STAND-ALONE SYSTEM FOR THE PURIFICATION OF BRACKISH WATER DIRECTLY POWERED BY PHOTOVOLTAIC SOLAR ENERGY

PATENTED TECHNOLOGY

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ABSTRACT

The Applied Electrochemical and Electrocatalysis Group (LEQA) at the University of Alicante has developed an Stand-alone system for the desalination and disinfection of water by Electrodialysis (ED) and the necessary water pre- and post-conditioning steps. The developed system is sustainable and environmentally-friendly being directly powered by a photovoltaic solar plant without using battery racks.

This new system substantially decreases both the investment and maintenance costs by eliminating the batteries. Also, it can be adjusted to be used in water from very different sources like seawater, brackish water wells, wastewater treatment plants, industrial processes water, etc. being of particular interest for remote areas isolated from the electric grid.

The Research Group has a demonstration Pilot Plant with the capacity to produce up to $1m^3$ of drinking water per day. The Group is looking for companies interested in the commercial exploitation of this technology through licensing agreements and/or technical cooperation.

ADVANTAGES AND INNOVATIVE ASPECTS

The new system:

- Allows the autonomous desalination, disinfection and purification of water in remote locations isolated from the mains.
- Is sustainable and environmentally friendly. The process is free of CO2 emissions and does not contribute to climate change.
- Substantially reduces the investment cost and the amortization of these systems by eliminating the high cost of batteries, regulators and inverters.
- Reduces maintenance time and costs by avoiding the use of batteries. Also avoids economic and environmental costs associated with the disposal of spent batteries.
- Can be applied to the desalination of water coming from different sources such as seawater, brackish well water, sewage or industrial wastewater treatment plants or others.
- Has a high availability allowing the accumulation of treated water for periods of failure of the renewable energy sources
- Improves the efficiency of use of the electric power generated by not using batteries or change to AC power, thus avoiding the energy losses associated.
- Allows implementation of operating strategies of the various subsystems, adapting them to the amount of energy available at all times and improving the energy efficiency of the system.
- Allows a mixed feed of different renewable energy sources, being possible the combination with conventional electricity grid when the first are insufficient.
- Is very flexible and can adapt its dimensions and characteristics depending on the requirements, application and specific characteristics of the water to be treated.

MARKET APPLICATIONS

The system can be used to obtain water suitable for various uses (human consumption, irrigation, wash-down or others) from the treatment of waters coming from diverse origins: seawater, brackish wells, wastewater treatment plants, industrial processes or others.

Potential customers can include:

- Industrial developers of water treatment systems.
- Consulting and engineering companies in the environmental sector interested in incorporating this new desalination system among its wastewater treatment activities.
- Food and Industrial companies in general wishing to incorporate this brackish water desalination system.
- Irrigation communities, golf courses, housing developments, etc.

COLLABORATION SOUGHT

Companies interested in acquiring this technology for use and/or commercial exploitation through:

- Patent and/or know-how license agreements to transfer use, manufacture or commercialization rights.
- Design and construction of industrial equipment, including automation, according to the technical specifications and customer needs.
- R&D project agreement (technical cooperation) for use of technology or application in other sectors.
- Subcontracting agreement (technical assessment, turnkey plant, training, etc.)