06.2

Concession-type infrastructures

Abengoa boasts an impressive portfolio of proprietary assets under concession, all generating income through long-term sale agreements, guaranteed purchase agreements (take or pay) and power purchase agreements.

	2012	2011	2010	Chg. 12-11 (%)
Key figures - financial				
Revenue (€ M)	473	428	308	10.6 %
EBITDA (€ M)	307	298	208	3.0 %
EBITDA margin (%)	64.9	69.7	67.5	–6.8 %
Key figures - power transmission				
Km Constructed (km)	1,476	3,903	3,717	–62.18 %
Average availability factor (%)	99.40 %	99.50 %	99.10 %	–0.10 %
Key figures - solar				
Plants in operation (MW)	743	443	193	68 %
Plants under construction (MW)	910	1,060	930	–14 %
Production (MWh)	~990	~367	~160	~170 %
Key figures - desalination				
Installed capacity (ML)	675,000	375,000	315,000	80 %
Annual production (ML)	97,435	82,405	60,745	18.1 %
Key figures - cogeneration				
Installed electricity capacity (MWe)	70.56	70.56	70.56	0.00 %
Installed thermal capacity (MWt)	142.91	142.91	142.91	0.00 %
Annual electricity generation (MWh)	345,231.00	396,664.26	392,455.39	–12.97 %
Annual thermal power generation (MWh)	238,702.99	285,922.89	279,451.61	–16.51 %

Transmission lines

When compared with electrical systems as a whole (generation, transmission and distribution), power transmission infrastructures account for only a small percentage of total costs, both in terms of the initial investment and subsequent operation and maintenance costs. They are, however, a core element of the electricity system as a whole and promise much for the future.

Abengoa enjoys a strong international presence and a tried and tested track record in managing power transmission assets. It therefore has a bright future in store with huge growth opportunities to be had.

Abengoa's power transmission concessions are found in numerous countries, while the assets it manages are at different stages of maturity. At present, the company has 6,693 km of lines under concession spanning the length of Peru, Chile and Brazil. This year Abengoa has added 129 km to its project pipeline thanks to two new transmission line contracts awarded in Chile, which are already under construction, and a further 2,472 km owing to the three new power lines secured in Brazil.

Abengoa aims to cement its position of international leadership in power transmission concessions that contribute towards sustainable development. With this objective in mind, the company's power transmission division is chiefly engaged in the implementation and exploitation under concession of public and private electrical power transmission systems.

Abengoa's leadership as an international power transmission and distribution contractor affords it a major competitive edge in harnessing the wealth of opportunities to be had in power transmission concessions. This, coupled with its proven experience in line engineering and construction, has opened up huge opportunities in many different regions worldwide.

The main points underpinning Abengoa's strategy in power concessions are as follows:

- Maintaining its leadership in Latin America. The region remains critical to ongoing growth. Moreover, assets approaching maturity can be rotated, thus creating new investment opportunities.
- The United States remains a key objective given the obsolescence of existing transmission systems, the huge distance between power generation on the one hand and end consumption on the other, and the increasing presence of renewable energies within the energy mix.
- Asia. Due to the current shortage of much-needed electrical power infrastructures, the region is also an attractive target market.

In the first quarter of 2012, Abengoa reached an agreement with "Compañía Energética de Minas Gerais" (CEMIG), one of Brazil's leading electrical utilities, to sell 50 % of the joint venture, embracing four power transmission concessions relating to the STE, ATE I, ATE II and ATE III lines. Abengoa had already sold the first package of 50 % back in 2011 as part of the asset rotation strategy announced by the company, thus enabling it to make new investments to continue growing.

As part of this asset rotation strategy, the Chilean transmission lines (Abenor, Araucana and Huepil), in which Abengoa held a 20 % stake through Transam, were sold to the company Transelec Norte, S. A. at year-end.

Abengoa has a grand total of 6,693 km of transmission lines under concession, 1,476 km of which are already in operation in Brazil, Chile and Peru.

The following lines are also scheduled to enter into operation in the near future:

- In Brazil, the Manaus and Línea Verde lines, spanning a total of 586 and 987 km, respectively, ATE VIII covering 108 km, and Norte Brasil at 2,375 km.
- In Peru, the ATS line measuring 900 km and ATN2 at 132 km.
- In Chile, the two new lines spanning 129 km.

Detailed below are Abengoa's main concessions in the three countries where it operates:

Chile

Abengoa business remains strong in Chile and the company is a key player in the country's electricity market. The company expects to report sharp growth for the coming years based on its investments and market position.

Construction of a transmission tower (Chile)

Brazil

Abengoa remains heavily involved in the Brazilian power transmission market, with the following projects currently in operation:

- ATE IV: Aneel has awarded Abengoa a contract for the 30-year operation and maintenance under concession of the 85 km transmission line (TL) and four substations.
- ATE V: the company has secured a 30-year concession to operate and maintain the 132 km of 230 kV TL and substation.

- ATE VI: the contract envisages the 30-year operation and maintenance of the 230 kV TL and substation for Aneel. The transmission line spans a total of 131 km.
- ATE VII: the agreement involves the 30-year operation and maintenance under concession of the 230 kV TL and substation. The power transmission line is 115 km in length.

Peru

Abengoa continues to grow in the power transmission line market, with the following lines currently in operation:

- ATN: 220 kV high-voltage line and associated substations. The project embraces the design, supply and construction of the entire electricity system, plus operation and maintenance for a 30-year term. The project involves 570 km of 220 kV line, two new substations and upgrades to five existing substations.

Upcoming concessions

In 2012, construction work got under way on a direct current power line spanning 2,375 km in Brazil, while two transmission lines were awarded in Chile and construction continued on various lines in Peru.

Solar power

The enormous advantages offered by solar thermal power have driven the sector forward over recent years, with solar power currently providing a mature, profitable and efficient solution for power generation.

In this regard, the solar power market has continued to experience global growth over 2012, due in part to its expanding globalization and international expansion. Although certain countries with experience in the solar power market, such as Spain, have scaled down their growth plans, other countries with huge solar resource potential have taken up the mantle and are driving growth within the market. Countries such as South Africa, India, China and Saudi Arabia have been rolling out lofty plans to develop and promote renewable energies based on the concession of new projects and with specific capacity targets in place for both photovoltaic and solar thermal energy.

From a technological standpoint, rapid gains have been made in solar thermal power plants, with the aim invariably being to render them more efficient. The sector will therefore witness a gradual reduction in costs, allowing solar energy to compete in cost-terms with conventional power sources in the mid-term, while providing clean and safe generation. Thanks to these advances, solar energy is, and will continue to be, an optimal solution for power generation in both developed and emerging countries, while playing a central part in the energy mix of these countries.

Against this backdrop of fierce competition, Abengoa's technological innovation and flexibility in adapting to new regions allowed it, in 2012, to cement its position as an international benchmark within the solar power market.

Solar concessions at Abengoa are divided into the following lines of activity:

- Development of solar and hybrid power plants.
- Commercial operation of solar and hybrid power plants.

By constructing and commissioning new plants, ramping up its international presence in new markets and securing contracts in relation to new projects featuring groundbreaking technologies hitherto untested in a commercial environment, Abengoa has underscored its position of global leadership in the field of solar thermal power plants under concession.

Abengoa's solar business has power generation facilities and offices across the globe, covering a wide range of different regions:

- Europe: Spain and Italy.
- America: United States and Chile.
- Africa: Morocco, Algeria and South Africa.
- Asia: UAE, China and India.
- Oceania: Australia.

Solana

Although most of its plants are located in its two main markets, namely Spain and the United States, Abengoa is striving to expand internationally. Through this process of internationalization, Abengoa is not only spurring on the future growth of its concession-based solar power business, but is also diversifying its business, enabling it to reduce concentration risk, meaning the uncertainty associated with possible regulatory or market changes.

The company also focuses heavily on analyzing and developing potential new markets, working actively with local governments in preparing new development plans for solar power and offering them its many years of experience in plant development.

Moreover, our commitment to diversification and technological innovation means we can swiftly adapt to the conditions and requirements of new markets while offering bespoke solutions that optimize solar-based power generation in each region.

Abengoa's solar business continued to meet its targets over the course of 2012 while cementing its global leadership in installed solar technology capacity. Abengoa currently has 19 solar power plants in commercial operation.

All plants operating commercially (2 power tower plants, 4 parabolic trough plants, 5 photovoltaic plants and 1 hybrid plant) have reported high levels of efficiency, while actual production is exceeding the production levels estimated prior to construction. A total of seven new plants were also commissioned in 2012.

Looking ahead to 2013, Abengoa's solar business will focus its efforts on reaching a number of international milestones:

- Ongoing construction of its international projects in South Africa and the United States.
- Operational start-up of the Shams-1 plant in the United Arab Emirates and the Solana facility in the United States.
- Expanding the project pipeline by bidding on new business opportunities in emerging markets.

Solar power concessions at Abengoa are divided into the following lines of activity:

- Development of solar and hybrid power plants.
  This area includes activities such as prospecting ideal locations for solar plants, carrying out the necessary administrative formalities to proceed with construction, negotiating project financing and construction agreements and, when needed, identifying potential partners and reaching agreements with the same. These steps are invariably followed, whether in the case of solar plants that generate electricity, hybrid plants that harness sunlight along with a conventional energy source, or industrial plants that generate heat for commercial and industrial uses.
- Commercial operation:
  The solar power plants developed by Abengoa sell their electricity under long-term concession-based agreements. Optimal operation and maintenance of these plants is key to locking in or even enhancing the projected returns from the plants, while the company's experience in carrying out this crucial work enables it to make technological improvements to future plants. Moreover, the sheer number of commercial plants currently in operation has allowed Abengoa to harness synergies between the different facilities, thus increasing their operational efficiency further.

Solúcar platform

At year-end 2012, Abengoa had a total of 743 MW in operation and a further 910 MW under construction in different regions worldwide:

Spain

During 2012, the company gained further experience in operating the two main solar thermal technologies: power tower and parabolic trough.

In terms of power tower technology, we already have over five years of experience operating the PS10 plant, the world's first commercial plant, and more than three years operating the PS20, both located at the Solúcar Platform in Sanlúcar la Mayor, Seville (Spain). The PS10 facility generates clean energy to meet the needs of 5,500 households, thus helping to cut annual CO_2 emissions by 6,000 t, whereas the PS20 plant generates enough electricity to power 10,000 households while helping to slash annual CO_2 emissions by 12,000 t.

PS20

Shifting our attention to parabolic trough plants, 550 MW have entered commercial operation at a number of different solar platforms in Spain, with 11 plants now utilizing this technology. Each of these parabolic trough plants generates enough electricity to meet the yearly power needs of 26,000 households while helping to cut annual CO_2 emissions by 31,400 t.

One of the main advantages of the company operating and maintaining a large number of plants is that it helps to lower operation and maintenance costs due to the synergies, warehouse management and maintenance agreements with manufacturers, and training of highly skilled personnel. Furthermore, benchmarking can be conducted, thus helping to pinpoint things that can be improved on and develop optimal operating strategies.

At the Solúcar Platform, the first three parabolic trough plants to have been brought into commercial operation by Abengoa have been operating successfully since 2010. These facilities are providing considerable value-added, as operating them on a daily basis has proved to be a continual learning process and has generated a wealth of valuable experience that can be used when designing new plants and operating methods, and also when developing specific operational support components, thus confirming Abengoa's position of technological leadership within the sector.

In addition, Spain has a further four solar platforms featuring parabolic trough plants, three of them in collaboration with leading international partners: Eon, JGC and ITOCHU.

These plants are located at the Écija Solar Platform, with the first of its two plants operational since 2011 and the second since 2012, and at the El Carpio, Solar Extremadura and Solar Castilla-La Mancha Platforms, also operational since 2012. All these plants have been operating commercially for several months at least, reporting very promising results in terms of power output. The success of these new arrivals has been made possible thanks to the experience Abengoa has built up over the years.

Extremadura platform

Algeria

Algeria

Abengoa has been consolidating operations at the 150 MW Hassi R'Mel hybrid combined cycle facility with solar field in Algeria, which is celebrating its first year in commercial operation.

Upcoming concessions

Looking ahead to 2013, the Solana (Arizona, United States) and Shams-1 (located in the desert of Abu Dhabi) are expected to enter operation, with both to become part of Abengoa's infrastructure under concession line of business, illustrating once again the company's drive towards diversifying and internationalizing its business. In the coming years, the company intends to continue expanding its concession-based business internationally with the Mojave Solar project, in California, United States, and Khi Solar and Kaxu Solar in South Africa. All these plants are currently under construction.

Desalination

The world is facing a major challenge in terms of water, which is materializing on two fronts:

- Water shortage, which is reaching alarming levels and is exacerbated further by a lack of water treatment facilities.
- Industry consumes huge volumes of water and depends heavily on this resource to function smoothly, meaning water management is now critical for its ongoing survival.

The global economic crisis facing us now is making the situation even more complicated. The world needs major investments to upgrade existing facilities and develop new water infrastructures to help correct or mitigate existing water shortage and contamination problems. However, countries and governments lack the financial resources needed to tackle this problem effectively and in many cases we cannot wait any longer. This opens up a huge market opportunity for the private sector wishing to invest in water, as public-private partnerships can be used to construct the required water infrastructures with private capital, which are then operated under a concession agreement.

Abengoa is engaged in the promotion, development and operation of water treatment plants and seeks to consolidate its international leadership in the desalination plant business by managing company-owned assets and expanding water treatment and reuse business and industrial outsourcing.

Abengoa focuses primarily on the international stage and is present on four continents. 30 % of its employees can be found at its offices in Seville and Madrid, while 70 % work at company offices in the United States (Harlingen and Austin, Texas), China (Beijing and Dalian), the United Arab Emirates (Abu Dhabi) and at the offices of concessionaire companies and projects in Skikda, Tenes and Honaine (Algeria), Chennai (India), Qingdao (China) and Accra (Ghana).

Looking ahead to the future, Abengoa intends to center on concession-based wastewater treatment and regeneration plants for reuse, a market offering tremendous potential as water reuse will become an integral part of the solution to the water quantity and quality problems facing the planet.

The industrial water sector is another key future market, in which Abengoa strategy is to rely on a services-oriented business model, enabling industrial plants and factories to outsource their water operations (industrial outsourcing).

R&D investment in water treatment technologies is a key aspect of Abengoa's strategy. Over the course of 2012, Abengoa invested €5 M into a total of 30 different R&D+i projects so as not to lose grip of its technological leadership in desalination plants and to open up new business opportunities.

Abengoa business in the water desalination market is articulated through four divisions:

- Water treatment plants under concession: development and management of seawater and brackish water assets under concession.
- Operation and maintenance of desalination and wastewater plants.
- Water treatment solutions: design engineering, specification and EPC monitoring in desalination projects.
- Developing new technologies through the company's R&D department.

Algeria

Skikda: the Skikda desalination plant, with a capacity of 100,000 m³/day and in operation and maintenance since 2009, produced 100 million cubic meters of desalinated water in 2012.

Honaine: following provisional acceptance, the plant was brought on-line on July 12 and has continued production since then. The facility boasts a capacity of 200,000 m³/day and is currently Abengoa's largest desalination plant in operation.

Honaine, Algeria

Ténès. Abengoa has resumed construction of the Tenes desalination plant after various months of stoppage for reasons beyond the company's control. The plant will have a capacity of 200,000 m³/day. Operation and maintenance of the facility is scheduled for summer 2014.

View of the Ténès desalination plant, Algeria

India

The Chennai desalination plant, with a capacity of 100,000 m³/day, has been producing water since 2010 and is the first plant to have been developed in India under a project finance framework.

Spain

Production at the desalination plants in Almeria and Cartagena, with a capacity of 50,000 m³/day and 65,000 m³/day, respectively, is continuing to meet our expectations. The operation and maintenance period is 25 years for the former and 15 for the latter.

Desalination plant in Cartagena

Ghana

In November 2012, Abengoa started construction of the Nungua desalination plant in Ghana. The desalination plant will require an investment of $125 M and will have a desalination capacity of 60,000 m³/day. Work is expected to last approximately 24 months, during which time roughly 400 direct and indirect jobs will be created.

China

In March, we were invited to take part in the official ceremony organized by the Dalian local authorities to celebrate the laying of the cornerstone of what is set to become one of China's largest industrial hubs, to be constructed at the new petrochemical park on Xizhong island. Abengoa, signed a collaboration agreement to construct water treatment plants to supply local industry.

In May, Abengoa signed a memorandum of understanding (MoU) in Madrid with the Qingdao authorities, to sign a bilateral agreement to collaborate on wastewater regeneration and reuse projects.

United States

In the United States, Abengoa has been awarded the feasibility and preliminary engineering study for a drinking water nanofiltration plant.

Abengoa Water has also signed an agreement to develop solutions for the treatment and reuse of water used in the shale gas extraction process.

Abengoa also gave an address before the Natural Resources Committee of the Texas House of Representatives, highlighting its leadership in the Texas desalination market.

Cogeneration and other concessions

The cogeneration market in Spain is facing a difficult situation, due firstly to a slow-down in business over recent years and secondly to the enactment of the new energy reforms, which will most likely cause the market to shrink further. That said, Europe as a whole and Latin America are becoming increasingly aware of the value of efficient technologies capable of generating significant cost savings and boosting industrial competitiveness, a must in these times of crisis. Abengoa therefore expects to see large-scale development of cogeneration facilities in these regions over the coming years, especially in terms of large cogeneration facilities attached to refineries or chemical plants (heavy energy consumers).

At present, Abengoa has cogeneration plants in Spain and Mexico with an installed capacity of 400 MW, with the optimal management of these assets becoming the main mission of this business line. We might define Abengoa's vision in this area as setting itself up as an international benchmark in managing concession-based cogeneration plants safely, reliably and efficiently.

Cogeneration generates electricity and high-temperature heat simultaneously, both of which are used in industrial processes; an energy-efficient solution being spearheaded by Abengoa. Heat and electricity are therefore generated from biomass, natural gas or industrial waste for subsequent use in industrial processes, with the surplus sold to the grid.

São Luiz cogeneration plant in Pirassununga, Brazil

Abengoa has also been active in the wind power market by constructing and operating numerous wind farms in Uruguay and Brazil.

The company is also involved in concession-based custom construction projects, such as hospitals, courthouses and cultural centers.

Abengoa operates the following installations:

- Cogeneración Villaricos, S. A. (Covisa), Enernova Ayamonte, S. A. (Enernova) and Aprovechamientos Energéticos Furesa, S. A. (Aprofursa). These companies generate electrical power while using the heat to produce water or steam. The electricity is then sold, while the heat is used by the host industry.
- Procesos Ecológicos Vilches: company specializing in the recycling of livestock waste to produce fertilizer and electrical power through a purine treatment plant (pig waste, mixed excrement, urine, water, leftover animal feed and other foreign bodies), combined with an electrical power cogeneration plant.
- The Centro Cultural Mexiquense de Oriente (CCMO) cultural center, Abengoa's first concession in Mexico. The complex, with an operational term of 20 years, sits on 17 ha of land and boasts 35,000 m² of museums, libraries, workshop modules with over 60 classrooms intended for a range of different art-related subjects, an administrative building, auditoriums, an open-air theater, a concert hall with seating for 1,200 people, a cafeteria, a restaurant and parking spaces for over 1,000 vehicles.
- Irrigation zone of the Navarra Canal. The intention with this concession is to recover investment by levying an irrigation charge.
- Cerrato hydroelectric power plant on the Pisuerga river and mini-stations along the Canal de Aragón y Cataluña irrigation canal. Toe-of-dam, run-of-river and diversion plants in northern Spain. Investment here is recovered by selling the electricity generated by the plants.
- Hospital Costa del Sol (Malaga): the contract envisages the 40-year operation of the hospital building and underground parking lot. The hospital building has a floor area of 31,200 m², while the parking lot occupies 25,500 m² (960 spaces).
- Hospital del Tajo (Aranjuez, Madrid): the contract envisions the exploitation (management and maintenance) of the hospital for a 30-year term. Gross surface area amounts to 58,000 m².
- Court buildings: Abengoa owns surface rights to construct and maintain the courthouses at Olot, Cerdanyola and Santa Coloma de Gramanet, and to operate the buildings through a lease with the regional government of Catalonia.

Upcoming concessions

In 2012, construction got under way on the El Zapotillo aqueduct (Mexico), the Peralta wind farm (Uruguay) and three wind farms in Brazil.

Construction of the cogeneration plant in Tabasco (Mexico)