Comune di ZUNGOLI

(Provincia di Avellino)

PROGETTO PER LA REALIZZAZIONE DI UN IMPIANTO EOLICO

in località "C. Cervaro e Piano dell'Olmo"

Elaborato 9	CALCOLO PRODUCIBILITA'

COMMITTENTE ECOENERGIA S.R.L. Via Cardito n. 5 83012 - CERVINARA (AV)	PROGETTISTA Ing. Saverio Vitagliano

	DATA Marzo 2016	

SPAZIO PER I VISTI

Project:
090202gimusECOENERGIA-Zungoli15V90 3MW hh80m

Printed/Page
02/20/2009 4:23 PM / 1

Licensed user:
Vestas Italy
Via Ariosto 12 Zona Industriale
IT-74100 Taranto
+39 099 4 606111

Calculated:
02/20/2009 4:01 PM/2.6.0.235

PARK - Main Result

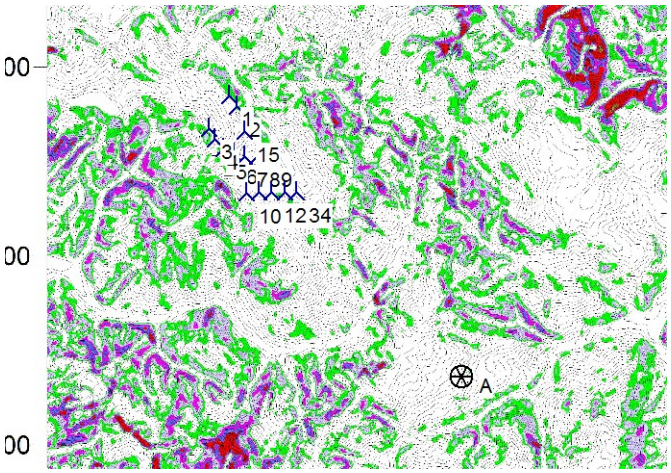
Calculation: Client 15V90 3MW hh80m

Wake Model N.O. Jensen (RISØ/EMD)

Calculation Settings
Air density calculation mode Fixed for all WTGs (User defined)
Result for WTG at hub altitude 1.120 kg/m3

Wake Model Parameters
Wake Decay Constan 0.075

Wind statistics IT Vallata_mmast - 30.00 m.wws



Scale 1:200,000
New WTG Site Data

Key results for height 80.0 m above ground level

Terrain UTM ED50 Zone: 33

	East	North	Name of wind distribution	Type	Wind energy [kWh/m2]	Mean wind speed [m/s]	Equivalent roughness
A	525,985	4,546,802	Park for Vallata_mast	WAsP (RVEA0011 1, 0, 0, 13)	3,036	6.7	0.8

Calculated Annual Energy for Wind Farm

WTG combination	Annual Energy Result [MWh]	--0.0% [MWh]	Park Efficiency [%]	Mean WTG energy [MWh]	Capacity Factor for Result [%]	--0.0% [%]
Wind farm	103,289.1	103,289.1	95.2	6,885.9	26.2	26.2

Calculated Annual Energy for each of 15 new WTG's with total 45.0 MW rated power

	WTG type Terrain	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Power curve Creator	Name		Annual Energy Result [MWh]	--0.0% [MWh]	Park Efficiency [%]	Mean wind speed [m/s]
1	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	7,524.1	7,524	96.5	7.4
2	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	6,584.9	6,585	92.3	7.0
3	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	6,421.2	6,421	98.6	6.7
4	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	6,343.0	6,343	96.4	6.8
5	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	6,406.6	6,407	96.6	6.8
6	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	6,765.6	6,766	96.4	7.0
7	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	7,310.6	7,311	95.4	7.3
8	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	7,289.9	7,290	93.6	7.3
9	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	6,243.0	6,243	91.6	6.9
10	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	7,533.8	7,534	97.2	7.4
11	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	7,836.8	7,837	95.1	7.6
12	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	7,909.4	7,909	95.9	7.6
13	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	6,452.2	6,452	96.7	6.8
14	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	6,213.2	6,213	96.1	6.7
15	A	Yes	VESTAS	V90 3.0 (2005-6-13)-3,000	3,000	90.0	80.0	USER	Noise opt.(1.12kg/m3)	Mode 0 - 109.4 dB(A)	6,454.8	6,455	89.6	7.1

WTG siting

UTM ED50 Zone: 33

	East UTM ED50 Zone: 33	North	Z [m]	Row data/Description
1 New	519,804	4,554,249	782.3	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (1)
2 New	520,013	4,553,975	773.8	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (2)
3 New	519,276	4,553,369	726.2	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (3)

Continued on next page...

Project:
090202gimusECOENERGIA-Zungoli15V90 3MW hh80m

Printed/Page
02/20/2009 4:23 PM / 2

Licensed user:
Vestas Italy
Via Ariosto 12 Zona Industriale
IT-74100 Taranto
+39 099 4 606111

Calculated:
02/20/2009 4:01 PM/2.6.0.235

PARK - Main Result

Calculation: Client 15V90 3MW hh80m

...continued from previous page

		UTM ED50 Zone: 33 East	North	Z	Row data/Description
		UTM ED50 Zone: 33		[m]	
4	New	519,426	4,553,099	744.8	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (4)
5	New	519,661	4,552,846	770.0	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (5)
6	New	519,937	4,552,732	799.7	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (6)
7	New	520,226	4,552,642	836.0	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (7)
8	New	520,545	4,552,637	845.5	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (8)
9	New	520,855	4,552,637	817.7	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (9)
10	New	520,283	4,551,671	860.0	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (10)
11	New	520,606	4,551,695	865.5	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (11)
12	New	520,934	4,551,695	851.5	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (12)
13	New	521,294	4,551,713	796.9	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (13)
14	New	521,602	4,551,690	800.0	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (14)
15	New	520,233	4,553,298	792.4	VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! hub: 80.0 m (15)

Project:
090202gimusECOENERGIA-Zungoli15V90 3MW hh80m

Printed/Page
02/20/2009 4:23 PM / 3

Licensed user:
Vestas Italy
Via Ariosto 12 Zona Industriale
IT-74100 Taranto
+39 099 4 606111

Calculated:
02/20/2009 4:01 PM/2.6.0.235

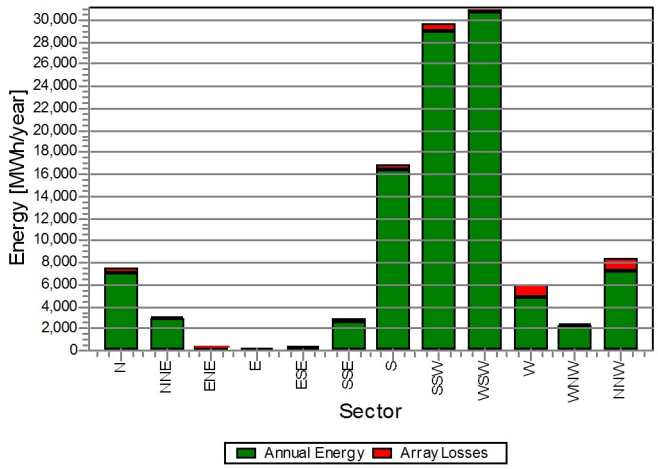
PARK - Production Analysis

Calculation: Client 15V90 3MW hh80m **WTG:** All new WTG's, Air density: 1.120 kg/m3

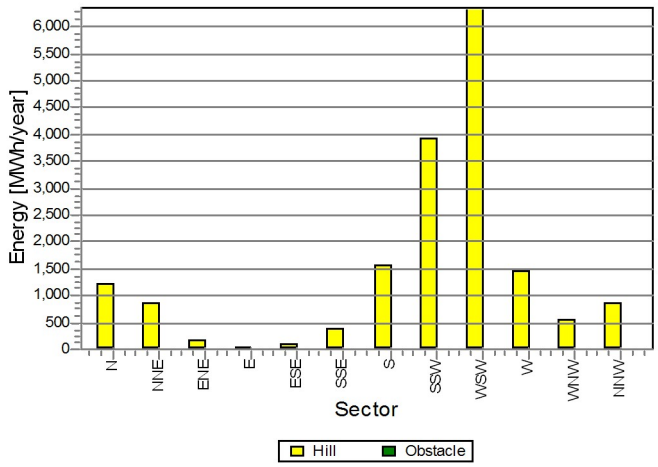
Directional Analysis

Sector		0 N	1 NNE	2 ENE	3 E	4 ESE	5 SSE	6 S	7 SSW	8 WSW	9 W	10 WNW	11 NNW	Total
Roughness based energy	[MWh]	6,227.1	2,208.6	223.7	65.1	165.7	2,518.6	15,343.9	25,704.0	24,802.3	4,454.2	1,857.5	7,401.9	90,972.6
+Increase due to hills	[MWh]	1,218.0	877.7	186.6	34.1	112.7	372.6	1,570.8	3,922.2	6,355.3	1,447.1	564.2	883.3	17,544.6
-Decrease due to array losses	[MWh]	448.0	139.9	15.1	27.8	34.9	258.2	549.7	657.2	543.7	1,209.3	279.1	1,065.2	5,228.1
Resulting energy	**[MWh]**	**6,997.1**	**2,946.4**	**395.2**	**71.4**	**243.4**	**2,633.0**	**16,365.0**	**28,969.0**	**30,614.0**	**4,691.9**	**2,142.6**	**7,220.1**	**103,289.1**
Specific energy	[kWh/m2]													1,082
Specific energy	[kWh/kW]													2,295
Increase due to hills	[%]	19.6	39.7	83.4	52.3	68.0	14.8	10.2	15.3	25.6	32.5	30.4	11.9	19.3
Decrease due to array losses	[%]	6.0	4.5	3.7	28.1	12.6	8.9	3.2	2.2	1.7	20.5	11.5	12.9	4.8
Utilization	[%]	36.4	38.1	35.5	25.2	30.7	26.5	25.0	27.1	35.3	31.2	34.7	33.4	30.3
Operational	[Hours/year]	852	682	219	83	84	214	910	1,475	1,637	509	255	544	7,465
Full Load Equivalent	[Hours/year]	155	65	9	2	5	59	364	644	680	104	48	160	2,295

Energy vs. sector



Impact of hills and obstacles vs. sector



Project:
090202gimusECOENERGIA-Zungoli15V90 3MW hh80m

Printed/Page
02/20/2009 4:23 PM / 4

Licensed user:
Vestas Italy
Via Ariosto 12 Zona Industriale
IT-74100 Taranto
+39 099 4 606111

Calculated:
02/20/2009 4:01 PM/2.6.0.235

PARK - Power Curve Analysis

Calculation: Client 15V90 3MW hh80m **WTG:** 1 - VESTAS V90 3.0 (2005-6-13) 3000 90.0 !O! Noise opt.(1.12kg/m3) Mode 0 - 109.4 dB(A), Hub height: 80.0 m

Name: Noise opt.(1.12kg/m3) Mode 0 - 109.4 dB(A)
Source:

Source/Date	Created by	Created	Edited	Stop wind speed [m/s]	Power control	CT curve type
01/27/2006	USER	01/27/2006	01/27/2006	25.0	Pitch	User defined

Power curve

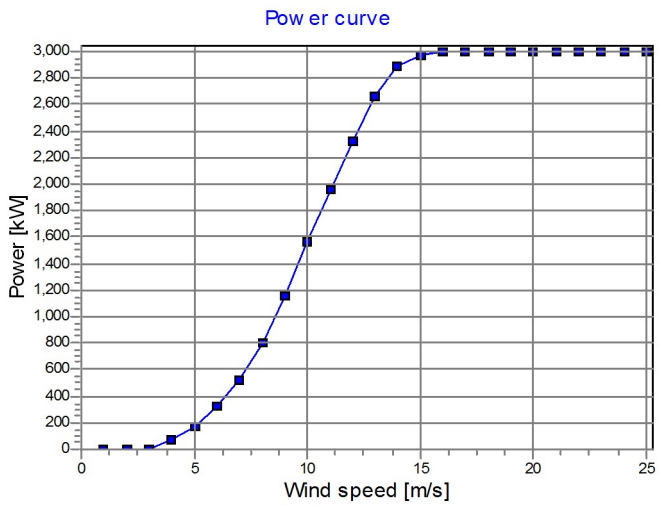
Original data from Windcat, Air density: 1.120 kg/m3

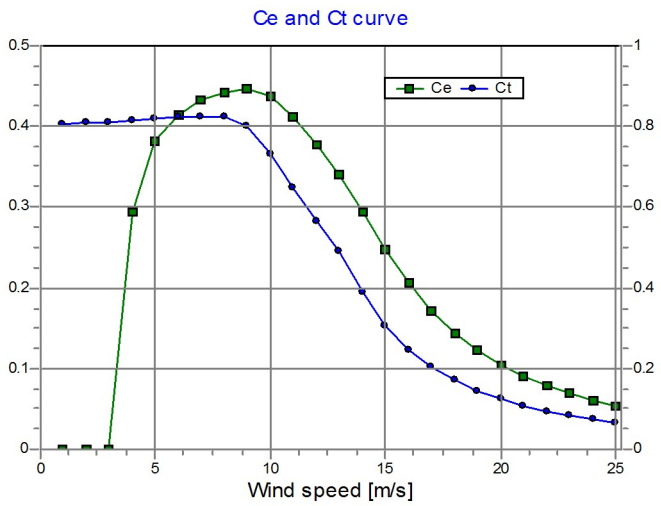
Wind speed [m/s]	Power [kW]	Ce	Wind speed [m/s]	Ct curve
4.0	67.0	0.29	4.0	0.81
5.0	170.0	0.38	5.0	0.82
6.0	319.0	0.41	6.0	0.82
7.0	528.0	0.43	7.0	0.82
8.0	806.0	0.44	8.0	0.82
9.0	1,159.0	0.45	9.0	0.80
10.0	1,558.0	0.44	10.0	0.73
11.0	1,956.0	0.41	11.0	0.65
12.0	2,329.0	0.38	12.0	0.56
13.0	2,658.0	0.34	13.0	0.49
14.0	2,883.0	0.29	14.0	0.39
15.0	2,975.0	0.25	15.0	0.30
16.0	2,996.0	0.21	16.0	0.25
17.0	3,000.0	0.17	17.0	0.20
18.0	3,000.0	0.14	18.0	0.17
19.0	3,000.0	0.12	19.0	0.14
20.0	3,000.0	0.11	20.0	0.12
21.0	3,000.0	0.09	21.0	0.11
22.0	3,000.0	0.08	22.0	0.09
23.0	3,000.0	0.07	23.0	0.08
24.0	3,000.0	0.06	24.0	0.07
25.0	3,000.0	0.05	25.0	0.06

Power, Efficiency and energy vs. wind speed

Data used in calculation, Air density: 1.120 kg/m3

Wind speed [m/s]	Power [kW]	Ce	Interval [m/s]	Energy [MWh]	Acc.Energy [MWh]	Relative [%]
1.0	0.0	0.00	0.50- 1.50	0.0	0.0	0.0
2.0	0.0	0.00	1.50- 2.50	0.0	0.0	0.0
3.0	0.0	0.00	2.50- 3.50	5.6	5.6	0.1
4.0	67.0	0.29	3.50- 4.50	53.1	58.6	0.8
5.0	170.0	0.38	4.50- 5.50	150.0	208.7	2.8
6.0	319.0	0.41	5.50- 6.50	278.4	487.0	6.5
7.0	528.0	0.43	6.50- 7.50	437.2	924.2	12.3
8.0	806.0	0.44	7.50- 8.50	608.3	1,532.5	20.4
9.0	1,159.0	0.45	8.50- 9.50	761.2	2,293.7	30.5
10.0	1,558.0	0.44	9.50-10.50	857.8	3,151.5	41.9
11.0	1,956.0	0.41	10.50-11.50	874.3	4,025.8	53.5
12.0	2,329.0	0.38	11.50-12.50	815.9	4,841.7	64.3
13.0	2,658.0	0.34	12.50-13.50	704.0	5,545.8	73.7
14.0	2,883.0	0.29	13.50-14.50	564.0	6,109.7	81.2
15.0	2,975.0	0.25	14.50-15.50	423.6	6,533.3	86.8
16.0	2,996.0	0.21	15.50-16.50	305.2	6,838.5	90.9
17.0	3,000.0	0.17	16.50-17.50	215.9	7,054.4	93.8
18.0	3,000.0	0.14	17.50-18.50	151.9	7,206.3	95.8
19.0	3,000.0	0.12	18.50-19.50	106.7	7,313.0	97.2
20.0	3,000.0	0.11	19.50-20.50	74.8	7,387.8	98.2
21.0	3,000.0	0.09	20.50-21.50	52.2	7,440.0	98.9
22.0	3,000.0	0.08	21.50-22.50	36.1	7,476.1	99.4
23.0	3,000.0	0.07	22.50-23.50	24.7	7,500.8	99.7
24.0	3,000.0	0.06	23.50-24.50	16.6	7,517.4	99.9
25.0	3,000.0	0.05	24.50-25.50	6.7	7,524.1	100.0





Project:
090202gimusECOENERGIA-Zungoli15V90 3MW hh80m

Printed/Page
02/20/2009 4:23 PM / 5

Licensed user:
Vestas Italy
Via Ariosto 12 Zona Industriale
IT-74100 Taranto
+39 099 4 606111

Calculated:
02/20/2009 4:01 PM/2.6.0.235

PARK - Wind Data Analysis

Calculation: Client 15V90 3MW hh80m **Wind data:** A - Park for Vallata_mast; Hub height: 80.0

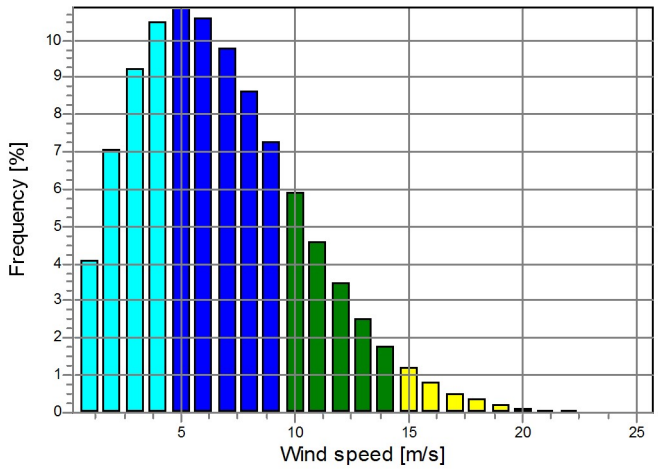
Site Coordinates
UTM ED50 Zone: 33 East: 525,985 North: 4,546,802
Wind statistics
IT Vallata_mmast - 30.00 m.wws

Weibull Data

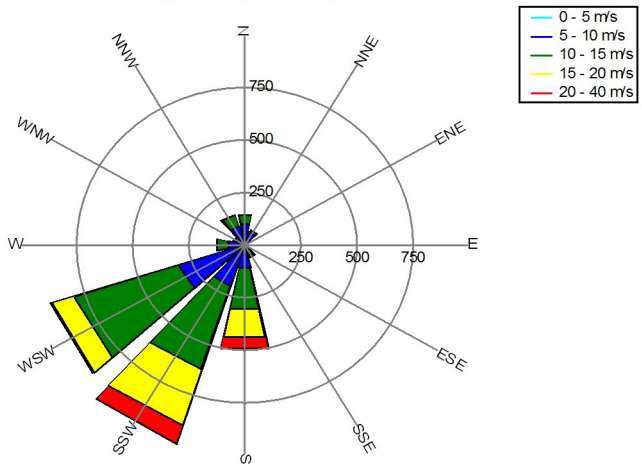
Current site

Sector	A- parameter [m/s]	Wind speed [m/s]	k- parameter	Frequency [%]
0 N	5.95	5.27	2.014	11.0
1 NNE	4.91	4.36	1.916	9.6
2 ENE	3.63	3.25	1.674	3.2
3 E	2.74	2.51	1.369	1.1
4 ESE	3.55	3.33	1.217	1.1
5 SSE	6.69	5.98	1.658	2.5
6 S	8.38	7.45	1.807	11.5
7 SSW	9.15	8.11	2.002	19.8
8 WSW	9.10	8.09	2.693	23.3
9 W	7.05	6.24	2.342	6.6
10 WNW	6.32	5.60	2.143	3.4
11 NNW	7.62	6.78	2.748	6.8
All	7.58	6.73	1.881	100.0

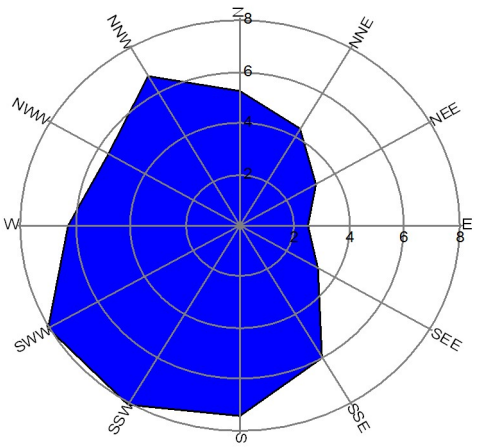
Weibull Distribution



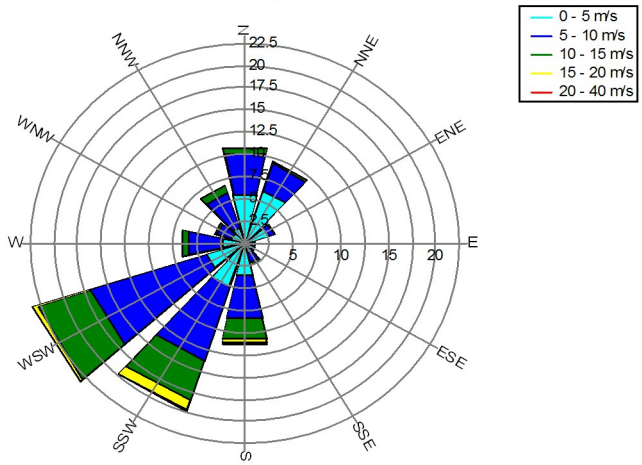
Energy Rose (kWh/m2/year)



Mean w ind speed (m/s)



Frequency (%)



Project:
090202gimusECOENERGIA-Zungoli15V90 3MW hh80m

Printed/Page
02/20/2009 4:23 PM / 6

Licensed user:
Vestas Italy
Via Ariosto 12 Zona Industriale
IT-74100 Taranto
+39 099 4 606111

Calculated:
02/20/2009 4:01 PM/2.6.0.235

PARK - Park power curve

Calculation: Client 15V90 3MW hh80m

Wind speed [m/s]	Power Free WTGs [kW]	Park WTGs [kW]	N [kW]	NNE [kW]	ENE [kW]	E [kW]	ESE [kW]	SSE [kW]	S [kW]	SSW [kW]	WSW [kW]	W [kW]	WNW [kW]	NNW [kW]
0.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3.5	233	163	156	178	203	111	142	93	150	179	203	114	138	95
4.5	1,778	1,573	1,604	1,659	1,709	1,133	1,458	1,328	1,600	1,660	1,709	1,146	1,443	1,315
5.5	3,668	3,325	3,365	3,461	3,548	2,640	3,144	2,938	3,358	3,463	3,548	2,653	3,125	2,915
6.5	6,353	5,795	5,857	6,012	6,158	4,711	5,507	5,158	5,843	6,015	6,158	4,735	5,473	5,126
7.5	10,005	9,156	9,254	9,488	9,710	7,492	8,713	8,184	9,231	9,493	9,710	7,528	8,662	8,142
8.5	14,738	13,535	13,682	14,015	14,322	11,130	12,895	12,146	13,648	14,021	14,322	11,179	12,829	12,095
9.5	20,378	18,902	19,124	19,529	19,883	15,697	18,070	17,161	19,082	19,536	19,884	15,752	18,004	17,105
10.5	26,355	24,822	25,124	25,530	25,870	21,021	23,903	23,015	25,087	25,537	25,870	21,078	23,838	22,942
11.5	32,138	30,724	31,057	31,418	31,712	26,809	29,843	29,086	31,026	31,423	31,712	26,851	29,792	29,026
12.5	37,403	36,216	36,527	36,821	37,057	32,685	35,463	34,869	36,503	36,825	37,057	32,715	35,426	34,824
13.5	41,558	40,759	41,021	41,204	41,345	38,041	40,202	39,834	41,004	41,207	41,346	38,047	40,201	39,835
14.5	43,935	43,587	43,751	43,813	43,864	42,044	43,311	43,201	43,741	43,814	43,864	42,042	43,323	43,229
15.5	44,783	44,695	44,749	44,760	44,770	44,212	44,618	44,610	44,745	44,760	44,770	44,206	44,628	44,624
16.5	44,970	44,956	44,965	44,966	44,968	44,877	44,945	44,942	44,964	44,967	44,968	44,877	44,947	44,945
17.5	45,000	44,999	45,000	45,000	45,000	44,990	44,998	44,998	45,000	45,000	45,000	44,990	44,998	44,998
18.5	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
19.5	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
20.5	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
21.5	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
22.5	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
23.5	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
24.5	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
25.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
26.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
27.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
28.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0
29.5	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Description:
The park power curve is similar to a WTG power curve, meaning that when a given wind speed appears in front of the park with same speed in the entire wind farm area (before influence from the park), the output from the park can be found in the park power curve. Another way to say this: The park power curve includes array losses, but do NOT include terrain given variations in the wind speed over the park area.
Measuring a park power curve is not as simple as measuring a WTG power curve due to the fact that the park power curve depends on the wind direction and that the same wind speed normally will not appear for the entire park area at the same time (only in very flat non-complex terrain). The idea with this version of the park power curve is not to use it for validation based on measurements. This would require at least 2 measurement masts at two sides of the park, unless only a few direction sectors should be tested, AND non complex terrain (normally only useable off shore). Another park power curve version for complex terrain is available in WindPRO.

The park power curve can be used for:

1. Forecast systems, based on more rough (approximated) wind data, the park power curve would be an efficient way to make the connection from wind speed (and direction) to power.
2. Construction of duration curves, telling how often a given power output will appear, the park power curve can be used together with the average wind distribution for the Wind farm area in hub height. The average wind distribution can eventually be obtained based on the Weibull parameters for each WTG position. These are found at print menu: >Result to file< in the >Park result< which can be saved to file or copied to clipboard and pasted in Excel.
3. Calculation of wind energy index based on the PARK production (see below).
4. Estimation of the expected PARK production for an existing wind farm based on wind measurements at minimum 2 measurement masts at two sides of wind farm. The masts must be used for obtaining the free wind speed. The free wind speed is used in the simulation of expected energy production with the PARK power curve. This procedure will only work suitable in non complex terrains. For complex terrain another park power curve calculation is available in WindPRO (PPV-model).

Note:
From the >Result to file< the >Wind Speeds Inside Wind farm< is also available. These can (e.g. via Excel) be used for extracting the wake induced reductions in measured wind speed.

Project:
090202gimusECOENERGIA-Zungoli15V90 3MW hh80m

Printed/Page
02/20/2009 4:23 PM / 7

Licensed user:
Vestas Italy
Via Ariosto 12 Zona Industriale
IT-74100 Taranto
+39 099 4 606111

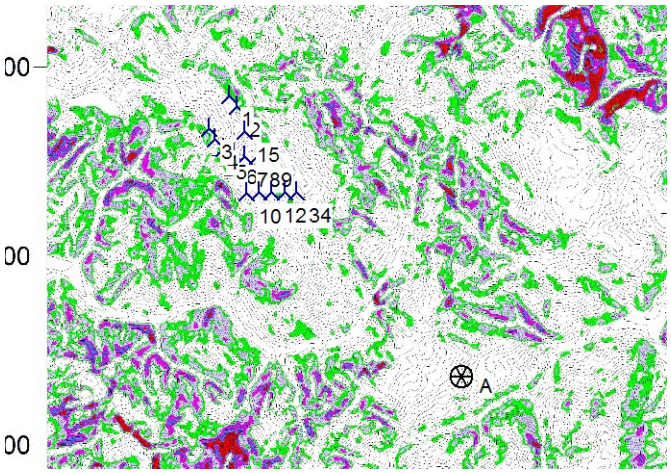
Calculated:
02/20/2009 4:01 PM/2.6.0.235

PARK - WTG distances

Calculation: Client 15V90 3MW hh80m

WTG distances

	Z [m]	Nearest WTG	Z [m]	Horizontal distance [m]	Distance in rotor diameters
1	782.3	2	773.8	345	3.8
2	773.8	1	782.3	345	3.8
3	726.2	4	744.8	309	3.4
4	744.8	3	726.2	309	3.4
5	770.0	6	799.7	299	3.3
6	799.7	5	770.0	299	3.3
7	836.0	6	799.7	303	3.4
8	845.5	9	817.7	310	3.4
9	817.7	8	845.5	310	3.4
10	860.0	11	865.5	324	3.6
11	865.5	10	860.0	324	3.6
12	851.5	11	865.5	328	3.6
13	796.9	14	800.0	309	3.4
14	800.0	13	796.9	309	3.4
15	792.4	6	799.7	639	7.1



Scale 1:200,000

New WTG Site Data

Project:
090202gimusECOENERGIA-Zungoli15V90 3MW hh80m

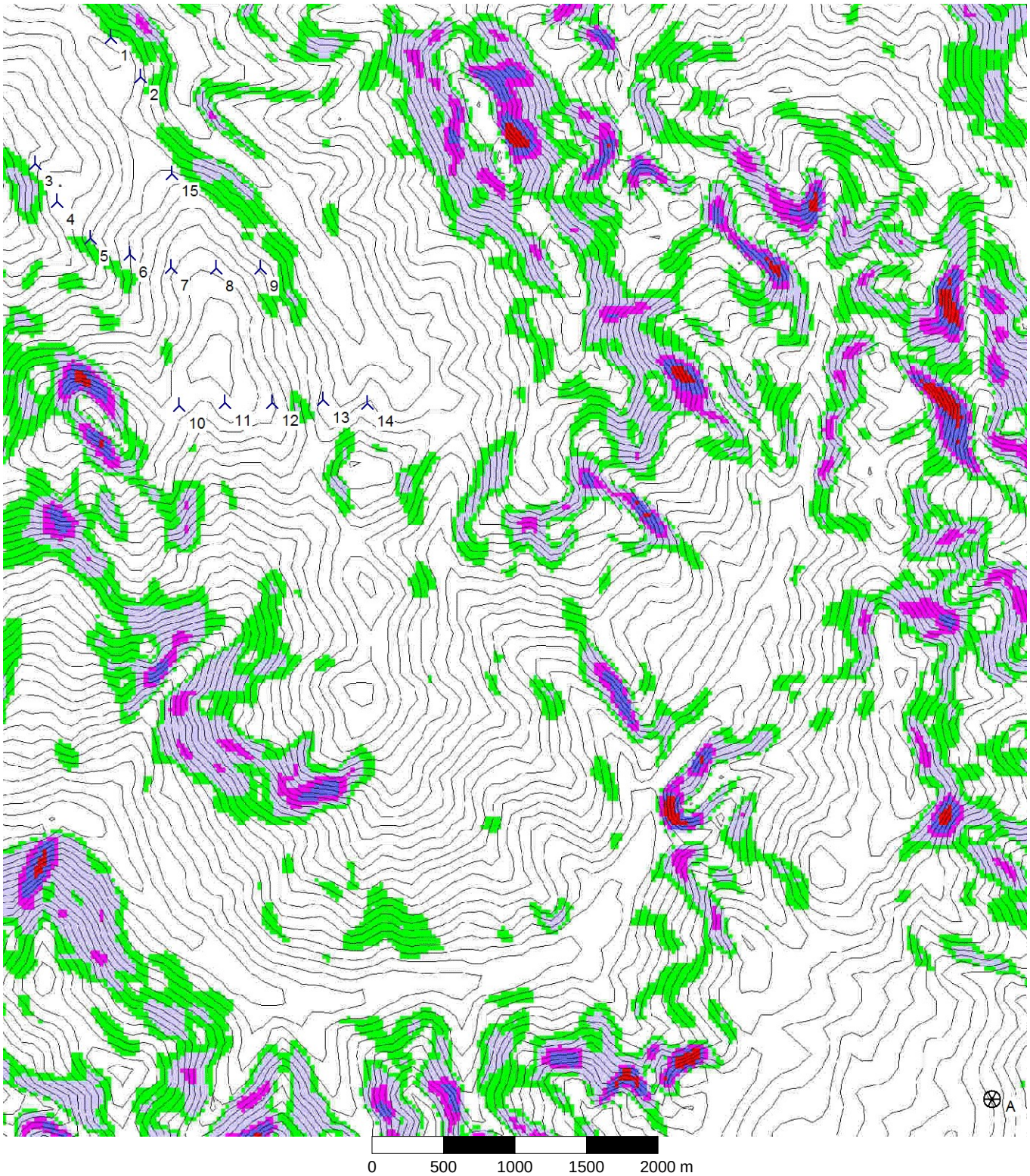
Printed/Page
02/20/2009 4:23 PM / 8

Licensed user:
Vestas Italy
Via Ariosto 12 Zona Industriale
IT-74100 Taranto
+39 099 4 606111

Calculated:
02/20/2009 4:01 PM/2.6.0.235

PARK - ECOENERGIA Zungoli_sat slope map

Calculation: Client 15V90 3MW hh80m **File:** ECOENERGIA Zungoli_sat slope map.bmi



Map: ECOENERGIA Zungoli_sat slope map , Print scale 1:40,000, Map center UTM ED50 Zone: 33 East: 522,631 North: 4,550,525

New WTG Site Data