

Taiwan SWT Brief & Hi-VAWT Wind System



Presented By

Hi-VAWT Technology Corp.

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About Taiwan

Source: IDB/MOEA

The Worldwide Top 1

- Steel nuts, 6.6 Billions Nuts/Year
- Bicycles
- Hand Tools
- Power Chairs
- Hardware of Information, Telecommunication, Computer
 - Switching Power Supply
 - Liquid Crystal Display (LCD)
 - Laptop Computer (NB)
 - Wireless LAN
- The Top 4 grant of the US patents.
(Behind the United States, Japan, and Germany)

Area: 36K km²

Coast line: 1,566 km

People: 23M

Work hr: 48/wk

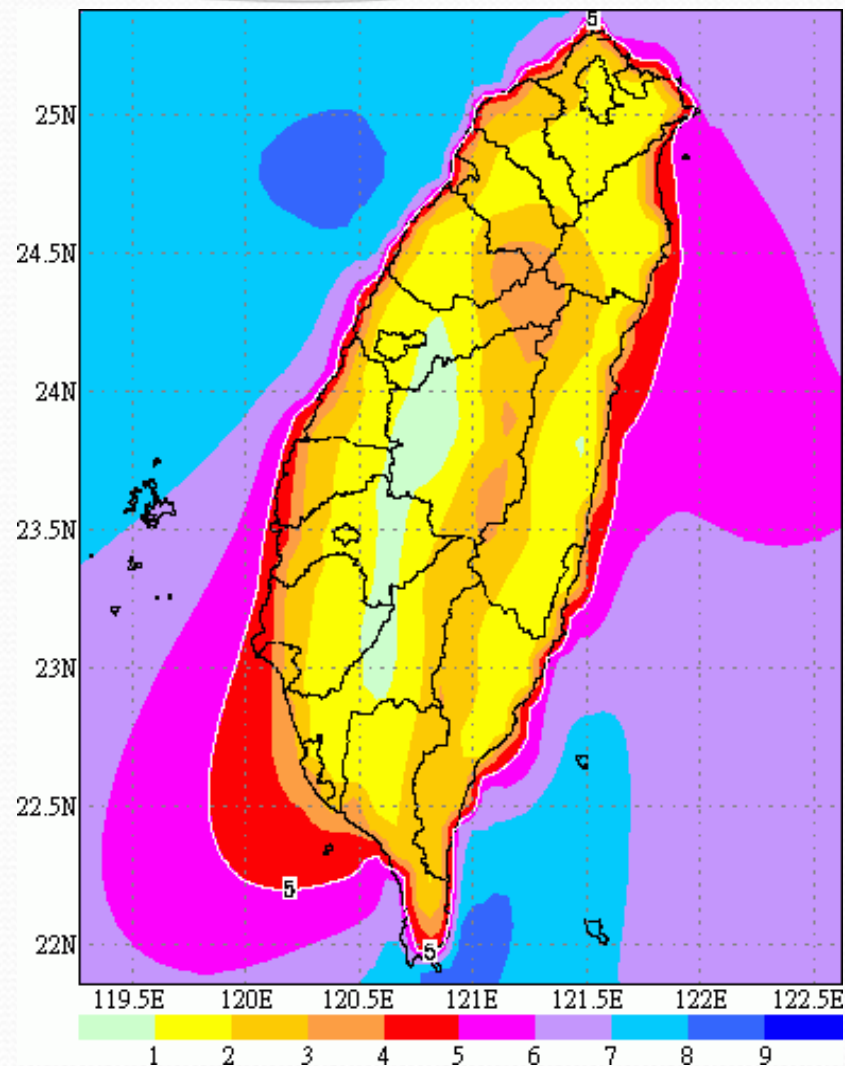


Windy Taiwan



Country	Estimated average Full load hours per year	Estimated Average Capacity factor
Unit	Hours	%
UK	2,880	32%
Taiwan	2,800	30%
Denmark	2,250	26%
China	2,100	24%
USA	2,000	23%
Germany	1,880	21%
World avg	2,000	23%

Typhoon Hazard 3-4 per year, Summer to Autumn



Taiwan Average Wind Speed (m/s),
10m above sea level

Taiwan Renewable Energy Incentives

- No grant program for Small Wind Turbine Installation yet
- In Feb 2010, A premium loan interests rate at **1.985%** for the business renewable energy investment but household, total fund **US\$ 645 Million**
- In July 2009, Feed-in-Tariff program on the road

Items	2010 FiT (£/KWH)
1KW-10KW Solar PV	23.1 p Plus grant: US\$1,500/kW
10KW-500KW PV	26.8 p
500KW PV	23.0 p
1KW-10KW SWT	15.0 p
Electricity rate	6.3 p
>10KW SWT	4.9 p
Off-shore LWT	8.7 p
Water	4.3 p
Geo-thermal	10.7 p
Bio-mass	5 4.3 p

Facts and Resources of Taiwan

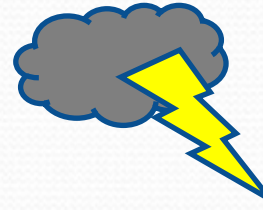
Low electricity rate supported by export-driven economic policy



Low export cost



Paradox of Peak Wind Season in Winter and Peak Electricity Consumption in Summer



Increasing demands of Complementary power

Government Incentive Solar PV > SWT



Typhoon Hazard 3+ times, Summer to Autumn per Year



Good for SWT testing & verification

Taiwan SWT Market Brief

- In 2009, sales of SWT is NT\$45M and 68% export in 2009
- In 2010, the expected sales US\$100M, 230% YtoY growth rate
 - Ready to phase into commercial operations
 - Increasing worldwide demands and orders
 - The expectation of FiT and more incentive program

TW SWT Market Size	2009	2010
Sales (NT\$)	45M	150M

Source from: Taiwan small wind & middle wind turbine association

Taiwan Wind Turbine Industry

SWT industry	Type	Company	Power
Systems (11)	VAWT	3	300-5KW
	HAWT	8	100-150 KW
Parts (32)	Blades	7	>600KW
	Generator	4	1k-3MW
	Gearbox	4	10K-600KW
	Axis	common	>600KW
	Grid-tied inverter	4	>600KW
	Monitoring	3	1-10KW
	Pole and Tower	common	>600KW



Hi-VAWT is the first MP-ready VAWT System Company with CE certified commercial product ranges from 300w to 3000w in Taiwan.

The Leading HAWT Developed in Institute of Nuclear Energy Research (INER)

25kW
**(25m tower,
blade dia. 13m)**



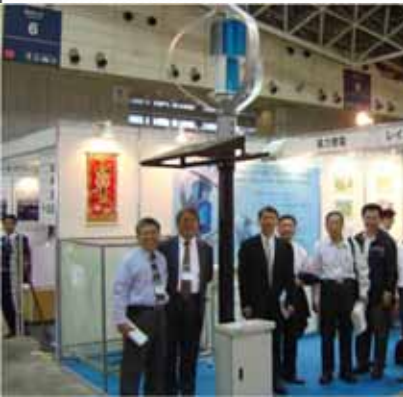
150 kW
(blade dia. 25m)

The Leading VAWT Developed by Hi-VAWT

Commercial model ranges from 300W to 3KW

3 KW

300W



Company Profile

Establishment: January 20, 2005

Name: Hi-VAWT Technology Corp.

Company Logo: The HiVAWT logo, which consists of the word "HiVAWT" in a stylized font with a blue and yellow color scheme and a green dot above the 'i'.

Core Business: Design & Manufacture of VASWT

Capital: US\$ 4,000,000 by April 2009.

Business Item: Design & Manufacture

Current Employee Number:

-Taiwan: 19 persons

-China: 25 Persons

Design in TW, MP in China

Taiwan Linkou

- Function: R&D, Operation center & Production
- Factory space: 1,250 sq meters
- Monthly Production Capacity: 200 sets DS3000

China Kunsan

- Function: Mass production
- Factory Space: 7,000 sq meters
- Monthly Production Capacity: 1,000 sets DS3000



North American VASWTs under developing



Low Power Efficient Blades



Clean Field/Canada
motoring start



Quietrevolution/UK supply the 1st 2.8kW turbine in 2008



Ropatec/Italy changed design entirely in year 2007

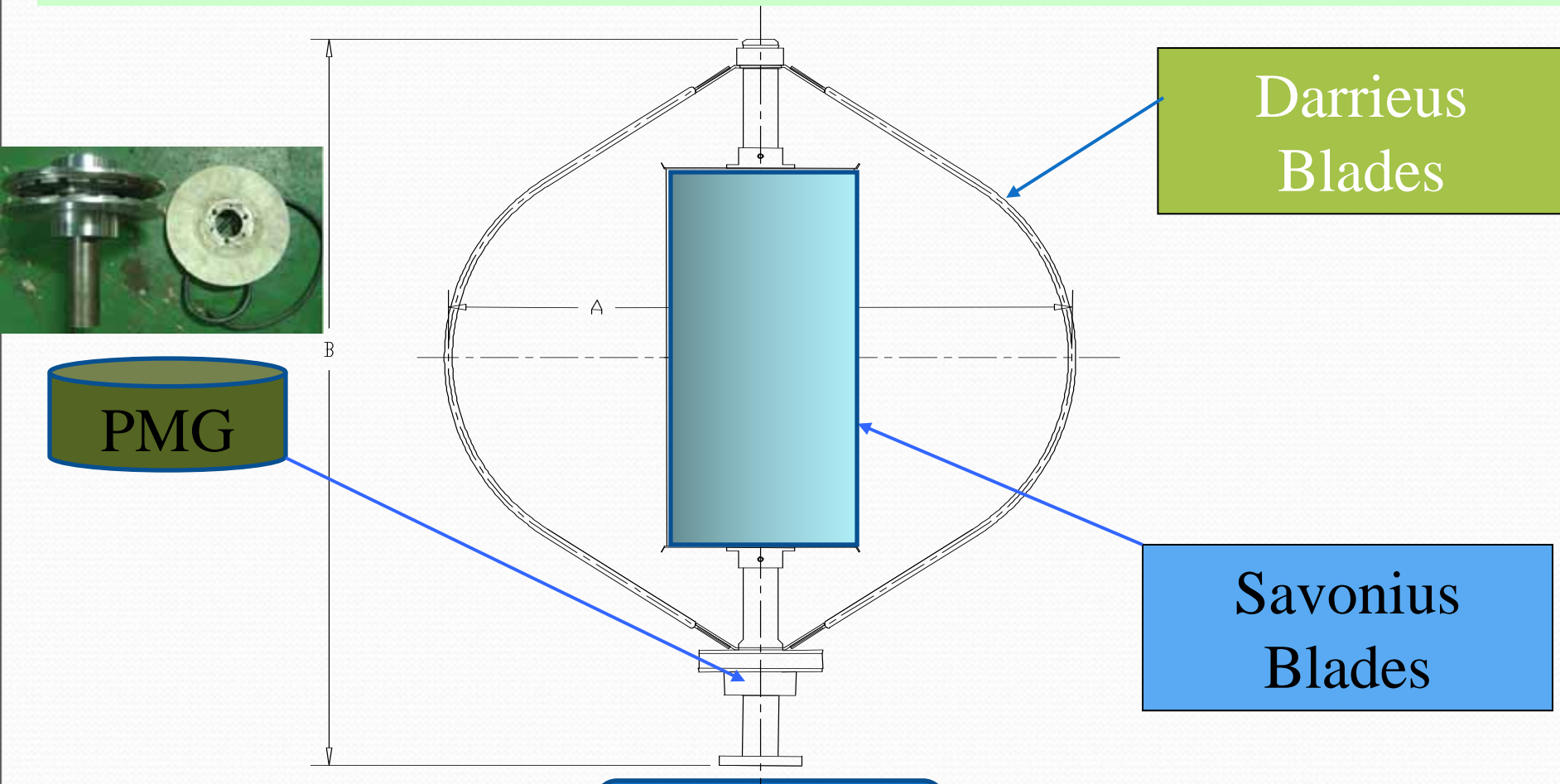


Turby/Hol.
Has claimed
to start
commercial
supply for
more than 2
years but
not.

The Innovation of Hi-VAWT Small Wind System

Hi-VAWT Wind System

Low cut-in + High Cp + Durable ME + SMART power



Specific MPPT, ABS, Rectifier Technology

General Specifications

Product		300W	700W	1.5kW	3kW	5kW	10kW
Size (m)	A	1.0	1.6	2.8	4.0	5.5	7.0
	B	1.2	2.0	3.2	4.5	6.2	7.7
Gen.		Direct Drive, Coreless PMG, Outer rotor type					
Converter/ Inverter		Stand-alone battery storage system		Dynamic grid-tied power control system			
Cut in WS		<3m/s		Cut out WS		15m/s	
Rated WS		12m/s		Survival WS		60m/s	

Black is commercial available; Green is to be available in late 2010

Hi-VAWT vs Japanese VAWTs

	E&E 	Shinko 	Hi-VAWT 
Rotor Design	D+S Hybrid	D straight Blade	D+S Hybrid
Tech. Source	Waseta University	Own-developed	Own-developed
Commer. year	2003	2002	2005
Commercial	750W~20kW	340W~1.5kW	300W~3kW
Model No.	HW-5A	WK16-09	DS-300
Rated Power	750W	340W	300W
Weight	300kg	37kg	25kg
Swept Area	2.1m ²	1.5m	0.657m ²
Cut in WS	2 m/s (Motoring Start)	4m/s (Motoring Start)	2.2m/s
Rated WS	1 3m/s	1 2m/s	1 2m/s
Cp	27%	21.8%	30.9%

Designed to Live with Natural

Hi-VAWT solutions

- Low Wind Self-Start
- Good wind direction adaptability
- Dynamic Silence
- Typhoon-proof ABS



Applications and Examples

DS-300 in Expo 2010 Shanghai China



Hybrid Street Lamp in Taiwan



Hsinchu



Taipei

Taipei



Taoyuan

DS-300 ,2007.03



New Zealand



Australia

DS300 For Boat UPS Charging





DS-300 for Hybrid Monitoring System
2009/2 Incheon Water Supply Corp., Korea

Outlet WP Blower Gen system

400W Gird-tied Wind Power Recycling System



LCD Fab, AUO, Taiwan

Grid-tied DS-3000 on Top of Building



DS-1500, Japan

DS-3000 in Korea

Installed by Samsung Construction Korea ,2008/10



Remote Telecom Station



1.5kW(WP) + 1.5kW(PV)



300W(WP) + 200W(PV)

2009/4 , SKT Korea

DS-3000 for Remote Island



DS-3000 , India Resort

2008/4, India



Dynamic Landscape

2009/2, Museum, Taiwan

2008/10, Bridge, Taiwan



DS-3000, Advertising Board

2009/7, Austria





Grid-tied DS-3000 in Hub

2009/6, Dallas USA





HIVAWT Patents (20+)

- Patent pending since April 2008 in USA, Germany, UK, India and Korea



CE Certificate

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Electronics & Communication Services
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SGS

Certificate No: ED20078661C

VERIFICATION OF EMC COMPLIANCE

SGS-TW Reference No: ED20078661C

Model No.	DS-3000G
Serial Model No.	DS-3000G DS-1500G DS-1000G DS-1000G DS-1200G DS-400W DS-400WP
Product Name	Vertical Axis Wind Turbine Power Generation System
Applicant	H Energy Technology Co., Ltd.
Address of Applicant	No.158, Zhulin 1st Rd., Linkou Township, Taipei county, 244, Taiwan
SGS approved laboratory	SGS Taiwan
Date of Issue	August 30, 2007
Test(s) Required	SGS Onsite Test Standard: 2002 EN 61000-6-2: 2001, EN 61000-6-4: 2001

Conclusion:
The equipment complies with the principal prescriptive requirements of the directive 89/324/EEC, amended by 2004/108/EC. The apparatus meets the requirements of the above standards.
This certificate is only valid for the equipment and configuration described, and in conjunction with the test data sheets above. It contains the result of the single determination of the subject being tested and does not represent any subsequent, more detailed, concerning the quality of other related or other systems production.

Authorized Signatory:

SGS TAIWAN LTD.
James Lin

CE

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EMC ONSITE TEST REPORT

Test Report No: ED20078661C

Applicant : H Energy Technology Co., Ltd.

Address of Applicant : No.158, Zhulin 1st Rd., Linkou Township, Taipei county, 244, Taiwan

Equipment Under Test (EUT):
Name : Vertical Axis Wind Turbine Power Generation System
Model No. : DS-3000G
Series Model No. : DS-3000G,DS-1500G,DS-1500G,DS-1000G,DS-1000G,DS-400W,DS-400WP

Test(s) Required : SGS Onsite Test Standard: 2002
EN 61000-6-2: 2001, EN 61000-6-4: 2001

Date of Tests: August 16, 2007
Date of Issue: August 30, 2007

Test Result: PASS

Remarks:
This report states the results of the testing carried out on one sample, the results contained in this report do not relate to other samples of the same product. The manufacturer should ensure that all products in series production are in conformity with the product sample detailed in this report.
This report may only be reproduced and distributed in full. If its product in this report is used in any configuration other than that detailed in the report, the manufacturer must ensure the new system complies with all relevant standards. Any modification of SGS EMC Services or testing done by SGS EMC Services in connection with distribution or use of the product described in this report must be approved by SGS EMC Services in writing.

Authorized Signatory:

SGS TAIWAN LTD.
James Lin

TM 2265178

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SGS

Certificate No: ED20078661C

VERIFICATION OF MD&LVD COMPLIANCE

SGS-TW Reference No: ED20078661C

Model No.	DS-3000G, DS-3000G, DS-1500G, DS-1500G, DS-1000G, DS-1000G, DS-400W, DS-400WP
Product Name	Vertical Axis Wind Turbine Power Generation System
Applicant	H Energy Technology Co., Ltd.
Address of Applicant	No.158, Zhulin 1st Rd., Linkou Township, Taipei county, 244, Taiwan
TCF Number(s)	MD&LVD-2007-A1
Date of Issue	January 31, 2008
Applicable Standards	EN 60204-1: 2005, EN 60204-2: 2005, EN 60204-1: 2006, EN 61439-1: 2008

Conclusion:
Based upon a review of the worksheets and the Technical Construction File, the apparatus is deemed to meet the requirements of the above standards and hence fulfil the requirements of Machinery Directive 89/32/EEC as amended by 2006/42/EC.
Low Voltage Directive 2006/95/EC.
Note: This certificate is only valid for the equipment and configuration described, and in conjunction with the test data sheets above.

Authorized Signatory:

SGS TAIWAN LTD.
James Lin
Technical Manager

CE

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UK Microgeneration Certification Scheme

Product Name	Product Model(s)	MCS Certification Number
<u>Hi-Energy Vertical Axis Wind Turbine</u>	DS-3000	Transition Product 333
<u>Stand Alone System</u>	DS-300	Transition Product 334
<u>Grid Ties System</u>	DS-1500	Transition Product 335

Listed in CEC qualified SWT for ERP Rebate Program

California
Energy
Commission

Consumer Energy Center

List of Eligible Small Wind Turbines


http://www.consumerenergycenter.org/cgi-bin/eligible_smallwind.cgi

California Energy Commission
Emerging Renewables Program
ERP Rebate Program

Manufacturer Name	Model Number	Description	Power Output (Watts)	Notes
Hi-VAWT Technology Corp	DS-300	300W VAWT Wind Turbine	300	Rated at 30 mph
Hi-VAWT Technology Corp	DS-3000	3,000W VAWT Wind Turbine	3,000	Rated at 26.8 mph
Hi-VAWT Technology Corp	DS-1500	1,500W VAWT Wind Turbine	1,500	Rated at 26.8 mph

Conclusions

- Windy Taiwan is good for SWT ODM/OEM business with sophistic supply-chains
- Hi-VAWT system is CE certified
- Hi-VAWT system delivers Low Noise ,High Cp and Returns for urban application

A nighttime photograph of a waterfront promenade. The scene is illuminated by modern, vertical, cylindrical streetlights that cast a bright glow. The lights are arranged in a line along a paved walkway that curves towards the right. In the background, there are buildings with lit windows and balconies, and a body of water in the foreground that reflects the lights. The overall atmosphere is modern and urban.

Welcome for
Distribution, Licensing
and JV assembling business

Thank You

10.10.2009