The Ascent of Australian Algae

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The story of biofuels in Australia is not a straight forward one. The conventional biofuels industry collapsed in 2006 and has continued to decline ever since. Whilst the rest of the world is focussing on the great promise of cellulosic biofuels, as detailed elsewhere in this publication, Australia appears uninterested. However, there is one area of biofuels in which Australia has a presence in the leading pack of global developers: the integration of carbon capture and algae biofuels.

The Collapse of Conventional Biofuels

For the couple of years to the middle of 2006, conventional biofuels was a booming sector in Australia. There were ten or so IPOs and investors were seeing great promise being driven by rising oil prices, increasing regulatory drivers, plentiful feedstock and abnormally high rates of return. Sadly, those rates were indeed abnormal. In 2006, two of these drivers collapsed: the drought started to hit crop and tallow feedstock prices squeezing margins; and the government support fell away with the announced removal of the fuel rebate that had made biofuels cheaper than diesel.

As an indication of this demise, the ACT Biofuels Index has shown a steady and depressing decline since 30 June 2006 when it was established. From its starting point of 100, it fell to 53.8 over the first twelve months, to 23.9 by June 2008 and to a mere 9.5 by June 2009. At the end of January 2010, the Biofuels Index had made a modest recovery and sat at 13.8, following some successes by Mission NewEnergy, with its diverse Asia-centric strategy as detailed on page ???.

The No-show of Cellulosic

It is unclear as to why there has been little development in cellulosic technologies in Australia. There are pockets of university research making good headway. Flinders University in Adelaide for instance is making great progress on bio-refineries and the integration of cellulosic refining with the potential to create multiple revenue streams.

(As a matter of interest, this same group is also working on biofuels with reduced freezing temperatures that are suitable for the aviation industry.) There are, however, no commercial entities that have managed to raise any funds of note that are developing cellulosic technologies.

It may be that the research has only focussed on this opportunity fairly late in the piece. With the apparent success of the first generation biofuels and no available research grants for second generation fuels from the previous government, which was not overly concerned with environmental issues, the universities and private research institutions had no incentive to explore this as a possibility.

Algae's Ascendency

The arguments presented for cellulosic biofuels all apply to the development of algae biofuels, so it is a strange tale to tell of the absence of one and apparent good progress of the other. Algae biofuels is moving forward quickly with reasonable levels of funding driving demonstration projects at scale. Success is far from assured but, in the same way that cellulosic technologies are being driven to success elsewhere, Australia is backing algae and seeing the potential to secure and benefit from a global leadership position.

So what is driving this interest? Firstly the climate in Australia is conducive to processes that rely on consistent and high levels of solar radiation. As shown by the small scale of the local solar industry, however this is not sufficient on its own to drive growth.

The biggest driver appears to be the Australian Government's commitment to the coal industry. The Government has very publicly backed and funded sequestration demonstration projects through both the Carbon Capture and Storage (CCS) Flagships Program and the Global CCS Institute, the latter of which was launched internationally at the at the G8 meeting in L'Aquila in 2009. There has been a commitment to date to spend A$2.4 billion over nine years to build 1 GW of low emissions fossil fuel generation.

There is be a growing realisation within government that to meet its targets will require additional funding and is going to take many years to achieve any progress: certainly much longer than the election cycle. There is also a growing concern that,

even once proven, CCS will end up being unviable because the carbon transport costs. Algae projects, that take flue gas as a feedstock, present an opportunity to achieve scale more quickly, appear to have multiple benefits and can still be seen to be assisting in the survival of the coal industry.

One of the highest profile companies leading the algae work in Australia is MBD Energy. As detailed further on page ??? , the company is developing a number of projects with the aim of building revenue from the manufacture of high grade plastics, transport fuel and nutritious feed for livestock as part of its Carbon Capture and Recycling (CCR) strategy.

Another interesting project is being developed by SARDI, the South Australian State Government research body. Its photobioreactor project was completed in late 2009. This facility provides the capability to research microalgal growth in experimental photobioreactors and raceways, and enables manipulation and monitoring of algal production systems to improve yields.

So Algae is Australia's technology of preference and appears to be driven by the Government's overzealous support of geosequestration. As with competing technologies, it will still face scale up hurdles, but with willing providers of carbon dioxide feedstock and cheap land and solar resources aplenty, large scale facilities mat well be built within the next five years.

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