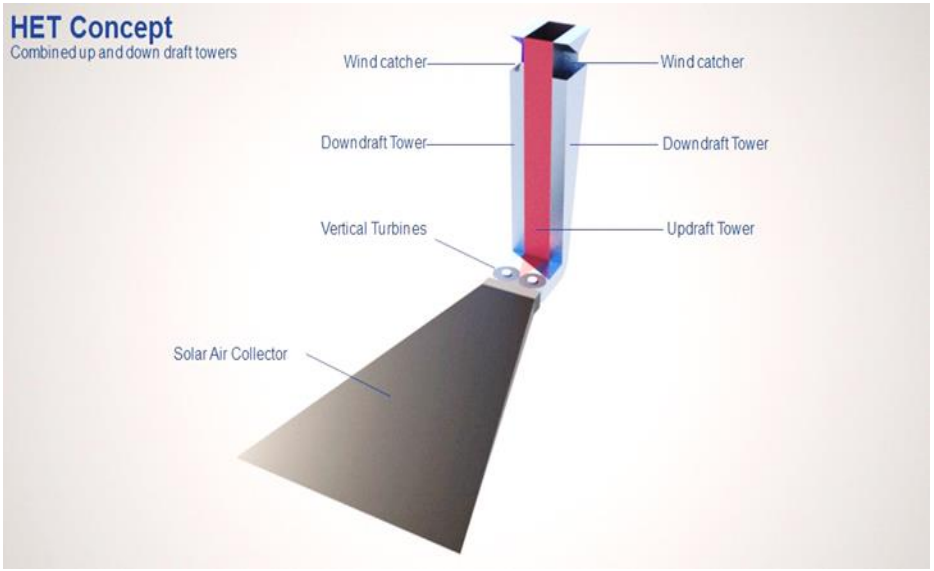
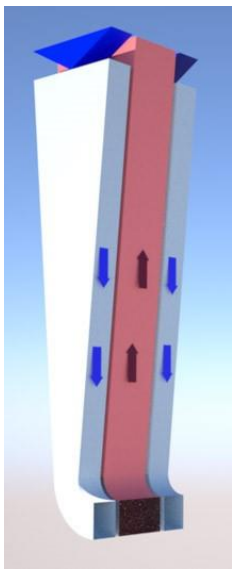
Technical Assistance Request

Conserval Systems Inc.
Buffalo NY
Contact John Hollick
E: jhollick@solarwall.com
Tel: 1-877-768-4328

Solar Thermal Power Tower

Conserval and its CEO, John Hollick, the inventor of the transpired solar air collector (SolarWall) are developing a revolutionary new concept which combines the best features of multiple renewable technologies into one Hybrid Energy Tower. The goal is to utilize low temperature heat from SolarWall panels to produce power. The concept also includes the capture and storage of PV thermal energy for release at night.

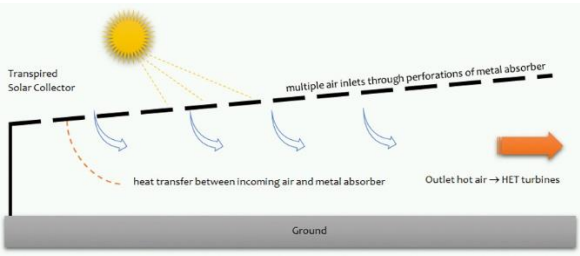


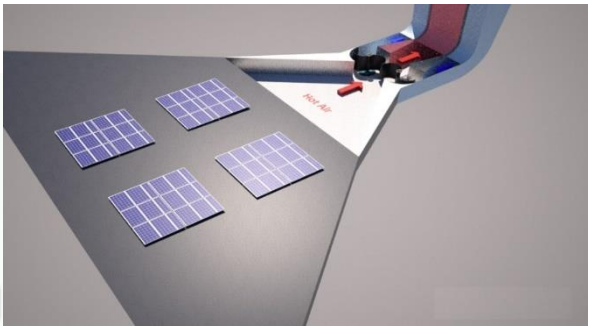


The Solar Thermal Power Tower includes transpired solar air collectors, solar updraft tower, wind downdraft tower, Venturi or diffuser chamber for turbines, phase change material (PCM) thermal storage and integration of PV with recovery of wasted PV heat.

The thermal energy will be stored in a salt based phase change material (PCM) to be produced on a low cost automated packaging line. The PCM will convert energy at 25 C and be installed under the PV modules resting on top of the transpired collectors. In addition to recovering much of the 80% wasted thermal energy, the PV modules will operate at lower temperatures, thus improving their efficiency and electrical output by 5 to 10%

Two prototypes built to date confirm the much higher efficiencies compared with traditional solar updraft towers, but additional work is necessary to finalize the modular a working system. One combination is with 150 kW HET 100' tower and 350 kW of PV. Various combinations of these technologies are possible depending on local wind and solar resources. The LCOE calculator will be used to optimize designs based on costs and performance.





Heat from transpired collectors provide the driving force and can be coupled with PV arrays in a PVT configuration to recover the thermal energy and produce more power.

Components requiring further optimization include the turbines and blades, likely a vertical axis configuration but not ruling out horizontal axis turbines, design of the tower and connecting turbine chamber and better understanding of the air movements at the top of the tower and at the turbines.

Sandia will perform CFD analysis of the turbines, provide a best-estimate value for Cp and make recommendations for optimizing the vertical axis turbine design with a Venturi or diffuser chamber receiving air flows from two directions.

A partner will be required to produce the turbines. Suppliers for the turbines are being requested especially those interested in developing a new line of turbines for our team.

Manufacturers of towers will be required. One potential is to modify agricultural grain bins using similar construction techniques to suit the solar towers.

University of Arizona Tech Park will be recommending suitable partners to provide the PV installation and interconnect designs and experience, as well as to monitor the demonstration installation.

PV developers and installers are asked to contact Conserval to participate in the demonstration and work with our team for ongoing projects after the demonstration has been completed.