

trade-offs between the higher installation and equipment costs of a solar energy system compared to the money you will save by using a smaller amount of conventional fuel. However, there may be non-economic reasons for using solar too. For example, people living in passive solar homes report that they prefer the radiant heat emitted by passive storage elements to the heat provided by conventional systems.

Q. Will I Be Able To Get A Mortgage Or A Home Improvement Loan To Install A Solar Energy Domestic Water Or Space Heating System?

A. Obtaining a loan for solar energy retrofit or a mortgage for a new solar home should not pose any special problems. Most lending institutions will consider making solar loans, and some are promoting the use of solar energy by offering better terms for solar loans. If possible, try to secure a loan from a bank that has financed solar energy systems before. As banks become more familiar with solar, their terms sometimes become more favorable.

The Federal Housing Administration will insure mortgages for homes with solar systems that meet HUD standards. The maximum level of mortgage insurance allowed by the Federal Housing Administration (FHA) may be increased by 20% to cover the additional cost of the solar system. In addition, the Farmers Home Administration and Veterans Administration operate loan insurance programs for solar energy systems.

ACTIVE AND PASSIVE SYSTEMS - A COMPARISON

ACTIVE

PASSIVE

Q. Will I Have To Modify My Home Before Installing A Solar Energy System?

A. Probably. Unless your home is very tight (air infiltration is at a minimum) you should add insulation, caulking, weatherstripping, and storm windows. Solar collectors are usually mounted on the roof. Storage tanks or bins are usually located in basements, but they can be placed underground or outside the home. If you add solar equipment to your existing heating system, you may have to allow for piping or duct work connections.

A. As with active systems, you will need to take conservation measures first if your house is not sufficiently sealed against infiltration. The simplest passive retrofit uses one or more south-facing windows. Sometimes existing windows can be used as they are. However, "thermal storage," such as containers of water or a masonry floor or wall, must be added if it's not already present. This will allow some heat to be stored for sunless periods.

Q. Should I Use An Active System Or Passive System?

A. Active systems can be used in either new or existing houses. Although they are easier to install in existing homes, active systems are more complicated and expensive than passive systems.

A. Passive solar energy systems are simple, and less likely to need repairs than active systems. They are best suited to new constructions - where the passive elements can be included in the home's design. However, passive systems can sometimes be added to existing homes.

Q. How Does The Heat Get Distributed Throughout The House?

A. There are basically two ways that the heat from the collector or storage area can reach the rooms of your house. Heat can circulate through a forced air duct system that distributes the warm air. Or it can be circulated as hot water in radiators or baseboard units, with the water being preheated by solar and brought up to the required temperature by the backup system. In many cases, this means that your present heating system can be adapted to distribute solar heat.

A. Naturally, through convection, conduction, and radiation. *Conduction* occurs when heat moves through a solid. If you've ever touched the metal handle of a frying pan while cooking, you've experienced conductive heat transfer. *Convection* is how heat moves through air or water. For example, warm air rises because it is lighter than cold air, which sinks. This is why the second floor of a house is warmer than the first floor. *Radiation* is heat moving as a wave, similar to light. Inside a house, a warmed surface emits heat, (infrared) radiation, that travels toward cooler areas.