
R&D&I, Quality and Environment



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R&D&I

In a difficult year for technology on the financial markets, Abengoa maintained and strengthened its commitment to technological development, in the conviction that innovation is a continuous and complex long-term process that must not be influenced by the ups and downs of the business cycle.

Abengoa's R&D&I policies are geared to creating and sustaining value. Its innovation efforts are focused on getting results, and three tangible objectives are pursued to this end:

- Diversification: new products and services
- Differentiation: improvement and adaptation of existing products
- Process improvement

Intangible objects pursued include the acquisition of key competencies and expertise and, most importantly, the generation of future options. The latter is closely linked to the creation of value through growth prospects and the development of new business.

Abengoa achieves innovation in various ways: internal innovation aimed at providing specific solutions for individual customers and for in-house developments and outsourced innovation based on collaboration agreements with universities, public research bodies and other third parties, when the work is usually shared. In other cases technology is purchased. Another means that has been put into practice recently is the acquisition of strategic financial interests in tech companies. In such cases, the move is usually a corporate initiative, although the subsequent management is undertaken by the specific companies involved.

At the corporate level, Abengoa establishes institutional relations, such as framework agreements with universities and research centres, participation in Cotec, etc., although the responsibility for innovation lies with each business segment and its respective specialised companies.

In November 2001 Abengoa was awarded a prize by the Spanish Association of Scientists (AEC) for its R&D&I work in environmental protection. Sainco was also awarded a prize for its outstanding contribution to the development of wind energy for the product it calls Velflex at the 2001 European Wind Energy Conference held in Copenhagen in July.



Abengoa continued to take part in a number of public R&D&I programmes: European Union 5th Framework Programme, Profit Programme, National R&D Plan and various R&D&I programmes implemented by the Junta de Andalucía, the regional government of Andalusia.

The most significant R&D&I efforts carried out by our companies are as follows.

Bioenergy

The multi-pronged R&D&I drive in the area of biofuels aims to:

- Increase the efficiency of plants operating in Spain and the USA.
- Develop new bioethanol production processes using lignocellulosic biomass as a raw material.
- Develop additives to extend the use of bioethanol to diesel engine fuel (E-Diesel).
- Valorise by-products of the bioethanol process: DDGS used as animal feed.

To this end, Abengoa has its own R&D structure in place in Spain and in the USA, supported by a series of agreements and ownership interests in innovative US and European companies.

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Inabensa

The most significant developments were achieved in the solar energy and fuel cell areas. It led or participated in projects under the 5th Framework Programme, including:

- Eurotrough II Project: to improve 25 m long parabolic trough collectors.
- Solair Project: to develop a high-temperature, high-flux, solar radiation, volumetric air receiver incorporating ceramic technology. The first stage of the project has already been completed with the manufacture of a 300 kW receiver.
- Cocon Project: to develop a photoelectrocatalytic device to reduce CO₂ by transforming it into organic matter through solar power.
- Solgate Project: to develop compressed air solar receiver technology to directly feed a Brayton cycle.
- Sanlucar PV Prototype: photovoltaic heliostat with dual axis tracking and 2x solar concentration.
- Hispa-PEM Project: to develop a totally Spanish 5 kW PEM battery. Profit Programme.
- Bio-H Project: viability study for a bioethanol reformer for the production of H₂.

Telvent

- Velflex is an advanced control system for optimal orientation of wind turbines based on a digital signal processing system that supplies information about the wind turbine tower's degree of flexion.
- **Sainco Tráfico** developed the following systems:
 - Mobifast for rail ticket purchase and cancellation.
 - SmartToll, an intelligent toll management and control system for motorways, bridges and tunnels.
 - Movismart: to improve traffic circulation in the city.
- **Telvent Interactiva** developed the following systems:
 - Rilco: B2B portal to promote trade exchanges between Europe and Latin America.
 - Illión and PISTA Cable Projects: intranet management systems for businesses.
 - WWMF: maintenance technician management platform.
- **Sainsel** developed the prototype of a new WECDIS navigation console.
- **Abentel** carried out the Integra and Siloc Projects.

Quality and Environment

As in previous years, the quality assurance and environmental management systems were consistently implemented in the companies belonging to Abengoa and Befesa Medio Ambiente, S.A., and sixty-eight visits were made by Abengoa's Quality Assurance and Environmental Management Department to monitor the situation.

Proof of the progress achieved in this area is that the number of companies to have received company registration certificates and Environmental Management System certificates under the ISO 9000 and ISO 14001 standards increased once again in 2001.

The computer application for problem resolution reports and improvement action developed the previous year was implemented in all the companies in 2001 and, on the suggestion of our Chairman, it was adjusted to include occupational health and safety.

In the course of the year that it has been in operation, certain problems and requirements have arisen as the application was put into practice. The adjustments necessary to incorporate improvements based on actual experience are now being formulated and will be implemented next year.

Efforts have continued to pursue the objective set last year of using the problem resolution and management and improvement action application to help manage all problems successfully from their identification and assessment to effective resolution, so that the statistics produced by the application can be studied and used to minimise problems and resulting costs.