

Spanish island to be fully powered by wind, water

April 28 2014, by Katell Abiven



Wind turbines are pictured near the upper reservoir of the Gorona power station on El Hierro island on March 28, 2014

The smallest and least known of Spain's Canary Islands, El Hierro, is making a splash by becoming the first island in the world fully energy self-sufficient through combined water and wind power.

A wind farm opening at the end of June will turn into [electricity](#) the

gusts that rake the steep cliffs and green mountains of the volcanic island off the Atlantic coast of Africa.

Its five turbines installed at the northeastern tip of El Hierro near the capital Valverde will have a total output of 11.5 megawatts—more than enough power to meet the demand of the island's roughly 10,000 residents and its energy-hungry water desalination plants.

Although other [islands](#) around the world are powered by solar or wind energy, experts say El Hierro is the first to secure a constant supply of electricity by combining wind and water power and with no connection to any outside electricity network.

Surplus power from the wind turbines will be used to pump fresh water from a reservoir near the harbour to a larger one at volcanic crater located about 700 metres (2,300 feet) above sea level.

When there is little or no wind, the water will be channelled down to the lower reservoir through turbines to generate electricity in turn.

"This system guarantees us a supply of electricity," said the director of the Gorona del Viento [wind power plant](#), Juan Manuel Quintero who is supervising final tests before the plant starts functioning in a few weeks.

The plant will account for 50 percent of the island's electricity demand when it is officially inaugurated at the end of June, a figure that will rise to 100 percent over the following months.

The scheme will cut [carbon dioxide emissions](#) by 18,700 tonnes per year and eliminate the island's annual consumption of 40,000 barrels of oil.

El Hierro will maintain its fuel oil power station as a back up, just in case.



The lower reservoir and hydropower station at the Gorona power station on El Hierro island on March 28, 2014

'World pioneer'

The island is cited as a pioneering project by IRENA, the international organisation for [renewable energy](#), and other experts such as Alain Gioda, a climate historian at France IRD science research institute.

"The true novelty of El Hierro is that technicians have managed, without being connected to any national network, to guarantee a stable production of electricity, that comes 100 percent from renewable energy, overcoming the intermittent nature of the wind," he said.

El Hierro's wind power plant has sparked interest from other islands seeking to follow its example.

Officials from Aruba, Hawaii, Samsø in Denmark, Oki in Japan, and

Indonesia have all shown interest.



A recharging point for electric vehicles at the Gorona power station on El Hierro island on March 28, 2014

"It is a project which is considered at the world level as a pioneer and it is one of the most important in the production of renewable energy," said the president of island's local council, Alpidio Armas.

"El Hierro can be a sort of laboratory," he added, providing an example to other islands around the world which are home to around 600 million

people.

El Hierro, the westernmost of Spain's Canary Islands, has also been invited to present its project at several international conferences, including in Malta and South Korea.



Employees work in the pump room at the Gorona power station on El Hierro island on March 28, 2014

Electric vehicles

El Hierro wants to extend its environmental credentials even further by ensuring that by 2020 all of its 6,000 vehicles are run on electricity thanks to an agreement with the Renault-Nissan alliance.

The [wind power](#) plant cost 80 million euros (\$110 million) to build.

The island authorities own 60 percent of the plant, with 30 percent held by Spanish energy company Endesa—a subsidiary of Italian group Enel—and 10 percent by a local technology institute.



A Turbogenerator set (L) and a lubrication (blue) at the Gorona power station on El Hierro island on March 28, 2014

"We wanted to be the owners of the majority of the plant. That means that the profits as well as the possible losses, that is the destiny of Gorona del Viento, is the responsibility of the residents of the island," said Armas.

Revenues from the plant will boost the island's budget by about one to three million euros per year, he said.

"These are revenues that can go to the local residents, to subsidise water prices, infrastructure, social policies," he said.

El Hierro, designated by UNESCO as a Biosphere Reserve with 60 percent of its territory of 278 square kilometres (107 square miles) protected to preserve its natural diversity, also hopes its green energy drive will draw visitors interested in nature and science.

"We cannot turn down the benefits that tourism brings, but we don't want mass tourism," said Armas.

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