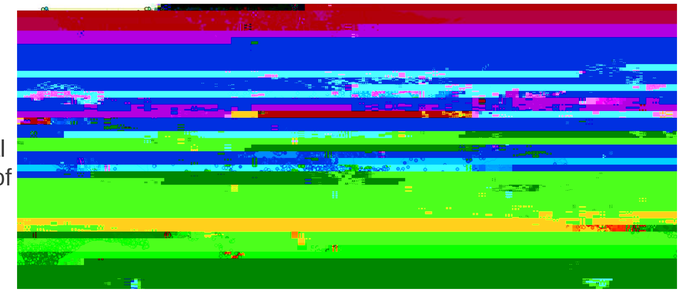
U.S. Department of Energy Geothermal Technologies Office Desalination Projects

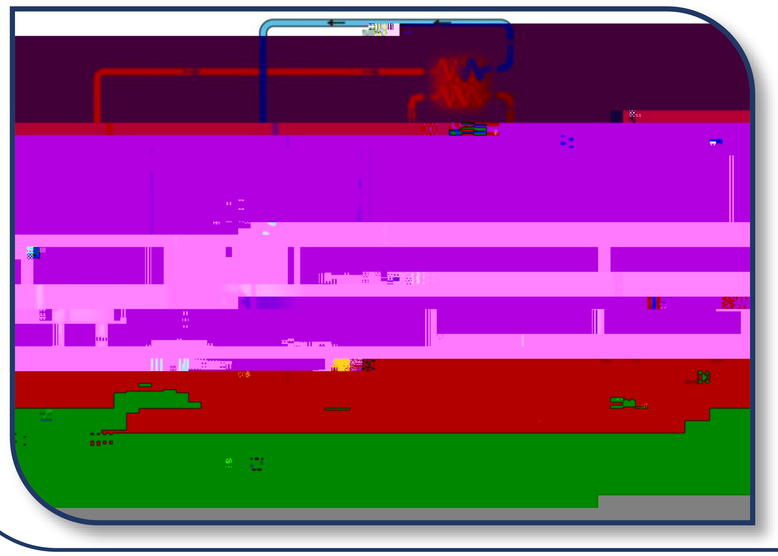
Water resources are increasingly becoming more scarce, variable, and uncertain both domestically and internationally. Desalination technologies can assure water availability, but this solution is not yet cost competitive. The industry standard for desalination is Reverse Osmosis which is a pressure driven technology that has a large energy demand. Energy production requires water resources creating an interdependency called the Energy-Water Nexus.[1]

Thermal desalination technologies can use low-grade or waste heat reducing the energy requirements. Coupling renewable energy with desalination can address the Energy-Water Nexus and help to reduce carbon emission. Using intermittent renewables like wind or solar introduces the problems of energy storage or running at reduced capacity both of which increase costs. Using geothermal resources for desalination can address all of these concerns.

The chart below shows an estimate of the cost of water for two technologies assuming a large seawater desalination plant. The capital costs for each are similar and aside from the energy requirements the operating costs for a thermal plant is lower. There is an opportunity to reduce the energy costs of desalinating produced waters by using co-produced geothermal resource.

In addition to these benefits, thermal desalination has the potential to treat waters that have higher Total Dissolved Solids and to recover a larger percentage of





[2] J.Ziol2 re W*M7(ow)10(s3 32.04 P5]4 P5]4 P5]4 P5]4 P5]4 P5

Josh Mengers
joshua.mengers@ee.doe.go
(202) 287-1652