

3 July 2015

Project Manager
Queensland Biofuel Mandate
Department of Energy and Water Supply
PO Box 15456
City East QLD 4002

To the Project Manager

Submission to the Government's Discussion Paper on the 2% E10 Mandate and Biodiesel

Thank you for the opportunity to make a submission on the discussion paper, *'Towards a clean energy economy: Achieving a biofuel mandate for Queensland.'*

Queensland Urban Utilities (QUU) supports the development of a sustainable and competitive biofuels industry in Queensland. Our support for the Government's proposal is aligned with QUU's corporate goals of reducing greenhouse gas emissions through renewable energy initiatives, to the benefit of its customers and the community. QUU pursues cost-effective solutions in our capital investments, efficiency of operations and by converting waste into resources. **Attachment 1** provides some examples of QUU's waste-to-resource strategy in action.

QUU makes the following observations on the discussion paper, recognising its context within the Advance Queensland initiative:

- To successfully implement the biofuel mandate in the most cost-effective and equitable manner, the scope of the mandate must be broadened to include waste-to-resources and deepened to incorporate vertical aggregation of the value chain.
- Biogas produced from sewage and trade waste, is a renewable as well as sustainable energy source, which increases with population growth. QUU has been successfully generating biogas at Luggage Point sewage treatment plant for the past 30 years, and generating electricity for on-site use. Combined with high strength organic waste materials in the trade waste stream, biogas production can be enhanced significantly. To be a significant economic benefit, this requires capital investment and access to energy customers.
- Water is critical for the production of biomass from conventional agriculture or algae farming. Treated recycled water from sewage effluent is a renewable source and given its latent nutrients, can enhance production of biomass. This biomass is an input to biodiesel production. While recycled water can be readily produced, supplying it to agriculture or algae farms requires access to pipeline systems and energy for pumping. There are some concepts, potential locations and opportunities in South East Queensland worth investigating. The added benefits include reduced effluent and nutrient discharge to rivers.

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- Underutilised recycled water pipeline assets could be recommissioned to enable large scale biomass production. The existing transmission main pipelines to key agricultural areas in South East Queensland are underutilised and mothballed; and under current projections, may not be used for a number of years. If these assets remain unused, it is likely that in ten years' time they may not be serviceable and could require significant capital works.
- Residual biosolids from sewage treatment process contain nutrients and can enhance agriculture production. Phosphorous based fertiliser from sewage treatment contains more essential minerals and less heavy metals, such as cadmium, than fertiliser produced from mined phosphorous.

Endorsing and implementing the following recommendations would enable the Waste-to-Resource Industry to support the Government's Biofuel Strategy. These recommendations increase the co-benefits to the community through cost-effectiveness and environmental sustainability:

- Include biogas in the biofuel initiative, thus allowing biogas to be valued for mobility fuels; consider electricity cogeneration from biogas to be equivalent to a biofuel.
- Ease the regulatory burden on Water Utilities for beneficial use of recycled water on land/crops. Irrigation of recycled water is stringently regulated if a Utility undertakes the irrigation, but if a 3rd party undertakes the irrigation, it is unregulated. The viability of biomass production is compromised by the high cost of this additional regulation. As a first step, specifically consider relaxation for research and development into biomass production.
- Provide financial incentives to bridge the issue of scaling-up to manufacture of biofuels. Typically, while biomass is readily produced at small scale, the pathway to economically viable production requires large-scale production of biofuels. QUU has been testing glycerol (a by-product of biodiesel manufacturing) at our sewage treatment plants, to enhance biogas production, reduce residual biosolids and generate electricity. In view of these co-benefits, consideration should be given to vertical aggregation of value chains.
- Initiate collaboration among the Departments of Energy and Water Supply, Agriculture, State Development, Environment and Heritage Protection, Seqwater and the retail Utilities, to develop a pragmatic approach to support the Government's objectives using underutilised assets.

Waste-to-resource initiatives and vertical aggregation measures will benefit regional communities. Sewage treatment plants, recycled water, biosolids, effluent disposal, and energy needs, are significant issues for all communities.

QUU would be pleased to discuss with you, and show you our current projects that demonstrate these waste-to-resource initiatives are feasible and sustainable. Please contact me on [REDACTED] or [REDACTED] should you require further information.

Yours sincerely



PAUL BELZ
Executive Leader Planning
Queensland Urban Utilities

Enc. Attachment 1 - QUU's Waste-to-Resource Strategies in Action

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QUU’s Initiatives in Solar Energy for sewage treatment

By harnessing regional South East Queensland’s abundance of sunshine and space, QUU is now using sustainable, solar energy to partially power our sewage treatment plants, which reduces operational costs and benefits customers, the local community and the environment. Using solar energy saves around \$45,000 a year and reduces the annual carbon dioxide emissions to the equivalent of taking 57 cars off the road for a year.

In an innovation first for the Lockyer Valley region, around 250 solar panels were installed at the Laidley, Gatton and Forest Hill sewage treatment plants, as well as the Gatton depot. In Somerset, around 20 solar panels were installed at Kilcoy sewage treatment plant, and in the Scenic Rim, 300 panels installed at Beaudesert, Boonah, Kalbar and Kooralbyn sewage treatment plants. In Lockyer Valley alone, QUU generates 59 kilowatts of green energy, cutting power use at the facilities by more than 20 per cent.

Over the coming year, QUU will install solar panels at more sewage treatment plant sites across areas including Esk, Fernvale, Goodna, Wynnum, SAS Labs, Bundamba and Fairfield. Treating sewage with energy from renewable sources, such as solar, reduces carbon emissions, lessens reliance on the power grid, and reduces the cost of providing essential services to communities which ultimately saves customers money. It also helps preserve South East Queensland’s environment for future generations to enjoy.

QUU are one of the first water utilities in Queensland to utilise solar power in this way and to be future-proofing sewage treatment with renewable energy. With increasing energy costs and diminishing supplies of fossil fuels, QUU are planning for the future of water and sewerage service provision.

By innovating and exploring the use of new technologies, QUU are able to find more sustainable ways to deliver services which reduces the cost of essential services for our customers. This initiative is just one of many QUU projects to reduce our carbon footprint and explore new ways to operate to benefit our customers, community and the environment.



QUU turning sewage into power to run sewage treatment plants

QUU are set to save up to \$1.45 million a year, at the two biggest sewage treatment plants by harnessing the power of biogas.

Three new cogeneration units have been installed at the Luggage Point and Oxley Creek plants where biogas is produced from sewage sludge and used to generate electricity. Pumping and treating sewage uses large amounts of power. The state-of-the-art cogeneration technology allows production of up to 40 per cent of the plants' electricity needs. This is equivalent energy to power 1,250 homes each year.

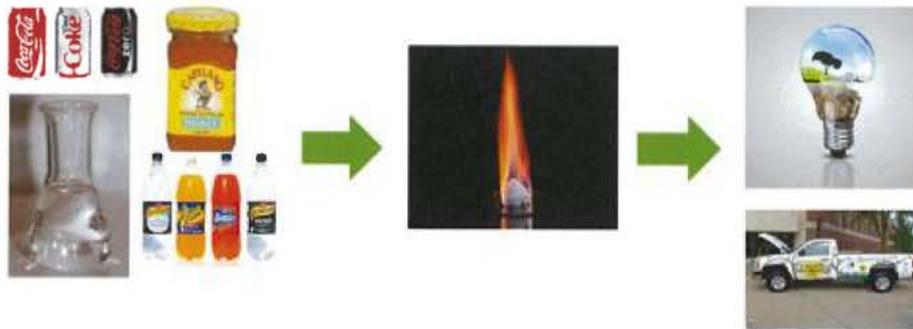
Cogeneration involves capturing the biogas produced from sewage sludge, then using it to drive an engine which produces electricity. This is a great example of modern sewage treatment plants becoming resource recovery centres.

Phosphorous rich Struvite extracted from sewage treatment, used in fertilisers



Initiatives part of QUU's Renewable Energy Plan which aims to make its sewage treatment plants cleaner and greener

- QUU is conducting a trial where soft drink, juice, honey and alcohol by-products are added to the sludge digesters to increase the amount of biogas produced. This will allow QUU to supply biogas for vehicles or to increase energy yields even further, to meet demand.



- An exciting QUU innovation in the pipeline is to establish 'energy crops.' Energy crops are low-cost, low-maintenance plants grown to produce bio-fuel (clean burning renewable fuel made using natural vegetable oils and fats), near QUU sewage treatment plant (STP) sites. This innovation will reduce effluent discharged into the environment, by irrigating the 'energy crops' with treated effluent (drought-proof source of water); generate revenue by harvesting the seeds that produce bio-fuel to reduce costs; and to reduce environmental footprint.

