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# SOLARIS PRESS RELEASE



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## SOLARIS MAKES THE MOST OF EVERY RAY

**SOLARIS is a Horizon Europe project that started in July 2024 for a duration of 4 years. Its main goal is to improve the performance, longevity, and operating costs of solar power systems across Europe and beyond.**

### Objectives and approach

Through transdisciplinary research, SOLARIS will develop **smart digital and physical tools** to help solar plant operators better predict weather and energy production, monitor equipment health, detect problems early, reduce maintenance costs and increase revenues.

To achieve this, the project follows a clear step-by-step approach structured around three data-driven pillars: **better forecasting** (to improve weather, solar production, and seasonal predictions), **AI energy management** (to optimise plant operation and energy trading), and **enhanced maintenance** (using smart sensors, drones, reconfigurable inverter architecture, and advanced diagnostics).

### Methodology

To turn its innovations into practical solutions for the solar industry, SOLARIS follows a structured five-step methodology.

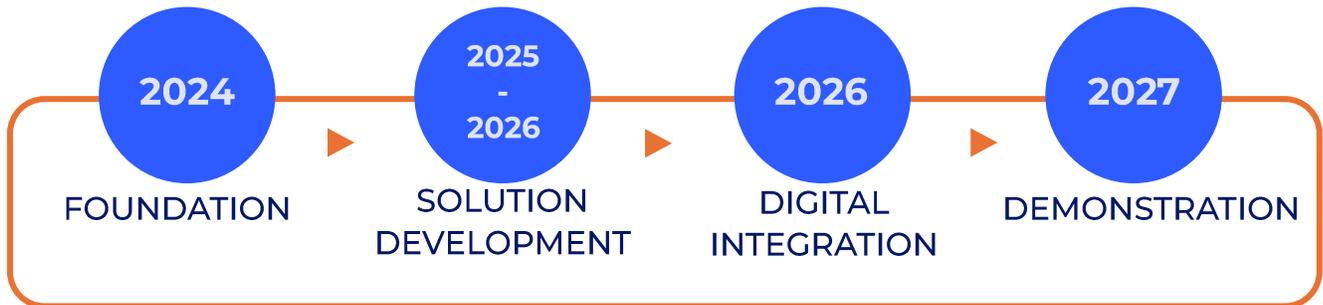
- 1- (2024) Agreement on technical specifications and design of secure data exchange and common data structure.
- 2- (2025-2026) Development of solutions that allow for:
  - More accurate forecasts of weather and solar power.
  - Smarter energy management.
  - Improved maintenance tools
- 3- (2026) Integration in three main digital solutions:
  - Comprehensive forecasting tool,
  - PV asset management software,
  - AI-based energy trading tool,



All data from these tools are collected in a central IoT platform.

4- (2027) Demonstration of the solutions in real conditions across Europe (ground-mounted, rooftop and agri-solar).

5- (2027) Assess the performance and prepare for market uptake



## Key achievements

SOLARIS achieved major advances in predictive capabilities for photovoltaic systems, enabling more accurate weather and power forecasts alongside a new approach to inverter lifetime monitoring.

The project also advanced practical technologies to better monitor, protect, and inspect PV plants.

- Smarter sensing for real PV plants: Development of a low-cost smart dust sensor that detects soiling in real time using infrared scattering. In parallel, work progressed on wind load sensors.
- Anti-soiling semi-permanent, water-based cleaning fluids: Semi-permanent, water-based cleaning fluids using sol-gel technology to reduce dust accumulation on PV modules. The best formulation increased surface water repellence significantly and achieved about **10% soiling reduction** in laboratory tests. Both hydrophobic (dry climates) and hydrophilic (rainy climates) strategies were validated, paving the way for reduced cleaning needs in the field.
- Drone inspection: Advanced daylight electroluminescence (EL) techniques demonstrated reliable defect detection in real operating conditions.
- Plug-and-play impedance diagnostics: Non-intrusive impedance sensor was created that can be retrofitted to existing PV converters without electrical disruption.



- Reconfigurable PV inverter: Validation of a novel fault-tolerant inverter architecture was conducted, dynamically redistributing electrical stress. Simulations show up to **23% lifetime improvement**, confirming the potential for higher availability and smarter predictive maintenance in future PV plants.

## About SOLARIS

The SOLARIS project brings together 15 partners from 8 EU countries, including universities, research centres, and specialised SMEs. Through transdisciplinary research, SOLARIS will develop smart digital and physical tools that help solar plant operators predict weather and energy production more accurately, monitor equipment health, detect problems early, reduce maintenance costs and increase revenues. The solutions will be tested across various types of solar installations, including rooftop, ground-mounted, and agricultural systems. The project ultimately aims to keep solar plants running more reliably (over 98% availability), improve their performance, and reduce the cost of solar electricity by 10%.

## More information

Website: [SOLARIS - Home](#)

Partners: [SOLARIS - Partners](#)

## Press contact

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