Dear reader,

Welcome to the third newsletter of the SiLEAN project, the Autumn edition!

Having reached the halfway point of the project, 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.

Results Achieved

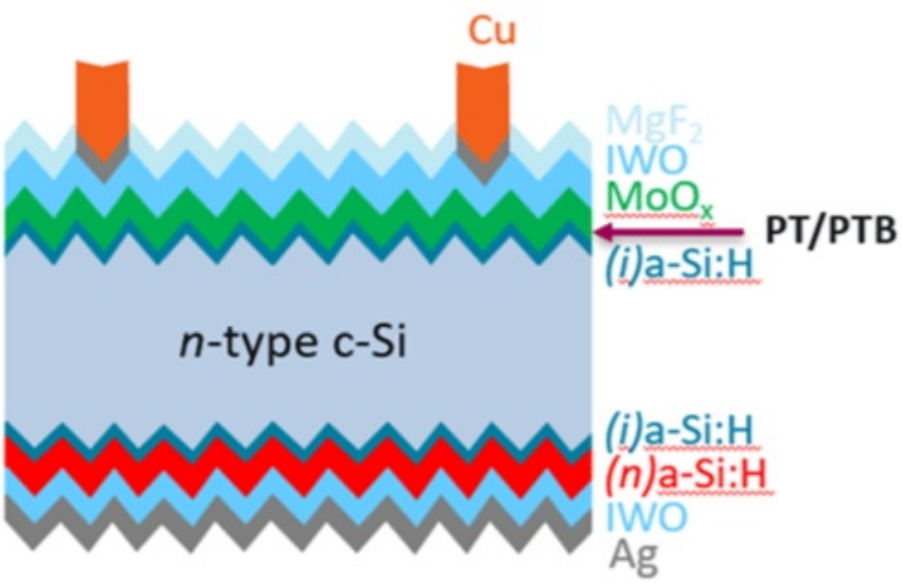
Over the past six months, the SiLEAN project has reached several important technical milestones, driving progress toward more sustainable PV technologies:

- **Resource-Efficient Solar Technology:** At the core of the SiLEAN strategy is the substitution of traditional, energy-intensive silicon wafers with **epitaxially grown wafers** from NexWafe. This innovation aims to lower energy consumption and material use while maintaining high performance. The full results are available here!

- **Innovative contact materials for high-efficiency SHJ solar cells**: A key focus of the project is developing alternatives to conventional silicon-based thin-film layers in silicon heterojunction (SHJ) solar cells. These efforts aim to reduce energy losses, improve light transmission, and boost overall cell efficiency.

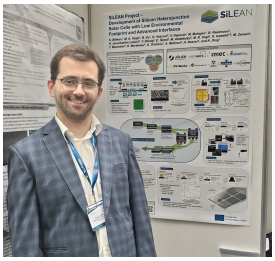
  Researchers at Forschungszentrum Jülich have focused on **Transparent Passivating Contacts (TPC) design.** This architecture combines an ultra-thin (< 1.5 nm) silicon tunnel oxide layer with hydrogenated nanocrystalline silicon carbide layers, achieving highly homogeneous and efficient passivation on industrially relevant wafers. Read our detailed findings here.

  In parallel, project partner TU Delft is exploring **Transition Metal Oxides (TMOs)** such as molybdenum oxide as transparent, high-performing alternatives to doped silicon layers. These materials can improve hole selectivity and transparency, supporting higher efficiency in SHJ solar cells. Have a look at our report here.



SiLEAN at EUPVSEC and upcoming events

In September, partners from **FZJ**, **TUD**, and **IMEC** proudly represented SiLEAN at the **EUPVSEC conference in Bilbao**, showcasing the project's latest advances in sustainable photovoltaic



technology.

Come meet us at these upcoming events:

The SiLEAN team will be sharing insights and results at several key events this autumn:

- Metallization and Interconnection Workshop, Berlin- October 2025 (presentation by IMEC)
- IPV conference, Florence - November 2025
- Silicon heterojunction workshop - December 2025

We look forward to meeting colleagues, partners, and new collaborators at these events.

SMARTIES Online Cluster Workshop

Following the success of our last SMARTIES workshop, *"Advanced concepts for high-efficiency crystalline silicon technology: how to ensure affordability, security of supply, and sustainability of PV technologies,"* we're excited to announce that a **new edition is planned for early 2026**!

The event will once again bring together researchers, industry experts, and policymakers to discuss European initiatives and the future of sustainable, affordable PV technologies. You can stay up to date by following SiLEAN on LinkedIn for announcements and event details.

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 **Thomas Baumeler (GET)** and **Engin Özkol (TUD)**!

GraphEnergyTech

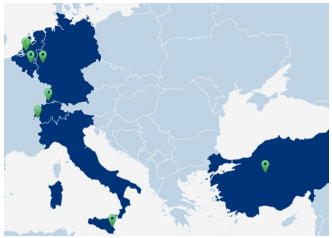
TU Delft
Delft University of Technology

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, Turkey, 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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Start date: 1st May 2024
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