DOCKETED	
Docket Number:	19-ERDD-01
Project Title:	Research Idea Exchange
TN #:	231375
Document Title:	Geo. McCalip Comments - Two Birds One Stone
Description:	N/A
Filer:	System
Organization:	Geo. McCalip
Submitter Role:	Public
Submission Date:	1/3/2020 8:15:52 PM
Docketed Date:	1/6/2020

Comment Received From: Geo. McCalip
Submitted On: 1/3/2020
Docket Number: 19-ERDD-01

Two Birds One Stone

PROBLEM THE FIRST:
Currently in California the fight between agriculture and urban use of water stops just short of all out war.
Hereâ€™s a major news flash: California does not suffer from a shortage of water. California borders on the largest known body of water in the universe, the Pacific Ocean.
We face two issues regarding the water in the Pacific Ocean. First, and arguably the lesser of the two, is that ocean water has a high salt content. What issue could possibly surpass that? We need water at altitude, not sea level. The DWP Haynes and Edison Los Alamitos Power Plants, near the mouth of the San Gabriel River were (and may still be) the largest single point source of electric power production on the Pacific Rim. To run the pumps for all six pipes at the Tehachapi Pumping Station draws every watt of power produced by Haynes/Los Al.

PROBLEM THE SECOND:
So, now we have run squarely into the other supposed problem California has, a shortage of energy.
Seriously? A four hundred square mile section of California desert could produce enough electricity from solar energy to power the state (not including all of the electric cars being proposed). We also have abundant wind energy, and geothermal, and tidal energy.
Our problem is not one of energy, but of storage. I donâ€™t care how much solar energy you produce, without storage you cannot use it to watch Stephen Colbert.

AND THE SOLUTION:
I would not mention the problems without proposing a solution. In this case looking at the problem from slightly outside the box reveals a simple and elegant solution. What if we donâ€™t try to pump the water up the hill? What if we donâ€™t even try to remove the salt from the water? Why not remove the hydrogen from the water and pump it up the hill? After all, it takes nine (technical 8.937) times as much energy to pump water as it does to pump hydrogen.
Side note: for extracting hydrogen the naturally occurring salts in Pacific Ocean sea water are over 90% as effective a catalyst as any yet produced in a lab.
Once you have the hydrogen at altitude, you recombine it with oxygen using fuel cells and you get two products. Not only do you now have fresh water at altitude, you also get energy on demand. By siting the fuel cells high enough, you can generate more power on demand by running the water through turbines on its way to the farm or the city.
This provides a dual stage pump storage system with sufficient capacity to handle the needs of California.
While basing the cost of the system on energy storage alone might make it cost prohibitive, adding the revenue from the water changes the equation significantly.
And, with proper design of the electrodes, the accretion on them van be used as a building material, giving a third profit center.
Confession: This is basically a high tech rip off of the rain cycle.