

The logo features a stylized blue wind turbine with three blades, set against a blue background with a subtle pattern of wind turbines. To the left of the logo is a vertical line drawing of a wind tower structure, and below it is a smaller line drawing of a vehicle or component.

# WIND TOWER

Advanced Power generation system

Master the power of wind. A new efficient way to capture wind gave birth to a new energy source.



The World's First  
WIND TOWER  
Power Generation



Innovative WIND  
TOWER Power  
Generation



Wind Tower Construction Plan

<http://www.zenasystem.co.jp/en/>



## The World's First WIND TOWER Power Generation

### WIND TOWER: Master the power of wind.



Since 1000 BC, human beings have been considering wind as an important source of energy. These days, more and more people are interested in wind as a clean, non-polluting and unlimited energy source.

Until now, wind power generation systems have been considered as an inefficient method. Their efficiency depended on variable factors linked to the nature of wind. They could receive wind from only one direction.

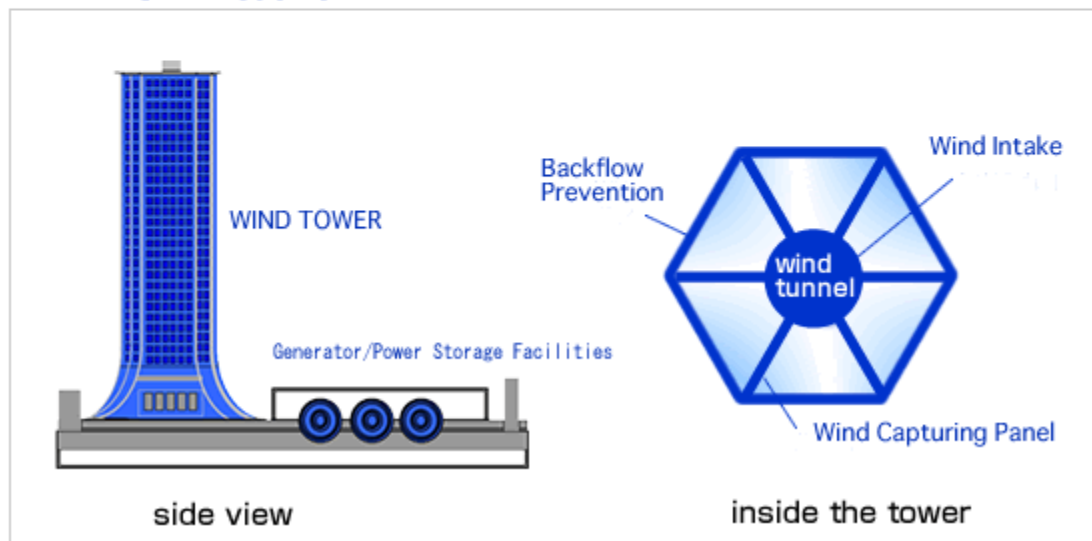
### ZENA System's innovation.

Wind is irregular. It can blow from any direction, at any strength. Zena System's research was based on how to collect efficiently this irregular source of energy. The answer is a system that collects wind from every direction, anytime and at any speed (wind tunnel theory).

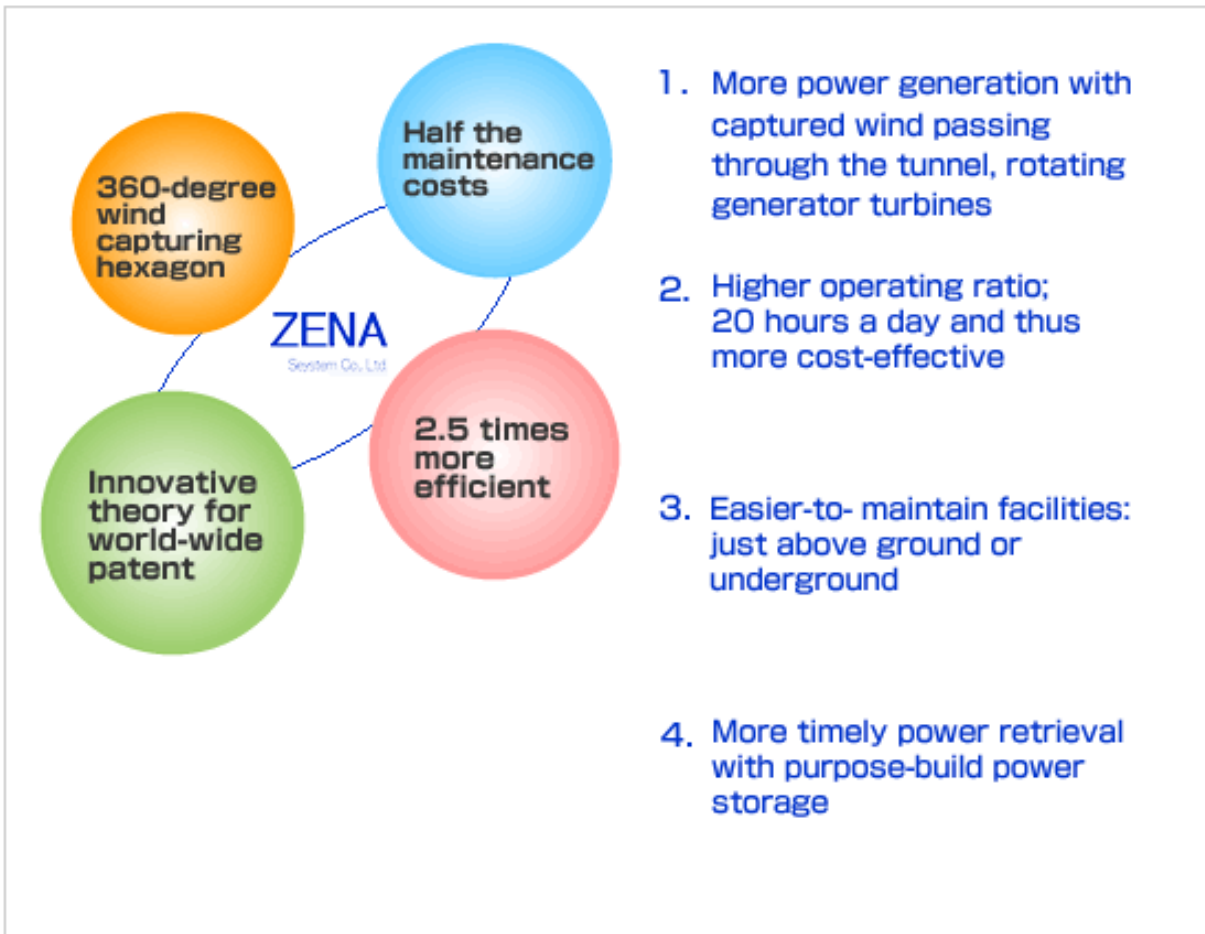
The Wind Tower is hexagonal and can collect wind from any of its six faces, at any height, at any speed. Once inside the Wind Tower, collected wind is compressed and accelerated through the installation.

A new efficient way to capture wind gave birth to a new energy source.

### WIND TOWER outline



## Comparison of WIND TOWER with Windmills



## Safe and easy-to-customize Power Storage Battery



ZENA has developed its own power storage system, deemed the next-generation storage battery, enabling easy storage/retrieval

This safe liquid battery, posing no threat of fires, utilizes vanadium concentrate solution diluted with nano-water and pure water.

The anode/cathode tanks have vanadium solution circulated with a pump to the battery cells (ion-exchange membrane), thus charging and discharging

## Totally Innovative Wind Power Generation

### Conventional Propeller-Type Windmills are Costly



Trouble-ridden windmills

Propeller-type windmills are currently used in the world, and Japanese local governments also promote windmill power generation thanks to its "eco-friendly" image. However, its share is below 1% of the total electricity production.

Due to its inefficient wind energy conversion, wind turbines are far from cost-effective, plus causing noise pollution.

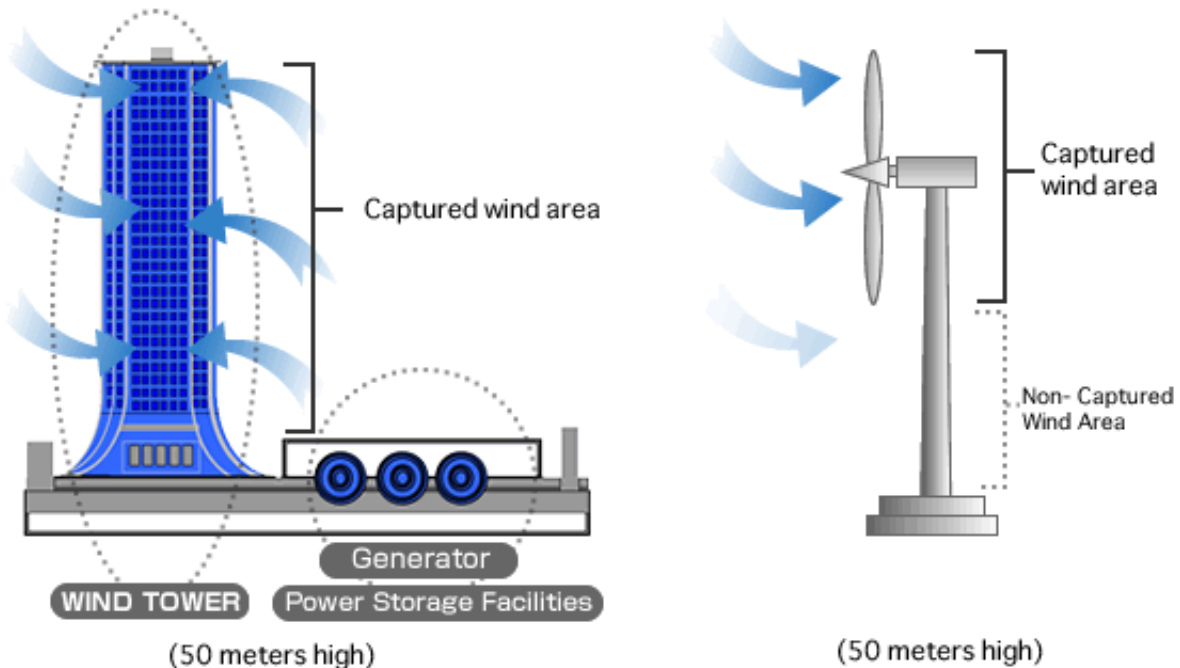
Large-scale windmill power generation systems have originated in Europe, and it makes daily maintenance difficult and trouble-shooting costly, causing some windmills to cease their operations.

### Totally Innovative WIND TUNNEL Power Generation

ZENA's WIND TUNNEL power generation system also utilizes inexhaustible wind just as the traditional windmill, both producing no CO<sub>2</sub>, the culprit for global warming.

ZENA's wind-capturing system, however, is radically different from the propeller-type windmill.

### Comparison of Wind-capturing Surface Area between ZENA's WIND TOWER and the conventional windmill

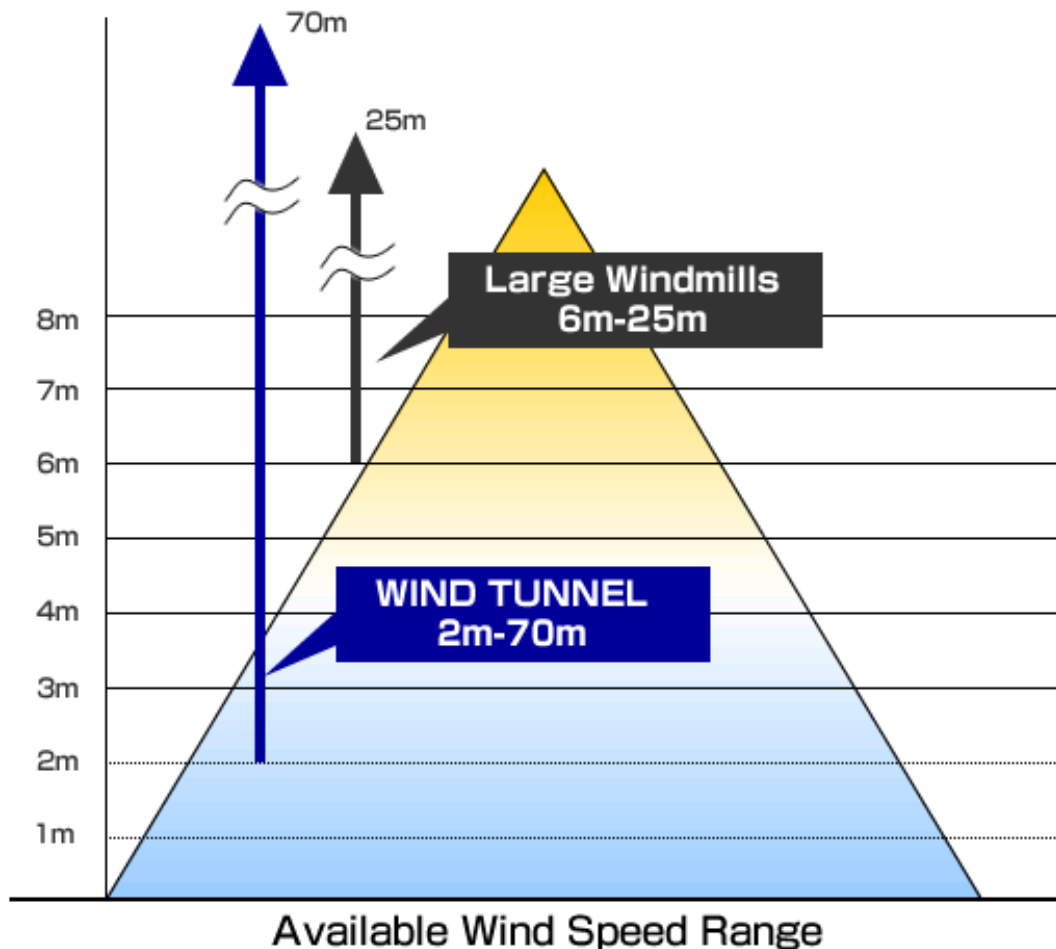


\*WIND TOWER: Height:40-120 meters. Diameter:9-30 meters.

Efficient, 360 degree-wind capturing

Only blades capture wind

	<b>WIND TOWER (TUNNEL)</b>	Propeller-Type WINDMILL
Wind Capture	Wide surface captures wind going into the tunnel	Only small blades capture wind.
Blade	Turbine blades installed underground. free from damage	Blades subjected to constant swinging motion
Lightning	Only the WIND TOWER is above ground.	Prone to lightning-related problems
Maintenance	The underground generator easy to maintain	Maintenance work done at high places, subjecting workers to danger
Cost Effectiveness	Plural generators produce much electricity	Cost efficiency low
Eco-friendliness	No rotating blades above ground cause no bird strikes	Causes bird strikes
Expandability	Can be used as restaurants, observation decks, heliports	Only used for power generation
Appearance	Any color chosen to fit the surroundings	No choice in color selection



## Going Global with International Patent (PCT)

### Application with Patent Cooperation Treaty Organization



International patent application with PCT, once granted, gives the applicant the same patent rights in all 179 PCT member countries as if individually applied.

ZENA applied to the organization on WIND TUNNEL power generation in December 2006.

The assessment report from Patent Cooperation Treaty Organization has given Zena's core technology Triple A in all three categories; patentability, inventiveness, and commercial feasibility.

No documentation on WIND TUNNEL ever existed nor have patent applications been made. ZENA reaches out to the world with WIND TUNNEL power generation, thus contributing to reducing CO2 emissions.

\*Ref. PCT: [Global Patent Application \(Courtesy: the Japan Patent Office\)](#)

### ZENA's Patent Ownership Status

2005/6/16	Domestic application
2006/12/20	International application with PCT
2006/12/28	Domestic patent publication
2007/01/30	Assessment Report from PCT Organization
2007/12/18	Additional patent application to PCT
2008/06/26	International patent publication
2009/06/10	Transfer application in 24 countries

### ZENA's Patent Status

ZENA' WIND TUNNEL power generation is a trademark registered in Japan and its patent is open to the public.

Please refer to the Japan Patent Office Website (Industrial Property Digital Library) for details of ZENA's patent. (Domestic patent publication, 2006/12/28)

\*[The Japan Patent Office Website \(Industrial Property Digital Library\)](#):  
<http://www.ipdl.inpit.go.jp/homepg.ipdl>

## Overall View of WIND TOWER



*\*Click here for larger image*

1. **WIND TOWER (hexagonal, 50m high, 27m in diameter)**
2. **Power Generation Facilities**
3. **Power Storage/Control Facilities**
4. **Administration/Commercial Area**
5. **Administration/Commercial Area**
6. **Training Center**
7. **Total Area:13,000 square meters**

*\* The tower can be built any place where over 3-meter wind blows.*

*\* The facilities may be used for commercial purposes.*

*The facilities built on an isolated island may have a desalination plant.*