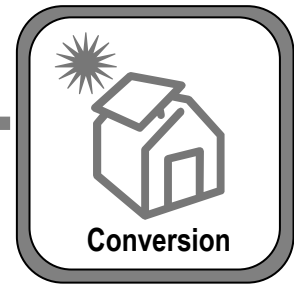


Solar Assisted Heat Pump Demonstration



Lead Organizations: MaineHousing and Ascendant Energy Company

Community Need:

Volatile and escalating fossil fuel prices are forcing Maine households to live in colder homes and even to move in with other family members or leave the state. In Maine, geothermal is a proven system to reduce energy bills as the heating method with the lowest operating cost. The proposed project uses solar energy panels made in Maine to pre-heat fluid for higher heat pump efficiency and to require minimal or no groundwork since solar heated fluid is stored in a tank. Further the energy costs for system operation are paid for by the electricity generated by the solar panels.

The intended solar panels for the project will be made in Maine by Ascendant Energy under the auspices of a Development Award by the Maine Technology Institute (MTI). The SHP (Solar Heat and Power) panels generate both electricity to pay for heat pump operation and heat to improve heat pump efficiency. The 240 square feet of SHP panels have been beta tested at the Chewonki Foundation to deliver 3kW (kiloWatts) of electricity and hot water heating with solar fluid that is consistently 50 degrees warmer than the outdoor ambient temperature. This temperature differential is ideal for the proposed project.

Geothermal heat pumps deliver heat at the lowest cost per Btu (British thermal unit) than any other heating source to warm an entire home. Using the ground as a heat source, an electrically driven compressor similar to a refrigerator squeezes more heat than the amount of energy used to drive the compressor. One unit of electricity may produce 4 or more units of heat so that the heating cost is less than other competing fuels.

Project Activities:

Based on funding availability, the project will commence as soon as October 2008 to procure materials for assembling Ascendant Energy's SHP (Solar Heat and Power) panels. Project activities are as follows:

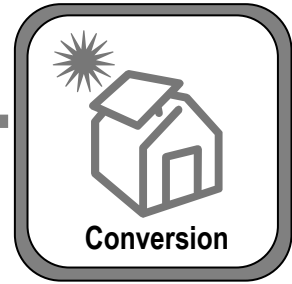
1. Identify candidate household through MaineHousing for installing solar panels, inverter equipment, tanks, heat pumps, and low-temperature radiant panels.
2. Assemble project components at Ascendant Energy's facility.
3. Install system at candidate household.
4. Monitor and report electrical and thermal performance of solar panels, as well as heat pump energy consumption.

Outcomes / Impact:

The project will confirm the sizing and system price of a solar-assisted heat pump for whole house heating with a goal of validating the system design for widespread availability in future heating seasons.

Further, Ascendant's SHP design will be enhanced based on lessons learned from the Chewonki implementation. From the same batch of panels that will be assembled for the proposed project, Ascendant will submit modules for 3rd party certification in anticipation of full commercial manufacturing in Rockland, ME in 2009.

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Total Project Budget:

The overall budget for the project is \$67,000 for the single demonstration system by Ascendant. The budget for the system is as follows:

<u>Item</u>	<u>Cost</u>
240 ft2 Solar Panels for 3kW power and 16kW thermal Heat production	\$30,000
Electrical System Components	\$4800
Tanks + Heat Exchangers	\$6200
Water Source Heat Pump	\$8500
Space Heating Panels	\$3000
Monitoring System	\$2000
Installation Cost	\$12,500
Total	\$67,000

Using funds from its MTI Development Award, Ascendant Energy will provide \$12,500 in installation costs and \$7,500 in panel assembly costs totaling \$20,000.

Funds Requested from the Philanthropic Sector:

\$47,000 is sought for equipment and installation components in addition to the \$20,000 provided by Ascendant Energy.

Ability to Target Funds:

To maintain projected installation costs, the installation site ideally will be designated in relative proximity to Ascendant Energy in Rockland. However, other parts of Maine are viable.

Accountability / Reporting: Funds will be dispersed by MaineHousing based on the presentation of invoices by Ascendant Energy. Ascendant Energy will oversee procurement, assembly, and installation.

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