

Desalination for the Environment: Clean Water and Energy
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Dakhla desalination plant using renewable energy

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A B S T R A C T

This paper concerns the project of desalination in the Dakhla region in the south of Morocco. The project involves the construction of a seawater desalination complex that comprises four categories of components: (1) an industrial seawater desalination unit with a production capacity of 113,376 m³/d of desalinated water intended for irrigation and potable water, located on the southern slope of the Skiyamate estuarine Guelta, above the upper submergence level of this Guelta, 130 km north of Dakhla; (2) a wind farm (PE) to supply energy to the plant and its annexes, as well as to the irrigation facilities; (3) water distribution networks (irrigation and drinking water) and electrical power; (4) an irrigated perimeter of 5,000 ha. The Dakhla seawater desalination complex project comprises several components: (1) a desalination plant comprising a seawater collection and pumping basin, a seawater desalination plant (building with internal equipment), two desalinated water storage tanks for agricultural use (2 × 87,000 m³), and two desalinated water storage tanks for drinking water requirements (2 × 2,500 m³); (2) two underwater and underground pipelines: one to convey oceanic water from the open-sea intake to the plant, and the other to transport the brine from desalination operations; (3) an underground land pipeline between the seawater collection and pumping basin and the desalination plant; (4) a small-scale wind farm (12 wind turbines, 60 MW), which will serve as a source of energy for the project, with the surplus delivered to the ONEE; (5) a transformer station to supply power to a local grid; (6) a network of underground power cables between the turbines and the substation; (7) two overhead power cables,

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one between the substation and the plant, and the other between the substation and the ONEE network; (8) a network of access tracks and roads to the various project components. This project is supported by an agreement called the Public-Private Partnership (PPP) between the Ministry of Agriculture and the Nareva-Engie group. The project is under construction.

Keywords: desalination; irrigation; renewable energy; potable water supply
