

## Attention American Made Challenge – Solar Desalination Prize:

Crystal Clearwater Resources (CCR) is confident of advancing to the design stage of the American Made Solar Desalination Challenge. We have built strategic partnerships with solar collector technology companies, research organizations, and end use partners that can help us in not only advancing in the challenge, but also in achieving commercialization.

As a clean-technology water treatment company focused on continuous improvement, we would like to be able to develop incremental improvements in our overall efficiency (thermodynamic, solar collector and solar thermal energy storage) that would lead to cost reduction(s), increase in treatment capacity and find the optimum process to implement a solar thermal solution not just in southern California and south-western United States but also in northern climates.

Specific expertise within the Lawrence Berkley National Laboratory has already committed to assist CCR with identifying ways to increase thermodynamic efficiencies in the LTDis<sup>®</sup> process. The Brackish Groundwater National Desalination Research Facility (BGNDRF) will provide a facility for testing CCR's demonstration plant and provides an ideal location for the test phase due to its proximity to produced water sources of wastewater and access to our partner Solaris Water Midstream's field locations. The research and development of the solar collector technology is further being developed by UC Merced and they will continue to update CCR about their findings.

In addition, CCR believes we would greatly benefit from working with national laboratories such as the National Renewable Energy Laboratory (NREL), Lawrence Berkley National Laboratory (LBNL), Los Alamos National Laboratory (LANL) in specific areas highlighted below. Also, an opportunity to work with DOE's Solar Energy Technologies (SETO) within the office of Energy Efficiency & Renewable Energy to advance further improvements for solar thermal storage. We would welcome any help the DOE can provide us with contacts within the SETO group particularly focused on concentrating solar- thermal power (CSP) technologies helping address the grid integration challenges related to variability of solar energy and enabling solar-generated heat to be stored until alternative energy sources are needed.

The CCR team is looking to learn (with our solar collector technology partners) from the cutting-edge research being done by NREL in the areas of concentrating solar power (CSP). In this area CCR and its solar partners would benefit directly for development of new designs, materials and manufacturing processes for solar components with an increased emphasis on improved performance, reliability and service life. We are also open to any facilities reaching out that think CCR's technology can be implemented in their process or research opportunities.

CCR is particularly focused on working and learning with researchers within the Water Research team within the Integrated Water Systems Research and the Integrated Energy Solutions group(s) within NREL. NREL's focus on the nexus of energy, water, land, atmospheric, and urban sectors is a direct application of our technology focus for applications in southern/central California particularly in the Kern County. Our partners and end users such as Berry Petroleum would work actively with us in this process. CCR's already innovative technology would benefit tremendously from applications developed within the Water and Power Systems Integration teams and the expertise to support the development, validation, demonstration of water technologies and integrated solutions.

We look forward to contributing to the DOE's American Made Challenge's goals.

Sincerely,

Crystal Clearwater Resources