



LIFE PULPCYCLE - Demonstrating a new approach for used beverage cartons and polycup recycling

LIFE18 ENV/NL/000339

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Project description:

Background

Laminated paper containers are a waste stream that is very difficult to recycle. Consisting of used beverage cartons (UBC) and polycups (e.g. single-use coffee cups), these popular composite packaging materials are made of multiple layers of paper/cardboard, plastic and metals such as aluminium. The fusion of different materials makes these products very difficult to recycle efficiently. As a result, over one million tonnes of potentially valuable materials are incinerated or landfilled every year, with a significant environmental impact. Current recycling initiatives are limited to recovering the paper/cardboard materials and cover only a fraction of the total waste stream. Due to difficulties in collecting and/or separating the materials, only half of the 900 000 tonnes of UBC discarded in Europe annually are recycled today. The figure is even lower for polycups. Moreover, the focus on paper pulp in recycling processes leads to low yields due to a lack of specialised equipment capable of separating the individual components. As a result, a mixed stream of polyethylene and aluminium, commonly referred to as PolyAl, is currently discarded and either incinerated or landfilled. The key issue with current recycling initiatives for UBC and polycups (UBC&P) lies in historical and practical developments. In order to use the recovered paper pulp instantly, recycling today takes place at paper mills. This current recycling process for UBC&P waste is highly inefficient. A large part of the material is not recycled due to problems with recovery and separation. Additionally, UBC&P materials that are recycled are often treated in suboptimal facilities, resulting in the loss of large amounts of valuable materials throughout the value chain. Moreover, potentially reusable materials are incinerated or landfilled in large quantities and waste streams are transported back and forth unnecessarily. This inefficient value chain originated from practical and historical factors and is outdated. A new and more efficient approach is required to extract valuable paper, plastic and aluminium components from UBC&P, to meet EU waste recycling targets.

Objectives

The LIFE PULPCYCLE project aims to demonstrate a new approach and business model for recycling used beverage cartons and polycups (UBC&P). This will involve building an industrial-scale (25 000 tonne/year) pulping and treatment installation combined with an existing waste processing and energy plant.

The projects specific objectives are to:

- demonstrate a new, integrated and continuous process for pulping, treatment and sanitisation of UBC&P with higher pulp yield and quality;
- improve the logistics chain (lower carbon footprint) by eliminating unnecessary transport of resource and waste streams;
- increase the recycling rate of plastics and aluminium; and
- produce a new, high quality product in the form of dried, sanitised fibre.

LIFE PULPCYCLE will contribute to a plethora of EU policy and legislation, including the Waste Framework Directive, the Renewable Energy Directive, the Landfill Directive, the Packaging and Packaging Waste Directive, the circular economy package and the plastics strategy.

Results

Expected results:

- demonstration facility for recycling UBC&P waste to produce sanitised pulp and aluminium, high density polyethylene (HDPE) and low density polyethylene (LDPE) raw materials, including: Over an 18-month demonstration period: - 20 000 tonnes/yr of wet UBC waste processed; - 5 000 tonnes/yr of polycups processed; - 12 000 tonnes/yr of dried pulp recovered; - 600 tonnes/yr of HDPE recovered; - 2 000 tonnes/yr of LDPE recovered; and - 300 tonnes/yr of aluminium recovered;
- integration of the recycling value chain with the waste-to-energy process;
- validated life-cycle analysis quantifying the environmental impact of the projects new approach compared to existing state-of-the-art techniques: - 20% increase in fibre yield per tonne of UBC&P; - 70% reduction in tonne-km transported per year; and - 52% net reduction in heat energy use, equivalent to over 14 000 GJ/yr;
- detailed business case for continuation of the project;
- analysis identifying relevant stakeholders throughout Europe; and
- replication and transfer plan.

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Environmental issues addressed:

Themes

Waste - Packaging and plastic waste
Waste - Waste recycling
Industry-Production - Food and Beverages
Waste - Waste reduction - Raw material saving

Keywords

recycling, packaging, beverage industry, waste paper, plastic waste

Target EU Legislation

- Climate Change & Energy efficiency
- COM(2013)216 - EU Strategy on adaptation to climate change (16.04.2013)
- Waste
- COM(2015)614 - "Closing the loop - An EU action plan for the Circular Economy" (02.12.2015)
- Directive 75/442/EEC - "Waste framework directive" (15.07.1975)
- Directive 94/62 - Packaging and packaging waste (20.12.1994)
- Directive 1999/31 - Landfill of waste (26.04.1999)

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	HVC Grondstoffen NV
Partners	Bluemats(Bluemats Technology BV), Netherlands Smurfit(Smurfit Kappa Paper Services B.V.), Netherlands

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Administrative data:

Project reference	LIFE18 ENV/NL/000339
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Duration	01-SEP-2019 to 31-AUG -2023
Total budget	11,125,168.00 €
EU contribution	3,518,992.00 €
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