Solar power air conditioner cost

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Solar-Powered HVAC Systems: What You Need to Know

On this overheated planet with its limited electricity supply, the time for solar air conditioners has come. Here"s how to use the sun to keep cool.

The year 2023 is on track to become the hottest ever recorded on Earth. Air conditioning can provide relief from the heat. But if too many people rely on it, the electric grid can’t keep up, forcing power companies to temporarily cut service to millions of households.

Solar air conditioners offer a straightforward solution to this dilemma.

Where I live on the coast of Central California, heat is seldom as oppressive as in Southern California, Arizona, Texas or the Southeast. Seldom doesn’t mean never, though. So as part of the solar upgrade to our off-grid property, we’re looking closely at air conditioning options.

We’re leaning heavily in favor of a heat pump system, because it cools as well as heats, and our solar array should handle it quite nicely. But it turns out there are other ways we could go.

One example: Australia’s Commonwealth Scientific and Industrial Research Organization (CSIRO) is developing a rooftop system that uses the sun’s energy to heat water, which vaporizes and passes through a spinning desiccant wheel to dry out. It then goes through an evaporative cooler and finally into a duct system to cool the house.

The system provides hot water and cool air for the house while using only enough electricity to spin the desiccant wheel and circulation fans. It isn’t a realistic option for us, but it might be for other homeowners.

The most common solar air conditioner design uses photovoltaic (PV) panels to power the compressor and fan. The compressor may connect to indoor evaporative units (think mini-splits) or circulate cool air through a duct system. It draws all its power from the panels, although hybrid units are available that can also use grid power.

In places where grid power isn’t available, a battery can be added allow the air conditioner to operate at night.

Another type, called a solar thermal air conditioner, uses water heated by the sun to drive the refrigerant. Like a compressor, the hot water condenses a refrigerant and drives it into evaporator coils, vaporizing it and

absorbing heat from the house.

This type of unit needs some electricity to operate circulation fans, but not as much as a conventional air conditioner, and it works with smaller panels.

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