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## BIOFUELS DISCUSSION PAPER

### Personal Comments

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#### GENERAL COMMENTS

The Discussion Paper is profoundly disappointing in its narrow focus on the mechanics of implementation of an ethanol fuel mandate.

There are many more issues related to biofuels than ethanol and much more to biomanufacturing than biofuels. The Paper takes little space to explore other biofuels and biomanufacturing. There has been considerable effort on biomanufacturing in the USA and this should have been reviewed.

The Paper makes no mention of the current difficult relationship between sugar cane growers and millers re the ownership of milled sugar. Unless and until this is satisfactorily resolved, little progress can be made on biomanufacturing.

#### SPECIFIC COMMENTS

##### Industry Snapshot

Nothing is said about the range of biofuels related research currently underway in various Qld universities.

Nothing is said about the three proposed ethanol plants and their likelihood of proceeding. At least one would seem to be having trouble raising the finance needed.

Nothing was said about the large grain ethanol plant proposed for Pinkenba and the proposed Rosella Ethanol plant in the Burdekin, presumably based around the sugar industry, which did not proceed. Why did these not proceed? Was the lack of a mandate the only reason?

Any ethanol project would presumably need to be viable at the current 38.143 cents per litre fuel excise. Currently, the low excise currently levied on fuel ethanol is in effect a levy on imported ethanol, which is against the Federal Government's free trade policies. Any fuel ethanol plant would need to be viable at the full fuel excise.

##### Biofuel Mandate

No comments are offered except to not state the ethanol percentage in legislation gives useful flexibility.

## Implementation

The points raised are relevant.

However, nothing is said about any technical issues involved in fuel retailing. It is understood that some modification of fuel storage tanks is needed at petrol stations.

Regarding securing food supplies:

- Molasses is most unlikely to be an adequate feedstock for largescale ethanol production. Molasses is also an animal feed supplement. Also, if mills move to membrane filtration as an alternative to the current milling technology, which uses large amounts of heat, there may be no molasses at all.
- The impacts on grain being used for ethanol as against stock feed need careful analysis. It is suspected that this has been done in the past but needs revisiting. However, using say sorghum for ethanol leaves a high protein residue, which in principle could be used as animal feed.
- Given the limited volumes of molasses available, in the absence of low cost monosaccharides from bagasse fractionation, this leaves only cane sucrose as fermentation feed. The economics of this need to be analysed but this is also diverting a foodstuff to industrial uses. However, the 'value' of sucrose as a food can be debated.
- Very little is said in the Discussion Paper on the production of monosaccharides from bagasse. It is likely that such monosaccharides would be the key to a longer term ethanol industry, although it may be that higher value chemicals could be produced by fermentation, making ethanol possibly a less viable product.
- The Scientific Committee on Problems of the Environment (SCOPE) has published a report, *Bioenergy and Sustainability: Bridging the Gaps*, in April 2015. This report is claimed to show that informed management of bioenergy crops can actually alleviate factors contributing to food insecurity as well as reducing greenhouse gasses and preserving biodiversity. This report needs to be evaluated.

## Biomanufacturing

It is not clear why an ethanol industry will give rise to a biomanufacturing industry, unless bagasse fractionation is involved and ethanol fermenters can be used for other, higher value products.

The US Government has spent considerable funds on research on bagasse, and other woody plant material, fractionation, ie lignocellulosics. I have seen reference to three industrial scale plants that have been established in the USA using different technologies. I have seen no analysis of how these three plants have performed. Such information would be important.

Given the limited volume of molasses available, and the price of cane sucrose, it would seem that the monosaccharides produced from cellulose and hemicellulose in cane, and available via bagasse fractionation, would be the fermentation raw material of choice.

Such technology may also be more widely useful in Qld using straw from grain crops and woody plant material from the clearing of woody weeds eg prickly acacia.

It is assumed that any fermentation plant using raw material from sugar cane would be best sited next to a sugar mill. Most of the Qld mills are owned by overseas companies. The cooperation of these companies will presumably be needed. It is hoped that they have been included in discussions so far.

Ethanol is another commodity, just like raw sugar. It is a concern that there seems to be a rush into yet another commodity when most commentators are saying that Australia needs to move into higher value products. Fermentation plants can theoretically make higher value chemicals than ethanol.

Three key issues arise re fermentation facilities at Qld sugar mills;

- Such facilities will likely be built and operated by international chemical companies, who have been involved in such work now for some years. These companies have a full understanding of the markets for the organic chemicals which can be produced by fermentation. They also have access to the capital to build such facilities. This could suggest that no local fermentation etc research is needed. These companies have their own facilities. It may be possible for Qld research groups to win R&D contracts with these companies.
- It is likely that the Qld mill owners have been in discussions with the various international chemical companies for some time on such fermentation opportunities. If so, then there is little need for further research as this is probably already done. The role of an ethanol mandate in the establishment of such plants needs consideration. Consultation between the Qld Government and mills regarding such discussions is a matter of urgency.
- For Qld cane producers to gain real benefit from such fermentation plants they need to have some equity in these plants. This could be by direct investment or by long term supply contracts or some other business model. Such business models need to be examined. Also, the current impasse between Qld cane producers and the mills over ownership and marketing of raw sugar needs to be resolved as a matter of urgency. Recourse to legal solutions or legislation is unlikely to build the sound business relationship needed. Some kind of collaborative relationship is needed between growers and millers to facilitate the cane supply needed for such major new investments. Developing such a relationship is needed as a matter of urgency.

Other issues re biofuels not addressed include:

- The US Government has a fuel mandate that requires the use of biofuels, which does not specifically mandate ethanol. Such an approach may be better in that it presumably would encourage the development of a wider range of biofuels.
- Methane from local government rubbish dumps, which is being harvested already in some areas. Are there ways to harvest increased methane from such rubbish dumps?
- Methane from sewage treatment plants. Is this a possibility?
- Methane from the anaerobic fermentation of organic wastes from abattoirs, fruit and vegetable processors etc. At least one abattoir is doing this at the moment. The Qld Dept of Environment holds, or used to hold, the intellectual property on research on fermenting unsaleable bananas into methane for use as an on-farm fuel. Is such research feasible for wider application?
- Biodiesel from algae. This is theoretically possible. Qld has lots of land with little economic value but with water available. Is this an option? The University of Qld is doing some research on this.
- Electric cars are being developed by a number of companies, including Google and Apple. There almost seems to be a 'race to market' here. If these become more available, and as storage batteries become more efficient and cheaper, what might be the longer term market for liquid transport fuels?