

# Bioenergy

- Production of ethyl alcohol from vegetable products (cereals, biomass). The resulting alcohol (bioethanol) is used to manufacture ETBE (a petrol additive) or is blended directly with petrol or gas oil. Thus, upon it being a renewable energy, net CO<sub>2</sub> emissions are reduced (greenhouse effect).
- Production of DDGS (Distillers Dried Grains with Solubles), a protein complement for animals and CO<sub>2</sub>.



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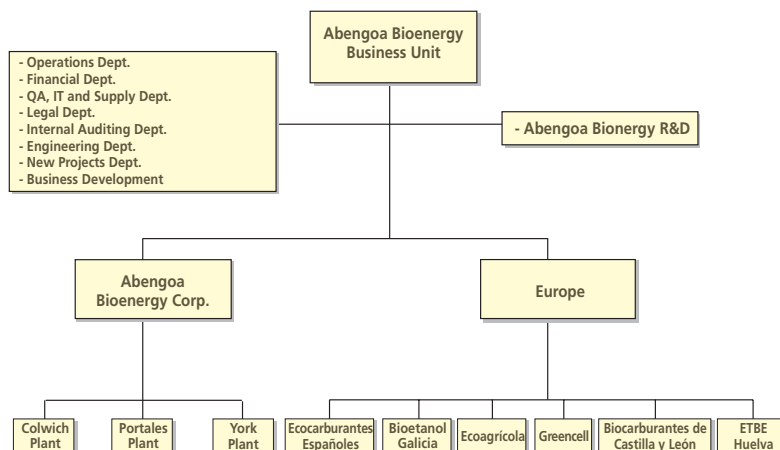
## Organization

During the year 2003, we have continued the integration of the Business Group initiated in 2002. In this respect, the common objective to standardize our Operation Management systems and the Control and Management of the companies in the U.S.A. and the EU, have experienced remarkable advances, of which we should emphasize:

- Standardization of purchase management systems by means of the use of tools in Lotus Notes.
- Standardization of the integrated quality, environment, security, and prevention of risks management systems.
- Standardization of commodities risk management systems.
- Standardization of production plants operation management systems.
- Standardization of internal control and auditing management systems.

In addition, we have reinforced our commitment to service, quality and technological innovation, making them present in our image of Abengoa Bioenergy, in which we continue working: Science. Solutions. Service.

At the end of the year 2003, and along with the corporate departments already in existence, we created the Corporate Department of New Projects responsible for the supervision of the engineering, supply, construction and starting up of new installations in the USA and in the EU.



The Business Unit integrates the management of the following companies:

- Ecocarburantes Españoles, S.A.
- Ecoagrícola, S.A.
- Bioetanol Galicia, S.A.
- Biocarburantes de Castilla y León, S.A.
- ETBE Huelva, S.A.
- Abengoa Bioenergy Corp. (replacement of High Plains, Corp.).
- Abengoa Bioenergy R&D.
- Greencell, S.A.

## Workforce in Spain

Spain	Total employees
<b>Ecocarburantes Españoles</b>	<b>80</b>
<b>Bioetanol Galicia</b>	<b>67</b>
<b>Biocarburantes de Castilla y León</b>	<b>8</b>
<b>Corporativo Abengoa Bioenergía and Ecoagrícola</b>	<b>11</b>
<b>Total workforce in Spain</b>	<b>166</b>

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As significant targets of 2003, which will be treated specifically and in greater depth further on, the following should be emphasized:

## USA

- Obtaining of sale agreements with the main North American oil companies and refineries.
- In-house commercialization of our byproduct DDGS.
- Strategic positioning in the development and promotion of new projects in the U.S.A..
- Expansion of operational capacity of the Colwich plant.
- Start up of expansion of the capacity of the Portales plant.
- Incorporation of 6 Sigma methodology for the improvement of our production processes.
- Integration of the corporate ABC offices and of the Business Unit in Saint Louis.

## Europe

- Obtaining ethanol export agreements to Sweden and Germany.
- Starting up of wine alcohol plant by Ecoagrícola in Galicia.
- Starting up of the third bioethanol plant in Spain.
- Strategic positioning in the development and promotion of new projects in Europe.

## R&D

- Signing of 35 million USD contract with the Department of Energy of USA for the financing of biomass project.
- Signing of 3.9 million Euros contract with the EU for the financing of a biomass pilot plant in Spain.
- Commencement of construction of a Residual Starch Conversion Plant in USA.
- Incorporation of the management of Greencell within the Business Unit.
- Completion of the structure of resources of R&D of the Business Unit.

The perspective of the development of the U.S.A. and EU market is a fact that is worth emphasizing. The legislative advances in the U.S.A. and EU will allow promotion in both continents, a substantial development of the biofuel markets in which Abengoa Bioenergía aspires to play a main role.



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## Operations Europe

Abengoa Bioenergía currently operates two production plants of bioethanol from cereals in Spain. The first is Ecocarburantes Españoles, S.A., in Cartagena (Murcia), with a production capacity of 142 million litres, and Bioetanol Galicia, S.A., in Curtis (Coruña), with a production capacity that reaches 168 million litres. Additionally, there is another plant under construction, Biocarburantes de Castilla y León, S.A., in Babilafuente (Salamanca), with an annual production capacity of 200 million litres.

What is more, Abengoa Bioenergía has foreseen in its Business Plan in Europe the promotion and construction of two new bioethanol plants on the continent. Collaboration agreements and the studies of viability of locating them in the markets where the demand and the legislative frame allow a fast and safe expansion of Bioethanol are being developed at present, supported by the recent approval of the European Directives of Promotion and Detaxation of Biofuels and their transpositions to the national legislations by the different Member States.



## Ecocarburantes Españoles

The plant, Ecocarburantes Españoles, is situated in Valle de Escombreras (Cartagena), with a production capacity of 100 million litres from cereal, and another 42 million litres from wine alcohol. It should be emphasised that this plant has continued with the optimization of costs started in previous years. The control and the flexibility obtained in the operation of the plant, with better yields each time, has resulted in what was expected of the company, this being the most important point to emphasize.

## Bioetanol Galicia

Located in Curtis (Coruña), and with a production capacity of 168 million litres of bioethanol from cereal, and the plant Bioetanol Galicia, has managed to reach its commercial production capacity in a stable manner and in record time. Once the tests had



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been passed, the plant has continued to operate with results superior to those expected, using wheat as raw material.

## Ecoagrícola

Abengoa Bioenergía has Ecoagrícola, a company that purchases grain, sells DDGS – ecological protein feed – and provides comprehensive logistics management for the Spanish plants. It is also the owner of the wine alcohol plants installed in Cartagena and Curtis. The challenge that the increased volume of business as a result of the continuous production of the plant in Galicia, with raw materials and products different to those in Cartagena, has been well overcome by Ecoagrícola.

The obtaining of cereal contracts from set-aside lands in other European Community countries other than Spain, has, for the first time, also marked a significant landmark and an important experience regarding the European expansion that Abengoa Bioenergía has predicted in the coming years.

## Biocarburantes de Castilla y León

During 2003, Abengoa Bioenergía has begun construction of its third plant in Spain through its company Biocarburantes de Castilla y León, S.A., with a 50% ownership interest with Ebro Puleva. The facility will be located in Babilafuente (Salamanca), with a production capacity of 200 million litres, of which 5 million come from the conversion of biomass by means of a new technology that is being developed by Abengoa Bioenergía R&D. It is scheduled to start functioning commercially in December 2005.

## Consumption and Production Figures for 2003 at plants in Spain

	Ecocarburantes Españoles	Bioetanol Galicia	Total
<b>Consumption</b>			
<u>Inputs</u>			
Cereal (Tm)	163,210	251,656	414,866
Wine alcohol (m3)	43,886	15,612	59,498
Gas Natural (Mwh)	624,355	818,263	1,442,619
<b>Production</b>			
<u>Outputs</u>			
Ethanol (m3)	97,704	106,829	204,533
DDGS (Tm)	72,205	83,349	155,554
Exported Electricity (Mwh)	155,895	156,931	312,826

## Legislative Framework

The approval of the European Directives of Promotion and Detaxation of biofuels during the year 2003, has defined a stable frame in the long term for the bioethanol industry in Europe, having consolidated therefore the strategic target that results in an export market for Abengoa Bioenergía and the development of new projects in the European Union.

Also on a national scale, important legislative advances have been obtained, that make Spain, and therefore Abengoa Bioenergía, the unquestionable European leader in the bioethanol market. The approval during the year 2003 of the transposition of the mentioned European directives on detaxation, with a new regulation of Special Taxes for the application of a total tax exemption for biofuels, as well as the necessary legislative adaptation for the use of blending of bioethanol with gasoline, has resulted in an adequate frame in Spain for continuous improvement in the development of the biofuel market.

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## Abengoa Bioenergia and Exports to the European Union

Abengoa Bioenergia's bioethanol plants in Spain, Ecocarburantes Españoles and Bioetanol Galicia, have a surplus production capacity which allows them to export a certain amount of bioethanol to countries in the European Union, and this in turn, by means of development of necessary infrastructures for the expansion of biofuels, permits immediate access to European markets.

An important factor in the competitiveness of supplying is the reliability and flexibility derived from the improvements made in the production process and an effective operation in Abengoa Bioenergia's plants, in addition to the capacity of introducing a great volume of high quality bioethanol into the market.

In 2003, the first exports were carried out, starting with the supply of 10 million litres to Sweden to the Svenska Shell company for their depots in Goteborg and Lulea, to be used for blending with gasoline, and another 1.4 million litres to Preem Petroleum AB for their depot in Goteborg, and have finished at the end of the year with the attainment of a new contract for the supply of 23.2 million litres for the PCK refinery in Schwedt (Alemania), participated by BP, Shell, AGIP and Total, for ETBE production in 2004.

Abengoa Bioenergia's strategy is directed towards a continual attainment of long term agreements for the following years, which will represent an excellent opportunity for end-consumers, and the opening up of the market by means of developing necessary infrastructures for the introduction of bioethanol, at the same time an additional value for new projects in Europe that are being promoted by Abengoa Bioenergia.

## World Biofuels Conferences

For the third year running, Abengoa Bioenergia has organised the International Biofuels Conference, World Biofuels 2003, jointly with the Foundation Focus-Abengoa, which was celebrated in Seville on the 13<sup>th</sup> and 14<sup>th</sup> of May, at the Foundation's headquarters in los Venerables.

These conferences fit within the framework of the activities of the Forum of Thought on Environment and Sustainable Development of Abengoa, an instrument of reflection and action of the highest level which promotes knowledge and the creation of public opinion regarding our future, and they brought together, as in previous years, international agents from each sector, authorities, companies, agriculturists, oil companies, financial organizations, with top professionals in each case.

The annual organization in Seville of this International Biofuels Conference appears amongst the activities of the Forum, and has been consolidated as an encounter of the highest quality and has been a genuine success in 2003 as in the two previous years.

## Management Systems

During 2003, numerous projects related to management systems have been carried out, under the understanding that we act in a more and more global market.

One of the implemented management systems has been the Purchase application in Lotus Notes. This application arose from the conviction in the Bioenergia Business Unit of the concept of centralization of purchases and the systematization of similar purchases for the rest of the organization.

The main goal has been to channel all the purchase, order and invoice requests of each company of Bioenergia Business Group, with the object of diminishing the risks inherent to any purchase, using the requirements of the Norms of Obligatory Fulfillment (NOC), Safety and Hygiene and Quality, as indispensable elements included in the specification of the requirements for any product and/or service that is to be bought and/or contracted.



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The main effect obtained and since the Bioenergía Business Unit has production plants all over the world, has been to control the purchase conditions and invoicing of each company of Bioenergía. This has been done by means of this application sharing a global vision. Likewise, this application has joined together the rest of information systems that compose the global scheme of our Business Unit such as the accounting system (Baan), the management tool of Rossmiman maintenance, etc... Telvent Outsourcing has developed this application in Lotus Notes, which has become our corporative tool for purchases. It has all been done within the Abengoa Information systems scheme.

## Six Sigma Methodology as a Corporate Tool for Continuous Improvement

With the intention of creating qualitative and quantitative growth, providing competitive value to all the interested parts (internal clients, partners, shareholders and clients) and to maintain profit, the Bioenergía Business Group has decided to integrate, during 2003, Six Sigma methodology in our management process and each one of the integrated plants of our Business Unit. This will allow us to share knowledge between the plants located in different countries. Six Sigma has been during year 2003, a tool of continuous improvement within the Business Unit, a key factor in our Integrated Quality System. In addition, it constitutes a key element for our capacity to provide Science, Solutions and Services, an offer collected in our new message to those interested using the motto "Science. Solutions. Service".

The importance is in the creation of a solid frame by means of the optimization of the supply chain in our business to obtain the most effective and precise operations possible.

During 2003, 20 Six Sigma projects have been carried out which is beginning to form part of the cultural change within Business Unit. A concerted effort has been made to train our personnel in this methodology. These efforts required an investment in 2003 of about 120,000 dollars and will require in 2004 an investment of 100,000 dollars.

## Integrated Management System in Bioenergía Business Unit

All the companies belonging to the Bioenergy Business Unit depend on the implementation of an Integrated Management System (S.G.I), to reinforce their commitment to Quality, Environment, Health and Safety. The peculiarity of the Integrated Quality, Environment, Health and Safety Management System and the reason why the Bioenergy Business Unit chose this approach, lies in the implementation of a global and simplified model of three key aspects of the management of our Business Unit; the satisfaction of our customers, the protection of the environment and the prevention of occupational risks. All of this being framed within a continuous and sustainable improvement process.

The result of this work has been enriching and has given us a better approach to processes for the development, implementation and improvement of the effectiveness of the management system, increasing the satisfaction of our clients and diminishing the environmental risks as well as occupational risks. At present the companies belonging to the Bioenergía Business Group are in the final phase of obtaining the corresponding ISO 9001, ISO 14001 and OSHA 18001 certificates.



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## U.S. Operations

### Introduction

2003 was an active year for the U.S. operations. The company name was changed from High Plains Corporation to Abengoa Bioenergy Corporation to take full advantage of the international recognition of Abengoa, and to further reinforce the Abengoa culture. In addition to changing the company name, the corporate offices have been relocated from Wichita, Kansas to St. Louis, Missouri to join with the headquarters of the Bioenergy Business Unit. Abengoa Bioenergy Corporation is now the 4<sup>th</sup> largest ethanol producer in the United States with an overall annual capacity of more than 95 million gallons of ethanol. Abengoa Bioenergy Corporation currently operates three plants located in the states of Kansas, Nebraska and New Mexico.

The beginning of 2003 marked the first shipments of ethanol into the state of California. This event, along with additional states banning the use of MTBE, ethanol's competitive product, restored balance to the market's supply and demand. This resulted in significantly improved pricing for ethanol throughout 2003. Additional benefits were realized in the second half of the year as the 2003-2004 corn crop developed into one of the largest on record, resulting in improved prices for the single, largest cost-component. Continued advances in operational efficiencies and variable and fixed cost reductions also were significant contributors to the improved financial performance in 2003.

Many significant initiatives were accomplished in 2003. Abengoa Bioenergy Corporation internalized the marketing and sales functions for 100% of its co-products. Abengoa Bioenergy Corporation achieved corporate certification to the ISO 9001 standard. Complete implementation of an integrated purchasing control and invoicing system was achieved. Six-sigma process improvement methodology was initiated with significant training and multiple projects at the York, Nebraska facility. Additionally, the York, Nebraska facility was recognized by the Nebraska Diplomats, a state organization commissioned to secure investments in the Nebraska economy, as the winner of the

prestigious Nebraska Diplomat's Outstanding Business Innovation award.

Building on the successes in 2003, and with the expectation of a Renewable Fuels Standard becoming law in 2004, coupled with the continued increase in ethanol consumption as additional states eliminate the use of MTBE, all indications are for a continued positive business climate in 2004.

### Business Segment Activities

#### Plant Operations Results

Ethanol is a renewable fuel produced from plants, unlike petroleum-based fossil fuels that have a limited supply and are the major contributor of carbon dioxide emissions, a greenhouse gas.

**Abengoa Bioenergy Corporation 2003 Consumptions and Production**

Consumption (Input)	York	Colwich	Portales	Total
Grain (Bushel)	18,247,164	7,988,890	5,520,261	31,756,315
Wet Alcohol (gal.)	6,946,829	1,444,688	1,118,973	9,510,489
Electricity (kW)	49,070,812	32,477,549	27,468,000	109,016,361
Natural Gas (MMbtu)	1,633,849	180,285	275,180	2,089,314

Production (Output)	York	Colwich	Portales	Total
Bioethanol (gal.)	57,948,467	23,094,946	16,708,052	97,751,465
DDGS, Dry Tons	142,770	68,700	53,064	264,534

Ethanol is one of the best tools we have to fight air pollution from vehicles. Ethanol contains 35% oxygen. Adding oxygen to fuel results in more complete fuel combustion, reducing harmful tailpipe emissions. Ethanol also displaces the use of toxic gasoline components such as benzene, a carcinogen. Ethanol is non-toxic, water soluble and quickly biodegradable.

Ethanol reduces tailpipe carbon monoxide emissions by as much as 30%, exhaust VOC emissions by 12% and toxic emissions by 30%.



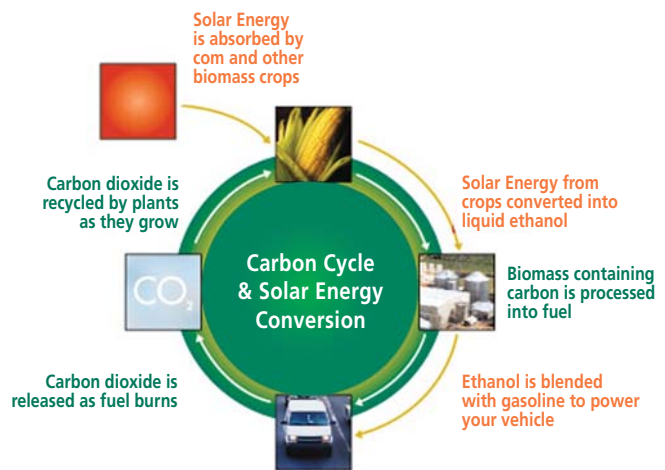
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The use of ethanol-blended fuels reduces greenhouse gas emissions by 12-19% compared with conventional gasoline, according to Argonne National Laboratory.

The ethanol production process represents a carbon cycle, where plants absorb carbon dioxide during growth, "recycling" the carbon released during fuel combustion.

## Ethanol Market Overview and ABC market share & strategy

A soft market to start the year as a result of new production resulting in higher than normal inventory levels recovered into a robust market late in the third quarter and throughout the fourth quarter. The late in the year bull pricing market was fueled by two key market sources. The first contributing factor was as a result of the further integration of ethanol supply into California ahead of the January 1, 2004 ban on MTBE use as an oxygenate in gasoline. The California market is now expected to be well in excess of 900M gallons annually. The second factor was driven by the movement of ethanol into storage facilities in the Northeastern US. This comes as a result of the same ban on MTBE for use in RFG gasoline in the states of New York and Connecticut, effective January 1, 2004, as well. These two Northeastern markets are expected to consume in excess of 400M gallons annually. Our marketing focus has shifted from a Midwestern regional supplier to a nationwide supplier with over 50% of our 2004 production already contracted for shipment to California. Two international petroleum companies comprise over 40% of this California contracted production volume. A significant portion of this California volume will be shipped via the Burlington Northern Santa Fe "express train" which became operational in the fourth quarter of 2003.



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## Feed Market Overview and ABC market share & strategy

In July, Abengoa Bioenergy Corporation formed an internal feed marketing department to operate the Company's feed product sales and customer service functions. Previously, feed products had been sold primarily by a contracted marketing firm. The marketing of feed products is a key function that Abengoa Bioenergy decided to take within its exclusive control, recognizing a great opportunity to develop a new marketing group within a company that recognizes the benefits of controlling all aspects of the distribution of its feed products, from production to delivery to the end user. The new department was fully operational by October and is directed by Richard Emery, who joined Abengoa Bioenergy after six years of leading the marketing and product development functions of a Nebraska Grain and Feed Co. The new marketing department is supported at each US facility by Plant Grain & Feed Merchandisers who are sourcing the input grain while selling both wet and dry distillers grains and solubles. These high protein animal feed products are currently used primarily as a cattle and dairy feed ingredient.

Abengoa's commitment to quality and service is internationally recognized, and the assumption of the marketing functions is a natural extension of the Company's strategic plans.

## Feed Marketing Strategy

Abengoa Bioenergy Corporation is firmly committed to delivering the highest quality products and services to its U.S. customers at competitive prices. ABC strives to provide its customers with the highest quality feed products available in the U.S. marketplace. ABC plans to continue to provide consistent product quality through its serious commitment to research and

development. ABC has an extensive research and development initiative to improve product quality and consistency. ABC is working with several major universities on projects that will lead to the development of feed products which will meet the nutritional requirement for various feed markets such as cattle, dairy, swine, poultry, aquaculture and companion animals. These internal and external research projects demonstrate ABC's commitment to livestock nutrition.

ABC's Feed Marketing group received high customer satisfaction ratings in recent customer surveys. This commitment to continued customer satisfaction is essential to our business and demonstrates this focus by building strong customer relationships through commitment to improving customers' service. In order to guarantee a high level of customer satisfaction, ABC has chosen to market directly to its customers, rather than using third-party brokers to interact with our customers.

Each ABC facility in the U.S. employs experienced grain and feed merchandisers dedicated to provide ABC customers with the most up-to-date market information and logistics professionals to ensure accurate and timely product delivery.

## Management Systems

Because the Bioenergy Business Unit has production plants all across the world, and in order to generate value and improve the operations in the organization, assuring effectiveness in all the processes, evaluating risks and assuring internal control, several and important actions were taken in order to implement standardized the Management Systems in all the Business Unit.

One of the most relevant management systems we have put in place during the 2003 was the Purchasing Lotus Notes application. The main goal of this application is to channel the Purchase requests, Orders



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and Invoices that generate the Orders in the different companies dependent on the Bioenergy Business Unit and to minimize the risks inherent in any purchase, involving the Noc, the Health, Safety and the Quality as indispensable elements that must be contained in the specification of requirements to a certain product and/or service being bought or contracted. The only way of obtaining this is by using an application where a global vision is shared.

Another important and relevant issue during the 2003 about Management Systems was that the Bioenergy Business Unit has launched its web page with a structure oriented towards "stakeholders" (customers, suppliers, shareholders and internal customers) with the goal of strengthening our commitment with them and reinforcing our communication policy.

We understand that in a global market, the importance of clear and accurate communication, and of ample diffusion, is an imperative objective for a company with a clear will of performance in markets of international scope as in our case.

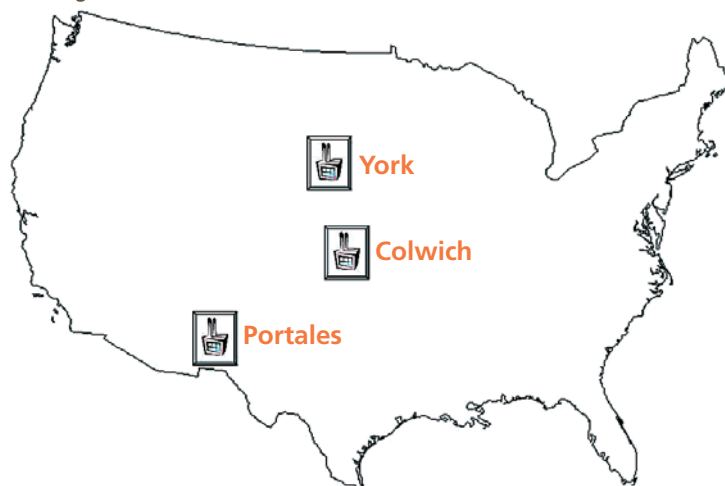
Obviously, these are only the first steps focused towards the communication and management systems for our Bioenergy Business Unit.

## Management System Integrated in the Bioenergy Business Group

All the companies belonging to the Bioenergy Business Unit depend on the implementation of an Integrated Management System (S.G.I), to reinforce their commitment to Quality, Environment, Health and Safety. The peculiarity of the Integrated System of Management of Quality, Environment, Health and Safety and the reason why the Bioenergy Business Unit chose this approach, lies in the implementation of a global and simplified model of three key aspects of the management of our Business Unit; the satisfaction of our customers, the protection of the environment and the prevention of occupational risks. All of this being framed within a continuous and sustainable improvement process.

The S.G.I promotes the adoption of an approach to processes for the development, implementation and improvement of the effectiveness of the management system, with the aim of increasing customer satisfaction and diminishing both environmental and occupational risks. The risks will be identified and the necessary processes of management with the aim of controlling them will be determined. As a system based on the

## Feed Target Market Areas



management by processes, the key processes should be identified, to measure and follow-up for continuous improvement. The tool for its development consists in the implantation which intends to prevent non-conforming products, damage to the environment, and to assure that its operation is adapted to the concept of accident prevention and the integration of the prevention of occupational risks within all activities and processes. Risks will be identified and the necessary processes of management with the aim of controlling them will be determined.

All the societies of the Bioenergy Business Unit have as criteria that their products, services and work are in agreement with the established norms and specifications that affect them, since quality and security are essential for the economic viability of the company. Also the implementation of this S.G.I forces us to assure that the significant environmental aspects are identified associated to their activities, considering regular conditions of operation and the associated potential impacts to reasonably foreseeable emergency situations.

## Research and Development

Research and development is one of the basic pillars of Abengoa Bioenergy strategy, concentrated in Abengoa Bioenergy R&D – which is a subsidiary wholly owned by Abengoa Bioenergy Corporation with its head office in St. Louis- its activity and efforts in the area of research and development.

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Abengoa Bioenergy started up a four-year research and development plan in 2002 focusing primarily on the following areas:

- Increase efficiency in ethanol production by converting and fermenting the residual starch and fibre contained in DGS.
- Increase in protein content of DGS for use in animal nutrition.
- Conversion of agriculture residues into ethanol (biomass).
- Development of future markets for final uses of ethanol (FFV, e-diesel and fuel cells).

In 2003, the research and development plan started in 2002 has been promoted, reaching important achievements, amongst which the following should be highlighted:

In February 2003 a contract was signed with the European Union for the development of an R&D project with regard to the yearly production of 200 million litres of ethanol from cereal and biomass in Babilafuente (Salamanca), under the 5<sup>th</sup> Framework Programme. The project has a budget of 11,8 million euros and will last 4 years.

In May of 2003 a contract was signed with the Department of Energy of the United States to develop and to demonstrate the technology "Dry Mill" and of biomass for the conversion to ethanol of the DDGS and the biomass from maize. The total investment of the project is 35.4 million dollars.

In May of 2003 the company Greencell was incorporated by Abengoa Bioenergy, with the clear objective to develop the technology of fuel cells from ethanol. During 2003, the research phase on a laboratory scale was finalized and the construction of a first prototype of 10 kW was initiated.

In October of 2002 the inauguration act of the project of the pilot plant of Abengoa Bioenergy R&D in York took place, in which the tests included in the project of conversion of the residual starch and biomass will be developed. These works are included in the project signed this same year with the Department of Energy of the United States.

In December of 2003 the contract of the Renewal Project of 6<sup>th</sup> Framework Programme was signed for the renewable fuel development for advanced motors by means of gasification of biomass and catalytic synthesis of fuels. This project, in which Abengoa Bioenergia participates as leader in the ethanol production subproject, has a budget of 20 million euro.

Abengoa Bioenergy R&D carries out its research projects in close collaboration with the most important universities, research centres and companies in the sector of biofuels, in Europe as well as in America.

## Workforce in Usa

Usa	Total employees
Colwich	37
Portales	42
York	53
Corporativo Usa	31
Abengoa Bioenergy R&D	9
<b>Total workforce in Usa</b>	<b>172</b>

