



LIFE-PSLOOP - Polystyrene Loop

LIFE16 ENV/NL/000271

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Project description:

Background

Expanded polystyrene (EPS) foam is used extensively throughout Europe as an insulation material. Currently, the amount of EPS construction waste equals 200 kilotonnes per year in Europe and may reach up to 1 000 ktonnes per year in the decades to come. Some 52.5% of this waste is incinerated and the energy recovered, while only 7.5% of EPS waste is recycled. The rest is landfilled or incinerated without energy recovery.

EPS that was produced before 2015 contains the flame retardant Hexabromocyclododecane (HBCD), which has been listed since then as a persistent organic pollutant. A product is no longer allowed to contain more than 100 parts per million of HBCD. Recycling of EPS construction waste is already challenging because of the pollutants (glue, cement residues, etc.) contained within it. It has now become even more so because HBCD must be removed.

Objectives

The objective of the PSLoop project is to recycle both EPS construction waste and extruded polystyrene (XPS) and to demonstrate an economically viable alternative to incineration. The recycling process is based on the dissolution of PS foam and the removal of the HBCD. The process delivers a PS gel ready for use as a raw material for EPS or XPS. Furthermore, bromine is recovered from the HBCD and recycled.

The project will construct a recycling plant to demonstrate the process on an industrial scale; the process will have already been tested in a pilot plant. The process has been designed to deal with different qualities of input material to maximise internal recycling of the solvent used and to obtain optimised polymers that are in line with virgin quality PS. In addition, the project aims to create a value chain for EPS/XPS with recycling and collection companies by

demonstrating a standard collection and pre-treatment system.

The project will have significant climate action implication, given that the PSLoop value chain is much more energy and resource efficient than the production of PS from virgin raw materials. Furthermore, the project contributes to the Circular Economy Action Plan, the Roadmap to a Resource Efficient Europe and the Waste Framework Directive, as it is creating a value chain for EPS/XPS. It also contributes to implementation of the REACH regulation by reducing the impact of chemicals on the environment or human health through their substitution with safer substances.

Expected results:

- Construction of a demonstration plant able to recycle 3 000 tonnes of EPS/XPS waste per year;
- Establishment of a collection system able to supply the required EPS/XPS waste quantities to the demonstration plant;
- Production of 2 100 tonnes/year of PS gel and 43 tonnes/year of bromine;
- Avoidance of the emission of 210 tonnes/year of carbon monoxide, 25 tonnes/year of aromatic hydrocarbons and 10 tonnes/year of aliphatic hydrocarbons;
- Reduction by 12 000 tonnes/year of greenhouse gas emissions (78%) compared to the baseline scenario; and
- Saving of 150 000 GJ of energy.

Results

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Environmental issues addressed:

Themes

Waste - Waste recycling
Waste - Hazardous waste

Keywords

building waste, waste recycling, chemical industry, hazardous substance, resource conservation

Target EU Legislation

- Chemicals & Hazardous substances
- "Regulation 1272/2008 - Classification, labelling and packaging of substances and mixtures (amend ...

- Waste
- COM(2015)614 - "Closing the loop - An EU action plan for the Circular Economy" (02.12.2015)
- Directive 2008/98 - Waste and repealing certain Directives (Waste Framework Directive) (19.11.200 ...

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	PolystyreneLoop Coperatief UA (PSLoop UA)
Type of organisation	Large enterprise
Description	Synbra BV is specialised in the production of expanded polystyrene (EPS) and other foams for technical and thermal insulation systems. Synbra Technology BV, based in Etten-Leur, will be directly involved in the project; it is a technology centre and also produces raw materials for the company's downstream processing plants.
Partners	ICL Europe Coöperatief U.A., The Netherlands Fraunhofer-Gesellschaft zur Förderung der angewandten Forschung e.V., Germany

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Administrative data:

Project reference	LIFE16 ENV/NL/000271
Duration	01-JUL-2017 to 01-JUL -2023
Total budget	8,412,884.00 €
EU contribution	2,699,977.00 €
Project location	Noord-Brabant(Nederland)

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Read more:

Brochure	Title: "The circular economy in action: Closed-loop recovery of polystyrene foam and bromine" (1.27 MB) Editor: PolyStyreneLoop No of pages: 6
Brochure	Title: "Oběhová ekonomika v akci: Uzavřený okruh zpětného získávání polystyrenové pěny a bromu" (1.58 MB) Editor: PolyStyreneLoop No of pages: 6
Brochure	Title: "Circular Economy – Kreislaufwirtschaft in der Praxis: Rückgewinnung Von Polystyrolschaumstoff Und Brom Im Geschlossenen Kreislauf" (954 KB) Editor: PolyStyreneLoop No of pages: 6
Newsletter	Title: "Welcome to the PolyStyreneLoop Foundation Newsletter!" (438 KB) Year: 2016 Editor: PolyStyreneLoop No of pages: 3
Newsletter	Title: "In the loop: Update PolyStyreneLoop - March 2018" (1.22 MB) Year: 2018 Editor: PolyStyreneLoop No of pages: 6
Newsletter	Title: "In the loop: Update PolyStyreneLoop December 2017" (927 KB) Year: 2017 Editor: PolyStyreneLoop No of pages: 5
Newsletter	Title: "Welcome to the PolyStyreneLoop Newsletter" (651 KB) Year: 2017 Editor: PolyStyreneLoop No of pages: 3
Poster	Title: "The circular economy in action: Closed-Loop recovery of polystyrene foam and bromine" (6.63 MB) Editor: PolyStyreneLoop No of pages: 1
Poster	Title: "The circular economy in action closed-loop recovery of Polystyrene foam and bromine" (2.59 MB) Year: 2017 Editor: PolyStyreneLoop No of pages: 1
Poster	Title: "PolyStyreneLoop: Circular Economy in action: Closed-loop recovery of HBCDD-containing polystyrene foam waste" (239 KB) Editor: PolyStyreneLoop No of pages: 1
Project web site	Project's website
Slides Presentation	Title: "Introduction PolyStyreneLoop Cooperative U.A" (5.12 MB) Author: Lein Tange, Jan Noordegraaf Editor: PolyStyreneLoop No of pages: 25
Slides Presentation	Title: "The feasibility of a demo plant for PolyStyrene Dissolution: The basis for discussion during the Rotterdam Conference on Circular Economy 8./9. December 2016" (1.21 MB) Year: 2016 Editor: PolyStyreneLoop No of pages: 14

Slides Presentation

Title: "EPR schemes in a circular economy: 22nd May 2018" (2.11 MB) Author: Edmar Meuwissen
Year: 2018 Editor: PolyStyreneLoop No of pages: 32

Slides Presentation

Title: "PolyStyreneLoop: une solution unique de recyclage adaptée aux déchets de PSE et XPS contenant du HBCD" (2.12 MB) Year: 2017
Editor: PolyStyreneLoop, Afiped No of pages: 21

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