

**Sector:** Liquid Bio-fuels  
**Country:** Spain  
**Location:** Cartagena and Curtis

# Bioethanol

176,000 t/y of Bioethanol Production  
 for ETBE in Spain

## Background

The commitment made by the EU -and therefore also Spain as part of it- at the Kyoto Conference, obliges the national authorities, as well as the companies that produce and distribute fuels to pay special attention to the fact that it is necessary to reduce as soon as possible the net CO<sub>2</sub> emissions in the atmosphere.

In a period of economic growth in which people like to enjoy great freedom of movement, it seems obvious that the tendency will not be the reduction; but a slight increase in fuel consumption.

Although the efficiency of the engines is increasing constantly and the fuel consumption per unit has already decreased remarkably, it is also obvious that the number of cars is growing in absolute terms.

In these circumstances; how is it possible to reduce the CO<sub>2</sub> emissions? We have already mentioned the possibility of improving the efficiency of the engines, the other one is to apply components in fuels, which have no or practically no net-emissions, i.e. using fuels proceeding from renewable sources.

Within this project, the two biggest Spanish Petroleum Companies, REPSOL-YPF and CEPSA, will use ethanol from the fermentation of cereal produced by the engineering company ABENGOA, in the manufacturing of an oxygenated additive for gasolines called ETBE (Ethyl Ter Butyl Ether)

### Promoters

REPSOL-YPF, S.A.  
 CEPSA  
 ABENGOA

### Parties Involved

Ecocarburantes Españoles, S.A.  
 Bioetanol Galicia, S.A.



*Plant for the production of 100 Mlitres of bioethanol, Ecocarburantes Españoles, S.A., Cartagena*

## Objectives

The main aim of this project will be to commercialised in the petrol stations of REPSOL-YPF and CEPSA, who represents 78% of the Spanish market, 176,000 t/y of bioethanol through the manufacturing of ETBE fuel.

The project has several environmental, economic, social and technical benefits:

### Environmental

- This project has the effect to reduce the net CO<sub>2</sub> emissions to the atmosphere.
- The use of oxygenates in the gasolines reduces by a 5% the HC emissions and by up to 10% the CO tailpipe emissions, hence reducing the ozone precursors.
- The ethanol and its derivative ETBE reduce the emissions of sulphur, aromatics and olefins by means of a substitution effect.

### Economic

- Because ethanol is produced from barley and wheat. For these crops and for the purpose of producing bio-fuels, the set aside land can be used, therefore this activity increases the farmers incomes. This project allows to crop more than 85,000 set aside Ha.
- This project contributes to preserve the employment in the rural areas. It is calculated, according to the Levy's report, that more than 3,000 new jobs will be created in the rural areas, as a consequence of this project.
- This project helps to balance the import/export balance within the European Union because the external dependence in oil and animal feed is reduced.
- From the tax point of view, this project returns more than 90% of the total tax exemption, because of the increase of the local economic activity.

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### Social

- This project will generate more than 150 direct jobs in depressed areas.
- It is evaluated as well, that the project will generate more than 500 indirect jobs (transportation, external maintenance, supplies, etc), in addition to those generated during the construction phase.
- The number of new jobs estimated in the agriculture field is 2,500.

### Technical

- The project allows to develop a new technology in the EU.
- The project demonstrates the possibility to use biomass for commercial projects.

## Actions

The project consists basically of three main activities:

1. Production of 226,000 m<sup>3</sup>/year bioethanol, in two factories in Spain. The first one located in Cartagena, and operated by Ecocarburantes Españoles, S.A., is designed to produce 100,000 m<sup>3</sup>/year and is already operative. The second will be erected in Curtis (Galicia) and it is designed to produce 126,000 m<sup>3</sup>/year. This second plant will be operated by Bioetanol Galicia, S.A.
2. Manufacturing of 500,000 m<sup>3</sup>/year ETBE.
3. Marketing of green gasoline in approximately 78% of the retail stations around Spain.

This project is probably one of the most important in the area of bio-fuels because of its magnitude, the huge scope and the spread out.

The project is today a reality because it is commercially running. The plant in Cartagena is producing ethanol, and the refineries of Puertollano, La Coruña and Algeciras are manufacturing ETBE.

By 2002, when the plant at Curtis will be operative, the dependence of Spain on imported oil will be reduced by 200,000 toe., simultaneously net GHG emissions will be reduced by 168,000 Tm/year.

## Financing Sources

Sources of financing	Allocation (in Euro)
Investment	156,260,000
Financial resources	
Partners share	39,000,000
Public aids	46,878,000
External financing	70,382,000
Single payback period	Five years

## Monitoring

The project will be monitored by the governmental tributary agency who makes severe controles of the movements of the Ethanol and therefore elaborates a record of all the productions and destinations.

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