

IMPACT

REPORT



INTRODUCTION



This report presents the results of one of the innovation tracks carried out by the teams of the European Interreg project Wonderful.stream (2020-2023). In this project, seven partners from the Euregio Meuse-Rhine have pooled their knowledge, strengths and resources to jointly support small and medium-sized enterprises in their transition to a circular economy.

Wonderful.stream offers companies free advice and guidance on the recovery of their residual flows; it also initiates and facilitates the co-creation of circular solutions with experts in technology, design and business development in the framework of innovation tracks.

This report focuses on the results of the innovation track of the company Charles Liégeois.

INNOVATION TEAM

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CHARLES LIÉGEOIS ROASTERY

Charles Liégeois Roastery, based in Thimister, is active in the coffee roasting sector. It is a family business with unique know-how and strong social and environmental values: "A coffee that is generous in taste, generous for the planet and generous for those who live off it". In addition to roasting, Charles Liégeois selects the coffee, develops the recipes for its products and produces their packaging and distribution.

Charles Liégeois is committed to pursuing the Sustainable Development Goals of the United Nations Charter in relation to its own activities. Between 2005 and 2020, the company has improved its energy efficiency by 17% and reduced its CO2 emissions by 24%. Charles Liégeois is also focusing on reducing packaging and developing packaging that can be recycled industrially and at home.

It is within the framework of this environmental process that the company is interested in the Wonderful.stream project, as it sees the opportunity to recycle the coffee grounds of its customers, which are currently considered as waste and thrown away in the bin. However, coffee grounds are a resource with a high potential for recovery in sectors such as cosmetics, water treatment and construction. Each kilogram of recycled coffee grounds would represent 775 grams of CO2 saved according to the recent Möbius report for the King Baudouin Foundation, Fevia and Koffiecafe (ref to be integrated). With this in mind, Charles Liégeois wishes to contribute to reducing this impact to which coffee production involuntarily contributes.

80 tons

of coffee grounds per month are produced by "Out Of Home" customers



In the province of Liège, Charles Liégeois sells 40 tonnes of coffee per month to its "Out Of Home" customers (hotels, restaurants, companies, communities/organisations). This is equivalent to a production of about 80 tons of coffee grounds per month. At present, the grounds are disposed of at the customer's premises at no cost to Charles Liégeois.

The challenge for Charles Liégeois is therefore twofold: to set up logistics for the recovery of coffee grounds from its customers and to recycle them.

www.charles-liegeois.com

CHALLENGES

- 01.** A high value-added recovery solution
- 02.** A recovery solution in line with the company's values
- 03.** Economically viable collection logistics

INNOVATION PROCESS

STEP 1

Identification of value-added opportunities

A benchmark of the possible ways of adding value to coffee grounds was carried out based on a literature review. The options were then evaluated according to several factors: consistency with the company's values, use of the intrinsic properties of the grounds, complexity of the technical development required and estimated commercial potential. Two of these leads were selected to be explored as part of the innovation track.

01. FOOD SMOKING

The idea of fuel for smoking food was chosen. This idea was initially proposed by STEAM students during a bootcamp organised in the framework of Wanderful.stream before the innovation track. Although it does not enable large quantities of coffee grounds to be recovered, this solution enables Charles Liégeois to maintain a link with the food sector. It is based on organoleptic properties and the search for taste enhancement, which correspond to the values of Charles Liégeois.



02. BIOPLASTICS

It was also decided to investigate the use of coffee grounds as a bioplastic, with the initial idea of developing a biodegradable coffee capsule made from coffee grounds. The development of sustainable packaging is one of Charles Liégeois' main areas of focus and the market for bioplastics is growing rapidly. In addition, this solution would make it possible to recover large volumes of coffee grounds.

STEP 2

Feasibility study of the valorisation options

Experts were consulted to evaluate the two selected options and validate the concepts. The main objective of this step was to assess the commercial potential of the solutions and to determine the constraints related to their implementation. In particular, the project team was concerned that the waste status of coffee grounds might limit certain applications.

STEP 3

Concept development

The project team worked on preparing partnerships for both concepts. First trials have been carried out for the smoking fuel concept. The development of a bioplastic product proposal is underway.

STEP 4

Collection feasibility study

The objective of the technical expertise is to study the feasibility and implementation of a coffee grounds recovery logistics at Charles Liégeois' customers. This requires a major analysis of the materials and processes that will make it possible to define all the ins and outs in which this reverse logistics will be carried out:

- Characterisation of the coffee grounds before collection according to the type of customer and of the raw material expected after collection for the recovery concepts;
- Assessment of the risks of contamination of the coffee grounds at the customers' premises, during transport and during storage;
- -Analysis of the storage conditions of the coffee grounds at the customer's premises and of the transport and storage conditions to be observed at the company;
- Assessment of the capacity and flexibility of the company's current logistics;
- ...

The collection feasibility study is ongoing.

RESULTS

FOOD SMOKING

A Spanish fuel producer has shown an interest in the project and has carried out initial conclusive tests. It is willing to collaborate with Charles Liégeois to develop and market the product. The interest of customers in the food smoking market will soon be sounded out at a barbecue fair. The challenge lies in the possibility of using local products (e.g. wood) in the product recipe.

The business expert has drawn up a first draft financial plan for the smoking fuel concept. However, some unknowns remain: location of the production site, type of packaging of the product, type of logistics for the recovery of coffee grounds.

Before further implementation of this solution, the conclusions of the coffee grounds collection feasibility study and an agreement between the partners on all aspects of commercial collaboration are essential.



BIOPLASTICS

A Dutch producer of bioplastic made from coffee grounds has been identified. The bioplastic from this producer cannot be used for coffee capsules because legislation currently prohibits the use of coffee grounds in a product that comes into direct contact with food.

However, the bioplastic could be used to replace products related to the coffee sector that Charles Liégeois markets, such as restaurant trays. This possibility is currently being investigated by the project team. As the producer's collection network is developing in Belgium, it could take over Charles Liégeois' grounds, but without any financial compensation. The challenge therefore lies in the technical and economic feasibility of a product that Charles Liégeois can make his own and that meets the expectations of customers.



CONCLUSION

The joint contribution of the experts made it possible, on the one hand, to test the innovative use of coffee grounds as fuel for smoking food, which could lead to the creation of a new product.

On the other hand, the bioplastic track could also make it possible to recover the coffee grounds of Charles Liégeois' customers. The study of this application also opens up the possibility of replacing products sold by Charles Liégeois with bioplastic substitutes for coffee grounds.

Finally, the feasibility study of the collection of coffee grounds from the company's customers will provide essential information for Charles Liégeois to implement relevant and efficient recovery logistics.

IN THE SHORT TERM

- Feasibility study on the collection of coffee grounds from Charles Liégeois' customers.
- Feasibility study on the collection of coffee grounds from Charles Liégeois' customers.
- Feasibility study of a biopolymer product based on coffee grounds relevant to Charles Liégeois.

IN THE MEDIUM TERM

- Testing and implementation of coffee grounds collection at Charles Liégeois' customers.
- Development of potential collaboration to produce food smoking fuel.
- Development of a potential bioplastic product and/or potential discussions to assess whether Charles Liégeois can become a supplier of coffee grounds to the Dutch producer.

ULTERIOR OBJECTIVES

- Development of the production and/or marketing of a potential coffee grounds fuel for food smoking.
- Development of the processing and/or marketing of a potential bioplastic product based on coffee grounds.

Interreg

Euregio Meuse-Rhine

European Regional Development Fund



Interreg EMR transcends borders by enabling collaboration between regional areas in different countries. We are investing in projects on innovation, the economy, social inclusion and training, and territorial cohesion. By encouraging cross-border collaboration, we strengthen the economic and social fabric in the border region between Belgium, Germany, and the Netherlands.

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