

Advanced materials solutions and architectures for high efficiency solar energy harvesting

Proposals should develop durable materials solutions for novel high efficiency solar (PV or CSP) technologies, to enhance system conversion efficiencies, while preserving lifetime and ensuring materials resource efficiency. Activities related to concentrated PV are out of scope of this topic. Research efforts must focus on delivering advanced materials (including but not limited to particles, thin films, nanostructures, heat transfer fluids, phase change materials and receptors), and/or their combinations into innovative device architectures. The proposed solutions need to demonstrate their added value in terms performance or unique application options and their viability in terms of manufacturability, yield and stability. Finally, the high efficiency concepts should be assessed for technical and economic viability and developed towards readiness for upscaling the materials production.

This topic calls for proposals with focus on advanced materials solutions and architectures. A complementary topic is published in the “Secure, clean and efficient energy” part of this Work Programme (LCE 7a/b-2016-2017: Developing the next generation technologies of renewable electricity and heating/cooling), calling for proposals on solutions with a technology-approach.

The implementation of this topic is intended to start at TRL 4 and target TRL 6.

The Commission considers that proposals requesting a contribution from the EU between EUR 3 and 5 million would allow this specific challenge to be addressed appropriately. Nonetheless, this does not preclude submission and selection of proposals requesting other amounts.

High efficiency solar energy harvesting (high-efficiency photo-voltaics (PV) or concentrated solar power (CSP)) is an important building block in installing a secure, competitive and sustainable energy system. Increased efforts have to be made to

make these technologies cost competitive under suitable electricity market conditions. Novel functional materials and material combinations throughout the solar system manufacturing chain enhance the efficiency of solar energy harvesting beyond that of the current state-of-the-art technologies. These new materials and processes allow the European materials supply sector to expand its industrial leadership towards the next generation of solar energy harvesting which is expected to reach the markets beyond 2020.

The performance levels of the proposed materials solution(s) should be in line with those specified in relevant parts of the SET-Plan Integrated Roadmap and its Annexes, available at <https://setis.ec.europa.eu/set-plan-process/integrated-roadmap-and-action-plan>

- A deeper understanding of the material and interface characteristics and their long-term performance;
- The demonstration of device designs and fabrication processes for high efficiency technologies of at least 22% efficiency at cell level and above 18 % efficiency at module level;
- The demonstration of material manufacturing readiness to accomodate emerging and/or novel high efficiency technologies with a potential levelized cost of electricity of 0.05 – 0.10 €/kWh (PV) for an irradiation range of 2000 – 1450 kWh/(m²a) and 0.10 – 0.15 €/kWh (CSP) for a direct normal irradiation in the range of 2700 – 2100 kWh/(m²a) in 2020.

Proposals should include a business case and exploitation strategy, as outlined in the Introduction to the LEIT part of this Work Programme.

Última actualización: 12 Abril 2024

Permalink: https://cordis.europa.eu/programme/id/H2020_NMBP-17-2016/es

European Union, 2025