

Desalination and Water Storage Modelling in H2RES Energy Planning Model

ABSTRACT

A flexible desalination and water storage modules was developed for H2RES capable of incorporating various possibilities for both storage units as well as the desalination model itself.

The modules are able to simulate the behavior of closed as well as open reservoirs both artificial and natural occurring such as lakes. It is also able to incorporate the effects of water hourly temperature variations on the desalination process itself which enables the module of better predictions especially if the module is used in simulations for regions with significant temperature variations throughout the year.

The modules energy consumption and generation is controlled mainly by H2RES to ensure an efficient utilization of the modules within the power and water full grid, the main constraint being the effective coverage of fresh water demand. Other constraints will be the maximum and minimum allowed storage(s), fresh water production allowable limits, and other natural limits such as natural inflows and outflows for open storages like rivers, evaporation, and precipitation.

The development of the modules was done using Matlab and the results for various case studies showed good agreement with Energy Plan results