Department of Energy and Water Supply

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

> Discussion paper (June 2015)



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Foreword by the Treasurer and Minister

We want Queensland to be part of the biofuel energy economy.

The introduction of a biofuel mandate would enable industry to power the state towards a cleaner, greener energy future and create more jobs.

A biofuel mandate is the first step toward growing our biofuel and bio-manufacturing industries. By increasing the mandate over time and in a measured way, we will ensure sustainable growth of both supply and demand. The biofuel mandate also provides a level of certainty to our regional industries, giving business the confidence to invest capital in regional Queensland.

Our Government is working closely with all Queenslanders to create jobs and a diverse economy, protect the environment and build safe, caring and connected communities. A strong biofuel and bio-manufacturing sector will help us deliver on these objectives.

We want to know what you think. *Towards a clean energy economy: achieving a biofuel mandate for Queensland* seeks your views on how to build a vibrant biofuel and bio-manufacturing industry to support regional Queensland and our clean energy future.



Hon. Curtis Pitt, MP Treasurer, Minister for Employment and Industrial Relations and Minister for Aboriginal and Torres Strait Islander Partnerships



Hon. Mark Bailey, MP Minister for Main Roads, Road Safety and Ports and Minister for Energy and Water Supply

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1. Introduction

What we aim to achieve

The Government will support the development of a sustainable, internationally competitive, biofuels industry that can help Queensland transition to a clean energy economy. Liquid energy derived from organic material can power our vehicles, diversify our fuel mix and reduce emissions. It drives growth in regional areas and adds value to our world-class agricultural systems.

Through its proposed biofuel mandate, the Queensland Government will provide certainty to the biofuel industry so that it can invest, innovate, grow and create jobs. While a thriving biofuels industry is highly beneficial in its own right, it will also help create the foundation for a new high-value, knowledge-based bio-manufacturing industry for Queensland.

A biofuel mandate also aligns with the Queensland Government's Advance Queensland – Developing the knowledge based economy of the future policy, which identifies areas where Queensland is considered to have a competitive advantage including in clean energy production and storage, and particularly in renewables and bio-refining.

The Advance Queensland policy emphasises the need for research focused on the stimulation of new areas of industry employment such as industrial biotechnology (defined as the creation of fuel, plastics and materials from organic materials). The biofuel mandate will open the door to unleash Queensland's potential for developing a strong, secure and prosperous bio-manufacturing industry in our regional communities and towns.

How we will do it

The Queensland Government is working with industry and the community to develop initiatives that will encourage biofuel production and use. A first step and a key element of this approach is the introduction of a biofuel mandate that will initially require a certain proportion of ethanol to be incorporated into Queensland fuel. To achieve this outcome, the Queensland Government proposes to introduce the Liquid Fuel Supply (Biofuel Mandate) Amendment Bill 2015 which prescribes a phase-in of ethanol blended fuel. The Government is considering commencing with a two per cent target. A mandated percentage for biodiesel will also be prescribed following further consultation. It is expected that the Biofuel Mandate will commence on 1 July 2016. Implemented effectively, this mandate will provide certainty to Queensland producers while laying the foundations for a high value, bio-manufacturing sector.

Why we need your help

The development and implementation of a biofuel mandate is complex. To get the policy settings right and to ensure we implement this measure in the most cost-efficient and equitable manner, we need to hear from industry and the community.

This Discussion Paper outlines the key issues associated with a biofuel mandate and provides details on the Government's approach. With your input, we can develop a measured and sensible approach to help guide this exciting industry transformation and ultimately achieve a sustainable biofuels and bio-manufacturing industry for Queensland.

Next steps

In coming weeks, the Government will consult widely with stakeholders on implementation issues associated with the mandate and options to further develop Queensland's biofuel and bio-manufacturing capacity. Your feedback will be used to help optimise implementation and further develop the Government's biofuel policy.

What is a biofuel?

Biofuels are fuels derived from organic material. There are two main types of biofuel. *Ethanol* is an alcohol that is distilled or chemically produced from various crops and crop wastes. It is generally blended with petrol. *Bio-based diesels* are fuels made from vegetable oils and animal fats (biodiesel) or are refined from syngas or biocrude.

2. Industry snapshot

Biofuel production in Queensland

- In Queensland, ethanol is generally sourced from sugarcane (molasses) and grain (sorghum). There are two operating ethanol plants in Queensland with capacity to produce 140 megalitres (ML) per year.
- Queensland's only biodiesel production facility uses tallow and used cooking oil as its feedstock and has capacity to produce approximately 30ML of biodiesel per year.
- Queensland has three proposed ethanol plants in various stages of development. These proposed plants, if they all become operational, would produce a further 230-290ML of fuel grade ethanol.

Biofuel use in Queensland

Ethanol-blended fuel in Queensland is referred to as E10 and contains up to 10 per cent ethanol and 90 per cent petrol. E10 has been available in Queensland for more than a decade. In 2013-14, E10 comprised 10 per cent of total petrol sales or just over 350ML. Ethanol content as a proportion of total regular unleaded petrol and E10 sales, was approximately 1.2 per cent in 2013-14. Approximately 345 petrol stations in Queensland currently offer ethanol-blended fuels. More than half of these are located in South East Queensland.

E10 use has been declining in recent years. This decline has been caused in part by policy uncertainty, declining availability of E10 pumps and a consumer preference for regular unleaded over E10. Limited information among consumers about the suitability of ethanol in vehicles and the lack of price differential between E10 and regular petrol have also contributed to the decline.

Up to five per cent biodiesel is commonly blended with regular diesel. Referred to as B5, this blend is suitable for use in any diesel vehicle and is sold by several major fuel chains across the state. B5 is not labelled because it meets the mineral diesel fuel quality standard, so consumers are frequently not aware they are purchasing B5. Use of diesel in Queensland is growing on average by about 9.3 per cent per year.

The policy environment

The Queensland Government has provided a range of support for the biofuels industry in the past including consumer education campaigns and research grants and funding. While ethanol mandates have been proposed in Queensland, none have eventuated. New South Wales is the only state in Australia that has a mandate, which is prescribed at six per cent, however this target has not been met.

The Federal Government has also actively encouraged development of a biofuel industry. It currently provides full excise reimbursement to Australian ethanol producers through the Ethanol Production Grants program. However, this program will cease on 1 July 2015. From 1 July 2015 to 1 July 2016, the Federal Government has lowered the fuel excise to zero but this will increase by 2.5 cents per litre for the next five years until it reaches 12.5 cents per litre in 2020. This could potentially increase the cost of E10 by 1.25 cents per litre. With E10 currently retailing for approximately two cents per litre less than regular unleaded petrol, the application of excise, even at the discounted rate, could reduce any perceived price advantage of E10. Imported ethanol continues to be subject to the full fuel excise – a duty of 38.143 cents per litre.



- 1. Will the changes to excise arrangements proposed by the Federal Government have an effect on the use of biofuels by consumers?
- 2. What measures can be taken to offset any possible negative impacts by the proposed changes to excise arrangements by the Federal Government?

How will the mandate work?

The mandate will work by requiring both fuel wholesalers and retailers to ensure the fuel they sell in aggregate contains a specified amount of ethanol. For example, a major fuel retailer sells 80,000 litres of regular unleaded petrol and 20,000 litres of petrol-ethanol blend (E10) totalling 100,000 litres. The minimum volume of ethanol sold is 2,000 litres (refer Figure 1). This would satisfy a two per cent ethanol mandate.

3. Biofuel mandate

Overview

It is proposed that the Queensland Government will introduce the *Liquid Fuel Supply (Biofuel Mandate) Amendment Bill 2015*, which will amend the *Liquid Fuel Supply Act 1984* to mandate the use of ethanol and other biofuels in Queensland.

Specifically it is proposed that the Bill will mandate a phase-in of ethanol-blended fuel commencing with a two per cent target. This would be effective from 1 July 2016. Increases after two years will be subject to the outcome of a Productivity Commission review. The review would consider economic, social and environmental factors and ensure the mandate is supporting domestic production as opposed to growing an import market from interstate and abroad.

Further consideration will also be given to an appropriate mandate for biodiesel at a percentage to be confirmed. Broadening the scope to consider biodiesel provides a more holistic industry solution with the potential to deliver greater environmental benefits, jobs and investment opportunities for producers.

What does the mandate aim to achieve?

The biofuel mandate aims to:

- provide confidence to existing ethanol and biodiesel producers and stimulate the orderly development of, and investment in, a sustainable biofuels industry in Queensland
- contribute to regional growth and jobs creation
- reduce greenhouse gas emissions from motor vehicles
- take advantage of advanced biofuel production technologies which can use a range of feed stocks, including waste.

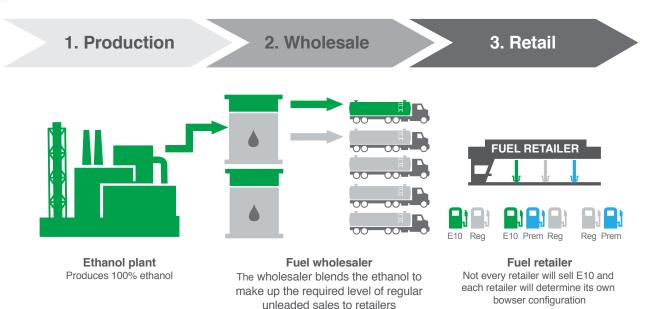


Figure 1. How the mandate works

Getting the settings right

The proposed *Liquid Fuel Supply (Biofuel Mandate) Amendment Bill 2015* will detail the mechanisms that would underpin a Queensland biofuel mandate. The Queensland Government is interested in hearing your views on a range of implementation issues associated with the Bill.

These include:

The ethanol percentage

The biofuel content will be set in the legislation at levels that provide support to existing producers and allow for a gradual increase in supply and demand over time. It is suggested that this be set at two per cent for ethanol which equates to approximately 59ML per annum, based on 2013-14 figures. This target would provide time for industry to ramp up production while encouraging a smooth transition for the broader industry, particularly fuel retailers who may have to make changes to fuelling infrastructure. A two per cent mandate would also ensure consumers retain choice at the petrol bowser. Any subsequent increases in the percentage would be subject to a review by the Queensland Productivity Commission, with subsequent percentages prescribed in a regulation.

While the legislation will include a provision for a biodiesel component, it is proposed that a biodiesel percentage will initially be set at zero. Once further consultation is undertaken, a percentage requirement for biodiesel will be prescribed in a regulation.



- 3. Is a two per cent ethanol mandate appropriate?
- 4. Should the percentage increase, and if so, over what time period should any increases occur?
- 5. What is an appropriate mandated percentage for biodiesel?
- 6. What timeframe would stakeholders need to prepare for and meet this requirement?
- 7. When do you think that a mandate will no longer be necessary?

Liable parties

It is expected that the legislation will require fuel wholesalers and major fuel retailers to meet the mandate. These liable parties would also be required to report on a quarterly basis on how they complied with the mandate.

It is proposed that a fuel wholesaler would be a person who sells petrol or diesel to a fuel retailer for resale by the fuel retailer. A major fuel retailer would be a fuel retailer who owns or operates 10 or more service stations. A service station would mean a place where petrol or diesel is sold to the public, whether or not the place is used for another purpose, including for example for selling other products. A large number of smaller retailers would be excluded by this definition. The exclusion of these retailers from the legislation may be appropriate given the infrastructure conversion costs associated with retailing biofuels may adversely affect the ability of these retailers to compete in the market.



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



Reporting requirements

It is proposed that quarterly reports be submitted to the Government for compliance purposes. This information would include the following volumes of fuel sold by the fuel seller in the calendar quarter:

- petrol and petrol-ethanol blend
- regular petrol
- regular petrol-ethanol blend
- premium petrol-ethanol blend
- sustainable ethanol in the petrol-ethanol blend sold in the quarter
- diesel and diesel-biodiesel blend
- diesel-biodiesel blend
- sustainable biodiesel in the diesel-biodiesel blend sold in the quarter.



- 10. Is this level of detail appropriate for liable entities?
- 11. Is there any other data or information that should be requested in the quarterly reports?
- 12. Can this information and data be used in other ways to support industry?

Exemptions

An exemption for complying with the fuel content requirements may be granted to a liable party to avoid adverse impacts on industry and consumers.

The Minister may, on application by a fuel seller in the approved form, exempt a fuel seller from complying with the ethanol or biodiesel mandate, if the Minister is satisfied:

- the fuel seller cannot get enough biofuel because of a shortage of supply
- the requirement to comply threatens the viability of the seller's business, or
- there are other extraordinary circumstances to justify granting an exemption.



- 13. To ensure that the exemption framework is effective, what would be a reasonable timeframe for response to a request for exemption?
- 14. How can government ensure that an exemption framework is not used as a way for liable parties to negate their responsibilities?

Penalties

The Queensland Government would require the power to enforce the legislation. Failure to comply with the minimum content requirement, reporting arrangements, retaining records or submitting false or misleading information, may result in penalties.

The penalty provisions will be finalised during consultation. For example, it is proposed that a failure to comply with the minimum content requirement will incur 200 penalty units in the case of the first offence, or 2000 penalty units for second or subsequent offences. At May 2015, one penalty unit equalled \$113.85.

Have your say

- 15. Are these penalties appropriate?
- 16. Do they incentivise liable parties to meet their obligation?
- 17. If the mandate increases should the penalties change?

Reviews and sunset clause

It is intended that the Queensland Productivity Commission undertake a review following the introduction of the legislation and preliminary mandated percentages, but prior to any increase to these mandated percentages. It is proposed that the legislation be subject to a 10-year sunset clause.

Expert Panel/Implementation Board

In New South Wales, an expert panel provides advice to the Minister on granting an exemption or suspending the minimum biofuel requirements. In Queensland it is proposed that the Government may consult with an interested stakeholder before making a decision. An interested stakeholder would mean an entity with expertise or an interest in biofuel and could include, for example:

- a Queensland Government Agency,
- another state or the Commonwealth; and an entity involved in, or representing, the motor vehicle industry, fuel industry, biodiesel industry, ethanol industry, feedstock industry, biofuel or bio-manufacturing researchers, consumers of feedstock or motor vehicle users.

Have your say

- 18. Should Queensland have an expert panel or implementation board? If so, which sectors should be represented?
- 19. How can the panel discharge their responsibilities appropriately and facilitate the required mandate being met?



Case study – Learning from Europe

In 2003, the European Union (EU) established a biofuel mandate to replace 5.75 per cent of fuel with biofuels by 2010. When the EU set the mandate, it did not include requirements for sustainable production of biofuels. Some companies invested in new palm oil plantations which resulted in deforestation in South East Asia and South America. At the same time, the carbon footprint of palm-oil biodiesel in the most extreme cases was 2070 per cent worse than conventional oil on a life-cycle basis. In 2013, the EU introduced stringent sustainability criteria for biofuels to ensure biodiversity is protected, indirect land use change is limited, greenhouse gases from deforestation and other land use change is limited.

4. Implementation – managing the risks

The Queensland Government is committed to supporting the growth of the biofuels sector but is cognisant of the risks associated with implementing a biofuel mandate. This section summarises some of the key implementation risks and seeks feedback on how Government can most appropriately address them.

Protecting the environment

Biofuels that are produced and used in a sustainable manner are generally a lower emission alternative to fossil fuels. Ethanol-blended fuels for example produce three to five per cent lower greenhouse gas emissions than conventional unleaded fuel. In some cases however, the production of biofuels can result in broader negative environmental impacts (refer to the above Case Study). These impacts can largely be avoided with appropriate policy oversight and stringent environmental standards.

The Queensland Government is committed to supporting biofuel and bio-manufacturing sector growth in an environmentally responsible manner. With this in mind, and in addition to existing environmental requirements, the following draft sustainability principles have been developed to support the growth of the biofuels sector in Queensland. It is intended that following consultation, the finalised principles will be prescribed in regulation prior to the introduction of the mandate.

- 1. Biofuel production in Queensland must not negatively impact biodiversity, ecosystems and areas of high conservation value.
- 2. The production and use of biofuels must result in a net reduction of greenhouse gas emissions compared with conventional fossil fuels.
- 3. Biofuel production must involve:
 - sustainable use of surface and groundwater resources
 - maintenance of soil quality and minimisation of soil degradation
 - avoiding negative impacts on water quality due to nutrient and sediment run-off.



- 20. Are these sustainability principles appropriate?
- 21. Should more stringent environmental measures be applied to the biofuel sector?
- 22. What other environmental risks must be considered in relation to an expanded biofuels industry?
- 23. How should they be enforced?

Maintaining consumer choice

In developing a biofuel mandate for Queensland, the Government is committed to ensuring that consumers retain choice. This is important as approximately 15 per cent of Queensland's 2.5 million vehicles are incompatible with E10 fuel. In addition, research shows that consumers tend to favour regular and premium unleaded petrol over E10 when the price difference is small and choice is available. Consumers should have access to a range of fuels and the ability to compare and choose the fuel they prefer for their vehicles.

If the mandate was set at two per cent, it is anticipated that choice of fuel will be maintained. Further, it is proposed that the Bill will allow for unblended petrol in the market by applying the mandate on the total volume of regular unleaded sales (rather than requiring every litre of petrol to contain ethanol) and excluding premium unleaded petrol. This will ensure there is a choice of unblended fuels – regular unleaded and premium unleaded – for servicing those vehicles that are incompatible with ethanol blends. In addition, and to support implementation and educate consumers about the biofuels mandate, the Government proposes to develop a targeted education campaign that would be launched prior to the biofuel mandate commencing.



- 24. What are the issues that need to be addressed if consumer choice is maintained?
- 25. Will choice of fuel increase costs to retailers or consumers?
- 26. Would a targeted education campaign on the actual benefits and disadvantages of biofuels/ E10 contribute to informed consumer choice?
- 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?

Ensuring consumer protection

An ethanol requirement is expected to provide a range of benefits to Queensland through increased employment and industry development. However, there is potential that the mandate could lead to consumers paying more for fuel if suitable consumer protections are not identified.

For instance, ethanol proponents suggest that a mature and competitive biofuels industry will be able to provide ethanol at a considerable discount to wholesale petrol. However, because of distortions in the petrol market, there is a risk that larger fuel companies will absorb much of the pricing benefit rather than passing them on to consumers. The Government would like to identify how best to ensure consumers see the benefits of low-cost ethanol.

On the other hand, in times of drought or other natural disasters, there might be limited commodities that could be turned into ethanol, and this shortage might lead to higher fuel costs for consumers. At any price higher than energy parity, there is a clear trade-off between the value of industry/jobs created and additional costs faced by consumers.

In the short term, mandating demand for ethanol in a market with few producers could also allow those producers to raise prices well above costs. However, over time the mandate could increase competition by encouraging additional suppliers to enter the market and drive down prices. A number of new market entrants have already expressed a desire to invest in expanding Queensland's ethanol industry.

In developing an ethanol mandate, the Government is interested in identifying a framework that will enable new entrants to be attracted to the industry on sustainable terms, while ensuring consumers also gain the benefits of the industry. This will mean that customers see the benefits of cheaper ethanol but are also protected from potential price increases at times when ethanol is not available at reasonable prices.



- 28. What options could we employ to protect consumers?
- 29. How can we ensure that fuel companies pass the benefits of ethanol through to consumers?
- 30. What is an appropriate method for estimating a 'reasonable' ethanol price?
- 31. What is an appropriate balance between costs to consumers and the creation of regional jobs?

Securing food supplies

A biofuel mandate should provide alternative markets and additional revenue streams for Queensland's primary producers. At the same time however, a mandate could create additional competition for feedstocks. For example, a biofuel mandate could create greater demand for both grain (sorghum) and sugarcane (molasses) to supply the two existing ethanol plants in Queensland.

If demand increases to a point where existing buyers of these commodities, particularly in the livestock industry, are forced to source higher cost feed, it may impact the profitability of some primary producers. In addition, during low feedstock production years, inflexible demand from an ethanol mandate could potentially inflate grain and food prices or reduce access to cost-effective energy sources such as molasses for drought feeding.



Ultimately the level of impact will depend on the percentage of the mandate and the feedstock used. Research indicates that the impact of a two per cent ethanol mandate is likely to be small and the flow-on impact on food prices of a two per cent mandate will be negligible, as feedstocks (molasses and sorghum) are just one component of the farm-gate price and a much smaller component of the final retail food price.



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



5. Bio-manufacturing – beyond biofuels

Through its biofuel mandate, the Queensland Government will provide certainty to the biofuel industry so that it can invest, innovate and grow. While a thriving biofuels industry is highly beneficial in its own right, it will also help create the foundation for a new high-value, knowledge-based biomanufacturing industry for Queensland.

Bio-manufacturing, or bio-refining, converts biomass into value-added chemicals, plastics and fuels. It uses modern scientific techniques, such as biotechnology, to transform organic material, often common agricultural feedstocks into new and functionally-improved products. Bio-manufacturing is seen as a major global growth opportunity and Queensland, with its tropical/sub-tropical climate, technically advanced agricultural sector, and large biomass supply (including waste) is well placed to benefit.

The opportunity

The Queensland Government's Advance Queensland – Developing the knowledge based economy of the future policy identifies areas where Queensland is considered to have a competitive advantage including clean energy production and storage, particularly renewables and bio-refining. The policy emphasises the need for research focused on the stimulation of new areas of industry employment such as industrial biotechnology (defined as the creation of fuel, plastics and materials from organic materials).

A 2014 report by Deloitte Access Economics and the Queensland University of Technology suggested that by 2035 a bio-manufacturing industry could create up to 6640 full time jobs and generate \$1.8 billion for Queensland's economy. This industry will build upon the states established primary industries and leverage our substantial scientific expertise to encourage investment, grow new jobs, generate export earnings and help diversify the state's economy. It can also significantly value-add to agricultural outputs and create new revenue streams for agricultural producers.

The challenges

In the past, government support for biomanufacturing has generated intensive local and international interest across a spectrum of projects including food production, paper products and high-value biochemical products such as plastics and chemicals. However as the industry is in an establishment phase, and due to unresolved issues along the supply chain (such as feedstock availability, financing and complexity of infrastructure and planning requirements), few projects have eventuated.

A new approach

With the introduction of a biofuel mandate, the Queensland Government has unequivocally demonstrated its support and intention to grow the biofuels industry. An added benefit of this approach is that it represents a transitional step that will help position Queensland to develop and realise the much greater opportunities offered through second generation processes, advanced fuels and biomanufacturing.

With this in mind, the Queensland Government is keen to take a proactive approach to help develop the bio-manufacturing industry. In coming months, the Government will work with key industry stakeholders to more clearly understand the biomanufacturing opportunity, the challenges and barriers and the role of the Government in providing a supportive environment to develop this substantial growth opportunity for the state.



- 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?
- 35. What additional actions can the Queensland Government take to increase the likelihood of project opportunities becoming operational projects?
- 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?
- 37. What regional centres could become hubs for bio-refinery investment/development in Queensland?
- 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)?

6. Summary of consultation questions

The policy environment

- Will the changes to excise arrangements proposed by the Federal Government have an effect on the use of biofuels by consumers?
- 2. What measures can be taken to offset any possible negative impacts by the proposed changes to excise arrangements by the Federal Government?

The ethanol percentage

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Bio-manufacturing – a new approach

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- 35. What additional actions can the Queensland Government take to increase the likelihood of project opportunities becoming operational projects?
- 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?
- 37. What regional centres could become hubs for bio-refinery investment/development in Queensland?
- 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)?

Have your say

To ensure we get the settings right and implement a biofuel mandate in the most cost-efficient and equitable manner, the Queensland Government wants to hear from industry and community members.

Submissions can be made by:

Email: biofuels@dews.qld.gov.au

Mail: Project Manager - Queensland biofuel mandate

PO Box 15456, City East Qld 4002

Submissions close Friday 3 July 2015 at 5pm.

Please indicate whether you would prefer any elements of your feedback to remain confidential. Submissions not marked as confidential may be published in full or quoted in public deocuments. For more information, call the Department of Energy and Water Supply on 13 43 87.

Further information is available at **biofuels@dews.qld.gov.au or** by calling 13 43 87.