International Seminar on Bioenergy & Sustainable Rural Development

Casa de Gobierno
Paseo de la República 1500 Col. Oviedo Mota

Morelia, México
26-28 June 2003

SEMINAR PROCEEDINGS (Excerpt)

ANES

The International Seminar of Bioenergy and Sustainable Rural Development was held in Morelia, Mexico, from June 26 to 28 2003. It was organized jointly by the Latin American Thematic Network on Bioenergy (LAMNET), the Center for Ecosystem Research (CIECO) from the National Autonomous University of Mexico, the Food and Agriculture Organization of the United Nations (FAO), the National Association for Solar Energy (ANES) and the State Government of Michoacan, Mexico.

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Updated information on this workshop is available at http://www.bioenergy-lamnet.org, http://bioenergia.oikos.unam.mx and http://www.anes.org.

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International Seminar on Bioenergy and Sustainable Rural Development
- 5th LAMNET Project Workshop – Mexico 2003

THE PATH IS CLEARING FOR FUEL ALCOHOLS IN COLOMBIA

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Abstract

This is an ambitious program which introduces renewable fuels in the national energy basket, which purpose is to improve air quality, and at the same time, natural renewal resources have a better use, generating a wide stimulation to country development reducing greenhouse effect gas emission. The program includes the expansion of sugar cane growings and some other agricultural products, and the building of nine agroindustrial complexes in different regions of the country to produce anhydrous bioethanol which will be mixed with gasoline producing a new fuel for the country.

La Corporación para el Desarrollo Industrial de la Biotecnología y Producción Limpia – CORPODIB – (The Corporation for Industrial Development of Biotechnology and Clean Production), a mixed entity, a non profit association, have been promoting seven years ago, a national program to introduce renewable fuels, particularly fuel bioethanol and biodiesel. The program is directed to the reduction of movable sources emissions and to the development of energy agriculture in the country.

Law 693 of September 2001 demands the use of biomass ethanol in gasolines used in the main cities of the country. Law regulation indicated that not later than September 27th, 2005, gasolines of Bogota, Cali, Medellín and Barranquilla should contain fuel alcohols in a 10% volume. The same condition is set one year later in the cities of Bucaramanga, Cartagena and Pereira. While agroindustrial projects are developed, its use will be extended in the rest of the national territory.

“We just approve the rules and now we have to install the alcohol distilleries in Colombia, so they are at a prudent distance of the greatest fuel consumption places” said President Uribe[1] in his recent trip to Brazil. With rules of Law 693 of fuel alcohols, Colombia will enter the era of clean fuels, of sustainable production and which respect the environment.

CORPODIB has estimated, in the full application of the program, an annual decrease of six million tons in greenhouse effect gases (GEI) with an important economic potential in the proceeding of Emissions Reduction Certificates (CRE’s) through the Clean Development Mechanism (MDL)of Kyoto Protocol.

[1] Ofiprensa Finagro. 11/03/2003

AGRO FUEL

The sugar cane is an excellent growing to produce energy due to its high efficiency level in the photosynthesis process, condition which is located in the first option to fuel ethanol production. Growings as yuca, potato, corn and others are included for agroecological regions which make that its use is profitable.

A 10% of ethanol in gasolines will demand 700 millions of liters per year, which belong to sugar cane growings of 150 thousand hectares around alcohol complexes identified in the North Coast, Antioquia, Cundinamarca, Hoya del Río Suárez (Santander y Boyacá), Llanos Orientales, Valle del Cauca, Eje Cafetero, Huila, Nariño and Norte de Santander.

ECONOMIC BENEFITS FOR THE COUNTRY

The program will generate 150.000 new employments, direct and indirect employments, mainly in the agricultural sector, related to the new fuel production, substituting 130 MUSD per year, which nowadays are consumed in gasoline. The agro participation in the energy sector is equivalent, in terms of fuel production, to the building of an oil refinery of 40.000 BPD and it represents a growing of the agricultural PIB of 3%.

FUEL ALCOHOLS IN THE WORLD

Brazil introduces the use of fuel alcohol around 30 years ago.
In year 2002, it produces 13.000 MLA and exported 500 MLA[2].

Its production is supported by 307 distilleries with incomes over 4.000 million Dollars in figures of 2002. The sector uses near one million of workers in the country and in industry. It has a cultivated area of 6.5 millions of hectares with a performance of 85 tons of sugar cane per hectare.

In the middle of the 70s, when oil prices were very high due to the Arab-israeli conflict, Brazil, which depended on imported oil, applied a program of alcohol use in gasoline creating Proalcool to promote its growing. The results were very positive and at the ten years, the production was 11 thousand millions of liters and the greater part of the auto fleet was moved with the new fuel. Nowadays, there are 3 millions of autos moved 100% with ethanol and the remaining 17 millions use gasoline mixed with a 25% of alcohol.

In the United States, the fuel ethanol production is growing. In 1996, American producers located in market 3.500 millions of liters of alcohol and in 2002 the figure was increased up to 7.000 millions of liters. It is mainly used in 10% mixtures in gasoline. There is a new law which will treble bioethanol demand, reaching a figure of 17.500 millions of liters at a medium term. This is mainly due to the necessity of substituting MTBE additive (metil-ter-butil-eter), highly pollutant, and prohibited in seventeen states of the United States and in some other countries.

Canadá requests a mixture of 10% in the most polluted regions. México will adopt the same solution in order to deal with grave problems of the capital city.

[2] The Brazilian Foreign Trade Magazine. Noviembre 2002
MLA: Millones de litros por año

Japan, with a fleet of 72.6 millions of vehicles, is prepared to import increasing volumes of alcohol from Brazil. Thailand, per Law obligues to add 10% of alcohol in gasoline in areas with environment problems. China advances alcohol tests and creates an initial demand of 7.000 millions of tones per year.

The European Union, where environment stuff is urgently dealt, should use in all countries, from 2005, unless 10% of biofuels, according to the Resolution of the European Parliament. In 2010, the ratio should increase to 5.75%.

THE ALCOHOL PROGRAM IN COLOMBIA

In order to meet the requirements of Law 693, and extending the use to the rest of the national territory, alcohol agroindustrial complexes should be installed and distributed in different regions of the country. CORPODIB studies, indicate, industrial facilities locations and sizes as they are shown in Table 1.
Indicative projects of fuel alcohol producers

Location	**Capacity Liters/day**	**Raw material**
Hoya del Río Suarez	300.000	Sugar cane
Vegachí (Antioquia)	350.000	Sugar Cane
Valle del Cauca	300.000	Sugar cane
Northern Coast	300.000	Sugar cane - yuca
Cundinamarca	150.000	Sugar cane
Llanos Orientales	100.000	Yuca – Sugar cane
Eje Cafetero	250.000	Sugar cane
Huila	200.000	Sugar cane
Nariño	150.000	Sugar cane

The first projects will be developed in Hoya del Río Suárez, Vegachí and Valle del Cauca, cane regions, where the first steps are in process.

Alcohol production costs from sugar cane are estimated between 27 and 30 dollar cents per liter. Taking into account that fuel alcohol does not pay gasoline taxes, as it was approved in tax reform last year, investments are profitable both for the cane producer and for the agroindustry investor. Dollar return rates are over 20%, which makes that projects are attractive for national and foreign investors. These profitabilities are achieved without increasing fuel cost for the final consumer.

Available technologies in market for anhydrous alcohol production have substantially evolved from its initiation 30 years ago in Brazil. Progress has been remarkable in fermentation performances, process energy efficiency, ethanol drying, electricity cogeneration from bagasse to strong wine processing.

The strong wines, a plant byproduct which was before thrown away and it polluted rivers and water springs, now is transformed in a rich potassium fertilizer which is totally applied in the same plantations contributing to the process economics. Industrial equipment investments are around 400 million dollars in next 5 years, approximately a 70% of equipments will be nationally manufactured. Investments near to 100 million dollars are required in infrastructure (ways, bridges and plantations harvest systems) and growings adaptation in the same period.

HOW FUEL ALCOHOLS PRODUCTIVE CHAIN OPERATES

Fuel ethanol should be mixed with gasoline nearest the consumption point, due to the afinity of anhydrous alcohol with water. Gasoline storage and transport (poly pipelines) have water in minor proportions which causes problems in ethanol-gasoline mixture. For this reason, alcohol production should be done in different regions of the country where exists raw material and consumption centers are near.

Ethanol will be transported through tank truck from distilleries to supply plants located near big cities and there, the wholesale distributor will make mixtures according to specifications set by the Ministry of Environment, before it is dispatched in tank truck to the service stations. The system, as it is seen, maintains the same condition as nowadays, only with the change of some tanks and mixture systems in supply plants. Storage capacity in supply plants is a 10% of gasoline storage capacity.

The refinery, continues its production, as nowadays base fuel and dispatching it by polypipelines to the supply plants. Due to ethanol has a high content of octane, gasoline dispatched from the refinery requires less octane, with an economic benefit in productive chain operation.

The final consumer will be helped with a better quality fuel, which will reduce atmosphere harmful emissions in a 25%.

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This Thematic Network is funded by the European Commission, DG Research, (Project No. ICA4-CT-2001-10106).