

1C4PV

One intelligent cloud for PV Assets Diagnosis and Maintenance

Project duration: from 02.2020 to 02.2022

Report submitted: 05.2021

Publishable Summary

1C4PV is an industry-driven demonstration project that will contribute to achieve the reduction of the total costs of photovoltaic (PV) generation and the Levelized Cost of Electricity (LCoE), providing advanced and automated functions for data analysis for the early fault diagnosis (detection and classification) and maintenance planning for PV assets. Those functions will be part of a cloud platform that collects data from the Supervisory Control and Data Acquisition (SCADA), Internet of Things (IoT), sensors and information systems, such as maintenance management or inspections and facilitates the decision making for optimum Operations and Maintenance (O&M). Machine learning algorithms and other artificial intelligence techniques are the back-bone of early and reliable fault diagnosis. As a result, 1C4PV will face the main challenges of the PV industry (LCoE reduction) through the optimization of O&M processes in PV plants while maximizing production using the available resources. The main KPIs to measure the project success are the expected O&M costs reduction by 10% and the increase of the Performance Ratio (PR) indicator by 3-4%. To achieve the project's objectives, the partners will bring on board their extensive experience and expertise in the field, starting the project from a leading position. The working plan includes the standardization of a prototype solution, the testing phase in laboratory and the demonstration in real operating environment.

The plan covers the following technical actions: analyse technologies and application, modelling PV plants and data characterization for multiple topologies, algorithms development for problem diagnosis and maintenance decision support systems.

The project consortium is well balanced with three actors covering the whole value chain: a specialist in information systems for monitoring and control of renewables (Isotrol, Spain), an O&M company for solar plants (Tegnatia, Turkey) and a Research Centre for PV generation optimization (FOSS - UCY, Cyprus).

Project consortium

Coordinator and all contact details:

Full name of organisation	ISOTROL SA
First and family name of coordinator:	Mr Jose Garcia Franquelo
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Participating countries and financing:

Country	Number of organisations involved	Project costs in EUR	Public funding in EUR
Spain	1	238'342	119'171
Turkey	1	91'154.83	53674.15
Cyprus	1	172'560	172'560
	3	502'056.83	345'405.15

Funding agencies involved and contracts

Funding Agency	Contract N° and Title
Centro para el Desarrollo Tecnológico Industrial (CDTI)	Project Number: EXP 00128042/ SERA-20201002 Title: 1C4PV_One Intelligent Cloud For Pv Assets Diagnosis and Maintenance
TUBITAK (The Scientific and Technological Research Council of Turkey)	Project Number: 9190050 Title: Intelligent cloud system for the failure detection and maintenance of PV Investments
Research and Innovation Foundation (RIF) of Cyprus	P2P/SOLAR/0818/0010 Title: One intelligent cloud for PV Assets Diagnosis and Maintenance Acronym: 1C4PV