

OVERVIEW OF ETHANOL PRODUCTION IN JAMAICA

THE BACKGROUND

Ethanol has gained popularity in recent years as the preferred octane booster for gasoline blending in North America and several other regions of the world. This has followed a phase-out of lead as an additive due to its polluting effects in areas of high population and motor car density, particularly in the United States of America.

In Jamaica, several pre-conditions exist to encourage the production of ethanol. Sugar cane is one of the crops from which ethanol can be produced and is widely grown in Jamaica and other Caribbean regions. The technology and skilled manpower are available.

In 1984, ethanol was included in a list of commodities for which duty-free access to the United States was allowed under the *Caribbean Basin Initiative (CBI)*. The then stated intention of the U.S. legislation was to facilitate Caribbean economic development by allowing duty-free access to the U.S. for certain commodities produced in the Caribbean, provided that there was at least 35% value added to the commodity within the Caribbean. This meant that Caribbean ethanol can enter the United States without paying the present US\$0.54 per gallon import duty.

HISTORY OF PETROJAM OPERATION

In 1985, *Petrojam Ethanol Limited (PEL)* decided to take advantage of this opportunity and developed plans to establish an ethanol plant on its Kingston refinery site. Construction of the plant was completed in 1986 and it began operation in 1987, utilizing ethanol feedstock sourced in the Caribbean, Europe and Brazil.

To ensure an adequate supply of Caribbean sourced feedstock, two initiatives were taken. In 1985, *PEL*'s parent corporation, the *Petroleum Corporation of Jamaica (PCJ)* acquired the *Bernard Lodge Sugar Factory* which was slated for closure. The factory was rehabilitated where fermentation and distillation facilities were installed with the capacity to produce some 15 million gallons of hydrous ethanol each year for use by the *PEL* facility.

In 1986, the *CBI* legislation was modified to require more *CBI* sourced feedstock than Jamaica could produce. *PEL* then identified a recently closed sugar factory at *Libertad* in Belize, with a capacity similar to that at Bernard Lodge, and having access to abundant sugar cane production capacity.

PEL leased the *Libertad* factory for five years initially with a purchase option, and undertook a program of growing sugar cane and making high grade molasses. The operation commenced in 1989 and continued until 1997.

Originally at *PEL*, the feedstock was processed in dehydration facility consisting of two plants with a combined capacity of 52 million gallons of ethanol per year. The first plant, purchased from *Conger* in Brazil, was installed in 1985, and had an annual capacity of 10 million gallons. The second plant, purchased from *APV* in the United States, was installed in 1986 and had a capacity of 42 million gallons per year. Both plants have similar operating conditions, using azeotropic distillation.

Currently, the *Conger* plant is obsolete and the *APV* plant has been mothballed since 1997 because of inefficiencies in production and environmental concerns from the use of benzene. However, *PEL* maintained its stake in the ethanol business through a fobbing and tolling arrangement with *ED&F Man*, a commodity trading company from Europe, which owned and operated two ethanol dehydration plants in Rockfort, Kingston. The source of the feedstock for this arrangement was the *European Commission (EC)* under a tendering system for surplus wine alcohol. The volume which *PEL* was able to access under this arrangement was limited to approximately 5 million US gallons per year and the entire supply was discontinued in 2004 as Europe was in the process of developing their own biofuels

programme.

REHABILITATION PROJECT

With the USA market for ethanol growing significantly in 2004 and with new and more aggressive *Renewable Fuels Standards (RFS)*, the market was poised for continued growth in the future. Additionally, in 2004 the quota for ethanol imports from *CBI* countries into the USA market had been below target by more than 50%. As a result, *PEL* sought to identify reliable sources of feedstock at competitive prices in order to economically rehabilitate the dehydration plant. Since Brazil was among the highest producers of alcohol worldwide, it was advantageous that *PEL* establish a strategic alliance with potential investors that would provide access to a reliable source of feedstock preferably from Brazil where there was an abundant supply of sugar cane.

In 2005 *PEL* and *Coimex Trading Company* established a partnership to secure the supply of hydrous alcohol from reliable producers, primarily in Brazil, at competitive prices, then to dehydrate it into fuel ethanol at the *PEL* plant in Jamaica for an agreed processing fee, and for the partners to jointly market the finished product in the US for an acceptable margin. As part of the agreement between *Coimex* and *PEL*, *Coimex* financed the construction of a new 40 million US gallon per year ethanol dehydration plant and provided services related to the procurement of feedstock and the sale of anhydrous ethanol jointly with *PEL* and the profits on the sale of anhydrous ethanol split on a 50/50 basis. The agreement with *Coimex Trading Company* expired on June 30, 2008 and the ethanol dehydration plant is now fully owned by *PEL*.

Petrojam Refinery, where the ethanol dehydration plant is located, provides support to the operation of *PEL* primarily in the areas of utilities, maintenance, shipping, laboratory services and other technical services. These expenses are allocated appropriately to *PEL*.

OTHER ETHANOL PRODUCERS

There are currently two other ethanol dehydration plants in Jamaica. The *Jamaica Ethanol Processing Limited (JEPCO)* plant is located in Rockfort, St. Andrew and is rated at 50 million gallons per year. This capacity was achieved after upgrading and modernization work on the facility in 2004 which increased the capacity from 20 to 50 million gallons per year. The original plant was built and commissioned in 1986 by *Tropicana International*. In 1992, the London based company *ED&F Man*, purchased the plant and is still the principal of *JEPCO*.

The other plant is new and is owned by *Jamaica Broilers Group of Companies*. The plant is rated at 60 million gallon per year and production started in August 2007. The company is now embarking on an expansion project to double their production capacity in the first quarter of 2009.