

1. Background

Most of the materials used for food packaging are still produced from fossil fuels which are not renewable and the plastic produced are most often not biodegradable. Outlander B.V. develops an alternative to such plastic packaging. The development of new innovative biobased materials that are renewable and/or biodegradable is an essential part of tackling the plastic problem and an integral part of the transition to a circular economy.

2. Objective

Outlander B.V. has performed this study to determine the technical and economic feasibility of their production processes.

3. Work plan

The project was executed in two work packages (WP). The technical feasibility was investigated in WP1 and the economic feasibility in WP2.

Specifically, in WP1.1 the technical feasibility of Outlander's biobased production process was investigated. In WP1.2 the feasibility of using innovative drying technologies as a means of feedstock preparation and/or drying were analyzed. In WP1.3 the possible methods of creating Outlander's foils on the larger scale were investigated. In WP1.4 the ecological impact of Outlander's products was determined and compared to the ecological impact of common packaging materials. Finally, in WP2.1 and WP2.2 Outlander studied the economic feasibility, in part by revising the business plan and determining the capital expenses needed for the entire production process.

4. Results and conclusions

Many achievements have been met during this project. Outlander designed a scalable bioprocess facility that has the potential to produce Outlander's precursor product more economically and ecologically friendly than any other process known to date. Outlander also designed a hypothetical scalable foil production facility and evaluated the possibilities of using existing infrastructures. Additionally, the possible use of electromagnetic energy was examined, and the ecological impact factors of UnPlastic were established. With the same amount of packaging, Outlander will realize a factor 2 in CO₂ reductions compared to paper packaging, and almost a factor 3 when compared to common polyethylene!

Economically, Outlander established that there is a large request for a product with the specs of UnPlastic in the packaging market. This is already clear from the 7 letters of intent that were obtained during the scope of this project. This allowed Outlander to formulate an optimistic business model. Additionally, two potential new markets were determined that are very optimistic about the potential use of UnPlastic – a path to be further explored in subsequent studies. The work that Outlander performed, combined with the economic and ecological potential of Outlander's invention, is expected to contribute greatly to the knowledge position of the Netherlands in the fields of sustainability and material sciences.

Due to the intention to file for IP, Outlander cannot publicly disseminate the report. However, for more information, please do not hesitate to reach out via info@outlandermaterials.nl.

We, at Outlander Materials, are very grateful for this subsidy, which allowed us to explore the potential for UnPlastic to a level of detail that we would otherwise never been able to achieve. The project is executed with subsidy from the Ministerie van Economische Zaken, Nationale regelingen EZ-subsidies, Topsector Energie uitgevoerd door Rijksdienst voor Ondernemend Nederland.