

Algal Biofuels: Full Bloom or Dead in the Water?

Policy Lates Debate Summary

November 2013

Our recent Policy Lates event set out to discuss the future of Algal biofuels and included talks and audience discussion from researchers, policy makers and industry.

Global attempts to control greenhouse gases have encouraged the use of greener energy sources such as solar and wind power, however many of these renewable energy sources are not particularly useful for the transport sector. Our first speaker Olly Chadwick from the Department for Transport explained that 25% of energy used by the UK was in the transport sector and that this was the hardest to decarbonise. Biofuels; fuel typically derived from crops such as corn or soy, can be used as renewable transport fuels but require land and water resources, which are already in high demand. Algae grown in bioreactors or seaweed grown at sea would circumvent the land use issue, but will algae ever become a major source of biofuel?

A recurring theme throughout the talks was that the high cost of production means that algal biofuels are not currently economically viable. Crude oil is a cheap and abundant resource, and we need around 80 – 90 million barrels every day; growing enough algae to compete with this would be an expensive task. Andrew Spicer (Scientific Director of Algenuity) was keen to mention that the poor economics has resulted in many algal biofuel companies to use their algae to produce higher value, more economical products such as food supplements and cosmetics instead of fuel.

Several of the speakers discussed lowering costs by growing algae on waste gases or water. Algae grown on waste gases from a power station could then be made into biofuel or high value products essentially turning waste into profits. Michele Stanley (Scottish Association of Marine Sciences) discussed integrating seaweed farms with other aquaculture such as fish farms. Fish farms are not used all year round, so growing seaweed for biofuel or other products could help the farm owners turn a bigger profit.

Prof Rod Scott (University of Bath) believes the costs of large scale bioreactors will always be too high and that cheaper open pond systems are a more credible option for large scale algae production. He proposes that carefully selected or engineered algal strains could be able to resist contamination when in an open pond system thus dramatically lowering the costs.

Technologies such as genome editing will soon allow us to engineer new strains of algae that are ideal suited from commercial applications. Before these strains can be grown in an open pond system a discussion on the laws and definitions of GM needs to take place, so that the use of these strains will not be impeded in the future.

To round off the talks Duncan Eggar reminded scientists not to over promise on the potential of their discoveries, since failure to deliver on over ambitious claims would lower public trust in science.

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The discussion highlighted a strong future for algae research, particularly for treatment of wastes and production of high value products. However the economics and volumes required mean that algae biofuels will only ever make a small contribution to the UK transport fuels market. The future of transport fuel is likely to require a diverse range of biofuel crops combined with energy efficient vehicles and infrastructure.