Technical Assistance Request

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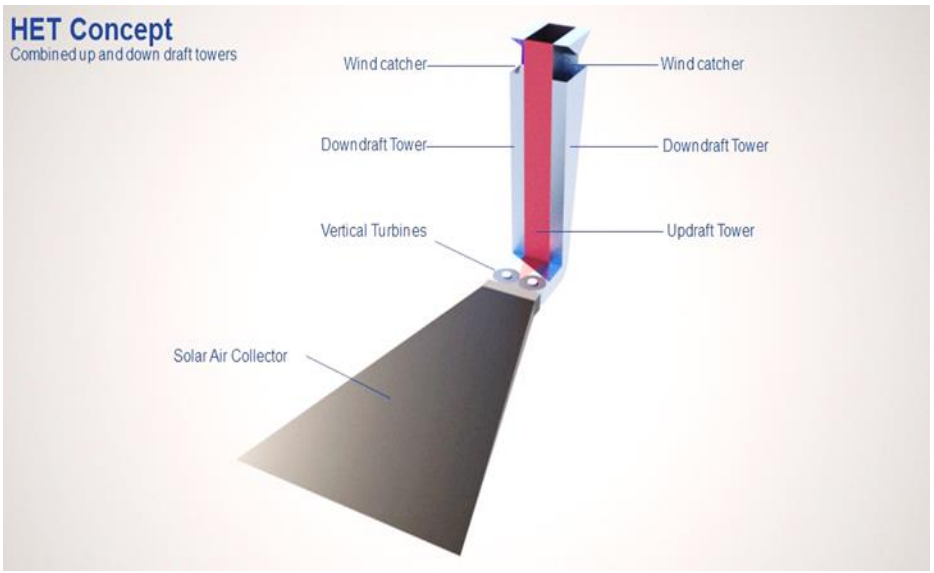
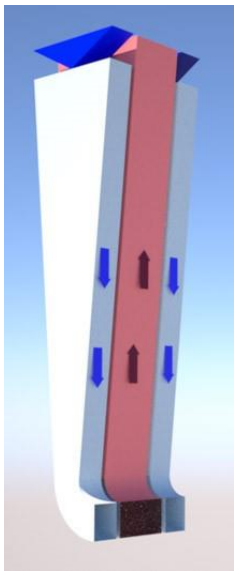
SolarWall Power Tower

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 and PV modules to produce power.

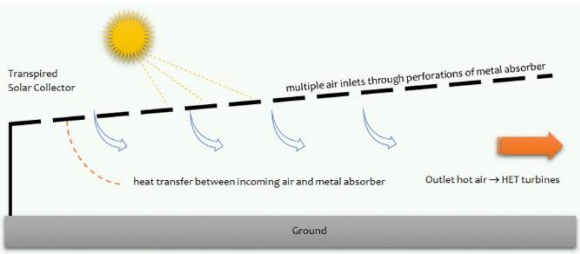


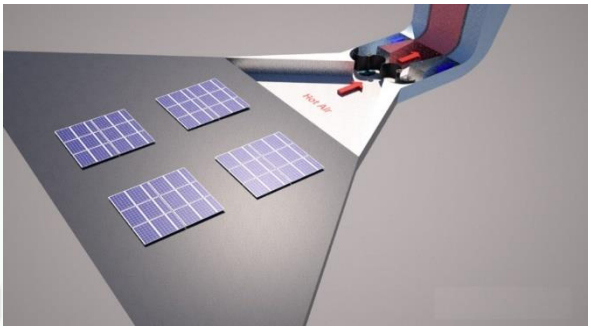


The SolarWall Power Tower includes transpired solar air collectors, solar updraft tower, wind downdraft tower, Venturi or diffuser chamber for turbines, integration of PV with recovery of wasted PV thermal energy and PCM thermal storage for release at night.

Two prototypes built to date confirm the much higher efficiencies compared with traditional solar updraft towers, but additional work is necessary to optimize the turbine design and then create modular systems in sizes of 250kW and 1 MW. One design includes 250 kW of thermal electric energy for 24 hour operation via 100' tower and 750 kW of PV with heat recovery. 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.

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%





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

Components requiring further optimization include the vertical axis turbines and blades, 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 vertical axis 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.