ZERODEFECT4PV

Advanced Panel-Level Monitoring and Predictive Maintenance for Optimized Solar Plant Efficiency

> ZERODEFECT4PV project offers optimal panel-level monitoring by deploying Data Collection Units(DCU) linked via a mesh network

ZERODEFECT4PV offers a streamlined approach with prototype sensors, named Data Collection Units (DCUs), deployed on individual panels or clusters and linked via a mesh network for optimal panel-level monitoring. This master-slave architecture ensures seamless data transfer to the Energy Operations Center (EOC) and other analytic and storage components. Features, including a mathematical "toolbox", address data inconsistencies, promoting accurate forecasting. These innovations culminate in an assistant system designed to guide operators through large data volumes, offering actionable KPI-driven insights within the EOC environment.

The global imperative of transitioning the energy system to align with the objectives set forth in the Paris Agreement is clear and urgent. As the European Union aspires to pioneer this transformation, its ambition to be the first climate-neutral continent hinges upon the integration of key strategies.

ZERODEFECT4PV embodies the call's essence by using digitalization to innovate renewable energy management. With its dedicated consortium and pilots, it emphasizes the EU's dedication to sustainable energy.

Key points:

Relevance: We target pivotal solar plant monitoring inefficiencies, aiming for enhanced renewable energy accessibility and affordability.

Societal Impact: Our project bridges energy efficiency with broader societal and environmental benefits.

Innovation: We merge sensors with AI in an interdisciplinary method, perfectly aligning with the call's emphasis on groundbreaking energy solutions.

Benefits: Our approach is set to cut operational costs, enhancing the allure of solar energy investments.

Project Duration

01.02.2024 - 31.05.2026

Project Budget

Total Budget: € 867,000

Funding: € 719,000

Project Coordinator

BEIA Consult International S.R.L (Romania)

Project Partners

- INELSO (Turkey)
- Fraunhofer (Germany)

Project Website

https://zerodefect4pv.agile.ro/

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ERA-Net Smart Energy Systems

ERA-Net Smart Energy Systems Joint Call 2023 (MICall23)

This project has been awarded funding within the ERA-Net SES Joint Call 2023 for transnational research, development and demonstration projects.

This project has been funded by partners of the ERA-Net Smart Energy Systems (www.eranet-smartenergysystems.eu) and Mission Innovation (mission-innovation.net) through the Joint Call 2023. As such, this project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 883973.

Joint Programming for Flourishing Innovation – from Local and Regional Trials towards a Transnational Knowledge Community

www.eranet-smartenergysystems.eu

Main Objectives

- Development and testing of a state-of-the art integrated sensor prototype for large-scale photovoltaic systems
- Precise and redundant sensor data acquisition and AI-based evaluation to localize and classify faults and fault types
- Predictive detection of defects, failures and inefficiencies
- Prototypical realization and validation for a scalable adaptive system

Main Results

Technology

- Implementation of prototype sensors, known as Digital Control Units (DCUs),
- Integration of artificial intelligence to predict failures and plan maintenance proactively, optimizing operational efficiency and reducing downtime
- Comprehensive Control via the Efficient Operations Center (EOC)

Market

- Specifications and Implementation Guidelines for the development of products and services
- Market size for solar energy will reach USD 170.0 billion by 2024
- Targeting a 11 % share of this market by 2026

Adoption

- Dissemination and Sharing of Early Adopters' Experiences
- Pilot Implementations and Validation
- Communication and Dissemination Strategy