>
</tr>
<tr>
<td><strong>Social</strong></td>
<td>Maximize Acceptability of AD plant</td>
<td>Acceptability parameter, increased diffusion</td>
<td>Negatively affected people (number)</td>
</tr>
<tr>
<td><strong>Economic</strong></td>
<td>Minimize capital costs</td>
<td>AD Type, Technology, Business Model</td>
<td>Investment and operation cost (million £)</td>
</tr>
<tr>
<td></td>
<td>Maximize net biogas produced</td>
<td>AD Type, Technology, Business Model</td>
<td>Net generated biogas (kWhr)</td>
</tr>
<tr>
<td></td>
<td>Minimise operating costs</td>
<td>Recycle rate (kg/kg)</td>
<td>Food waste to landfill (ton)</td>
</tr>
<tr>
<td></td>
<td>Minimise transport costs</td>
<td>CO2 emmision rate of transport vehicles (m3/km)</td>
<td>CO2 produced by trucks (m3)</td>
</tr>
</tbody>
</table>
Thank you

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