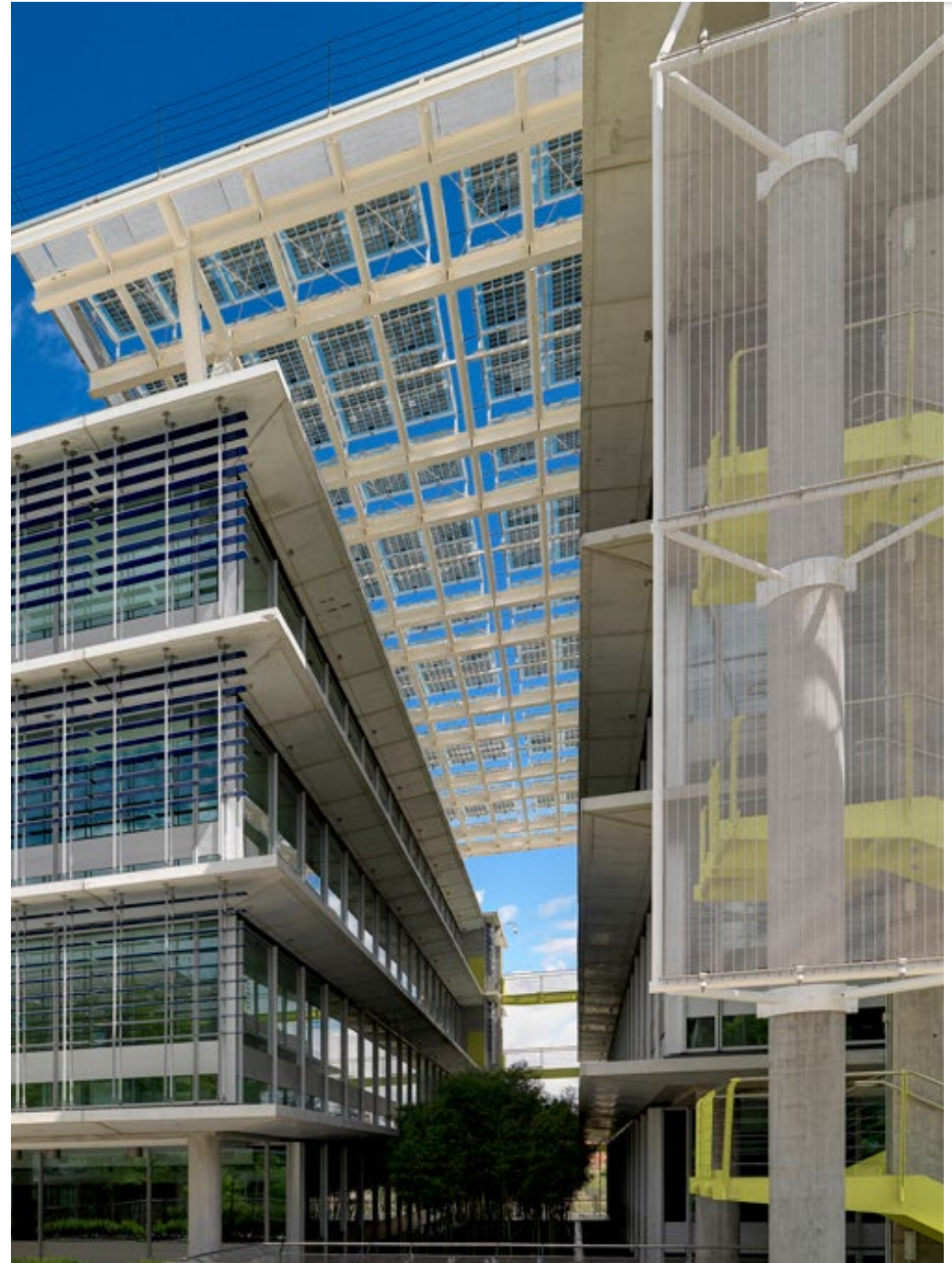




06.2 Business development

Abengoa, a global leader in projects involving solar energy and other sources of electric power, energy storage, transmission lines, water desalination, treatment and reuse, bioenergy, hydrogen, energy crops and custom-made buildings.





Abengoa intends to cement its leadership in the solar thermal power market by banking on its proven experience and track record in operating and maintaining these kinds of facilities, among other factors

Solar energy

Two very different products can be obtained by harnessing the power of the sun: **solar thermal energy and photovoltaic energy**, both having different characteristics and features and, therefore, different markets. Abengoa is present in both through its solar energy business, operating in the markets that offer the right levels of solar radiation for each technology and stable regulatory frameworks that allow business to proceed with as little risk as possible.

Starting with the solar thermal market, there is currently 4.2 GW of installed capacity worldwide: Spain leads the market with 2.3 GW, followed by the United States, with 1.8 GW. Other markets with a significant presence of solar thermal technology include: South Africa, with 300 MW, Morocco, with 184 MW, Chile, with 110 MW, Abu Dhabi, with 100 MW, Algeria, with 25 MW and Egypt, with 20 MW.

All external analysts expect to see heavy growth, with 10 to 15 GW installed by the end of 2020. The main drivers of this growth are expected to be the United States, the Middle East, North Africa, South Africa and Chile, while other countries such as India, China and Australia also include solar thermal energy as part of their long-term energy plans, despite their cautious start. They are therefore expected to make their presence felt in the market in the medium term. Projected market growth beyond 2020 and through to 2030 looks very promising, with the solar thermal market showing greater growth ratios than in previous years, due largely to the technology-related cost savings that are expected to be achieved from 2020 onward in line with the envisaged cost reduction plan.

Abengoa leads the solar thermal market with a share of 40 % and intends to cement its position thanks, among other things, to its unrivalled technological prowess and experience in operation and maintenance.

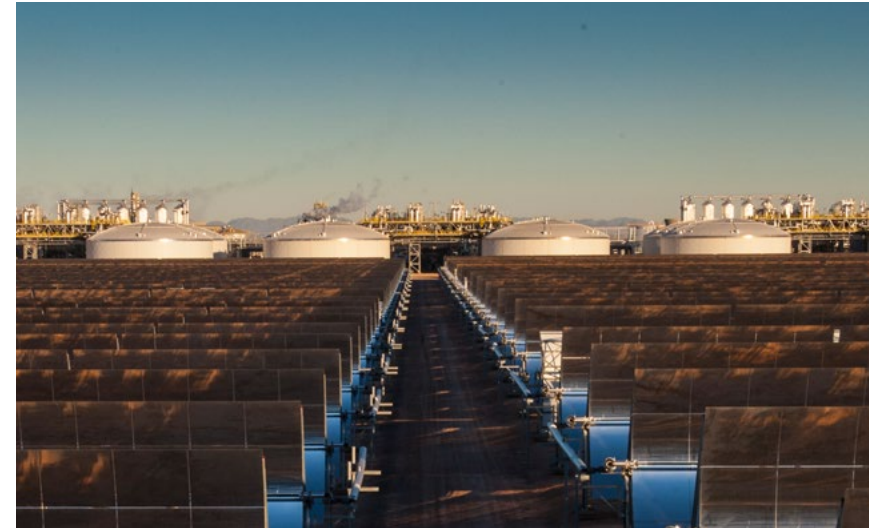
It is expected that total combined capacity for the photovoltaic market will stand at around 580 GW by 2020. When you consider that the installed capacity in 2013 was 147 GW, you can begin to appreciate the enormous growth expected to occur within the photovoltaic market in the coming years. It is important to note that most of the new capacity - over 50 % - will come from distributed generation. In general, growth of the photovoltaics sector will be spearheaded by China and India, supported to a lesser extent by the United States, Japan and Chile, among others.

Within the photovoltaics sector we would underscore the efforts being made to roll out new technologies to help boost plant performance while lowering the associated costs. A key technology in this regard is high concentration photovoltaics, also known as HCPV. This technology requires similar levels of solar radiation to solar thermal technologies and is more efficient than conventional photovoltaics. There are a number of pilot plants currently showcasing this technology and the market is expected to reach approximately 2 GW by 2020. This fledgling market is currently been driven by China, the United States and Spain.

Abengoa is fully aware of the importance of the photovoltaics market. Given the synergies of this technology with solar thermal technology, coupled with the company's presence in regions offering high levels of solar radiation, Abengoa has committed itself to expanding its presence in the market, relying not only on conventional photovoltaic technology, but also new technologies being developed within the company.

The lines of activity associated with the solar energy business are:

- › Developing new solar technologies, embracing both solar thermal and photovoltaics.
- › Industrializing the new technologies and developing solar products, including both solar thermal and photovoltaics.
- › Developing solar power plants from these products.
- › Manufacturing and selling components for solar power plants.
- › Overseeing construction and managing the asset during the construction of the solar power plants.
- › Operation and maintenance (O&M) of solar power plants.
- › Ownership of solar power plants.



Thanks to thermal storage technologies, plants can be operated 24 hours a day



Abengoa has four power tower facilities in operation and under construction

A number of major milestones were reached in 2014 in the solar business, including the successful start-up of the **Mojave** and **KaXu Solar** One parabolic trough solar thermal power plants, the former a 280 MW facility located in the Mojave Desert, California. The latter a 100 MW plant, has 2.5 hours of thermal storage and is South Africa's first solar thermal power plant to enter service. The **Solana** plant, the world's largest parabolic trough facility, with 280 MW capacity and six hours of thermal storage, celebrated its first year of operation in September. Abengoa has also started construction of two ambitious solar thermal power facilities in Chile and South Africa, namely Atacama-1, a molten salt-based power tower plant with 110 MW of installed capacity and 17.5 hours of storage, and Xina Solar One, a 100 MW parabolic trough plant with up to five hours of thermal storage.

Other sources of power generation

For as long as developing countries continue to become more industrialized, global demand for resources will rise exponentially due to the boom in the population (8.4 billion forecast for 2032) and the rise of the middle class, which in 2020 will be up 78 % on the same figure for 2010, according to a study conducted by an international consultancy firm. Abengoa wishes to play an active role in helping to ensure that the global population has access to essential resources.

Abengoa constructs renewable energy facilities, such as **wind farms**, **biomass plants** and **waste to energy (W2E) facilities**, as well as conventional generation facilities, such as **combined cycle plants**, **cogeneration plants** and other kinds of facilities. It does this in all corners of the world, working on groundbreaking projects tailored to the specific needs of the region in question and the client.

Abengoa promotes, designs, conducts site assessments, analyzes energy production, purchases supplies, constructs, fits out and commissions these kinds of plants. Moreover, the company handles the management of the facility, while marketing and selling the energy produced and

carrying out maintenance work. In other words, **it covers every single link in the value chain.**

The electricity sector shows considerable promise for the coming years. Installed capacity is expected to grow by roughly 2,121 GW, half of which will be generated in Asia, with China at the forefront, followed by India and Indonesia. By country, the United States is second only to China in terms of projected growth in installed capacity for the coming six years, with gains expected to reach 385 GW.

According to World Energy Outlook, the report published by the International Energy Agency (IEA), natural gas is set to become the second largest source of energy for installed capacity, with over 2 TW, and will experience the greatest overall growth during the period.

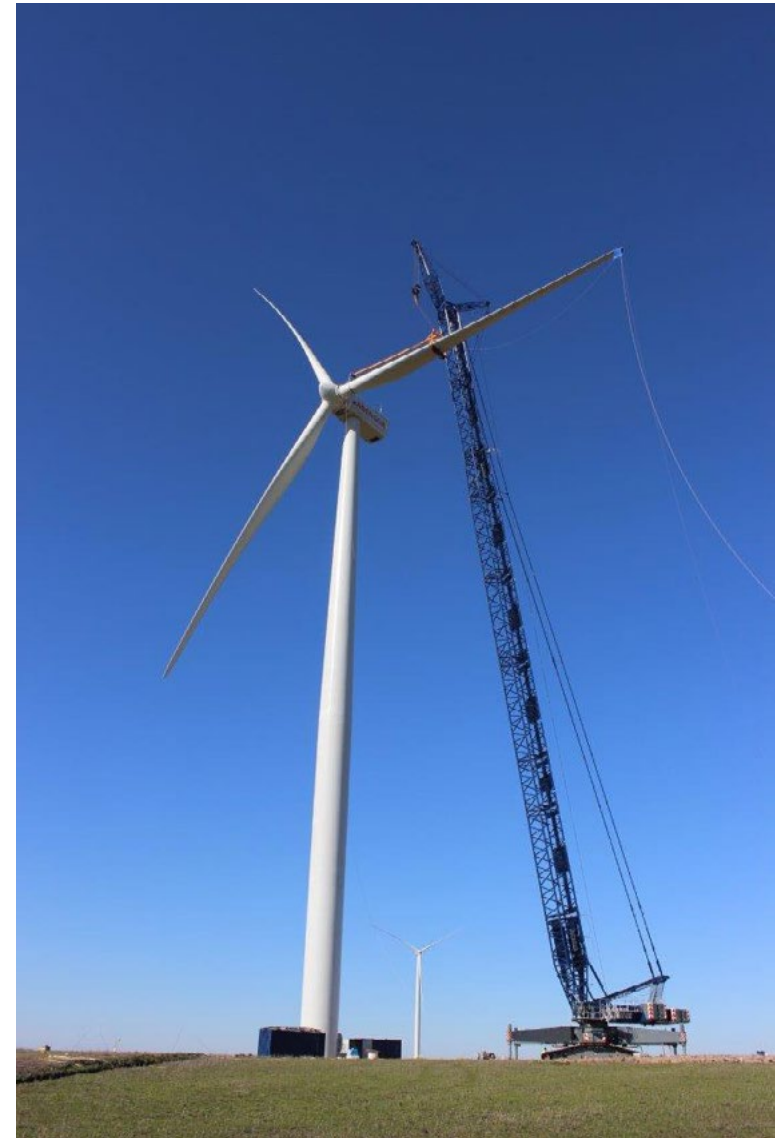


Abengoa has more than 9 GW of installed capacity in conventional generation

Abengoa has **more than 9 GW of installed capacity** in conventional generation, encompassing simple and combined cycles, conversion of simple cycle to combined cycle, internal combustion plants, cogeneration facilities and biomass plants. The company's experience in this sector and the fact it has already completed a number of groundbreaking projects have been key to cementing its status as the **second largest international construction** firm when it comes to cogeneration plants, according to the ranking prepared by the prestigious journal Engineering News-Record (ENR).

Abengoa started operating in the wind sector back in 1985, following construction of its first wind farm in Spain. Since then, the company has been involved in the construction of wind farms with a total installed capacity of over 340 MW. At present, the company has a capacity of 170 MW under construction and in operation in Latin America.

According to a report published by the Global Wind Energy Council, total wind power installed capacity amounted to 35 GW in 2013, down on same figure for 2012, which exceeded 45 GW. Mexico is a prime example of the sector's potential, with the country tapping only 3.2 % of its potential capacity to produce wind energy, according to estimates of the U.S. government. The country expects that the sector will receive investment of up to \$ 20,000 M to develop this potential in the coming years.



Abengoa has been involved in the construction of wind farms with a total installed capacity of over 340 MW



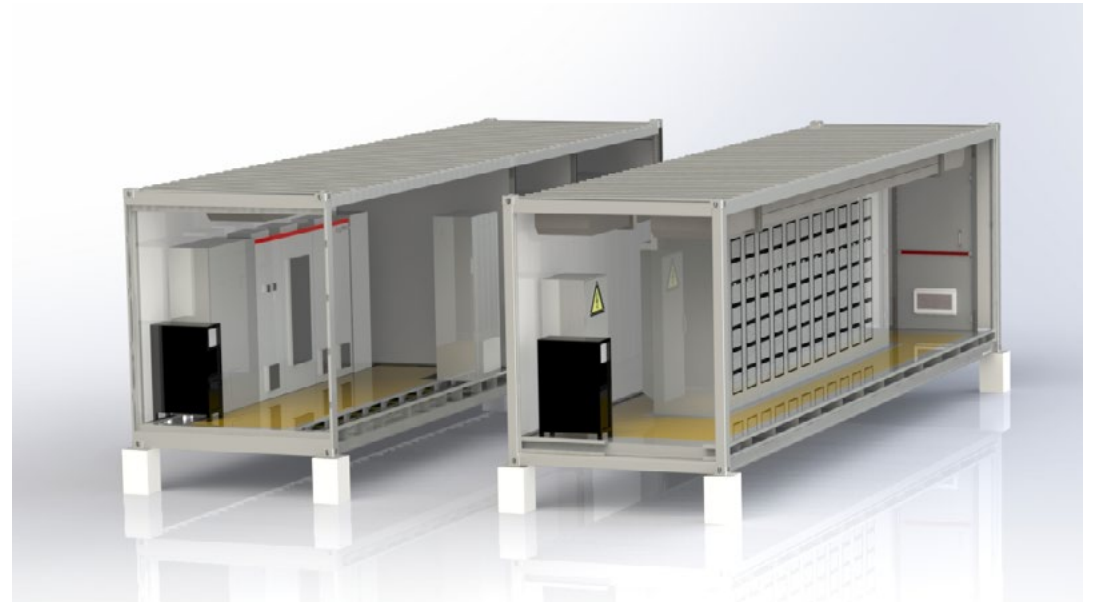
Molten salt energy storage

Energy storage

There are currently a number of breaches in existing energy systems and Abengoa is able to bridge these by implementing energy storage systems at both renewable power plants and facilities linked up to the grid. The company relies on energy storage technologies, which may be thermal, electric, or thermochemical, to tackle and respond to the four major problems facing existing energy systems:

- › Integrating renewables: storage technologies improve management and flexibility at renewable power plants, responding swiftly to demand from the grid at any time of day.
- › Need for new transmission and distribution infrastructure: due to rising energy demands and an ageing infrastructure, energy storage systems help improve the functioning of the power grid, thus deferring the need to invest in new power transmission and distribution lines.
- › Need to regulate grid voltage and frequency: energy storage enables the grid to be operated more smartly and efficiently.
- › Need to meet peak demand: energy storage systems are the cheapest alternative for end consumers when covering periods of peak demand for electricity, without having to overload the power grid.

Energy storage systems can provide a range of different grid support services, from mitigating power fluctuations and boosting power transmission capacity to improving frequency stability within the electrical grid. They also allow renewable energies to be fed into the grid, a solution Abengoa has already applied at existing solar thermal plants such as Solana and which it also intends to apply through combined thermal heat and electricity systems at the Atacama-1 solar power facility currently under construction in Chile.



Infographic of a modular energy storage system featuring lithium batteries built into 40-foot containers

Energy storage is the most efficient means of responding to the advances in the electrical grid by supplying capacity at peak times and rendering the grid more stable, while also helping to feed sources of renewable power into the grid. Abengoa is therefore committed to developing a full range of energy storage technologies, making it a benchmark company when it comes to services to improve the functioning of electrical grids. These innovative systems can also be used to construct renewable power plants capable of providing a rapid response to grid power demand day or night.

The company currently has sufficient technological capacity to provide both operators of the electrical system and utilities with a spectrum of energy storage solutions tailored to their individual needs, thus offering the best possible solution in each case:

- › Molten salt tanks with electrical resistors and a steam turbine (new turbines or existing ones from obsolete plants, such as coal power stations).
- › Electric battery systems.
- › S3 Smart Storage System, which includes molten salt tanks, electric batteries and system control and management.

Abengoa is also working on alternative storage systems to enable adaptation to other needs as they arise:

- › Hydrogen-based energy storage systems.
- › Thermochemical storage systems.



Transmission line in Argentina, where Abengoa built its first transmission line outside Spain

Power transmission lines

Here Abengoa is the undisputed leader on the international stage. According to Engineering News-Record (ENR), it is the **world's largest construction firm when it comes to power transmission and distribution**. The company has been awarded over 25,000 km of transmission lines and 284 substations across the world over the last ten years.

The electricity sector shows considerable promise for the coming years. According to figures published in the latest Global Electricity Transmission Report, it is estimated that one million km of high voltage line will be erected. Asia will be the continent to see the greatest growth, with China and India leading the way. In turn, Latin America, North America, the Middle East and Africa will all experience similar growth of around 6 %.

Abengoa's first ventured into the field of power transmission and distribution back in 1944, with the installation of a 15 kV line and a transformer station in Spain. Twenty-two years down the line, Abengoa would develop its first transmission line outside Spain, a 500 kV line in Argentina. As it currently stands the company has installed transmission lines and constructed electrical substations in over 30 countries worldwide.

Transmission lines allow electricity to be transported efficiently from wherever it is generated (meaning wherever production is optimal) to demand centers. Abengoa offers safe and efficient electrical storage systems in any electrical substation or renewable energy plant.

Abengoa is one of the leading private concessionaire companies in Latin America, with a total of 12,000 km of active transmission lines in Peru, Chile and, above all, Brazil, where it has demonstrated its unrivalled expertise in direct current systems with the construction and start-up of South America's largest extra high voltage system (HVDC).

The year also saw the company secure its first power line concession in India.

The wide range of technical solutions that Abengoa offers in the field of transmission and distribution includes lines and electrical substations of all shapes and sizes: alternating current and direct current; all levels of voltage (low, medium, high and very high); overhead, underground and underwater lines; substations insulated with air, oil, gas and hybrid solutions; as well as power upgrading work to boost the power transportation capacity of existing lines.



Abengoa has built 284 substations in the last 10 years

Abengoa covers the entire value chain in this area, from engineering to operation and maintenance, with key services including plant verification and start-up, monitoring, system oversight and control 24 hours a day, seven days a week, planning of maintenance engineering and maintenance work on live lines.

The company also offers a range of other services, including financial structuring of large-scale projects, for which it has its own specialist team.

Water desalination, treatment and reuse

Water is an essential natural resource, being vital for all life and our very existence. We need it to drink, to keep ourselves clean and to produce the food we eat. We also require water to produce the energy we use and to fuel the economy.

If we truly understand the water cycle, we know full well that to solve the existing problems in water management, we need not only generate drinking water from natural resources, but also manage this key resource efficiently and purify and regenerate the wastewater produced by human activity so that it can be reintegrated safely and sustainably into the cycle, whether through responsible disposal or regeneration for other economically viable uses.

Aware of this need, Abengoa wishes to push its message that it is a company fully committed to sustainable development, relying on its know-how and expertise in **water resource management and purification, and regeneration of wastewater** (municipal and industrial), and also on its reputation as a benchmark company in **water purification and desalination**.



Desalination plant, Cartagena, Spain, with an installed capacity of 65,000 m³/day

According to the GWM¹ 2014 report, the global water market was worth \$556,800 M in 2013, with estimated annual growth of 3.9 % through to 2018. This figure encompasses all investment in capital and in operation and maintenance on a global scale in both the industrial and municipal sectors.

Although water-related problems tend to be limited geographically speaking and heavily influenced by society's acute awareness of the issue, there are currently numerous global factors (economic, social and political) behind the forecast growth for the sector in the years to come. These factors can be summed up as follows:

- › Increasing problems of water scarcity and contamination.
- › Increased regulation of water management and greater oversight of compliance with applicable law.
- › Need for improved water purification infrastructure in cities experiencing heavy growth.
- › Pressure to optimize the management of water resources.
- › Need to enhance the management of industrial wastewater and the close relationship between water and energy.
- › Growing concern about the impact of climate change on the water cycle.

These factors, among others, have led to the widespread growth of the water market and of the sub-sectors where the greatest growth is expected to be seen. For example, capital investment in desalination through to 2018 is estimated to witness annual growth of 19.8 % on its way to reaching a market value of \$15,188 M. The water reuse market, on the other hand, is likely to see 20 % growth to reach a market value of \$7,683 M by 2018.

By operating within the water business, Abengoa is driving towards sustainable development, providing innovative across-the-board technological solutions in the field of water treatment, purification, regeneration and management for both municipal and industrial clients. It strives to become a truly global technological company and a benchmark figure in the promotion, construction, development and management of technologically innovative infrastructures in the water sector, serving both municipal and industrial clients.

¹ Global Water Intelligence (2014)

To this end, the company is involved in various lines of business in the water sector:

- › Promotion, development, construction and operation of integral projects in the following sectors:
 - Desalination of seawater and brackish water
 - Water purification and transportation
 - Purification and regeneration of municipal wastewater and associated sludge management
- › Design, construction and advisory services in relation to infrastructures for treating process water and wastewater for industrial clients.
- › Management of drainage basins and delegated management services.
- › Research, development and innovation in the field of water



Desalination plant at Cartagena, Spain, with an installed capacity of 65,000 m³/day and featuring reverse osmosis technology

Bioenergy

We have witnessed a number of major changes in the biofuels market in recent years, requiring us to act and adapt swiftly and innovatively in response. Oil consumption and oil prices continue to fluctuate based on market performance. This fact, along with various other factors, has begun to change the profile of the biofuels industry and its role in mitigating problems relating to safety, the impact on the economic landscape and its ongoing contribution to the sustainability of the environment in which we all live.

The last decade has been crucial in helping us understand the future potential of biofuels as the main alternative in reducing oil dependence at a global level. It has also been a period marked by research, specifically in the development of biofuels from new feedstocks, such as lignocellulosic materials and municipal solid waste. These advances have led to a range of new opportunities in the market.

Despite the current economic and political landscape, Abengoa continues to be positioned as a biotechnology leader who is expanding its activities and diversifying its bio-product creation and production. Proprietary technology is the focus for the creation of new products and bio-products that result in diversifying and expanding our portfolio.

While the weakened biofuels market in Europe has lost momentum and the less than favourable political support for the biofuels sector has only perpetuated this current landscape, Abengoa finished 2014 with a **strong presence and proven success in the United States and Brazilian bioenergy sectors**. In the United States, the bioenergy business has shown positive, solid returns thanks to the development and promotion of advanced biofuels.



Biomass bale for the production of cellulosic ethanol

Abengoa’s corporate mission for its bioenergy business is to develop and expand the following lines of business so as to provide the best possible results for its stakeholders, the industry and society as a whole.

- › **Fostering the sustainable development of the biofuel** for transportation market while developing biochemical products through the use of renewable raw materials and environmentally friendly technologies that help curb GHG (greenhouse gas) emissions and cushion environmental impact.
- › **Developing innovative technological** solutions through continuous investment in R&D, leading to more efficient production processes, diversification of raw materials and the manufacture of new products.



Facilities of Biocarburantes de Castilla y León at Babilafuente (Salamanca, Spain)

Following this approach, Abengoa's objective is as follows:

- › To become an international leader in the **production and sale of biofuels and chemical bioproducts produced from renewable inputs**.
- › To be recognized as a global leader in research and development, widely-known for **its technological innovation in converting biomass** into fermentable sugars, bioethanol, biodiesel, aviation fuel, chemical bioproducts, and in upgrading first-generation assets so as to diversify its product portfolio.
- › In the biofuels market, Abengoa is **Europe's leading producer and one of the main producers in the United States and Brazil**, with a grand total of **3,175 ML of installed production capacity** distributed between **14 different plants operating in five different countries across two continents**. Abengoa has also ended the year with a new plant in operation: the first commercial facility to produce cellulosic ethanol (also known as second generation (2G) ethanol) from agricultural residues (waste).



Crop unloading at the Hugoton plant (Kansas, USA)

In addition to its first and second generation plants, Abengoa also produces biodiesel from vegetable oils, which, in contrast to oil-based diesel, help reduce emissions of air polluting gases. It is worth noting that the plants also yield a number of important coproducts. A prime example here would be DGS (distillers grains with solubles), which is used for animal fodder, or the crystal sugar obtained at Brazilian facilities for both export and sale within the domestic market.

These plants are also set up to generate steam and electricity to meet the plant's own power supply needs, while the surplus electricity produced is exported to the national grid. Bioethanol production through fermentation produces CO₂ (carbon dioxide) emissions. This CO₂ is captured and supplied to gas companies, thus leading to a reduction in greenhouse gas emissions from the production process.



Electricity cogeneration at Abengoa's plant in Sao Luiz (Pirassununga, Sao Paulo, Brazil)

With a view to diversifying the raw materials or inputs used to produce biofuels and bioproducts, the company focuses its attention on enzymatic hydrolysis and catalysis processes to obtain bioethanol from lignocellulosic raw materials, chiefly crop residue, which would have no value otherwise. A major milestone in 2014 was the fact that Abengoa started marketing its own enzymes with a proprietary technology successfully developed after various years of ongoing research and development.

Abengoa also offers a wide range of services, including technology licensing, project development, biomass supply and logistics, agricultural management of biomass (energy crops), construction management, management of operations and product marketing and coverage of raw materials and contribution margins.

Hydrogen

The last 12 months have been a key period without doubt in the use of **hydrogen as an alternative fuel for transportation**. In addition to the tenders in California for 68 hydrogen service stations, we have the launch in Europe of the Directive on the deployment of alternative fuels, hydrogen being one of these, coupled with the commitments made by the main automobile manufacturers.

This has opened up a much larger market for hydrogen than that offered by traditional niche markets, such as captive fleets of forklift trucks, or the aerospace or defense sectors.

Abengoa aspires to become an international benchmark within the hydrogen economy, applying proprietary technology to offer solutions based on hydrogen and fuel cells, with the ultimate aim of championing an energy system that is sustainable for everyone.

In relation to hydrogen production, Abengoa provides plants based on both water electrolysis and biofuel reforming, focusing especially on those technologies compatible with renewable energy sources to offer renewable energy storage solutions.

In the field of electrical and thermal power production, the company designs and constructs plants that can operate with both fuel cells (polymer and molten carbonate) and hydrogen motors or microturbines, thus offering various solutions for distributed generation.

Abengoa reached a number of significant milestones in 2014 in developing its AIP (air-independent propulsion) system for the S-80 class submarines the Navantia shipyard is currently constructing for the Spanish Navy. It also completed development of the different modules that make up the MCFC (Molten Carbonates Fuel Cell) cogeneration plant to be assembled at Abengoa's headquarters in Torrecuellar, Seville.

Energy crops

Biomass is a type of energy that has seen significant growth in recent years, providing both heat and electricity and accounting for roughly 10 % of the worldwide supply of primary energy. The leading biomass markets vary, depending on the type of fuel in question. Biomass is making a steadily increasing contribution to the energy demands of many countries and already represents a significant part of the total energy supplied in some of these countries, including the Nordic states in Europe, where biomass energy accounts for more than 25 % of the total energy consumed. Biomass markets have grown at different rates. Pellets and chips are now regularly sold internationally in large volumes, yet despite the growth, they remain relatively small markets; pellets account for just 1-2 % of the total global demand for solid biomass. 2014 saw the completion of numerous large-scale plants (over 750 MW) that use pellets as a fuel, especially in the UK. New producers have emerged in response to this demand, particularly in the Southeastern United States, with new facilities starting up in Florida, Virginia, South Carolina and Georgia. Global demand for the pellets market, in which Abengoa has a number of projects in advanced state of completion, is expected to grow significantly in the next ten years for both industrial and residential uses. The average consensus for 2022 is 36 million metric tons, although the greatest growth will be seen in the coming five years.



Wood chips for energy use

Abengoa has become a market leader in Uruguay in the field of forestry services, developing **groundbreaking solutions for the biomass value chain as a raw material for both industry and energy generation.**

It aims to become a global leader in technology and in the development and supply of biomass as an efficient source of energy through innovation and sustainability.

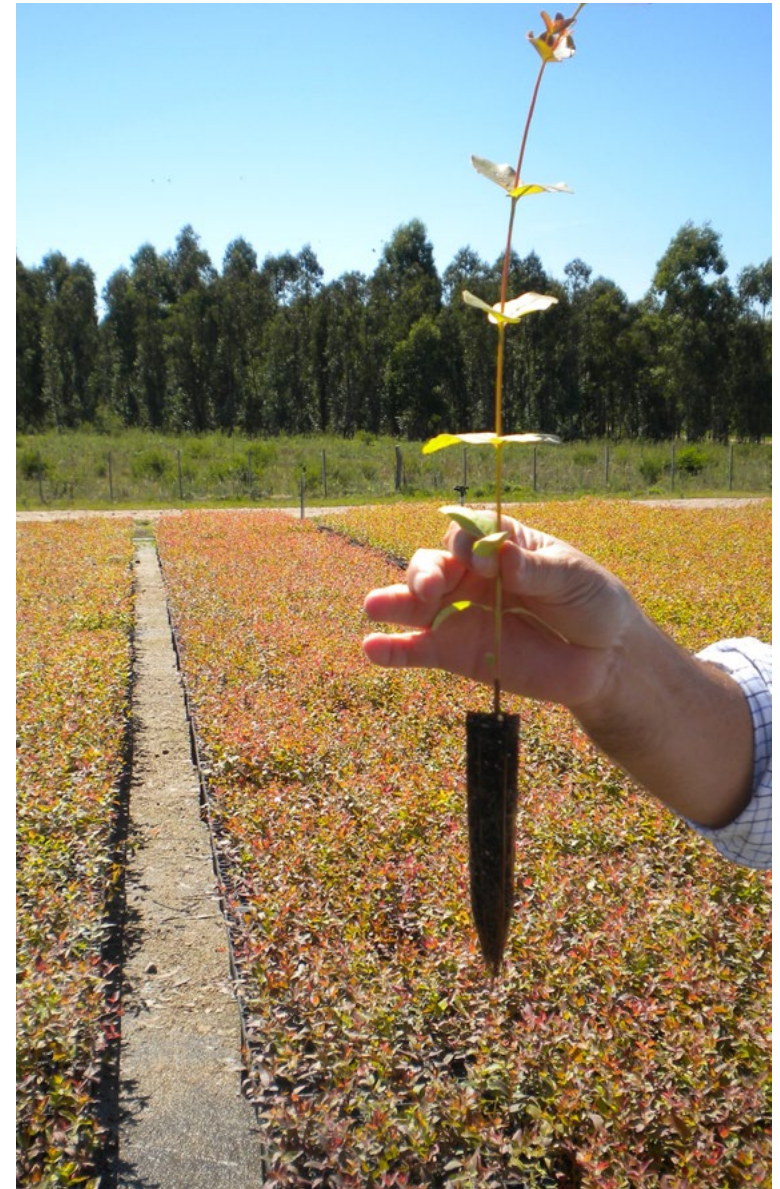
With this goal in mind, Abengoa is currently working on three main fronts, with its market divided into the following key regions: United States, Uruguay and the rest of the world (RoW), in which it carries out the following **lines of business**:

- › Promotion: **energy crop plantations.**
- › Logistics services for: harvesting, biomass transportation, forestry and operation of biomass deposits.
- › Biomass trading to power industries (Wood chip, refrigeration, etc.).
- › R&D and innovation to develop genetic material for combustion processes, focusing on temperate zones.

Abengoa similarly has a wide range of activities and projects in the United States related to the energy crop business:

- › Promotion: **pellet plants, chip plants and energy crop plantations.**
- › Logistics services for: Harvesting, biomass transportation and forestry.
- › Biomass trading to power industries (wood chip, wood pellets, etc.)
- › Infrastructure management of pellet and chip mills (operation, maintenance and Management).
- › R&D and innovation to develop genetic material for combustion processes and biofuels, focusing on temperate zones of the northern hemisphere.

The company is also seeking out new markets and opportunities and developing new lines of business in the rest of the world.



Eucalyptus seedlings at a forestry nursery



Abengoa has secured its first project in Denmark

Custom-made buildings

Another facet of Abengoa's business is the construction and management of custom-made buildings such as **hospitals, administrative complexes, courthouses, cultural centers and correctional institutions**, among others.

The company's involvement in the sector typically takes the form of **public-private partnerships** (PPPs), which offer huge benefits for both parties. On the one hand, the public sector can benefit from the know-how and expertise of the private sector, while in return, the private sector obtains a regular source of low-risk, long-term income.

According to figures published by Standard & Poor's, the public-private partnership market will grow significantly in the coming years, and close to 60 % will relate to custom-made buildings. Abengoa will share in this growth as a key player in the world's main markets.

Abengoa's business in this sector embraces the entire value chain, from development, financing and civil engineering, including electrical and mechanical installation work, through to ventilation and air conditioning systems, communications systems, fire protection, and so on. The company **manages assets in this sector** in a number of different countries, including Brazil, Spain, Uruguay and Mexico.