MILLION Solar ROOFS

SUCCESS STORIES

The goal of the Million Solar Roofs Initiative is to install one million solar energy systems on U.S. buildings by 2010. President Clinton announced the Initiative on June 26, 1997 in a speech before the United Nations Session on Environment and Development. The Initiative focuses on two types of solar energy technology — photovoltaics that produce electricity from sunlight, and solar thermal systems that produce heat for domestic hot water, space heating or heating swimming pools. The U.S. Department of Energy leads this effort in partnership with the building industry, other federal agencies, utilities, the solar energy industry, financial institutions, state and local governments, and non-governmental organizations. These partnerships concentrate on removing market barriers and developing and strengthening demand for solar energy products and applications. As progress is made toward the goal of one million solar roofs, greenhouse gases and other harmful emissions will be reduced, high tech jobs will be created, and the U.S. solar energy industry will retain its competitive edge.

Project: Leadville Water Treatment Plant

Type: Transpired Solar Collector

Location: Rocky Mountains, Colorado

Background: The Leadville Water Treatment Plant, operated by the U.S. Bureau of Reclamation, is a 12,600 square foot metal building used to treat contaminated runoff from the Leadville Mine Drainage Tunnel. The Treatment Plant is located high in the mountains of Colorado, at an elevation of 10,200 feet. Because it is located in such a high, cool region, the Plant needs heat year round, including heated makeup air to ventilate the process area. Chemical vapors that come from chemical storage tanks in the building also must be ventilated. The Plant's heating and ventilating equipment had featured a gas-fired makeup air unit.

Heating large volumes of air can be expensive without a solar system. The solar transpired collector technology is suitable in large buildings that require large volumes of heated air. Since the Leadville Water Treatment Plant requires large amounts of heated air all year round, the solar transpired collector is ideal for the Plant.

In order to conserve energy, the Bureau of Reclamation and the U.S. Department of Energy's Federal Energy Management Program (FEMP) worked together to install the unglazed transpired solar collector on the south wall of the building. This collector, also known as a SOLARWALL®, preheats ventilation air and thus removes a substantial load from a building's conventional heating system. Transpired solar collectors help facility managers and operators save on energy bills.

System Description: A transpired solar collector is basically a dark, perforated metal wall that is installed on the south-facing side of a large building. The collector in Leadville is installed onto the south wall of the Treatment Plant and measures 70 feet wide by 25 feet high by 9 inches deep. The collector makes use of solar radiation to heat the ambient air. Fans mounted at the top of the collector wall pull outside air through its perforations, and the thermal energy collected by the wall is transferred to the air passing through the holes. The fans distribute the heated air into the building through flexible ducts mounted near the ceiling.

Financing: The system was paid for by the Bureau of Reclamation, with a $15,000 buy down grant from the Department of Energy Federal Energy Management Program (FEMP).

Climate: Its high mountain location makes the climate of the Leadville Water Treatment Plant cool or cold year round. However, there are enough sunny days even in the winter in Colorado to make solar energy a cost-effective option in numerous locations, and the State boasts a number of solar heating and solar electric systems in both grid-independent and grid-tied applications.

Installed Cost: $30,000

Optimum Maintenance Costs: $0 (except for periodic lubrication of the fans). The transpired collector has a life span of twenty-five years.

Direct Saving: Energy savings are estimated to be 728 million Btu per year at $0.43 per therm and 70% efficiency. This equals an energy cost savings of nearly $4,370 per year, and indicates a simple payback of 6.9 years.

Environmental benefit: In addition to reducing greenhouse gases, acid rain emissions, and the amount of natural gas and electricity used, the transpired collector improves the indoor air quality of the building. Furthermore, the SOLARWALL® is made of galvanized steel, which is completely recyclable.

Contact:

Harry Remmers, Bureau of Reclamation, 1-800-822-7358

Conserval Systems, Inc. 716-835-4903

Patrina Eiffert, Ph.D., NREL 303-275-3066

U.S. Department of Energy

Office of Energy Efficency and Renewable Energy

DOE Regional Support Offices

Atlanta Regional Support Office
Steve Hortin, 404/347-0239
730 Peachtree, NE, Suite 876
Atlanta, GA 30308
fax: 404/347-3098
Southeast Region: FL, GA, SC, NC, AL, MS, KY, TN, AR, USVI, PR

Boston Regional Support Office
Richard Michaud, 617/565-9713
One Congress Street
Room 1101
Boston, MA 02114-2021
fax: (617)656-9723
Northeast Region: CT, ME, MA, NH, NY, VT, RI

Chicago Regional Support Office
Mark Burger, 312/886-8583
Julie Pollit, 312/886-8571
One South Wacker Drive
Chicago, IL 60606
fax: 312/886-8561
Region: IL, IN, IA, MI, MN, MO, OH, WI

Denver Regional Support Office
Steve Sargent, 303/275-4820
1617 Cole Blvd.
Golden, CO 80401-2266
fax: 303/275-4830
Region: CO, KS, LA, MT, NE, NM, ND, OK, SD, TX, UT, WY

Philadelphia Regional Support Office
Susan Guard, 215/656-6965
1880 John F. Kennedy Blvd.
Suite 501
Philadelphia, PA 19103-7483
fax: 215/656-6981
Region: DE, DC, MD, NJ, PA, VA, WV

Seattle Regional Support Office
Curtis Framel, 206/553-7841
Michael Lottier, 206/553-2156
800 Fifth Ave., Suite 3950
Seattle, Washington98104-3122
fax: 206/553-2200
Northwest Regionl: AK, WA, ID, OR, CA, NV, AZ, HI, Pacific Territories

Hawaii only:
Eileen Yoshinaka, 808/541-2564
300 Ala Moana Blvd.
Honolulu, HI 96813
fax: 808/541-2562

For more information:
By phone:
Efficiency and Renewable Energy Clearinghouse (EREC)
1-800-DOE-EREC (363-3732)

On the Internet:
Million Solar Roofs Website
www.MillionSolarRoofs.org