Research content for the short video SolaH2r_ Utopia 2023

"Imagine a FUTURE where SUN fuels life ... directly with the new PHOTOCATALYTIC COLLECTOR"

Student Statement: "This video demonstrates a new technology that can be used to obtain hydrogen directly through sunlight and what areas this could be useful for."

Hydrogen directly from the sun moves ships, among other things, in a climate-neutral manner

The use of green hydrogen is a key building block in the future energy system as energy storage as well as an energy vector also for future marine and aviation.

So far, work is underway to produce hydrogen in sunny and windy parts of the world using PV and wind power via electrolysis and then convert it, e.g. as synthetic fuels. This is costly and inefficient.

In the future, direct photocatalytic production of hydrogen without electrolysis will be used, a game changer for the important building block of the energy system of the future.

Trials are underway at AEE Intec for this purpose. This means that in addition to solar collectors (heat), PV systems (electricity), solar reactors (hydrogen) will now be possible in the future. The overall efficiency increases massively with decreasing costs.

Shipping is indispensable in the global economic and transport system, but is one of the world's largest CO2 emitters. 90 percent of large ships still use heavy oil as fuel.

Austria, a landlocked country, has the potential to put global shipping on a new green path and reduce emissions by 97 percent: green hydrogen is used as liquid methanol on the ship, the resulting CO2 is captured, stored on the ship, and reused on land for the production of methanol (i.e., used in a cycle).

Research in Green Tech Valley:

Hydrogen COMET Center HyCentA

Large Engines Cometence Center LEC

Photocatalytic hydrogen production AAE INTEC

Decarbonization of shipping LEC

Update 2026: www.soleas-project.eu

SOLEAS is a groundbreaking research initiative focused on developing innovative solar photoreactors that harness sunlight to produce sustainable energy and energy carriers for the production of materials. Our technology represents a significant step forward in renewable energy solutions, addressing the global challenge of sustainable chemical-energy production.
Through cutting-edge research and development, we are pioneering methods to convert solar energy directly into chemical energy stored in molecular bonds. This approach offers a clean, sustainable alternative to traditional fossil fuel-based ammonia and ethene production.

Our project brings together leading scientists and industry partners from across the EU, combining expertise in photochemistry, materials science, chemical engineering, and process technology.