# Spring SiLEAN

Dear reader,

Welcome to the spring edition of the SiLEAN project newsletter!

We're happy to share our latest progress, insights, and what's coming next on our journey, as the project is entering an exciting phase with significant progress and promising developments ahead.

Would you like to stay informed about the project's progress and achievements? Visit here to learn more about the project and subscribe to our newsletter.

Best regards,
the SiLEAN team

## Upcoming events

**3 June 2026**: SMARTIES Cluster Workshop 2026 - online

**28 June - 3 July 2026**: Photovoltaic Systems Summer School 2026, Delft, the Netherlands

**29 June - 1 July 2026**: PVCON, Ankara, Türkiye

**2 July 2026**: GA05, Ankara, Türkiye

## Key recent achievements

In the past six months, the SiLEAN project has made strong progress, delivering key results that support the transition toward more sustainable PV technologies:

**Energy yield simulations confirm strong performance of SiLEAN solar technology:**
The work, led by PV Works with support from TU Delft, 3SUN, and Forschungszentrum Jülich, compared a state-of-the-art SHJ reference module with two advanced concepts: a Transition Metal Oxide (TMO)–based module and a Transparent Passivating Contact (TPC)–based module. Simulation results across multiple climates show that the TMO- and TPC-based designs can match or outperform the current technology, achieving higher power output and comparable or improved energy yield. These findings highlight the strong potential of the SiLEAN concepts while supporting ongoing assessments of their performance and sustainability benefits. Read our detailed findings here.

**Europe's PV supply chains: New SiLEAN analysis highlights key risks and opportunities:**
A recent analysis led by TUD examined the supply chains of key raw materials used in PV modules, including silicon, silver, copper, bismuth, aluminium, and silica sand. The study highlights significant supply risks for silicon, driven by strong geographical concentration and Europe's reliance on external suppliers, particularly China, while materials like copper show greater resilience. The findings also reveal limited integration and contribution of European production within the PV value chain but point to clear opportunities to strengthen regional capabilities. The full report is available here.

**Advancing Indium-free contacts for sustainable SHJ solar cells:**
SiLEAN has achieved a key milestone in reducing the use of critical raw materials in silicon heterojunction (SHJ) solar cells by developing and testing indium-free transparent conductive oxide (TCO) alternatives. Materials such as ZnO, AZO, and especially sputtered SnOx were investigated, with fully indium-free devices reaching 22.0% efficiency. By introducing a thin ITO seed layer to improve contact resistivity, efficiency was further increased to a champion value of 23.4%, while reducing indium use by around 80% compared to conventional SHJ technology. These results mark an important step toward high-efficiency, lower-material PV devices, with further gains expected through advanced contact engineering and industrial scaling. Read the full report here.

## SiLEAN upcoming events

**Cluster workshop**

The SiLEAN, BURST, and TERASUN projects are jointly organising an online workshop on **Industrial Pathways to Scalable, High-Performance Silicon PV** on **3 June 2026 (09:00–12:00 CET)**.

The event will explore how next-generation silicon PV technologies can be scaled to terawatt-level manufacturing, with a focus on interfaces, metallisation, and wafer innovations compatible with SHJ and TOPCon industrial platforms.

The programme will feature contributions from leading European PV initiatives and conclude with a high-level roundtable on industrial scaling challenges and supply chain resilience. Info and registration here.


**PVCON 2026**

Our partner **ODTÜ-GÜNAM** is organising the **Photovoltaic Conference PVCon 2026** in Ankara, Türkiye, taking place from **29 June to 1 July 2026**. This international event will bring together researchers, industry experts, and policy stakeholders to discuss the latest developments across the full spectrum of photovoltaics, from advanced cell and module technologies to system-level innovation,

sustainability, and digitalisation.

Abstract submissions are open until **30 April 2026**. More information and registration details are available on the PVCon website.

## Meet the people behind SiLEAN

Curious to learn more about the teams driving the SiLEAN project forward? Our website regularly features “Coffee Break” interviews with project partners, sharing their insights and experiences.

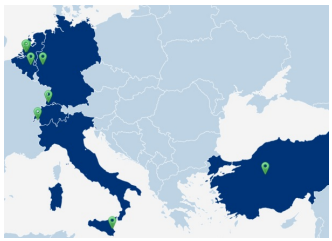
Check out the latest conversations with **Malte Vogt - TUD**, **Miro Zeman - PVW** and **Valerie Depauw - imec**.


Stay connected and follow our journey! SiLEAN has an official LinkedIn page, where you’ll find regular updates on the project, events, and partner activities. Follow us also on LinkedIn and never miss an update!

## SiLEAN as a Consortium

### Project Partners

SiLEAN brings together a multi-disciplinary consortium with three research institutes, one university, four SME's, and one industry partner located in 6 countries including Germany, Belgium, the Netherlands, Italy, Türkiye, and Switzerland, to develop advanced innovations in sillicon heterojunction solar cell technology.



JÜLICH Forschungszentrum · imec · TU Delft · UNIRESEARCH · NEXWAFE · PV Works · GraphEnergyTech · 3SUN · ODTÜ GÜNAM

### Facts & Figures

Acronym: SiLEAN
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