

93 million miles away—

Sun's energy can heat your home

by Marsha Shewczyk

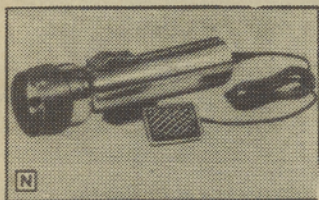
One of the natural features of the Warm Springs area is the abundance of sunshine. Kah-Nee-Ta advertizes 340 days of sunshine each year, enough to meet vacationer's dreams. Even in cold winter months the sun's rays shine down on this part of the country.

All of this sunshine need not go to waste. Even though 93 million miles away the sun's rays can be converted into a useful energy source which will cut down energy bills and at the same time increase harmony with the environment.

Rather than existing as a consumer of energy, a building can be made to be a producer of energy. Solar energy is safe and it is available.

Research into solar energy is increasing. Homeowners are asked and are oftentimes interested in participating in this research particularly because of the "energy crunch."

Both the federal and state governments offer a tax credit for those interested in cutting normal energy consumption by the installation of energy saving devices including solar heating systems. The tax credit is available to homeowners who simply want to add solar collecting panels to their rooftop or for those who want an entire heating system built right into the structure of their home.



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An emergency solar flashlight that recharges with sun power. Mount the detachable solar cell array to your car's dashboard or windowsill to recharge. Includes NiCd batteries. 7½" long. 12 oz. Solar Flashlight

No. 61,102 \$29.95

A forty percent federal tax credit for up to \$10,000 in a system's cost is augmented by a 25 percent tax credit for up to \$4,000 dollars of the cost. Oregon's tax credit tax also applies to passive applications like greenhouses and heat storage. And there are also tax credits available for commercial and industrial applications.

Solar energy may be no more complex than well-placed windows to admit sunlight and a masonry floor to retain the heat. A carefully planned house has the potential to receive up to 100 percent of its warmth from the sun. Houses on the average consume one-fifth of America's energy, mostly due to bad planning and poor insulation.

A house with good solar orientation will take advantage of both the daily and the yearly cycles of the sun. In winter, when heat is needed, the sun is low in the southern sky. In summer the sun's rays come from high overhead and from the east and west. If properly oriented the house will minimize the southern exposure and minimize the east-west exposure.

The basic idea is to face windows and collectors to the south to obtain winter heat and avoid summer overheating. Precision is not crucial,

although direction should be within 25 degrees of true south.

All solar heating systems share the same objectives—to collect the sun's heat, to store that heat and to distribute it when and where it is needed while avoiding underheating and overheating.

There are two distinct approaches to the solar heating of buildings, **active** and **passive**. Active systems use hardware and mechanical equipment to collect and transport heat. A collector mounted on the roof of a house indicates an active system in use. Water or air pumped through the collector absorbs heat and transports it to a storage unit. The heat in the storage unit heats space in a building by a completely mechanical distribution system.

Passive systems, on the other hand, collect and transport heat by non-mechanical means. The thermal energy is distributed by natural means such as radiation, conduction and natural convection. The passive system operates on available energy while the active system uses electricity or other energy sources to power fans and pumps which make the system work.

Active Solar Systems

Most of the emphasis in homes is on active solar systems. The advantages of an active solar system are several: They can achieve hotter and more useful temperatures than passive systems; Less collection area is needed: They may be easier to install usefully on existing buildings; and, the systems do not require the careful balancing necessary for natural passive heat distribution and storage.

The collector, often seen on housetops, for the more popular active solar heating systems consists of an absorbing surface made of metal, rubber or plastic and a layer of glass or plastic to reduce heat loss. The panels are painted black for a higher rate of absorption.

The active solar system can be either an air or water system. Large amounts of air must be removed in the air system which consumes a lot of electricity and is noisy as compared to the water system where pumps drive the liquid through the system. The liquid system can supply hot water all year around, installation is less cumbersome and the collectors are, so far, more efficient.

Preventive maintenance is necessary in the active water system to prevent freezing and corrosion. Anti-freeze may be used instead of water with the addition of heat exchanger.

Passive solar system

Solar system is at its simplest in the passive solar heating system. It is silent and automatic demanding no expensive or complex equipment. The systems require very careful design to avoid overheating and to distribute air evenly.

Careful place and design of windows are important in the passive system because they are the most direct solar collectors. They should be placed to



Solar panels collect heat to warm this Warm Springs home's water

receive the low winter sun but protected with overhangs to block the high summer sun.

Other means of collecting vary from the use of reflectors, stone or masonry slabs to retain heat, a water wall to a roof pond where plastic bags containing water are heated daily releasing the heat into the house at night.

Technology in solar heating expands continuously. It is an infant industry. The cost is still high for 100 percent house heating. But water heating systems are abundant and inexpensive. According to Tom Blaskrod, proprietor of Heaven's Heating Unlimited in Bend, Oregon the cost of an active system consisting of 2-4X8 panels to heat water for a family of four is \$3195 completely installed.

Norma Gerardo of Bend who recently had two such panels installed expects a 25 percent savings on her electricity bill. The solar collector perched on her modular home will heat 82 gallons of water. She says, "running out of hot water is the number one problem in mobile homes." She has enough water now to do laundry and the day's chores.

Her greatest incentive for purchasing such a system was saving money on her utility bill as well as the generous tax credit allowed here. She says, "Anything done in preparation for installing the system is included in the tax credit determination." Along with the solar panels she had heating coils installed behind her wood stove to supplement the system. The complete cost including installation was \$3900 through a Bend company.

It is important, of course, to find a reputable dealer. The solar industry is in its infant stage. There are those who are in the business to make a quick dollar and those who sincerely believe in their product and will back it up.

With solar heating still in research stages it may not be cost-effective to install any type of system. According to a NASA study the installation of a solar energy system will pay for itself in four to ten years. Large scale solar heating is still expensive. Warm Springs contracting officer Les Yaw



When the day is cool and overcast coils located next to a wood burning stove can provide heat needed to warm a home's water

says, "It is not cost-effective now. It takes too long to recover the initial investment."

Yaw says, "We're following it very closely. Eventually solar energy will be a real resource for heating. A more effective collector will probably come about."

As far as use in Warm Springs Yaw expresses his opinion by saying, "I don't know how effective solar heating is here, no one knows. We need to get contractors to get involved in it."

Solar energy can provide more than just heat for a house. With the use of photoelectric cells solar rays can provide energy which may be converted into electricity. Currently on the market are small solar collectors to recharge a car battery and a very small collector which if

put in the car window during the day will receive enough charge to operate a flashlight.

Watches and music boxes are also available which run on solar energy. The potential for solar energy seems boundless. "The demand is increasing everyday," commented Heaven's Heating proprietor Flaskenrod.

United States citizens and businesses consume 30 percent of the world's energy. Conservation is necessary along with developing new energy sources to meeting growing demands. Solar energy may be the answer. The energy in the sunlight falling on the United States in one day is equivalent to the amount of energy the United States consumers use in one year. Shouldn't this be utilized?