Evaluating Transferability of the Digital Marketplace: the Estonian Perspective

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Introduction

The future circular bioeconomy is based on the efficient use of raw materials that also supports the use of local resources. Working closely with farmers, other industries, municipalities, and regions, TREASoURcE project aims to create circular bioeconomy markets and business models, to support the formation of biobased value chains and explore the possibilities of using urban and rural waste and side streams[1].

Today, the effective use of side streams from agriculture has been slowed down by challenges related to profitability and logistics. On an individual farm, the quantities of side streams can be small and/or seasonal and suitable buyers cannot be found. To address these challenges and connect supply with demand, the *KiertoaSuomesta.fi* (*CircularFinland* in English) digital marketplace was created, providing a meeting point for sellers and buyers of these materials to promote their more efficient and sustainable use. The main target groups for the marketplace are companies in agriculture, forestry, and the food industry producing biobased side and waste streams, as well as industry and the public sector that use these raw materials. The uniqueness of this platform lies in its ability to connect all stakeholders of the value chain (Figure 1). The *KiertoaSuomesta.fi* platform has been developed to be the central platform

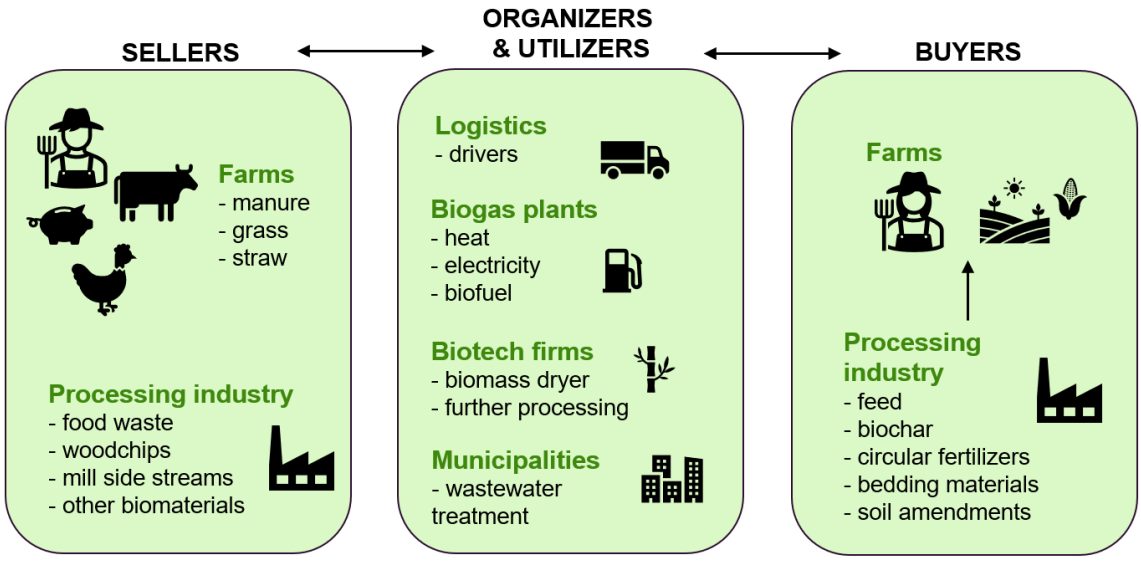

Figure 1. The stakeholders connected through KiertoaSuomesta.fi platform.

[1] More solutions in the biobased side and waste stream domain are presented here: https://treasource.eu/systemic-ce-solutions/bio-based-side-and-waste-streams/ 28.5.2025

for the biobased side streams, bringing together geographically dispersed producers and potential buyers in Finland[2].

In TREASoURcE project we also aim to understand if and how the solutions we create can be replicated in and transferred to other countries. In this project brief we present our conclusions on potential transferability of *KiertoaSuomesta.fi* platform to Estonian conditions.

Methodology

In this qualitative study we focused on Estonian stakeholders and conducted a series of semi-structured individual and focus group interviews. In total 5 interviews with 12 participants (3 individual interviews and 2 focus group interviews) were conducted from autumn 2024 to winter 2025. Interviews lasted between 60-90 minutes and were recorded and transcribed.

The following stakeholder categories were approached during the study:

- Owner/developer of the service
- Professional associations/unions
- Public sector
- Agricultural enterprises
- Waste valorisation companies
- An agricultural residue broker

The study is based on **a value proposition analysis** and structured in two stages. First, the service provider/the owner of the platform presents its service, together with its benefits and the solutions to the problems identified during its development (Figure 2). In the same way, the service provider/the owner of the platform defines its vision, i.e. the potential needs, problems and motivation of the target market (Figure 3). Once these nuances have been identified, the second step is to examine their overlap with consumer or related target market aspects to identify the "jobs-to-be-done". By considering the views of both parties (the service provider and the target market), the analysis can identify both the benefits of the service and the barriers to its implementation in the existing system.

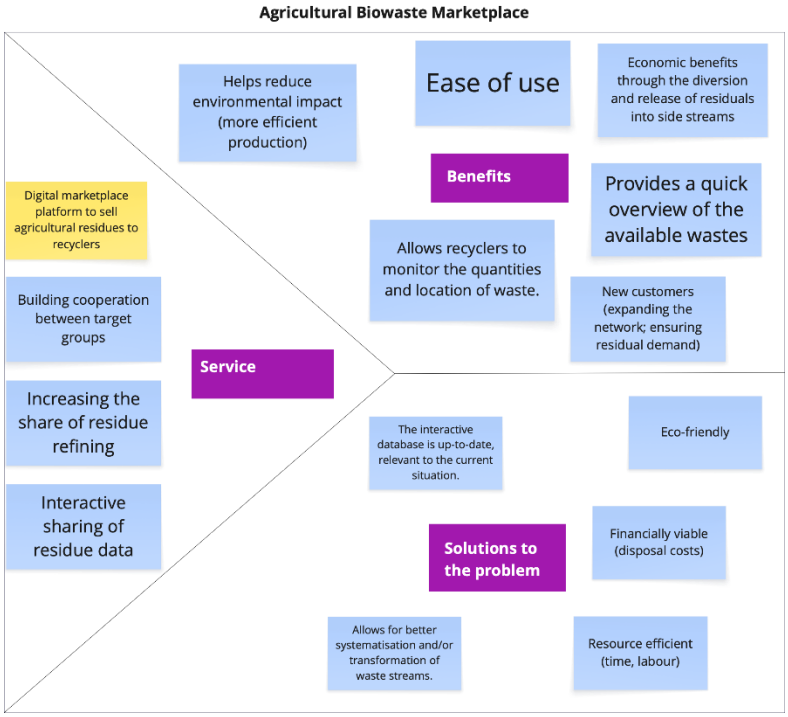

Figure 2. Value proposition. Methodology for the interviews (I).

[2] More information on the Finnish digital marketplace is accessible here: https://www.kiertoasuomesta.fi/en/faq/ 28.5.2025

To assess all possible aspects of the overlap between the digital market for biobased side and waste streams and the needs of the Estonian market, a first interview with the owner of the platform (MTK[3]) was carried out, following the structure of the value proposition analysis (Figure 2 and Figure 3). Subsequently, the stakeholders from the Estonian market were interviewed through 8 different perspectives: 1) waste recovery, 2) regulations and legislation, 3) new business models, 4) expectations of the digital marketplace 5) cross-supply chain collaboration, 6) awareness, 7) stakeholder pressure and readiness, and 8) future vision. To this end, key questions for semi-structured interviews were drafted, considering the need of the target audience to pick up the most and least important topics.

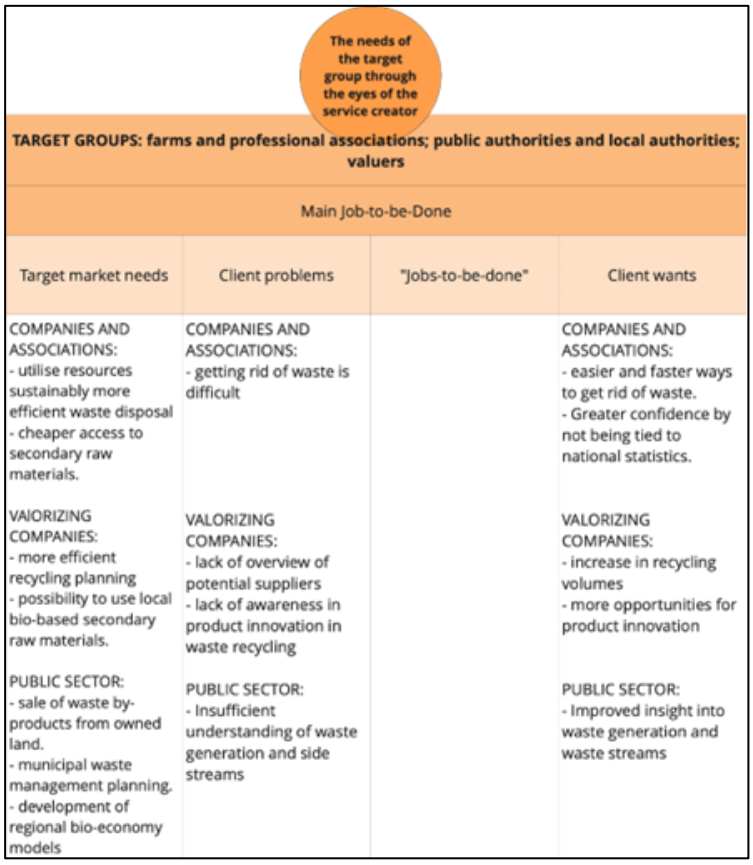

Figure 3. Value proposition. Methodology of the interviews (II)

Conclusions and Recommendations

To replicate the digital marketplace in Estonia, the study identified the "jobs-to-be-done" for the developer of the potential Estonian digital marketplace based on the value proposition framework. In addition, the national (i.e. Estonian) 'jobs-to-be-done'/recommendations that would enable the application of such digital markets in Estonia were identified. Alongside with digital marketplace adaptation suggestions, we reached several conclusions that relate to Estonian bioeconomy in general.

Following recommendations concern the development of the Estonian bioeconomy and are also integral to the adaptation of the digital marketplace to Estonian conditions:

- In Estonia (and most likely in other EU Member States) there is the need **to clarify the terms 'waste', 'residues' and 'by-products',** and to adjust the system of waste codes, particularly regarding sector-specific issues. For instance, digestate from biogas production is classified as a residue from a national perspective, yet as a by-product from the perspective of the biogas producer, who inherently generates it during the production process. However, for the purpose

[3] MTK - the Central Union of Agricultural Producers and Forest Owners. More information available at: https://www.mtk.fi/web/en 28.5.2025

of directing digestate to farmers for utilisation as a soil amendment, it is imperative for them to obtain an environmental permit authorising the use of digestate as a residue. Analogous scenarios with different types of waste exist in other sectors, underscoring the necessity to align definitions with EU climate policy objectives.

- Furthermore, as the study demonstrated, **it is vital to simplify the application process for waste permits in Estonia.** For instance, when a biogas plant needs to promptly utilise waste streams in the production process, such as production waste from the food industry (e.g. yoghurt waste) or low-volume, unstable waste streams (e.g. potatoes) from farmers, an environmental permit has to be applied for. However, the process of obtaining an environmental permit is typically lengthy (spanning approximately one year) and entails substantial financial costs. This impedes the utilisation of these residues since their energy value and quality suitability will be diminished if they are stored.

- **In Estonia, the establishment of industrial symbiosis parks in proximity to biogas facilities throughout the country is recommended.** These parks could incorporate a pyrolysis plant, facilitating the refinement of woody biomass (e.g. stumps). Additionally, enterprises capable of sharing locally generated energy, materials and water should be included.

Furthermore, our study demonstrated two context-dependent conclusions that may apply only to Estonian target market and that require adaptations of the platform to be replicated in Estonia:

- The digital marketplace should be prepared **to establish cross-connectivity with national systems** to ensure that environmental authorisation requirements and sales and purchase rights are met. As environmental permits applied for are registered in a separate database in Estonia, it is envisaged that it would be both possible and necessary to link the same database to the platform. The national data system would facilitate the automatic identification of permits held by both the seller and the buyer, enabling the platform to determine the validity of their placement of waste for sale. In the absence of the relevant permits, the system would automatically block transactions, and, conversely, will allow transactions to proceed if the permits are deemed to be invalid.[4]

- In Estonia, there is the understanding that the large and main waste streams (manure, silo, etc.) are well-established, and regional biogas plants are involved in these streams. This is primarily due to the high investment required to build a biogas plant. Hence, when it comes to digital marketplace replication in Estonia, the focus is directed towards **smaller and less volatile waste flows**. Smaller streams are primarily concerned with regions where there are no biogas plants in geographically defined proximity, or waste types that are less generated and of unstable volumes. Consequently, developers of the digital marketplace may face the challenge of managing a reduced volume of waste flows, which can also result in a more limited user base for the platform. This prompts the question of how to ensure the sustainable development of the platform, particularly from a financial perspective.

[4] In case the potential operator is a private entity, the topic of GDPR and the possibilities of such connection remain to be researched.

Additionally, we present context independent recommendations that could be important to apply irrespective of the target area:

- The digital marketplace could be prepared to function **as an information centre**, providing clear and accessible information on recycling opportunities, legislation, regulations, and support measures to both buyers and sellers (similarly to *KiertoaSuomesta.fi*, which includes a dedicated content hub to share knowledge on circular economy and side streams). Additionally, there is a necessity to identify methods of integrating the platform with R&D institutions to enhance awareness and promote product innovation in the field of waste recycling.

- Furthermore, the digital marketplace could be **expanded to encompass multiple sectors**. For instance, a biogas plant or a farmer is not only dependent on agricultural residues, but also on residues from the food and drink industry. Conversely, agricultural residues are not only used by farms. For instance, the horticultural sector has expressed interest in fertilisers, given the transition in climate policy towards a substantial reduction in peat extraction, which will consequently diminish the availability of peat substrate. Other sectors, such as the chemical industry and those that use agricultural residues, have also expressed interest in fertilisers.

- It is vital **to simplify and facilitate the usage of the digital marketplace**, particularly **for waste sellers**. Practitioners have noted the extensive use of numerous platforms, which necessitates a substantial time investment. Furthermore, the uploading of images and relevant information may not be feasible or a priority for all potential users, highlighting the importance of integrating automated solutions into workflows to reflect relevant information on the platforms as far as possible, particularly for the purchaser.

- Ensuring that the exchanged product **has passed the necessary analyses** is of particular importance, especially in the case of agricultural residues, where there is a higher risk of transfer of biological hazards in the residue use area. For example, it is important to carry out analyses on silage if it is to be used to feed dairy cattle, so as to avoid an increase in the incidence of miscarriages. Additionally, the utilisation of municipal sludge for refining is constrained by its chemical compounds.

- It is crucial to ensure that **comprehensive information is provided on the waste being sold**, as practitioners have noted that a general description can act as a barrier to transactions and potentially result in the purchase of substandard or unusable waste. This necessitates ensuring direct contact between the buyer and the seller of the waste.

- Furthermore, it is essential **to ensure that the market price of the waste is competitive.** The sale of residues is perceived as a means of generating additional income; however, as farmers do not prioritise the sale of residues, they might lack awareness of their actual monetary value. Furthermore, a considerable proportion of waste is seasonal in nature, resulting in significant fluctuations in selling prices from year to year. Consequently, the digital marketplace must ensure a minimum market price that is aligned with the quality and seasonality of the waste being sold. This is necessary to ensure that farmers also derive benefit from the sale of residues, thereby encouraging the increased valorisation of agricultural waste.

In a nutshell, the digital marketplace developer should consider strategies to ensure a substantial user base, as well as identify potential leaders and financiers for platform development. To mitigate risks, it would be worthwhile to focus on specific and unstable agricultural residues, to extend the use of the platform across different industrial sectors and to ensure a competitive price for the waste streams. From the seller's point of view, it is important to ensure the ease of use of the digital marketplace and, from the buyer's point of view, a detailed overview of the residues to be sold. It is also imperative to ensure that the entire process of buying and selling complies with legislation and regulations.

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Notes

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