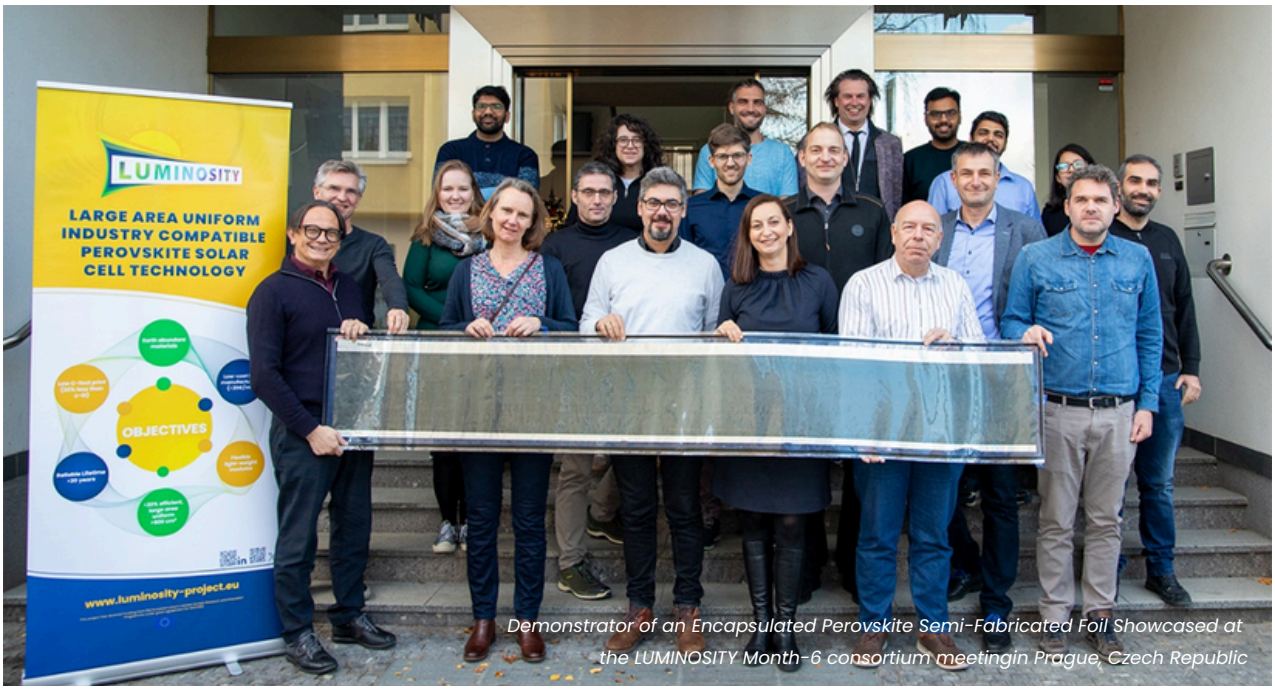
Press Release

LUMINOSITY

LIGHTING THE PATH TO A BRIGHTER SOLAR FUTURE



Demonstrator of an Encapsulated Perovskite Semi-Fabricated Foil Showcased at the LUMINOSITY Month-6 consortium meetingin Prague, Czech Republic

To combat climate change, the European Union has set a clear goal of achieving net-zero greenhouse gas emissions by 2050. Solar energy, especially photovoltaics, is a crucial part of this strategy, offering one of the most cost-effective and sustainable energy solutions. It is increasingly integrated into Europe's energy landscape, reducing dependence on fossil fuels and cutting CO2 emissions. Emerging technologies, such as perovskite photovoltaics, promise to accelerate this transition by delivering higher efficiency, greater flexibility, and a significantly lower environmental impact than traditional solar technologies.

Here comes the role of the LUMINOSITY project, which aims to drive forward flexible perovskite solar cell technology. Supported by the Horizon Europe programme, the project focuses on scaling up perovskite production for industrial manufacturing. Over 4 years, LUMINOSITY will develop modules with a surface area of more than 900 square centimetres, targeting high efficiency (over 20%), minimal efficiency loss, and a projected lifespan exceeding 20 years.

By using established industrial methods like roll-to-roll manufacturing, LUMINOSITY aims to boost the industrial production and commercialization of perovskite photovoltaics. The project seeks to strengthen Europe's technological expertise in the PV sector while keeping the final cost of the modules below €20 per square meter, ensuring an affordable and competitive product for the market.

> *"Flexible perovskite solar cell solutions are being developed across Europe, with lab efficiencies reaching 26% under controlled conditions," said Dr. Ilker Dogan, Team Lead & Senior Scientist at TNO. "In scenarios, where scalable materials are implemented, efficiencies of around 21% have been achieved, but these are limited to small-scale formats. With LUMINOSITY, we aim to advance the technology to a readiness level (TRL) of 7, opening new opportunities for widespread commercialization."*

The LUMINOSITY team brings together Europe's leading experts in R&D for perovskite solar cells. It includes top research institutions and leading machine builders, specializing in module production, laser scribing/processing, and vacuum technologies. This collaboration ensures cutting-edge expertise and innovation across all stages of production.

Just six months after the project began, the LUMINOSITY consortium has already made a significant achievement. The team's first demonstrator showcases their motivation and goal-oriented approach, presenting a successful R2R-coated, semi-fabricated perovskite stack with a surface area of 6000 cm².

The coated foil, measuring 2.5 meters in length and covering around 7500 cm², was encapsulated into a 3-meter-long demonstrator. This perovskite semi-fabricated foil was produced using advanced R2R techniques: R2R Atmospheric Pressure Chemical Vapor Deposition (APCVD) at HyET Solar, R2R Slot-Die Coating (SD), and R2R Encapsulation at TNO.

LLUMINOSITY prioritizes environmental sustainability by striving to develop a fully circular product with an environmental impact less than half that of current crystalline silicon solar panels. The project's life cycle analysis will focus on scaling up the commercial production of perovskite solar panels at high volumes. The initiative remains dedicated to incorporating environmental considerations into every stage of development and manufacturing.

Looking ahead, LUMINOSITY is committed to advancing perovskite solar technology while supporting Europe's strategic goals for energy independence and sustainability. With a solid foundation and collaborative expertise, LUMINOSITY aims to drive innovation in photovoltaics, contribute to the EU's energy transition, and help achieve crucial climate targets, bringing the future of sustainable solar technology within reach.

About LUMINOSITY "Large area uniform industry compatible perovskite solar cell technology"

The project LUMINOSITY has started on 1st June 2024 and will run 48 months.

The project has received funding from the European Union's Horizon Europe Research and Innovation Programme under grant agreement No 101147653.

LUMINOSITY consortium consists of 15 European partners, including research organisation, universities, and private companies: Helmholtz-Zentrum Berlin für Materialien und Energy GmbH, Fraunhofer Institut für Elektronenstrahl- und Plasmatechnik FEP, Consiglio Nazionale delle Ricerche, HyET Solar B.V., Technische Universiteit Eindhoven, Lunds Universitet, Technische Universiteit Delft, AMIRES, The Business Innovation Management Institute, z.ú., InfinityPV ApS, VON ARDENNE GmbH, Universiteit Hasselt, LPKF SolarQuipment GmbH, Cyprus University of Technology, Eidgenossische Materialprufungs- und Forschungsanstalt (Empa).

The project coordinator is the Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek-TNO, the Netherlands.

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