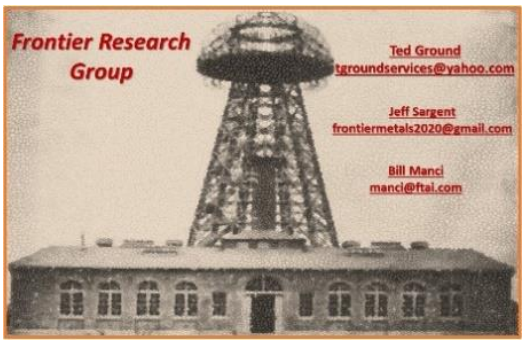

REQUEST FOR TECHNICAL ASSISTANCE FOR THE FRONTIER RESEARCH GROUP'S *CLOUDS & RAIN* SOLAR THERMAL DESALINATION R&D PROPOSAL

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Re: US DOE Solar Desalination Prize - Teaming Stage
Clouds & Rain: Optimum Solar Thermal Desalination
https://www.ftai.com/articles-media/doe-solar-desalination
Keywords: HDH desalination, microbubbles, fluidic oscillation, Direct Contact Evaporation, heat transfer, mass transfer, enhanced condensation

February 8, 2022

1) Identifying Potential Customers and Markets, and Transport Logistics.

We have been in contact with key individuals that are either potential customers, or whose companies could serve as distributors or sales channels for a lease hold business model for our planned portable modular *Solar Spindletop* desalination units. We plan to build these around, and on the inside, of high-cube shipping containers. These will serve as the means of allowing storage and safe transport all of the equipment, including the modular Winston Cone Optics (WCO) NASH solar collectors.

We consider disaster relief response applications as one potential market for these portable modular desalination systems. In considering the end-users of this technology, we are asking for assistance in identifying contacts for emergency management agencies in every state and territory of the United States. One example we are aware of is the Texas General Land Office (GLO).

We consider this technical information because the transport logistics may require analysis of whether regional hubs could be set up across the USA, from which the desalination and water purification units could be transported to be deployed in disaster areas where there would be need for temporary desalination or water treatment systems whenever municipal water treatment plants are disrupted. We are aware of the Federal Emergency Management Agency (FEMA), but, is there a list of emergency management agencies, state by state, for example, including key individual decision makers, whereby we might contact them directly, and analyze the transport logistics? Or, alternatively, are there transport logistic analysts in the US DOE Connectors Network that could assist with this analysis? Could the Army Corps of Engineers, the Bureau of Land Management, or the Bureau of Reclamation potentially assist in this analysis?

2) **Energy Efficient Low-Volume Water Pumps and Low-Pressure Air Blowers.**
We have explored specifications of energy efficient low-volume water pumps and low-pressure high-volume air blowers in commercially available off-the shelf products by manufacturers and distributors in the USA. We are still seeking some nearly perfect equipment for our applications. For example, one manufacturer offers a $1/8^{th}$ HP air blower that can generate 27 cfm of air at fairly low air pressure, but to scale up the air flow to 270 cfm, for example, that air flow, instead of 1.25 or 1.5 HP blowers. We want to watch every Watt, so to speak, and we are looking for air blowers in that scaled up range that will do so with far less Watts of electrical power requirements. Corrosion resistance is also a key factor. A similar situation applies to small water pumps. Are there any helpful analysts or suppliers or available information resources out there, perhaps within the DOE Connector Network?

3) **Heat Exchange Pipes that are Cost Effective and Durable.**
We are seeking alternatives to the use of copper tubing or pipes for heat exchange applications. We are aware of stainless-steel or titanium alloy pipes, but at the same time we need to watch the cost very closely. If there are any thermally conducting polymer composite pipes being made, for example, or inexpensive coatings for copper pipes that are corrosion resistant and durable for salt water applications, then we would ask assistance in sourcing those.