Strategy, Organisation and Management Systems

Strategy, Organisation and Management Systems

Action Principles and Values

Mission

Abengoa is an industrial and technological company providing solutions for sustainable development, the information and knowledge society and infrastructure creation. It promotes innovation as a valuable asset and source of sustained growth.

The focal points of Abengoa activity are its customers, the professional development and welfare of its employees, and the creation of value for its shareholders.

Vision

Abengoa believes that a mandate for innovation in a market economy context is an efficient and necessary instrument for becoming a sustainable development company.

Values

Throughout its history, Abengoa has continued to develop on the basis of a series of shared values. These principles constitute the structure of our ethical code. Through all of its channels, Abengoa promotes its knowhow and applications, as well as providing control and revision mechanisms to ensure adherence and updating. The most important points underlying this set of values are summarized below.

- Integrity: Pride in professional performance forms part of the very identity of Abengoa and is evident in all undertakings of our staff, both on and off site. Uncompromising integrity is seen as credibility by our customers, suppliers, shareholders and other third parties with whom we have dealings. Integrity also generates value both at the individual and company level.
- Law Abiding: Law abidance is not just an external requirement, it is also a personal and company obligation. The law provides a secure framework for company undertakings and also serves to reduce risks in business dealings.
- Professional Rigour: The concept of professionalism in Abengoa is closely linked to our service culture in activity development, performance and business project involvement. All undertakings in the performance of allocated functions must be guided by professional responsibility and governed by the principles provided for by common management systems.
- Confidentiality: Abengoa expects discretion and caution from the people attached to its organisation when communicating and dealing with third parties. Adequate steps are also taken to safeguard information in the company's possession.
- Quality: Abengoa is committed to quality in all aspects of its performance - internal and external alike. This task is assigned neither to a specific group of people nor to senior management as it concerns all members of the organisation in a day-to-day capacity. Abengoa has specific quality standards in place, which have developed from awareness, common sense, rigour, order and responsibility.

Strategy

In Abengoa, corporate social responsibility is regarded as a strategic factor. It is one of the essential pillars which uphold our current and future strategy. We have generally incorporated this factor into our strategy through our environment, quality and human resources policies, and have also integrated it into all company management systems. In support of this strategic factor, Abengoa maintains a presence in forums which are involved in sustainable development. In addition, in 2002, Abengoa signed, with the United Nations, the World Business Leadership Pact. The purpose of this agreement is to contribute to the adoption of shared values and principles which give the world market a more human face.

The World Pact involves the institution of its principles in the strategy and operation of the signatory company, through a process of dialogue, transparency in information and training. These principles consist of the following:

In the sphere of human rights, adherence means to support and uphold the protection of internationally proclaimed human rights and avoid circumstances involving infringement.

In the area of labour rights, adherence means to uphold freedom of association and effective recognition of the right to collective negotiation, to eradicate all forms of forced and obligatory labour, and to eliminate discrimination in employment and occupation practices.

With regard to the environment, adherence means to support a cautious approach to environmental issues, to adopt initiatives to promote greater environmental responsibility and to encourage the development and diffusion of environmentally-friendly technologies.

Abengoa, together with the other signatory companies, actively participates in action to promote the World Pact in Spain.

Organisation Chart

Abengoa is organised around four Business Units: Bioenergy, Environmental Services, Information Technologies and Engineering and Industrial Construction, and one Corporate Area. Through its Focus-Abengoa Foundation, Abengoa channels all of the social action of this initiative.

The Corporative Area, has the following corporate services: Human Resources, Economy and Finance, Systems and Organisation, Legal and Risks, with the following functions associated:

- Synergism and value creation
- Budgets, planning and control
- Financial coordination
- Human Resource policies
- Market development
- Corporate development and R&D&I
- Information systems and collaborative environment
- Quality systems and environment
- Risk control

The management structure is to be found in the Activity Report, page 93.

Management Systems

Commitment to Quality

Since its founding, Abengoa has been convinced of the need for its processes, products, services and systems to pursue full customer satisfaction.

The current common management system was introduced in 1997. It is structured around a set of compulsory internal rules designed to unify the managements of the companies making up Abengoa. Quality systems have also been put in place in all companies of the group as a strategic objective which goes beyond certification.

In accordance with standard ISO 9001:2000, there must be a mechanism in place that controls the mandatory design and implementation of quality management systems. Based on solid management leadership, these systems provide the training and resources necessary for employees to contribute to constant improvement in their day-to-day activitites.

The principles that underpin this Quality policy are:

- Rational use of resources, error avoidance and minimisation, through implementation of constant improvement programs and goal and objective setting.
- Promotion of active and responsible involvement of all members of the organisation and provision of adequate ongoing training, allowing for participation in the constant improvement process of the system.
- Fostering of team work and sharing of necessary information, for raising the quality of our activities.
- Compliance with regulations currently in force and any other commitment subscribed to by the company.
- Reinforcement of innovation, new ideas, new methods and updating of resources, which are vital components of the constant improvement process, the results of which are threefold.
  - Customer satisfaction: identification of key attributes and minimisation of failure rates; process control and improvement.
  - Employee satisfaction: development and training programs; responsible participation; and achievement recognition.
  - Improvement of economic results: increase in earnings via differentiation; reduction in the resulting cost of poor quality and an increase in competitiveness in the markets in which Abengoa operates.

Our standard Management System, and also the Quality Management System implemented in Abengoa companies, assure that we fulfill the legal requirements and the applicable regulations in the relation with our clients.

Structure and Quality Organisation

Each company under the Abengoa umbrella is capable of structuring and organising itself according to its needs. The determination of resources necessary to implement the company's commitment to quality is the responsibility of the management teams.

As an instrument for developing this commitment, each company is specifically organised in view of its needs and dedicated to the development and maintenance of the Quality Management System. The reporting flow in each company is targeted directly at the applicable management team, on either a company or Business Unit basis. In each case, the management team is comprised of fully qualified personnel with the appropriate academic and specific training in the relevant areas.

The companies devoted to Engineering and Industrial Construction have a decentralised structure, with activities in specific works or projects, both on the permanent site (branch or regional management) and in the main office (which reports to general management).

At the company level and reporting directly to the Abengoa Chair, there is a corporate management structure for organisation, quality and environment,

each with its own resources. In the sphere of quality, the purpose of this area of responsibility is to inform the Abengoa Chair as to the evolution and position of the Quality Management Systems in the different companies of the group. This supervision is led by the general coordinator for quality and environment, who verifies attainment of these objectives and capitalisation on synergism through spot checks and follow-up.

The functions of the Environment and Quality organisations mainly consist of managing and developing the documentation of the systems; keeping it updated as required under applicable national and international standards; proposing and developing the annual plan for internal audits; assuming the role of secretary to the Quality and Environment Committee, where the objectives, indicators and goals are proposed for the company, areas and departments; responding to consultations and requests for advice from the areas and departments; collaborating on training programmes; evaluating suppliers; acting as supervisor in the application of problem solving (PSR) and improvement action (IA) initiative; and collaborating with General Management on the annual revision of the systems, in order to determine proposals for improvement.

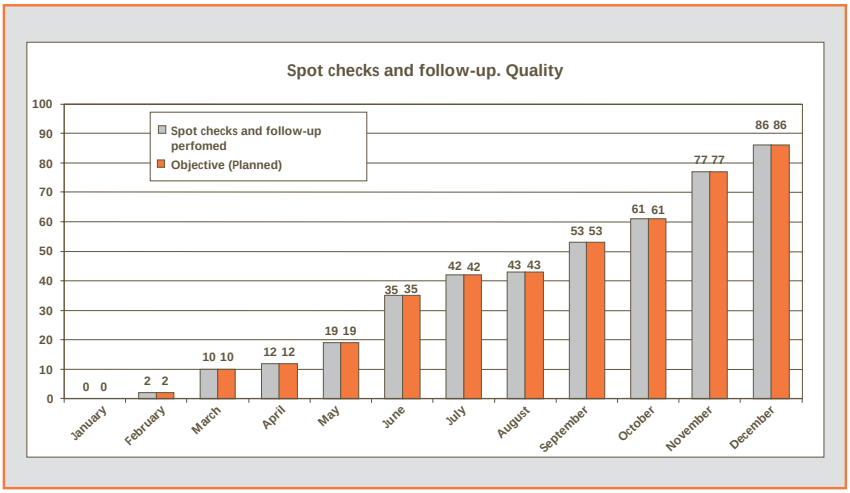
Quality Management Systems

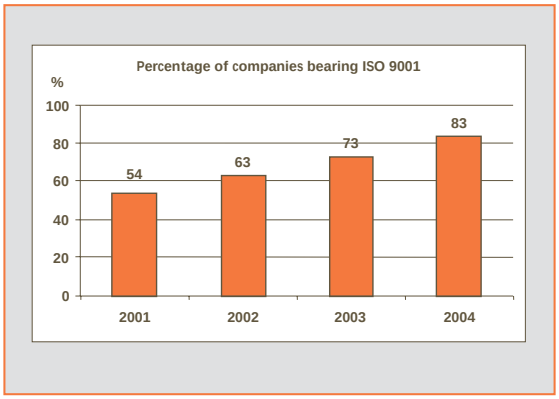
The progressive introduction of the quality management systems in the Abengoa group of companies is one of the strategic objectives of the group's commitment to quality. This objective revolves around the quality management model which conforms to ISO 9001 and ISO 9004 and the EFQM model of excellence.

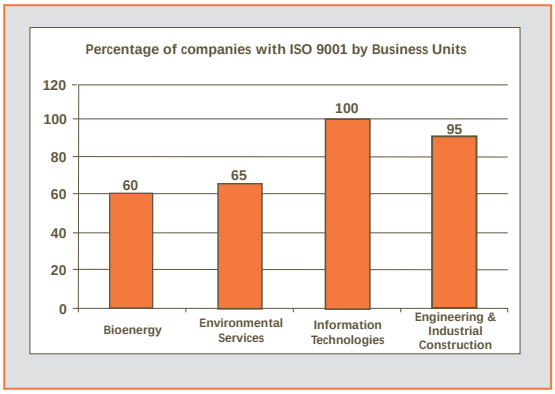
UNE-EN ISO 9001 and 9004

These international standards are used by Abengoa as a basic reference for the development and introduction of Quality Management Systems.

The percentage distribution of the companies bearing Quality certificates by Business Unit is detailed in the attached graphics:







It is necessary to point out that the bioenergy Business Unit has been set up recently and has companies in Spain and the USA. The companies Ecocarburantes Españoles, S.A. and Bioetanol Galicia, S.A. have developed and introduced an integrated management model of Quality, Environment and Occupational Health and Safety, receiving international certification in 2004.

The American company Abengoa Bioenergy is governed by US standards, which are more stringent in this area of production.

EFQM Model

The EFQM model of Excellence is a voluntary framework designed for the sustained achievement of excellence of an organisation, based on the following principles: customer satisfaction, employee satisfaction and positive impact on society. These principles are attained through leadership in policy and strategy, proper personnel management, the efficient use of resources and an adequate definition of processes, eventually leading to excellence in business results. These principles are developed through nine criteria which permit a comprehensive evaluation in order to determine the organisation's progress towards excellence. This model has already been introduced in the Information Technologies Business Unit, and is in the final stages of implementation in the remainder of the Business Units.

In the Information Technologies Unit, EFQM self-assessments were continued throughout 2004 in all Abengoa companies in Spain, using the simplified tool, "Profile" with licences from the Quality Management Club. The comparative results were published and improvement actions with better synergism prospects and mutual convergence were prioritised. The initiative to validate self-assessments with licence-holders from the Quality Management Club has also continued, the self-assessment of the Traffic and Transport area of Telvent having received validation.

The initiative to receive external EFQM assessments based on the "REDER" tool has also continued, having been awarded in the Energy and Environment area of Telvent the certificate of "European Excellence" (Silver Seal) by the Quality Management Club, scoring 401 out of a possible 500, as well as the certificate Recognised for Excellence in Europe awarded by the EFQM.

On the subject of awards of recognised prestige, Telvent is competing for the "Asturias Prize for Business Quality", for the "Prince Felipe Prize for Industrial Quality" and the "Andalusian Prize for Excellence", having already won in the V edition of the latter.

In addition, in the Engineering and Industrial Construction Business Unit, Instalaciones Inabensa was a finalist in the 2004 prizes, in which the electricity company Iberdrola received the "Supplier of the Year", awarding corporate social responsibility of companies in their choice of suppliers. This award is designed to reinforce constant improvement, the optimisation of products and services. and environmental awareness.

Commitment to the Environment

Abengoa is aware that its services, systems, processes and products must be environmentally friendly. It identifies and controls associated activities and potential environmental impact with a view to reducing incidence of the latter.

This commitment to the Environment is reflected by the very structuring of the business. Two Business Units, Environmental Services and Bioenergy actively work for the environment. Together with the environmental perspective of the remaining areas, the group has a clear environmental orientation.

Strategy, Organisation and Management Systems

The Environmental Management Systems are supported by solid leadership from management, who provides training and necessary resources so that all Abengoa employees can help to improve the environment through their day-to-day activities.

The principles underpinning Abengoa's Environmental Policy are:

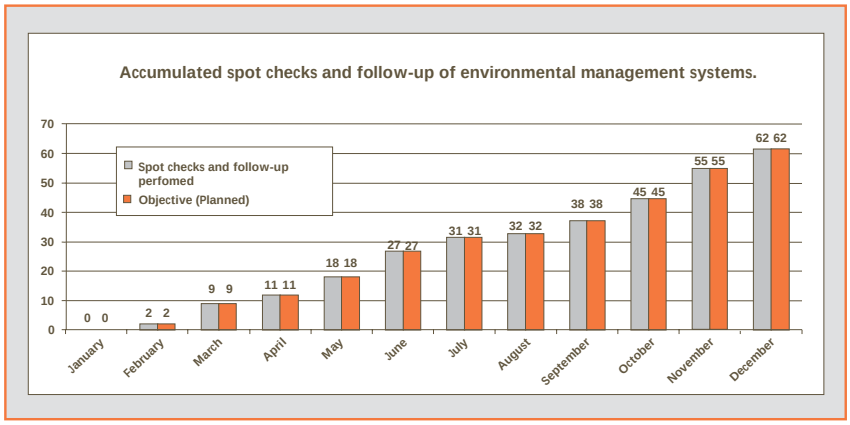
- Compliance with legal standards in force from time to time, requirements occurring within the company, demands made by our customers or interested parties and goals and objectives set
- Prevention and/or minimisation of harmful or negative repercussions on the environment
- Reduction in consumption of energy and natural resources by using, to the greatest extent possible, sources which can be renewed or regenerated
- And finally, constant improvement of environmental behaviour

Structure and Environmental Organisation

For the Abengoa group of companies the following obligations, pertinent to structure and environmental organisation, flow from the development of internal management standards:

- Constitution of a Quality and Environment Committee, representative of the whole organisation and presided over by company Management. Its function is to be the governing body of the environmental management system.
- Provision of structure and environmental organisation necessary for fulfilment of the environmental commitment expressed in the standard. The application of this standard, which is the responsibility of management, must be in proportion to the needs of the company.

Each company is specifically organised to suit its needs and is dedicated to developing and upholding the environmental Management System. As a general rule, these organisations report directly to the Managements of the companies, or in some areas to a specific management of the Business Unit for this area. In every case, fully qualified personnel with the necessary academic and environmental training make up the teams that are responsible for the Environmental Management System. Likewise, these teams are responsible for specific environmental management activities such as: identification of legal requirements; proposal and development of annual plans of internal auditing; assumption of the role of secretary to the Quality and Environment Committee, where objectives, indicators and goals are proposed for the company, areas and departments; response to consultations and requests for advice from the areas and departments; collaboration on training programmes; evaluation of suppliers; assumption of a supervisory role in the application of problem solving (PSR) and improvement actions (IA); and collaboration with general management on the annual revision of the systems in order to determine proposals for improvement.

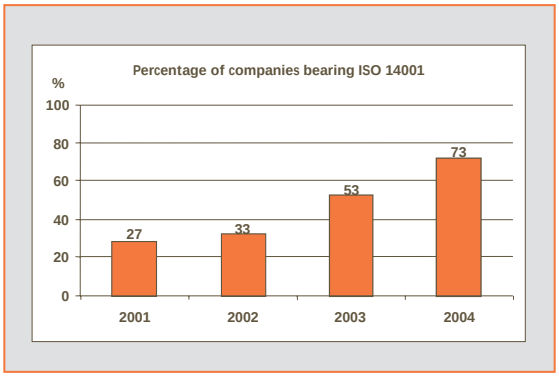


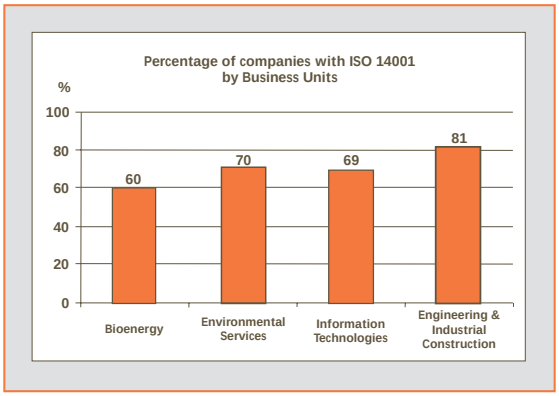
Environmental Management Systems

The progressive introduction of the Environmental Management Systems in the Abengoa group of companies is one of the strategic objectives included in the commitment to the environment of the group. The objective revolves around two environmental management models: the international standard ISO 14001 and the Eco-Management and Audit Scheme (EMAS).

ISO 14001

This is the international standard that Abengoa has set as a reference for the development and introduction of Environmental Management Systems. Below is a representation of the evolution of these systems, certified by certification bodies:





The Eco-Management and Audit Scheme (EMAS)

At present, there are three companies in the Business Unit Environmental Services that have obtained the Verification Certificate, proof of environmental management system compliance with the requirements made under the Eco-Management and Audit Scheme (EMAS).

Over the coming fiscal periods, several companies in this Business Unit and other areas of the business will be preparing to obtain this same verification designation.

Constant Improvement

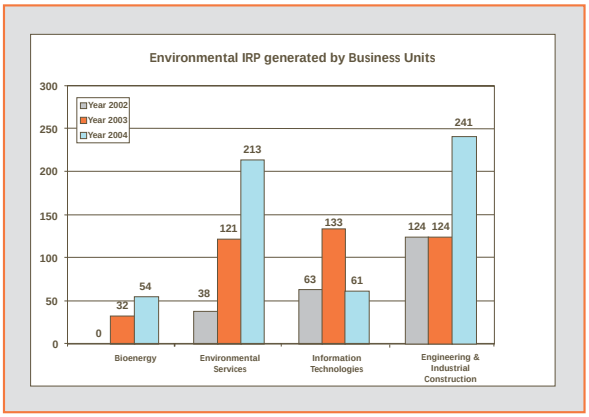
Abengoa bases its evolution on constant improvement in the development of its Management Systems and the following instruments, which it considers to be strategic: Six Sigma, Problem Solving Report (IRP) and Improvement Actions (AM).

Six Sigma

In 2003, Abengoa opted for Six Sigma as a tool for constant improvement in the important processes of the business with an irregular or unsatisfactory track performance. Six sigma is a methodology that applies statistical techniques from project management to control and reduce variables affecting global performance; the results of which are threefold:

- Customer satisfaction: the identification of the key attributes of their demands, minimisation of failure rates and better control of processes
- Employee satisfaction: through participation in development and training programs which allow individuals to participate responsibly and gain recognition for achievements
- Improvement of economic results: increase in earnings by differentiation and reduction of the costs associated with poor quality output

In 2004, as a result of the above, each Business Unit was equipped with teams, staffed by members trained at "Green Belt" levels, with officers performing the role of "Champion". Their projects, some currently underway, others that have already been completed, are applicable to all Business Units.

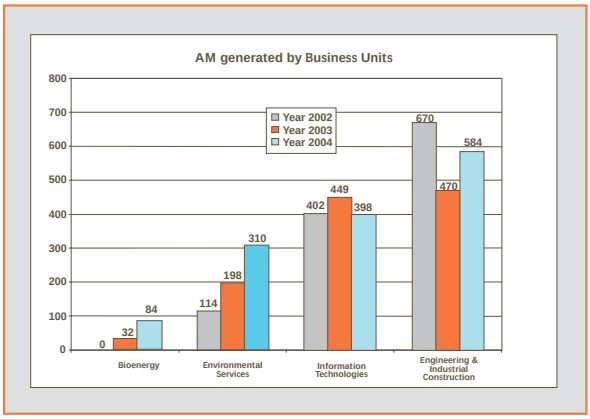


Problem Solving Report and Improvement Actions

As strategic tools for improving management of Quality and Environmental Management systems, new versions of two computer applications have been installed in all Abengoa companies, one for management and Problem Solving (IRP) and the other for processing Improvement Actions (AM).

The essential aspect of these applications is that problem management and solution and improvement actions alike can be proposed at the most relevant level to the problem, in such a way that problem detection (IRP) and solutions or improvement proposals (AM) go from "low to high". Full utilisation of these tools can be enormously advantageous in the day-to-day handling of problems. This type of constant improvement is designed tp be redundant in view of the efficiency of the system.

Below is the comparison, broken down by Business Unit, of the results obtained in 2002, 2003 and 2004 relative to problem detection and proposals for improvement actions, as well as the distribution of the problems detected and proposed improvement actions.



Commitment to the Future. R&D&I

Even though the last few years have been very difficult for technology companies in the international financial markets, Abengoa has maintained and reinforced its focus on technology in the belief that innovation is a complex and continuous process which takes place over a long period of time and should not be subject to short-term fluctuations. This technology focus is a key part of our commitment to the future.

In fact, Abengoa is one of the nine Spanish companies that invest most in R&D&I according to "The 2004 EU Industrial Research Investment Score Board" ranking, drawn up by the European Union and published in December. Abengoa is in seventh place among the Spanish companies that invest in R&D.

Innovation is focused on results, in pursuit of three groups of tangible objectives: diversification, through the development of new products and services, differentiation, through improvement and adaptation of existing products, and services for the improvement of processes.

In addition, the intangible objective pursued in Abengoa is the acquisition of essential skills, and above all, the generation of future options. This last point is especially related to value through prospects of growth and development of new businesses.

Innovation is carried out in Abengoa in several forms. It is put into practise internally, and designed to provide specific customers with solutions or integrated into their own development efforts. It is also put into practise externally based on collaboration agreements with universities, research centres, and third parties, with the execution typically shared between the participants. On other occasions, technology is acquired, and additionally, as has taken place in the past, strategic shareholdings have been acquired in technology firms.

With regard to financing, Abengoa also has external resources (taxation, grants, Universities–Research Centres, shared or customer R&D) and well as its own internal resources.

During its innovative history, Abengoa has received recognition in multiple business and academic forums on account of its R&D&I activities. Some of the prizes it has received over the last ten years are listed below:

- Prize for Best Energy Website, The Web Marketing Association, USA, 2004, **Bioenergy.**
- Prize for Excellence and Practical Improvements in the Area of Technological Innovation, AENA, 2003 **Information Technologies.**
- ComputerWorld Prize for Technological Innovation in Andalusia, 2003, **Information Technologies.**
- Nebraska Business Innovation Prize, USA, 2003, Abengoa Bioenergy Corporation, Bioenergy
- Prize for Technological Innovation in the Sector of Recovery 2000, Spanish Recovery Federation, 2003, **Befesa.**
- Prize for the Best Project of the Year, Hynergreen Eight Grove Fuel Cell Symposium, 2003, Engineering and industrial construction, **Engineering and Industrial Construction.**
- Dilectae Academia Prize (First Edition), in recognition its innovative career, Abengoa, Engineering Academy, December 2002
- AEC Prize, for R&D&I to Protect the Environment, AEC Spanish Association of Scientists (AEC), Madrid, November 2001
- Prize for Most Valuable Innovation, Telvent Velflex product, European Wind Energy Conference, Copenhagen, June 2001, **Information Technologies.**
- European Union Prize for the Best Industrial Initiative in the Use of Renewable Energies, for the project on utilization of bioethanol within the programme Renewable Energy for Europe, Camping for Take-Off, Abengoa, Repsol-YPF and Cepsa, European Union, Toulouse, October 2000, **Bioenergy.**
- Prince Felipe Prize for Business Excellence, in the category of Business Competitiveness: Energy and Industry Ministry and the Commerce and Tourism Ministry, March 1996

- Prince Felipe Prize for Business Excellence, in the category of Technological Effort:: Energy and Industry Ministry, March 1996

Innovative Significant Projects

Abengoa believes that demonstration projects are key to implementing an innovation policy for the development of new products aimed at the market. Demonstration projects achieve operational validation of a product, system or innovative process and market testing. They also provide knowledge about anticipated cost so that an initial budget can be set, which can be later lowered through the experience curve. On the other hand, demonstration projects produce a real demand in the public R&D system which enables science to respond to the needs of society.

Once again, this year, we must highlight the project for the Production of Bioethanol from lingo-cellulosic biomass. This project is designed to convert straw from corn and other cereals into bioethanol, as well as other agricultural waste. This will give rise to new benefits for farmers, as production costs will be lowered bringing them closer to the price of gasoline and the greenhouse effect will be lessened through absorption of CO_2 by plants – a raw material in the production of bioethanol – through chlorophyllic function. With investment scheduled for five years of US$35,478,765, this project has received major non-returnable assistance from the Department of Energy (DOE) of the Federal Government of the United States for a value of US$17,739,38, accounting for 50% of investment.

Below is a selection of other innovation projects that our companies carried out in 2004:

Bioenergy

- **Conversion of waste starch** - Construction of an experimental plant in York (Nebraska, USA) to increase the current level of conversion of starch into bioethanol (2.6 gallons /bushel to 2.9 gallons /bushel). Completed in May 2004. The project was co-financed by the DOE (US Department of Energy).
- **Enzyme hydrolysis of biomass** - Conversion of ligno-cellulosic agricultural waste into sugars and bioethanol. Research co-financed by the DOE. Construction of a demonstration plant for this technology in Babilafuente (Salamanca), under Framework Programme V of the European Union.
- **ACES project for gasification and catalysis** to obtain bioethanol from syngas. With the help of the ICP (Institute of Catalysis and Petrochemistry of the Higher Council for Scientific Research (CSIC)), under Framework Programme VI of the European Union.
- **Thermochemical conversion of biomass** Development of renewable fuels for advanced engines. RENEW project of Framework Programme VI of the European Union.
- **Recovery and improvement of DGS** to extend its application as feed for poultry and pig farming. The present composition is only permitted for use in cattle farming. With the support of Novus and the Universities of Nebraska and Kansas State, USA.
- **FFV** Experimental testing program for the use of bioethanol in flexible fuel vehicles.
- **Fuel cells** - Project for reforming bioethanol for the production of H_2 and feed for a fuel cell. The research aims to apply bioethanol as a fuel in future cell vehicles. Prototype reformers of 1 kW and 10 kW completed. Co-financed by the Spanish Ministry of Science and Technology.
- **E-Diesel** Commercial use of bioethanol and gasoline blends in diesel vehicles.
- **Energy plantations** Project for the development of sweet sorghum and Jerusalem artichoke in collaboration with the School for Advanced Agricultural Engineering of the Polytechnic University of Madrid (UPM) and the Agricultural Technological Institute of Castilla y León. Profit project programme from the Spanish Ministry of Science and Technology.
- **Agrobiol** for analysis of the viability of bioethanol as an alternative fuel in ethanol/gasoline, ethanol/diesel blends and as a hydrogen producer for fuel cells. Carried out in collaboration with the UPM, Ford Spain, Technological Institute of Castilla y León, Energy, Environmental and Technologies Research Centre (Ciemat), ICP, Comillas University and

Automotive Technology Research and Development Centre (Cidaut). Profit project.

- **Project for the optimization of the production process of bioethanol from cereals, wheat and barley**. Development in collaboration with the University of Santiago de Compostela. Financed with the support of the Council of Galicia.

Environmental Services

- **Experimental plant for the reuse of organic industrial waste**. In collaboration with the National Metallurgical Research Centre (CENIM). Profit program of the Spanish Ministry of Science and Technology.
- **Compal** - Portable equipment for testing slag produced in the new slag compactor.
- **Calidal** - Development of equipment to eliminate the foam in the straining of metal in moulds.
- **Less waste** Research into fluxing salts in aluminium casting to minimise salt slag production.
- **Rechupal** - Elimination of shrink cavity in high silicon-content alloys.
- **Recovery of heavy metals** with the Polytechnic University of Cartagena..
- **Applications of low-content magnesium in environmental technology**, as a substitute for limestone reagent in waste inerting processes. In collaboration with the Department of Chemical Engineering and Metallurgy of the University of Barcelona. Profit program of the Spanish Ministry of Science and Technology.
- **Development of OSCA technology** for the supercritical water oxidation of urban sewage sludge. In collaboration with Water Supply and Drainage Muni of Seville (Emasesa).

Information Technologies

- **SmarTOLL** - Design and construction of an Electronic Transactions System using national technology for application in tolls and a free-flow multi-lane toll system. It has undergone the approval tests to manufacture this remote toll system in accordance with the PISTA project (Pilot of Interoperable System for Tolling Applications).
- **SatTOLL** Tolling application based on GPS and CN communications. INTEK (Basque Government) and Profit project financing.
- **ValTick** Ticketing management system for buses based on contact-less smartcard technology. INTEK (Basque Government) and Profit project financing.
- **WebPark** advanced car park management system based on the Internet.
- **Genio** Development of interface in natural language for the ticketing vending machine. Fagor and Intek (Basque Government) financing.
- **ElockA** Electronic interlocking system for railway control.
- **Gepes** new tolling in the shade application.
- **SaReF** Development of new algorithms of regulation for railway traffic, integrable in Televent CTC. Profit project.
- **Trafing** Development of new low cost products for urban traffic control systems.
- **SiVAEX** Development of new modules based on adaptive control for the improvement of urban traffic control systems.
- **Visitran** Use of the latest advances in vision systems, applying them to new utilities for transport systems.
- **Avantis** Advanced system for the management and control of roads and tunnels.
- **ValTick** Design and development of a new centralised bus control and management system, incorporating important new features, such as considering prepayment to be a basic method of payment, implemented on contact-less cards. Profit project of the Spanish Ministry of Science and Technology.
- **SubCAT** Development of a line of equipment based on Saitel-2000DP for the control of substations geared to the North American and Chinese markets.
- **Complug** Development and demonstration of a broadband network access technology in a PLC environment, on the electric distribution network, based on latest generation FPGA circuits, allowing for the provision of voice and data services. Andalusian Council financing.

- **GasCAT Stand-Alone**. Development of a remote teletransmission station adapted to the requirements of the gas-producing sector.
- **JRC-SHEEL** Development of a system for the management and registration of shipping lanes and catches for fishing fleets.
- **Technological upkeep** of the Saitel 2000 suite (Saimed and Saimet+).
- **Families** Consolidation of the CMMI standards (Capability Maturity Model Integration), security in dynamically deployable distributed systems, quality variability techniques in dynamic derivation of applications, case studies on development of suites based on "Model Driven Architecture", processes for the integration of suites, recovery of assets of third parts based on open code. Eureka project.
- **Osmose** Open Source Middleware for Open Systems in Europe. Project led by Telvent with the participation of the R&D centres of leading European companies (Bull, France Télécom, Philips, Telefónica, Thales etc.), research institutes and universities (Charles University, EPFL, INRIA). Development of an open platform for distributed systems that will be validated on test beds for residential broadband services. Profit financing. Eureka project.
- **Jules Verne** Testing of the potential of the interactive digital diffusion industry in the creation of contents and capacity of future terminals and domestic networks. Profit financing. Eureka project.
- **Em ComPAs** Programme spanning several years involving the collaboration of 15 companies and five counties. Designed as an open initiative to accelerate deployment of broadband networks through the development of products and advanced applications for the residential environment, creating new multimedia services, home automation, remote control, security and surveillance, developing international standards and processes. Profit financing. Eureka project. Profit financing. Eureka project.
- **IberPLC-MV Multicarrier** Iberoeka project aimed at the Latin American environment for development of communication technologies in the medium voltage networks for the implementation of advanced remote control functions. Profit project.
- **PLC Disc** Trial equipment combining PLC multicarrier technologies and Telvent Metering System (TMS) based on Networked Energy Services of Echelon. Profit project.
- **Opera** Project with European financing in cooperation with 36 members to facilitate economic access to broadband communications in PLC environment.
- **IDEAL** Definition, development and exploitation of a platform of host services, dedicated and shared, of business information systems, information portals and business platforms via the Internet. Profit project of the Spanish Ministry of Science and Technology.
- **OASyS DNA** Real-time information management and leading operation in industry system. In 2004, in its third year of development, it has incorporated news levels of functioning, reliability and safety.
- **GMAS** development of a gas measurements system for Gas Suite application of management of gas pipelines and Televent gas networks.
- **Advanced Apps** for the development of GMAS (Gas Measurements Applications) for gas pipeline management.

Engineering and Industrial Construction

- **Metallic towers trial station in the Eucomsa factory in Utrera.** Seville
- **Ceramsol.** Development of a new manufacturing process of silicon carbide materials, with special structural characteristics for their use as absorbing elements of thermoelectric solar plants receptors. Profit and Andalusian Council financing.
- **Plasma Air.** Continuation of the Plactor project. Development of a plasma reactor, based on barrier discharge for the elimination of polluting gases, operating at ambient temperature. In collaboration with the Materials Science Institute of Seville of the CSIC and Green Power Technologies. Profit project.
- **Esteriplasma** Development of a medical materials sterilisation system through the use of cold plasmas, effective against a number of microorganisms and proteins. In collaboration with the Materials Science Institute of the University of Seville. Profit project.

- **SIBHI** development, design and construction of a scanner with a beam of charged ions, previously accelerated in a particles accelerator to achieve uniform beaming in the target area to be beamed. In collaboration with the National Accelerators Centre (CAN). Profit project.
- **Res2H2** demonstration project for the supply of energy and water to an isolated community through the integration of renewable energy sources with the hydrogen vector. The plant comprises a wind generator, electrolyser, desalinator and fuel cell.
- **Microcell** Miniature 50 MW fuel cell. In collaboration with the Association of Research and Industrial Cooperation of Andalusia (AICIA) and partially subsidised by the Employment and Technological Development Board of the Council of Andalusia.
- **Homecell** Development, construction and validation of an electric energy generator prototype with fuel cell for domestic applications. In collaboration with the AICIA and partially subsidised by the Employment and Technological Development Board of the Council of Andalusia.
- **Solo-H** Evaluation of the applicability of H_2 obtained from sources of industrial waste, purification through absorbers PSA procedure and use in fuel cells. In collaboration with the Institute for Catalysis and Petrochemistry of the CSIC and the National Distance Learning University (UNED). Profit project.
- **Mahres** Development of a map of renewable hydrogen in Spain, studying production potential and the distribution of demand, in collaboration with the Pablo de Olavide University. Profit project.
- **Solter-H** Generation of hydrogen from high temperature thermal solar energy, in collaboration with the Solar Platform in Almería. Profit project.
- **Fresnel PV-5X** Development of a Fresnel mechanism under low concentrations of five suns designed for testing of photovoltaic modules. In collaboration with Gamesa Solar and the University of Lérida. Profit project the support of Development Institute of Andalusia (IFA).
- **Hicon PV** for the development of electricity production through PV cells which use III-V technology and are subject to flows of concentrated radiation in the order of 1,000X. Solucar heads a European consortium with RWE, Solar Space Power, EdF, DLR, Fraunhofer Institut, PSE, Ciemat, and the Ben Gurion University and the University of Malta.
- **Megahelio** Development of a heliostat prototype for concentration thermal solar plants with a useful surface of over 200m^2.
- **Aznalcollar TH** Small plant with eight parabolic dishes with their corresponding Stirling machines for 80 kW of power.
- **Sattub** Development in collaboration with the Ciemat of a new concept of absorption tube for direct steam generation saturated in thermal solar plants with parabolic cylinder concentrators.
- **Project PS-10** Development and construction of a 10MW thermal solar station using concentration tower technology in Sanlucar la Mayor. Seville.
- **Seville PV project** Development and construction of a 1.2MW photovoltaic solar station with two-fold concentration technology and doble access suntracking, with the participation of the Institute for Energy Diversification and Saving (IDAE), in Sanlucar la Mayor. Seville.

Significant Innovative Lines

At present, there are four important innovative lines in Abengoa: Bioenergy, Solar Energy, Hydrogen Technologies and Information Technologies.

Bioenergy This Business Unit works on enhancing innovations, improving efficiency, such as waste starch conversion, "Fiber Conversion" or DGS recovery, as well as on radical innovations to transform the business, such as ligno-cellulosic biomass, fuel cells, E-diesel or biorefinary.

In this line, state funding is received from the Department of Energy of the United States Government, the European Commission via 5 the Framework Programme, and the National R&D Plan.

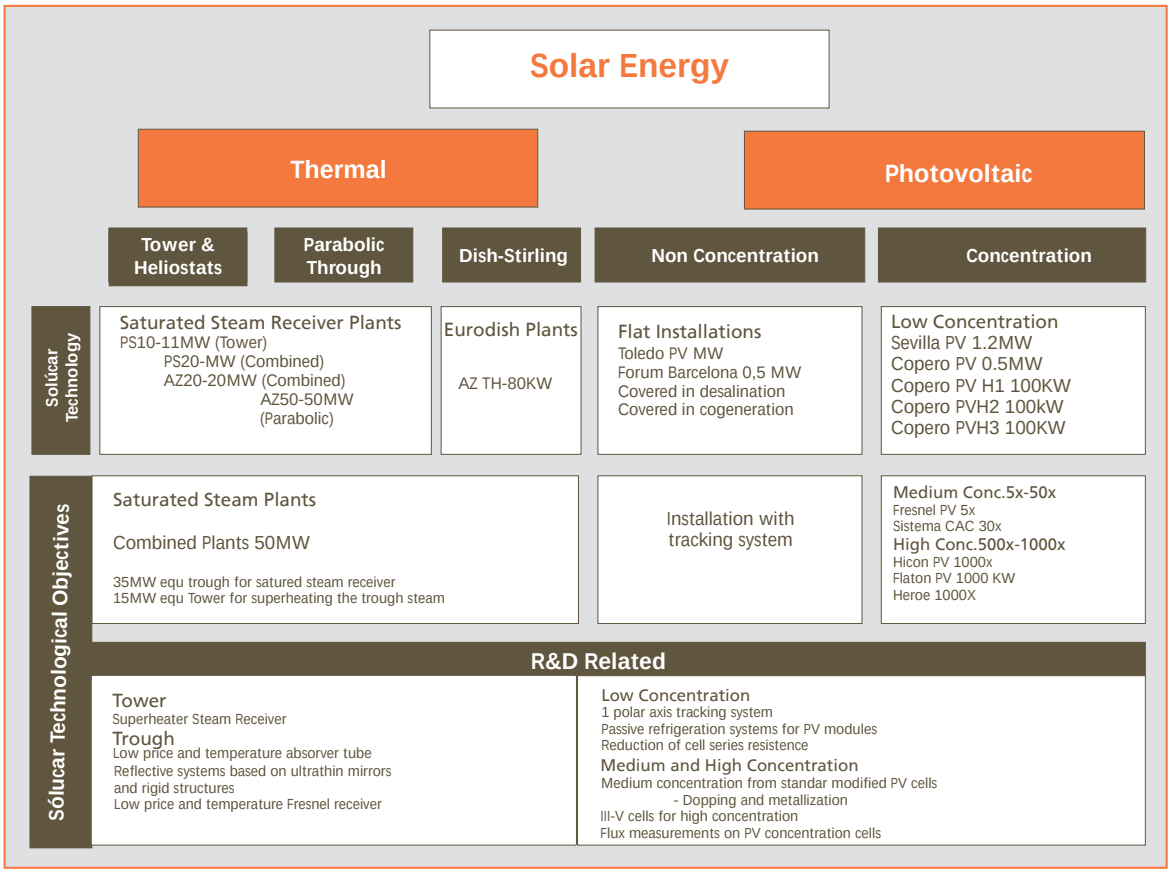
R&D&I Plan in the area of Bioenergy for the years 2003-2006.

R&D Plan of Bioenergy, Objectives.

Objectives	Production of ethanol at prices competitive with gasoline					Widen the market
Work Areas	Mejora del proceso actual	Production of biomass		Increase in value of co-products	Development of new raw materials	e-diesel
Projects	Conversión de almidón residual	Gasification and catalysis	Enzime Hydrolysis	Co-products	Energy Crops	Demostrate the viability of the use of E-diesel
Partners	Genencor and Novozymes	ICP, AICIA, PNNL, ANL, UOP, Enerkem, others	Novozymes, NREL, SunOpta, U. Auburn, Genecor, Cargill Dow*	Novus, Vogelbusch and Barr Rosin	IBVF, ETSIA, ITA, Ciemat	Tussam, Cidaut, Lubrizol
R&D programme	DOE N.P. R&D	F.P. IV	DOE F.P. V	DOE N.P. R&D	N.P. R&D	N.P. R&D
Goals	2.9 gal/Bu performance Increase starch coversion to 95%	Production of ethanol from biomass	Production of ethanol from biomass	To maximise the quality of ecoproteins	To develop energy crops suitable for ethanol production	Economic and technical evaluation of the use of E-diesel Dissemination of results
Term	Short	Medium	Medium	Short	Long	Short

* Agreements under negotiation

Solar Energy Abengoa is pursuing two lines of innovation in solar energy: solar thermoelectric and photovoltaic energy.



Hydrogen Technologies

To drive the development of hydrogen technologies and fuel cells, Abengoa has two companies Hynergreen Technologies, S.A. (Hynergreen) and Greencell.

The aim of Hynergreen is to produce clean hydrogen from other environmentally friendly sources (especially from renewable sources) and to use it in fuel cells for the production of thermal and electric energy.

In order to achieve this, a series of medium term objectives are being worked on, such as:

- Following adequate purification and processing, the use of waste industrial gases high in hydrogen in fuel cells; this enables the plants producing them to cover part of their own electric or thermal energy needs, or sell it to the network.
- Integration of renewable energies with the "Hydrogen Vector", to capitalise on the synergism of the two technologies and contribute to the development of sustainable energy.
- The use of alternative means to store hydrogen, such as metallic hydrides and chemical hydrides.
- The use of direct methanol fuel cells for small portable applications, such as, for example, in the area of telecommunications.

Furthermore, Hyneergreen participates in national and international standardisation committees for the drawing up of a set of adequate standards in relation to hydrogen and fuel cells, favouring development of these technologies and lowering associated costs.

The aim of Greencell is to produce renewable hydrogen from bioethanol. Among other R&D&I projects, Greencell has developed, in collaboration with the Catalysis and Petrochemistry Institute of the CSIC, a pilot system for the production of electric energy comprising a bioethanol reformer, a hydrogen purifier and a 10 kW fuel cell.

Information Technologies

Abengoa develops its activities in information technologies through Telvent, which runs a number of R&D&I programmes, especially in the fields of digital electronics, real-time-computing, modern telecommunications and Internet applications. In particular, we will present one of our most complex lines of ongoing technological development, led by Telvent.

OASyS DNA It is a data acquisition, supervision and control system developed by Telvent. It is based on an evolved version of Telvent's original SCADA platform and provides the technological infrastructure to support and integrate different applications for the electric, gas, petroleum, water and waste management sectors. It is an open platform managing the control of processes, relations and interfaces with other internal and external systems and advanced level communication. Among the supported applications developed specifically by Telvent are:

- LMS Liquid Management Suite for the management of petroleum pipelines.
- GMS Gas Management Suite for the management of gas pipelines.
- GMAS Gas Measurement Applications Suite for data collection and processing in gas networks.
- SimSuite PipeLine Advanced pipe line operation simulation system, working online.
- Polaris Liquids Integrated commercial management of petroleum pipelines via the Internet.
- Polaris Gas Integrated commercial management of gas pipelines.
- WMS Water Management Suite: Management of treatment plants and water distribution networks.
- Service Suite VIP maintenance management.

Abengoa Investment R&D&I

Investment R&D&I by concepts

Main Projects	2003 M €	2003 % s/ Sales	2004 M €	2004 % s/ Sales	2005 (P) M €	2005 (P) % s/ Sales
Ethanol efficiency enhancement (waste starch)	0.4		1		1.2	
Conversion of biomass to ethanol	0.4		3.8		19.6	
Hydrogen Technology. Fuel Cells	2.2		0.6		2.8	
Aluminum efficiency enhancement	0		0.6		0.2	
Vitrification	0		0.8		2.9	
Electric, environmental, oil and gas control centers	6.2		6.4		6.5	
Road and rail traffic and ticketing	3.4		3.7		3.6	
Public Administration support systems	1.1		1.5		1.6	
Solar Energy	0		0.6		32.4	
Other Projects	3.8		4.3		5.7	
Total Investment in R&D&I	**17.5**	**1.1%**	**23.3**	**1.4%**	**76.6**	**4.2%**