

29 June, 2015

Project Manager
Queensland Biofuel Mandate
P.O. Box 15456
City East, Queensland 4002

I Michael Bryan, CEO of BBI Biofuels Australia, respectfully submit the following comments pertaining to the proposed Queensland Biofuels Mandate.

Background

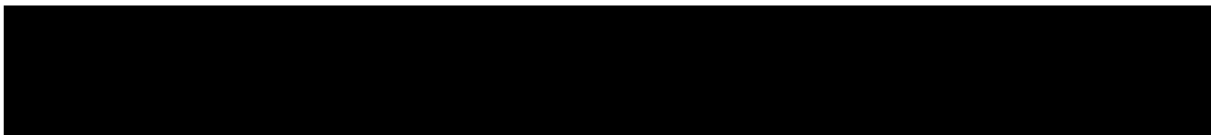
BBI Biofuels Australia is an Australian-owned entity established in 2006 dedicated to the advancement of the biofuels and bio-manufacturing industries. I am a citizen of Australia, residing in Queensland. As CEO of BBI Biofuels Australia I have been involved in the biofuels industry in the United State and Canada for the past 32 years. I am also Chairman and founder of BBI International, a US-based company that is dedicated to the renewable fuels industry in America.

BBI International publishes a number of renewable energy trade journals. They include: *The Ethanol Producer Magazine*, *The Biodiesel Magazine*, *Biomass Magazine* and *The Biorefining Magazine*. In addition, BBI International coordinates a number of national/international conferences for the biofuels, biomass and biodiesel industries and have been involved in hundreds of feasibility studies, and project development initiatives for ethanol, biodiesel and biomass facilities, worldwide.

My years in the biofuels industry have afforded me the opportunity to be on the front lines of the development of ethanol, biodiesel and biomass, particularly in America and Canada and more recently in Australia. I was deeply involved in the development of the US ethanol industry from its very onset in the early 1980's and still remain active on almost a daily basis in the US biofuels industry, although my two sons now run and manage BBI International in America.

Comments

There will be numerous discussion papers submitted on the matter of a biofuels mandate in Queensland that will address in detail the various issues laid out in the discussion paper titled: *Towards a clean energy economy: achieving a biofuel mandate for Queensland*. I felt it important to provide a slightly different perspective on the matter, by highlighting a number of experiences encountered in America when faced with almost identical issues now facing the Queensland Government in implementing a similar strategy.



The American Experience

In the United States, the introduction of an ethanol mandate began on a state level, as a result of significant air pollution problems in some major US cities. In particular, the city of Denver, Colorado and cities in California and Minnesota. As time went on, a Renewable Fuels Standard (RFS) was enacted on a federal level in 2005 as part of the Energy Policy Act and was then expanded in 2007 under the Energy Independence and Security Act.

In the early days of the industry prior to any mandates, many petroleum retailers had signs on the street that touted “No Ethanol in our Gas”, scare campaigns were rampant, using auto mechanics as one of the primary sources of inciting consumer concerns about ethanol. Often, when consumers brought in their car for a particular problem, they were asked by the mechanic if they used ethanol blended fuels, if they said they did, they were likely told that that was likely the cause of their problem. In truth, there was never any documented evidence that ethanol blended fuel created any performance problems. It was not until the Renewable Fuels Association (RFA), the trade association for the US ethanol industry retained a knowledgeable automobile expert to organize a nationwide campaign to educate auto mechanics on the truth about ethanol blended fuels that the misinformation began to subside. There still is a booklet in print today that is designed to educate auto mechanics on ethanol blended fuels titled: *Changes in Gasoline IV*.

Colorado, California, Minnesota

One of the first cities to introduce an ethanol mandate in the US was Denver, Colorado. Those of us who sat in the hearings sponsored by the City Government were astounded to hear comments from the oil industry and others regarding the calamity that would befall the citizens of Denver if such a mandate was introduced.

Some from the oil industry claimed that there would be deaths on the highways because of stalled automobiles resulting from ethanol blended fuels. Others emphatically stated that pollution would show a sharp increase because of harmful emissions and that consumer complaints would run rampant.

In the final analysis, it was a non-event when implemented, no cars were stalled along the highways, consumers did not complain and the CO₂ emissions began to dramatically reduce. In fact, they found that consumers actually liked the idea of doing something good for the environment, as long as it didn't cost them any more at the pump.

In Los Angeles, California similar concerns were raised when a mandate was introduced and nothing happened. In Minnesota, the State Government set up a fully staffed hotline for consumers to call when they had problems with ethanol blends as the Minnesota statewide mandate was initially adopted in 2003. No one called! The hotline was soon after taken down. Minnesota set a blend level at 7% in 2003, then in 2007 increased it to 10% and recently, the Governor of Minnesota Mark Dayton, signed into law a bill that raises the blend level of ethanol to 20%.

The point here is that in all of these cases and many others across America, despite dire predictions by those opposed to ethanol, nothing happened. In fact, now there have been literally hundreds of billions of trouble-free kilometres driven on ethanol blends worldwide. The only thing that ethanol has caused is a cleaner environment, a stronger rural economy and greater energy independence.

DRAFT

Changes to the Federal Excise Tax Exemption

In Australia there has been a myth perpetrated by the oil industry that ethanol blended fuel needs to be sold for less in order to encourage consumers to purchase it. The myth is based on the premise that 10% ethanol has less energy than in an equal amount of petrol. While this is true, the myth that it somehow significantly reduces fuel economy and therefore must sell for less is simply not true.

To set the record straight, there have been dozens of tests conducted on fuel economy with a range of ethanol blends. While some show a slight reduction others show no reduction and some even show an improvement in fuel economy. The fact is, that when you blend 10% ethanol into 90% petrol and then burn it in an internal combustion engine that has, on a good day, 30 – 35% energy conversion efficiency, it does not take a chemical engineer to understand that there could simply not be a significant reduction in fuel economy.

The other thing that is left out of the equation by the oil industry is that blending ethanol adds as much as three octane points to the fuel into which it is blended. This allows the refiner/blender to reduce other light-end hydrocarbons such as benzene, toluene and xylene (called the BTX group) used for octane enhancement that cost more than ethanol and are environmentally harmful and carcinogenic.

So the oil industry buys ethanol for less, based on a myth that they have to sell it for less, then they reduce their costs by reducing more expensive octane components, while providing a cleaner burning fuel to meet environmental regulations and adding needed octane to the fuel.

There is no reason that ethanol blended fuel should sell for less than regular petrol. In fact, it should sell for more, because it's a better product. So, the removal of the federal excise tax should have little effect on the market for ethanol. The US has now removed all excise tax exemptions for ethanol blends but has retained the Renewable Fuels Standard and the industry is flourishing.

Ethanol pricing is done on a daily basis using a pre-determined method agreed to by the ethanol producer and the oil industry. This is often based on the price of petrol imported from Singapore, plus applicable taxes. This pricing method should be reviewed as it grossly favours the oil industry and has no connection to the price of grain or sugarcane. Under some scenarios the price of grain or sugarcane could be quite high and the price of petrol quite low, which puts a squeeze on the ethanol producer. Any pricing mechanism should have some relationship to the price of the feedstock.

Should Queensland choose to provide an additional tax incentive for domestically (in-state) produced ethanol and biodiesel, it would go a long way towards encouraging the development of Queensland production, and help facilitate the State's primary objectives.

Percent of Blend

The starting percentage of the mandated blend is a topic of significant debate. Those who are strong biofuel advocates would suggest that it is a minimum of 10%, those who prefer no blend at all, think 2% is excessive.

The approach being considered by the Queensland Government is a good one, in that it provides an opportunity to move forward as production and consumer acceptance grow. Given the fact, however, that America and other countries are now touting blends of 15% and higher with no engine modifications, 2% seems unrealistically low.

Supporting a higher level blend on a technical level, studies show us that the vapor pressure of petrol increases as ethanol is added and that vapor pressure bump occurs in the first 2-3% of the blend. As the amount of ethanol added to petrol increases, the vapor pressure decreases to a point where it is at the same vapor pressure as the base petrol at about the 20% range.

The point here being that at 2% you get the vapor pressure bump but only minimal benefits of the ethanol as you might start to expect at 5% and higher. Also, there is no reason that we cannot meet a 5% requirement with current production levels. It appears that the 2% level is more of a concession than it is a real effort to improve air quality and create economic development. It certainly does not significantly impact the quality of the base fuel nor does it even begin to address any fuel security issues.

It is important to recognize the effect of a biofuels mandate on research and development on 2nd generation fuels and the feedstock used to create them. A biodiesel mandate should therefore be introduced concurrently, to maximize the effect of regional development and stimulate the production of 2nd generation feedstock for ethanol and biodiesel.

The applicable level of biodiesel mandate should recognize current feedstock capability, but also stimulate the production of biodiesel in regional areas, to subsequently assist both the ethanol and biodiesel industry.

Penalties for Non-compliance

One only has to look at New South Wales to see that a lack of strong penalties for non-compliance is a crucial part of creating a successful program. There may be a number of reasons for non-compliance and those reasons may have to be assessed on a case by case basis.

If a major retailer demonstrates non-compliance at a number of the retail outlets or shows disregard for the regulation then strict penalties must apply and must be sufficiently harsh to dissuade them from repeating the offence. In that case the suggested penalty of 200 units at \$113.85 per unit and a subsequent penalty for a second violation may not be sufficient. Consider that these companies generate hundreds of millions of dollars of profit every year.

In the case of smaller independent retailers a first time penalty of \$22,760 may put their business in difficult financial strife and clearly a penalty of \$227,600 would be problematic. So again, these violations, if they occur, should have to be assessed on a case by case basis to ascertain the reason for the violation. In some instances, the first-time violators may need nothing more than a slap on the wrist and a stern warning.

In the initial stages of the program, if consumer concerns are prevalent then a smaller retailer could choose to not blend and run the risk of being in violation in order to attract business from the larger chain retailers. It would be unusual for a retailer of any size to willfully be non-compliant in a metropolitan area. It is most likely that violations would occur in the rural areas where testing is less frequent and there are perhaps a larger number of reasons for non-compliance. At the same time, those petrol stations are mostly individually owned, even if they are brand name and penalty costs, especially for the first offense, may be excessive.

The source of the fuel is an important consideration. No petrol station large or small, rural or urban blends its own fuel. Therefore, the source of the violations will likely be at the source of the fuel. In most cases, fuel will be blended with ethanol at the terminal and delivered to the retailer whether chain or independent already blended. So if a fuel or retailer is non-compliant, the first place to look is up-stream to the blender. That will go far in determining who is at fault. If the product was ordered as a non-blended product then, that leads to the retailer. If the product was ordered blended, but was not, that leads to the blender who either willfully did not blend or did not blend by mistake.

In summary, it seems as though the first time penalty may be a bit excessive unless it is a blatant disregard for the regulation, but the second offence should be significant enough to thoroughly discourage a third offence.

Exemptions

Exemptions are the loop-hole in the NSW biofuels mandate program. The proposed Queensland exemption that states if; “The requirement to comply threatens the viability of the seller’s business or there are extraordinary circumstances to justify granting an exemption,” is indeed a very grey area.

The criteria used to assess such an ambiguous definition needs to be fully developed in advance, rather than on a case by case basis. Does the retailer or blender meet the criteria for an exemption based on these pre-established criteria? Either they do or they don’t and as a result either qualify for an exemption or not. Those criteria should be well documented and published in advance.

Expert Panel

An expert panel would be a great idea as long as it is a panel of “experts” in their field and not simply made up of advocates or those opposed. Each panel member should represent a particular segment of the various industries involved from a marketing and technical perspective. The Government should try to ensure that it not be politicised, which is often the case.

The panel should be able to reasonably discuss and reach consensus on major issues affecting all stakeholders. While there will always be special interests around the table, it should be made clear from the onset that the primary beneficiary of this program is the consumer, the environment and the economic stability of Queensland, not any one particular industry.

Managing the Environmental Risks

Almost any manufacturing industry carries with it environmental risks. The biofuels industry is no exception. It is not sufficient to say that because ethanol and biodiesel burn cleaner and reduce emissions over fossil fuels that there is no need for concern. There are other environmental issues that surround the production of biofuels that need to be addressed.

Dalby is perhaps not the best example of a modern day ethanol plant, it is not as efficient as the newer facilities and its water and energy consumption do not match the standard of today’s ethanol plant.

Water consumption in ethanol plants primarily consists of make-up water. This is water that must be replaced through evaporation from the cooling towers and boiler blow-down water. This accounts for 90% of the new water usage in an ethanol plant. Other than

those two major water loss areas, all of the rest of the water is recycled back into the plant and reused.

A newly constructed 150 million litre per year grain ethanol plant will require approximately 135 million litres of make-up water annually. That number continues to decline as it has over the past 20 years.

In terms of waste water, all effluent from the plant is moved from the plant into settling ponds where it is continually aeriated to keep it aerobic. The clean water flows into a second pond and is allowed to settle out a second time and then the water is either discharged into a river or stream, used for irrigation, or in some cases re-cycled back into the plant as make-up water.

There is no run-off from an ethanol plant. All storage tanks have containment barriers surrounding them and all other production and storage facilities in the plant are under-cover. Today's biofuels plants are state-of-the-art facilities that have been continually improving over the past 30 years.

The most significant risk/issue from a biofuels production facility are possible odours. These come primarily from the dryer stack in an ethanol facility as the distiller's grain is being dried. Other odour issues can include a slight smell of ethanol. While neither of these two odours is particularly offensive, if you are downwind of the plant it can be an annoyance.

It is important to note that when feasibility studies are conducted, factors of wind direction and residency must always be taken into account.

Consumer Education

Despite what the oil industry says, consumer loyalty to a particular brand of petrol is minimal. A recent study done in America showed that 65% of consumers choose where to purchase their petrol based on price. Another 20% based on location (is it on the way to or from work or the market) and 10% on ease of access to the petrol station. Only 5% in the most recent study bought their petrol because of the brand.

This is important because it demonstrates that price is the driver, not brand loyalty. The oil industry will vigorously argue that if they sell ethanol and the petrol station across the street does not, people will go across the street to fill up their cars. Research data, however, does not back that up. Add to that, under a mandated requirement, the station across the street would be selling biofuels as well, so that levels the playing field.

Consumers trust that wherever they purchase their petrol it will work just as well as the next brand. Most consumers know that petrol is petrol and that most of it comes from the same place and minor amounts of proprietary ingredients are added to make it specific for a particular brand. Having said that, people do trust the oil industry to provide them with a quality product fill-up after fill-up. Therefore, one of the primary sources of good consumer education should be the oil industry.

The legislation takes away the competitive nature of who does and does not sell ethanol blends. If the oil industry were to be encouraged to get on-board with point of purchase signage promoting ethanol blended fuels, consumers would readily accept it just as they accept that the petrol they purchase will always perform.

It is concerning to think that the government will wage a massive consumer education campaign on ethanol while the oil industry either sits on its hands and does nothing or

worse yet, talks ethanol and biodiesel blends down. The government's role in consumer education should be one of showing the economic impact, the environmental impact and the impact on energy security. It should promote the benefits to Queensland, not try to sell the consumer on the quality of the fuel. That should be the oil and biofuel industries responsibility, perhaps with some financial assistance from the Government. All it takes is one major petroleum retailer to get on board and promote the benefits of ethanol and biodiesel blends and others will quickly follow suit. While at the same time the Government is touting the social and economic impacts of biofuels.

Economic Impact

Ethanol was re-introduced into the fuel stream in America shortly after the Arab Oil Embargo of 1976. It was initiated by President Jimmy Carter to show Americans that the government was doing something about becoming more energy independent, but it soon became apparent that the economic ramifications for rural America were even more important than the original intent.

There are often concerns raised by dairy farmers and cattle ranchers that ethanol production drives up the price of grain and increases their financial burden. Those concerns have been raised in the US many times, but in truth, the coproduct of distillers grain from the ethanol process, largely mitigates those concerns.

For example, the dairy industry in New Zealand imports thousands of tonnes of distiller's grain annually. The cattle industry here in Australia, in America and many other countries around the world use distiller's grain as a viable feed supplement. The ethanol process removes the non-nutritional starch from the grain and converts it to fermentable sugars, what's left is a highly nutritional feed supplement. Fully one third of the grain processed for ethanol is converted to distiller's grain. While there is no similar coproduct derived from the processing of sugarcane to ethanol, the economic advantages of sugarcane far outweigh the lack of coproduct.

In America today, the ethanol industry alone, has created nearly 100,000 direct jobs and several hundred thousand indirect jobs. It is a multi-billion dollar industry and represents over 10% of all the fuel sold. Population will dictate that it will never be that large in Australia, but there is no reason to believe that a fully developed industry would not create thousands of jobs and millions of dollars in economic activity. Add to that the production of biodiesel and eventually bio-manufacturing and we have created an industry that creates jobs in rural communities, reduces pollution and generates greater energy independence.

One does not have to look far to begin to understand the economic impact created by a robust biofuels industry. Ask any mayor of a small town, whether it be in Australia, America, Canada or some other country and the response will be the same. "It's the best thing that ever happened to this town".

Ethanol production does slightly raise grain prices in the local area, but more importantly, it provides a floor for grain prices and helps minimize wild grain price fluctuations. At the same time, it injects millions of dollars into the pockets of grain farmers and sugarcane growers. In turn, they buy new farm equipment, expand their operations and put those millions back into the local community.

Data from hundreds of biofuel plants show us that 80% of the revenue generated by an ethanol or biodiesel plant is spent within a 100 kilometre radius of the plant. That's money that goes into main street businesses. From food to farm equipment and clothing

to cars, the economic impact created in rural communities by biofuel production is enormous.

Drought Conditions and Grain Prices

Given Australia's continuing cycle of drought and flood, grain prices will fluctuate accordingly. As in the US, when grain prices are high the margins at ethanol plants are less, when they are low, margins are higher. This is not as critical an issue in the sugarcane industry. A frequently reoccurring problem in that industry pertaining to ethanol production is the world price of sugar. Like all industries, ethanol and biodiesel producers have to ride the changes in the cost of their feedstock. Assuming the worst case scenario is part of every business plan.

Project Development

According to the scope of the proposed mandate, it is designed to primarily encourage job creation and economic development and a cleaner environment. The development of projects occur over an extended period of time. In other words, if there are going to be ten fuel ethanol and biodiesel facilities built in Queensland, they are not all going to receive financing and begin construction at the same time. Those facilities will be designed and built over a period of ten years or more.

Nothing happens until you have the money! Financing a biofuels project is difficult. The proposed mandate would help to alleviate one of the major hurdles, however, the other major concern of banks and private investors is the certainty of the length of the mandate.

The average biofuels plant has a payback between 8-10 years. Certainty of a market for that length of time is critical to any investor, public or private. Since these facilities will be developed and built over many years (not all at once) it is imperative that the mandate or whatever incentive is available long enough to ensure their viability. For example, if there are ten biofuel plants projected to be built in Queensland and it will take a minimum of ten years to build all of those plants then the investor must be given some assurance that the mandate will be in place for at least 20 years, more realistically 25 years in order for investors to have some assurance that the last plant built will also be able to recoup their investment. The proposed 10 year sunset clause is clearly not sufficient.

A typical project is developed in the following sequence:

- Feasibility Study – 3 months
- Decision to proceed or not – 1 month
- Business Plan if proceeding – 3 months
- Select Engineering and construction firm – 6 months
- Permitting – 6 months minimum perhaps more
- Construction – 12 -16 months
- Start-up – 2 months

This equates to a minimum of 33 months from concept to full operation and beginning of cash flow. A typical ethanol project of say 150 million litres per year will cost in the neighborhood of AU \$95 million. Capital required would be in the range of AU\$35 million with finance carrying the balance. Depending on the market, payback would be scheduled for 10 years.

Currently financing is difficult in Australia, banks are nervous as a result of the problems that the Dalby plant had. Therefore, future financing would likely be a

combination of capital invested by the developer and private finance with a small portion of the money coming from banks.

There are investors globally that would have an interest in investing in biofuel projects in Queensland, but those investors will certainly require some type of long-term market assurance. Part of that assurance would be that imported ethanol from another country or even from another states has a price disadvantage. The foreign import issue is resolved with the removal of the federal excise exemption. The importation from other states needs to be addressed. While Queensland cannot stop the importation of ethanol and biodiesel from other states, it can and should further incentivise in-state production to encourage development and to further provide assurance to investors that their market is reasonably secure.

Summary

There perhaps has never been a better time to initiate a biofuels mandate. Both from a state perspective as well as on a national level. Queensland can and should lead the way on this, learning from the mistakes made in NSW and moving forward with a program that encompasses a much larger vision than our neighbors to the south.

It is very important that the ethanol and the biodiesel requirement be introduced concurrently. The data is there, the demand is real and the ethanol and biodiesel industries are ready to ramp up production.

This initiative demonstrates that Queensland means business when it comes to creating jobs, improving the State's economy and protecting our environment on the renewable fuels front. All Queensland need to do is give the green flag to the biofuels industry, by providing a program that ensures longevity and creates a platform of investor confidence. It's time to join the rest of the world in demonstrating our commitment to the environment, energy independence and a strong rural economy.

Respectfully Submitted

Michael Bryan
CEO BBI Biofuels Australia