

## Ecological footprint in a reverse osmosis seawater desalination plant. Case study: Canary Islands

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### ABSTRACT

The case study of the Canary Islands (Spain) considered in this paper involves the historical problem of resolving the demand for freshwater. After many years, the focus in the islands turned towards seawater desalination processes to provide safe water for, above all, its citizens, agriculture, and tourism. Due to the high demand for freshwater, the Canary Islands have been a world pioneer in desalination issues, improving the techniques and materials used. While several desalination technologies are available, today the most used worldwide is reverse osmosis. The major drawback of desalination is the high energy cost that the process requires. To this can be added the peculiarities of the electricity generation system in the Canary Islands, which generates more emissions per unit of energy produced compared with the system in mainland Spain. In this study, we selected a desalination plant located on the island of Tenerife, specifically in the municipality of Granadilla de Abona and, after determining its technical characteristics, calculated its ecological footprint. For this, we performed various calculations, including the carbon fixing capacity of forests in the Canary Islands (expressed per hectare) and the total amount of emissions produced in the generation of energy to feed the desalination plant.

*Keywords:* Ecological footprint; Carbon footprint; Reverse osmosis; Desalination

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