Five Options of Home Renewable Energy

What’s the first thing that comes to mind when you think about renewable energy for the home? More than likely, you’re picturing big [solar panels](https://www.thespruce.com/options-for-solar-power-at-home-1182573) propped up in someone’s yard or on the roof. Solar panels are great for generating electricity, but they're just one of many alternative power sources for the home.

1. Residential Wind Power

We’ve seen those massive wind turbines, but it's also possible to use wind energy on a smaller scale to power your home. Small wind energy is renewable, clean, and cost-effective. Depending on your location and the type of home [wind system](https://elemental.green/faqs-for-small-wind-systems/)installed, you’ll typically see a return on investment anywhere from six to 30 years. After that, the electricity the turbine produces will be virtually free.

If your main goal is to [lower your electric bill](https://www.thespruce.com/reduce-your-home-energy-cost-1824739), a grid-connected wind system might be ideal for you. Grid-connected systems are cheaper because you can install a smaller system that doesn't necessarily have to meet all of your home's power needs. When your energy demands are too high for your wind turbines, the extra power you need is drawn from the grid. And if you consistently generate more electricity than you need, you could find yourself getting cash back from your utility company.

Additionally, the investment can increase the value of your home, and you might be eligible for some tax incentives. Like many other renewable energy options, small wind turbines qualify for a [federal tax credit](https://programs.dsireusa.org/system/program/detail/1235) of 30 percent in the United States. Other financial incentives might be available through your state or individual utilities, some of which you can find via the [Database of State Incentives for Renewables and Efficiency](http://www.dsireusa.org/).

2. Hybrid

If [off-grid living](https://www.thespruce.com/glam-and-rustic-log-home-designs-4707225) is your ideal scenario, many renewable energy experts recommend a hybrid system of wind and solar energy. Hybrid systems feature both wind turbines and solar panels to double up on the generative power. These systems are the most efficient and reliable, as wind and solar energy tend to be most available at different times.

Depending on the location, [wind speeds](https://www.eia.gov/todayinenergy/detail.php?id=20112) tend to be lower in the summer when the sun shines brightest and longest, and they're higher in the winter when less sunlight is available. Because peak generation for wind and solar systems often occurs at different times, a hybrid system is more likely to consistently produce the energy your home needs.

3. Geothermal

Geothermal energy is derived from the heat below the earth’s surface. This clean energy source supplies renewable power around the clock and emits little to no greenhouse gases—all while requiring a small environmental footprint to develop.

[Geothermal heat pumps](https://www.energy.gov/energysaver/choosing-and-installing-geothermal-heat-pumps) use 25 percent to 50 percent less electricity than conventional HVAC systems, and they can be retrofitted onto existing systems. Plus, because the hardware requires less space than a typical HVAC system, equipment rooms can be smaller. And the components often come with warranties lasting 20 years or longer.

Moreover, a geothermal [heat pump](https://www.thespruce.com/types-of-home-heating-systems-1824772) doesn't have a condensing unit like an air conditioner, so noise outside the home isn't a factor. The system sometimes is so quiet that residents can't even tell it’s running. It's also adept at keeping a home comfortable, as a unit maintains about 50 percent relative indoor humidity.

Shallow ground temperatures are pretty consistent throughout the U.S., so geothermal heat pumps can be installed in most places. Your installer will determine what's best for your home based on the specific geological, hydrological, and spatial characteristics of your land.

4. Microhydropower

For those who have flowing water on their property, the affordability and major returns from a microhydro generator make it a total no-brainer. Even a small stream can generate consistent, clean, dam-free, renewable electricity at a price lower than solar or wind.

A [microhydropower system](https://www.energy.gov/energysaver/buying-and-making-electricity/microhydropower-systems) needs a waterwheel, turbine, or pump to convert the power of water into electricity. First, water is diverted to a water conveyance—usually a pipeline—that delivers it to a waterwheel (or another similar component). The moving water rotates the wheel, and this motion powers the alternator or generator to create electricity. The system can be on- or off-grid and should be able to power a typical large house.

5. Solar Shingles

Say goodbye to giant, cumbersome solar panels. Photovoltaic roof tiles, or “solar shingles,” have become a great option for homeowners looking to lower their electric bills without sacrificing the aesthetic value of their homes.

These shingles are much easier to install than traditional bolt-on solar panels, and they’re certainly more pleasing to the eye. Solar shingles blend with [conventional shingles](https://www.thespruce.com/basic-types-and-cost-of-roofing-materials-1822016) almost seamlessly, and they do their part to protect the roof from the elements. In fact, [Tesla](https://www.tesla.com/solarroof) says its solar shingles are three times stronger than traditional shingles, and the company guarantees them for the lifetime of your house.

[Solar shingles](https://www.energy.gov/energysaver/articles/solar-panel-design-ideas-your-home) cost roughly a third more than the average solar panel installation, but there are [tax incentives](http://www.seia.org/about/solar-energy/solar-faq/what-rebates-incentives-are-available-solar-energy) to help offset the price. A similar, less expensive option could be to install solar skylights. These are see-through solar panels that have the appearance of traditional skylights but generate some energy for your home.

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