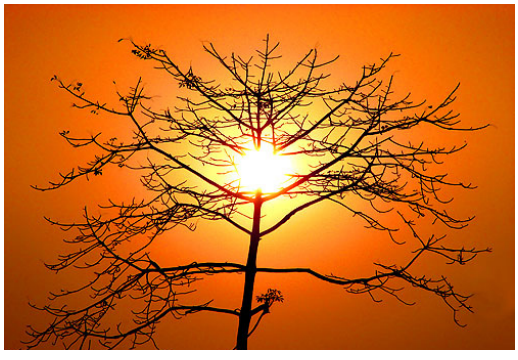
SCITEC Solar Thermal Energy Extended Design Project ’08-‘09

Project Description

CATC plumbing and heating students and students from Maranacook High School will be designing and installing a solar thermal water heating system to complement the existing water heating system at the technical center. The system will use the radiant energy from the sun to pre-heat water, which will then be added to the standard water tank. Because it is already at an elevated temperature, the pre-heated water will require less energy to be brought to standard hot-water temperature.



Design Elements/Parameters

Students will need to make decisions about how the panels will be angled and how they will be situated in order to optimize solar energy collection for the months of highest need and ensure that the system does not overheat in the solar-rich summer months.

CATC plumbing and heating students will be designing the specific connection between the panel installation and the storage tank(s).

Timeline

The solar thermal panel(s) are currently in or on order. The initial siting design will be adopted by late fall, and the design and installation of the system will take place in early winter.

Students and teachers already involved

Cheryl Marvinney (Maranacook HS), has three independent study students that will consider taking on a strong role in this project, including helping plan the siting, examining the plumbing design process and developing and presenting a potential design for implementation at Maranacook HS.

Opportunities for involvement

- Students from any class can devise proposals for the angle and orientation of the panels; these will not be determined officially for several months. Classes wishing to participate in this aspect of the project should research solar thermal heating array types and their siting considerations, and design specifications including the latitude of Augusta, Maine and a peak solar energy gain in January of the year.
- Teachers and students may wish to learn more about the design process for a solar thermal heating array like this. Several opportunities are available for this. Classes or teachers can easily arrange visits to CATC to see the arrays and talk with students and teachers about the process. Classes and teachers are also welcome to come observe the installation process, which is projected to take place in early winter.
- Teachers and/or classes interested in other opportunities to learn about harnessing solar thermal energy may want to consider arranging a visit to the Chewonki Foundation to see their projects in action. Plans are underway to arrange a visit for SCITEC teachers and some students interested in participating in this project, and space should be open for others interested in this topic. This trip would be planned for early November.
- An important part of the process of installing efficient energy sources such as this is proper data collection before and during the project, to determine the degree of energy efficiency gained. This will be done via temperature monitoring and consideration of the general plumbing layout. Classes from sending schools may participate in this vital calculation and monitoring process, part of which may be Internet-accessible.