

03 July 2015

Vice-Chancellor and President

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Dear Sir,

**RE: Submission in response to Discussion Paper - Towards a clean energy economy:
achieving a biofuel mandate for Queensland**

I have pleasure in submitting the attached response of The University of Queensland (UQ) to the Queensland Government's Discussion Paper on a biofuel mandate.

In relation to biofuels and mandates, there have been numerous proposals and calls for mandates over many years by various industry advocates and other groups. It is pleasing to see this government undertake a systematic and consultative approach to determining the appropriate form, level and conditions for any mandate. We also commend the Queensland Government on its *Advance Queensland* policy and its emphasis on research focused on stimulation of areas of industry employment such as industrial biotechnology. The State has been rewarded handsomely by past science and innovation driven policies, such as the *Smart State* initiative, and we look forward to a reinvigorated innovation agenda in Queensland.

The UQ submission draws upon the expertise of a number of UQ academics from various faculties and institutes. Our comments are offered constructively and we recognise the considerable challenges and inevitable trade-offs in balancing economic, energy security and sustainability objectives.

UQ welcomes the opportunity to participate in the Queensland Government's consultation process and we look forward to ongoing engagement in this important policy initiative. If you have any queries, your office can contact [REDACTED]

Yours sincerely



Professor Peter Høj
Vice-Chancellor and President

Attachment

D15/17175-6



**THE UNIVERSITY
OF QUEENSLAND**
AUSTRALIA

The University of Queensland (UQ)

**Submission to the Queensland Government
Department of Energy and Water Supplies**

In response to the

Discussion Paper
entitled

**Towards a clean energy economy:
achieving a biofuel mandate for Queensland**

03 July 2015

The policy environment

1. Will the changes to excise arrangements proposed by the Federal Government have an effect on the use of biofuels by consumers?

Consumers currently exercise their preference for biofuel blended options based on a combination of price and/or perceived environmental benefits. Removal of the excise reimbursement program will ultimately remove any price benefit associated with such blends and therefore reduce their consumption.

2. What measures can be taken to offset any proposed changes to excise arrangements by the Federal Government?

In Queensland, consumers do not presently have the choice of a biofuel option at all fuel retail outlets. The proposed Queensland mandate will provide that choice to consumers by increasing the number of fuel retail outlets offering E10.

As stated above however, consumers will exercise their preference based on a combination of price and/or perceived environmental /other benefits. If the E10 blend price advantage is reduced, uptake will be reduced.

Education and marketing campaigns to promote the environmental benefits and the economic benefits to Queensland will assist to overcome a price gap but it is likely to have minimal effect without a price incentive. Therefore it is vital that the biofuel production sector increases in scale and productivity to reduce cost of production. The proposed mandate will be positive in this regard provided that investors have certainty that such policies will be sustained and consistent over the life of their investments.

The ethanol percentage

3. Is a two per cent ethanol mandate appropriate?

A two percent mandate is considered a modest and appropriate entry point. This would approximately double the biofuel consumption in Queensland and represents an opportunity for potential expansion of existing facilities and investment in one production facilities of competitive scale.

It is important that the mandate be framed as a percentage target rather than an absolute volume requirement. Examples of absolute volume based targets such as the Renewable Electricity Target in Australia and the Renewable Fuel Standard in the USA have both seen unintended outcomes and resulted in investor uncertainty and greater costs to consumers.

Certainty that this mandate will remain a 'floor' for a reasonable period will be vital as will certainty in relation to the Federal Government's excise arrangements.

Ultimately to assure biofuels remain competitive (discounted) with conventional oil-derived fuels and that the industry is resilient, the scale, diversity and competition among biofuels supplies will need to increase. Hence, while the two percent figure is a reasonable starting position, it is likely that it will need to be increased over time to assure a thriving biofuels industry is developed and maintained.

4. Should the percentage increase, and if so, over what time period should any increases occur?

The proposed starting position will likely support the expansion of existing sugarcane or grain based ethanol production facility. As such it may provide limited economic stimulation of specific regional centres, but it won't necessarily support the broader, longer term objectives around fuels security and GHG emissions reduction. UQ believes the government should consider tying the biofuels mandate policy to its broader, long-term economic and sustainability objectives.

A competitive biofuel production sector must also be increased in scale and productivity to reduce cost of production. This will require significant increases in the mandate over time.

In the long run, a thriving, resilient biofuels industry should include greater diversity of biofuels - different biomass feedstocks, different biodiversity impacts, first and second generation, and different blend / end-use specifications (ethanol, diesel, kerosene/aviation fuel). Such diversity will assist in protecting the industry and the Queensland economy from internal and external shocks - droughts, environmental pressures, other commodity (e.g. grain / sugar) prices, carbon pricing, transport sector trends and even shifting consumer attitudes.

An increased mandate percentage, in conjunction with appropriate levels of targeted economic incentive/support is likely to be necessary to drive this diversity.

5. What is an appropriate mandated percentage for biodiesel?

The mandate for biodiesel is arguably more important than for ethanol. International trends toward increasing restrictions on GHG emissions and other pollutants will drive increasing demand for non-fossil fuel based energy. In the transport sector, this should create opportunities for electrification, biofuels and, in the long term, hydrogen. Unlike light passenger transportation, in the case of long-haul heavy road/rail transport and shipping, both typically diesel based, electrification of the transport fleet is problematic. Therefore biodiesel is likely to be more critical for that sector, in a carbon-constrained future, than ethanol.

Note the same driver exists for aviation fuel and we recommend the Queensland Government continue to invest in collaborative research looking at opportunities for sustainable aviation fuel production.

Selection of the mandate for biodiesel production should be set by consultation with prospective investors with the level set to at least cover the production from one internationally competitive, scale plant with longer term plans to increase the mandate.

6. What timeframe would stakeholders need to prepare for and meet this requirement?

Stakeholders include potential producers, wholesalers (blenders) and retailers. In reality the lead time for new production capacity including front-end studies, financing, construction and commissioning will be the rate determining step in bring on new production and is likely to be circa four years. Therefore the phasing in of a mandate on biodiesel prior to 2020 would seem appropriate.

7. When do you think that a mandate will no longer be necessary?

The requirement for a mandate (along with other economic incentives) is likely to endure until such time as the scarcity of conventional hydrocarbons causes the cost of biofuels to be substantially discounted versus oil-derived fuels. While the timeframe for such oil shortages is unknown it is likely to be measured in decades. Even in major biofuels producing countries like Brazil, lower oil prices (in the absence of higher sugar prices) have a direct and significant impact on the viability of ethanol producers and sugarcane growers.

In relation to any long term mandates and subsidies, caution is warranted as history is littered with examples of regional economic demise following the closure of industries which had become over-reliant on subsidies only to see them eventually wound back.

Liable parties

8. Is the class of retailer appropriate? Should the definition be expanded to include those with less retail sites?

The class of retailer appears appropriate to initiate the desired demand response. Expansion of the definition can be considered over time.

9. Is there an alternative method of defining the retailer? For example, should all sites that sell three or more petrol blends be included under the definition? Or should all sites that trade over a certain volume of fuel be included?

UQ has no strongly held view on this issue but agrees with the discussion paper's comments on avoiding excessive, mandatory cost imposts on smaller, independent retailers.

Reporting requirements

10. Is this level of detail appropriate for liable entities?

The level of reporting seems appropriate in terms of both detail and regularity.

11. Is there any other data or information that should be requested in the quarterly reports?

Over time it would be useful to gather information on sales according to the 'type' of sustainable fuel – e.g. the biomass feedstock from which it has been produced. This will help monitor progress toward broader, long term targets in relation to diversity and sustainability. Whether this is best obtained from producers, wholesalers or retailers should be determined.

12. Can this information and data be used in other ways to support industry?

Depending on future incentive arrangements to target specific diversity parameters within the biofuel mix, the above mentioned information will provide early signals to potential investors on future priorities.

Exemptions

13. To ensure the exemption framework is effective, what would be a reasonable timeframe for response to a request for exemption?

UQ is not in a position to comment on this question.

14. How can Government ensure that an exemption framework is not used as a way for liable parties to negate their responsibilities?

UQ is not in a position to comment on this question.

Penalties

15. Are these penalties appropriate?

The penalties appear to be significant and appropriate. Any expansion of the definition of liable parties may need to distinguish between the varying financial capacities of the retail organisations.

16. Do they incentivise liable parties to meet their obligation?

UQ is not in a position to comment on this question.

17. If the mandate increases should the penalties change?

If the proposed penalties are deemed appropriate, then it seems logical for them to be increased as the mandate increases.

Expert Panel/Implementation Board

18. Should Queensland have an expert panel or implementation board? If so, which sectors should be represented?

Yes, Queensland should have an expert panel and as proposed in the discussion paper, that panel should comprise representatives from government, industry (full supply chain), transport (end-use) sector and bio research sector. Recognising the diverse interests of the membership, the panel's role should be advisory rather than decision-making. However Government should resist policy changes or even a structure which signals the potential for policy uncertainty amongst investors. The panel should also be directed and represented by an appropriately qualified, independent Chairman.

19. How can the panel discharge their responsibilities appropriately and facilitate the required mandate being met?

The panel should be run by an independent Chairman who represents the panel and synthesises the panel's views when advising government and, be advisory rather than decision making.

Protecting the environment

20. Are these sustainability principles appropriate?

These sustainability principles represent a useful start but don't go far enough. Prior to setting the sustainability principles, the Queensland Government should define current best practice across the biofuels industry and establish clear long term (to say 2050), and intermediate, future targets for the whole biofuels industry including:

- 2050 emissions reductions for the transport sector;
- *Energy Return on Energy Invested* metrics;
- Technology specific GHG intensity targets,
- Food vs fuel metrics;
- Water use metrics; and
- Waste stream metrics.

The initial principles could be enhanced as follows:

- The sustainability principles should drive, and make explicit reference to, life-cycle assessment of impacts. This is especially critical in respect of new projects or projects which utilise forests not currently harvested for beneficial use. (The lifecycle greenhouse gas emissions calculations are somewhat complex and often subject to misrepresentation.)
- Sustainability principles which recognise feedstocks and practices requiring reduced inputs of fertilisers.
- In relation to water quality impacts due to nutrients and sediment run-off, specific attention should be placed upon the Great Barrier Reef. While this is captured when principles 1 and 3 are considered together, the sensitivities and value associated with the Great Barrier Reef warrant a specific and explicit sustainability principle.

In the longer run, sustainability principles should be extended to consider conservation of agricultural land and water assets for food production. As a net exporter of sugar, grain and meat, Queensland is unlikely to see negative impacts on domestic food supplies, however we do have a global responsibility in this regard. Therefore sustainability principles which favour second generation biofuels, which do not compete with food or current agricultural cropping land and water resources, such as lignocellulosic, algae and *Pongamia* derived fuels should be included.

The Queensland government has actively supported research in many of these areas including at UQ and such programs should be continued and expanded if Queensland is going to see a thriving and sustainable biofuels industry going forward.

21. Should more stringent environmental measures be applied to the biofuel sector?

Refer to comments above.

22. What other environmental risks must be considered in relation to an expanded biofuels industry?

Refer to comments above.

23. How should they be enforced?

The biofuels industry should be subject to the same environmental protection enforcement arrangements and penalties that Queensland resources sector is subjected to.

Maintaining consumer choice

24. What are the issues that need to be addressed if consumer choice is maintained?

UQ has no specific issues to raise beyond those mentioned in the Discussion Paper.

25. Will choice of fuel increase costs to retailers or consumers?

In the short term, cost increases are likely. In the longer term if the scheme is successful in driving scale, competition and diversity of supplies then net cost increases should be minimised.

26. Would a targeted education campaign on the actual benefits and disadvantages of biofuels/E10 contribute to informed consumer choice?

Yes a targeted education campaign on the actual benefits and disadvantages of biofuels/E10 is likely to have a major impact of informing consumers, provided it is delivered by credible independent bodies.

27. What are the key messages that must be included in any education campaign for biofuels? Who is the primary audience and what is the most appropriate mechanism to target them? The key messages should cover:

- Long term environmental benefits;
- Impact on motor vehicle engine life and performance;
- How the industry is positioning Queensland to become less impacted by oil price volatility and rises in the very long term; and
- Job creation for Queenslanders.

These are issues about which many consumers are not informed or worse, misinformed. It will be important that these messages are delivered by credible independent persons and organisations.

Ensuring consumer protection

28. What options could we employ to protect consumers?

Current arrangements to inform and protect fuel consumers and to penalise retailers for inappropriate pricing and anticompetitive behaviour should continue to be applied to protect consumers. Ultimately diversity and competition among wholesalers and retailers is the key to assuring a fair and competitive marketplace.

It must be recognised however, that fuel prices are impacted by a range of factors including oil price and exchange rate and any associated variability will continue. The cost of domestic biofuels may be influenced by different factors, such as feedstock availability and sugar/grain prices but will nonetheless also be potentially quite variable.

29. How can we ensure that fuel companies pass the benefits of ethanol through to consumers?

Current 'price watchdog' bodies and the ACCC role and powers are considered appropriate. Ultimately competition among suppliers must be maintained.

30. What is an appropriate method for estimating a 'reasonable' ethanol price?

This could be a task for the Independent Panel. The method should be based on cost with an acceptable risk-assessed return on assets for the producer and an assessment of the reasonable costs for transport, blending, distribution and retailing including reasonable margins for those elements of the supply chain.

31. What is an appropriate balance between costs to consumers and the creation of regional jobs?

Ultimately the balance must lie with the consumer. Regional jobs are important but ultimately this scheme should be fundamentally about improving the long-term resilience of the Queensland economy by taking early steps to ensure Queenslanders are less exposed to future potential price shocks (and long term structural increases) associated with oil price volatility or constraints on GHG emissions. These factors are likely to be increasingly important and more enduring than current socio-political pressures to replace jobs lost following the end of the recent resources boom.

Securing food supplies

32. Will an effective 'floor' in grain prices, as a result of a mandate, signal to grain growers an opportunity to increase production and investment on-farm?

The proposed mandate will be positive in this regard provided that grain growers have a level of certainty that such policies will be sustained long enough for them to yield an acceptable return. More importantly, this will be driven primarily by decisions to invest in new or expanded biofuels facilities and the practices of fuel producers in relation to feedstock procurement.

Therefore it seems as important to provide investors in production facilities with sufficient certainty to proceed with investment in new capacity and to commit to long-term procurement contracts.

33. What mechanisms, if any, should be put in place to avoid distorting the drought feeding market next time drought conditions persist in Queensland?

Refer to earlier comments in relation to diversity and sustainability metrics. In the absence of policies which drive diversity of supplies (biomass inputs) and sustainability principles which include fuel versus food metrics, this scheme will encourage mainly sugarcane and grain based ethanol production. Accordingly, it will be impossible to avoid distorting the

drought feeding market during periods of sustained drought conditions without either compromising the biofuels target (in which case the biofuel producer is affected) or high fuel prices (in which case the consumer is impacted).

Bio-manufacturing – a new approach

34. What is the role of the Government in attracting a new bio-manufacturing industry in Queensland? Are there specific policy mechanisms or actions that will attract investment and development?

Reinvigorating the science and innovation led policies of previous governments such as *Smart State* and providing clear long term goals in relation to the economy and sustainability should be the cornerstone of such policies. Setting targets and designing incentives which aim to reduce the non-renewable resource content of products.

35. What additional actions can the Queensland Government take to increase the likelihood of project opportunities becoming operational projects?

Provide policy and regulatory certainty. The energy sector in Australia has been plagued by policy uncertainty for over a decade with result that investors will not invest in the electricity generation sector. The biofuels sector will be no different, unless the industry has a level of confidence that policies and regulatory settings will be consistent.

Contrasting the coal seam gas sectors of Queensland and NSW provides a clarifying case study. In Queensland the CSG industry has thrived due to bipartisan support and the resulting policy and regulatory consistency. The benefits to the Queensland economy including regional areas have been obvious. In NSW, the opposite is true and the result has seen developments stalled and the state potentially facing gas supply shortages.

36. Development of the biofuel industry, specifically ethanol, has struggled from a lack of long-term certainty and a problematic history. How do stakeholders including the Government provide the long-term certainty necessary for the development of, and investment in, bio-manufacturing?

As outlined above, investment certainty requires confidence that government policy and regulatory settings will be stable and consistent over the long term - at least the economic life of investments. Clarity of industry target metrics and sustainability principles (refer Question 20) are essential. These need to be properly considered and underpin the core purpose of the policy. This is why *regional jobs creation* is not a sufficient basis to underpin the scheme. It has to be driven by a greater enduring purpose like a 2050 fuel security and/or GHG target which has bipartisan support.

37. What regional centres could become hubs for bio-refinery investment/development in Queensland?

The concentration and scale of feedstocks will initially drive these prospective investment hubs. Places like Townsville, Mackay, Bundaberg/Maryborough and the Darling Downs will be the early contenders. In the longer run, potential second generation production from algae, eucalypts and *Pongamia* could expand the geographic diversity to less traditional agricultural centres.

38. How could Queensland science support the development of the industry? How should it build on previous research (including the involvement of key end users)?

Under the previous labour government's *Smart State* initiative, a range of significant biofuels and bio-manufacturing research programs were supported. UQ was and continues to be involved in many of these. In many cases, the projects involve a range of key stakeholders across the biofuels supply chain from feedstock growers to biofuel producers, wholesalers, retailers and end-users. Most of these programs also involve international partnerships, which means the research is able to leverage the more significant research investment that occurs in the USA and Europe as well as the lessons learned from more mature bioprocessing industries there.

These schemes have been cut back substantially in recent years. Such programs should be reinvigorated and expanded as a matter of urgency. Clarity of purpose and an industry . market driven research agenda is paramount to its effectiveness.

The impact of contributions from the science community is, of course, likely to be long term and so should be focussed on positioning Queensland for its longer term targets in terms of economic resilience, fuels security, reduce non-renewable resource dependency and environmental sustainability – second generation feedstocks, bio-products and fuels which will be critical to meet Queensland's 2050 targets for:

- Emissions reductions target for the transport sector;
- *Energy Return on Energy Invested* metrics;
- Biofuel diversity metrics;
- Food vs fuel metrics;
- Water use metrics; and
- Waste stream metrics.

Any investments in research should involve industry and end-users (oversight and cash or in-kind) and preferably be connected with relevant international collaborators.

END