
Environmental Services

- **Aluminium waste recycling. Salt cake recycling. Zinc waste recycling. Industrial waste management. Industrial cleanup services and environmental engineering (engineering and construction for water treatment and waste management).**



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The environmental services business segment underwent far-reaching changes once again in 2001, reflecting the dynamic trends that characterise the sector.

In 2001 Befesa Medio Ambiente, S.A., acquired by Abengoa in June 2000, contributed its first full year's results to the company. During the year, all of Abengoa's environmental activities were grouped together under Befesa, according to plan.

The most significant development in this regard was the integration of all the environmental activities carried out through Abensur Servicios Urbanos, S.A. in Befesa. This was achieved by an increase of capital in July, which was wholly subscribed by Abengoa, with the assets of Abensur being transferred to Befesa as a non-cash contribution. Abensur, a company that provides engineering and construction for hydraulic and water treatment projects, complements Befesa's range of activities and resources perfectly and has contributed to substantially reinforcing its environmental engineering operations.

The close of Befesa's financial year has been adjusted to coincide with the calendar year and therefore with the close of all Abengoa's activities.

In a sector where the process of consolidation and concentration is still a predominant trend, Befesa has been successful in further strengthening its market presence by introducing new services for its customers and incorporating new companies. Befesa has redesigned its commercial organization, which now operates on the basis of geographic areas, with task coordination at the national level and a "multi-product" approach to commercial operations, promoting the "unique" image of Befesa, with a view to offering waste producers an integral service.



Befesa's activities are currently structured into the following areas of business:

- **Aluminium waste recycling**
- **Salt cake recycling**
- **Zinc and desulphurisation waste recycling**
- **Industrial waste management**
- **Hydrocarbon and industrial cleanup**
- **Environmental engineering**

Since its formation in September 1993, Befesa has expanded rapidly, focusing its drive on recycling and industrial waste management. It currently employs 1200 people and operates through more than 50 companies in the Iberian Peninsula and abroad. In 2001 the company managed and treated 985,000 MT of industrial waste, which represents an increase of more than 46%. These figures are proof of Befesa's beneficial contribution to protecting the environment.

The economic slowdown also affected the environmental sector, particularly in the latter months of 2001. Demand fell sharply, as did the price of certain recycled products. However, in spite of these adverse conditions, the environmental services business segment reported good results once again in 2001.



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Metallic waste

Aluminium waste recycling

Befesa is the leading Spanish operator for the integral recovery of aluminium waste and scrap and the production of secondary aluminium alloys. It is also the top European operator in the recycling of waste containing aluminium.

The secondary aluminium market, like the zinc market, was affected, particularly in the latter part of the year, by a big drop in prices and, more importantly, by a sharp fall in demand.

Nevertheless, Befesa achieved satisfactory results in 2001, owing to its wide range of products and to its high level of technological expertise, which enables it to improve processes continually. New contracts were won for ingoting strips, the company's star product, and business was given a significant boost by our Ukrainian subsidiary's products. The Ukrainian company Donsplav, in which Befesa has a 51% ownership interest, commenced its secondary aluminium operations in 2001.



All in all, Befesa treated over 171,000 MT of aluminium waste in 2001, more than 10% up on the previous year, figures that confirm its irrefutable leadership position in Spain in this sector.

Salt cake recycling

Salt cake is highly toxic waste produced during the aluminium waste recycling process. It is essential that this salt cake be recycled in order to bring the recycling cycle round full circle and ensure full reuse of waste containing aluminium and achieve zero waste.

Befesa is the only company in Spain with the facilities and expertise to provide an integral aluminium recycling service.

Befesa currently operates the only salt cake recycling plant in Spain. The facility incorporates in-house technology and can treat over 100,000 T of salt cake, the capacity required to treat all such waste generated in Spain.

Operations also commenced at the first and only facility of this kind in the UK in 2001, significantly expanding our international presence in a field of activity key to providing customers with an integral recycling service. The plant has the capacity to treat 100,000 T of waste a year. The activity is also considered to be one of the pillars of our growth strategy in the area of integral aluminium waste treatment services, essential to building up a strong position in what promises to be a high-growth sector around the world and to providing those who generate waste the full range of integral recycling services required to achieve zero waste.



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In 2001 Befesa treated over 136,000 MT of salt cake, 40% up on the previous year.

Zinc and desulphurisation waste recycling

2001 was a particularly difficult year for the zinc waste recycling sector; zinc prices fell sharply to the lowest level in twenty years, the downward trend finally denting our margins. However, we managed to return satisfactory results, thanks to our strong market position, coupled with the strategic position of our activity that has put us ahead of other zinc waste recyclers in Spain and allowed us to achieve spectacular growth in product sales.

Befesa is the only Spanish company that provides an integral steel EAF dust collection and treatment service. In 2001 an important agreement was signed to treat EAF dust generated by the Basque Country iron and steel industry. Under the agreement, Befesa will provide the most advanced, long-term, integral environmental solution to deal with some 130,000 T of waste produced by the industry in the region each year. Not only does the agreement provide us with a basis on which to extend our facilities, it is also a further reflection of its spirit of collaboration with waste producing industries in the quest to find viable, environmentally acceptable solutions permitting sustainable growth.

In 2001 Befesa treated over 223,000 MT of waste containing zinc and waste from desulphurisation, more than 3% up on the previous year. The total production of marketable products increased by more than 6% to over 371,000 MT.



Industrial waste management

Spain is still lagging behind many European countries in terms of the volume of the industrial waste management market. Following the trend of recent years, Spain continued to narrow the gap with its European neighbours, achieving very attractive rates of growth.

Non-metallic waste

Befesa once again stepped up its commercial and coordination efforts, with a view to offering our customers optimal, integral solutions in this area of activity, which includes operations relating to waste transfer stations and environmental facilities for the physico-chemical treatment and inertisation of waste and ordinary and secure waste disposal sites.



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As a result of these efforts, the volume of industrial waste managed in 2001 increased by 82% to a total of 279,000 MT.

In order to offer our customers a fully reliable, integral service, Befesa's state-of-the-art facilities include a number of waste transfer stations and two environmental facilities, which are the most advanced and comprehensive in Spain. Over the year, the physico-chemical treatment and inertisation facilities were modernised and extended to provide the capacity to treat over 300,000 MT of waste a year and a storage capacity of over 6 million m³ of industrial waste.

Befesa also has the most complete environmental facility in Argentina, equipped with a 900,000 MT secure disposal site, an industrial waste incineration and inertisation plant and facilities for the recycling and recovery of waste fuel.



Hydrocarbon and industrial cleanup services

In view of Befesa's increasingly strong market presence in the hydrocarbon and industrial cleanup sector, this new business area was created in 2001 to manage all our activities in this area.

2001 was the first full year of operation for the company Tratamiento de Aceites y Marpoles, S.L. (Tracemar), formed at the end of 2000 and in which Befesa and Urbaser each have a 50% ownership interest. The company, which collects, treats, recovers and regenerates used oils, was set up with a view to joining forces to offer more effective solutions to the serious environmental problem of dealing with oily waste generated in Spain.



Tracemar carries out all the activities required to treat used oil and Marpol waste (oily waste from boat cleaning) and other port and garage recyclables.

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Compañía Unión Química Naval e Industrial (Unquinaval) was acquired at the beginning of 2001. It has its headquarters in Cadiz and its main business is the treatment of waste petroleum. It also carries out activities relating to the cleaning and repair of tanks in general and service station petrol tanks, including degasification. It also treats and manages all hazardous waste petroleum in the Canary Islands. Its main customers include companies such as Cepsa and CHL.

Befesa's drive to expand in the hydrocarbon and industrial cleanup sector resulted in an important development after the close of the financial year: the acquisition of 70% of the Berako Group in March 2002, with a purchase option for the remaining 30%.

The Berako Group, formed in 1977, consists of four companies (Berako, S.A., Hidro-Clean, S.A., Hidro Limp, S.A. and Ecomat, S.A.) and has facilities in Vizcaya and Catalonia. It provides highly specialised, cleanup services incorporating a high level of technological expertise throughout Spain for sectors including the petrochemical industry, the iron and steel industry and the energy industry. It also provides services for the cleaning of crude oil tanks nationwide using an innovative automatic cleaning process.

Using both permanent and mobile facilities, the Berako Group is one of the leading companies in this sector and has an extensive customer base, which includes large and medium-sized companies, institutions and local administrations.

With these acquisitions, Befesa has established a leadership position in the refinery and industrial cleanup sector nationally and has strengthened its business base in a sector with very promising growth prospects.

Also in this area of business, Befesa recycles most of the plastic greenhouse covering waste produced in Spain and provides an effective solution for PCB contaminated equipment through Etrinsa, a company in which Befesa increased its ownership interest from 50% to 100% in 2001.

Befesa managed and treated more than 175,000 MT of such waste in 2001, a remarkable increase of 260% compared with the previous year.

Environmental engineering

The environmental engineering operations of the Befesa Group are implemented through the companies Abensur, Abensur Medio Ambiente and Felguera Fluidos.

In an increasingly dynamic market, where Abensur's traditional lines of business, namely hydraulics, hydroelectric power stations, water treatment and desalination, are particularly in demand, this area of business continued to grow, achieving high levels of market penetration, as a result of a high level of competitiveness and the application of highly effective, leading edge technical solutions. In the water market, particularly purified and desalinated water reuse, trends pointed to sustainable growth.

The desalination of seawater and brackish water is an important alternative source of water for the water supply system, providing an additional guarantee to



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traditional surface and groundwater resources. In 2001 we participated in various national and international fora on desalination and secured the contract for a desalination facility in El Atabal, with the capacity to desalinate 165,000 m³/day of water for Malaga's water supply, earning us the position of leaders in the sector.

As in 2000, there was an increase in the number of invitations to bid for water-related projects issued by the Ministry for the Environment, our main client, the state-owned Hydrographic Basin and Agricultural Infrastructure companies, responsible for investment in modernising irrigation systems, and the rest of the public sector, including regional governments and municipalities responsible for urban sewerage and wastewater treatment works, which are required to be completed by 2005 according to EU directive 91/271.

Other marginal activities, such as hydrological-forestry restoration, recovery of public domain hydraulics, cleaning up river beds, dam maintenance, preservation and exploitation of hydrological systems, etc., have begun to gain budgetary importance.

The most significant contracts secured in 2001 include the El Atabal desalination facility for Acusur, with the capacity to desalinate 165,000 m³ a day for Malaga's water supply, part XIII of the Sewage and 100% Water Purification Plan for Canal de Isabel II and Section I, pressurisation of the Cortes reservoir and the Júcar-Vinalopó water transfer for Aguas del Júcar, S.A.

The National Hydrological Plan, including the Ebro water transfer to Catalonia and the Mediterranean Levante, and the National Irrigation Plan, which are now both in progress, boosted Abensur's traditional business of hydraulic projects.

Projects carried out abroad include the drinking water supply project for the municipality of Loja (Ecuador) and work has begun on the 8420 m³ a day wastewater treatment plant for the towns of Buin Oriente, Linderos, Paine and Alto Jahuel for Emos, the Metropolitan Wastewater Company of Santiago, Chile.



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The most significant projects carried out in 2001 include:

Uptake, 39 km conveyance system and a water purification plant capable of handling 500 l/s, extendable to 1000 l/s, for a population of 175,000 inhabitants in the municipality of Loja (Ecuador).

Sea outfall for the wastewater treatment plant in Baix Llobregat (Barcelona) for Depurbaix, S.A. It is 3980 m long and has a nominal flow rate of 14.58 m³/s.

Pressurisation for the Negratín reservoir in Granada and for the 5445 m long Negratín-Almanzora water transfer with a nominal flow rate of 2m³/s at 421 m, constructed with varying diameters and materials, for Acusur.

Reverse osmosis seawater desalination plant producing up to 65,000 m³ a day to supply the towns of the Campo de Cartagena (province of Murcia) for the Spanish Environment Ministry.

Reverse osmosis seawater desalination plant for Acusur producing up to 120,000 m³ a day in Carboneras (province of Almería) for Acusur. It is the biggest desalination plant in Europe and provides irrigation water for the Campo de Níjar.

Desalination plant in El Atabal for Acusur to treat the brackish water from the Guadalteba-Guadalhorce, Viñuela and Limonero reservoirs and from the aquifer on which it is built, with salinity ranging between 6500 mg/l and 850 mg/l. It can handle up to 165,000 m³ a day and provides the water supply for Malaga.

Wastewater treatment plant for El Vellón, El Molar and Pedrezuela (Madrid) serving a population of 12,000 for Canal de Isabel II. It has a flow rate of 3000 m³ a day and operates using prolonged aeration (light load).

Wastewater treatment plant in Rincón de la Victoria for the Spanish Environment Ministry, with a flow rate of 4430 m³ a day and serving a population of 65,000. It operates using a conventional biological process and tertiary treatments with sand filters and ozonation.



Extension of the Barranco Seco II wastewater treatment plant (Las Palmas) for the Spanish Environment Ministry, serving a population of 245,000. It operates on the basis of tertiary treatments using electro dialysis reversal (EDR) to provide 26,000 m³ of water a day for irrigation purposes.

Wastewater treatment plant for the towns of Buin Oriente, Linderos, Paine and Alto Jahuel for Emos, the Metropolitan Wastewater Company of Santiago, Chile. It has a flow rate of 8420 m³ a day, serves a population of 45,960 and operates using biological treatments with two active sludge lines and first-stage nitrogen removal.

In 2001 Abensur Medio Ambiente established itself as the company responsible for carrying out environmental engineering, development and construction for Befesa's industrial waste treatment and disposal projects.

In this sector, the activities carried out by Abensur Medio Ambiente centred on the design, engineering, site management, construction, installation, commissioning and maintenance of projects for urban solid waste, industrial waste and livestock waste treatment, environmental protection and associated plant and facility management and integral project development.

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Some of the most significant projects carried out include:

Start-up of urban solid waste sorting and composting plant in Utrera (province of Seville). It has the capacity to treat 50,000 MT of urban solid waste a year and serves a population of 100,000.

Construction of a recycling and composting plant for urban solid waste and sludge from the wastewater treatment plant in Estepa (province of Seville). It can treat 34,000 MT a year and serves 70,000 inhabitants.

Construction of an urban solid waste recycling and composting plant for the Poniente Almeriense area in Gádor (province of Almería). It has the capacity to treat 130,000 MT of urban solid waste a year and is designed to serve a population of over 267,000.

Construction and commissioning of an urban waste transfer station and a Clean Point in the municipality of Santa María de Guía (Las Palmas, Gran Canaria). It has a transfer capacity of 30,000 MT of waste a year and serves a population of over 65,000.

Construction and commissioning of an urban solid waste transfer and compacting station in Tarragona for Mancomunitat d'Incineració dels Residus Urbans, with the capacity to handle 6500 MT of waste a month.

Construction of a slurry treatment and purification plant in Vilches (province of Jaén) It has the capacity to treat 200,000 m³ of slurry a year and generates 15 MW of electricity.

Felguera Fluidos

In 2001 Felguera Fluidos, a company which designs and constructs industrial plants and facilities to treat and purify industrial water and disposal-site leachates, continued to secure contracts and carry out projects for combined-cycle thermal power stations and iron and steel works. A new activity was the treatment of wastewater from the olive preparation and packaging process.



Felguera Fluidos also designed and built a leachate treatment plant for Urbaser to handle leachates from the biomethanisation facilities of the waste centre located in Avila. It has a nominal flow rate of 11,000 m³ a year and uses a state-of-the-art two-stage, reverse-osmosis technology with CD modules, also known as plate membranes. It is the first facility in Spain to use this technology.

