



LIFE + PROJECT K-12

LIFE13 ENV/IT/001238

With the contribution of the LIFE financial instrument of the European Community



LIFE is the EU's financial instrument supporting environmental, nature conservation and climate action projects throughout the EU.

Since 1992, LIFE has co-financed some 4 171 projects, contributing approximately €3.4 billion euros to the protection of the environment and climate.

The LIFE programme is the EU's funding instrument for the environment and climate action. The general objective of LIFE is to contribute to the implementation, updating and development of EU environmental and climate policy and legislation by co-financing projects with European added value.

LIFE began in 1992 and to date there have been four complete phases of the programme (LIFE I: 1992-1995, LIFE II: 1996-1999, LIFE III: 2000-2006 and LIFE+: 2007-2013). During this period, LIFE has co-financed some 3954 projects across the EU, contributing approximately €3.1 billion to the protection of the environment.

The European Commission (DG Environment and DG Climate Action) manages the LIFE programme. The Commission has delegated the implementation of many components of the LIFE programme to the Executive Agency for Small and Medium-sized Enterprises (EASME). External selection, monitoring and communication teams provide assistance to the Commission and EASME. The European Investment Bank will manage the two new financial instruments (NCFE and PF4EE).

- LIFE multiannual work programme (2014-2017)
- LIFE 2014-2020 Regulation
- Continuation of LIFE+ beyond 2013 (archived)
- Evaluation of LIFE+ (2007-2013)
- LIFE+ Regulation (2007-2013)
- The history of LIFE
- Before LIFE began

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Dow Italia (The Dow Chemical Company group), **Whirlpool** and **Afros-Cannon** are partners in the **K-12 Project** funded by **LIFE+**, the **European's** financial instrument supporting environmental and nature conservation projects.

The K-12 Project focuses on developing a new insulating technology to offer 20% energy improvement for domestic appliance insulation.

Background

The domestic household sector is one of the largest consumers of electrical energy in the European Union (EU), consuming around **30% of the total electrical energy** supply. The total energy consumption of EU households in 2010 was about 840 TWh/yr, with a per capita consumption of 6.2 MWh/yr, distributed over 140 million households.

In the past few years, the development of new green technologies has helped to reduce the energy consumption of individual electrical devices. However, at the same time, the number of such devices has increased dramatically, as the amount of time they are typically in use. Thus, overall energy consumption has still increased.

Cold appliances - refrigerators and freezers - accounted for 14.5% of household energy consumption in 2010. Currently, most households still use old, energy-inefficient cold appliances.

Objectives

The **LIFE+ K-12** project aims to demonstrate the feasibility and effectiveness of innovative polyurethane (PU) foams for improving thermal insulation and, thus, the energy efficiency of households' cold appliances. In doing so it aims to contribute to the EU's goals of creating an energy-efficient economy and mitigating the threat of global warming.

The project seeks to define at least 2-3 formulations of innovative PU foams with different chemistries, and to make corresponding adaptations to the manufacturing process at pre-industrial scale. Manufacturing adaptations will include the design of new injection equipments, the optimization of the foaming injection parameters, using blowing agents



with ZERO Ozone Depletion Potential (ODP) and minimum Global Warming Potential (GWP).

The project will demonstrate the innovative foaming technology at pilot scale, validating the thermal conductivity improvements of the new foam through efficiency tests. The real applied thermal-insulation - and thus energy-saving - benefits will be tested on 30-50 refrigerators prototype.

LIFE+ K-12 project will develop European and global 'market introduction impact scenarios' for the new foam, and conduct a specific product life cycle assessment (LCA). The results will be used to quantify the environmental impact of a potential market introduction of the innovative foam, in terms of reduced energy consumption and carbon footprint.

Expected results

- A new manufacturing process at pilot scale - with optimized foaming injection parameters and an new injection equipment - for the production of an innovative PU foam
- **A 30% improvement in the thermal conductivity performance of the new foam**, compared to the current best in class PU foams available in the market place
- **A 20% reduction in the energy consumption of cold appliances**, with respect to the current best in class labelled A+/A++
- **Reduced energy** use in the overall industrial production process of refrigerators
- Demonstrated feasibility of applying **the novel insulation material with a zero ODP** (Ozone Depletion Potential) and **minimum - reduced to 1 - GWP** (Global Warming Potential)

