

**To: Queensland Government, Department of Energy and Water Supply**

**From: Unitywater (Northern SEQ Water Distributor Retailer)**

**Date: 3 July 2015**

**Re: Towards a clean energy economy: achieving a biofuel mandate for Queensland (Discussion Paper)**

Unitywater is a statutory authority that provides water supply and sewerage services to approximately 700,000 people in Moreton Bay and Sunshine Coast, which is one of the fastest growing regions of Australia (16% of Queensland's population). Unitywater's core business is the delivery of drinking water and recycled water to customers and the collection and treatment of sewage and trade waste from customers.

Whilst Unitywater operates a fleet of vehicles to service the water and sewer network and infrastructure across a wide geographical area and fuel usage is more than 1 million litres p.a., the main issue to be presented in this submission is related to the utilisation of glycerol, a co-product of biodiesel production. Unitywater envisages two potential uses for glycerol:

1. To provide an alternative organic carbon source for nitrogen removal; and
2. To increase biogas production from anaerobic digestion of sewage sludge by co-digestion with glycerol, which would then allow greater production of electricity from the biogas.

These two potential uses for glycerol are not unique to Unitywater, and would be equally applicable to most water authorities in Queensland. This is because high levels of nitrogen removal are an environmental regulatory requirement for many sewage treatment plants in Queensland, and anaerobic digestion is one of the most practical, cost effective and widely used processes for converting "waste to energy" that is applicable to most larger sized sewage treatment plants.

As part of Unitywater's corporate cost reduction strategy, we have embarked upon a project to utilise a co-product of the biodiesel industry (glycerol) to provide a lower cost and safer alternative to methanol (derived from fossil fuels) that is currently used at some sewage treatment plants for enhanced nitrogen removal. While this project is ongoing, results thus far have been promising.

Although Unitywater currently operates a limited number of anaerobic digesters at present, there is increasing interest within the business to generate electricity from biogas to reduce expenditure on electricity and reduce the carbon footprint of Unitywater's operations, and ultimately to reduce costs to our customers (rate-payers). Co-digestion of sewage sludge and glycerol has the potential to increase the biogas yield, increase the electricity that can be generated and improve the pay-back period for future investment in co-generation technology.

A Queensland mandate of biodiesel would contribute to the following outcomes:

1. Provide confidence for Unitywater to continue with investigations into uses for glycerol as the ability to supply the biodiesel co-products would be further guaranteed.
2. Contribute to local jobs both in the biodiesel industry and in Unitywater.
3. Reduce the cost of production of biodiesel since glycerol co-products could be beneficially used at sewage treatment plants rather than requiring disposal via liquid waste contractors.
4. Encourage innovation and stimulate any further improvements that may come from bio-refining industries such as biodiesel.
5. Contribute to reducing the carbon footprint of Unitywater.

In summary, Unitywater would like to raise awareness of two potential applications in the sewage treatment industry for beneficial use of the glycerol co-products from biodiesel production. Glycerol can be used as an alternative organic carbon source for enhanced nitrogen removal, and for increased biogas production from anaerobic co-digestion of sewage sludge with glycerol, which would then allow greater production of electricity from the biogas. Both of these beneficial uses of glycerol would contribute to reducing the carbon footprint of sewage treatment processes and have the potential to reduce the costs to rate-payers.