



We are a company that supplies products that allow you to be independent of power grids. Our company's offer includes innovative wind turbines with a vertical axis of rotation, solar PV panels, and solar trackers to increase the efficiency of solar systems up to 45%.



Green Energy Solutions as an EU affiliate and trade company provides an individual approach to each client, adapts all its offered products to the needs of the customer and environmental conditions, such as geographical location, insolation, terrain, level of average wind speeds, which makes it unrivaled in comparison to other companies.

The customer who will benefit from our offer by purchasing a hybrid wind turbine + photovoltaic track system and an additional tailored electric generator or using already used (old owned) we can be quite independent of the power grid and we can produce energy for other needs through energy sales or



resale to power networks. They use single products, we can limit the energy demand from public energy networks. Our systems can be used in both individual and commercial installations.



The ECO wind turbine line is one of our flagship product. We produce turbines with powers from 300 W to 19000 W. ECO turbines were created by our team of designers and constructors in close cooperation of Rzeszów University of Technology with a flagship research institution specializing in aviation. The wind turbine allows conversion of 71% (at 0.42 Betz number) of wind energy into electricity. The materials from which our product is made come from 98% from EU producers. A disk generator that converts the kinetic energy of wind into electrical energy has been developed so that it does not have friction elements, thanks to which it excludes inspection and service activities. Turbine blades due to the use of an extruded aluminum profile of seamless monolith construction are characterized by resistance to thermal expansion caused by heating. In addition, white reflective paint with a C5 + M resistance class was applied to the turbines. Additionally, to ensure more effective corrosion protection, steel elements are galvanized and aluminum anodized.



### **The advantages of our wind turbines include:**

- Independent work of the wind direction,
- Simple mechanical construction that allows trouble-free operation,
- The possibility of easy assembly on hotels, stores, blocks, production halls, and other facilities,
- Aesthetic appearance,
- High quality,
- High quality of used materials,
- High durability,
- Vitality
- Silent work,
- Resistance to strong wind,
- The possibility of using an airfoil as an advertising space,
- Relatively lower cost compared to classic windmills,
- A small start speed of around 1 m/s,
- The ability to work in temperatures from -40 °C to +80 °C,
- Resistance to all climatic conditions,
- No friction elements.



Photovoltaic trackers (follow-up systems) are devices that allow for increasing the efficiency of the photovoltaic system by as much as 45% per year thanks to the reduction of losses resulting from the angle of incidence of solar rays. The movement of the panels prevents dust and other impurities from accumulating, which may cause local overheating of the panels. The follow-up system increases the efficiency of the inverters controlling the process of generating electricity from solar radiation. Inverters work best at high load, which is achieved only by using trackers (follow-up systems). Through the use of wind sensors and snow/ice sensors in the control automatics, we protect the tracker from adverse weather conditions. The construction is made entirely of steel and aluminum, is driven by two German K + G actuators and a ring gear designed for reliable operation of the device in extreme weather conditions. Our offer includes trackers from 500W to 10000W

### **The advantages of produced our PV Trackers include:**

- Very high use of sunlight, characterized by the ability to set the tracker perpendicular to the sun at any time of the day,
- Flexible range of motion, for every geographical location:
- Angle of inclination of panels: from 1° to 90°



- Panel rotation angle: from 0 degrees to 350 degrees
- Increase panel productivity by approx. 45% per year,
- Work safety,
- Reduction of the area needed for PV systems installation compared to stationary systems,
- Reliability,
- Resistance to weather conditions,
- Visual attractiveness compared to stationary systems,
- Increasing the efficiency of inverters,
- Protection of panels against settling of dust, dirt,
- Soundless operation of the device.
- The system can be installed without building permits thanks to the foundation on the ground.

The electronics we use allow synchronization with any voltage and frequency of the network in the world. For customer needs, we provide Off Grid, On Grid systems, intelligent systems equipped with a Power Manager driver combining the advantages of two systems of processing the voltage produced. We also prepare systems for heating utility water, energy storage systems in batteries. We work with Polish and foreign companies thanks to which we are able to offer you the best and most effective product / installation. Such companies include Polish manufacturer of inverters and electronics from TWERD Toruń, Solis, ABB Warsaw, Elektronix Warsaw, Victron Energy and others.

Solar PV systems, wind turbines, and trackers manufactured by our company are being blasted out with the highest possible quality. This is confirmed by the strength and efficiency results carried out by the Rzeszów University of Technology at the Faculty of Machine and Aeronautical Engineering, FIRES Slovakia Research Institute, Gliwice Institute of Welding and the Polish Academy of Sciences which set our turbines at the Arctowski Polish Research Station at the South Pole where wind speeds reach 71m / s. Our turbines and trackers have been evaluated by independent research units as products of unprecedented performance and parameters. Thanks to specialized technical and construction personnel and over 20 years of experience in the mechanical industry, our company, apart from the production of turbines and trackers, deals with the Automotive industry used by such companies as Volvo, Volkswagen, Mercedes, BMW, Festo, Caterpillar, and many others.