

## Abengoa in the USA



**At Abengoa, we believe that the world needs solutions that  
allow us to develop more sustainably**

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Abengoa (MCE: ABG.B/P SM /NASDAQ: ABGB) is an international company that applies innovative technology solutions for sustainability in the energy and environment sectors, generating energy from the sun, producing biofuels, desalinating sea water and recycling industrial waste.

## Sectors of activity

### Energy



The growing demand for energy globally as well as within the United States means it is important to come up with new solutions, prioritizing those that use clean and renewable sources. Abengoa therefore promotes infrastructures and technologies that convert energy from renewable sources into electricity and biofuels, as well as construct the transmission lines that make up our electricity networks.



### Environment



The growth of the population, improved living conditions in developing countries and climate change are going to lead to significant changes in demand for natural resources. Aware of this trend, Abengoa produces drinking water from sea water and waste water in order to recover it and minimize its environmental impact.



## **Abengoa carries out its engineering, infrastructure concessions and industrial production activities in both sectors:**

### **1 Engineering and construction**

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Engineering and construction includes our traditional engineering activities in the energy and water sectors, with more than 70 years of experience in the market. We specialize in carrying out complex turn-key projects for solar-thermal plants, solar-gas hybrid plants, conventional generation plants, biofuels plants and water infrastructures, as well as large-scale desalination plants and transmission lines, among others.

### **2 Concession-type infrastructures**

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We have an extensive and young portfolio of proprietary concession assets that generate revenues that are governed by long term sales agreements with formats such as take-or-pay contracts, tariff contracts or power purchase agreements (PPAs). This activity includes the operation of electric (solar, cogeneration or wind) energy generation plants and transmission lines. These assets generate no demand risk and we focus on operating them as efficiently as possible.

### **3 Industrial production**

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Industrial production includes involving our businesses with a high technological component, such as biofuels or the development of solar technology. The company holds an important leadership position in these activities in the geographical markets in which it operates.

## Abengoa in the United States

Abengoa has achieved a leading position within the renewable energy construction and technology sector in the United States. Through its efforts in developing commercial scale concentrated solar power (CSP) projects, as well as the production of advanced biofuels at a commercial scale, Abengoa is at the forefront of helping the United States achieve its energy needs.

With a total investment of \$3.3 billion the United States has become Abengoa's largest market in terms of sales volume, primarily from developing solar, bioethanol, and water projects.

Abengoa's investments, R&D activities, and track record of successful projects in the US have been recognized by the United States government through various agreement programs. President Barack Obama himself announced the federal guarantee of \$1.45 billion that was crucial to the launch and completion of Solana, Abengoa's solar thermal plant in Arizona.

The United States is a strategically important market for Abengoa, representing the firm's largest market. As the company continues to expand in the US, Abengoa will look to leverage its experience in areas such as intelligent electricity networks, transmission line optimization and the use of other renewable energies such as hydrogen, as a means to continue providing clean and renewable energy to the United States.



Abengoa's presence in the United States has grown exponentially since the company decided over a decade ago to expand its business in the world's largest economy. Abengoa's activity in this market is enormously diverse, ranging from bioenergy to the development of solar technology and many other fields relating to engineering and the environment. Some 31% of the company's assets today are in the United States.

## 1 Biofuels

Abengoa is a market leader in the United States in terms of producing and marketing bioethanol. In fact, Abengoa is the only company with a presence in the world's three top biofuel markets – the United States, Europe and Brazil.

Ethanol production reduces oil dependency by contributing to the diversification and security of energy supply, and significantly reduces fuel costs for consumers. Ethanol also reduces CO2 emissions, and thus plays a fundamental role in the battle against climate change. Ethanol production also contributes to higher values for farm crops, increasing income security for rural populations and helping to reduce the cost of farm subsidy programs.



Abengoa's biofuel operations in the United States include production, marketing and research. Abengoa has spent over \$500 million on R&D projects, on improving the efficiency of its current production processes and on developing bioethanol production technologies using cellulosic biomass (such as the stalks and leaves of plants) instead of food grains. This gives Abengoa a unique opportunity to be one of the largest grain-based ethanol companies and a pioneer in second-generation biofuel production in the United States.

The biomass-based projects that Abengoa carries out in the United States combine latest-generation ethanol plant technology with enzymatic hydrolysis and electricity production. The raw material used to produce the energy is agricultural residues – such as corn and milo waste (stalks, leaves and cobs) and wheat straw.

Abengoa's solid position in the North American market is underpinned by investments of more than \$1.4 billion in its six first generation starch ethanol plants -- York (NE), Portales (NM), Colwich (KS), Ravenna (NE), Mount Vernon (IN) and Granite City (IL), with a combined capacity of 380 Mgal / year -- together with its new cellulosic ethanol plant in Kansas which will produce an additional 25 million gallons of cellulosic ethanol and 21 MW of electricity annually. The new Kansas project has also been supported by a \$140 million cooperative investment by the US Department of Energy.



### 2 **Solar-thermal energy**

Abengoa is a world leader in harnessing and storing the power of the sun through concentrating solar power (CSP) technologies.

Abengoa recently completed the 280 MW Solana Generating Station in Arizona, the largest parabolic trough plant in the world. Abengoa's second plant is the 280 MW Mojave Solar plant in California, which is currently under construction.

Utilizing parabolic trough technology with a 6 hour thermal storage system, and a solar field of 3 square miles, Solana is able to supply 70,000 homes with clean energy, preventing 475,000 tons of CO<sub>2</sub> from entering the atmosphere and bringing in more than \$420 million in tax revenue over the next 30 years.

Mojave Solar will utilize parabolic trough technology with a solar field of 1,765 acres, supplying 54,000 homes with clean energy and eliminating 350,000 tons of CO<sub>2</sub>.

The construction of Solana and Mojave will create more than 3,000 direct jobs, giving a strong boost to their respective local economies.

Abengoa specifically devotes resources to research and development in solar energy. In the United States, 24 research staff are working with the National Renewable Energy Laboratory (NREL) and other top-class institutions and universities. This team involves some of the world's leading experts, including NREL employees at plants such as the one in the Mojave Desert.



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## **Water treatment**

Abengoa is recognized as an innovator in the private development of water-related infrastructure projects, offering a range of successful alternative project delivery models, such as public delegated services, public-private partnerships and turn-key design-build-finance-operations contracts.

The U.S. is the leading geography in terms of revenues for Abengoa, accounting for 26 percent of global revenues in 2012 and is also the company's fastest growing market. Abengoa has successfully designed and constructed over 200 water supply treatment and transmission infrastructure projects, including a total of over 317 MGD of desalination capacity.

Abengoa is a major player in the international water treatment and desalination market, with the capacity to desalinate more than 1.2 million cubic meters of water per day (equivalent to the amount consumed by six million people).



## 4 Other activities

A large part of Abengoa's business involves carrying out turnkey projects, for example bioethanol and solar thermal energy plants, in order to reduce greenhouse gas emissions.

In partnership with BrightSource Energy, Abengoa is building the 500 MW Palen solar thermal power system as the engineering, procurement and construction contractor, and will lead the operation and maintenance of the plant once online. Palen will provide reliable solar electricity to more than 200,000 homes, create more than 2,300 jobs for construction workers and support staff, and reduce CO<sub>2</sub> emissions by more than 17 million tons over its 30 year life cycle.

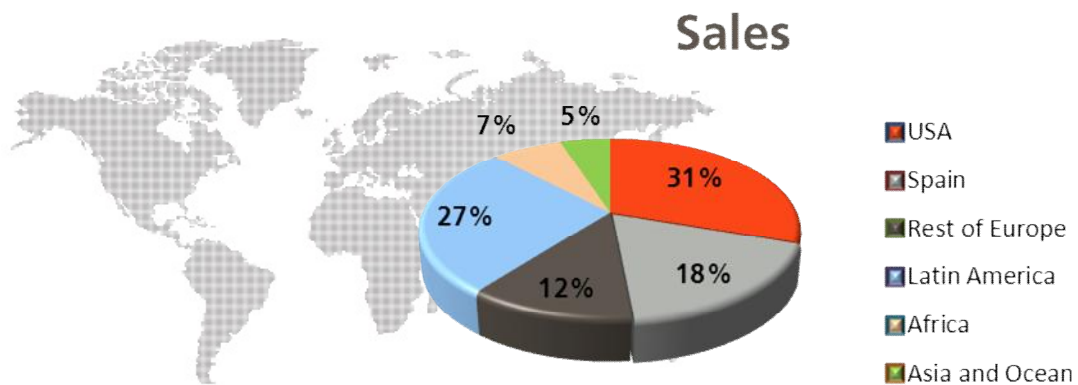
The company also hopes to become a key electricity transmission player in the North American lines market through its subsidiary in Denver, Abengoa T&D.

As part of its on-going commitment to the environment, Abengoa has an office in New York that is working on projects to reduce greenhouse gas emissions in voluntary markets. Abengoa is studying new opportunities in the context of the country's current and future regulations, both in terms of advisory services to help reduce greenhouse gas emissions and in mitigating and labeling such emissions.



## Abengoa: local partner, global reach

The internationalization of Abengoa is strengthening our commitment to offering innovative solutions for sustainable development with a local perspective, integrated in a global outlook.



Abengoa is committed to global expansion as a key aspect of its strategic plan. With a presence on five continents, our strategy is based on the following points:

- Become an international leader for promoting, constructing and operating innovative solutions for sustainable development.
- Provide customized solutions for all the sectors in which we operate.
- Guarantee efficient and responsible distribution and sales of our technologies and products around the world.
- Achieve leadership in technologies such as second generation biofuels or solar-thermal plants in order to supply a sustainable energy alternative to the planet.

## Summary of key projects in the US

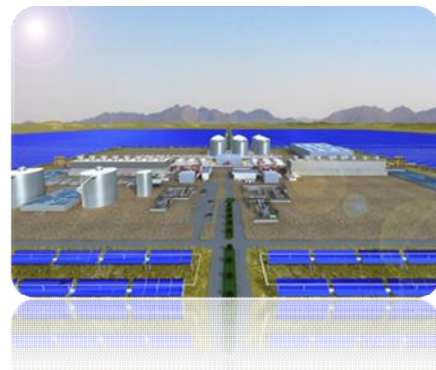
### **Hugoton: 2G bioethanol plant**

- ✓ Location: Hugoton, Kansas.
- ✓ Technology: cellulosic bioethanol from a mix of agricultural waste, wood waste and non-food energy crops.
- ✓ Capacity: 25 Mgal (95 ML).
- ✓ Operational by 1Q 2014.



### **Solana: 280 MW CSP Plant**

- ✓ Location: southwest of Phoenix, Arizona.
- ✓ Technology: CSP plant with six hours of storage capacity through molten salt technology, enabling it to match demand curve.
- ✓ Capacity: 280 MW (250 MW net).
- ✓ Construction started in 1Q 2011.
- ✓ Became operational in 4Q 2013.



### **Mojave: 280 MW CSP Plant**

- ✓ Location: Mojave Desert, northeast of Los Angeles, near Harper Dry Lake.
- ✓ Technology: CSP plant.
- ✓ Capacity: 280 MW (250 MW net).
- ✓ Finance: US\$ 1.6 million.
- ✓ Operational in 2014.

