Desalination Batteries for Microgrid Energy Storage and Potable Water Production

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Abstract
The overall objective of the project is to develop and demonstrate a hybrid energy storage and desalination system for operation with renewable energy sources such as solar and wind. This will be accomplished using desalination batteries, a patented technology developed by Lynntech that can flexibly produce potable water from seawater as well as reversibly store electrical energy. Seawater or brackish water is pumped through the desalination battery and salt ions are removed through electrodialysis and as the battery produces electrical energy. Lynntech has shown that desalination batteries can remove >99.8% of salt from seawater and brackish water and are highly energy efficient.

Desalination batteries have the potential to provide long duration energy storage that is cost-competitive with current Li-ion battery storage while producing potable water that is cost competitive with seawater reverse osmosis desalination plants. The envisioned product to be developed is a containerized desalination battery system which can be used in renewable energy microgrids to provide a levelized cost of energy storage of <$100/kWh and a levelized cost of water of <$1.50/$m^3$.

Biography
Mr. Parkey is currently a Technology Team Manager at Lynntech, Inc in College Station, TX. He started his career studying biochemistry at Reed College and Texas A&M University. He then joined the fuel cell group at Lynntech in 2003 where he helped design, fabricate, and test kW-scale power systems for military applications. He has since expanded his research to include a wide range of multi-disciplinary technologies ranging from biosensors, water treatment, corrosion and biofouling control, and numerous fuel cell and battery technologies. His current projects are focused primarily on two areas: desalination and batteries operating in extreme environments. Mr. Parkey is the lead inventor and principal investigator for Lynntech's desalination battery projects which have the potential to provide energy efficient potable water production from brackish and seawater sources.