

**R&D AND
INNOVATION**
**INNOVATIVE
TECHNOLOGY**

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ACCIONA, pioneering development and sustainability

ACCIONA is one of Spain's leading business groups, spearheading the development and management of infrastructures, renewable energy, water and services. Created over one hundred years ago, the Group now has over 30,000 employees and operates in more than 30 countries on five continents, with revenues that reached €6.646 billion in 2011. ACCIONA is listed in the blue-chip Ibex 35 index and is a market benchmark.

The Group's position as pioneers in development and sustainability shows its capacity to meet the challenge of achieving sustainable development in all its business areas, and it is fully committed to gradually reducing its carbon footprint and leading the transition to a low-carbon economy. As a result, in 2011 ACCIONA activities and business avoided 11.7 million metric tons of CO₂ being emitted into the atmosphere.

ACCIONA's strategy revolves around the principles of sustainability and social well-being as the building blocks for economic growth, environmental balance and social progress. This commitment has earned the Group a place in such highly regarded sustainability indices as the Dow Jones Sustainability World Index (DJSI World) and the Dow Jones Stoxx Sustainability Index (DJSI Stoxx), where it was the most highly rated company in its sector. In 2012 the Group ranked 37th in the Global 100 Most Sustainable Corporations in the World table, compiled by Corporate Knights, topping all other Spanish companies in the index.

ACCIONA has consolidated its commitment to innovation by stepping up spending, developing more projects and programs and expanding its workforce, a sign of its intention to maintain its leadership position in the development of more sustainable solutions and alternatives.

Innovative technology

In a globalized, competitive world where sustainable development is essential, innovation and the use of groundbreaking technology in projects, processes and business activities are part of a company's added value.

ACCIONA is no stranger to this concept, and innovation is the driving force behind the Group's evolution, both on the national and international stage.

Our Company has a long-standing commitment to R&D and Innovation, and has for many years invested both

manpower and considerable financial resources in these projects. Under our 2010-2015 Sustainable Development Plan we will be investing €500M in research and development.

The excellence of our research and the quality of our development system have received the highest recognition, and we were the first group of our kind to obtain UNE 166002:2006 standard certification for our R&D Management System. Our management model also:

- Protects industrial and intellectual property.

- Encourages Open Innovation by seeking out market openings for both technology and business.
- Fosters internal partnerships, synergies and technology pooling.
- Enables our technology to be included in a wide range of programs on a national, European and international level.

ACCIONA has technology centers in Madrid, Barcelona and Pamplona, focusing on sustainable building, water technology and renewable energy, respectively.

The A-63 highway, Grado –Doriga section. Asturias (northern Spain).





Innovation is an intrinsic part of adding value to business activities

We work on developing the most groundbreaking technology applied to the production of alternative energies, namely wind energy, photovoltaic and solar power and biomass. In the construction industry we develop new building materials, improve processes and focus on sustainable buildings; we also develop technology for desalination and wastewater treatment.

ACCIONA's work and dedication to technological innovation has earned it a place in the annual R&D Industrial Scoreboard drawn up by the European Commission's Directorate-General for Research.

In 2011, ACCIONA headed the list of electricity sector and construction industry companies. The quality of our R&D and Innovation projects, meanwhile, has led to a number of industry awards, including the Innovation in Composite Materials Award, and the Global Water Intelligence Award. We are also present in all the major European technology platforms.

This combination of commitment and excellence has enabled ACCIONA to lead the field in the development of solutions and alternatives blending innovation and sustainability.

Renewable energy

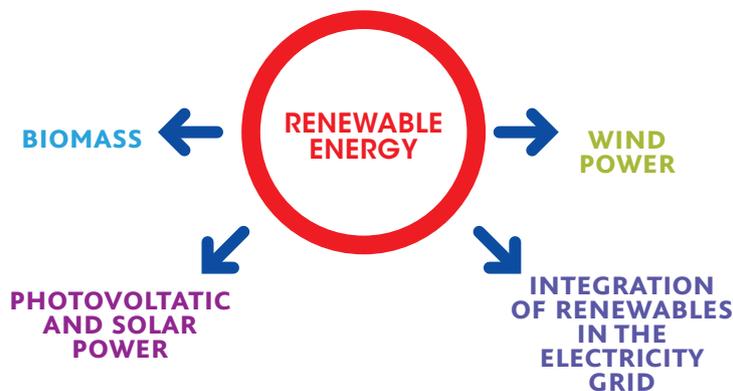
ACCIONA conducts research into alternative energies at its Technology Center in Pamplona (northeastern Spain), and tests the results of its research into wind turbines at its experimental wind farms.

Furthermore, the Group's various renewable energy power plants provide an ideal platform for implementing its pilot projects, improving processes and maintenance

engineering, and obtaining official certification for its technology.

In the field of applied innovation, ACCIONA tests and profiles the best technology available on the market and works on new products with various manufacturers to generate cheaper, more reliable energy.

Some of our most important lines of research are:



Renewable Energy Control Center.
Sarriguren. Navarre (northeastern Spain).





acciona
Windpower

Clotilde

The 3 MW wind turbine has the largest sweep of any rotor in its market segment



A.- WIND TECHNOLOGY

ACCIONA focuses much of its research budget on wind power. Innovation in this field extends to all the Group's business areas: Wind park development and promotion (sustainability), O&M (grid integration), design, production and installation of wind turbines (new multi-megawatt turbines and offshore wind farms).

The experimental wind farms transferred to ACCIONA allow the Group to test both their AW3000 models and

their concrete tower designs and prototypes.

- The 3 MW wind turbine and concrete tower is the latest technological achievement of the ACCIONA Wind power engineering team. A 3 MW wind turbine with the largest sweep of any rotor in its market segment and innovations that make it both reliable and strong.
- Under the CENIT Eolia and Azimut projects, new testing

systems and in-house analysis and structural tools for floating wind turbines have been developed.

All this research will culminate in the HIPRWind demonstration project, which will conclude with the installation and monitoring of the first floating wind turbine off the coast of Spain.

- Offshore wind power is technologically challenging in many ways, and ACCIONA

is currently researching the design and analysis of feasible locations, specific construction methods and sturdy and efficient wind turbines.

- All projects focus on a common goal - to increase the integration of renewable energy into the power grid and make the latter more stable.

B.- CONCENTRATING SOLAR POWER (CSP)

ACCIONA is currently one of the largest operators, designers and constructors of parabolic cylinder-collector solar power plants in the world, and has 314 MW of capacity installed between Spain and the US.

ACCIONA has been operating solar power plants since 2007 and focuses on maximizing performance to increase production while ensuring the safest operating environment.

ACCIONA is currently working on a number of areas of improvement, the most important being the optimization of steam turbine startup curves to maximize solar radiation, the integration of advanced DNI (Direct Normal Irradiance) forecast tools in solar plant to improve operation and automation, together with plant modeling.

A solar power plant in Majadas. Caceres (southwestern Spain).



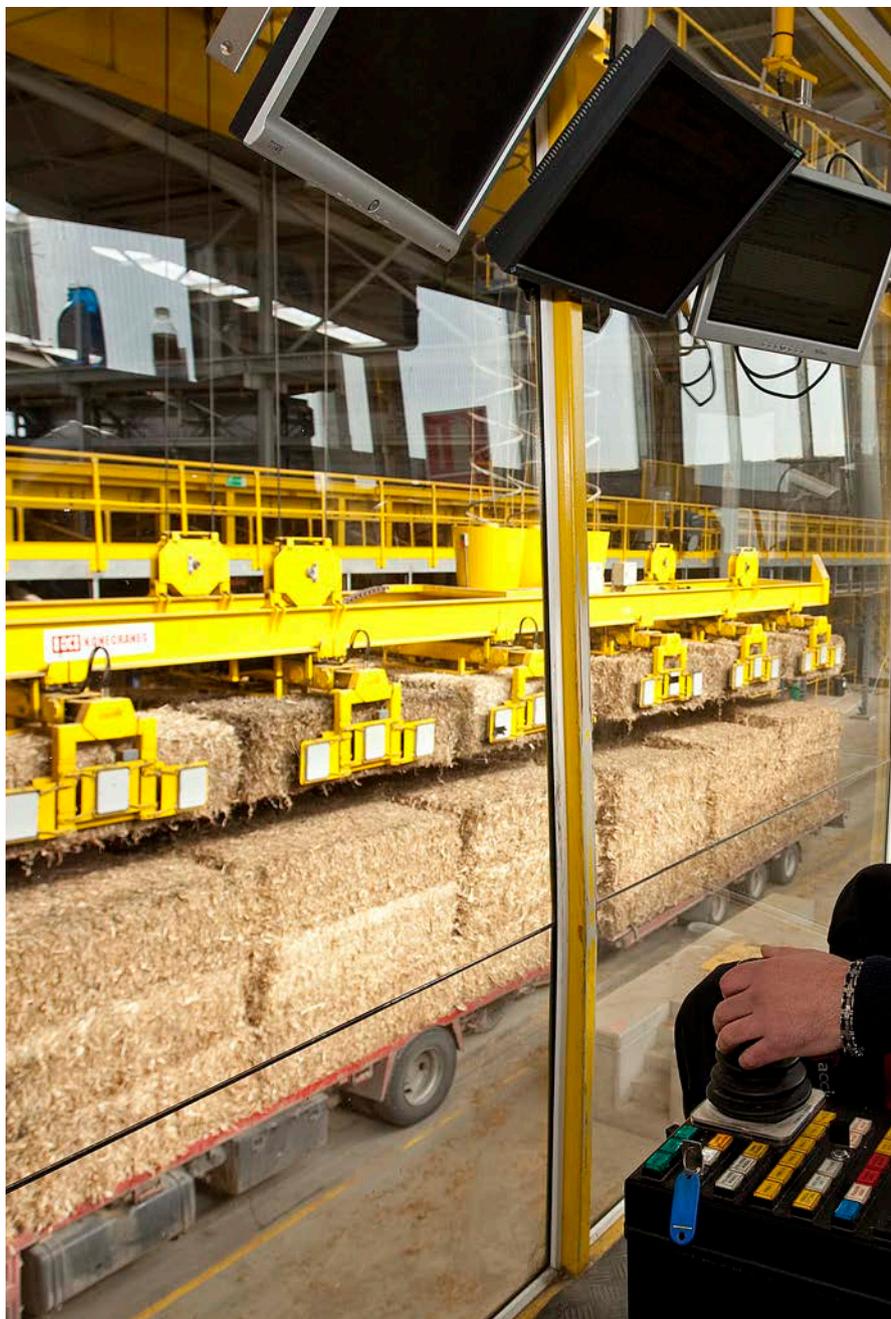


C.- IMPROVING GENERATION COSTS FOR BIOMASS ENERGY

ACCIONA operates three large electrical power plants fueled by energy crops and farm and forest waste products with an aggregate installed capacity of 56 MW.

The successful operation of these plants depends on fuel flexibility and use of the most readily available fuel source.

The challenge facing ACCIONA is that of optimizing the output of each plant while variegating the source of raw materials. To achieve this, it is working on the following areas:





- Introducing biomass analysis systems and advanced control systems to achieve uninterrupted operation of the boiler.
- Improving control of combustion parameters based on the type of fuel used, using the most efficient operating mode for any given situation.
- Analyzing the effect of each type of biomass used in the boiler and developing failure forecast technologies.

We are also introducing innovations in management and operation, with particular emphasis on:

- Innovation in the production of crops to increase the sustainability of the raw material produced.
- Characterization of new pretreatment technologies to make the biomass denser.
- Optimization of the supply chain and transport logistics, highlighting their sustainability and ensuring supply while bringing down costs.





D.- GRID CONNECTION OF RENEWABLE ENERGIES

ACCIONA has designed a renewable energy-based power plant capable of meeting the same operating standards as a conventional fossil fuel plant.

The system used can meet regulation set points sent by the system operator, and thus facilitate grid management.

The technology can be applied in countries where accumulation by regulation is or will shortly become mandatory.

ACCIONA chose its photovoltaic plant in Tudela to install what is the first 1MW+ storage system in Europe (ILIS PROJECT).

Energy storage and renewable energy manageability are the main lines of research in the field of energy.

The overall objective is to develop and apply management and storage solutions that allow greater integration of RE in the power grid and to improve the output of renewable energy generating infrastructures.

Infrastructure and sustainable transport

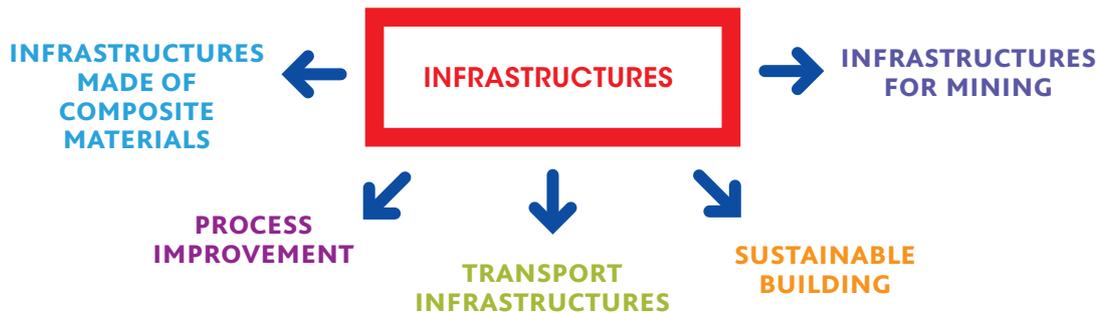
ACCIONA's Madrid Technology Center focuses on innovations in infrastructures, the environment and transport. The Center occupies an area of 3,500m² of offices and laboratories, with a further 1,200m² of workshops for manufacturing and testing full scale building elements. It also has 14 laboratories equipped with state-of-the-art

equipment that specialize in the development of advanced materials and more sustainable building processes.

The workshops also research other areas such as eco-efficient buildings or biotechnology, infrastructures made of composite materials, and process improvement, amongst others.

The lines of research focus on developing the kind of commercial technology that will differentiate the Company from the rest, by bringing it as close to the business as possible and thus giving it a competitive edge in this sector.

This is achieved by a number of strategies.





A.- APPLICATION OF NEW TECHNOLOGIES TO BUILDING PROCESSES

ACCIONA is successfully applying new technologies to processes and materials in order to optimize costs and improve the quality of the finished construction. This means using composite and sustainable materials, bioremediation, reducing CO₂ emissions, and decontamination, together with improved building processes.

One of the most important new technologies is the Building Information Modeling (BIM) system, adapted by ACCIONA, capable of detecting construction faults and

optimizing time and money by applying virtual reality to construction. This maximizes customer satisfaction by enabling clients to make changes and see the finished results of the project.

The use of information technology (ICT) during construction work gives added value by providing data and tools that help in the decision-making process.

ACCIONA is currently developing several ICT applications, such as the optimization of underground constructions and forecasting systems.



THE CUENCA FOOTBRIDGE

The walkway is 216m long, with 3 spans measuring 72m each. Each support has four alignments of 7 inclined micropiles measuring 200m in diameter, giving a total of 1,547m of micropiles.





The Company is fully engaged in developing building materials



B.- DEVELOPMENT OF 3G ROAD SURFACES

ACCIONA continues to work on developing materials for road surfaces, aiming to reduce both construction and maintenance costs. To achieve this, the Company is working on modifying existing materials by using different types of nanocharges capable of optimizing and improving their mechanical characteristics and resistance to different environmental and chemical weathering agents. This will prolong the life of road surfaces and

meet the current and future demands of the transport industry.

We are also protecting the environment by developing new kinds of asphalt that include recycled materials that would otherwise need to be transferred to dumping sites or used as fuel.

One example of this is the new access road to Alcalá de Henares from the M-300, where a new material made

from recycled plastic and rubber tires has been used for the first time. The M-300 is the first road where this new type of asphalt has been tested within this project.

The use of these groundbreaking materials on road surfaces has many advantages: They improve the resistance of the asphalt, reducing both energy consumption and maintenance costs.

C.- NEW MATERIALS

The aim of developing and applying such innovative new composite materials is to improve the performance of conventional building materials, such as concrete.

Another new development has been the use of glass and carbon fiber composites in a polymeric resin mold, combined with a structural design that maximizes the excellent properties of this type of material.

These new composite materials have a number of advantages: They are top quality, lightweight, can

easily be installed and loaded onto transport vehicles, and they are both waterproof and strong. Furthermore, because they do not rust, corrode or degrade, they need no maintenance and can reduce construction time. In other words, these materials overcome the type of construction problems that cannot be tackled with conventional materials.

Another example of our use of advanced materials is the self-compacting concrete used in the "Madrid Rio" Project (pictured right).





"MADRID RÍO" PROJECT

ACCIONA Infrastructure built two shell-type walkways for the "Madrid Río" project. The feature of these walkways is their double-vault roof measuring 49.08m in length, with a span of 43.46m between supports.





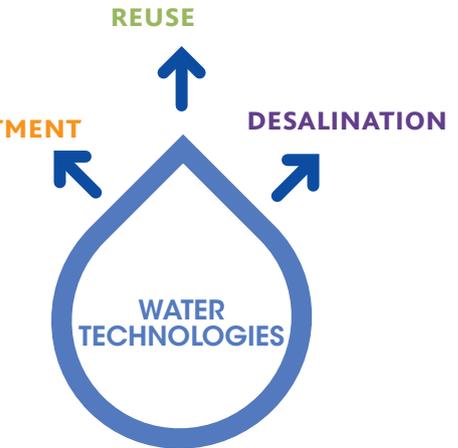
Water technologies

ACCIONA Agua focuses its innovation strategy on technological leadership, both on the national and international stage, in the supply of good quality water by developing efficient, sustainable technologies that can improve social well-being, the economy, the environment and public health.

The activities of the Barcelona Technology Center are particularly important for achieving these goals. It is here that ACCIONA undertakes its R&D and Innovation projects in a series of pilot plants for conducting field experiments.

The center has state-of-the-art facilities for studying and developing water technologies, including our research laboratory.

These facilities are among the most advanced of their kind, and are equipped with the latest technology for analyzing and characterizing membranes, the most modern chromatography techniques, equipment for characterizing porosity and of organic contamination, for measuring membrane flow potential, and for examining new processes. We also have a microbiology laboratory equipped with the latest analytical technology.



With a highly qualified, experienced multidisciplinary team that conduct basic laboratory-based research, test our developments in pilot plants and then implement them in industry, with the help of powerful modeling programs at every stage of development, our company is at the spearhead of water technology and leads the field in our sector.

Leading the way in desalination and water treatment technologies

A. DESALINATION

The characteristics of water to be desalinated vary from one plant to another. This makes each project a challenge and means that each treatment process will be different and must be designed according to the local situation.

In recent years we have been particularly successful in combining innovation with commercial requirements, developing products that are both technically superior and economical to implement and operate.

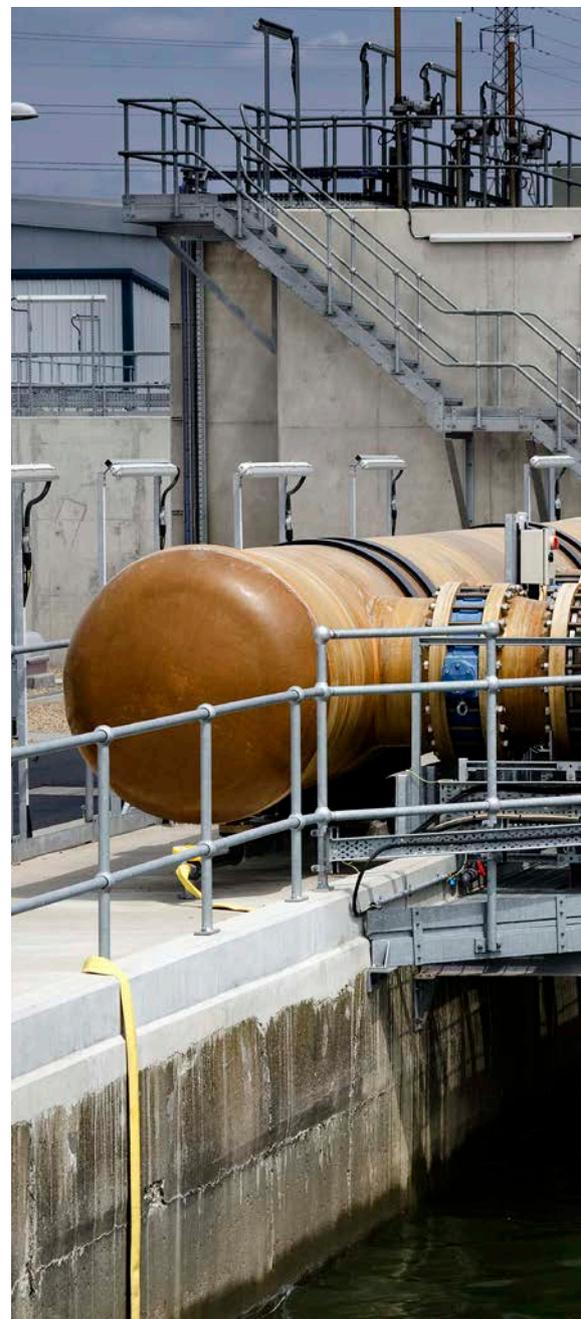
ACCIONA has developed different problem-specific solutions to improve desalination processes. Some of our most important projects have been the remineralization of the desalinated water produced by the Beckton plant (UK), technological

improvements to the reverse osmosis membranes in the desalination plants in Adelaide (Australia) and Fouka (Algeria), advanced pretreatment to eliminate algae in desalination plants such as that at Copiapó (Chile), where we treat the water used in mining operations.

At the pre-treatment stage, ACCIONA has developed various technologies, such as the ultra-rapid filtration system (ULTRAFLOT®), underwater filtration systems (SEPAFLOC) and the ACTIDAFF® countercurrent flotation system, all of which have been patented and provide ACCIONA with a competitive edge.

All these developments have greatly added to our know-how and will be incorporated into future projects.

Beckton Desalination Plant
London (UK).









B. TREATMENT

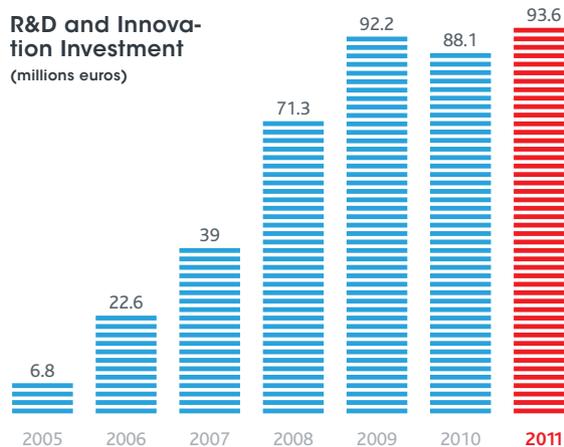
In the field of water treatment, ACCIONA is involved in two strategic projects: Sludge minimization and treatment, and optimizing treatment plant energy requirements.

The aim of sludge minimization and treatment is to first reduce energy consumption in sludge treatment operations, and secondly to enhance the sustainability of the treatment process.

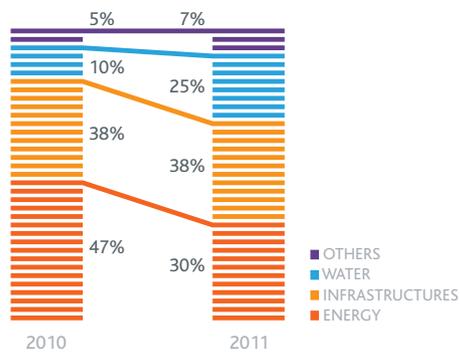
We never lose sight of the need to improve processes and overcome problems encountered in water treatment plants. Among the latest technologies we have developed are the application of membrane technology to water treatment processes (MEMPACK®) and the ELFA® process that uses nitrite to eliminate the nitrogen content of sludge return water.

ACCIONA and innova- tion in figures

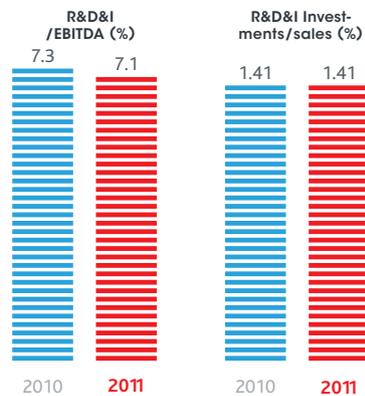
In 2011, ACCIONA raised its investment in R&D and Innovation by 6.25% over 2010.



Evolution of investments in R&D&I by business line (%)

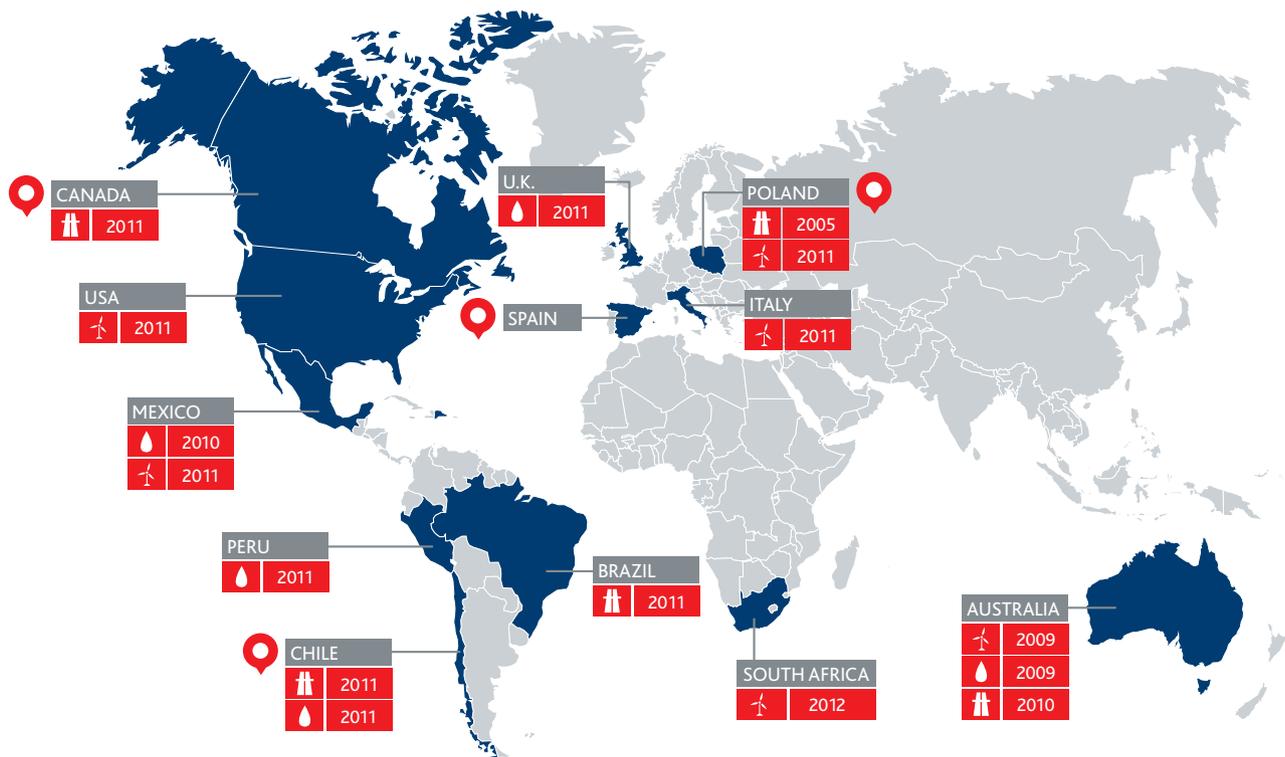


Innovation activity





International scope of innovation



📍 TECHNOLOGY SUPPORT UNIT
 💧 WATER
 🏗️ INFRASTRUCTURES
 🌪️ WIND ENERGY

INNOVATION PROJECT

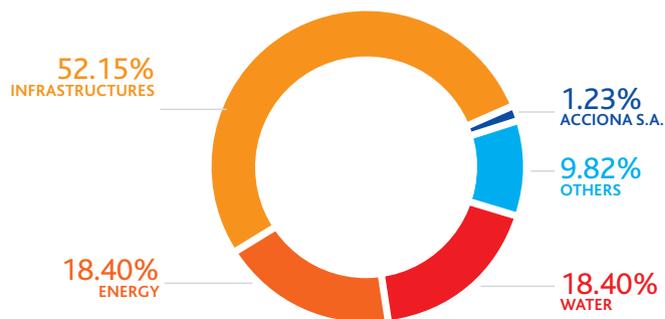
PERU — Country
 Division — 💧 2011 — Year Innovation Project Developed

ACCIONA is developing innovative technologies outside Spain. These innovations are being

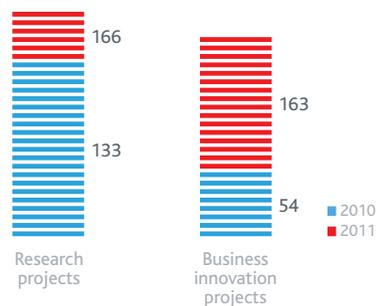
applied to projects currently being undertaken in Canada, the US, Mexico, Brazil, Chile, Poland

and Australia, and are distributed by company division as follows:

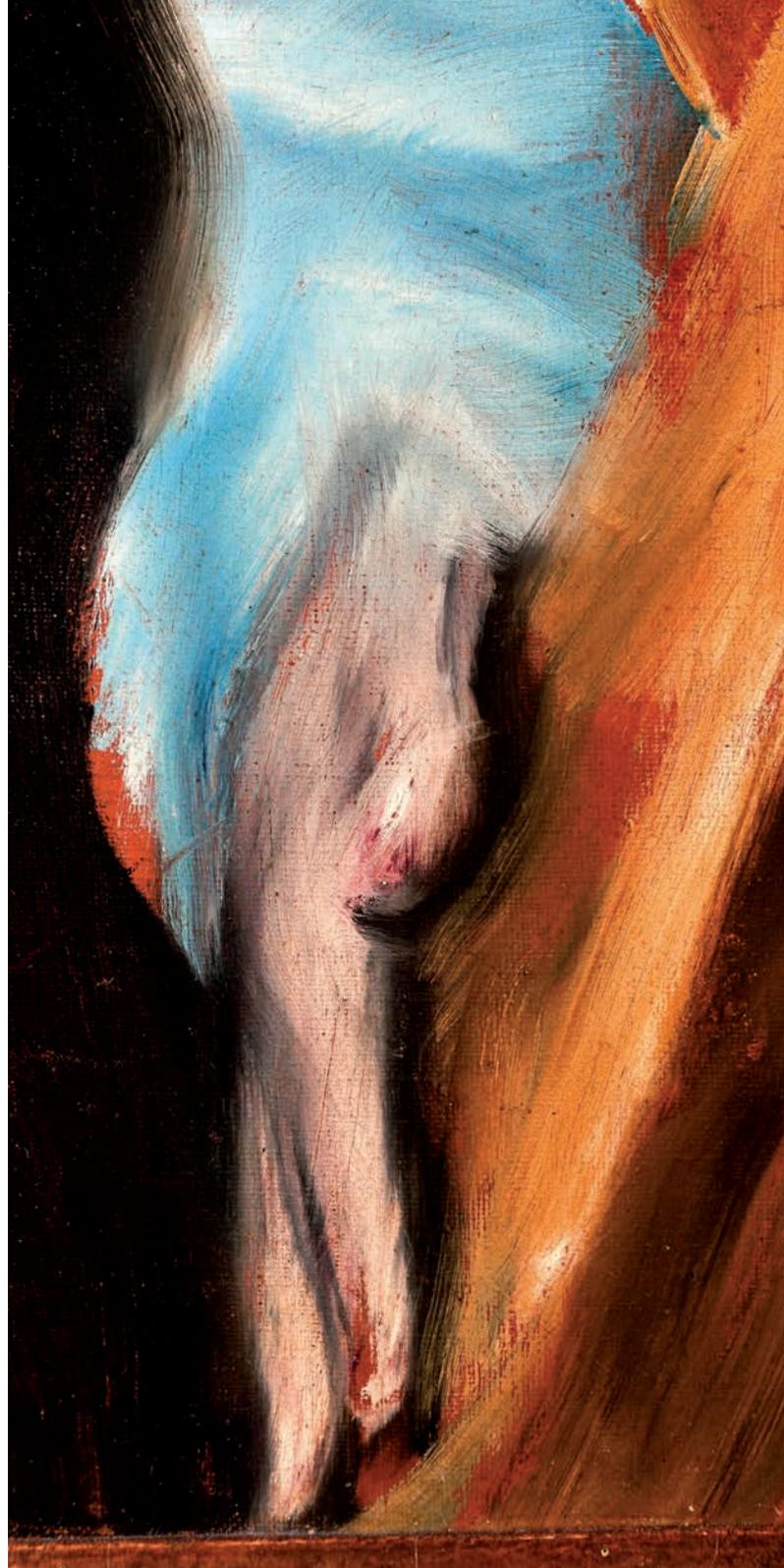
Number of innovation projects in 2011



Project portfolio



ACCIONA joins
a cultural and
social project
for the future



El Greco

ACCIONA, official sponsor of El Greco 2014

ACCIONA and the El Greco 2014 Foundation have signed a partnership agreement making the company one of the official sponsors of the events planned to mark the 4th centenary of the death of El Greco.

ACCIONA will be lending its support to a cultural project being prepared by the Foundation for 2014, an ambitious initiative that will be organized in Toledo (Spain) with events staged in other cities in Spain and abroad. With this sponsorship, the Company joins a cultural and social project for the future, and will be the official sponsor of the sculpture being prepared by Cristina Iglesias in Toledo.

The commemoration of the death of El Greco has been officially declared an "event of exceptional public interest".

The El Greco 2014 foundation was created on 13 May 2010, and is chaired by King Juan Carlos and Queen Sofia of Spain.

DOMÉNICO THEOTOCÓPULI "EL GRECO"

(Crete, 1541-Toledo, 1614) El Greco, a painter who synthesized traditional Greek painting, the color of Venice and Roman design, had a picturesque, varied artistic career in Crete, Rome and Toledo, where he lived for half his life. In Spain, the Greek from Toledo became the most notorious artist during the time of Philip II and Philip III, astounding all with his complex compositions, his bright colors, his mastery of light, shadow, transparency and reflection, his talent for bringing fabric and clouds to life, his boundless imagination when painting supernatural scenes, and his ability to breathe life into pictorial fiction.

Spain had not seen anything like it before, and his complex, intellectual and captivating art astonished his public and inspired in some admiration and in others distaste and outright rejection, particularly because he flaunted certain conventions and in doing so showed both his courage and disregard for tradition. With his paintings, El Greco created a new world of religious imagery and a revolutionary way of depicting divine or earthly individuals. His style is so unique that today his work is easily recognizable as being by "the Greek from Toledo".

EL GRECO 2014


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ELGRECO2014