

Green light for Iberdrola's new reversible pumped-storage hydroelectric power plant in Alcántara (Spain)

- *Pumped-storage power plants are known as gigabatteries.*
- *The Spanish Ministry for Ecological Transition and the Demographic Challenge has issued a favourable EIS for the project.*
- *It will enable reversible energy storage of 16 million kWh equivalent to the average daily consumption of 4 million people.*
- *The project, making use of existing facilities, will optimise the management of water resources without affecting other users of the Tagus River.*
- *It also has a grant of 44.9 million euros from IDAE as an 'innovative project'.*

The project for the construction of the new Alcántara II reversible hydroelectric pumping station, located in Alcántara (Extremadura, in southwest Spain), has obtained a favourable Environmental Impact Statement (EIS), according to a resolution of the Ministry for Ecological Transition and the Demographic Challenge.

As a result, the project has a favourable EIS and a permit for access to the grid, and is awaiting the next issuance of the prior administrative authorisation.

This reversible pumped-storage power plant will have an installed capacity of 440 MW, allowing reversible energy storage of 16 million kWh, equivalent to the average daily consumption of more than 4 million people, and providing a firmness to the electricity system of up to 37 hours with the machines at full load.

This plant will be able to generate more than 1,000 additional GWh per year using the same water resources as before, thereby avoiding the emission of an estimated 355,000 tonnes of CO₂ per year and contributing to the decarbonisation of the electricity system through greater integration of non-manageable renewable energies, solar and wind, providing the electricity system with greater capacity for adaptation and response.

With regard to its design, the plant will use the reservoirs created by the existing dams, taking into account the important environmental and heritage conditions of the surroundings, so that all the hydraulic circuits have been designed underground, including the power plant, which has been designed in a shaft.

The new plant will connect the lower reservoir of Cedillo and the upper reservoir of Alcántara by means of a double underground hydraulic circuit 0.9 km long and will take advantage of the difference in level between the reservoirs of up to 108 m by means of two reversible turbines with a capacity of 220 MW. This 'reversible' plant will improve the management and use of the existing hydroelectric system on the Tagus river, generating zero impact on the remaining users of the Tagus river, since in addition to making 'non-consumptive' use of the water resources of

both reservoirs, as is already the case in all hydroelectric plants, it will reuse the same water in its operation.

Pumped hydro: the most efficient large-scale storage system

These 'reversible' or pumped-storage plants have two reservoirs that operate as a 'closed loop'. The upper reservoir acts as a 'giant battery' storing potential energy in the form of water that is turbined to the lower reservoir to generate electricity when the system requires it. Once turbined, this water, now contained in the lower reservoir (lower reservoir), is pumped during off-peak hours to the higher reservoir (upper reservoir) following the same route, but in the opposite direction, operating as a closed loop.

Today, pumped hydro is the most efficient large-scale storage system available. It allows the storage of surplus energy from unmanageable renewable energy sources, solar and wind, to be delivered at the times when it is most needed, providing stability to the electricity system, as it can generate significant amounts of clean energy with a very fast response time.

In reference to the environmental aspects of the project, the set of measures adopted to protect birdlife, terrestrial fauna, aquatic fauna and local flora stand out, having established a set of measures with cross-border scope to improve biodiversity, or the use of recycled materials promoting the circular economy.

Innovative storage project for the IDAE

The project was awarded 44.9 million euros last July by the Institute for Energy Diversification and Saving (IDAE) for being considered 'the best proposal in terms of economic viability and technical characteristics enabling the integration of renewables', having obtained the maximum aid per installed capacity and the highest total score in the framework of the Recovery, Transformation and Resilience Plan - financed by the European Union - Next GenerationEU.