



Team

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LISAP
 LABORATORIO DI INGEGNERIA
 SANITARIA AMBIENTALE DELLA
 UNIVERSITÀ DI PISA



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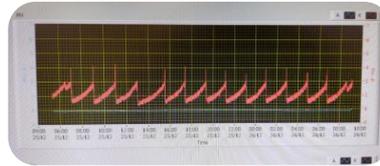
DESTEC - DEPARTMENT OF ENERGY, SYSTEM, TERRITORY AND CONSTRUCTION ENGINEERING - UNIVERSITY OF PISA



Research and Laboratory activities

LISAP focuses on **4 main** research lines

- **Waste >>>** Municipal Solid Waste and Biowaste
 - ✓ Biological stability of organic substrates
 - ✓ Innovative strategies for bioenergy and bioproducts recovery
- **Remediation >>>** Decontamination of sediment
 - ✓ Electrokinetic remediation of marine sediments
- **Water >>>** Wastewater treatment
 - ✓ Technical-economic optimization for the centralization of the wastewater treatment
 - ✓ Innovative and advanced solution of Wastewater treatment
- **Air >>>** Odor control, climate change mitigation and CO2 certificates



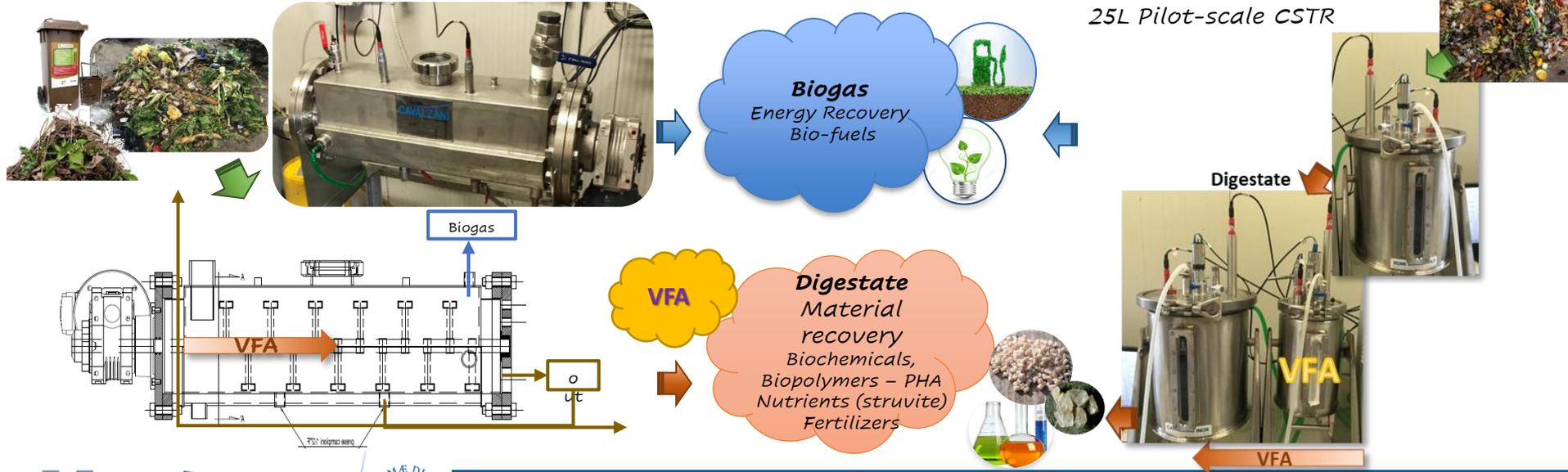


Waste >>> Municipal Solid Waste and Biowaste

✓ Innovative strategies for bioenergy and bioproducts recovery

❖ **Dry Anaerobic Digestion**
30L Pilot-scale PFR

❖ **Wet Anaerobic Digestion and Dark Fermentation**
25L Pilot-scale CSTR

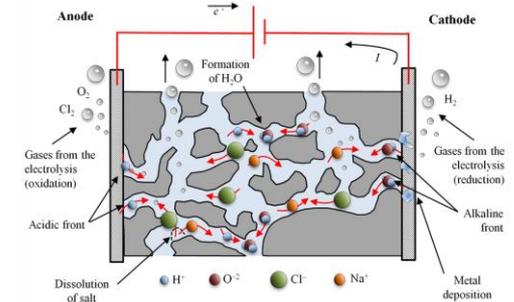
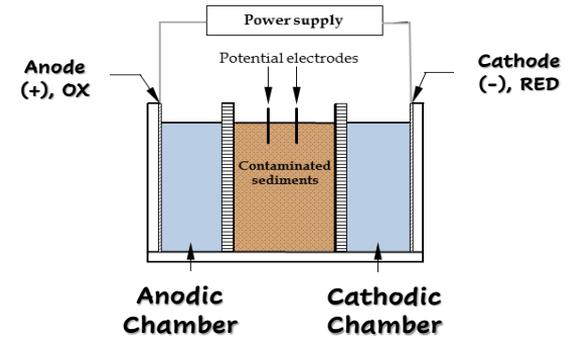




➤ Remediation >>> Decontamination of sediment

✓ Electrokinetic remediation of marine sediments

50 kg





Water >>> Wastewater treatment

- ✓ Technical-economic optimization study for the centralization of the wastewater collection and treatment services

GOALS:

- ❖ Reduction in the operating expense (OPEX)
- ❖ Improvement in the status of the environment
- ❖ Sustainable development



Reduction of energy consumption



Resource recovery (water and sludge)





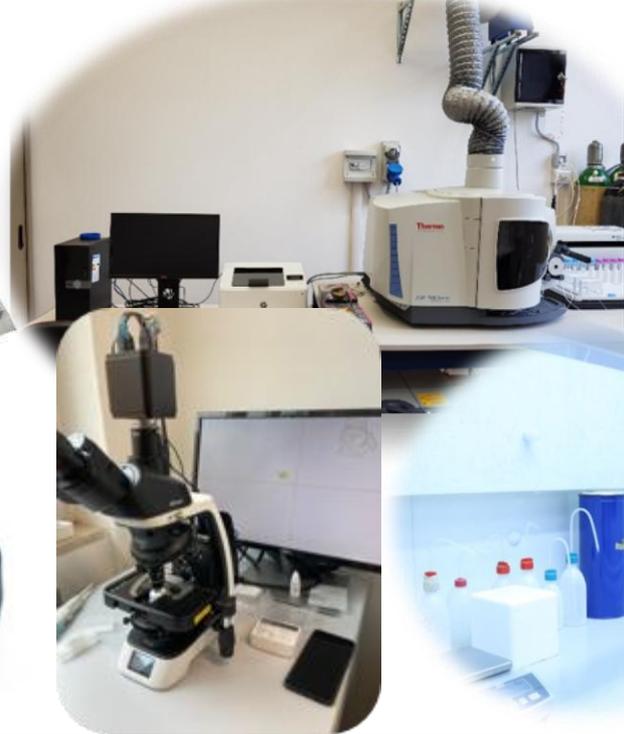
Laboratory equipment

Optical Emission Plasma Spectrometer
(ICP-OES)

Gas chromatography analyses to identify Volatile Fatty Acids
and Biogas composition

❖ Gas chromatograph 7890B Agilent Technology

❖ 3000 Micro GC (INFICON; Switzerland)





Partners

Interreg



Cofinanziato dall'Unione europea
Cofinancé par l'Union européenne



Marittimo-IT FR-Maritime



ARPA
Agenzia regionale per la protezione ambientale della Toscana

REGIONE TOSCANA



S. P. A.



UNIVERSITÀ DEGLI STUDI FIRENZE

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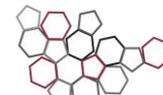
Aquarno



REGIONE AUTONOMA DE SARDIGNA
REGIONE AUTONOMA DELLA SARDEGNA



ISPRA
Istituto Superiore per la Protezione e la Ricerca Ambientale



Sistema Nazionale per la Protezione dell'Ambiente



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