EL HIERRO WIND-PUMPED HYDRO POWER STATION

Island self-sufficient in water and energy

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1. Who we are?

2. What have we done?

3. What can we contribute?

4. How can we work together?

Fortunate Islands







El Hierro, the smallest of the Canary Islands

Outermost region and double insularity.

Total external energy Dependence

278 Km2. 10.000 inhabitants.

Electric load (2014): 38.688 MWh/y

Socioeconomic conditions



Wind-Pumped Hydro Power Station

Socio-economic benefits





Canary Islands





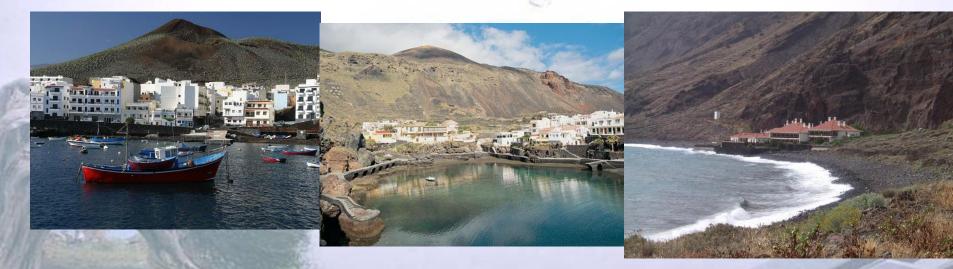


El Hierro





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World Biosphere Reserve (since 2000)



Sustainable Development Program (1997)



2. What have we done?

Sustainability Plan





- Agriculture, Livestock and Fisheries.
- Job creation.
- Waste management.
- Trade and Industry.
- Sustainability Laboratory.
- El Hierro 100% RES.





WATER

CONNECTION

ENERGY

El Hierro 100% RES.





700 million people lack access to safe drinking water 45%



3. What can we contribute? Island Strategy for Energy Self-Sufficiency.



Gorona del Viento El Hierro, S.A.









Gobierno de Canarias

The Wind-Pumped Hydro Power Station An innovative Project for island's energy self-efficiency

DEPOSITO SUPERIOR

GASETA DE VALVULAS

PARQUE EOLICO

VALVERDE

TUBERIAS FORZADAS

DEPOSITO INFERIOR

CENTRAL DE BOMBEO

CENTRAL HIDROELECTRICA

PUERTO DE LA ESTACA

CENTRAL DIESEL

Wind Farm



Potencia del parque : 11,5 MW



Upper Reservoir





Lower Reservoir





Hydraulic Station



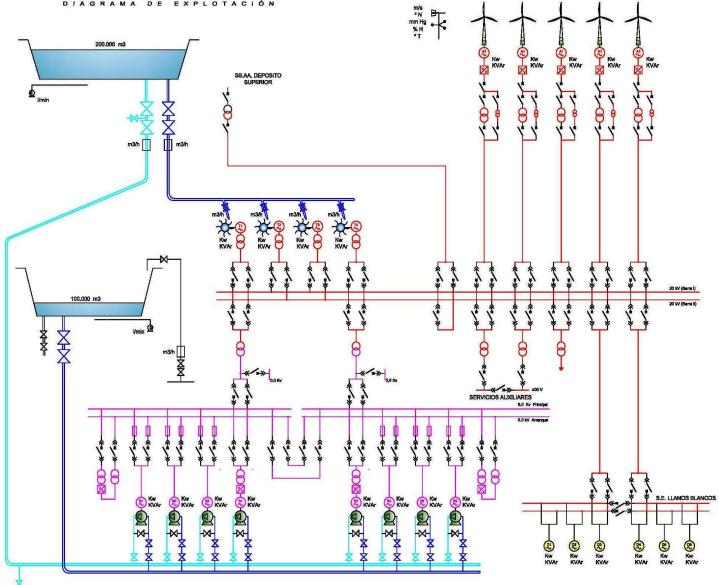


Pump Station





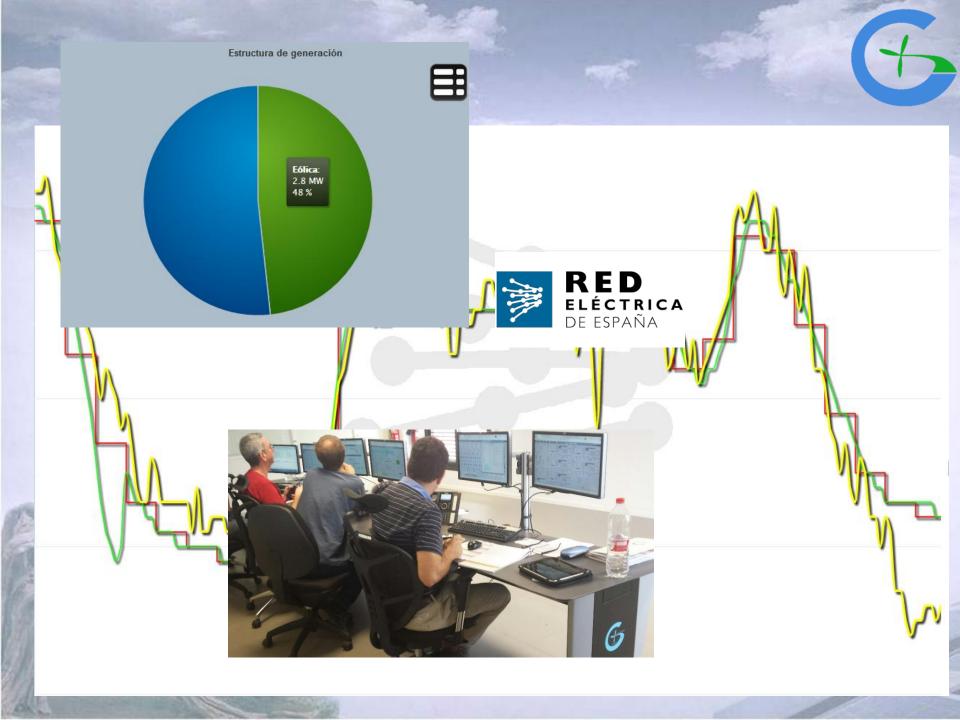
DIAGRAMA DE EXPLOTACIÓN



m/s

PROJECT REQUIREMENTS

- Small electrical grid with greater stability risk. Need to scale the facilities in order to guarantee running stability and security.
- Need to develop a reliable wind prediction system to harness this highly variable resource.
- Need to integrate different types of wind-hydraulicdiesel generation and to develop innovating management and control systems. In prolonged low wind conditions or during serious breakdowns of the hydro-wind system, need for emergency diesel generators.
- Additional investment is necessary for the construction of storage and pipeline depots.





Operating Outline

Objectives

To Obtain Environmental Benefits and Reduced External Dependence



Operating Outline

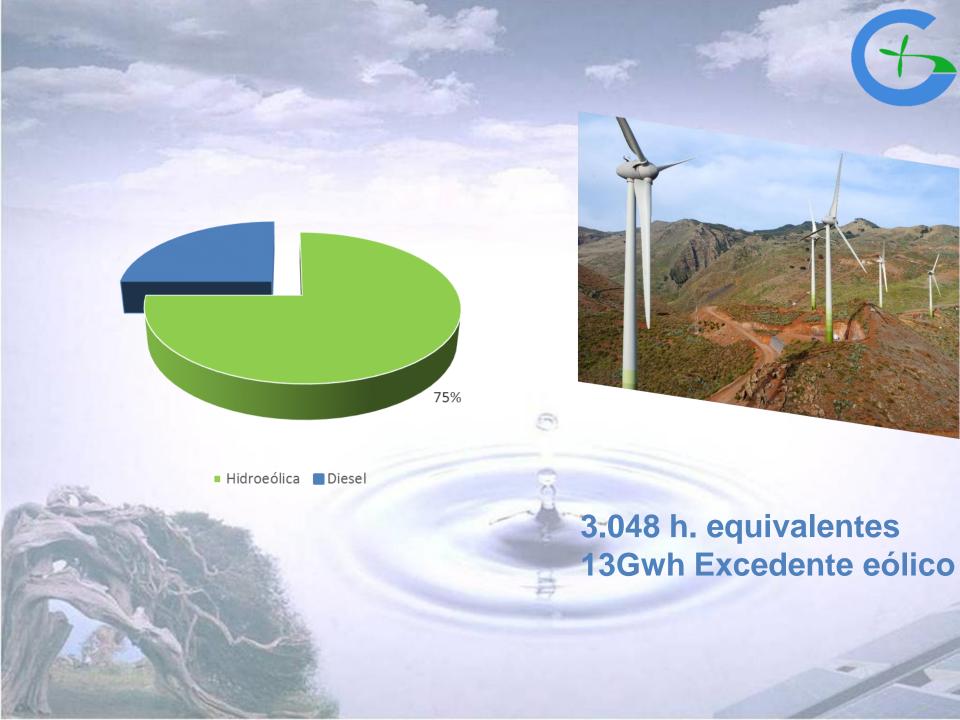
Objectives

To supply the island with power and water



PROJECT STRENGTHS

- Electricity and water self-sufficiency on the island. Reduction of power vulnerability.
- Power generation with greater dependency on renewable energy sources. Greater implementation of wind power.
- Reduction of CO2 and contaminant emissions.
- Use of facilities to dispose of elevated water resources (supply, irrigation, fire extinguishment).
- Reduction of costs with respect to diesel generation on El Hierro.





FUTURE

STORED WATER AT HIGH ALTITUDES



11-



El Hierro, the perfect setting. A project that can be extrapolated to other territories

7

64

other opportunities



International presence

Turism

Training

NOW...



Scientific tourism



Training

Avanza el proyecto "El Hierro, 100% energías renovables"

Media broadcast

neNational



DW-WORLD.DE

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4. How can we work together?

OBRIGADO

THANK YOU VERY MUCH



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