New circular business models for urban solid biowaste valorisation

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General context

Collection and treatment of urban solid biowaste is challenging: volumes and heterogeneity of biowaste, the organisation of logistics for the waste collection, separation from other waste.

In Europe, about 86 million tonnes of biowaste produced in 2017 (60% food waste and 40% garden waste), but only 43% collected separately (Brusselaers & Van Der Linden, 2020).

In France, most of the biowaste consists of garden waste, collected in waste disposal centres.

For households’ food waste, currently, only 175 municipalities representing only 6% of the French population offer separate collection schemes (ADEME, 2022).
Legal context for bio-waste treatment in France

<table>
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<tr>
<th>Deadline</th>
<th>Biowaste</th>
<th>Edible oil waste</th>
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</thead>
<tbody>
<tr>
<td>1(^{st}) January 2016</td>
<td>10 tonnes/year</td>
<td>60 liters/year</td>
</tr>
<tr>
<td>1(^{st}) January 2023</td>
<td>5 tonnes/year</td>
<td>60 liters/year</td>
</tr>
<tr>
<td>1(^{st}) January 2024</td>
<td>Obligation for all (incl. households)</td>
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</table>

ENVIRONMENTAL CODE

- Article R543-225 (2011)
- Arrêté du 12 juillet 2011
- Article L541-21-1 (2020)

On-site valorisation

OR

Separate collection
As urban biowaste treatment and valorisation remains a major challenge, several private start-up businesses have emerged in this domain.

Objective: to identify the different types of these new business models and their value propositions, and to understand the enablers and barriers of their development.
Methodology

- Case studies on 18 start-up businesses dealing with urban biowaste, and located in different cities across France.

- Semi-structured interviews conducted mainly with the enterprise managers in June and July 2022.

- Analysis according to their business model types, value propositions, enablers and barriers.
Results 1 - four different business model types

1. Most common type: main activity is the collection and valorisation of biowaste via composting;

2. A second type: biowaste valorisation as central value proposition (vermicomposting or biogas production by anaerobic digestion);

3. A third type: focus on the support of composting activities for example with trainings or awareness creation campaigns;

4. A fourth type: sales of technical solutions (software tools, composters, micro-biogas plants) for the management of biowaste.
Results 2 - value propositions

➢ Most of the companies are dealing with biowaste of professionals, as at present, the management of household waste is still a competence of local authorities.

➢ Local, small-scale and customer-oriented value propositions are important, such as:
  • waste collection within a limited geographical area, often by bikes or e-vehicles,
  • collection schemes corresponding to the individual customers’ needs,
  • transformation close to the city centres.
### Results 3 - enablers and barriers

<table>
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<tr>
<th>Enablers</th>
<th>Barriers</th>
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<tr>
<td>Need for soil amendment and energy production</td>
<td>Difficult to convince customers to pay for collection</td>
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<tr>
<td>Awareness of environmental issues leading to increased demand</td>
<td>Compost that is not financially valuable</td>
</tr>
<tr>
<td>Quality of the product or service</td>
<td>Investment costs, difficulties to find fundings</td>
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<tr>
<td>Legal obligation for biowaste treatment</td>
<td>Competition from major market players</td>
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</table>
Conclusion

➢ Most of the recently developed small-scale business models dealing with urban biowaste in France still have difficulties to enter the market or are not yet financially viable.

➢ In the future, the regulation for biowaste separation and collection of individual households will most probably create more demand but also more competition.

➢ Developing partnerships might be a solution for jointly responding to future calls for tenders from communities.
Thank you very much for your attention!

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