DOCKETED

Docket Number:	15-WATER-01
Project Title:	Water Energy Technology (WET) Program
TN #:	204794
Document Title:	Arthur M. Harris Comments: Portable, Scaleable, Hydrogen, Power, Pure water
Description:	N/A
Filer:	System
Organization:	Arthur M. Harris
Submitter Role:	Public
Submission Date:	5/31/2015 7:14:01 PM
Docketed Date:	6/1/2015

Comment Received From: Arthur M. Harris
Submitted On: 5/31/2015
Docket Number: 15-WATER-01

Portable, Scaleable, Hydrogen, Power, Pure water

Still not sure if you are ready for out project.

Additional submitted attachment is included below.

MSWP system barge

(Mobile Saleable Water and Power)

Proposal by:

IE Group LLC
Arthur M. Harris
February 21, 2015

Executive Summery MSWP

The MSWP (Mobile Saleable Water and Power) system is a mobile water desalinization, hydrogen production, and electrical energy production facility. This system is specifically designed to be run individually or in tandem with other MSWP platforms simultaneously. Each individual unit is complete with project goals that are as follows: to create 250,000 cubic feet of high pressure hydrogen per day, 6000-9000 gallons of distilled water and 4-12 MW an hour of alternating current in a 24 hour day. The subsequent additional benefits are to re-oxygenate oceanic dead zones, and provide pure water in regions suffering from a drought, and to help supply hydrogen to California and others state hydrogen infrastructure. By creating high pressure steam from available water sources to energize our three, 4 mega-watt steam turbines, pure water will be a byproduct of the process. We can choose to capture this water for distribution.

With our global partners the IE Group can create the alternative energy, ocean going, self propelled 400 meter barges and the framework for energy and desalination modules. The parabolic sun tracking array with temperature storage to heat the desalination module to 1500 degrees Celsius will be used to distill the water in an industrial way and create 4-12 Megawatts of electrical energy. With another partner we will mount twenty, 10kw wind turbines aboard the MSWP vessel. They will be used in the process of water electrolysis, then compress the water to produce pressurized hydrogen and oxygen. All processes are controlled and monitored onboard in the MSWP control bridge

The key tasks for the MSWP vessel are to produce electrical energy and hydrogen where it is needed. Because this platform is mobile any of the MSWP vessels are moved to where the needs are, where this electricity and/or pure water is required. The delivery infrastructure is then moved to the closest port of entry for ease of delivery and reduction of delivery costs. Depending on the needs of the region, the MSWP vessels can be anchored and produce it's products in the ocean or brackish water, within the same latitudes as the required delivery points.

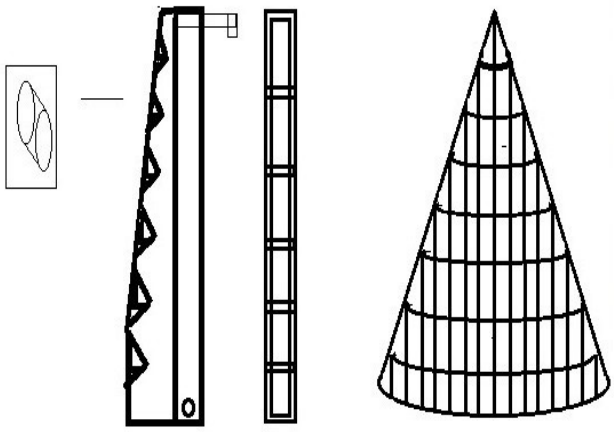
All partners have agreed to use their engineering prowess to produce their products, i.e. ships, steam turbines, wind generators, Fresnel lenses, etc., while providing all the support necessary to maintain their products over time within our budget and timeline. Along with the management team at the IE Group, LLC ,the day to day operation will be delegated to those with the required skill set to operate these vessels, on a three year contract. The MSWP vessel will have two teams of onboard ship's complement, a ship's Captains and 2 three man crews. The crew will consist of two electrician/electrical engineers, two steamfitter/plumbers, and first and second mate/divers. All members of the crew will have the additional responsibility of assisting the ship's captain in ship management.

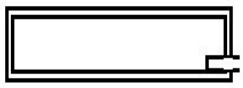
Although most of the systems are automated and tied into the IE Group science cloud, transportation for water and gasses typically will not be. All product sales are done at the executive level, with the priority given to California or drought stricken infrastructure or system participants. All power is supplied to the California grid or other individual community. All water is delivered upstream so water can collect minerals on its downstream path for crops or in a preselected reservoir. Pressurized hydrogen and oxygen is delivered to a preselected holding facility

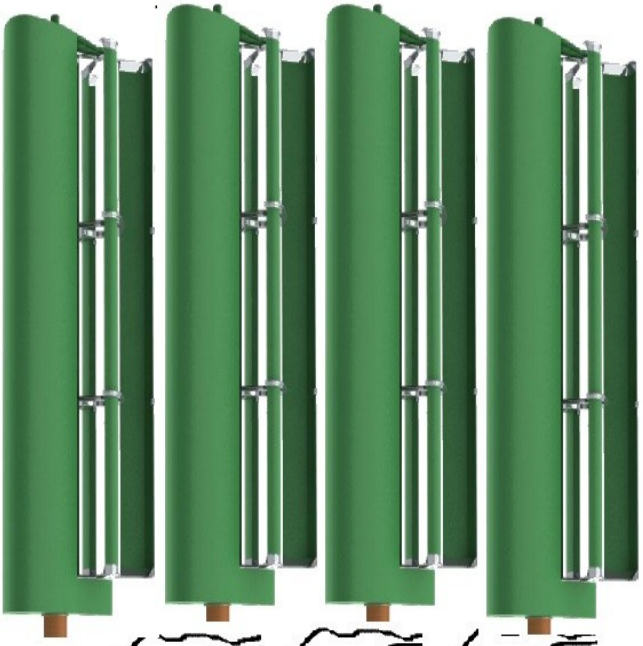
VAWT

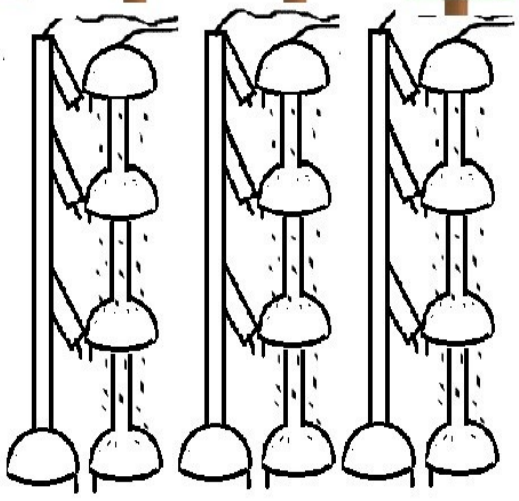
Vertical Axis Wind Turbine

focused convex array



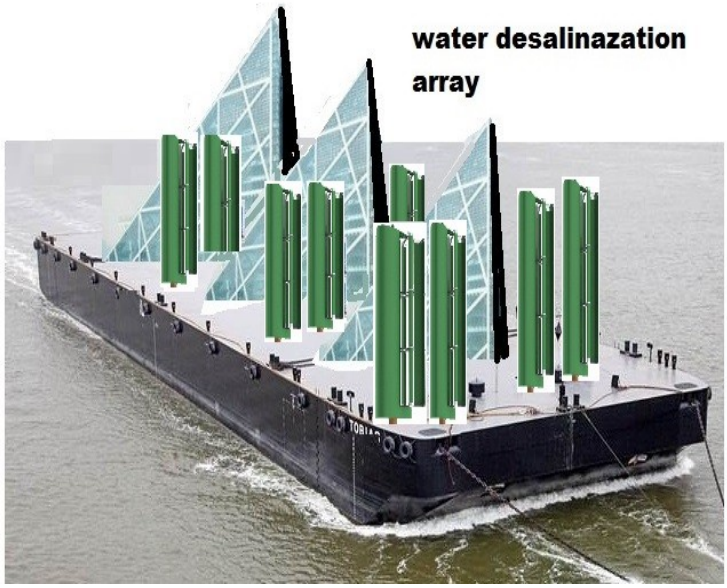






water electroisis array

water desalinazation array



The Issue

California needs water, hydrogen, and cheap electricity. The state is suffering from the worst drought in recorded history and hasn't ended. When Governor Jerry Brown was in office the last time he proposed a state wide canal to bring water from the northern to southern California. Water problems have existed in California for many years. The problem is that the state provides food and produce throughout the entire world. When there is a drought in the Imperial Valley everyone suffers most of all Californians. A state like California with over three hundred miles of coastline has a view of the largest body of water in the world. The Pacific Ocean, with over 70 million cubic miles of ocean, is the natural source for water. With an average of 284 sunny days in Los Angeles much of the southland takes its water from the Colorado river. Unfortunately the Colorado is at it lowest level in 100 years.

Over the last 10 years California has lead the nation in alternative fuel consumption. The most advanced development in sustainable energy production is hydrogen. California's biggest challenge is providing the infrastructure for hydrogen.

Project Description

The MSWP (Mobile Saleable Water and Power) system is mounted on a four hundred meter self propelled barge built by Crowley Ship Building in northern California. The MSWP barge has three, one hundred meter water distillery modules, 5 meters wide and 30 meters high. Each water distillery module has a solar tracking parabolic mirror array, from Newport Industrial Glass, that boils water and heats the solar heat storage block. Each of the parabolic mirror arrays heats the heat storage block to over 1500 degrees. It uses this heat throughout the night to power the distillery. The super heated steam is locked in the reaction chamber and piped to several micro steam turbine generators. Each of the 1500kW generators creates a total of 4.5MW of Alternating Current throughout a 24 hour day. The pure water condensation is collected and placed in a large multilayer bladder for distribution. The bladder is either airlifted or trucked to its final destination.

The MSWP barge will be equipped with 10 double stacked California Energy and Power 10kW VAWT (Vertical Axis Wind Turbines) producing 200kW per hour to be used for water electrolysis. With partners from the California Hydrogen Business Counsel, the IE Group will supply over 7 thousand kilograms of liquid hydrogen a day. With all ten ships in the fleet in full operation the MSWP system will be able to provide over 70 thousand kilograms of liquid hydrogen daily. The most important part of the MSWP system is that it is mobile. Wherever there is a need for water or power in the state the MSWP vessel can park and produce water and power for that immediate region.

Anticipated Benefits for California

In a state where there are over 30 million people where water has historically been a problem, water where you need it, plus clean power where you want it, is one of the best combinations that could help the people and economy of California. When there is the worst drought in California history, low cost water and energy is vital. When there's drought the price of everything goes up. Food, water and everything related becomes a premium. The MSWP is scalable: one, ten or a hundred MSWP vessels, depending on the need. The fleet of MSWP vessels can produce water and energy on demand to whatever scale required for as long as necessary. Hydrogen is the fuel of the future. With the MSWP fleet California will never need to rely on any other group for fuel. Clean, abundant, and available, California can usher in the new era of clean performance.

The tremendous magnitude of its impact on the California economy will rear it's ugly head when food or water becomes scarce. In time there might be land based SWP (Scalable Water and Power) stations, in a permanent location where the water and power is for a specific location.

Project Specifics

Contractor: Intrepid Engineering Group, LLC.
Partners: Crowley Ship Building, Newport Industrial Glass, California Energy and Power
Amount: $30,000,000 each

Technical Merit and Need

A.) Low cost clean water, power and alternative clean fuel are important to many countries. This portable saleable platform supplies all three to wherever the needs are for a region.

B.) Because the platform is mobile, it can deploy anywhere in the world with either a steady supply of wind or sun or both. The MSWP can deploy even in landlocked areas with any form, even toxic forms, of liquid water. Where there is a water, power or fuel need, this platform will operate to help eliminate this kind of crisis wherever the need is.

C.) None of the this technology aboard the MSWP platform is new. Because much of the technology is readily available anywhere in the world, the MSWP platform can be stitched together using global vendors and deploy in targeted areas within 6 - 9 months. Depending on the region's need and available funding, the platform can deploy to whatever scale that may be required.

D.) With EPIC (Electric Program Investment Charge), funding, the platform would be that much more enticing to private investors. From relieving a drought ridden community, or supplying clean energy indefinitely to an energy starved communities, or feeding a hydrogen based economy, the MSWP platform has never been implemented to this scale with this much modularity.

E.) Creating energy from high pressure steam has been around since Robert Fulton. Systems that employ solar arrays creating energy have been growing exponentially over the last 20 years. Extracting hydrogen using electrolysis has been done over the last 80 years. Using wind to create the energy needed to do the electrolysis has been done over the last 15 years. Creating pure water by distilling water has been done over the last 200 years. Putting it all on one platform has never been done, till now.

F.) All success is quantifiable simply by output. No products are used other than the systems utilized to create the products. The output is measured by the gallon or kilowatt. Fresnell lenses and parabolic mirrors have been measured to produce over 2500 C temperatures. Lower temperatures can be stored and utilized for steam turbine energy production for power and water distillation throughout the 24 hour day.

Average cost per kW hour is $0.12 allows this platform to produce approximately $1,440 before costs revenue dollars per hour or $34,560 a day for electrical energy.

Average revenue for 326,000 gallons of water per day at 15% of $0.01 per gallon is $500.

Average revenue for 568 kilograms of high pressure hydrogen at $3.50 per kilogram. is $1,989 per day.

Maximum total monthly revenue before costs are $1,037,372 or $12,448,464 a year.

Employee costs per barge per year is approx. $600,000

Annual maintenance is approx. $1 million. Total annual profit after cost is approx. $10,848,464

With a $30 million initial outlay for the barge and crew, the total revenue after costs over 10 years is approx. $108,484,640