RAMIRAN 2023

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Sustainable and efficient slurry management models for approaching climate-neutral farms

Perea-Cachero, A.*, Mateo-Marín, N., Guillén, M., Clavería, I., Daudén, A., Quílez, D. & Herrero, E.

*Corresponding author, email: aperea@cita-aragon.es

Department of Environment, Agricultural and Forest Systems. Agrifood Research and Technology Centre of Aragon (CITA)

Avda. Montañana 930, 50059, Zaragoza, Spain

THE PROJECT AND PARTNERS

LIFE CLINMED-FARM (LIFE20 CCM/ES/001751)

LIFE Programme: Climate Action – Climate Change Mitigation

Budget: 3,562,937 €

EU co-funding: 1,959,613 € (55%)

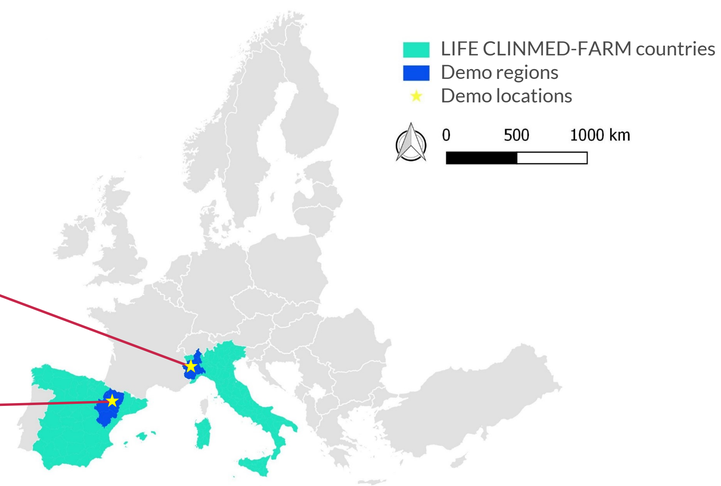
Duration: 01/09/2021 - 31/12/2025

Coordinator

cita – Centro de Investigación y Tecnología Agroalimentaria de Aragón

Partners

DISAFA Università degli studi di Torino; MICROPOWER energy & facility; Agropecuaria del Isabena; Segalés – Especialistas en tratamiento de purines; ECOBIOGAS; MAZANA

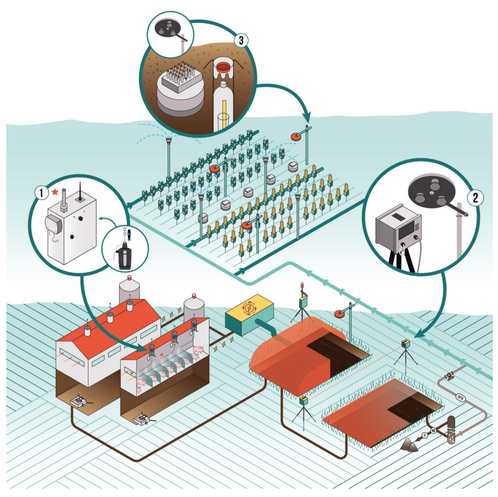


GOALS

- Demonstration of **circular slurry nutrient and energy management innovative techniques** on a large **farm scale** adapting existing facilities. The assessment addresses a **multipollutant case/control approach** comparing new techniques with traditional practices.
- **Reduction of 70% greenhouse gas and 60% ammonia emissions** by combining abatement techniques from animal buildings to crop nutrient recycling.
- **Valorisation of energy resources and nutrients** at the local level:
  - Minimising nutrient losses reducing storage periods and using **covering systems and efficient fertilising strategies**.
  - Using the thermal and electrical power from **biogas on-site**.
  - Minimising thermal losses in **anaerobic digestion and biomethane upgrading processes** setting synergies with nearby industries.
- Developing **robust gas emission monitoring methodologies** for manure management and fertilising activities at full scale.
- Involving all **stakeholders, policymakers and social agents** in the definition of sustainable agricultural production models in Mediterranean areas.

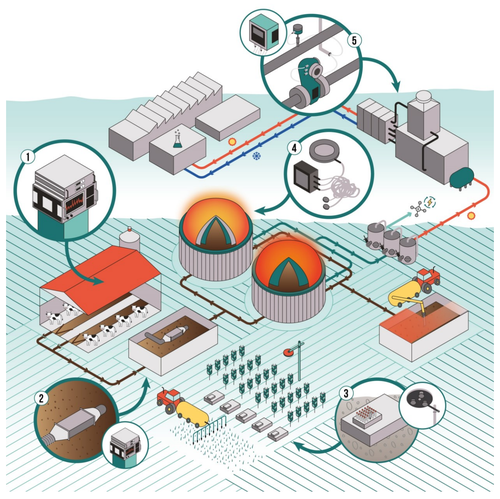
STUDY CASES

Study case 1 (ES): *Sow pig farm - 2,600 heads - 190 ha - 17,000 m³ slurry/yr.*

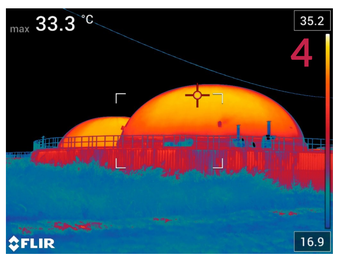


1. Frequent slurry removal by an autonomous vacuuming robot.
2. Covering slurry storage and biogas recovery.
3. Energy valorisation of biogas in the farm.
4. Fertigation with digestate (double crop).

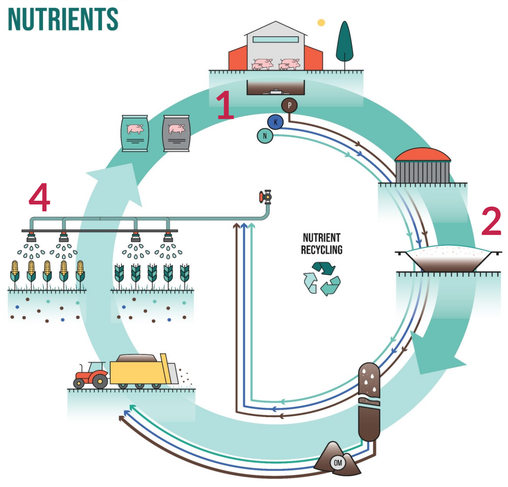
Study case 2 (IT): *Biogas plant - dairy farm - 1,200 dairy cows - 16,800 m³ slurry/yr.*



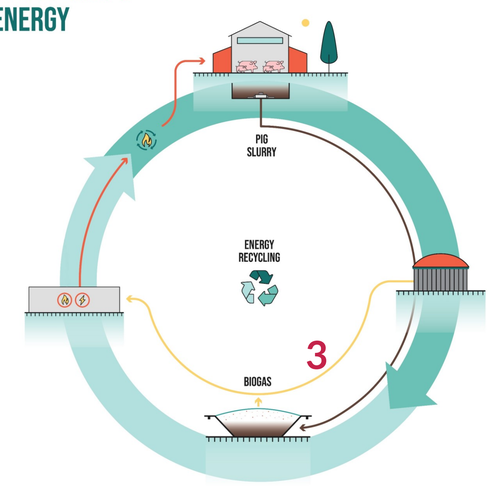
1. Frequent slurry removal practices.
2. Covering storage (natural crust).
3. Fertilising strategies: acidification, nitrification inhibitors, and direct incorporation.
4. Energy-efficient coverage for digesters.
5. Absorption refrigeration system to valorise surplus heat from biomethane production. A nearby industry uses surplus energy in the form of cooling in its production process.



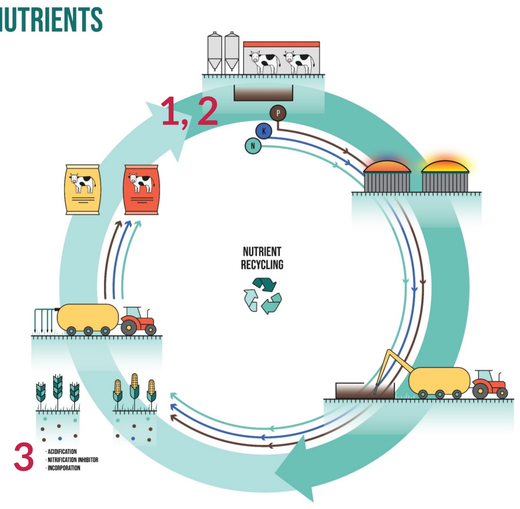
STUDY CASE 1 NUTRIENTS



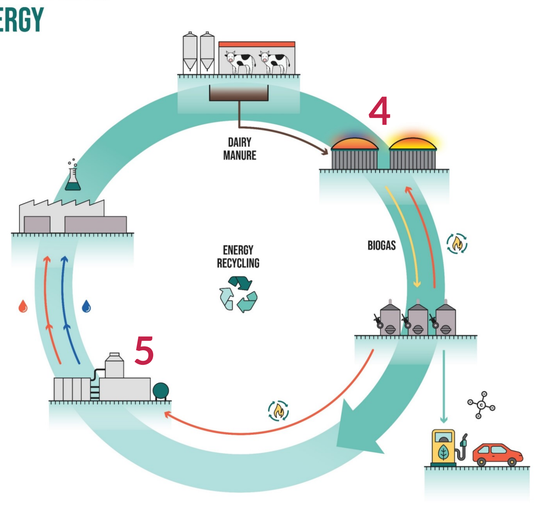
STUDY CASE 1 ENERGY



STUDY CASE 2 NUTRIENTS



STUDY CASE 2 ENERGY



TRANSFERENCE

Two Local Platforms, one in Piedmont (IT) and one in Aragon (ES) coordinated by Consorzio Italiano Biogas and i+Porc, respectively, will involve a balance of public, private, and civil societies to transfer know-how and expertise.

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