Windterra Systems Inc. is a company dedicated to creating sustainable solutions to the environmental and economic challenges presented by the growing global demand for energy. Windterra is involved in the engineering, design and manufacture of roof-mounted small-wind turbine systems that give homeowners and other small-application users the ability to generate their own safe, inexpensive, emissions-free power by harnessing an abundant, renewable and freely available energy source.

1. Windterra’s Vertical Axis Wind Turbine (VAWT) is designed to operate in micro-winds as low as 3 metres/second (10.8 km/h, 6.7 mph) and can withstand winds as strong as 53 m/s (190 km/h, 118 mph). The optimal output of 1 kW is reached in wind speeds of 11-12 m/s (39 - 43 km/h, 24.6 - 26.8 mph). Windterra’s VAWT technology employs a unique airbrake system designed to engage when the unit rotates beyond the desired 225 RPM without creating additional noise

Windterra's control system allow the turbine to operate at its most efficient level throughout the wind velocity range (Dynamic Loading). This ensures that the turbine is always producing the most energy possible for a given wind speed without overloading the turbine.

1.

The Windterra Advantage

1. Our blade design optimizes the turbine’s performance at typical lower wind speeds while designs yield a lower annual power output at typical wind speeds.

VAWTs are omni-directional (can instantaneously accept wind from any direction) as opposed to Horizontal Axis Wind Turbines (HAWTs) which have to constantly rotate so that they are facing the wind.

VAWTs are easily roof mountable and are less affected by turbulent air than HAWTs, which make VAWTs far better suited for residential areas where obstacles such as other houses and trees may disturb the airflow. Mounting the VAWT on a roof as opposed to a pole or tower makes the unit more accessible for easy routine maintenance.

Windterra's VAWTs rotate at a much lower speed than the very high speeds of existing HAWTs (225 rpm versus 900 rpm), resulting in much lower noise levels and vibration.

Windterra’s inverter technology provide efficiencies at lower voltages (lower wind speeds) not seen anywhere in the industry.

Windterra's control system allow the turbine to operate at its most efficient level throughout the wind velocity range (Dynamic Loading). This ensures that the turbine is always producing the most energy possible for a given wind speed without overloading the turbine.

Our blade design optimizes the turbine’s performance at typical lower wind speeds. Most designs concentrate on rated wind speed and rated power, which yield a lower annual power output at

typical wind speeds. Windterra's designs focus on generating the most amount of power at typical wind speeds. The result is a higher annual power output - this is what is important to the consumer - annual power output, not rated power!

Windterra ships an all in one, complete system; everything you need to mount the personal wind turbine to residence or commercial building comes in one package!

Windterra's ECO1200 is a complete "all-in-one" wind turbine system, which includes the turbine, controller/inverter, and mounting system.

1.

The Power of Small-Wind Generation

1. People have been harnessing the wind's power for centuries to operate mills, pump water and other perform other mechanical tasks. But it's only been in the last few decades that the technology for converting the wind's energy into electricity has made the necessary strides to become a viable source for large-scale energy production. Most developed countries are currently pursuing wind-energy initiatives to supplement traditional, nonrenewable energy sources.

Denmark, for example, has made such advances in building wind-power capacity and infrastructure that wind now provides almost 20 per cent of the country's electricity needs. According to the Global Wind Energy Council, Canada increased its installed wind energy capacity by 113 per cent in 2006, bringing it up to 1,459 megawatts – enough capacity to provide the energy needs of nearly a million households, while preventing the emission of 3 million tonnes of carbon dioxide a year. This is welcome news for people concerned about rising energy costs, the depletion of nonrenewable resources and global climate change driven by greenhouse gas omissions.

Unfortunately, most advances in wind-power technology have focused on large-scale applications that are simply not affordable or practical for individual users who want to establish their own energy independence, while reducing their energy costs and their impact on the environment. For the committed green consumer, choices have been few – buying into wind power meant investing in a horizontal axis wind turbine (HAWT), the purchase, installation and maintenance of which carried a prohibitively high price-tag. For city dwellers with no place to erect a HAWT, wind power has not been an option at all.

The vertical axis wind turbine (VAWT) provided a more economical alternative for domestic applications, but traditional designs were inefficient compared to HAWTs and presented a number of other practical problems, from their inability to self-start in light winds to issues around noise and vibration levels.

But things are changing. With the development of the ECO1200 VAWT, Windterra Environmental Systems is poised to change the face of green energy by providing consumers with an affordable, efficient, hassle-free small-wind power generation system. The ECO1200 utilizes innovative technology to operate in winds as light as 3 m/s (10.8 km/h, 6.7 mph), with a unique, silent braking system that prevents its turbine from rotating in excess of 225 rpm, thus

reducing the noise and vibrations that to traditional VAWTs impractical for home use.

The ECO1200 comes ready to mount on the roof of almost any home or small office building, removing the need for custom tower or pole installations that can double the cost of other small-wind generation units, and making the VAWT easily accessible for routine maintenance.

Best of all, the ECO1200 provides more than 1,600 kwH (based on average wind speed of 5 m/s [11.18 mph]) of emissions-free electricity per year, enabling consumers to become more energy independent, save money on their utility bills and reduce their personal carbon footprints by harvesting the free, abundant, nonpolluting energy provided by the wind.

Product

ECO 1200 1 kW Vertical Axis Wind Turbine

The Windterra ECO1200 Wind Turbine is a revolutionary Vertical Axis Wind Turbine (VAWT). Thanks to its advanced technical design, the ECO1200 is ideally suited to both rural and urban installations, generating green energy from a freely available source -- the wind! Wind generation provides a viable solution for addressing such issues as the increasing demand and cost of power, and directly addresses world environmental issues.

The advantages of the Windterra ECO1200 Vertical Axis Wind Turbine system are in its revolutionary design:

Omni-directional: The ECO1200 can instantaneously accept wind from any direction as opposed to HAWTs (Horizontal Axis Wind Turbines, which require an on-board motor to rotate the unit relative to wind direction.

Turbulent-wind friendly: The ECO1200 is easily roof mountable and is less affected by turbulent air, making ECO1200 suited for areas where houses and trees may disturb airflow.

Low rotation speed: The ECO1200 rotates up to 200rpm during normal operation and has a maximum rpm of 270.

Industry-leading annual output: The ECO1200 blade design is optimized for performance at typical lower wind speeds. The result is a higher annual output which makes the ECO1200 a cost effective choice for green energy.

All-in-one system: The ECO 1200is a complete power-generation package, including turbine, controller/inverter, and mounting system. This system can typically be installed and ready to use in four to five hours.

Roof-top mounting: The ECO1200 is designed for roof top use, eliminating the need for a pole or tower installation that significantly increase cost and complicate routine maintenance.

Technical specifications:

TURBINE
Three-blade Vertical Axis Wind Turbine
Rated at 1,000 W @ 11m/s (24.6 mph) Wind Speeds
Total Output at 4.5kWh / DAY with 5 m/s (11.18 mph) Wind Speed (Rayleigh Distribution)
Physical Dimensions: 2.25m (H) x 2.66m (D) [88.58" (H) x 104.72" (D)]
Weight: 140 kg (308.65 lb)

MOUNTING
Adjustable Mounting for any Variable Pitch Roof
Weight: 51 kg (112.44 lb)

INVERTER
Continuous Rated Output Power: 1,200 Watts
Continuous Output Voltage: 120 VAC
Dynamic Loading: Peak Power Tracking Algorithm
Distortion: Less than 5 per cent (2.5% typical)
Efficiency: 94 per cent (max.); 85 per cent (min.)
Temperature Operating Range: 0-60 degrees C (32-140 degrees F)
Altitude Operating: 4,500 m (15,000 ft)
Grid-Tie Interface: Compliant to regulations

*Regulatory Approvals
- UL Listed to UL1741 Inverters, Converters, and Controllers for use in independent power systems
- CSA 22.2 No 107.1 Standards Commercial and Industrial Power Supplies

Frequently Asked Questions - FAQ

What is Windterra?
Windterra Systems Inc. (Windterra) is committed to the design, prototyping, and production manufacturing of small wind turbine systems for home and light industrial use. Windterra was incorporated in 2003 and is headquartered in Calgary, Alberta, with a test facility in Kelowna, British Columbia.

What is unique about Windterra's products?
Windterra is delivering a new paradigm for green energy – small wind turbines! No one has an "affordable" small wind generator for the residential and commercial markets. There are wind generation products, but they are usually Horizontal Axis Wind Turbines directed more towards farm/rural market, requiring a tower installation for greater speeds and laminar wind-flow.

The Windterra roof-mounted VAWT has a number of distinct advantages over costlier HAWT systems:

1. VAWTs are omni-directional (can instantaneously accept wind from any direction) as opposed to Horizontal Axis Wind Turbines (HAWTs), which have to constantly rotate so that they are facing the wind.

2. VAWTs are easily roof mountable and are less affected by turbulent air than HAWTs, which make VAWTs far better suited for residential areas where obstacles such as other houses and trees may disturb the airflow. Mounting the VAWT on a roof as opposed to a pole or tower makes the unit more accessible for easy routine maintenance.

3. Windterra's VAWTs rotate at a much lower speed than the very high speeds of existing HAWTs (225 rpm versus 900 rpm), resulting in much lower noise levels and vibration.

4. Windterra's inverter technology provide efficiencies at lower voltages (lower wind speeds) not seen anywhere in the industry.

5. Windterra's control system allows the turbine to operate at its most efficient level throughout the wind velocity range (dynamic loading). This ensures that the turbine is always producing the most energy possible for a given wind speed without overloading the turbine.

6. Our blade design optimizes the turbine's performance at typical lower wind speeds. Most designs concentrate on rated wind speed and rated power, which yield a lower annual power output at typical wind speeds. Windterra's designs focus on generating the most amount of power at typical wind speeds. The result is a higher annual power output - this is what is important to the consumer - annual power output, not rated power!

7. Windterra's products will incorporate grid-tie, solar inputs, as well as optional battery charging capabilities.

8. Windterra's ECO1200 is a complete "all-in-one" wind turbine system, which includes the turbine, controller/inverter, and mounting system.

What is the average electrical consumption of average home/year?
The average household consumes 9,000 to 12,000 kWh /year.

What is the ECO 1200 output/year?
The output would be 1,642 kWh per year in 5 m/s (11.18 mph) mean wind speed, using Rayleigh Distribution of wind (the recognized method of calculating annualized output of the turbine).

What is the effect of the ECO 1200 on carbon footprint reduction on an average home?
Based on the U.S. average fuel mix, approximately 1.5 pounds of CO2 is emitted for every kWh

generated. Therefore the ECO 1200's annual production of 1,642 kWh would save 2,463 lbs (1.12 tonnes) of CO2 emissions per year.

What's their track record for performance and longevity in different applications?
Windterra has thoroughly tested several units on residential buildings and we will continue to test and gather data to ensure optimal design and performance for our customers.

What regulatory approvals have been achieved?
UL Listed to UL 1741 Inverters, Converters, and Controllers for use in independent power systems; CSA 22.2 No 107.1 Standards Commercial and Industrial Power Supplies.

Is there sufficient lightning protection?
There is no protection on the unit itself. Usually if a home is in an area prone to severe lightning, a grounding system will already be in place for the home.

How easy are they to install?
It will take two professional installers approximately five hours to complete most installations. Professional installers, approved by Windterra or our authorized resellers, will be responsible for the installations.

How much service is offered with the turbine?
The standard limited warranty on the units is three years. Since these units do not have a gearbox, they are relatively maintenance free. It is recommended that they be inspected every six months. Windterra offers an on-site service contract at an additional cost through our reseller network. For customers who do not purchase the service contract, they will be on a time-and-materials service level.

Do you need to buy the tower, electronics, and other components separately or are they all included?
Everything that is required to mount the unit on the roof of a residential or light industrial building is included. Additional wiring and small parts will be supplied by the electrical contractor who connects the system to the electrical panel of the home or commercial building.

How do I purchase a Windterra small wind generation system?
Windterra Eco Systems will be sold and supplied through our reseller network and customers will be able to place orders on line through our website. Payment for these direct purchases can be done using any major credit card. If a customer wants to order multiple systems there are price breaks at ten or more units. The customer will be able to choose the installing reseller from within their area. The installation fee will be negotiated separately with the installing Windterra reseller – the installation cost can vary according to electrical panel location and other extenuating circumstances.

How easy will it be to get replacement parts now and in 10-15 years?
The replacement parts are easy to obtain now and we will keep legacy parts for minimum of ten years.

What quality of AC power does the inverter produce?
Pure sine-wave utility grid quality power.

Does the manufacturer offer any technical support?
Windterra will provide technical support to our reseller network. Customers would obtain support from their installing Windterra reseller.

Are there special permits required before installing the units?
Depending on Country/State/Province by-laws these requirements may vary. Usually Windterra's authorized resellers would apply to the public permitting agency to acquire the permit to mount the unit. They would want to have the schematic of the roof mount system. A second permit may be required from the local electrical company, in which case you would need to provide a Windterra electrical line drawing.