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TEAP TS

**Agriculture Waste Pyrolysis and Thermocomposting
for Renewable Energy in Sustainable Agri-food Sector**

Liaison Webinar – AgriDataValue

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ABOUT

The **TEAPOTS** project represents a groundbreaking initiative funded by the European Union under Grant Agreement No. 101118296 through its HORIZON.2.5 - Climate, Energy and Mobility programme.

TEAPOTS aims to give agri-food players an innovative integrated, modular, and flexible solution to meet local and seasonal energy demand through the valorisation of lignocellulosic and difficult to be treated agricultural waste while producing biochar.

Start: January 2024

End: December 2027

Duration: 48 months



CONCEPT

The **TEAPOTS** project integrates **innovative technology** and **digital tools** to transform agricultural waste into renewable energy while supporting sustainable farming practices.

The concept rests on two main clusters:



TEAPOTS Integrated Solution (TIS)

= renewable energy system that uses agricultural waste to generate heat, electricity, and cooling, while converting waste into valuable biochar and compost.



TEAPOTS Digital Platform (TDP)

= digital platform offering tools to manage agricultural waste logistics, support local collaboration, and optimize eco-friendly waste management for cost-efficient operations.

CONCEPT



TEAPOTS Integrated Solution (TIS)

- The system converts agricultural waste into heat, cooling, and electricity while supporting energy independence, soil health, and sustainable fertilizer alternatives through biochar and compost.
- It combines **four technologies**:

1 Pyrolysis
Converts biomass into biochar and gas, producing energy while creating a valuable soil enhancer.

2 Compost Heat Recovery System (CHRS)
Captures heat during composting for energy use.

3 Organic Rankine Cycle (ORC)
Converts low-temperature heat into electricity efficiently.

4 Dry Cooler & Oil-free Air-Water Cooling System (DC & AWC)
Provides efficient cooling with minimal environmental impact.



CONCEPT



TEAPOTS Digital Platform (TDP)

- Empowers farmers as energy producers (prosumers).
- Supports regional development with tailored recommendations.
- Fosters precision agriculture, optimizing inputs like water and nutrients to maximize yields.

Integrated Database

Combines data from satellite imagery, field sensors, and TIS systems.

Prediction System

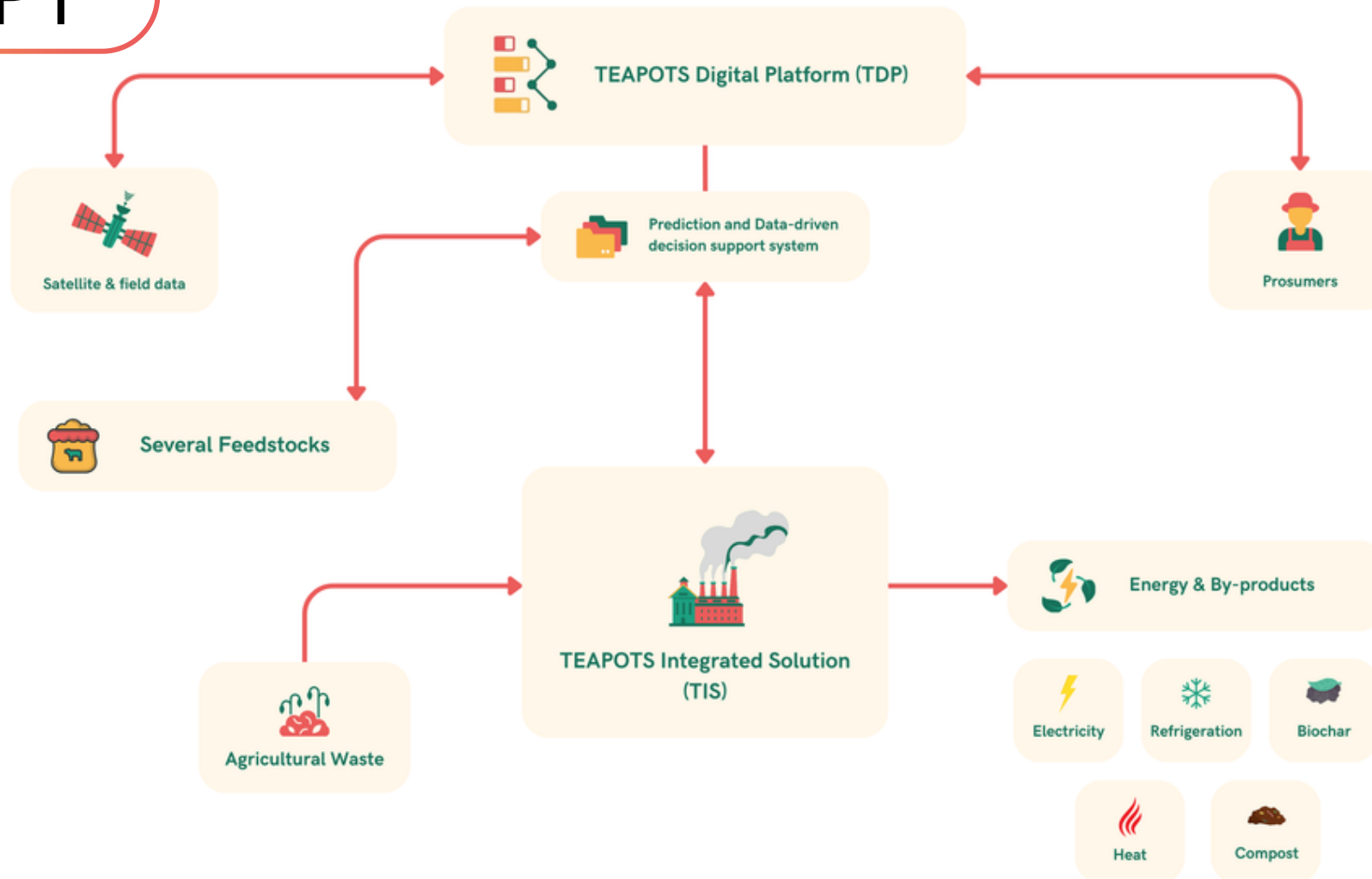
Models biomass yields, future availability, and logistics.

Decision Support System

Offers insights to farmers for efficient waste and energy management.



CONCEPT



The **TEAPOTS** approach represents a **modular, adaptable solution** that integrates cutting-edge technology and data to make agriculture greener, more efficient, and self-sufficient.

IMPACT

- ➔ Addresses up to **100% of farmers' energy needs** (electricity, heating, cooling).
- ➔ **Reduces 50% of greenhouse gas emissions** from agricultural waste and energy use.
- ➔ **Enhances biodiversity and soil quality** through sustainable practices.
- ➔ **Aligns with the EU Common Agricultural Policy (CAP) goals** for environmental and economic sustainability.
- ➔ Reaches over **350 farmers** and stakeholders and demonstrates scalability with **two pilot projects**.



PILOTS



ECO FARM Italy

- Develop the best strategy for energy independence and renewable energy production
- Utilize pyrolysis and ORC to produce biochar as an organic fertilizer, reducing chemical fertilizer use.



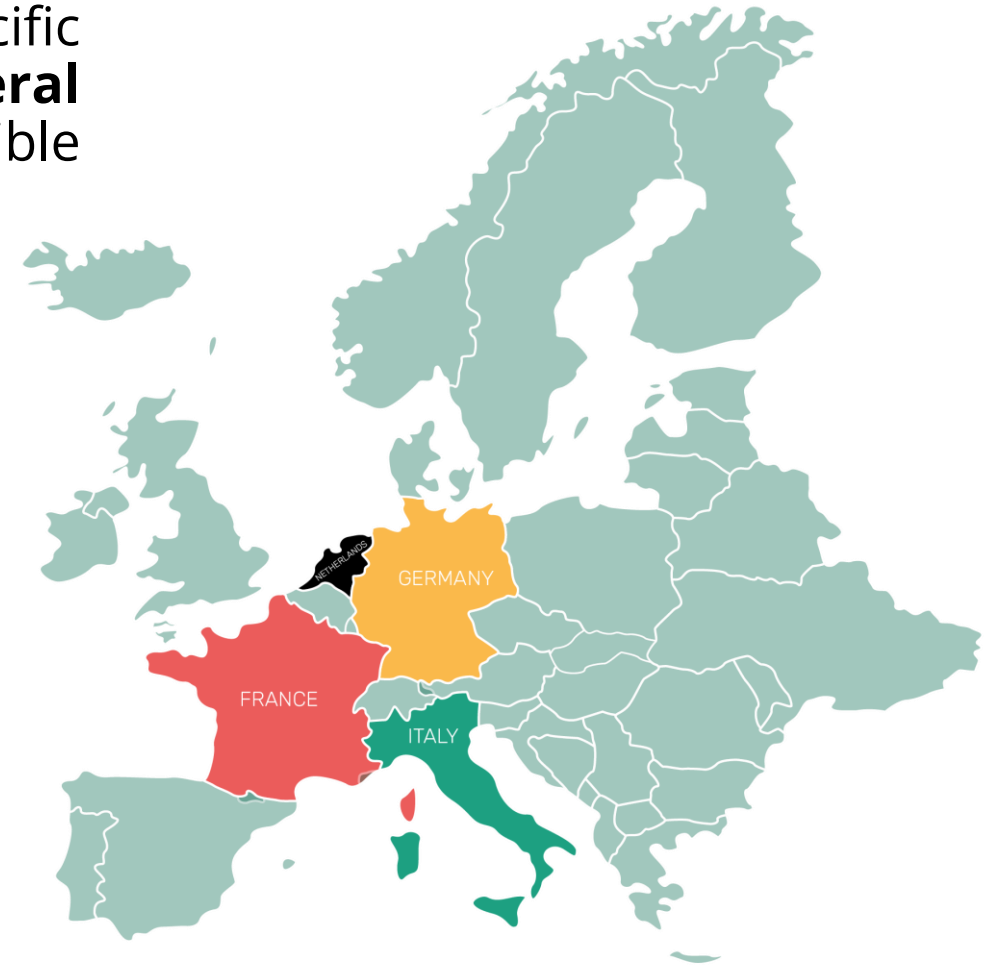
FILIA GHI Greece

- Utilizes local agricultural biomass for renewable electricity and cooling production
- Promotes biochar as an eco-friendly fertilizer for sustainable agriculture
- Develops a replicable model for green energy in the region.



Virtual Replications

- The digital replication will consider the specific environmental and economic conditions of **several parts of Europe** to analyse the possible implementation of the **TIS**.
- It will evaluate the results in different:
 - **Environments** (Germany, Netherlands)
 - **Feedstocks** (Italy, Germany, Netherlands)
 - **Dimensions of end-users** (France)



OBJECTIVES



Agri-waste management to meet end-users' seasonal energy demand



Decreasing the environmental impact of agriculture through waste management



Soil and biodiversity improvement



Technology development to meet farmers' economics



Farmers' empowerment as prosumers to increase societal impact



CONSORTIUM

- 16 partners from 7 different European countries



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TEAPOTS

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