Biofuel production in South Africa: the games, the cost of production and policy options

by

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Abstract

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The production of biofuels in South Africa has evolved very slowly and at present there are only a handful of plants producing some derivative of biofuel. The lack of commitment from government and the utter information distortion under which the current policy framework was developed have largely contributed to the current state of affairs. The manner in which the current policy framework was formulated based on the available information has impacted negatively on the development of the industry and it is hypothesised that had a better and more comprehensive analysis process been followed, the framework would be of such a nature that the industry could be sustainable in the long run. The study examines the policies and policy development process that have taken place in other biofuel producing countries and investigates the various policy instruments that are in use in these industries. The study further explores the interactions of industry role players at both government and producer level while attempting to explain the factors that could have caused their deviation from the rational and expected path of strategies and actions. In both games, each at a different level, the resultant Nash Equilibrium changes and prevailing strategies indicate that it is not in the role player's interest to commit to the industry. The government departments involved in formulating the biofuel policy seem to be uninformed and hence choose a low support route while oil companies

consistently choose not to invest in capacity and biofuel refiners find their Nash Equilibrium at high levels of investment. A decision tree is formulated to conduct an in-depth review of the current level of profitability of proposed and current projects with specific reference to current legislation. The decision tree unpacks the current economic environment in the industry and identifies various factors that are crucial to the long-term development and growth of the industry. Based on this comprehensive survey of the industry and a detailed comparison of various production costs, together with the design of the game theoretic framework, a conceptual policy framework is designed and it is proposed that this replaces the current biofuel strategy. The new policy framework establishes its sustainable structure based on facts, detailed figures and existing project information. The framework is based on a more sustainable policy structure that combines elements of rural development with the economics that are required in order for the industry to be sustainable in the long run. Unlike the official government biofuels policy, the Industrial Biofuels Strategy, this proposed policy framework takes the industry's and role players' requirements into account and is designed in such a way that government targets and goals are accomplished. It is hypothesised that the implementation of this comprehensive policy framework will assist in the establishment of a successful and sustainable biofuels industry.