



DAIRIUS - Sustainable management via energy exploitation of end-of-life dairy products in Cyprus

LIFE10 ENV/CY/000721



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Contact details:

Contact person: Stephanos PAPADOPOULOS

Tel: +357 22 443044

Fax: +357 22 443045

Email: spapadopoulos@charalambideschristis.com

Project description:

Background

Agro-industries are major contributors to industrial pollution and Cyprus is no exception to the rule. These industries, which process agricultural raw materials such as milk, fruits, vegetables and meat, generate millions of tonnes of waste and unexploited by-products that end up harming the environment. The production of milk and dairy products in Cyprus and the rest of Europe has increased significantly during recent years and this has resulted in larger amounts of non-consumed, returned and expired products - and milk products in particular. Most of these end up in landfills contributing to hazardous leachate generation and uncontrolled gaseous emissions. Landfilling of these products does not comply with the EU Landfill directive (1999/31), which imposes strict limits for the disposal of biodegradable wastes. Thus, there is a clear need for the dairy industry to develop sustainable management and treatment strategies for the ever increasing quantities of expired products. Anaerobic digestion of milk products and simultaneous methane recovery as a clean renewable energy source can be a highly sustainable solution for expired milk products with environmental, financial and social benefits. Although this process is state-of-the-art in the treatment of sewage sludge and industrial wastewater, very few applications can be found for the treatment of expired products themselves.

Objectives

The DAIRIUS project's overall objective is to demonstrate an environmentally and financially sustainable solution for the management and treatment of returned Expired Dairy Products (EDP). It aims to achieve this through the development and testing of a two-phase anaerobic co-digestion process of EDP with other substrates. The project will analyse the specific details of the EDP generation by the dairy industry in Cyprus. It will assess the optimal physical, chemical and biochemical conditions for the anaerobic co-digestion process to maximise biogas yields. This will include determining the ratios of potential substrates, such as manure, in the process through investigations at laboratory scale. A pilot anaerobic digestion plant will be designed and constructed; biogas from the process will be collected and used to generate energy. Running of the plant will permit further optimisations to the proposed process. The project will define the optimal plant operating conditions for EDP treatment to maximise biogas yields. It will also describe the best possible processes for aerobic composting or vermi-composting of the residual digested material. A cost-benefit analysis, environmental impact assessment, and lifecycle analysis will be performed and used to evaluate the exploitation and long-term commercialisation potential of the prototype pilot plant. The process is expected to be of wide interest in the dairy sector.

Expected results:

- Clear demonstration of the wide-scale applicability and environmental benefits of anaerobic treatment of EDP;
- Successful generation, collection and use of biogas as a renewable energy product from EDP - as well as residual material for composting; and
- The definition of optimal conditions and technical specifications for the treatment process to maximise production of useful by-products.

Results

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Environmental issues addressed:

Themes

Waste - Industrial waste

Keywords

industrial waste, waste treatment, beverage industry

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	Charalambides-Christis Ltd
Type of organisation	Large enterprise
Description	VIVARTIA Ltd is the largest dairy products company in Cyprus.
Partners	University of Patras, Greece RTD TALOS LTD, Cyprus ANIMALIA GENETICS LTD, Cyprus Green Technologies Ltd, Greece Department of Environment-Ministry of Agriculture, Natural Resources and Environment, Cyprus

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Administrative data:

Project reference	LIFE10 ENV/CY/000721
Duration	01-FEB-2012 to 30-SEP -2015
Total budget	1,404,252.00 €
EU contribution	702,126.00 €
Project location	Kypros / Kibris(Cyprus) Extra-Regio(Cyprus) Mediterr. Cyprus (CY)(Cyprus)

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Read more:

Brochure	Title: Project's brochure Year: 2014 No of pages: 2
Newsletter	Title: Newsletter - Issue 2 - December 2013 Year: 2013 No of pages: 2
Newsletter	Title: Newsletter - Issue 3 - April 2014 Year: 2014 No of pages: 2
Newsletter	Title: Newsletter - Issue 4 - July 2014 Year: 2014 No of pages: 2
Newsletter	Title: "Newsletter 7th Issue June 2015" (1.04 MB) Year: 2015 Editor: DAIRIUS No of pages: 2

Newsletter	Title: "Newsletter 6th Issue June 2015: Sustainable management via energy exploitation of end-of-life dairy products in Cyprus" (743 KB) Year: 2015 Editor: DAIRIUS No of pages: 2
Newsletter	Title: Newsletter - Issue 1 - July 2013 Year: 2013 No of pages: 2
Newsletter	Title: "Newsletter 5th Issue October 2014: Sustainable Management Via Energy Exploitation of End-of-Life Dairy Products in Cyprus" (439 KB) Year: 2014 Editor: DAIRIUS No of pages: 2
Project web site	Project's website
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