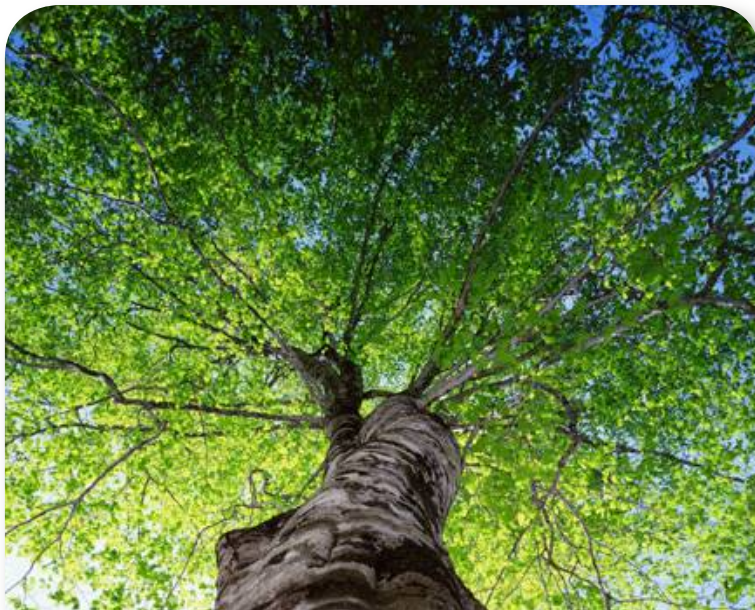


07

Environment



Our main challenge facing the company is that of reducing our environmental footprint

As part of its unwavering commitment to sustainability development, inherent to the very existence of Abengoa, **environmental protection** plays an **essential role**, for the former could not exist without the latter. Thus, the main challenge facing the company is that of reducing its environmental footprint through more efficient products and processes.

The major global challenge related to environmental protection is without a doubt the struggle against climate change. Abengoa, conscious of this, **quantifies all of the emissions** linked to its activities, which enables the company to **set annual reduction targets**.

Population growth, improved living conditions in developing countries and climate change are going to bring about significant changes in the demand for natural resources. Conscious of this transformation, at **Abengoa drinking water is produced from sea water; aluminum and zinc are recycled, thereby preventing primary extraction; industrial wastes are managed for subsequent valorization** and to minimize their environmental impact; **solar thermal power plants are built and operated; biofuels are produced**; and investment is made in **technological development** of new ways to produce renewable energies.

For all of these reasons, with a view to addressing the challenges this transformation entails, Abengoa has analyzed and **assessed a series of global and specific risks** and opportunities that are directly associated with climate change. This will serve to a **better manage** of such opportunities and risks and **anticipate future adverse situations**.

Significant global risks	Opportunities
Uncertainty surrounding the continuation of the Kyoto Protocol , which could lead to a reduction of capital allocated to efforts to halt climate change.	Growing concern regarding climate change could lead to the creation of an energy mix based on renewable energies, thereby generating business opportunities for the company.
Enactment of new regulatory frameworks with stringent requirements regarding the emissions associated with business production , penalizing companies that do not incorporate emissions abatement as a top management priority.	Companies that voluntarily take action to reduce their emissions and which have a systematized management scheme giving priority to the struggle against climate change will enjoy a competitive edge in adapting to regulatory changes based on their experience and reputation as a company. Abengoa has been thoroughly quantifying its GHG emissions since 2008 and draws up annual reduction programs based on this information.
Changes in physical parameters , such as rising temperatures, lower precipitation and increased occurrence of natural disasters, all of which can lead to water and crop shortages, damage infrastructure and paralyze routine business activity in territories that are directly affected.	Depletion of water reserves underscores the value of technology associated with water production and treatment, including desalination plants, generating a business opportunity for Abengoa . Furthermore, never-ending technological innovation enables the company to adapt its products and services to needs as they arise.

In 2011 Abengoa developed a **methodology for analyzing risks associated with climate change** that enabled the company to **assess the impact** on the technologies it operates: marine energy, water desalination, biofuel production, electrical power generation, solar plants and transmission lines, among others.

Based on the premise of an average temperature rise of 2.4 °C¹, specific risks associated with each technology were determined, as well as consequences, probability of occurrence and the measures that would need to be applied in order to mitigate them.

Note 1: Increase established under the B2 scenario of the Special Report on Emissions Scenarios (SRES) by the IPCC.



Essential in **reducing the environmental footprint** is having **reliable systems** in place to provide pertinent information on the environmental impact of the company's activity. For this purpose, Abengoa has implemented **two specific instruments** which, as part of the **Integrated Sustainability Management System (ISMS)**, provide information related to environmental impact: the **Environmental Management System (EMS)** and the **Greenhouse Gas (GHG) Management System**.

Environmental Management System

Together with the GHG Management System, the **Environmental Management System (EMS)** affords the company a **complete picture** of its **impact on the environment**. The EMS contains a series of indicators which, based on eleven environmental aspects or factors, enable the organization to compile information related to relevant aspects associated with environmental sustainability and linked to Abengoa operations. The eleven factors are:

- Raw materials.
- Energy.
- Water.
- Effluents and discharges.
- Wastes.
- Emissions.
- Biodiversity management.
- Products, services and transportation.
- Odors.
- Noise.
- Soil and aquifers.²

In addition, one of Abengoa's strategic objectives is to implement **environmental management systems** in all of its companies in accordance with ISO 14001 requirements in order to mitigate the potential negative environmental impacts of its products and services.

Activities with a significant environmental impact must likewise be taken into consideration in **monitoring and measurement plans** and in operational control programs for all companies that have ISO 14001-certified environmental management systems in place as assessment tools.

Note 2: This report does not include data related to Abengoa's impact with respect to factors involving effects in terms of odors, noise and soil and aquifers due to the fact that global historical reference data are not yet available.

The total percentage of Abengoa companies with a certified environmental management system in 2012 was 92.84 %³.

Planting trees to reduce CO₂ emissions

Global warming is one of the **main problems** affecting our planet. Abengoa, aware of this reality, is carrying out emissions **reduction plans** throughout the company in order to **mitigate** the **devastating consequences** of **climate change**.

With this **purpose in mind**, one of the company's initiatives aimed at achieving an emissions reduction is **planting trees** at the **Chilca** plant, an industrial waste treatment plant located in Peru. This facility is situated in an extremely arid region characterized by a high levels of conductivity, limited organic material and a high degree of salinity. In order to restore the area and attain fertile soil apt for forestation, a special soil treatment process was implemented, consisting, among other things, of fertilizer-based cleansing and sanitation.

The lack of humidity in the region prompted the use of Peruvian Pepper trees, native to the Andean deserts of Peru and resistant to adverse conditions. Meanwhile wastewater, treated at a specific plant located within the complex, is reused by means of a drip irrigation system that in turn runs on the energy generated by two solar panels, thus entailing no environmental impact whatsoever.

The aim of the project is to plant **1,000 trees**, one hundred per year, so that upon project completion the initiative will have resulted in an estimated reduction of **25.07 t of CO₂ per year**.



Note 3: Percentage established according to sales volume.

Calculating Abengoa's main environmental indicators

In calculating Abengoa's **environmental indicators**⁴, worksites, associated activities and all projects directly promoted by the company were taken into account.

For all other projects, figures relating to company business were reported, but excluding raw materials, consumption or waste attributable to the promoters of said projects and likewise excluding maintenance or operating activities carried out at customer facilities or purchases made between Abengoa companies.

Raw material inputs

Optimizing the use of natural resources and **appropriate resource** management are part of **Abengoa's commitment** to being sustainable. For this reason, resource impact and management are carefully examined in order to be able to quantify the use made of materials consumed, adaptation of products for reuse and efficiency in production and transportation methods. Each year the company carries out an **exhaustive inventory** of materials purchased with the aim of extending the range of its commitment to sustainability in this area.

Shown below is a list of the main raw material inputs used by activity.

Construction/installation/assembly activities (t)			
Material	2012	2011	2010
Binding materials used in construction (concrete, cement, plaster, etc.)	2,325,006	701,150	227,848
Aggregates and natural rocks	883,085	994,204	275,594
Iron-containing metal materials	307,119	271,681	95,217
Glass and ceramic material	76,758	165,184	36,923
Fossil-based materials	7,829	15,256	–
Oils, fats, and waxes	7,691	87	–
Motor oils	6,561	1,681	–
Non-iron-containing metal materials (others)	6,427	47,725	–
Non-iron-containing metal materials (aluminum)	6,016	1,993	1,845
Plant-based raw materials (grains, vegetable oils, biomass, etc.)	5,000	25	–
Lumber	3,799	1,156	25,319
Coating material (paint, varnish, etc.)	3,144	10,081	1,390
Plastics	2,699	8,101	–
Non-iron-containing metal materials (copper)	2,506	8,087	1,415
Non-renewable chemical products and additives	1,038	819	3,816
Minerals for industrial, chemical, fertilizer, refractory, foundry and pigment use	468	1,719	–

Note 4: All indicators were calculated using specific measurement and computation protocols in order to standardize applicable criteria.

The rise in the use of certain raw materials in construction activities was brought on by a high construction project volume, which increased purchasing of resources and consumption of binding materials used for this activity, including concrete, cement, plaster, etc.

Distribution/intermediation/storage activities (t)			
Material	2012	2011	2010
Iron-containing metal materials	6,872	9,082	–
Non-iron-containing metal materials (others)	1,417	–	–
Lumber	1,357	1,542	1,007
Plastics	890	5,400	6,791
Non-iron-containing metal materials (copper)	480	16,550	109,153
Non-iron-containing metal materials (aluminum)	341	140	7,735
Motor oils (with thermal degradation)	150	–	–

Production/manufacturing processes (t)			
Material	2012	2011	2010
Vegetable feedstocks (grains, vegetable oils, biomass, etc.)	4,689,443	4,736,566 ⁽¹⁾	8,413,146
Non-renewable chemical products and additives	223,356	506,629 ⁽¹⁾	830,089
Raw material of animal origin	77,466	74,822	77,188
Fossil-based materials	63,930	68,047	10,580
Iron-containing metal materials	58,590	422,626	22,481
Aggregates and natural rocks	33,774	28,430	34,496
Minerals for industrial, chemical, fertilizer, refractory, foundry and pigment use	27,311	41,530	659,922
Non-iron-containing metal materials (others)	16,562	16,697	15,676
Renewable chemical products and additives	15,762	24,168	13,173
Non-iron-containing metal materials (zinc)	4,201	2,681	–
Plastics	1,565	997	–
Binding materials used in construction (concrete, cement, plaster, etc.)	383	15,341	50,105
Non-iron-containing metal materials (aluminum)	330	–	–
Paper	266	215	–
Lumber	248	49	–
Oils and fats	215	425	–
Copper	123	173	–

(1) Data published in 2011 was modified upon the detection of an error in the calculations performed.

Abengoa, conscious of the growing problem entailed by global waste generation, provides waste collection, treatment and valorization services that help prevent the use of primary natural resources and limit the environmental impacts derived from wastes.

Wastes (t)	2012	2011	2010
Materials processed	2,692,025	1,770,508	1,664,289

The percentage of all materials used that are neither virgin materials nor materials for primary use totaled 31 %.

Energy

Rising world demand for energy necessitates **new solutions** in this field, giving preference to solutions that make use of clean, inexhaustible sources. Abengoa **applies innovative technology solutions** that **transform energy** from **renewable sources into electricity and biofuels**; builds **transmission lines** that provide the essential structure for electric systems; while at the same time **promoting responsible use based on autonomy**, energy diversification and the implementation of efficiency initiatives that are extended to the company's processes and activities.

The table below contains a breakdown by fuel type of the **primary energy consumption** associated with the entire range of production processes and construction activities.

Energy (GJ)	2012	2011	2010
Natural gas	39,935,635	35,782,545 ⁽¹⁾	22,916,041
Biomass	14,648,402	9,336,866	11,744,536
Petroleum derivatives	2,872,802	4,440,760	6,304,460
Biofuels	267,961	733,974	879,758
Others	1,319	19,268	251,869
Total energy	57,726,119	50,313,413	41,397,394

(1) Data published in 2011 was modified upon the detection of an error in the calculations performed.

Data on the amount of electrical power consumed from the grid corresponds to permanent work facilities, including both production plants and offices, and to projects undertaken directly by Abengoa.

Intermediate energy (GJ)	2012	2011	2010
Electrical energy	4,454,685	4,044,718	3,233,223
Thermal energy	1,588,444	1,643,355	1,420,822

In keeping with the company's commitment to clean technologies, 23 % of the electricity consumed at Abengoa comes from renewable energy sources.

If we transform this electrical consumption to the primary sources utilized for electricity generation, according to International Energy Agency (IEA) data for the different countries where Abengoa operates, the result is as follows:

Indirect energy consumption by renewable primary source (GJ)	2012	2011 ⁽¹⁾	2010 ⁽¹⁾
Hydraulic	723,671	636,873	601,090
Biomass	462,366	417,771	272,847
Wind	262,677	211,832	116,229
Photovoltaic	34,090	26,412	13,769
Geothermal	5,629	6,395	3,520
Tidal power	615	453	331
Concentrating solar power	357	372	138
Total	1,489,406	1,300,108	1,007,924

(1) Data for 2010 and 2011 have been modified, applying new computation criteria.

Indirect energy consumption by non-renewable primary source (GJ)	2012	2011 ⁽¹⁾	2010 ⁽¹⁾
Nuclear	4,017,497	3,437,950	2,327,404
Coal	3,560,589	3,531,019	2,317,516
Gas	2,141,770	1,922,990	1,220,261
Fuel oil	405,251	334,840	449,429
Wastes	32,806	28,752	16,756
Total	10,157,913	9,255,552	6,331,365

(1) Data for 2010 and 2011 have been modified, applying new computation criteria.

The breakdown of energy produced and sold in 2012 is shown below:

Energy produced and sold (GJ)		
Type	Produced	Sold
Biofuels	52,576,933	50,988,667
Electrical	14,000,671	12,418,705
Thermal	3,117,638	385,080
Biomass	17,630	–

Worth noting is that 27 % of electrical power production is of solar origin.

Another essential underpinning in fulfilling **Abengoa's sustainability policies** and objectives is the **implementation of measures** that help to **reduce energy use** with respect to the company's activity growth. For this reason, in 2012 a variety of initiatives were undertaken with a focus on energy efficiency enhancement. Noteworthy among them are the following:

- Replacement of the gas turbine for a higher efficiency turbine at Ecocarburantes Españoles, Murcia (Spain). The measure involved an investment of 2,927,617 €.
- Installation of a variable-flow climate control system at Campus Palmas Altas, Seville (Spain). The measure involved an investment of 77,220 €.
- Optimized electrical use through the implementation of a variety of improvement initiatives and plans at the Simosa IT data processing centers in Valgrande, Madrid (Spain) and Montesierra (Seville). The measure involved an investment of 28,000 €.

Further measures were implemented, including office light fixture replacement, central air conditioning and heating system enhancements, and power adaptation applied to production plant systems.

Water

Each year, Abengoa quantifies its impact derived from obtaining water in order to explore new strategies and thereby contribute to more **sustainable use in the future**.

According to Abengoa's information system, none of the sources used to collect water is on the Ramsar list of wetlands or may be considered especially sensitive. Nor is there any record of cases in which annual consumption totals more than 5 % of the volume of the sources affected.

The company's policy on sustainability prioritizes reduction at source by **minimizing the amount used**, reutilizing the resource for activities in which potability is not a key factor, or using alternatives to collection from water supply networks intended for human consumption.

Withdrawal of water intended for desalination processes (m ³)			
Withdrawal sources	2012	2011	2010
Sea water	151,086,634	130,407,394	83,050,309

Withdrawal of water intended for processes other than desalination (m ³)			
Withdrawal sources	2012	2011	2010
River water	11,496,878	9,239,370	9,361,962
Well water	4,874,918	5,252,978	6,144,271
Grid water	3,613,298	8,166,537	5,337,923
Used water	262,624	246,270	164,443
Rainwater	120,875	109,129	118,497

Withdrawal of water intended for other uses ⁽¹⁾ (m ³)			
Withdrawal sources	2012	2011	2010
Sea water	2,679,256	2,918,258	2,285,017
Well water	1,507,218	617,182	484,631
River water	1,233,962	494,617	306,986
Grid water	573,954	374,398	288,931
Rainwater	180,746	18,420	186

(1) Cooling, irrigation, sanitation, etc.

As in the case of energy consumption, the company focuses its efforts on regulating water consumption, particularly in activities involving more intensive use of this resource.

A case in point is the initiative undertaken at Campus Palmas Altas consisting of the installation of pumps for regulating water distribution according to demand and alternative systems for meeting off-peak demand, which takes on special importance in a geographical location such as Seville, an area enduring particular water stress.

The amount of reutilized water accounts for 4.70 % of the total volume of water collected by Abengoa.

The variation in reutilized water with respect to data reported in previous years is attributed to the application of new computation criteria, having established that for productive processes with closed cycles only circuit water volume should be taken into account, regardless of the number of times the cycle is performed.

Effluents and discharges

Abengoa, **keenly aware of the potential impacts of its activities**, for companies whose nature of operations negatively alters the composition of the water utilized, suitable water treatment is undertaken, **with final quality being rendered** within the limits established under legal requirements before being discharged into a public water source or sewer network.

Likewise, all dumping operations are authorized and controlled by competent agencies in order to ensure conformity and minimize their impact on the environment.

Abengoa **performs rigorous monitoring** every year of the release of **effluents and discharges arising from its activities**, as can be seen in the table below.

Effluents and discharges (m ³)	2012	2011	2010
Effluents discharged to surface water masses	80,062,898	72,542,252	48,391,034
Delivered to third parties for reuse	76,381,089	63,360,318	42,613,544
Effluents discharged to third-party sewer networks or treatment facilities	1,156,528	1,708,267	1,137,497
Discharged into the atmosphere – steam (t)	1,115,042	1,474,756	2,566
Discharged onto land as the result of infiltration	103,395	8,059	5,818
Third-party delivery – steam (t)	54,283	61,125	52,270
Dispersed or undefined soil discharges	47,917	1,211	773,273

Among the initiatives aimed at improving control over the water discharged into the environment is the implementation of a pH control and correction mechanism for the reverse osmosis unit that accounts for most of the effluent flow at the Ecocarburantes Españoles (Murcia) company. This measure involved an investment of 31,285 €.

In relation to effluent discharge-related incidents, Abengoa information channels reported three minor incidents that did not entail any action from the competent authorities.

In 2012, a total of 86 spills were reported through the Abengoa information channels, with the cost of repair totaling 53,675 €. There were no significant spills, and in most cases the environment was not affected.

Wastes

The different types of wastes Abengoa generates as a product of normal company operations are monitored through the environmental management systems in place at each company. The most significant of these wastes are listed below according to final destination.

Non-hazardous waste (t)	2012	2011	2010
Ground or underground deposit	243,413	247,209	141,375
Recycling or recovery of other inorganic material	235,426	209,912	232,503
Permanent deposit	121,976	52	286
Treatment in terrestrial environment	84,042	89,662	7,675
Disposal at specially designed landfills	42,484	16,588	648
Waste accumulation for use in subsequent operations	25,230	3,717	1,255
Recycling or recovery of metals and metal compounds	22,237	16,917	10,449
Recycling or recovery of organic substances not utilized as solvents	7,383	28,151	17,137
Deep injection	6,119	7,277	–
Physico-chemical treatment	5,479	1,623	51
Prior storage	4,508	2,533	202
Utilization as fuel or other means of producing energy	2,766	1,598	214
Soil treatment, resulting in agricultural benefit or ecological improvement	1,245	2,968	2,986
Recovery of elements used to reduce contamination	356	76	1,702
Utilization of waste obtained from operations	325	168	55
Surface reservoir	202	2,677	–
Others	3,420	–	–

Hazardous waste (t)	2012	2011	2010
Recycling or recovery of other inorganic material	80,469	90,198	76,288
Disposal at specially designed landfills	22,403	4,093	417
Recycling or recovery of metals and metal compounds	13,121	9,715	7,550
Physico-chemical treatment	6,570	4,935	16,088
Ground or underground deposit	2,693	821	854
Prior storage	2,397	4,583	3,453
On-land incineration	2,224	2,951	5,024
Recovery of elements used to reduce contamination	973	860	56
Utilization as fuel or other means of producing energy	713	681	1,706
Regeneration or other new use of oils	259	2,622	57
Solvent recovery or regeneration	145	99	52
Waste accumulation for use in subsequent operations	111	1,674	298
Other	1.743	–	–

The year-on-year rise in waste generation is primarily due to the increase in works in progress, higher production at a number of plants, and the one-off dismantling of a plant in Biscay (Spain).

Furthermore, the variability in final treatment can be put down to the different phases in which the range of projects are found and the fact that waste destination may change depending on the final handling agent.

In the waste management and recycling segment, Abengoa is responsible for transporting hazardous wastes. The table below shows the main figures associated with these transportation operations.

Transporting hazardous waste (t)	2012	2011	2010
Waste entering the country			
Spain	492,054	487,919	406,464
Germany	123,825	133,044	120,586
United Kingdom	44,672	39,757	43,897
Sweden	17,005	22,045	17,530
Mexico	9,982	13,223	–
Argentina	8,747	6,153	8,656
Peru	6,062	18,366	22,308
France	4,661	12,068	10,565
Total	707,008	732,575	630,006

Transporting hazardous waste (t)	2012	2011	2010
Waste leaving the country			
Spain	198,556	154,624	109,255
France	10,997	–	0,12
United Kingdom	5,556	23,559	6,961
Germany	2,864	3,040	2,985
Brazil	743	390	148
Chile	722	46	1,364
Total	219,438	181,659	120,713
Waste imported internationally			
Germany	136,873	157,980	162,156
France	58,328	41,067	29,882
Spain	46,072	118,748	50,336
Sweden	37,894	–	–
United Kingdom	5,211	23,249	7,133
Finland	–	32,560	35,412
Total	284,378	373,604	284,919
Waste exported internationally			
Germany	14,179	21,982	35,287
France	3,029	3,677	8,691
Total	17,208	25,660	43,978

NO_x, SO_x, CO, VOC, particle and ozone layer-depleting substance emissions

Shown below are the emissions reported in 2012 for ozone layer-depleting substances.

Ozone layer-depleting substances (t)	2012	2011	2010
Ozone layer-depleting substances	1.38	1.53	0.82

NO_x, SO_x, CO, VOC and particle emissions reported in 2012 are listed below.

NO _x , SO _x and other atmospheric emissions (t)	2012	2011	2010
CO	31,202	11,346	26,372
NO _x	19,292	7,093	6,547
Others	16,710	35	–
VOC	3,558	2,651	3,522
Particles	2,070	920	2,876
SO _x	905	1,019	785

As a result of the improvement in computing emissions of gases different from greenhouse gas gases, some companies have made adjustments to the basis for calculation in order to obtain a truer result. This is the main reason for the differences with respect to last year's emissions.

Managing biodiversity

Preserving biodiversity requires a management approach based on a combination of elements involving prevention, management and restoration of any damage that may be caused to the natural habitats in which the company operates. **Abengoa** therefore **minimizes its impacts by establishing a positive correlation with habitats and animal and plant species** that are more sensitive to human activity.

With this in mind, Abengoa has conducted **environmental impact studies** and **monitoring tasks** for operations carried out on land adjacent to or lying within protected areas, including the identification of affected species and valuation and assessment of resulting impacts.

Conserving these habitats is an objective that encompasses restoration and reforestation plans, strategies geared towards protecting plant and animal species, and training in forest fire prevention, etc.

Although Abengoa has companies in Brazil, France, South Africa and Spain that are located within protected areas, none of them has a particular impact on the ecosystem according to the company's information channels.

Abengoa Brasil (Brazil) is particularly relevant in this regard, as the company is involved in five electrical power transmission line construction projects that affect a combined protected area of 46,727 ha. This company is carrying out a series of initiatives aimed at preserving biodiversity:

- Plant replacement and upkeep in areas affected by activity, with investment totaling 132,054 €.
- Inventory, monitoring and analysis of the situation of affected species; protection and transfer of species to safer places in order to reduce environmental impact. The cost involved totaled 2,976,973 €.

Further activities to have been carried out in 2012 include perimeter enclosure and reforestation of land adjacent to the construction zone at the CSP complexes located in Cáceres and Ciudad Real (Spain). Such measures are valued at 313,167 €.

Products, services and transportation

For some sectors, the environmental impacts of products and services during their life time and at the end of their useful life can be equal to or greater in significance than those resulting from the production phase. Such impacts constitute an environmental challenge that is becoming more and more important each day. As Abengoa's products and services are sustainable by nature, there have been no reports of any initiatives to mitigate the environmental impacts of products and services, nor have there been any reports of significant quantities of products, packages and containers to have been recovered.

The Abengoa reporting system did not identify any significant impacts derived from transporting products and other goods and materials used for the organization's operations or in transporting members of the workforce. Nevertheless, an initiative has been undertaken to substitute the vehicle fleet for other more efficient vehicles at Abentel, Seville (Spain). The cost associated with this measure totaled 94,500 €.

Environmental expenditures and investments

Calculating environmental protection and mitigation expenditures enables Abengoa to determine the efficiency of its environmental initiatives. The following table provides a breakdown of environmental expenditures and investments.

Environmental expenditures and investments (€)	2012	2011	2010
Waste treatment and disposal	12,955,652	12,842,975	13,239,163
Other environmental management costs	11,493,534	3,865,400	153,166
Depreciation of specific equipment, maintenance, materials and services necessary for operation thereof	4,411,601	4,656,022	4,240,292
Costs of implementing cleaner technologies	3,483,150	4,086	274,772
Personnel dedicated to activities arising from environmental management	2,473,957	1,848,053	1,589,277
Third-party environmental management services	2,406,369	1,138,624	1,408,187
Emissions treatment	2,101,224	612,857	536,319
Research and development	708,043	1,382,899	7,367,413
Environmental liability insurance	690,800	610,754	630,790
Costs of remediation, cleanup and decontamination	557,240	661,072	559,437
Expenses resulting from purchasing and utilizing emissions certificates	463,836	2,025,632	2,751,783
External certification of management systems	304,507	263,656	210,553
Environmental training	81,211	75,972	1,165
Personnel engaged in training and instruction	84,695	48,556	351,464

In 2012, Abengoa clearly embraced the development of initiatives and projects aimed at environmental protection. Proof of this is found in the rise in investment allocated for this purpose by the company in most of the areas in which it invests. Noteworthy are allocations to environmental management costs and investment in emissions treatment, which have tripled, in addition to the investment made in all aspects of environmental training and education.

In 2012, one infraction involving an odor contamination problem was reported in the Netherlands, as well as an waste-related violation in Murcia, Spain. The cost of the former infringement totaled 60,000 € and the latter amounted to 170,000 €. There have been no reports at Abengoa of any other incidents.

Greenhouse Gas Management System

Abengoa has been computing the greenhouse gas (GHG) emissions associated with its products and services since 2008 through a management system designed by the company for this purpose and integrated into the ISMS.

This application incorporates **emissions accounting** for all **scopes and sources** established under Abengoa's internal norm governing the inventory, which was devised in accordance with international standards. The GHG emissions **inventory has been published in the Carbon Disclosure Project (CDP) since 2009.**

The aim of this system is to gain in-depth **knowledge of the direct and indirect GHG emissions** of each and every company activity. This emissions accounting also aids in setting annual reduction targets, labeling Abengoa products and services, and in evaluating suppliers according to the GHG emissions linked to the products and services they provide.

In addition to signing the Abengoa Social Responsibility Code (SRC), all Abengoa suppliers are required to sign the Greenhouse Gas Emissions Reporting System Implementation Agreement. The GHG management system requires all Abengoa companies to

obtain emissions reports from every supplier and has incorporated this requirement as a critical criterion in contracting the provider, thus helping to convey good practices in sustainability and in the fight against climate change across the supply chain.

To date, more than 16,300 agreements have been signed worldwide.



Photograph taken by Antonio Cubero Buitrago for the IV edition of the photography competition on sustainable development.

Since 2011, Aenor annually verifies the Abengoa system used to manage the emissions attributable to operations over which the company has control in accordance with the specific requirements contained in Section 7.3 of the ISO 14064-1 standard.

Provided below is the quantitative information included in the GHG emissions report that was verified by Aenor for this year:

Scope 1 emissions

Listed below are the Greenhouse Gas emissions occurring in Abengoa's own sources or those under the control of Abengoa by source, differentiating between emissions associated with biomass and emissions associated with other productive processes at Abengoa.

Stationary combustion is the most important emission source associated with productive processes. In relation to biomass, also significant are emissions linked to the processes involved in producing bioethanol.

Generic emissions (tCO _{2eq})		Biomass emissions (tCO _{2eq})	
Mobile combustion	93,056	Mobile combustion	1,572
Stationary combustion	2,294,097	Stationary combustion	1,339,026
Fugitive	27,286	Fugitive	0
Processes	580,732	Processes	1,578,642
Total	2,995,171	Total	2,919,240

Emissions by GHG type

Listed in the tables below are Scope 1 emissions; that is, emissions generated at Abengoa's own sources or those under the control of Abengoa, showing a breakdown by greenhouse gas type as defined under the Kyoto Protocol:

Scope 1 emissions - CO ₂ ⁽¹⁾	Total emissions (tCO _{2eq})
Mobile combustion	93,700
Stationary combustion	3,578,407
Fugitive	11,301
Processes	1,859,768
Total	5,543,176

(1) Data include emissions from biomass.

Scope 1 emissions - CH ₄	Total emissions (tCO _{2eq})
Mobile combustion	107
Stationary combustion	13,666
Fugitive	12,537
Processes	8,427
Total	34,737

Scope 1 emissions - N ₂ O	Total emissions (tCO _{2eq})
Mobile combustion	821
Stationary combustion	41,050
Processes	291,179
Total	333,050

Scope 1 emissions - HFC	Total emissions (tCO _{2eq})
Fugitive	2,974
Total	2,974

Scope 1 emissions - SF ₆	Total emissions (tCO _{2eq})
Fugitive	474
Total	474

Note: No PFC emission sources were identified.

Scope 2 emissions

Listed below are the emissions from electricity and thermal energy generated by other entities and acquired and consumed by Abengoa for its entire range of operations.

Scope 2 emissions - Greenhouse gases	Total emissions (tCO _{2eq})
Electrical power consumed	536,694
Thermal power consumed	121,496
Total	658,190

Scope 3 emissions

Finally, shown below is a breakdown of indirect emissions resulting from company activities but which occur at sources that are neither owned nor controlled by the company.

Scope 3 emissions - Greenhouse gases	Total emissions (tCO _{2eq})
Products and services acquired	4,389,269
Work-related travel	18,956
Work commutes	19,659
Losses occurring in electrical power distribution	74,064
Value chain of fuels used for acquired energy	89,009
Total	4,590,957

Abengoa understands the importance of reducing impacts in the company value chain, and therefore year after year the company makes a significant effort to measure its carbon footprint along the value chain, especially in the case of emissions associated with acquired products and services.

GHG emissions by business sector

Given that Abengoa structures its business around three industry segments: Industrial production, Concession-type infrastructure and Engineering and construction, shown below are data on emissions for each one of these segments according to each one of the three scopes:

	Industrial production	Infrastructure under concession	Engineering and construction	Total
Scope 1	2,144,359	794,142	56,670	2,995,171
Scope 2	622,261	23,138	12,791	658,190
Scope 3	3,209,963	440,905	940,089	4,590,957
Total	5,976,583	1,258,185	1,009,550	8,244,318

Emissions from biomass are as follows:

	Industrial production	Infrastructure under concession	Engineering and construction	Total
Biomass combustion	1,340,359	0	239	1,340,598
Other biomass emissions	1,578,642	0	0	1,578,642
Biomass total	2,919,001	0	239	2,919,240

Historical log of GHG emissions

The table below shows a summary of Abengoa's GHG emissions listed in all published inventories:

	2012	2011	2010
Scope 1 (tCO _{2eq})	5,914,411	5,416,292	4,224,450
Scope 2 (tCO _{2eq})	658,190	644,209	562,113
Scope 3 (tCO _{2eq}) ver notas, 1, 2 y 3	4,590,957	5,828,989	4,650,100
Total (tCO_{2eq})	11,163,558	11,889,490	9,436,663

As a product of Abengoa's efforts to reduce the carbon footprint of its activities, it can be seen that the increase in Scope 1 and 2 emissions is lower than the increase in revenues, obtaining a better emissions intensity ratio in 2012. In addition, Scope 3 emissions have dropped as a result of the effort made in conveying the importance throughout the value chain of reducing the carbon footprint of activities that are not under the control of Abengoa.

Note 1: Scope 3 data shown in the table include emissions associated with work-related travel, work commutes, losses in the transmission of electrical power, emissions in the value chain of fuels consumed for generating acquired electrical power and supply-linked emissions.

Note 2: Data on work-related travel for 2010 (included under Scope 3) was modified with respect to the data published in CSRR2011 after detecting an irregularity in the consolidation process, quantified with an excess of 8,350 tCO_{2e}, equivalent to a variation of 0.09% over the total figure for Abengoa's GHG emissions in 2010.

Note 3: Data on supply emissions for 2011 (included under Scope 3) was modified following the detection of an error identified in the Abengoa Bioenergia Agroindustria Agrícola company, whose supply-related emissions as of the 2011 inventory closing totaled 1,809,813 t CO_{2e}, for a total figure of 674,093 t CO_{2e} upon rectification of the error.

GHG emissions reduction

Abengoa encourages all group companies to draw up annual emissions reduction plans. As a result of the proposed emission reduction initiatives, it was estimated that Abengoa would be able to cut CO₂ emissions over 1.9 Mt in 2012, in comparison to the 2011 GHG Inventory, with the calculation based on Abengoa company activity parameters.

Taken into account in carrying out emissions accounting was activity type, a factor that has a significant distorting effect on the results. Thus, a company whose activity witnessed a year-on-year increase will also see a rise in its emission levels. For this reason, success in fulfilling reduction plans lies in ensuring that the rise in emissions stays below the activity increase.

In order to eliminate this distorting effect, Abengoa does not compare emissions from one year with respect to the previous year, but rather compares ratios: tons of CO₂/activity.

$$\frac{\text{Emissions 2011}}{\text{Revenues 2011}} \times \text{Revenues 2012} - \text{Emissions 2012} = \text{Emission cut}$$

Listed below are highlights from among the **initiatives undertaken in 2012** with the **aim of reducing the carbon footprint**:

- Capture of CO₂ emitted during the production process for sale to other businesses. This resulted in the capture of 144,000 t of CO₂ at the Abengoa Bioenergy plant in the Netherlands that were subsequently sold to Dutch greenhouse operators.
- Substitution of coke⁵ as a reducing agent for charcoal in industrial zinc recovery processes at the Befesa Zinc Freiberg plant in Germany. This initiative led to a reduction of 1,370 tCO₂.
- Regulating boiler pressure according to operation level for bioethanol production processes, thereby enabling a reduction in the amount of fuel used at the Bioetanol Galicia plant in Spain. This initiative led to a reduction of 851 tCO₂.

In addition, CO₂ labels were calculated and prepared for seventeen products and services⁶ over the course of the year.

Note 4: Solid fossil fuel.

Note: 5 More information can be found in the chapter devoted to customers.