

Bovine livestock waste recovery and reuse

Summary

In recent years the livestock population has significantly increased in Catalonia, while the useful agricultural surface area has decreased. Therefore, in high-density livestock areas it is necessary to develop and implement technologies that enable excess livestock excrement that cannot be safely used as fertiliser to be reused.

An option for the use of this excrement is the application of the biodrying process for energy recovery. Biodrying as applied in the livestock industry is an innovative process that yields a biofuel (LHV > 2,500–3,500 kcal/kg) that can be used in conventional biomass boilers. Biodrying is similar to composting, but its final objective is different. While the aim of composting is to maximise the stability of organic waste through the mineralisation of organic carbon, that of biodrying is to use the metabolic heat produced by the biological activity to remove water from the waste matrix in the shortest time possible, minimising the degradation of carbon and preserving the majority of the heat value of the matrix. La Fageda Foundation in conjunction with the BETA Technology Centre will carry out the first pilot test on a semi-industrial scale to demonstrate the technical and economic viability of the biodrying and energy recovery process in situ in a biomass boiler, contributing to the implementation of circular economy strategies at Fageda's premises.

Objectives

The main objective of the project is the development and optimisation of the cattle manure biodrying process with the aim of obtaining a biofuel suitable for use in conventional biomass boilers.

The submitted project will contribute to achieving the EU's climate/energy 20/20/20 targets, which include the reduction of greenhouse gas emissions by 20% (with respect to 1990), the increase to 20% of the use of renewable energy, and the increase of energy efficiency by 20%, and it will also contribute to the correct management of excess livestock waste, above all in areas classified as Nitrate Vulnerable Zones.

Description of initiatives outlined in the project

The following actions will be carried out in order to achieve the aforementioned objectives:

- Partial transformation of a compost trench into a biodrying reactor.
- Optimisation of the biodrying process (control system, mixes, residence time, etc.).
- Mono-combustion and co-combustion tests in conventional biomass boilers.
- Assessment of boiler energy recovery and efficiency, and of emission control.
- Environmental, technical and economic assessment of the process.

Expected results and practical recommendations

The expected result is an environmentally responsible and technically and economically viable process to obtain a biofuel whose properties are similar to those of conventional biomass.

In order to increase the reproducibility and impact of the project at the regional level and at the sector level of the process, a series of practical recommendations and methodological guides will be produced to both the construction and commissioning of the plant on an industrial scale, and the optimal operating conditions of the biodrying plant and of the combustion and energy recovery process.

Task force leader

Entity: **La Fageda Fundació**

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Typology of entity:
Agri-food company

Task force coordinator

Other task force members (grant beneficiaries)

Other task force members

Entity: **Fundació Universitària Balmes**

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Typology of entity:
University

Subject area(s) of application

Climate and climate change
Waste, by-products and residues
management

Geographical area(s) of application

Province(s)	Region(s)
Girona	Garrotxa

Dissemination of the project *(publications, conferences, multimedia...)*

Dissemination will be carried out at regional and international level.

At regional level, the project will be presented at various seminars aimed at the sector such as the 'Biomass Fair', the 'Technical Seminars of the Vic Mercat del Ram', the 'Annual Technology Transfer Plan (PATT) Technical Seminars', etc. Internationally, the results will be presented in scientific journals and at conferences on waste recovery and sustainability.

Both La Fageda Foundation and the BETA Technology Centre will publicise the project through their social media (Twitter, Facebook, LinkedIn, etc.). Moreover, an open day will be held at La Fageda Foundation to demonstrate the operation of the pilot plant for interested parties.

Project website

<http://www.fageda.com/> and <http://www.betatechcenter.com>

More information on the project

Project dates

Budget approved

Starting date (month-year): June 2018

Completion date (month-year):

Current status: *Underway*

Total budget: €115,000.00

DARP funding: €45,885.00

EU funding: €34,615.00

Own funding: €34,500.00

With funding from:



Generalitat de Catalunya
**Departament d'Agricultura,
Ramaderia, Pesca i Alimentació**



**Fons Europeu Agrícola
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Order ARP/133/2017, of 21 June, approving the regulatory bases of grants for cooperation for innovation through the promotion of the creation of European Association for Innovation task forces in terms of agricultural productivity and sustainability and the execution of innovative pilot projects by these groups.

Resolution ARP/1868/2017, of 20 July, calling for applications for grants for the year 2017.

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