



## Proyecto LIFE LEMNA

LIFE LEMNA aims to construct the first full scale nutrient removal system in EU based on the production of duckweed which will be applied to uptake N, P and other nutrients from the swine manure after an anaerobic digestion. The resulting duckweed biomass will be a source of high value protein source for feed (bio-based products) and biofertilizers.

The main objective is to improve nutrient management and reduce the environmental impact of animal farming by demonstrating the feasibility of an innovative nitrogen and phosphorous recovery technology based on duckweed (aquatic plant) production system for the sustainable treatment of anaerobically digested manure. In the proposed system, duckweed biomass is further processed to obtain new (bio)based products for local consumption, mainly biofertilisers and feed, within a circular and more sustainable animal production system.

The project tackle a main EU environmental problem existing in most countries which is polluted water bodies by surpluses of manure nutrients in animal farming areas causing eutrophication and other negative impacts. It will contribute to achieve the WFD and Nitrate Directive objectives and develop other related EU legislation and policies in areas like climate change, or air and soil quality. The project also tackles resource efficiency, scarcity of phosphorous, and the high environmental impact associated to animal protein production in comparison with vegetable protein.

LIFE LEMNA project LIFE15 ENV/ES/000382) is being developed under the support of the Life Programme of the European Commission

Specific objectives of the LIFE LEMNA project are listed below:

- 1. To reduce manure nutrient pollution of water bodies in farming areas.* To reduce manure nutrient pollution of water bodies in farming areas by implementing an innovative duckweed based technology which helps farmers to balance nutrient surpluses and facilitate an integrated nutrient management.
- 2. To demonstrate improved efficiency and sustainability of the duckweed based technology.* To demonstrate improved efficiency and sustainability of the duckweed based technology to achieve high rates of nutrient recovery including nitrogen and phosphorous, in comparison with existing technologies.
- 3. To reduce carbon footprint and other environmental impacts of animal protein production.* By i) treating manure via anaerobic digestion (AD) reducing GHG emissions, ii) producing duckweed from liquid digested manure while reducing nutrient pollution, and iii) replacing traditional fossil products by biobased high sustainable bio fertilisers and feed.

4. *To improve resource efficiency and close mineral cycles in animal farming systems.* To improve resource efficiency and close mineral cycles in animal farming systems by integrating duckweed production and biobased related products within a low input value chain inspired by circular economy concept.

5. To widely disseminate results and pave the way for their replication in EU farming regions. To widely disseminate results and pave the way for their replication in EU farming regions by developing specific resources, methodologies and a specific e-tool for other farms uptaking.

The partner of the LIFE LEMNA Project are the following.

The logo for AINIA, consisting of the word "ainia" in a lowercase, orange, sans-serif font.

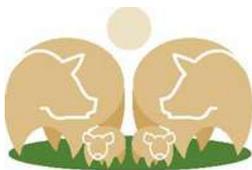
AINIA is a technological center created in 1987 and formed by more than 900 companies, mainly of the food sector. AINIA's mission is to add value to companies through innovation and technological development in a responsible and committed way. AINIA, is the coordinating beneficiary, and it develops R & D projects and technical assistance in these lines of work, developing and adapting technologies to valorize and treat different types of wastewater and organic waste.



The National Centre for Biotechnology (CNB) is a research centre that forms part of the Spanish National Research Council (Consejo Superior de Investigaciones Científicas, CSIC), Spain's most important public scientific institution. The CNB is distinguished by its versatile interdisciplinary research that combines molecular biology methods with the latest technology in the fields of functional and structural biology.



ECOBIOGAS develops sustainable energy production systems by exploiting the enormous potential represented by the extraction of biogas from organic matter. ECOBIOGAS is specialized in biogas plants, to obtain green energy and improve the management of organic waste. In a biogas plant, biogas is produced and transformed into electrical and thermal energy (hot water).



PORGAPORCS SL is a family business (family Porta) in the livestock sector. The business started with a little farm of fattening pigs 40 years ago. Nowadays the farm has got the capacity for 1.100 sows, 4.500 feeders and 965 growers. In 2006, the family Porta, built a biogas plant in order to take profit of the slurry produced in the farm. Mixing this slurry with other residues of the food industry the plant produces biogas..