

Bioenergy & Sustainability

a SCOPE series assessment

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Perspectives of Bioenergy in Latin America and the Caribbean

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Perspectives of Bioenergy in Latin America and the Caribbean

Outline

- 1. Bioenergy potential in LAC*
- 2. The current status of bioenergy programs*
- 3. Opportunities and challenges*



Bioenergy production potential in Latin America and the Caribbean

This region presents excellent conditions to produce bioenergy.

About 360 Mha of land suitable for rainfed agriculture are available for expanding agriculture in LAC (FAO, 2012); 37% of global total and more than 3X the area required to meet future world food needs.

20% of this area, managed properly and using efficient processes (3 Mha/EJ) could produce annually 24 EJ of liquid biofuels, equivalent to 11 million bpd, more than current US or Saudi Arabia oil production.

Current status of biofuel programs in LAC

Since the 80's several LAC countries have promoted biofuels production and use.

Several countries have introduced ethanol and biodiesel mandates: Argentina, Brazil, Colombia, [Costa Rica], Ecuador, Honduras, Jamaica, [Panamá], Peru, and Uruguay.

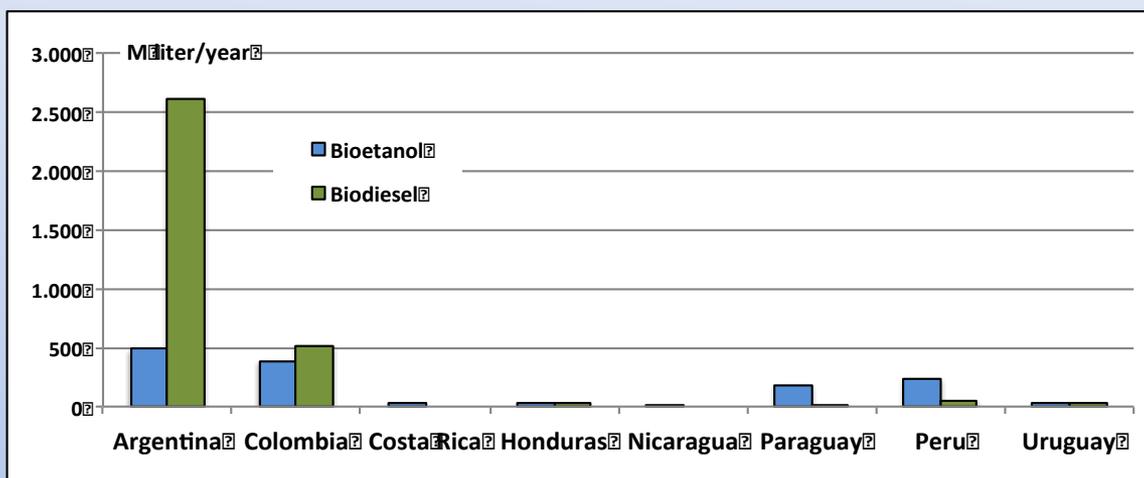
Programs for bioelectricity and biogas production have been also implemented.



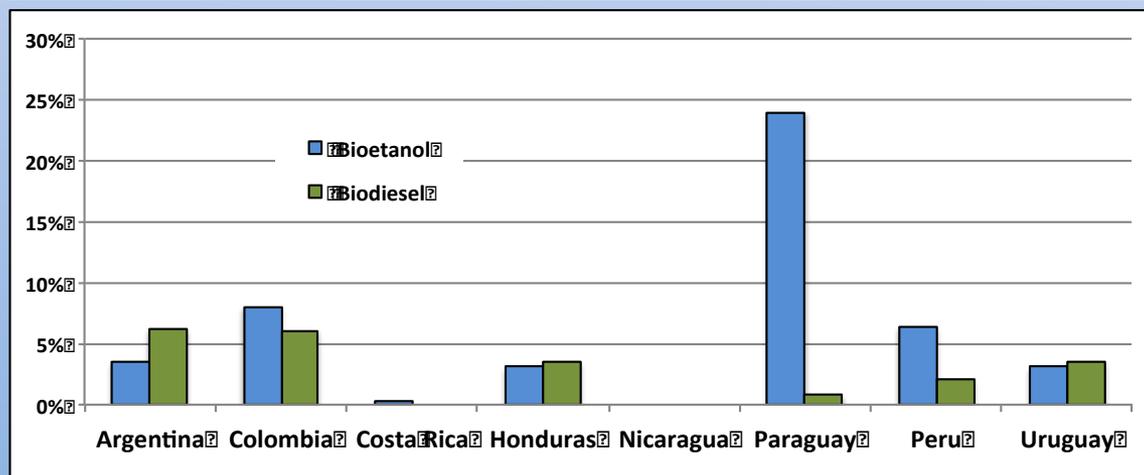
E5 in an Ecuadorian gas station

Current status of biofuel programs in LAC

Several countries are producing liquid biofuels, in some cases for just for trading. The relevance of production depends on the domestic market.



Ethanol/ biodiesel production (from official data, 2012/2013)



Average blending level (from official data, 2012/2013)

Ethanol production in Paraguay



Empresa: SAN LUIS SAECA
 Capacidad: 20.000.000 lts/año
 Producción: 17.000.000 lts/año
 Localización: Col. F. Caballero Álvarez

Empresa: INPASA
 Capacidad: 90.000.000 lts/año
 Volumen de Producción: 20.000.000 lts/año
 Localización: Col. Nueva Esperanza

Empresa: ALMISA
 Capacidad: 5.000.000 lts/año
 Producción: 1.000.000 lts/año
 Localización: Colonia Repatriación

Empresa: ALCOTEC SA
 Capacidad: 10.000.000 lts/año
 Producción: 4.000.000 lts/año
 Localización: Ruta 2 Km. 198

Empresa: NEUALCO SA
 Capacidad: 10.000.000 lts/año
 Producción: 4.000.000 lts/año
 Localización: Ruta 2 Km. 206

Empresa: EXPELLER SA
 Capacidad: 10.000.000 lts/año
 Producción: 3.300.000 lts/año
 Localización: Maciel,

Empresa: COOPERATIVA CNEL OVIEDO
 Capacidad: 10.000.000 lts/año
 Producción: 4.000.000 lts/año
 Localización: Ruta Cnel Oviedo- Carayao

Empresa: PETROPAR
 Capacidad: 36.000.000 lts/año
 Producción: 22.000.000 lts/año
 Localización: Mauricio Jose Troche

Empresa: ITURBE SA
 Capacidad: 20.000.000 lts/año
 Producción: 15.000.000 lts/año
 Localización: Iturbe

Empresa: AZPA SA
 Capacidad: 30.000.000 lts/año
 Producción: 26.000.000 lts/año
 Localización: Tebicuary

Empresa: PHOENIX
 Capacidad: 10.000.000 lts/año
 Producción: 2.000.000 lts/año
 Localización: Maciel

Empresa: ALPASA
 Capacidad: 15.000.000 lts/año
 Producción: 6.000.000 lts/año
 Localización: Colonia Santa Isabel, Dpto. de Paraguarí

**Capacidad de producción:
266 M litros etanol/año**

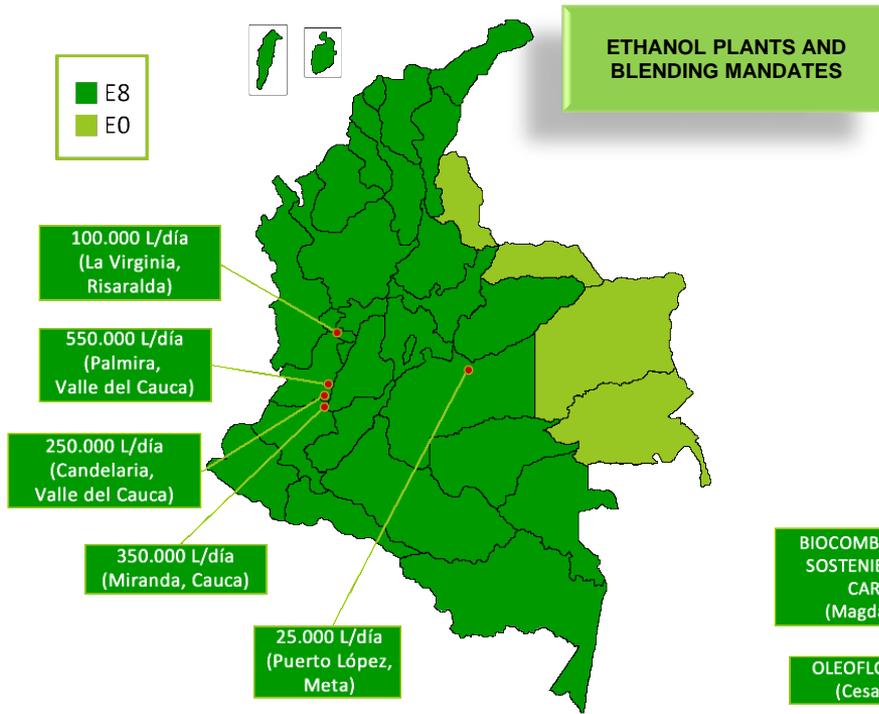
**Superficie Cultivada en
Caña para Etanol:
30.000 hectareas
(2011)**

(adapt. Comarca Guaireña, 2012)

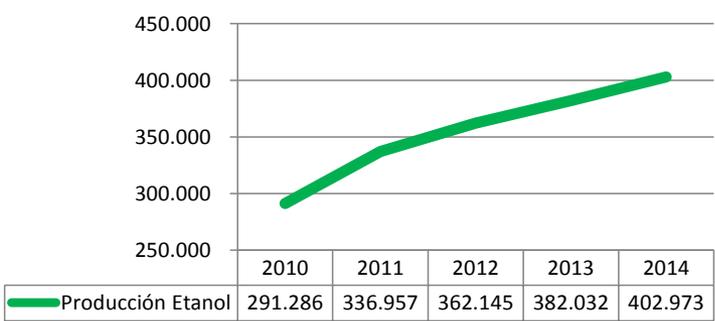
**Mano de Obra Agrícola: 18.000 Personas
Mano de Obra Industrial: 1.500 Personas**

**Rendimiento:
Agrícola: 55 ton/ha cañaveral
Industrial: 65 litros etanol/ton caña
Agrindustrial 3.080 litros etanol/ ha**

Biofuels production in Colombia

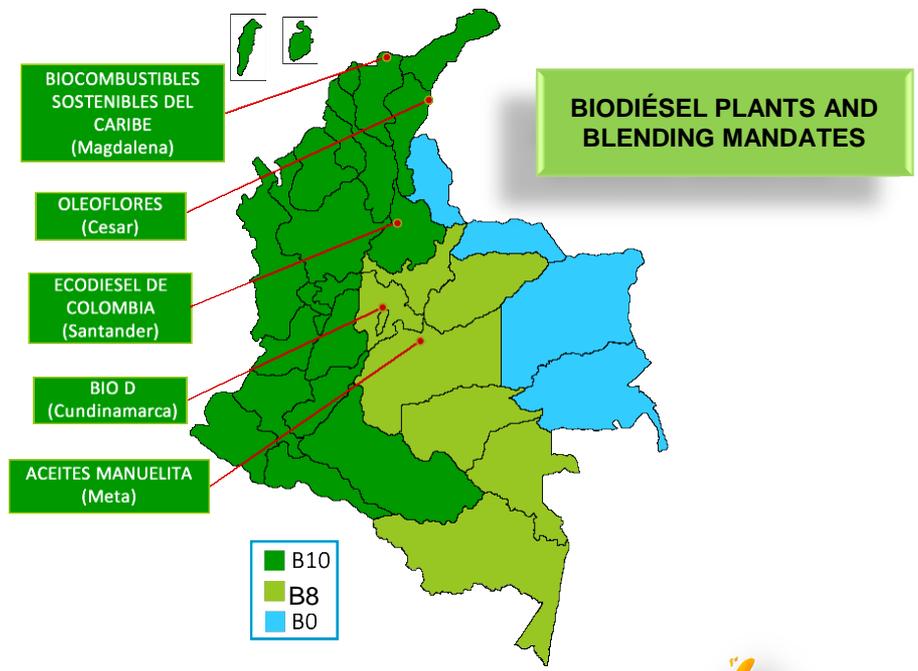
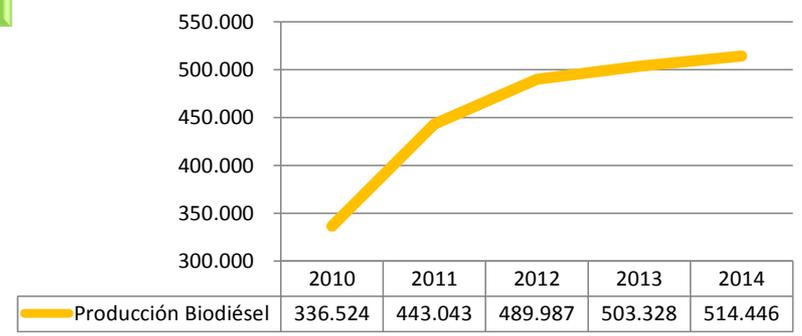


ETHANOL PRODUCTION



Source: Fedebioenergías.

BIODIESEL PRODUCTION



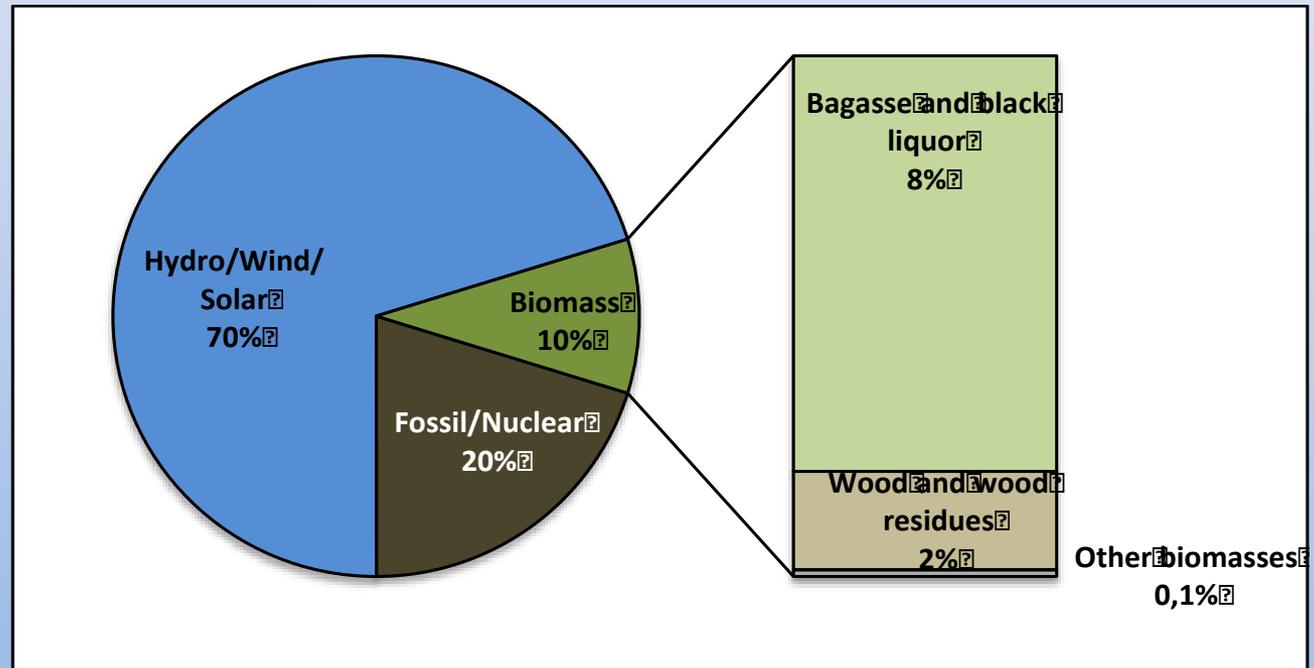
NATIONAL BIOFUELS FEDERATION OF COLOMBIA



Bioelectricity in Brazil

Availability of competitive biomass resources and adequate environment for independent power production have stimulate bioelectricity in conventional and innovative schemes.

To date, the total capacity of biomass power plants in Brazil sums 13.4 GW.



Power generation capacity by primary energy (ANEEL, 2015)

Bioelectricity in Brazil

Agroindustrial cogeneration plants predominate, but is growing the number of plants using biogas from municipal landfills and farms, wood and wood residues, as well as other agricultural residues, in many cases operating interconnected to the grid.



**Rural biogas plant, 80 kW
Candido Rondon PR Brazil**



**Wood residues power plant, 10 MW
Piratini, RS Brazil**

Opportunities and challenges

New frontiers for bioenergy in LAC

There are new areas to develop bioenergy projects in LAC, presenting risks and rewards. For instance, in Piura (North of Peru) two large greenfield sugar/ethanol projects were deployed (20,000 ha of sugarcane); in Uruguay the ALUR Paysandu plant, commissioned recently, will supply ethanol for E10.



Irrigated sugarcane in Piura, Peru, 2013

POR UNA MATRIZ ENERGÉTICA SOBERANA Y AMIGABLE CON EL MEDIO AMBIENTE.

En el marco de la Política Energética 2005-2030, en los últimos años se han dado importantes pasos en pos de alcanzar la soberanía energética, promoviendo la diversificación de la matriz energética de nuestro país.

A side-view photograph of a silver hatchback car. The car features a blue and green graphic design on its side, including the text 'Bio VEHICULO' and the ALUR logo. The car is set against a dark blue background with a subtle pattern of light blue squares.

Promoting ethanol use
in Uruguay, 2014



Opportunities and challenges

Setting equilibrate supporting measures

Besides blending mandates for biofuels and feed-in schemes for bioelectricity; balanced and stable tax regimes, as well as fair pricing mechanisms are essential to foster bioenergy markets.

Although presenting good conditions for producing ethanol enough to attend the domestic potential consumption, biofuel programs have been blocked by pricing distortions and weak governance in Mexico and Panama.

TAR location	Reference price offered by PEMEX	Minimum price offered by bidder
Salina Cruz, OAX	9.19 pesos (US\$ 0.66)	14.50 pesos (US\$ 1.05)
Tapachula, CHP	9.39 pesos (US\$ 0.68)	14.20 pesos (US\$ 1.03)

Source: PEMEX Refinacion and Grupo Refor

Ethanol price dispute in México, 2012



Campo de Pesé distillery, Panama

Opportunities and challenges

Informing consumers

It is relevant identify the risk perception associated to biofuels use and promote marketing campaigns and demonstration programs to reduce misunderstanding.

Guatemala produce and export large amounts of ethanol; adopting E10 blend could reduce gasoline imports, replace MTBE, among other advantages. However, there are persistent concerns about the technical feasibility of ethanol. A well planned demonstration program was launched to clarify these aspects.

Plan Piloto de Etanol

Modelo	Cantidad
2011-2014	2
2000-2010	10
1990-1999	6
1986-1989	2
1985-menor	3
motocicletas	5
TOTAL	30



Fleet composition, Guatemala demo plan, 2015

Final remarks

Modern bioenergy is expanding in Latin America and the Caribbean. The production is increasing, there are advances in the regulatory framework, new projects has been implemented, biofuel use is growing. However, there is still a large room for grow and improve.

Challenges to promote and develop sustainable bioenergy in LAC countries:

- How to overcome the lack of information, the misunderstanding of bioenergy impacts and benefits?***
- How balance properly market drivers and governmental support to bioenergy? a difficult task in times of cheap oil...***

SCOPE Bioenergy & Sustainability report can be a source of sound information, towards correct perspectives and effective public policies on bioenergy.

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