**Practice Abstract 8: The Agricultural Virtual Power Plant – Exploring Renewable Scenarios for Your Farm**



**COUNTRY AND CLIMATIC ZONE**

Pan-European

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**3 BENEFITS OF THE PRACTICE**

- Aggregates energy generation and storage resources from farms into a single virtual power plant.
- Enables participation in energy markets and improves energy self-sufficiency for rural communities.
- Offers a scalable and replicable model for decentralised energy coordination in agriculture.

**PRODUCTION SYSTEM**

N/A

**KEYWORDS**

Farming Decisions, Digital Tools, RES Integration

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

HarvRESt is creating an Agricultural Virtual Power Plant (AVPP) that enables farms to pool their renewable energy resources and act as a single coordinated energy unit. This helps maximise energy use locally, reduce costs, and allow participation in energy markets.

**LONGER DESCRIPTION – IN ENGLISH**

The HarvRESt Agricultural Virtual Power Plant (AVPP) is a forward-looking solution designed to enhance the role of farms and rural energy producers in the energy transition. The AVPP allows geographically distributed agricultural energy assets – such as solar panels, wind turbines, and batteries – to be managed as one unified entity.

This concept is drawn from the world of smart grids and decentralised energy systems, adapted to the unique conditions and operational rhythms of agriculture.

Key functions of the AVPP include:

- Real-time energy coordination across multiple farms
- Aggregation of surplus energy for local use or market participation
- Demand-response mechanisms to reduce strain on local energy infrastructure
- Integration with forecasting and optimisation tools from other HarvRESt components

By acting as a "virtual" utility, the AVPP helps rural communities collectively balance supply and demand, increase local energy resilience, and potentially generate income by selling surplus power back to the grid or other users.

From a technological standpoint, the AVPP uses a cloud-based control system with data input from smart meters, sensors, and predictive models. The system can send signals to individual farms, adjusting generation or storage behaviours based on network needs or price signals.

This innovation not only supports carbon neutrality goals but also creates a new space for farmers to be active participants in the energy economy – not just consumers, but smart producers and service providers.

**ADDITIONAL DISSEMINATION AND COMMUNICATION MATERIAL(S)**

Title/Description: HarvRESt Agricultural Virtual Power Plant (AVPP) architecture and use case report (forthcoming)

URL: TBD