BIOFUEL POTENTIAL IN GUYANA

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Government of Guyana

Project Document

Biofuels potential in Guyana

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Economic Commission for Latin America and the Caribbean (ECLAC)

This document has been prepared by the United Nation's Economic Commission for Latin America and the Caribbean (ECLAC) as part of a joint project with the Italian Cooperation Agency (Ministry of Foreign Affair of Italy) entitled "*Renewable Energies for the Productive Development of Andean and East Caribbean Countries", ITA/006/01.*

The report has been prepared by the international energy specialist and UN consultant, Prof. Augusto Horta Nogueira, under the coordination of Manlio F. Coviello, Economic Affair Officer at ECLAC, who also acted as project manager

The entire work has been carried out in direct and strict coordination with the Office of the President of the Republic and the Office of the Prime Minister of Guyana, in cooperation with other governmental entities. To this regard, special mention has to be made to the Special Adviser to the President and His Excellency the Primer Minister, who strongly supported the development of both field and conceptual work.

The text was reviewed by several guyanese governmental entities involved in the study, including GUYSUCO, GEA, IAST and EPA. Relevant support for the study was furnished by Charmaine Gomes and Rudolf Buitelaar, both officers with the ECLAC subregional headquarters in Port of Spain.

The project manager is grateful to the Ministry of Foreign Affair of Italy for its contribution to the execution of this study.

The views expressed in this study are the sole responsibility of the authors and do not necessarily reflect those of the institutions involved.

United Nations Publication

LC/W.118

Printed in Santiago, Chile – United Nations

Contents

Abstract

Guyana depends on imported fuel to meet the needs of its transport sector. In recent years, prices of derivatives of petroleum have increased significantly, further widening the current account deficit. In 2005, fuel accounted for 29% of the value of imports of the country.

The technology of using ethanol mixed with gasoline in four-stroke cycle engines is well-known, and, does not require any changes in vehicles for levels of ethanol in the mixture up to 10%. This technology is used in many countries with vehicle fleets, similar to those of Guyana.

The sugarcane industry of Guyana constitutes one of the most important economic activities of the country and is one of the main sources of foreign exchange. However, it is subject to very significant market risks, associated with changes in the Sugar Protocol and the reduction of preferential prices on the market of the European Union.

A diversity of raw materials, sweet or starchy, may be considered for the production of ethanol. However, when considering costs, available technology and energy productivity, sugarcane (directly as juice or as molasses) presents the most attractive option. In time, other possibilities may be considered.

In the most conservative scenario (use of final molasses, producing 8.8 liters of ethanol per ton of processed sugarcane), it is estimated that 30.8 million liters of ethanol may be obtained annually from the sugarcane industry in Guyana. This would be nearly 3 times the anticipated demand of 11.5 million liters, if a mixture of gasoline with 10 % ethanol were to be used in Guyana's vehicles. If other raw materials with higher productivity (sugarcane juice or primary molasses) are considered, the available potential ethanol would increase proportionally.

In 2005, the export price of molasses was US$ 83 per ton. Each ton of molasses can produce 260 liters of ethanol. This implies an estimated opportunity cost of US$ 0.392 per liter of ethanol. This is lower than the US$ 0.463 per liter that Guyana paid for its imported gasoline in 2005, indicating the competitiveness of the biofuel. Ethanol from molasses has consistently been price competitive in the past few years, even without consideration of positive externalities associated with it.

If Guyana were to utilize a mixture of gasoline with 10 % ethanol, a distillery producing 65 thousand liters of ethanol daily would be required to satisfy national demand. This would require an investment of approximately US$ 6.5 million. It would result in a net earning of

approximately US$ 800.000 and annual savings of US$ 5.4 million on the energy import bill, at 2005 prices.

Present conditions of the energy and the agro-industrial sector of Guyana provide an excellent opportunity for the production and use of ethanol as a source of fuel in the country. Furthermore, in addition to price considerations, it is important to be able to produce locally part of the national energy demand, using available natural resources and proven technologies. This would also stimulate diversification in the sugarcane industry which is currently exposed to well known challenges. Moreover, the use of ethanol as a source of energy would have significant environmental advantages. All together, these conditions make a decidedly sufficient and robust case to promote the use of ethanol for energy security in Guyana.

The promotion of ethanol as a source of fuel in Guyana requires the collaboration of all institutions and stakeholders arriving at an operational mechanism for the introduction of ethanol within the energy sector. For such an initiative to be successful clear timelines should be established and commitments obtained. It should also include a component for building public awareness as well as involvement of the local science and technology community.

I. Introduction and background

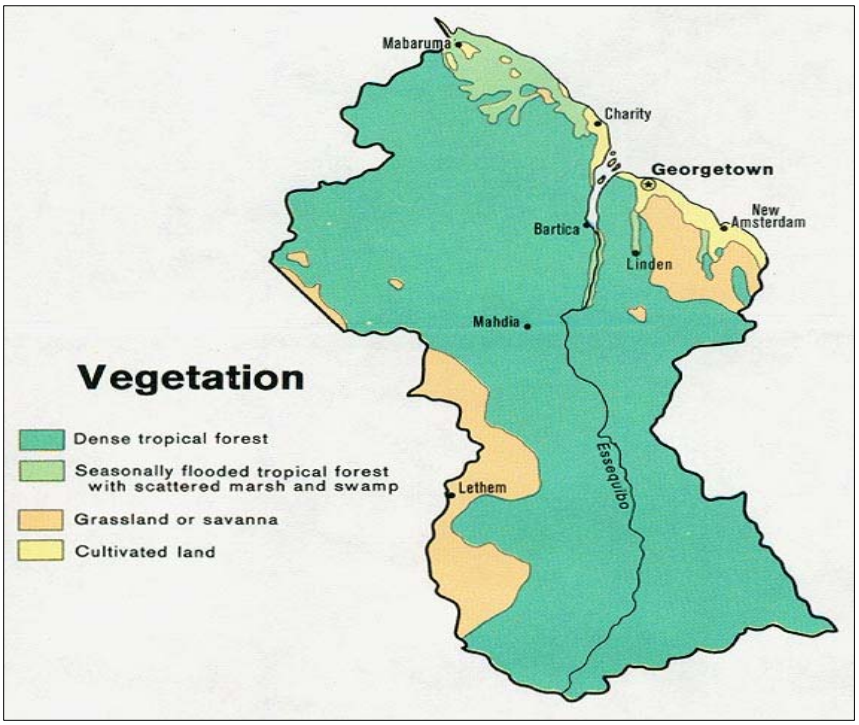
This outlook for the production and use of biofuels in Guyana is preceded by a brief look at the country's geographical and economic characteristics and an introduction to the energy situation and the objectives of the study.

Located on the Atlantic coast in the north of South America, Guyana has an area of 215,000 km^2 and a population of 752,000,[1] giving it a population density of fewer than four inhabitants per square kilometre. Most of the inhabitants are concentrated in coastal areas and are engaged in the main economic activities, which relate to the production and processing of agricultural crops such as sugar cane and rice, which are cultivated essentially on the coastal plains.

The interior consists basically of extensive forest formations, which cover more than 80% of the territory and sustain a sizeable timber industry. Guyana possesses substantial and diversified mineral resources and the bauxite industry plays a prominent role in the economy. Gross domestic product (GDP) was estimated at US$ 624.3 million in 2005, corresponding to per capita income of US$ 830 per year. Guyana's population and economic activity have not changed significantly in recent years.

[1] Estimated data for the end of 2005, Bureau of Statistics of Guyana/UNICEF, Statistical Bulletin, January-March 2006.

FIGURE 1
VEGETATION COVER IN GUYANA



Source: Perry-Castañeda Library Map Collection, University of Texas at Austin

FIGURE 2
COMPOSITION OF GUYANA'S GROSS NATIONAL PRODUCT