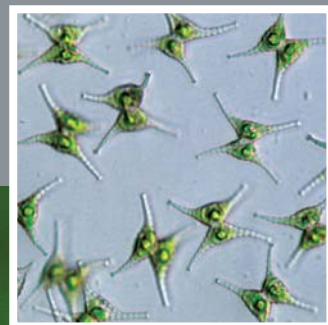


# Solar Fuels

Next generation clean renewable fuels  
from microalgae



Centre for  
Solar Biotechnology



# The initiative

*Third-generation solar biofuels from microalgae may be the way of the future*

## VISION

To develop advanced algae and bioinspired artificial photosynthetic systems that tap into the huge energy resource of the sun, and to drive the production of cost-competitive solar fuels.

Currently, 80% of global energy is used in the form of fuel and only 20% as electricity.

Advanced renewable Solar Fuel systems can produce crude bio-oil, diesel, jet fuel, ethanol, methane and hydrogen.

Solar fuels are urgently needed to minimise global CO<sub>2</sub> emissions and maintain fuel security.

**The US\$119 trillion global economy is powered by a US\$6 trillion energy sector. Of this energy, 80% is used in the form of fuel. Only 20% is in the form of electricity.**

Global energy demand is forecast to increase a further 50% by 2050 due to the rise in population from 7.4 to 9.6 billion people and an increased standard of living. Simultaneously CO<sub>2</sub> emissions will have to be reduced by ~80% to safeguard climate, social and political stability.

Over 3 billion years, microalgae have evolved intricate solar interfaces that contain the photosynthesis nano-machinery. This taps into the huge energy resource of the sun (~2,600 times the global energy demand) and uses this solar energy, along with CO<sub>2</sub>, to produce the food, fuel and atmospheric oxygen that supports life on Earth.

Microalgae feedstocks can be used for a wide range of advanced fuels on non-arable land, including crude oil, biodiesel, jet fuel, ethanol, methane and even solar-driven hydrogen from water.

The Solar Fuels initiative builds on synergies of biology, engineering and economics to increase system efficiency and drive down fuel production costs. Process development is enabled by structure guided design as well as sophisticated techno-economic and life cycle analysis to fast track systems optimisation, de-risk scale up and develop commercial business models.



Algae can produce a range of fuels.  
Top: Biodiesel. Middle: Methane.  
Bottom: Solar driven hydrogen production from water.

For more information please contact us.

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