

Vertical axis wind turbine for slow and changing wind speed

Our partner a Hungarian company developed a small vertical axis wind turbine with booster and regulator system to balance out the energy production. The company is interested in IP licensing or selling.

BACKGROUND:

The objective of the development was to find a solution to make the winds work in the speed ranges where other solutions are unable to work efficiently. There is no efficient solution for utilizing small winds and also the changing direction can be a difficulty. Simultaneously – even in the low average wind speed areas – there are high wind gusts that are hazards for most of the existing turbines. The changing direction and changing speed – especially the short time wind gusts – can result regulation problems and/or the stopping of the large turbines or even for the small horizontal axis turbines that are faced to the prevailing winds.

OVERVIEW:

This innovative technology is capable to utilize the low and scattered winds and to control the high winds, hence no need to stop the turbine in strong winds.

- **Regulator:** In order to protect the system in extreme winds, the system will open its valves over a certain level of wind speed and the inlet wind utilizes gusty winds.
- **Booster:** The all-round booster enables the wind turbine to accelerate 7-10 times the inlet wind speed from any direction

This provides balanced energy production, and - in case of multiple installed equipments - effective and scheduled supply to the grid.

The company is not competing rather completing the still existing wind generation technologies. It is providing energy for smaller communities in the areas where the average wind speed makes uneconomic the large turbines

POTENTIAL APPLICATIONS:

The wind turbine can be installed on:

- Elevated structure (the high wood or steel platform provides underneath storage area and easy access for maintenance)
 - The top of high buildings and to hill slopes
 - Existing wind farms where the wind conditions are known and the needed infrastructure is available and can be further utilized
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With this variety of placement the wind turbine is perfect for:

- complementary energy production tool for existing horizontal axis wind farms
- producing energy for flood protection, irrigation, military bases, etc.
- rural areas to produce the energy that is unavailable or unreliable
- community focused energy source e.g. for electric “filling stations”



CUSTOMER BENEFITS:

- Long life span
- Easy to install
- Low maintenance cost
- Simple, modular construction
- Depending on the volume of consumed annual; the estimated production can meet the demand of 4-10 families

ADDITIONAL TECHNICAL INFORMATION:

The estimated energy production of the technology is the function of the average wind speed (and the number of windy hours). The figures below show the results of a short simulation at different wind speeds and the Weibull distribution.

Windy hours/year 6740

Average wind speed m/s	3,3	3,4	3,64	4,1	4,5	5,2 and above
Produced energy MWh/year	8,1	8,8	10,7	11,9	11,6	20,7

The 5.2 m/s value in the table demonstrates the down control to limit the revolution of the rotor and by this

- increasing the lifetime of the equipment and
- achieve even and reliable energy production.

TECHNOLOGY READINESS LEVEL:

Prototype is ready in Hungary. Drawings available for production/further development.

INTELLECTUAL PROPERTY STATUS:

European patent pending for 28 European countries.

TYPE OF COLLABORATION:

- IP sale
- Licensing

If you are interested, please respond to:

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