

The 8 Best Home Wind Turbines in 2022

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This article has provided a review of the best home wind turbines available on the market as alternative energy sources. As the costs of living increase, more homeowners are looking for ways to reduce costs.

Generating electricity by yourself is an easy way to cut the electric bill in half. Although solar energy is generally an environmentally friendly option, for people living in areas with reliable wind conditions, wind power is an excellent energy resource.

Whether you live in a rural area with no access to an electric grid or in a suburb and want to reduce your electric bill, a home wind turbine is a great choice. All it requires is a little technical knowledge, land, and a high-voltage battery bank. For about \$800, you can buy a mid-range home wind turbine that can easily meet your needs.

Working principle of a Home Wind Turbine

The wind is used to produce a form of useful energy. Wind energy is a type of kinetic energy. Wind turbine takes this kinetic energy from the wind and transforms it into mechanical energy, which can then be converted into electrical power using a generator.

The working principle of the wind turbine is based on turning the energy of the wind into electricity by utilizing the aerodynamic force created by the wind turbine rotating blades. As the wind passes through these blades, the air pressure drops from one side to the side of the blade. So, a pressure difference is created which results in drag and lift forces, similar to flying machines.

The rotor of the wind turbine is connected to a generator via a drive turbine or shaft and gears. The aerodynamic force translates into the rotation of a generator, which then produces useful electricity.

Although according to [Mother Earth News](#), at least one acre of land is needed for the wind turbine to work usefully, it often depends on what wattage you are trying to obtain and also the turbine actual size. However, the important issue that has to be considered while making a decision for the use of a home wind turbine is zoning and local homeowner conditions.

Many of these conditions prevent a user from installing a large turbine powerful enough to run all the household devices in urban areas.

Additionally, the larger space where the turbine is located, the higher the wind speed created and the higher the energy level. Buildings and other constructed objects in an urban yard reduce wind speed that can potentially be used to supply a home wind turbine generator.

But, if you meet the zoning and homeowners requirements, you can still successfully install and employ small wind turbines.

However, if you want to supply your electricity demands totally off the grid, you should consider a combination of wind and solar power to fully power the home, particularly in urban or areas with poor wind conditions.

A parameter that plays an important role in the study of wind turbines is the rating wind speed, which is defined as the speed at which the wind turbine has the maximum output power. For home wind turbines, this value is usually less than 20 m/s. This parameter must be differentiated from [the cut-off and the cut-in wind speed](#).

Home wind turbines usually have a power output in the range of 200 W to 800 W. However, some wind turbines can generate a power output of as much as 2000 W.

To calculate the output of a wind turbine, the following formula is used:

$$\text{Power} = \frac{1}{2} C_p \rho A V^3$$

where:

P and C_p are power output (watts) and maximum power coefficient (a dimensionless variable ranging from 0.25 to 0.45 with a theoretical maximum of 0.59). Also, ρ and V are air density (kg/m^3) and wind speed (m/s), respectively.

A is the rotor swept area in m^2 calculated by the following relation:

$$A = \frac{\pi D^2}{4}$$

D is the rotor diameter in m.

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[What is Wind Turbine? The Short and Essential Answer](#)

Benefits of Home Wind Turbine

There are some advantages to using wind energy for your homes.

Clean and Renewable Energy Source

Perhaps the main reason for investing in wind power is that wind energy is a source of clean and renewable energy. Like solar power, wind power uses an abundant power source that does not require any destruction of land, smoke creation, and overuse of natural resources.

Friendly Energy Source

After calculating the initial cost and of course, commissioning wind power which is relatively expensive, the power of a home windmill is free. You do not need to plug into an electric company to be charged.

Possibility of Installation by Anyone

Note that we are talking about small home wind turbines, not the gigantic ones on the windmill farms. So, most people can install these smaller wind turbines in a few hours or less on their own. The kits come with all the necessary components and detailed instructions for placement, operation, and answers to essential questions.

Safe

In the case of safe installation in which the assigned information and setup meet the conditions of the home and land, these turbines can be securely established.

The main challenge against safety is that the wind turbine may be damaged, and one of its large blades may fall. Then, it may land on someone nearby. This is not generally an issue for home turbines because they are not so huge to cause permanent injury.

However, precautions should be taken to ensure that the blades are not damaged after storms or severe windy conditions.

Drawbacks of Home Wind Turbine

Weaknesses of home wind turbines include the following:

Low Quality of Low-cost turbines

Currently, low-cost turbines have higher quality than those used five years ago. However, they are still more challenging than the good ones made by reliable manufacturers. Remember that cheap products offer cheap warranties, whether or not they are valid.

Also, you should watch out for turbines that are on the approved lists for discount programs.

Many of these are lower quality products by manufacturers who test the turbines and rate them higher than the actual rate to be included in the list.

Lifetime

Wind turbines have lifespans shorter than solar panels which last more than twenty years.

Need for Frequent Maintenance (Heading 3)

As they have many parts, they require frequent maintenance. Thus, a high-quality product is an essential point to consider. However, even if you buy a good product, you need to replace some pieces from time to time.

You should inspect your turbine annually for safety considerations. Also, it is recommended to check additionally after any severe storms or winds.

Read More on Linquip

[Types of Wind Turbines](#): The Quick and Easy Intro

Home Wind Turbine Parts

There are several parts in a full wind turbine kit.

Turbine

Most home wind turbines produced today are similar to those in large wind farms. They include a machine on top of a tall tower with a horizontal axis for installing three blades to rotate a rotor. Blades for home-based units are typically made of a composite material such as fiberglass instead of steel.

The turbine frame is what the other components of the unit are connected to. The amount of energy generated by a turbine depends primarily on the rotor diameter, which determines how much wind can be harnessed by the turbine. A tail placed on the opposite side of the blades holds the turbine facing the wind.

Towers

As stated above, the speed of the wind increases with height. So, the best chance of running a successful wind turbine generator is to install the system on a tower. The higher the tower, the more power produced.

It does not take much cost or attempt to raise the tower height. According to the quantity of power that can be generated, look at this general rule: Raising a 10-kilowatt generator from 60 to 100 feet may cost 10% more, but it can generate 25% more power.

But installing the towers can be difficult. You are faced with a long piece of equipment that must be effectively secured. When you buy a wind turbine kit for home use, you will find that most of them include a tower to build.

There are two types of towers for home wind powers: free-standing (self-supporting) and guyed types. The latter is more common, less expensive, and easier to mount than the other type. The problem is that the guy wires must have a radius of one-half to three-quarters of the height of the tower. Thus, you need ample space to accommodate all the tools.

Self-supporting towers offer a simple approach to conduct maintenance on the turbine. Some self-supporting towers have a tilt-down feature that enables the turbine to be lowered to the ground in hazardous weather such as storms.

Visit [here](#) to know more about the design of a tower of a wind turbine.

Other Components

Except for the two mentioned basic parts, other components depend on your needs. Supplying a battery requires different parts compared to a water pumping system.

It is important to check whether the wind power system is connected to the power grid or is wholly off-grid, or even a combination. Depending on these conditions, you can buy the right package for the user.

Suppose that you need a home wind power generator that supplements the existing energy grid. The components you require are

- a controller
- storage batteries
- wiring
- an inverter for conditioning power
- an electrical disconnect switch
- a foundation for the tower
- a grounding system

Top Home Wind Turbine Reviews

Here, we discuss the best models of home wind turbines in detail.

1. Giosolar 3,000W 48V Hybrid Solar Wind Backup Power Kit



Giosolar 3,000W 48V Hybrid Solar Wind Backup Power Kit (Reference: [amazon.com](https://www.amazon.com))

Pros & Cons

Pros

- • Wind and solar hybrid kit
- • Coming with battery and inverter

Cons

- • More of a power kit for travel than home
- • Without tower for the wind turbine
- • Expensive

Specifications

Rated power	1000 W
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DC voltage	48 V
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Rated speed	450 rpm
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Blades number	5
Rated wind speed	12 m/s
Rotor diameter	2.2 m
Weight	31 kg
Blade material	fiberglass- reinforced plastics

General Description

The Giosolar 3,000W 48V Hybrid Solar Wind Backup Power Kit can generate power for remote regions in all seasons. It is suitable for both household and commercial applications. The 1000 W wind turbine that can generate power during the day and especially night is combined with solar panels to increase the charging capabilities of the battery.

The number of blades of the wind turbine generator is five rather than the typical three. Starting wind speed is as low as 3-2.5 m/s to collect electricity. The kit is assembled easily. It has a low noise level when working and is sealed to prevent the elements from leaving the turbine housing. The packing is made of foam with a wooden case.

2. Eco-Worthy 1,400W Wind Solar Power Kit



Eco-Worthy 1,400W Wind Solar Power Kit (Reference: [amazon.com](https://www.amazon.com))

Pros & Cons

Pros

- • Carbon fiber composite structure
- • 2000 W power capability depending on wind availability
- • Kit including controller, inverter, and a solar panel

Cons

- • No tower
- • No wiring
- • No battery

Specifications

Rated power	400 W
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DC voltage	12-24 V
Rated speed	800 rpm
Blades number	3
Rated wind speed	10.5 m/s
Rotor diameter	1.2 m
Weight	8 kg
Generator material	carbon fiber composite

General Description

The 1,400W Wind Solar Power Kit made by Eco-Worthy includes several basic components to run your wind turbine. The wind turbine generator has three 24-inch long blades with a somewhat larger than 4-foot diameter.

The housing and blades are made of carbon fiber composite to have excellent durability against adverse weather conditions. A combined 24V wind and the solar hybrid controller is in the kit rated at an 800 W capacity for the wind turbine and 1000 W for the solar panel. The inverter takes 24V DC power and turns to standard 110 Volts AC electricity.

It has high module conversion efficiency with an ideal daily output of 2000Wh per day. Starting wind speed is 2.5 m/s to generate electricity.

3. Pikasola 1000W 24V Wind Turbine Generator Kit



Pिकासola 1000W 24V Wind Turbine Generator Kit (Reference: [amazon.com](https://www.amazon.com))

Pros

- • Three-phase permanent magnet synchronous motor (PMSM)
- • Almost 48-inch long blades
- • charge controller

Cons

- • an additional cost for battery
- • Tower is extra
- • One to two-week shipping requirement

Specifications

Rated power	1000 W
DC voltage	24 V
Rated speed	800 rpm
Blades number	3
Rated wind speed	12.5 m/s
Rotor diameter	2.4 m
Weight	29 kg
Blades material	Nylon fiber

General Description

The components of the Pikasola 1000W 24V Wind Turbine Generator Kit are made of nylon/carbon fiber with a blade length of about 48-inch. The material is corrosion-resistant, water-resistant, sand-resistant, and lightweight. The turbine generator has a three-phase permanent magnet synchronous motor. The fully integrated voltage regulator shuts off automatically when the battery is fully charged.

The rotating body of the unit with a yaw adjustment system positions itself automatically according to the direction of the wind. The turbine only has a low starting speed of 2.5 m/s to produce energy. The unique design of the magnetic circuit reduces the starting torque, which can efficiently ensure the breeze starting ability of the wind turbine.

4. Auecoor 1,200 Watt Wind and Solar Power Kit



Auecoor 1,200 Watt Wind and Solar Power Kit (reference: [amazon.com](https://www.amazon.com))

Pros & Cons

Pros

- • Six-foot total diameter
- • starting speed of three m/s
- • 800 W capacity

Cons

- • additional cost for battery
- • lesser role of the turbine than the solar panels

Specifications

Rated power	800 W
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DC voltage	12 V/24 V/48 V
Rated speed	620 rpm
Blades number	5
Rated wind speed	12 m/s
Rotor diameter	1.85 m
Weight	28 kg
Blades material	fiberglass- reinforced plastics

General Description

The Auecoor 1,200 Watt Wind and Solar Power Kit has weather-resistant exterior durability. The wind turbine unit has a capacity of 800 Watts. It features five blades with a diameter of a little over six feet. Also, the turbine has a three-phase permanent magnet motor.

The kit features over-speed wind protection, tip stall protection, and electromagnetic brake. Also, equipment surface protection and plastic coating are other specifications of the turbine unit.

5. Tumo-Int 400W Vertical Wind Turbine Generator Kit with Controller



Tumo-Int 400W Vertical Wind Turbine Generator Kit with Controller (Reference: [amazon.com](https://www.amazon.com))

Pros & Cons

Pros

- • Excellent appearance
- • A vertical axis unit
- • Made of aluminum alloy
- • lightweight and durable

Cons

- • Coming with only the turbine and a controller
- • Expensive
- • Long lead time for delivery

Specifications

Rated power	400 W
DC voltage	24 V
Rated wind speed	11 m/s
Rotor diameter	1.4 m
Weight	26 kg
Blades material	Casting aluminum alloy

General Description

The Tumo-Int 400W Vertical Wind Turbine Generator uses a vertical axis. Although this wind turbine generator is a visually stimulating and beneficial unit, it cannot generate as much electricity as some other models discussed in this article. As this is a vertical wind turbine, it does not need to change the direction according to the wind. Additionally, it decreases the resistance towards the wind.

The main cylinder of this vertical type wind turbine consists of curved scoops that capture the wind along with two curved blades. The generator utilizes a permanent magnet rotor alternator with a specially designed stator. So, the resistance torque decreases efficiently. It starts generating electricity at a low wind speed of 2 m/s.

In each unit, an electric controller is included. But, everything else must be purchased separately. This is the biggest weakness of this attractive wind turbine. However, this home wind turbine is still an excellent choice for anyone with a bit of creativity.

6. Automaxx Windmill 1500W 24V 60A Wind Turbine Generator kit



Windmill Automaxx 1500w Wind Turbine Generator kit (Reference: [amazon.com](https://www.amazon.com))

Pros & Cons

Pros

- • Plenty of power for a home
- • Reasonable price

- • warranty

Cons

- • Customer service may not be of top quality
- • difficult installation

Specifications

Rated power	1500 W
DC voltage	24 V
Blades number	3
Rated wind speed	14 m/s
Rotor diameter	1.7 m
Weight	15 kg
Blades material	Polypropylene and Glass Fiber material

General Description

Automaxx Windmill 1500W 24V 60A Wind Turbine Generator kit is a well-known model. Automaxx offers both 1200- and 1500-watt models as powerful wind generators to provide off-grid energy for homes.

Similar to any larger turbine, this product has to be installed on a tower on a suitable site. Therefore, installing this turbine tower can be a professional project. The 24-volt Automaxx 1500 W is made of polypropylene and glass fiber, a weather-resistant material, as well as a UV-resistant layer coating to slow degradation.

It also features manual and automatic braking to avoid severe wind events. Aesthetically designed blades fit into the environment. This kit includes a one-year warranty.

7. Dyna-Living 500W Wind Turbine



Dyna-Living 500W Wind Turbine (Reference: [amazon.com](https://www.amazon.com))

Pros & Cons

Pros

- • High Quality Blade
- • Good heat Resistance

- • Durable parts

Cons

- Not much easy to use

Specifications

Rated power	500 W
DC voltage	12 V
Blades number	5
Rated wind speed	13 m/s
Rotor diameter	1.3 m
Weight	7.28 kg
Blades material	Nylon Fiber

General Description

The Dyna-Living 500W Wind Turbine blades have copper inlay components that do not degrade the material when the bolt is tightened and may not easily be deformed or broken. In addition, the design of the blade is aerodynamic so that the rotor runs reliably, smoothly, and quietly.

It is resistant to high temperatures and can guarantee the power generation rate. Effective regulation of current and voltage is another feature of the turbine, as well as the high wind energy utilization factor. This wind turbine is well-suited for a wide range of applications, including charging batteries of boats, gazebos, cabins, mobile homes, homes, green windmills, corporate and industrial energy supplements.

8. Happybuy Wind Turbine 600W White Lantern



Happybuy Wind Turbine 600W White Lantern (Reference: [amazon.com](https://www.amazon.com))

Pros & Cons

Pros

- • Easy installation
- • High quality blades
- • Wide applications

Cons

- Relatively large for those who want to use out of sight

Specifications

Rated power	600 W
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DC voltage	12 V
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Blades number	5
Rated wind speed	12 m/s
Rotor diameter	0.9 m
Weight	12 kg
Blades material	Nylon Fiber

General Description

One of the best features of the Happybuy Wind Turbine is its good operation in low-wind areas. With a starting wind speed of 2 m/s, the turbine is able to start producing power immediately. The unique design with the average rotor radius half of a standard home wind turbine allows for installation in tight quarters. So, it is a compact turbine and easy to install in small backyards or even on a roof.

The turbine can also gain energy from the turbulent airflow around constructions and buildings. So, this suits urban environments. The five-carbon fiber blades of the turbine are anti-corrosion and anti-UV. Another significant feature of the turbine is that it is equipped with an automatic braking system to protect the turbine from sudden severe gusts.