



SUSTAINABLE, HIGH-THROUGHPUT, INDUSTRY-READY, NEXT-GENERATION TECHNOLOGY FOR EUROPEAN MANUFACTURING LEADERSHIP IN PV

PROJECT FACTS

Start date: 01/01/2025

End date: 01/01/2029

Duration: 48 months

Project budget: € 12M

Grant agreement: 101172902

Call: HORIZON-CL5-2024-D3-01

Topic: HORIZON-CL5-2024-D3-01-01

HORIZON INNOVATION ACTION (IA)

CONTACTS

Project Coordinator

Dr. Victor Acinas (AMAT-IE)

victor_acinas@amat.com

Technical Coordinator

Dr. Marco Galiazzo (AMAT-IT)

Marco_Galiazzo@amat.com

Project and Dissemination Manager

Betina Debastiani Benato (ABIMI)

benato@amires.eu



CONSORTIUM

IE **APPLIED MATERIALS IRELAND LIMITED**
IT **APPLIED MATERIALS ITALIA SRL**
FR **CEA - COMMISSARIAT A L'ENERGIE ATOMIQUE ET AUX ENERGIES ALTERNATIVES**
DE **FRAUNHOFER GESELLSCHAFT ZUR FORDERUNG DER ANGEWANDTEN FORSCHUNG EV**
DE **HIGHLINE TECHNOLOGY GMBH**
BE **IMEC - INTERUNIVERSITAIR MICRO-ELECTRONICA CENTRUM**
FR **ARKEMA FRANCE SA**
AT **PCCL - POLYMER COMPETENCE CENTER LEOBEN GMBH**
EE **IPTE AUTOMATION OÜ**
BE **SOLTECH**
FR **HOLOSOLIS SAS**
SI **UNIVERZA V LJUBLJANI**
IT **ENGINSOFT SPA**
DE **KIWA PI BERLIN AG**
NL **TNO - NEDERLANDSE ORGANISATIE VOOR TOEGEPAST-NATUURWETENSCHAPPELIJK ONDERZOEK**
CZ **AMIRES THE BUSINESS INNOVATION MANAGEMENT INSTITUTE Z.Ú.**
IT **BEDIMENSIONAL SPA**

IMPORTANT FACTS

Project Overview: SHINE PV is an innovative project focused on advancing photovoltaic (PV) manufacturing technologies, particularly for Silicon Heterojunction (SHJ) and Tunnel Oxide Passivated Contact (TOPCon) solar cells. The project aims to develop alternative technological routes for three critical back-end manufacturing steps: **metallization**, **post-processing**, and **interconnection**. By implementing advanced equipment at Technology Readiness Level 7 (TRL7) with Industry 4.0 features, SHINE PV will enhance manufacturing efficiency, reduce costs, and strengthen the European PV supply chain.

Key Objectives

- Develop alternative PV production technologies to lower costs and reduce dependence on imported PV.
- Reduce silver (Ag) consumption by replacing it with copper (Cu), enabling large-scale PV production.
- Improve solar cell efficiency by 0.5% absolute while cutting overall cost of ownership (CoO) up to 10%.
- Demonstrate innovative processes and novel equipment in both virtual simulations and industrial pilot lines.

Technological Innovations

- **Metallization:** Introduction of parallel dispensing and plating as alternatives to screen printing, reducing Ag use by at least 20% and lowering metallization CoO by 15%.
- **Post-Processing:** Enhancing efficiency through Light Soaking (LS) and Edge Re-Passivation (ERP), recovering cutting-induced losses and increasing overall energy output.
- **Interconnection:** Adoption of Twill and Shingling interconnection methods, improving electrical performance, aesthetics, and reliability while reducing interconnection CoO by 5%.
- **Demonstration:** Integration of SHINE PV innovations at TRL7, including physical pilot lines, digital simulations, and validation within existing industrial production lines.

Impact and Benefits

- Strengthens Europe's position in PV manufacturing, reducing reliance on imports.
- Contributes to EU climate goals by supporting the transition to renewable energy.
- Enhances PV module efficiency and durability, increasing competitiveness with global PV technologies.
- Boosts European technological leadership in next-generation solar manufacturing.

Project Vision: SHINE PV aims to improve PV production by integrating cutting-edge materials, advanced manufacturing techniques, and Industry 4.0 technologies. By fostering innovation, the project supports Europe's ambition to achieve climate neutrality and energy independence while making PV technology more accessible and cost-effective.



SHINE PV has received funding from the European Union's Horizon Europe Research and Innovation Programme under grant agreement No 101172902.