



Rooftop solar water heating systems

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If you're considering installing a new solar hot water system on your home's rooftop as an alternative to traditional heating options, then undoubtedly, some of the burning questions on your mind are about the differences between a passive and active solar thermal systems, costs, and pros and cons of each option.

If these numbers seem to cover a wide range, it's because of the wide variety of options available when purchasing and installing a solar water heating system. Here are some descriptions and examples of the different types of systems and how we arrived at the above costs.

The heart of either a passive or an active solar water heating system is the solar collector. This is the part that transfers the sun's energy into hot water. There are three common types of collectors, and the type used will greatly affect the overall cost of having a solar water heating system installed.

The three types are: integral collector/storage systems (ICS), flat plate collector panels, and evacuated tube collectors. We will describe how each works before explaining the difference between a passive system and an active system.

The integral collector/storage system (ICSS) has several large diameter tubes or a black tank inside a sealed, insulated box. It will have a clear cover usually made of one or more layers of glass to let the sunshine directly onto the surface of the tubes and/or tank.

As the dark surfaces absorb the solar energy, the water inside them is heated. It is considered a collector/storage unit because it holds the heated water in its internal tank before it goes into the house.

This is the simplest type of solar collector, and many people have constructed their own. It is also the least expensive type of solar water heat collector and the least efficient too. It is sometimes called a batch collector or batch water heater.

The flat plate collector panel is basically a shallow aluminum-framed sealed box that has an absorber plate with a special dark coating behind a glass cover. Attached to this absorber plate are copper pipes through which the water flows.

This type of collector could be a DIY project if a person is very handy but is most often a purchased product. They are more expensive than ICS collectors, but less expensive than evacuated tube collectors.

The heat pipe evacuated tube collector consists of parallel rows of transparent, double-walled, vacuum-sealed tubes which have a special metallic coating in them to absorb the sun's heat. This heat is then



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transferred to an aluminum fin assembly which heats a sealed copper tube inside each glass collector tube.

The heat is transferred from the hot condenser bulb into the water in the manifold. This hot water then either migrates into a tank above the collector or is sent directly into the house, depending on the configuration of the whole system.

The direct flow evacuated tube collector is sometimes referred to as a "U" pipe collector. It is different from the heat pipe collector in that it has two copper pipes running through the center of each double-walled, vacuum-sealed glass tube.

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