USDA Foreign Agricultural Service
GAIN Report
Global Agricultural Information Network

Required Report - public distribution

Date: 6/15/2009
GAIN Report Number:

Mexico

BIOFUELS ANNUAL

Mexico Bio-fuels Report 2009

Approved By:
Richard Battaglia
Prepared By:
Luis Chavez

Report Highlights:
Mexico continues to define its public policy strategy to establish a formal bio-fuels industry that will generate and distribute fuel additives derived from agricultural commodities. After last year's publication of the Bio-fuels Promotion and Development Law, the Government of Mexico (GOM) started work on the second stage of the definition of the legal framework related to bio-fuel generation, storage, distribution and final use. Due to political pressure related to fossil-fuel energy reforms and the potential effect bio-fuel production could have on sensitive agricultural commodities, the GOM is proceeding cautiously, planning pilot programs and gathering information that will allow Mexico to enter the global bio-fuel production market in an orderly and sustainable way. This report summarizes actions taken by public and private organizations, updates information contained in the last Post report, and provides a general outlook for bio-fuels in Mexico.

Post:
Mexico

Commodities:
select

Author Defined:

1. SITUATION AND OUTLOOK

1.1. Government Bio-Fuel Policies

Mexico's Bio-fuel public policies are based on three elements:

I. The potential for renewable energy sources in Mexico to reduce fossil-fuel dependency, and address unpredictable changes in oil prices. Ironically, Mexico is a large crude oil producer, but imports a large amount of oil-derived products, so diversifying energy sources represents a critical task for the Government.

II. The need to reduce gas emissions related to fossil fuels by using "cleaner" environmentally friendly fuels. The use of ethanol as a substitute for gasoline additives such as Methyl Tertiary-Butyl Ether (MTBE) in order to reduce pollution in Mexico's metropolitan areas has been a recurrent request by environmental NGO's.

III. Rural development, a very sensitive element of the Mexican economy. Since bio-fuels use agricultural commodities as inputs, the relationship with agriculture is inevitable, and there is much political pressure to use bio-fuels to promote rural development without creating a "fuel vs. food" dispute.

Mexico's bio-fuel public policies are derived from several government planning documents. First, the 2007-2012 National Development Plan, (*Plan Nacional de Desarrollo*, or PND) which sets the current Administration's general objectives and strategies. Strategy 15.14 in this document mandates the GOM to develop the use of renewable energy sources and bio-fuels by setting up the legal framework that defines the GOM's capabilities to regulate the bio-fuels industry and promote investments to enhance the utilization of bio-fuels.

The PND mandates that the Ministries of Energy (*Secretaría de Energía*, or SENER), Agriculture (*Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación*, or SAGARPA), and Natural Resources (*Secretaría de Medio Ambiente y Recursos Naturales*, or SEMARNAT), define the objectives and strategies that will help achieve these goals in each of the ministries' programs.

Derived from the PND, the 2007-2012 Energy Sector Program (*Programa Sectorial de Energía*) defines in Objective III.2 the need to develop renewable sources of energy and bio-fuels that are feasible from a technical, economic, environmental and social viewpoint. From that

objective, two strategies are set: Strategy III.2.11, which defines the need to carry out studies which show the convenience and the socio-economic, environmental and technical feasibility of introducing bio-fuels in the mix of commercial fuels used in transportation; and Strategy III.2.12, which lays out the need for facilitating bio-fuels information and technology exchange with other countries.

Also derived from PND, the 2007-2012 Agriculture and Fisheries Sector Program (*Programa Sectorial de Desarrollo Agropecuario y Pesquero*) defines in Objective 3 that farmers can improve their income through increased participation in foreign markets, by promoting value-added processes and bio-fuel production. Specifically, the Program details in Strategy 3.7 that agricultural production of bio-fuel inputs such as castor oil plant, African palm tree, sunflower, rapeseed, sugar cane & beet, cassava plant, pineapples and other tropical products will be promoted, and that special care will be taken not to affect Mexico's bio-diversity and food supply. As part of this Strategy, the Program sets a 2012 goal of 300,000 hectares planted with the aforementioned bio-fuel input crops (expected to begin in 2009 with 70,000 hectares).

Finally, the 2007-2012 the Natural Resources and Environmental Sector Program (*Programa Sectorial de Medio Ambiente y Recursos Naturales*) defines in Objective 4.1.2 that in order to prevent and control air pollution, reduce gas and chemical substance emissions, SEMARNAT must coordinate with SENER, SAGARPA and the Ministry for the Economy (*Secretaría de Economía*, or ECONOMIA) to design bio-fuel promotion programs. Meanwhile, Objective 6.1.1 requires that as part of the National Climate Change Strategy, SEMARNAT will participate in the establishment of an inter-agency National Biofuels Program.

1.1.1 Bio-Fuels Promotion & Development Law

Following the aforementioned objectives, and in coordination with the Mexican Congress, which had been working since 2005 on a specific Bio-fuel Law, the GOM finally published the Bio-Fuels Promotion & Development Law (*Ley de Promoción y Desarrollo de los Bioenergéticos*, or LPDB) on February 1, 2008, establishing the legal framework from which all bio-fuel public policies will develop.

Since that time, President Felipe Calderon returned the LPDB to Congress in September 2007, which was not surprising given the controversy surrounding the "fast-track" treatment afforded to the Law at that time, when it was pushed through the legislature by House leadership at the very end of the Congressional session. The President's comments on the Law were discussed and accepted by Congress in 2008 and although it continues (in the tradition of Mexican lawmaking) to be a Law which merely sets the groundwork for a series of complementary laws, regulations, decrees, policies, standards, criteria, rules, and codes that will be needed, it does

establish a series of mandates which call for immediate action by Government agencies.

One of the main goals of the law is to promote bio-fuel input production derived from agricultural activities, forestry and biotechnological and enzymatic processes without jeopardizing food safety or sovereignty, while fostering rural development through production, commercialization and use of bio-fuels, reactivating the rural sector and improving economic conditions, especially in underprivileged communities. It also targets reducing greenhouse-effect gas emissions.

The Law also sets up a bio-fuel regulatory inter-agency mechanism: the Inter-Agency Bio-fuel Development Commission (*Comisión Intersecretarial para el Desarrollo de los Bioenergéticos*), made up of SAGARPA, SENER, SEMARNAT, ECONOMIA and the Ministry of Finance (*Secretaría de Hacienda y Crédito Público*, or SHCP). Formally established on February 28, 2008, the commission will overview and coordinate all GOM efforts related to bio-fuel production, storage, transportation, distribution, commercialization and final use.

1.1.2 Inter-Agency Bio-fuel Strategy

From the creation of the Bio-fuel Development Commission, the GOM launched an Inter-Agency Bio-Fuel Strategy (*Estrategia Intersecretarial de los Bioenergéticos*), emphasizing the aforementioned key elements of bio-fuel policy: reduction of fossil fuel dependency, developing environmental-friendly fuels and rural development.

The Strategy defines five courses of action:

I. Encourage information availability, providing a clear picture of bio-fuel business opportunities.
II. Promote research & development, creating conditions for domestic bio-fuel production technologies and fostering research networks.
III. Endorse bio-fuel production associations, promoting interaction between key players, consolidating a multidisciplinary industry.
IV. Generate market certainty, matching supply and demand in a fair, transparent environment, interacting with foreign bio-fuel markets.
V. Enhance production capacity, allowing bio-fuels to take a bigger role in the energy sector, reducing threats and risks to new projects and improving the industry's competitiveness.

A specific goal the strategy is to undertake a pilot project intended to test ethanol as fuel oxygenant in gasoline distributed within the metropolitan area of Guadalajara, Mexico's second largest city. Because Mexican Standard NOM-086-SEMARNAT-SENER-SCFI-2005 – Fossil Fuel

Specifications [1] defines that gasoline commercialized in Mexico should have no more than 2.7% (in weight) of fuel oxygenant, the GOM is aiming to produce 200 million liters of ethanol per year, which will be used in a 2% mix with the gasoline distributed in Guadalajara. This project is expected to begin during the last three months of 2010 and, depending on the results, is likely to extend to Mexico City (with a need of 530 million liters of ethanol per year) and Monterrey (with a need of 150 million liters of ethanol per year) by 2012. The following table summarizes the pilot project:

Table 1 – Ethanol introduction pilot project

Metropolitan area	Ethanol needs (in million liters per year)	Biomass required (in thousand MT per year)	States that could supply ethanol
Guadalajara	200	3,000	Jalisco, Michoacán, Colima & Nayarit
Monterrey	150	2,300	San Luis Potosi
Mexico City	530	7,900	Morelos, Puebla, Veracruz & Oaxaca
Total	880	13,200	

The pilot project is still in a very early stage, but it sends a clear signal that the GOM is cautious, yet resolved, to have a bio-fuel industry in place by the end of the current Administration. Several private organizations, like the E-Mision Foundation and the Mexican Bio-Energy Network are coordinating with SENER, SAGARPA and the Mexican public oil-company PEMEX (*Petróleos Mexicanos*) in order to keep the pilot program on schedule.

1.1.3 Sustainable Bio-fuel Input Production Program

This program recognizes Mexico's potential to utilize some agricultural production for bio-fuel inputs; according to the National Agriculture, Livestock and Forestry Research Institute, (*Instituto Nacional de Investigaciones Forestales, Agrícolas y Pecuarias*, or INIFAP), Mexico can use sugar beet, sweet sorghum and sugar cane as ethanol inputs, and jatropha (*Jatropha curcas*), castor oil plant (*Ricinus communis*) and oil palm (*Elaeis guineensis*) can be used for biodiesel production. The Program's main objective is to promote sustainable bio-fuel input crop production and commercialization, increasing competitiveness and profitability in the rural sector through the use of scientific and technological development.

With regards to specific actions, the Program sets several goals to be reached by 2012. First, it

sets the need to have a bio-fuel research and development network in place, providing a scientific platform for bio-fuel production projects, including second-generation bio-fuels. In a related objective, the Program expects the GOM to have a seed bank and a plant genetics database to help cover the demand for bio-fuel inputs. For that purpose, SAGARPA will map the potential production zones for the six crops identified as the ones with most potential due to Mexico's characteristics (see map).

Map 1 – Example of potential production areas for bio-fuel input crops

Finally, and in accordance with the pilot project for the use of ethanol in gasoline distributed in Guadalajara (and its future expansion to Mexico City and Monterrey), SAGARPA intends to have up to 300,000 hectares of bio-fuel input crops, which will yield 13.2 million MT of biomass to produce ethanol for the pilot project.

1.1.4 Bio-Fuel Introduction Program

In a coordinated effort with the Bio-Fuel Input Production Program, SENER is in charge of the Bio-Fuel Introduction Program, concentrating on the demand side of bio-fuels. The intent of this program is to establish the process to incorporate bio-fuels in the gasoline and diesel mix already commercialized in Mexico.

According to the Program, SENER will also monitor the energy balance, i.e. the relationship between the energy used by producing bio-fuels and the potential energy those bio-fuels will provide. The same applies for the emissions balance, or the relationship between the pollution generated by bio-fuel production and the greenhouse gasses prevented by the use of bio-fuels.

One of the first actions in this Program is to expand a feasibility study on the potential for ethanol and bio-diesel as fuel options in Mexico. The study, released in November 2006, was called "Potential and Feasibility of Ethanol and Biodiesel in Mexico's Transportation Sector" (*Potentials y Viabilidad del Uso de Bioetanol y Biodiesel para el Transporte en México*). Also, the Program mandates the establishment and expansion of the Bio-Fuel and Bio-Energy Consultative Committee, which includes private companies, NGO's and other related associations in order to include their interests in the design and implementation of all bio-fuel related policies.

Another specific activity outlined in the Program is to conduct an experiment where ethanol is mixed with regular gasoline. This is a different activity from the pilot program targeting the actual introduction of ethanol-oxygenated gasoline in Mexico's main metropolitan areas. This test, which has been carried out in Monterrey, involved 16,000 barrels (2.544 million liters) of base gasoline that where stored in a storage and distribution facility. The gasoline was then mixed with 3,500 liters of ethanol daily for 42 days between December 2008 and January 2009 and distributed in two service stations at a rate of 60,000 liters per day. SENER has yet to release the final results of the test, which had an estimated cost of US$ 4.2 million [2] .

2. CURRENT BIO-FUELS MARKET CONDITIONS

2.1 Fossil Fuels in Mexico

Mexico exports crude oil, and imports gasoline and fuel additives. It currently has an overall trade deficit in these products due to the recent rise in global oil prices and a higher volume of imports, due to a spike in gasoline demand.

With regards to the sales of domestic fuels, PEMEX reported in 2008 the following breakout: 52% gasoline, 22% diesel, 14.2% fuel-oil and the rest in other fuels like jet-oil, asphalts and other products.

Regarding imports, the following table summarized the volume of imports of refined products last reported by PEMEX.

Table 2 – Volume of imports of refined products, in thousand barrels daily

	2004	2005	2006	2007	2008	2009

						(Jan-Mar)
Gasoline [3]	94.9	169.8	204.7	308.1	340.5	311.4
Diesel	2.9	21.4	40.5	52.7	68.0	33.1
Fuel Oil	17.7	26.4	14.3	17.0	32.9	1.9
Others	34.0	43.2	33.7	34.0	22.4	22.1
Total	149.6	260.8	293.3	411.7	463.8	368.4

Source: PEMEX monthly petroleum statistics, April 2009

PEMEX distributes two brands of petroleum-based gasoline: Magna and Premium, and two types of diesel, depending on its use: Vehicle or Industrial. The sales volumes for these fuels are shown in the following tables [4] :

Table 3 – Daily gasoline sales volume, in thousand barrels

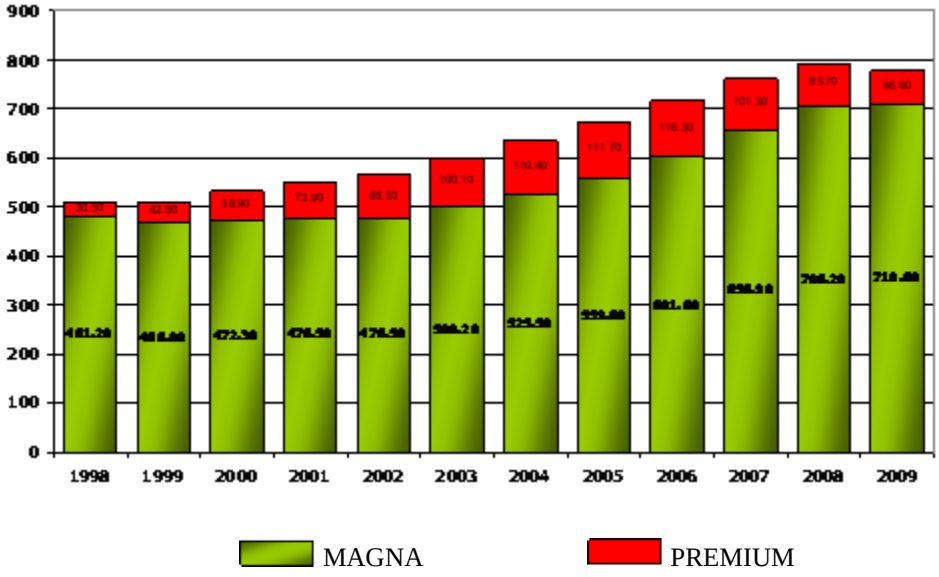
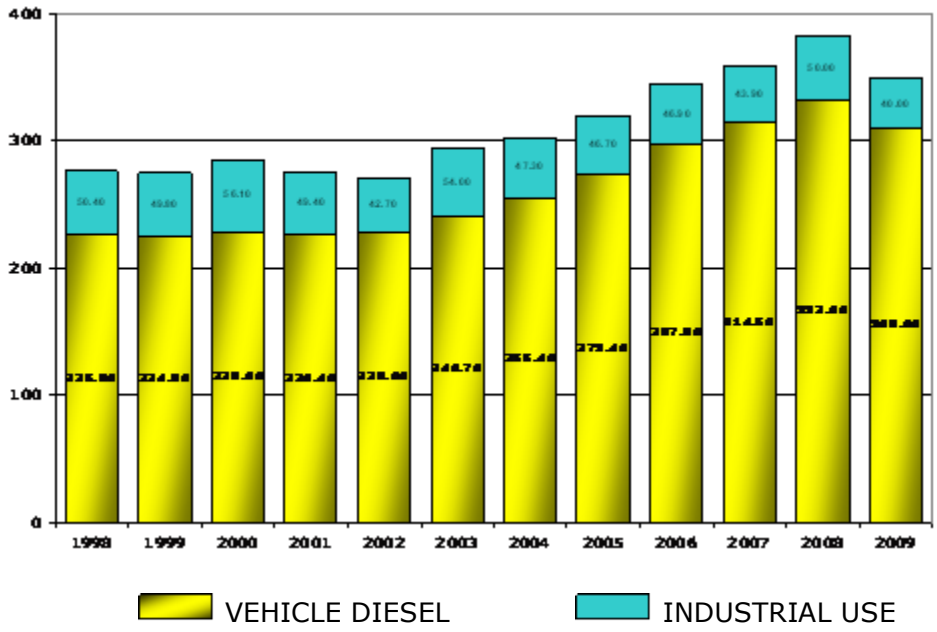


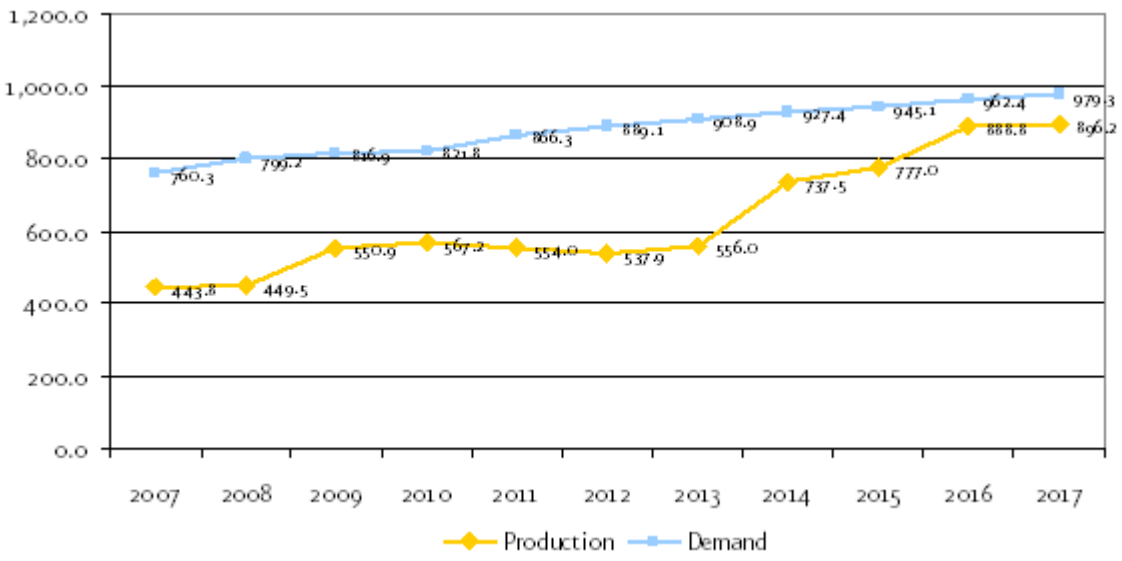
Table 4 – Daily diesel sales volume, in thousand barrels



According to PEMEX, Mexico's domestic gasoline sales totaled nearly US$ 20 billion in 2008, distributed throughout the more than 8,000 PEMEX's service stations all around the country. PEMEX also reports that their statistics show a 7.6% increase in the demand for Magna, and a 7.1% increase in the demand for Diesel and a reduction of 10.7% in the demand for Premium gasoline.

Regarding production and imports, Mexico produces gasoline and diesel but domestic production does not cover the demand of more than 22 million vehicles, out of which 94.6% use gasoline, 4.3% use diesel, and the rest use other fuels. In 2007, Mexico imported about 42% of its gasoline and 14% of the diesel demanded by the transportation sector. PEMEX reports that with improvements to existing refineries and the construction of a new one, production capacity of gasoline and diesel will increase, reducing demand for imported gasoline. The following table shows SENER's forecast of gasoline demand and production for the next 8 years.

Table 5 – Domestic production and total demand for gasoline, in daily thousand barrels



Source: SENER - Oil-derived products outlook 2008-2017

Regarding fuel additives, PEMEX uses MTBE and Tertiary-Amyl Methyl Ether (TAME) to oxygenate its gasoline, in a mix ranging from 10% to 12%. TAME demand is covered by domestic production, but Mexico must import MTBE in order to meet demand.

Table 6 – Domestic production and total demand for gasoline additives, in daily thousand barrels

Source: SENER & PEMEX reports

In 2009, PEMEX demand for fuel additives is expected to total 19,500 barrels daily, but domestic production might only reach 12,500. By 2014, total fuel additives demand is expected to reach 23,000 barrels daily. This situation has created an additional incentive for using ethanol as a fuel additive. The 2007 total value of imported MTBE totaled approximately US$ 305 million.

2.2. Ethanol production and projects

As previously reported, Mexico already produces ethanol, but not for fuel purposes. The current ethyl alcohol produced is a sub-product of sugar cane milling and is only used to produce alcoholic beverages and in the pharmaceutical industry. According to the Mexican Sugar Cane Producers Association, only two mills have the capability of producing ethanol with the technical requirements specified by PEMEX, equating to about 10 million liters per year. If these mills upgraded their facilities and operated at full capacity and efficiency, it is calculated that total production capacity for ethanol could reach 170 million liters per year [5] .

Per the Bio-Fuel Strategy, several GOM agencies and private associations and companies have begun to explore the possibility of using other crops as inputs for ethanol production. According to the National Statistics, Geography and Information Institute (*Instituto Nacional de Estadística, Geografía e Informática*, or INEGI), Mexico has 18 million hectares that could be used to plant crops with yields of up to 20 MT of biomass per hectare and 80 gallons of ethanol per MT of biomass, allowing it to produce 3.5 million gallons of ethanol per day. The general consensus is that the crops with the largest potential to be used for ethanol production are sugar cane, sugar beets and cassava (*Manihot esculenta*); wheat and sorghum are additional options being considered.

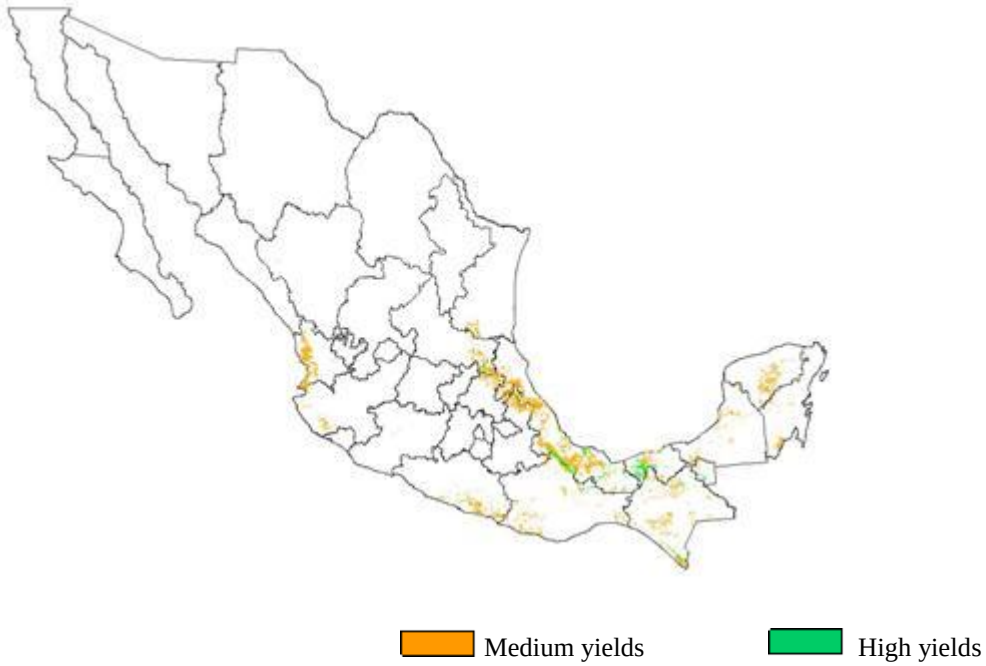
Table 7 – Average yields of ethanol from selected crops

Crop	Liters per MT
Sugar cane juice, or garapa	80
Sugar cane	138
Corn [6]	400
Sugar beet	98
Sweet sorghum	130
Sorghum	400
Wheat	700
Cassava	185

Source: SENER - Oil-derived products outlook 2008-2017

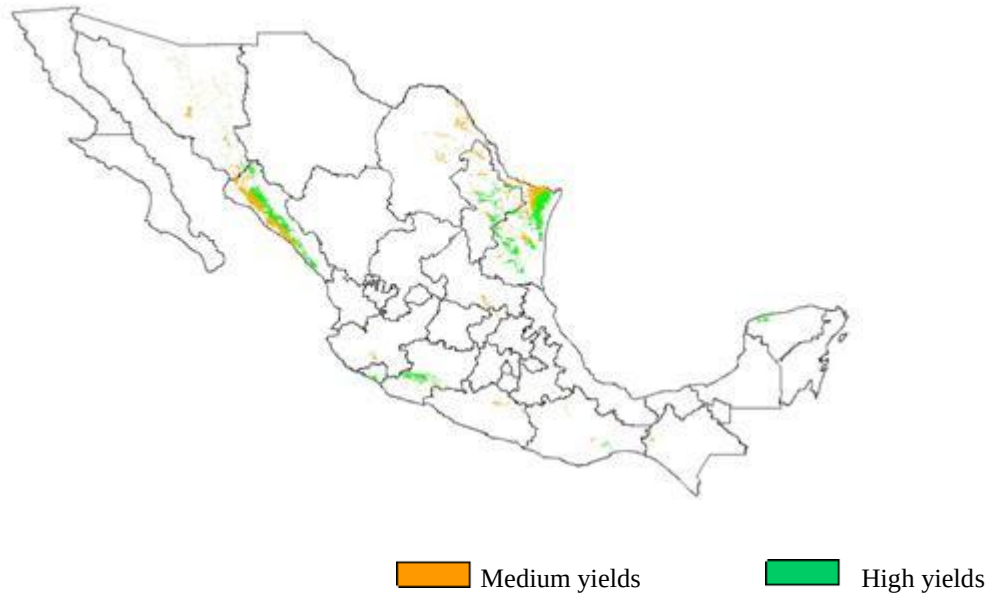
Several tests have been carried out by INIFAP and the E-Mision Foundation in order to identify and recognize production areas in Mexico for the specific crops that will be used as ethanol inputs.

Map 2 – Sugar cane as bio-fuel input potential production areas



Source: INIFAP

Map 3 – Sweet sorghum as bio-fuel input potential production areas



Source: INIFAP

Mexican sugar producer Destilmex, through its Biocyclos division, has established a US $60 million corn processing plant that covers 20 hectares in Navolato, Sinaloa. The plant, designed

to use Sinaloa's white corn production surplus, was expected to produce 30 million gallons of ethanol and 110,000 MT of protein feed. However, due to political pressure due to corn's "sensitive" nature in Mexico, the plant has not yet started production. Still, the GOM is expected to establish a rule under which a corn surplus could be declared, allowing the use of corn as a bio-fuel input.

2.3. Bio-diesel production and projects

The general consensus between the GOM, researchers, agricultural associations and private organizations is that Mexico should introduce at least 5% of biodiesel in the transportation sector by 2012, with some organizations pushing for 10%. Still, biodiesel production levels in Mexico are small-scaled (3.7 million liters per year). According to SENER, only the producing facility form Grupo Energeticos, located in Cadereyta, Nuevo Leon, is commercializing biodiesel mixtures ranging from 10% (B10) to 50% (B50) biodiesel content. In a recent test, Grupo Energeticos used a B20 mix in its trucks and compared the fuel efficiency levels to using regular diesel. Using B20 resulted in better fuel efficiency (between 1.7% and 5.2%) and the damage to fuel injectors was less when using biodiesel.

A biodiesel pilot plant in the state of Chiapas is expected to use the production of nearly 25,000 hectares of jatropha and castor oil plantations as inputs, and expects to produce 100 million liters of biodiesel by 2012. The biodiesel production resulting from these tests, however, sometimes turns out to be more expensive than fossil fuels, making it economically difficult to reach the commercial fuel market.

Finally, previously reported projects, like the Monterrey Institute of Technology (ITESM) and the Vasconcelos University biodiesel plants are basically research facilities, with no short-term expectations to fully commercialize their production. The same applies to private companies that intend to use their industrial waste, like grease and vegetable oil for biodiesel production to be used in their vehicle fleets.

3. IMPORT REGIMES FOR BIO-FUELS

As reported previously, Mexico's Customs Administration (*Aduana México*) classifies ethanol as ethyl alcohol and does not distinguish whether it will be used as fuel or as a fuel-production input, and other uses like medicines and alcoholic beverages. Thus Mexico classifies ethyl alcohol under the following HTCs:

Undenatured ethyl alcohol [with an alcoholic strength by volume of 80% vol. or higher]
2207.20.01 – Denatured ethyl alcohol of any strength [and other spirits]

Undenatured ethyl alcohol [with an alcoholic strength by volume of less than 80% vol.]

The requirements for all three HTCs when imported from the United States are:

- Tariff: 0% [In order to receive this benefit, the importer is required to attach a letter stating that the to-be-imported product has not benefited from the U.S. "Sugar Re-Export Program"]
- Must comply with labeling requirements detailed in NOM-050-SCFI-2004
- Importer must be registered in General Importer Database (*Padrón General de Importadores*)

Because there is no appropriate HTC, ethyl alcohol is subject to other requirements when imported, due to its potential use by other industries, such as pharmaceutical and alcoholic beverage production. For example, when undenatured (i.e., HTC 2207.10.01 and 2208.90.01), alcohol imports must also request a Sanitary Import Permit (*Autorización Sanitaria Previa de Importación*), issued by the Ministry of Health (*Secretaría de Salud*, or SALUD). Another example relates to the recent sanitary emergency caused by the human influenza virus A H1N1, which caused the GOM to temporarily lift all import duties and taxes on ethyl alcohol (among other products used by the pharmaceutical industry).

4. ETHANOL & BIODIESEL TRADE

Of the three HTCs under which ethylic alcohol is classified, only 2207.10.01 shows a significant volume in trade, according to SE's trade information. In 2008, 2207.20.01 exports accounted for 310,088 liters, while imports totaled 185,480. Regarding 2208.90.01, exports in 2008 were 347,686 liters, and imports were only 1,500 liters.

Table 8 – Exports, HTC 2207.10.01 (in million liters) [7]

Country	2008	2007	2006	2005	2004	2003
Switzerland	4.50	0	0	0	0	0
Dominican Republic	4.02	0	0	0	0	0
Trinidad & Tobago	3.78	0	1.52	0	0	0
United States	2.65	0.71	0.85	0.48	0	0.45
Others	2.83	6.53	6.74	2.60	2.23	6.53
Total	17.78	7.24	9.11	3.08	2.23	6.98

Table 9 – Imports, HTC 2207.10.01 (in million liters)

Country	2008	2007	2006	2005	2004	2003
Brazil	33.86	41.27	55.41	82.29	78.85	46.08
United States	12.68	10.35	18.71	23.57	32.96	86.65

Cuba	6.31	0	0	0.17	7.08	6.86
Guatemala	5.33	0	0.04	0.25	10.93	11.90
Others	1.37	2.94	17.90	7.17	14.98	15.54
Total	59.55	54.56	92.06	113.45	144.80	167.03

5. OUTLOOK AND PERSPECTIVES

The GOM acknowledges that the introduction of bio-fuels is a greater challenge because of the need to develop new products. PEMEX has observed that a large investment is needed if a new gasoline is to be introduced to the market because of the changes in the gasoline mixture and because production and distribution logistics will also change.

Another key element is the fact that bio-fuels are sometimes more expensive than fossil fuels; the GOM is expecting high costs in the early stages of the bio-fuel introduction process and is considering support programs via tax incentives and subsidies to bio-fuel input production. The idea is that costs will eventually diminish as Mexico's bio-fuel industry evolves.

Regarding the commercialization of bio-diesel, there are legal ambiguities. Because PEMEX has control over crude oil production and handling, bio-diesel blends could only be distributed through PEMEX's network. However, 100% pure bio-diesel, which is not derived from crude oil, is not subject to this regulation, hence this market segment would not be regulated or covered by the legal framework.

6. KEY CONTACTS

Contact information of government agencies, agricultural associations and private companies described in this report is as follows:

SENER – Secretaría de Energía
Lic. Roberto de la Maza Hernández
Director General Adjunto de Bioenergéticos
Insurgentes Sur # 890, Col. del Valle
México, D.F. 03100
T: +52 (55) 5000-6000 ext. 1090
E: rdelamaza@energia.gob.mx

SAGARPA – Secretaría de Agricultura, Ganadería, Desarrollo Rural, Pesca y Alimentación
Ing. Miguel Ángel Cervantes Sánchez
Director General Adjunto de Bio-Economía
Municipio Libre #377, Col. Santa Cruz Atoyac
México, D.F. 03310

T: +52 (55) 3871-1000 ext. 33302
E: miguel.cervantes@sagarpa.gob.mx

Fundación E-Misión A.C.
Lic. Isabel Gómez Macías
Presidente
Av. Américas #1600, Col. Country Club
Zapopan, JAL, 44610
T: +52 (333) 678-9153
E: emision_jal@hqgdl.com.mx

Red Mexicana de Bio-Energía
Dr. Omar R. Masera Cerutti
Presidente
Av. San Jose del Cerrito #400 Int. 52, Col. El Pueblito
Morelia, MICH, 58341
T: +52 (443) 322-2709
E: omasera@oikos.unam.mx

ITESM – Centro de Estudios de Energía
Dr. Oliver Probst Oleszewski
Investigador
Av. Eugenio Garza Sada #2501, Col. Tecnológico
Monterrey, N.L., 64849
T: +52 (81) 8358-2000 x. 4631
E: oprobst@itesm.mx

[1] Full text in Spanish available at: www.economia.gob.mx/work/normas/noms/2006/086senscfi.pdf

[2] "Prueba PEMEX nueva gasolina", an article printed in Reforma newspaper described the proposal in September 2008, when funds where requested to carry out the test. The article is available at: http://www.reforma.com/edicionimpresa/paginas/20080914/pdfs/rNAC20080914-002.pdf

[3] Includes gasoline and MTBE

[4] Information available from: www.ri.pemex.com/files/dcpe/petro/evolumenventas_ing.pdf and PEMEX's Statistical Yearbooks 2008, 2004 & 1999

[5] There is also a Special Tax on Products and Services, or IEPS, which is applied to alcohol production (at a 50% rate), which makes it further unfeasible for sugar mills to commercialize the ethanol they produce as part of their milling operations.

[6] Corn is specifically restricted by the LDPB to be used as bio-fuel input only when the GOM declares that a production surplus is declared.

[7] Source: Ministry of Economy (SE), Mexico's Central Bank & Mexico Customs Authority