

Biofuels in the energy sector

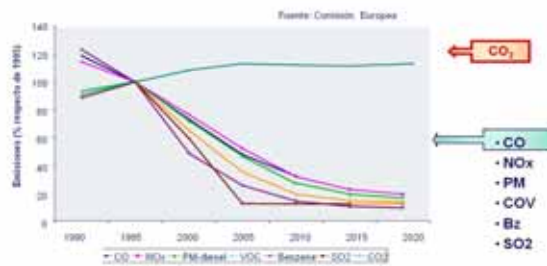
Abril 2009



Why using alternative biofuels?

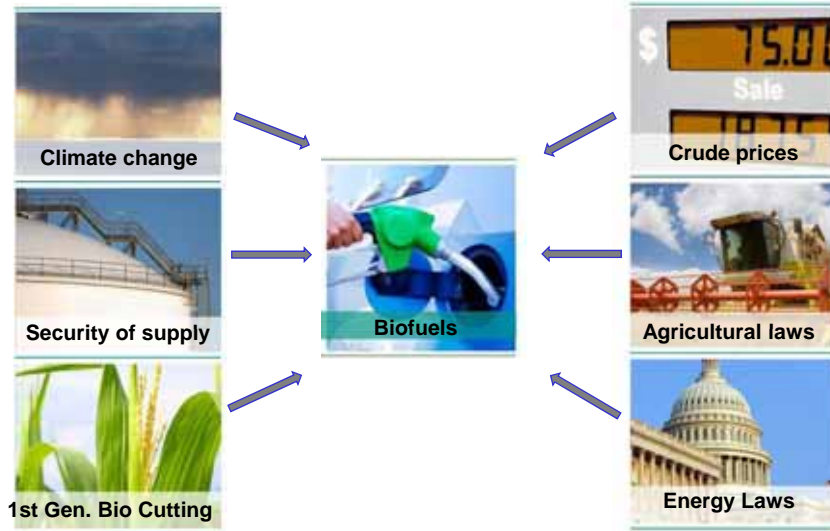
- Contribution to security of energy supply: reduction of imports of oil and its byproducts, diversification of energy sources

- Reduction of global GHG emissions



Why using alternative biofuels?

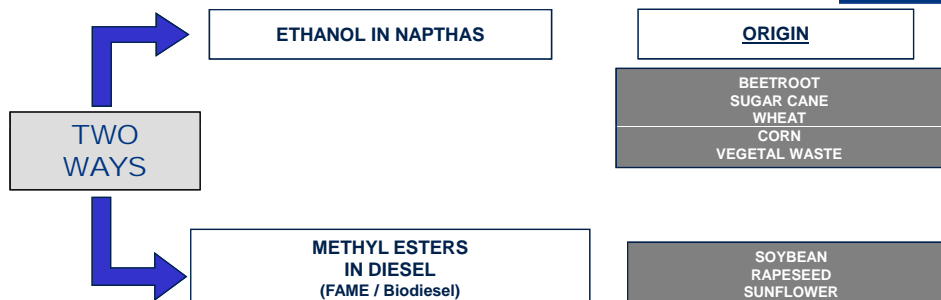
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What are biofuels today?

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And what will biofuels be tomorrow?

Low-cost oils and greases

- Cheaper oils
- Oiled waste
- Animal grease
- Marine farming

Lignocellulosic raw material

- Bagasse, cane shell, corn stover
- Wood residues
- Papermill discards



How? – Sustainability Criteria

Legal Framework

1. The production of biofuels will comply with all the applicable laws of the country in question and will try by all means to respect the international treaties related to the production of biofuels to which the country is a party.

Consultation, planning and monitoring

2. Biofuels projects will be designed and will operate according to transparent, extensive, and adequate processes of consultation and participation involving all stakeholders.

Greenhouse gas emissions

3. Biofuels will contribute to the mitigation of climate change reducing significantly the emissions of greenhouse gases (GHG) in comparison with fossil fuels.

Human and labor rights

4. The production of biofuels will not constitute a breach of human or labor rights and will ensure decent work and well-being for all workers.

Rural and social development

5. The production of biofuels will contribute to the economic and social development of the towns and the local, rural and indigenous communities.

Food safety

6. The production of biofuels will not affect food safety.

Sustainability Criteria



Soil

8. The production of biofuels will promote practices that seek to improve soil health and minimize soil degradation.

Water

9. The production of biofuels will optimize the use of water, including the reduction of pollution to a minimum and the prevention of water exhaustion, and will not infringe any existing formal or customary rights to water.

Air

10. Air pollution due to the production and processing of biofuels will be reduced to a minimum throughout the chain of supply.

Economic efficiency, technology and continuous improvement

11. Biofuels will be produced in the most profitable way. The use of technology should improve production efficiency, and social and environmental performance in all the stages of the biofuels value chain.

Right to land

12. The production of biofuels will respect the rights to land.

Sustainability Criteria - Initiatives



European and International Initiatives

- Commission DG TREN call for tender on RE-D implementation
- CEN TC 383 Sustainability Criteria for Biomass for energy applications
- Roundtable on Sustainable Biofuels (RSB)
- International Energy Agency Task 40 on Biofuels Sustainability
- BiofuelsGO
- Global Bioenergy Partnership (GBEP) Taskforce on Biofuels Sustainability
- World Energy Council WEC Taskforce on Biofuels and Sustainability
- Roundtable on Sustainable Palm Oil (RSPO)
- Roundtable on Responsible Soy (RTRS)
- MEO Institute International Sustainability Carbon Certification ISCC
- ISO 14040 and ISO TC 28/SC 7 Sustainability Criteria for Liquid Biofuels
- United Nations Environmental Programme UNEP Biofuels LCAs studies

Source:EBB

Sustainability Criteria - Initiatives

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National and Regional Initiatives

- Germany: IFEU for the Biofuels Sustainability Ordinance BSO
- United Kingdom: Renewable Transport Fuel Ordinance RTFO
- The Netherlands: Cramer Criteria NTA 8080
- Belgium: Green Certificates System (Wallonia and Brussels regions)
- Switzerland: Environmental Law
- USA State of Massachusetts: Environmental State Law
- USA State of California: Low Carbon Fuel Standard LCFSIII. Minor international initiatives, regional

Sectoral Initiatives

- SWAN Label Nordic Ecolabel
- SEKAB Certificates for Sustainable Brazilian Ethanol
- IPPC National GHG Inventory Programme NGGIP
- ENERS Labelling of Sustainable Biofuels

Source:EBB

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Sustainability Criteria

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Simple definitions are required for sustainability and its certification method

Source:EBB

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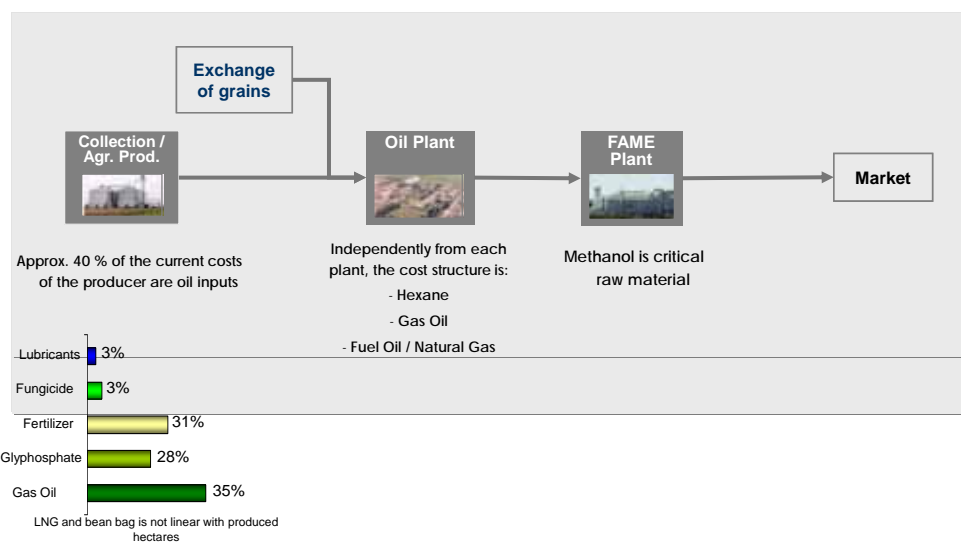
BIOFUELS – Value Chain

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FAME Value Chain

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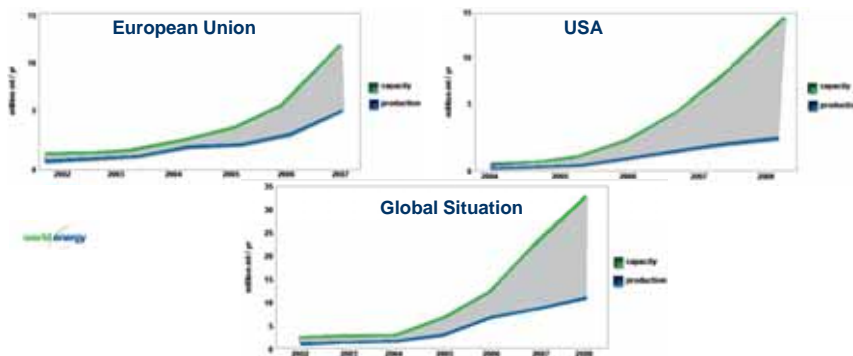


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Biodiesel

Global Situation

- Global deficit of diesel (140M tn/y for the EU and Asia);
- Increasing environmental requirements promote the use of biofuels;
- EU limitation to increase significantly the production of soybean/rape oil;



Oil Suppliers – Palm vs Soy

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2006/07 - Kton	Indonesia	Malasia	EU	China	India	Other
Palm Oil Exports/Imports	11.702	13.200	-4.279	-5.600	-3.600	1.734

- Palm oil competitiveness and its marketing in the EU are limited by:
 - ✓ Increasing domestic consumption of producers (Indonesia and Malasia >25%)
 - ✓ Economic penalties in the EU to products coming from deforested areas
 - ✓ Seasonal restrictions to its use do to behavior under cold conditions.



2006/07 - Kton	US	Brazil	Argentina	EU	India	China	Other
Soybean Oil Exports/Imports	669	2.342	6.026	237	-1.872	-1.735	610

2010 - for domestic consumption



Argentina is the only producer with export capacity

Fuente: Cosur

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Argentina - FAME - Balance and Value Chain

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- Argentina is the first exporter of soybean oil, supplying 65% of the global market.

ARGENTINA	2010
Soybean Oil Balance	(Mtn/y)
Production of Oil	7.6
Domestic Consumption	(0.6)
Mandatory Cutting (B5)	(0.7)
EXPORTABLE VOLUME	6.3

- 1st exporter of soybean flour and oil
- High efficiency of the value chain
- Industrial complex over the river, at an average distance of 200 km from the soybean nuclear area
- Important increase in crops and crushing capacity



Fuente: SAGyP

Argentina, oil/FAME producer with exportable balance

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Direct Seeding

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- Conservation of soils (96 % less of erosion)
- Fuel savings (66% less)
- Increased labor capacity
- Increased accumulation of useful water in the soil
- Higher stability of yield
- Lower production costs

80 % of the soybean production is carried out by direct seeding

GHG Reduction



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Bioethanol

Global Situation

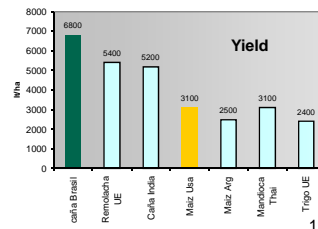
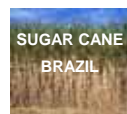
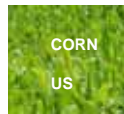
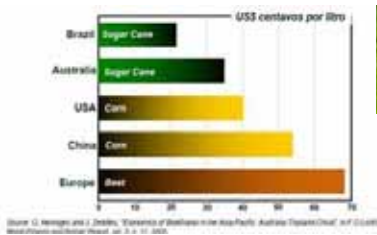
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- Strict environmental requirements at present, and even stricter for the next few years
- Deficit of gasolines and biofuels in EU, US and Pacific Asia

Bioethanol Suppliers – Corn vs Sugar Cane

Global Production 2005	US	Brazil	China	EU	India	Other
44 Mm ³	37%	35%	8%	6%	4%	10%

77% global production

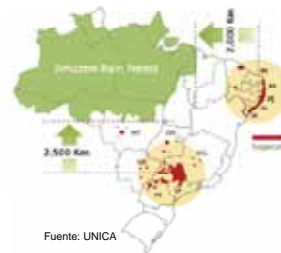


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Situation of Brazil

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E100 Industrial Projection	2010 (Mm ³ /y)	2015 (Mm ³ /y)	2020 (Mm ³ /y)
Production	29.7	46.9	65.3
Domestic consumption	(23.2)	(34.6)	(49.6)
EXPORTABLE VOLUME	6.5	12,3	15.7
Sugar Cane Production (Mtn)	601	829	1038
Cultivated Area (Mha)	8.5	11.4	13.9



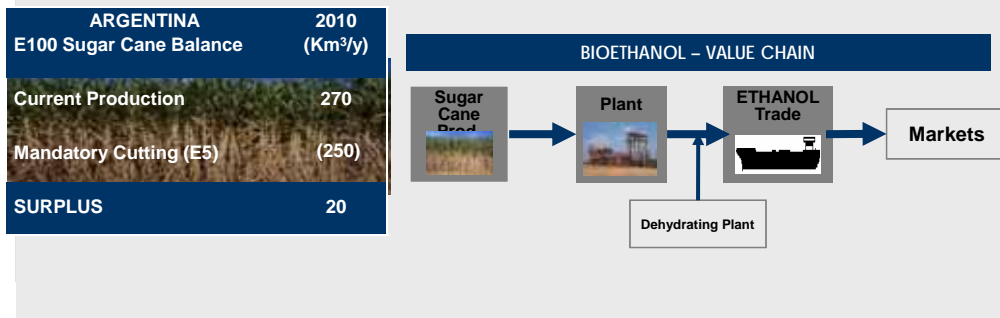
Brazil is the only producer with export capacity

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Argentina - Bioethanol - Balance and Value Chain

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- The US needs to use all its production to supply its domestic market;
- Brazil is the only producer with export capacity
- Production of sugar cane to meet the demand of the E5 in Argentina; investments required.



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YPF Domestic Market Strategy

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DOMESTIC MARKET PROJECT

Objective

To ensure supply to meet domestic demand of biofuels according to diesel quality required in each region in the country, within the framework of law 26.093

Leader in use of FAME in diesel

April '07



Nov '08



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Development of Alternative Raw Materials

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Alternative raw materials

Objective

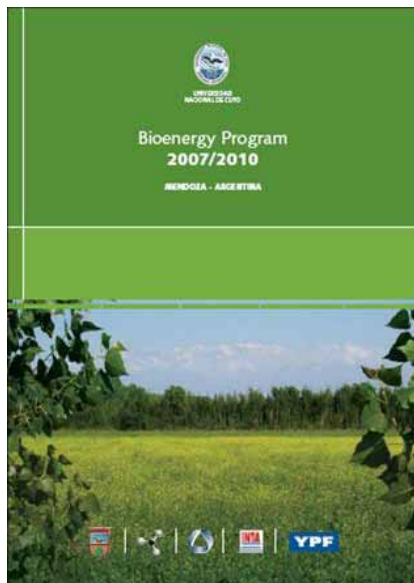
To develop non-traditional crops in marginal areas, promoting the development of regional economies and the use of unskilled intensive labor.

- Agreements with INTA for identification of areas and crops suitable for use in experimental units and project monitoring.
- Cooperation agreements with universities in each region and of the EU.
- Agreements with Provincial Governments and other governmental institutions to adhere to the project.
- Development of areas that are not suitable for traditional crops (either arid or semiarid) and use of industrial water.
- Development of alternative crops for production of renewable biofuels.
- Development of 2nd generation biofuels.

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Bioenergy Program 2007-2010

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