Pioneering approach uses soap films and sunlight to generate sustainable fuels

Producing renewable solar fuels by artificial photosynthesis is a promising solution to tackle the energy problem. By mimicking photosynthesis, researchers can produce sustainable fuels out of sunlight, water and CO2. The EU-funded SoFiA project is developing an innovative approach that involves soap films. The concept mimics the light-sensitive part of leaves called the thylakoid membrane and uses molecular catalysts made from ruthenium and earth-abundant materials to form self-assembled catalytic surfaces at the junction between soap bubble pairs. Researchers plan to scale the technology by designing a stream of regenerative soap bubbles that can handle large volumes of gas, continuously flowing through a conduit exposed to light.
We propose a radical breakthrough by developing economically viable solar fuel production technology, exploiting the surfactant self-assembly & proton transport properties of soap films. Producing renewable solar fuel by Artificial Photosynthesis (AP) is globally recognized as a promising solution to modern energy & environmental crisis with decisive social impacts, but there are critical roadblocks in technology development. SoFiA aims to initiate & consolidate a baseline of feasibility for soap film based AP technology and its future uses by establishing the essential proofs-of principle & foundational scientific underpinnings. We propose the concept of an economic artificial photosynthetic membrane in form of soap film with photocatalytic functional surfaces, formed at the junction between dis-symmetric soap bubble pairs. Our technology is made scalable by the design concept of a dynamic stream of regenerative soap bubbles capable of handling large volumes of gas, continuously flowing through a light exposed conduit. SoFiA bridges three mutually exclusive disciplines of surfactant science, renewable energy and fundamental science of water at nanoscale, supported by micro-systems engineering, and by actively engaging artists who are working with large soap film installations. The high risk is countered by engaging pioneering scientists and globally leading young researchers in an interdisciplinary research plan. An External Advisory Board composed of program managers from large industry and EU policy experts will guide the research deliverable towards commercial exploitation. Our long-term vision is to decisively alter Europe’s position in the world economic map as the leading green energy producer. Developed technology will be jointly exploited by European energy and detergent industries, kick-starting new ventures & production facilities. Major environmental impact is expected as SoFiA is devoted to transform the primary greenhouse gas (CO2) into fuel.
Call for proposal

H2020-FETOPEN-2018-2020

See other projects for this call

Sub call


Funding Scheme

RIA - Research and Innovation action

Coordinator

UPPSALA UNIVERSITET

Net EU contribution

€ 700 562,50

Address

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Sweden

Region

Östra Sverige > Östra Mellansverige > Uppsala län

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation Website Participation in EU R&I programmes HORIZON collaboration network

Other funding

€ 0,00

Participants (8)
THE CHANCELLOR MASTERS AND SCHOLARS OF THE UNIVERSITY OF CAMBRIDGE

United Kingdom
Net EU contribution
€ 478 342,50

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Activity type
Higher or Secondary Education Establishments

Links
Contact the organisation  Website  
Participation in EU R&I programmes  HORIZON collaboration network

Other funding
€ 0,00

UNIVERSITEIT LEIDEN

Netherlands
Net EU contribution
€ 477 500,00

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Activity type
Higher or Secondary Education Establishments

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Participation in EU R&I programmes  HORIZON collaboration network
STICHTING NEDERLANDSE WETENSCHAPPELIJK ONDERZOEK INSTITUTEN
Netherlands
Net EU contribution
€ 465 000,00
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Activity type
Research Organisations
Links
Contact the organisation  Website  Participation in EU R&I programmes  HORIZON collaboration network
Other funding
€ 0,00

UNITED NATIONS EDUCATIONAL SCIENTIFIC AND CULTURAL ORGANIZATION
France
Net EU contribution
€ 160 000,00
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Activity type
Research Organisations
Links
Contact the organisation  Website  Participation in EU R&I programmes
POLITECNICO DI TORINO

Italy

Net EU contribution

€ 291,375,00

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Region

Nord-Ovest > Piemonte > Torino

Activity type

Higher or Secondary Education Establishments

Links

Contact the organisation
Website
Participation in EU R&I programmes
HORIZON collaboration network

Other funding

€ 0,00

MICROFLUIDIC CHIPSHOP GMBH

Germany

Net EU contribution

€ 266,250,00

Address

Stockholmer Strasse 20
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SME

Yes

Region

Thüringen > Thüringen > Jena, Kreisfreie Stadt

Activity type

Private or profit entities (excluding Higher or Secondary Education Establishments)
Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links
Contact the organisation Website Participation in EU R&I programmes HORIZON collaboration network

Other funding
€ 0,00

TECLIS INSTRUMENTS
France
Net EU contribution
€ 366,250,00

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22 Chemin Des Pres Secs
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SME Yes

Region
Auvergne-Rhône-Alpes > Rhône-Alpes > Rhône

Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links
Contact the organisation Participation in EU R&I programmes HORIZON collaboration network

Other funding
€ 0,00

UASABI INOVEYSHANS
Bulgaria
Net EU contribution
€ 0,00

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SME  
Yes

Region
Югозападна и Южна централна България > Югозападен > София (столица)

Activity type
Private for-profit entities (excluding Higher or Secondary Education Establishments)

Links
Contact the organisation
Participation in EU R&I programmes
HORIZON collaboration network

Other funding
€ 30 000,00

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