Press Release
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REVOLUTIONISING SOLAR FUEL PRODUCTION WITH THE S2B PROJECT

HIGHLIGHTS:

A new Horizon Europe research and innovation project, S2B—Solar 2 Butanol, has been launched to transform solar fuel production through cutting-edge biotechnology. The project, funded with a €4 million grant under the Horizon Europe Cluster 5 program, brings together eight partners to develop an innovative, sustainable platform for producing butanol, a valuable solar fuel, using photosynthetic cell factories.

S2B represents a significant breakthrough by developing the next generation photosynthetic microbes that efficiently produce butanol, shifting conventional microbial suspensions to an artificial leaf architecture. This innovative approach enhances the efficiency and longevity of solar-driven biocatalysis, making the process far more effective. The project aims to drastically improve the production of n-butanol, a versatile fuel and chemical feedstock, using engineered cyanobacteria and sunlight.

A GAME-CHANGER IN RENEWABLE ENERGY:

In response to the growing need for clean energy and the European Union's goal of reaching net-zero greenhouse gas emissions by 2050, S2B offers a solution that bypasses the limitations of traditional biofuel production methods. Unlike conventional biomass, which competes with food resources and has supply constraints, the S2B platform leverages sunlight and atmospheric CO_2 to generate butanol, ensuring zero net carbon emissions during combustion.

"Our key technological innovation is a continuous, long-term platform for direct solar butanol production, using advanced photosynthetic cell factories as biocatalysts. The S2B technology will enhance energy conversion efficiency while being sustainable, reducing production costs and ensuring affordability. At the final stage, we plan to integrate this process with waste effluent and a direct air capture approach. This circular economy concept covers the entire value chain from light harvesting and CO_2 capture to butanol separation." explains Professor Yagut Allahverdiyeva-Rinne, the consortium coordinator.

AMBITIOUS GOALS FOR A SUSTAINABLE FUTURE:

Over the next four years, S2B will:

- Engineer cyanobacterial strains with superior CO_2 conversion and light-harvesting capabilities.
- Create 3D-printed living materials embedded with photosynthetic cell factories capable of long-term n-butanol production.
- Enhance cell factories' longevity and light distribution tailoring scaffold materials.
- Assess the economic and environmental viability of the butanol production value chain in diverse European climates.

This cutting-edge research has the potential to significantly impact the future of solar fuel technologies, offering both environmental and economic benefits. The successful demonstration of S2B's platform will bring Europe closer to a sustainable, renewable energy future.

The project was officially launched on November 7th, 2024, at the University of Turku, marking the beginning of a transformative journey in renewable energy.

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Figure 1 : The S2B consortium in Turku for the project kick-off

A PROJECT GATHERING KEY ACTORS ON THE FIELD:

S2B gathers together 8 partners, coordinated by Turku University (Finland) and, more especially, Yagut Allahverdiyeva-Rinne:

- Nantes Université (France)
- Kungliga Tekniska Högskolan (Sweden)
- Åbo Akademi University (Finland)
- The Vrije Universiteit Amsterdam (The Netherland)
- The University of Twente (The Netherland)
- Lappeenranta–Lahti University of Technology (Finland)
- Erdyn Consultants (France)

Duration: 48 months (October 2024 – September 28) | Total budget: 4 015 911€

For more information : https://cordis.europa.eu/project/id/101172911
https://www.utu.fi/en/news/press-release/new-project-coordinated-by-the-university-of-turku-receives-over-eu4-million-in

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