Wind vs solar power home

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History shows that advances in renewable energy often follow crises: In the 1970s, oil embargos caused the cost of oil to quadruple, spurring efforts to reduce American dependence on fossil fuels and find alternative sources of power, including solar energy or wind power.? The 2008-09 global financial crisis led to several governments linking part of their economic stimulus to investment in clean energy.? The COVID-19 pandemic led to an unprecedented energy shock, and following in 2021, investment in renewable energy reached the highest levels since the Great Recession.?

Following crises in Europe, Western economies are once again reminded of the importance of energy independence, and demand for renewable energy sources has gone through the roof. Two of the most popular renewable energy sources in the U.S., at this moment, are solar and wind. Will either take charge as a leader in 2022?

Thanks to the decreasing cost of solar, the technology has never been more worth it for homeowners. Its ease for residential use allows customers to reduce their carbon footprint along with their energy expenses. But humans have been using wind for thousands of years, well before the modern wind turbine ever arrived. In fact, wind power accounted for 5% more energy generation than solar did last year.?

So, as we enter the era of renewable energy, will either source of power come out on top? And if you"re considering making the switch to a renewable source of energy, which is better for your needs? Let"s explore.

We"ll start with a little background for color. The earliest recorded evidence of wind energy being used dates to around 6000 to 5000 B.C., when the sail was invented to catch the wind and propel boats.? Over the years, developments in wind power allowed humans to grind grain, pump water, and eventually, around the late 1800s, generate electricity from kinetic energy.

One could argue that solar energy has been used since 700 B.C., when mirrors were used to concentrate solar energy to make fire. But solar cells were not used to generate energy until 1839, when Edmond Becquerel, a young physicist working in France, first observed and noted the photovoltaic effect.? It took more than a century to produce a practical solar panel after Becquerel"s discovery. Solar energy remained in the research-and-development phase for several decades.

Fast forward to 1973 -- oil shocks caused gasoline and oil prices to spike, spreading anxiety about the United States" energy future. U.S. leaders grew increasingly curious about alternative, domestic sources of energy that would reduce dependence on foreign oil.

Coupled with mounting pressure from environmentalists, the "70s saw tangible federal support for renewable energy. To encourage its development, Congress passed the 1978 Energy Tax Act to provide tax credits for

homes with solar panels and fund the development of large wind turbines.? Solar was not cost-effective enough to take off quite yet, but wind turbines caught some modest gains in progressive states.

Over the next few decades, the share of U.S. electricity generation from wind grew from less than 1% in 1990 to about 8.4% in 2020. Solar energy’s share of total U.S. utility-scale electricity generation grew from 0.1% in 1990 to around 2.5% in 2020.?

In 2022, modern solar panels are either installed on a roof or ground-mounted to convert sunlight into energy. Solar panels are made up of photovoltaic cells (or solar cells) that use the semi-conductive material silicon to create an electric current. The electricity that the panels produce is direct current (DC), and it is converted by an inverter into AC electricity, which is what we use to power our homes.

The best solar panels these days average between a power capacity of 250 to 400 watts, and the most efficient solar panels reach efficiency levels around 20%, meaning 20% of the energy that strikes the panel is converted into electricity. A typical solar array ranges anywhere from 10 to 30 solar panels (or more), with the average being around 20 to power an American household.

The average cost of a solar installation is between $20,000 to $40,000, varying with the complexity of an installation, location, and the size and energy needs of a home. This is a steep barrier to entry, and it remains one of the largest challenges to solar"s growth (which is why some companies have began offering ‘free’ options). However, for those able to afford the upfront cost or take out a solar financing loan, solar provides decades of energy savings and can top even $50,000 of lifetime savings in the right location.

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