

La Graciosa RES microgrid

A project combining renewable energy (RES) and fossil fuel reduction

A Covenant of Mayors 2016 Case Study

In a nutshell

La Graciosa RES microgrid aims to offer energy autonomy by maximizing the penetration of RES and minimizing the needs for fossil fuels.

Background

The island of La Graciosa falls within the Cabildo (insular authority) of Lanzarote. With the assistance of the Canary Islands Institute of Technology (ITC), Lanzarote submitted a SEAP back in 2012 in the context of the Pact of Islands, committing to reach or exceed the CO₂ emission reduction target set by the EU to 20% by 2020.

La Graciosa's microgrid RES project is a renewable energy action that has ample potential to be replicated within island territories as well as inspire the development of such actions within island SECAPs.

Islands as ideal innovation test-beds

In La Graciosa electricity is supplied from Lanzarote through a submarine cable, installed in 1985. The objective of the proposed microgrid project is to optimally design an electric system that can offer energy autonomy to the island by maximizing the penetration of RES and minimizing the needs for fossil fuels to satisfy the electricity demand from households, productive activities and public services on the island. The proposed microgrid will include a photovoltaic system, low power wind turbines and a Li-ion battery for energy storage.

At an estimated cost of €2.5 million, an engineering project is being elaborated, which includes the installation of a 500 kWh capacity battery. Additional public funding from the Island and the Regional Government of the Canary Islands will be made available to subsidize the installation of PV. Most of the OPV systems would be installed in rooftops of the 350 existing house

La Graciosa in numbers

Number of inhabitants: 658 inhabitants

CO₂ reduction target: 20% by 2020, baseline 2001

Covenant of Mayor Signatories in the region: 9

buildings, and the objective is to achieve the installation of 1,500 kWp of PV. This power, operating at 1,700 hours, would produce the equivalent energy consumed by the island of La Graciosa in the yearly balance.

A consortium made of ITC, two Canary Islands Universities (ULL – ULPGC) and ENDESA, the local DSO and owner of the distribution grid is implementing the project through an R&D program financed by the Spanish Central Government. The island authority of Lanzarote provides funding for subvention of PV to be installed in La Graciosa, while the Regional Government of the Canary Islands will also launch a parallel subvention programme for PV in La Graciosa.

The island of La Graciosa emerges as a perfect test bed for new distributed generation solutions. Given its relative small size and its high RES potential, a realistic project for a microgrid to supply all the electricity demand, is feasible. The battery to be installed, in combination with solar and demand mathematical forecasting models, and implementation of Demand Response and Demand Management, a global approach for obtaining 100% RES island will be tested.

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