An Economic Assessment of Bioethanol Production from Sugar Cane: The Case of South Africa

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South Africa's high level of dependence on imported crude oil exposes the economy to global events that impact on crude oil supply and prices. Given the country's vulnerability to global crude oil price shocks these events have the potential to undermine South Africa's economic growth and development. The renewed efforts to develop a biofuel industry in South Africa are undoubtedly motivated by such concerns. The development of a national policy that promotes commercial biofuels production has however been countered by concerns relating to food security issues within South Africa. This concern has seen the prohibition of maize and the favouring of sugar cane as a feedstock in South Africa's Biofuels Industrial Strategy. The paper set out to analyse the economic feasibility of producing bioethanol from sugar based on the industry's efforts to diversify its product market base. The promotion of commercial bioethanol production in South Africa is seen not only as an opportunity to support the long-term financial survival of the country's sugar industry but also as an opportunity to promote social development within the country.

The results of this study suggest that the South African sugar sector has the potential to provide enormous promise in the development of the country's biofuels market. The key constraint to the country's commercial production of bioethanol is, however, the national regulatory environment. Without greater regulatory certainty and in the absence of government subsidisation, the work here concurs with the earlier findings of Van Zyl & Prior (2009) that investment in bioethanol production within South Africa's sugar sector will not take place. The study results suggest that costs associated with the production of bioethanol from sugar in South African are similar to those in the United States. These costs are significantly lower than those in EU countries, but somewhat 50 percent higher than production costs in Brazil (the lowest cost global producer). Furthermore it is established that South African bioethanol production is financially viable at US$102 per barrel. This is based on estimates that producers typically pay the equivalent of US$67 per barrel for sugar cane feedstock, incur approximately US$20 per barrel on operating & maintenance costs and require the equivalent of US$15 per barrel to recoup capital investments and secure a sustainable level of retained earnings.

It is clear from this study, that in the case of a bioethanol price equivalent to 95 percent of the basic fuel price, that returns to South African producers are likely to be negligible when crude oil prices are below US$82 per barrel. If bioethanol production from sugar cane is to have any meaningful impact on South Africa's liquid fuels supply security, the financial support for biofuels producers needs to extend beyond the national Biofuels Task Team's mandated biofuel selling price. Indeed it needs to be acknowledged, that the South African sugar industry requires substantial subsidisation to kick-start the commercial production of fuel grade ethanol. The study's results concur with the findings of Braude (2014), that additional state intervention is required in the form of fuel tax exemptions that are linked to both the price of crude oil and the exchange value of the country's currency. Additionally, clear state mandated subsidies and capital investment allowances are needed for the successful establishment of the commercial production of bioethanol from sugar in South Africa. This state support is lacking to date as South African authorities have merely indicated that a nominal fiscal incentive of a few cents per litre of fuel is to be
granted to assist potential bioethanol manufacturing plants with their initial capital cost hurdles. The costs of the fiscal incentive will according to the authorities be recovered through a levy included in the monthly price determination of the country's petroleum products. At the last count, licences had been granted to four producers to manufacture bioethanol from sorghum. It is, however, still the case that only one sugar cane company has been granted a licence to commercially produce bioethanol in South Africa.