



## Process of desalination of low energy consumption and high compatibility with the use of renewable energies

Pedro Peñas Ballester<sup>1</sup>, Francisco Javier Abad Garrido<sup>1</sup>

<sup>1</sup> Electrical Engineer

Phone/Fax number:+0034 652880706, e-mail: [pedro.penasb@ieec.org](mailto:pedro.penasb@ieec.org), [fj.abad.garrido@gmail.com](mailto:fj.abad.garrido@gmail.com)

**Abstract.** This document shows the theoretical justification of a new process of desalination with lower energy consumption than reverse osmosis and with a high compatibility for its use with the renewable energies.

The new desalination process involves the use of electro dialysis concepts regarding the use of charged- ion selective membranes to create differentiated cells of concentrated salt water and diluted or desalinated water. However, the concept of transporting ions changes; in this case, with respect to electro dialysis, since in order to transport the ions, it is used the second term of Lorentz equation instead the first term. In the first term, there is an electric field, which is used by conventional electro dialysis; whereas, in the second term, there is the joint action of a magnetic field together with the velocity of the fluid to cause the motion of electric charges according to their signs. The use of a magnetic field instead of the use of an electric field can be an advantage when trying to solve the electro-neutrality of the cells of the edges without having to turn to the use of redox reactions.

This process of desalination works from two main parameters.

- One permanent magnetic dipole. Therefore the energy of this magnetic field remains inalterable throughout the time.
- The electric charge speed, on the desalted water, versus the magnetic field of the magnetic dipole. This speed does not have to be high.

**Key words.** Desalination, magnetic, field, electrohydrodynamic, membranes.

- A new way for MHD industrial applications has been opened. The future development of this concept can get advantages in agriculture and potable water.

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