



Practice Abstract 7: Intelligent Energy Management Algorithms for Optimising Farm Self-Consumption



COUNTRY AND CLIMATIC ZONE

Pan-European

CONTACT

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3 BENEFITS OF THE PRACTICE

- Enables real-time monitoring and control of energy flows in agro-communities.
- Optimises energy use and boosts self-consumption of on-farm renewable energy.
- Provides actionable insights through AI-driven forecasting and optimisation tools.

PRODUCTION SYSTEM

N/A

KEYWORDS

HarvRESt, RES, AI, Analytics

SUMMARY FOR PRACTITIONERS ON THE MAIN FINDING(S)/INNOVATIVE SOLUTION(S) – IN ENGLISH



HarvRESt is developing AI-powered algorithms and energy management tools to improve how farms generate, consume, and share renewable energy. These tools help maximise the use of on-site energy, reduce costs, and potentially support local energy trading.

LONGER DESCRIPTION – IN ENGLISH

In the second half of the HarvRESt project, a suite of smart energy system algorithms will be introduced to transform how agricultural communities manage and optimise energy performance. These algorithms form part of a wider energy intelligence platform that links on-farm renewable energy assets to a central HarvRESt cloud system.

The system begins by collecting data from distributed energy resources (DERs) via existing platforms in the project's Use Cases. This data feeds into the central HarvRESt cloud capable of:

- Forecasting local renewable energy generation and consumption
- Analysing energy usage trends over time
- Generating optimisation strategies to increase self-consumption and minimise energy losses

These strategies will be delivered through a user-friendly interface, with future integration possibilities for direct control of local energy assets.

Ultimately, the algorithms are being designed for scalability and adaptability across different farming contexts, allowing farms to both manage their internal energy flows more efficiently, and engage in profitable trading of surplus renewable energy within local or regional markets.

The approach aligns with broader EU energy and digitalisation goals by demonstrating how artificial intelligence can be embedded into everyday agricultural decision-making, enabling energy-aware farming practices.

ADDITIONAL DISSEMINATION AND COMMUNICATION MATERIAL(S)

Title/Description: HarvRESt Smart Energy System Algorithms (under development)

URL: https://eu-cap-network.ec.europa.eu/projects/harnessing-vast-potential-res-sustainable-farming_en#practice-abstract--172966