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## Wind energy

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### Wind energy

The Costa Rican Nordteco with technology and services supporting the development of wind energy projects in Latin America

Luis Diego Quiros, Editor



Tejona power plant was installed the first wind farm in Costa Rica. It has a capacity of 20 MW, enough energy to supply over 13,000 homes.

#### POTENTIAL CLEAN

If Don Quixote looked toward the horizon of mountains Guanacaste, Costa Rica in the North Pacific, be prepared for a tough battle against the giant metal brandishing their swords to the beat of the breeze. The Spanish gentleman would have an uphill battle against the huge structures that exceed forty feet high and providing electricity to thousands of Costa Rican families through the wind to move their blades.

These wind turbine towers in recent years are part of the electrical system in Costa Rica. As part of the search for new energy options, state-run Costa Rican Electricity Institute (ICE) have discovered a huge potential in wind power to generate electricity, especially in the intermountain steps of the Cordillera de Guanacaste.

In Costa Rica, the wind speed and intensity is higher in the dry season (December to April); period when the rains diminish considerably in most of the territory. During this time of year, wind energy is an ideal complement to hydro power (based on the flow of rivers and reservoirs). Along with other renewables (geothermal, solar and biomass), makes up 93% of the total system.

The country has an installed capacity of wind power in operation of 91 megawatts (mw) in the coming weeks and another 25 mw will begin commercial operation. "At the end of this year, the installed wind generation capacity in the country is 5% of the total capacity of the National Electric System (SEN)," explains Gilbert de la Cruz, Director of Planning Electrical ice. That number is enough to supply energy to 80,000 homes.

- In late 2007, worldwide capacity of wind generators was 94.1 gigawatts (GW), about 1% of global electricity consumption. This represents about 19% of electricity production in Denmark, 9% in Spain and Portugal, and 6% in Germany and Ireland.
- It is an abundant resource, renewable and clean, which helps reduce emissions of greenhouse gases, by replacing coal plants that run on fossil fuels.
- The development of wind energy in Latin America just taking its first steps, with an installed capacity of about 600 mw, according to the Latin American Wind Energy Association (LAWEA, by its initials in English). In Central America and the Caribbean is estimated that there is a potential to produce approximately 100,000 mw.
- The main producers of wind power in the region are Brazil (256 mw), Costa Rica (116 mw), Mexico (88 MW), Nicaragua (40 mw), Argentina (27 mw), Chile (20 mw) and Colombia ( 20 mw).

One of the entrepreneurs who observed that potential and took advantage is Jan Borchgrevink, Nordteco who founded the company in 1993. "Our task is to provide goods and services to developers of wind projects, and advice at all stages, from site assessment to maintenance and operation of the completed project," said Borchgrevink, ceo of Nordteco.

The Norwegian executive, with over forty years of living in Costa Rica, started in the business of wind while working as business consultant for Scandinavian companies that were making inroads into Central America. Gradually his contacts with some key sector firms in Denmark and Holland provided him the experience necessary to obtain in 1999 the award of a contract with the ice for the construction and operation of Windfarm Tejon, on a nearby hill to the lake Arenal, Costa Rica in the North Pacific. In this pioneering plant, the turbines provided Nordteco, leased and operated facilities and maintenance were given for five years. After that period, the ice executes the purchase and the assets became their property. "Tejona developed when the price of wind power began to be competitive and showed that the project was technically, economically and environmentally feasible," complements De la Cruz.

The company has several international representations of towers, equipment and weather stations from companies like NRG Systems, 3TIER and Southwest Windpower (USA), Global Wind Power and Windbrokers (Netherlands), Carmanah Technologies Corporation and Pro-Bel (Canada), WindSim (Norway) and Sky Man (Belgium).

His experience with Tejona and its relationship with international suppliers opened the doors for more projects, not only in Costa Rican soil, but also in other countries in the region. While the firm employs only fourteen people, has operations throughout the isthmus, Mexico, Dominican Republic, Colombia and soon in Chile, Argentina and Brazil. It also advises potential developers in the pre-investment stage, as a first step in establishing the potential for wind farm somewhere like. For this work supplies and installs towers anemometry, especially for measuring wind speed and intensity. It also participates in strategy development as well as the *matchmaking* with investors, financial entities and suppliers. Also offers consultancy for the marketing of Certified Emission Reduction of greenhouse gases (CERs) systems under the Clean Development Mechanism (CDM) under Kyoto Protocol, can be used by operators of wind projects.

Nordteco not make the investment, but is responsible for providing certain services and equipment that is operating more as an integrator. Overall, a wind farm requires an investment of \$ 2,000,000 per MW, a figure that indicates the need for long-term contracts with previously established rates, which can roam between \$ 0.08 and \$ 0.12 per kilowatt - hour. These prices are well below the electricity produced by a thermal plant, which reaches up to \$ 0.50 per kilowatt hour.

The issue of fees is the Achilles heel of this sector. In Costa Rica and Latin America, one of the main problems is the uncertainty and lack of adequate laws on the topic. "Some countries like Mexico, Brazil and Chile have laws to encourage the development of such energy. However, it has had the desired effect, because some were not strong incentives to assure investors the rate necessary for profitable investment. For example, in the Costa Rican Congress is investigating a new electricity law that would change the game. Investors are preparing their projects, but also analyzes the market signals," says ceo.

While Costa Rica has been one of the pioneers of this industry, have been managed prudently penetration levels in the national electricity system. In 2004, as part of the Tejon, Nordteco conducted a study that showed that it can handle levels up to 10% penetration, and this motivated the ice recruit new projects with the Law of Private Cogeneration. The country has Tejona projects (20 MW), Pesa (20 mw), Aeroenergía (6 mw), Movasa (20 mw) and Guanacaste (50 mw by the end of year). Ice estimates indicate that commercially exploitable wind potential on Costa Rican soil is 600 mw.

Jan Borchgrevink was recently elected president of the Latin American Wind Energy Association (LAWEA, by its initials in English), founded just over two years to act as agent of change and support for companies operating in the sector. Part of the plans of the novel's leading organization promoting and give it the resources to act in front of education, advocacy and outreach. LAWEA also expected to be an agent of support in formulating energy policy and legislation in Latin America.

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