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A Realistic Estimate of Annual Typical Daily Wind Power of different heights in Urban Armidale NSW, Australia

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Abstract: - Wind is one of the common sources of renewable and clean energy. It is really difficult to predict wind performance at any specific moment. In addition to the very intermittent nature of wind, wind behaviour and speed are directly affected by several factors, specifically the nature of the environment and the height that wind blows at. Wind behaviour at urban large city areas and urban suburban areas is completely different than such behaviour at open terrain and flat unobstructed areas. Wind performance in urban and areas are completely different from either open areas or capital cities with huge high rise buildings. Wind is more disturbed and turbulent and wind speed decreases due to the existence of several obstructions, mostly buildings either single storey or medium rise or high rise buildings in addition to trees. Moreover, wind speed at different heights is directly affecting win energy can be generated from using wind turbines. Thus, it is never an easy task to provide a reliable realistic estimate of wind energy at a specific urban location or city. Many trials based on using meteorological announced wind speed which is a clear overestimation and misled non-specialists due to the fact that meteorological observations are conducted on specified heights (mostly 10 meters) in an open place with no restriction, this would provide a wind speed much higher than wind speed would occur in the urban environment of the same town. Armidale is a regional city in New South Wales (NSW) in Australia, as well it is the highest town all over Australia. This study aims to provide a justified realistic/creditable/ reliable estimate of annual typical daily wind power. The reason of this justification that this study depends on an accurate estimate wind speed at different heights calculated specifically for urban Armidale. Such estimate would be a great benefit of wind energy specialists and non-specialists households to obtain an estimate of daily potential wind power in Armidale.

Keywords: - *Armidale NSW, wind power, test meteorological year, test reference year, wind speed, micro-scale energy generation, micro-wind turbines*

I. INTRODUCTION

While wind flows over an open area which approaches the boundaries of the built-up area, it faces a high surface roughness, created by existing buildings. The increased resistance resulting from this roughness reduces the wind flow at the level of the urban canopy. In this way a transitional zone is created between the ground and the undisturbed wind flow above the urban air dome, which is called "urban boundary layer". The "undisturbed flow" is called the "gradient wind" and its velocity is called the gradient velocity. While, near the ground, wind experiences friction. Its speed is reduced more steeply and its turbulence increases. [1, 2 &3].

The main urban design elements which change wind conditions are: the overall density of the urban area, size and height of the individual buildings; existence of high-rise buildings, orientation of the streets, availability, size distribution, and aspects of design of open spaces and green shelter belts. [4, 5 & 6].

Wind field is characterized by two parameters: the vertical profile of the mean wind speed and the turbulence spectrum. Both parameters are affected and modified by the profile of the terrain and, in an urban setup, by the urban structure [4, 5, 6 & 7].

Micro-scale energy generation ranges from [0.5 to 10] kW which suits domestic/residential, educational and small commercial applications.

Most wind energy development in NSW will be in rural and regional areas. Wind energy is especially attractive to these communities because of the potential for employment, industry development, income for landholders, and supplementing existing tourist attractions. An independent study commissioned by Sustainable Energy Development Authority of NSW [8] showed that employment created by sustainable energy development tended to be concentrated in rural and regional areas. The study found that: manufacturing wind turbines creates 3–6 jobs per Megawatt of installed capacity; installation creates 0.5–0.8 jobs per Megawatt; the operation and maintenance of wind turbines creates 0.05–0.5 jobs per Megawatt [9 &10].

This study focuses on the generation of wind energy at urban Armidale NSW, Australia as a sample of regional Australian cities at heights (8, 9 &10) meters. This scope is selected mainly to provide micro-scale wind energy generation systems' designers an annual realistic mean daily wind power at such heights of micro-wind turbines' possible installations.

II. DATA AND LOCATION

A previous study estimated urban mean daily wind speed at (8, 9 &10m height was developed [11]. That study was generated based on a previous generated meteorological wind test reference year (TRY) which was generated based on the daily mean wind speed recorded during the period 1994–2010 recorded at Armidale's Airport Weather Station (AWS). That TYR was generated utilising Finkelstein-Schafer (FS) statistics [12 &13].

In Australia, meteorological observations are recorded by the Australian Bureau of Meteorology (BOM) weather stations are widely spreader in lots of cities and towns around Australia. In this study, the global wind speed data recorded by Armidale Airport Weather Automatic Station and published on the BOM's website where it was collected. The missing and invalid measurements account for 0.001% of the whole database of mean wind speed; those were replaced with the values of preceding or subsequent days by interpolation. During the calculations process, any year found with more than ten days in any month observations not available was excluded. "Table 1" provides geographical information for Armidale town and the periods of the relevant mean wind speed data and "figure 1" shows Armidale's location in NSW, Australia.

Table 1 Geographical and mean wind speed database information of Armidale NSW, Australia

	Longitude (†E)	Latitude(†S)	Elevation (m)	Mean Daily Wind Speed	
				Period	Total years
Armidale	151.67	30.52	970-1070	1994—2013	20

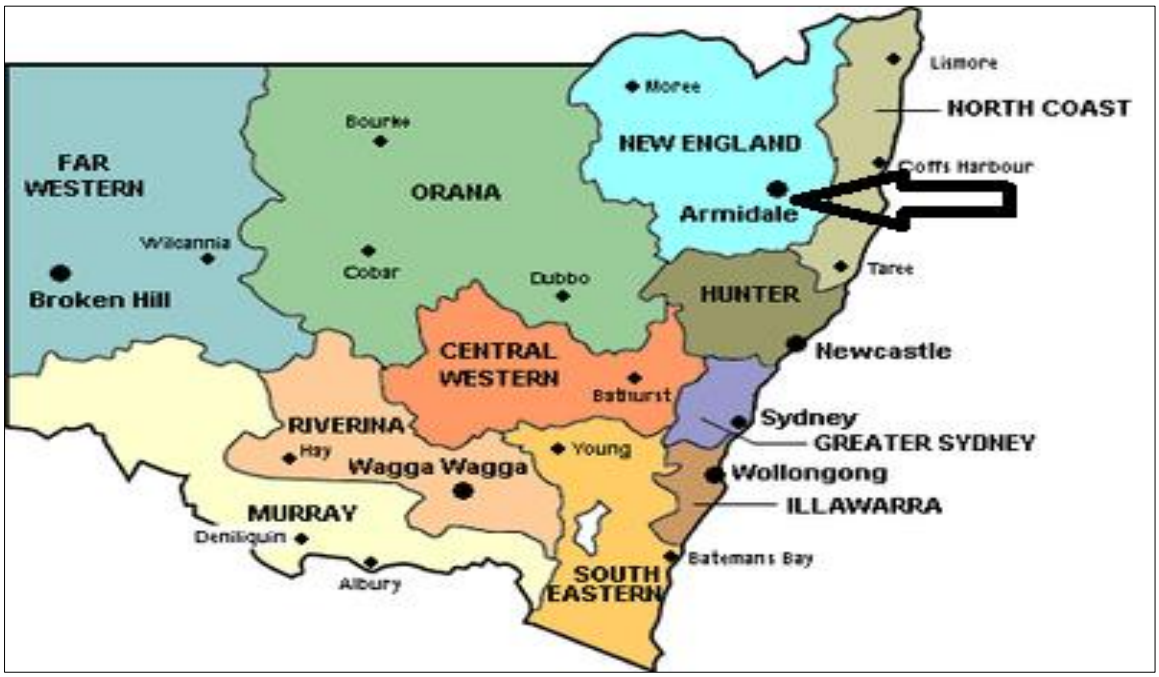

Figure1 Armidale NSW, Australia location

III. METHODOLOGY

The power of wind can be estimated by using the following equation [14]:

$$P_{(v)} = \frac{1}{2}\rho A\bar{v}^3 \quad (1)$$

where ρ is the mean air density, v3 is the mean value of the third power of the wind velocity, and A is the swept area.

In addition, for a height less than 100 m, the power density of the wind above the ground level is given by [15]:

$$P_h = P_{10}\left(\frac{h}{10}\right)^{3\alpha} \quad (2)$$

where P_{10} is the corrected power available in wind at a height of 10 m and α is the roughness factor, usually in the range 0.05–0.5. Wind velocity data were extrapolated by using the following power-law formula [16]:

$$\frac{v_1}{v_2} = \left(\frac{h_1}{h_2}\right)^{\alpha} \quad (3)$$

where v_1 and v_2 are the wind velocities at heights h_1 and h_2, respectively.
The capacity factor C_p is one of the performance parameters of wind turbines that both the user and manufacturer need to know. It represents the fraction of the total energy delivered over a period, Eout, divided by the maximum energy that could have been delivered if the turbine were used at maximum capacity over the entire period. The capacity factor C_p of a wind turbine can be calculated as the following [15]:

$$C_p = \frac{E_{out}}{E_r} \quad (4)$$

IV. GENERATION OF A TYPICAL ANNUAL MEAN WIND POWER

"Tables2, 9 & 16" show urban daily wind speed values obtained from Test Reference Year data for Armidale NSW, Australia at (8,9 &10) m height in (m/s). Applying the above methodology to those urban mean daily wind speed, results in mean daily wind power in kWp as shown in " Tables 3, 4, 5, 6, 7, 8, 10, 11, 12, 13, 14, 15, 17, 18, 19, 20, 21 & 22) " shows the calculated power in kWh per day for wind turbines' swept area of 10 m2 operating at height (8, 9 & 10) m above ground for all months for capacity factors (10, 20, 30, 40, 50 & 55)%. Additionally, Tables (23 & 24) shows the calculated power in kWh per month for wind turbines' swept area of 10 m^2 operating at (8, 9 & 10) m height above ground. An area of 10m^2 was selected for simplification purpose. Apparently, the higher the more wind power generated, as well the greater wind turbine capacity factor (Cp), the greater wind power.

Table 2 Urban daily wind speed values obtained from Test Reference Year data for Armidale NSW, Australia at 8 m height in (m/s)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	3.82	4.29	4.06	3.41	3.5	3.13	4.12	3.85	3.63	4.12	3.85	3.63
2	4.43	4.6	4	3.55	3.63	3.58	3.63	4	3.47	3.89	4	3.91
3	3.82	4.06	4	3.23	3.31	3.08	3.55	4.67	4.33	3.68	4.12	3.89
4	4.46	3.72	4.17	3.25	3.68	2.8	3.89	4.17	3.96	3.39	3.63	4.12
5	4	3.44	4.32	3.85	3.08	3.47	3.89	4.46	4.24	3.29	3.44	4.43
6	4.03	3.69	4.33	3.91	3.39	3.44	3.75	4.27	4.27	4.24	3.75	4.27
7	4.43	4.43	3.89	4.12	3.5	3.31	3.23	4.46	3.89	4	3.75	4.06
8	4.47	3.85	3.5	3.89	3.01	3.68	3.55	4.67	4.17	4.33	4	3.69
9	4.67	4.17	3.91	3.29	3.01	3.96	4.22	4.17	4.22	4.22	3.82	3.58
10	4.17	3.75	3.85	3.53	3.23	3.75	4.06	4.22	3.75	3.79	3.85	4.06
11	4.32	3.55	3.89	3.25	3.29	3.63	4.06	4.17	4.1	3.63	3.75	3.79
12	4.06	3.89	3.79	3.75	3.31	3.29	3.08	4.5	3.79	3.79	3.85	3.53
13	3.85	4.1	3.68	3.36	3.47	3.65	3.17	3.96	3.91	3.96	4.17	3.79
14	3.85	4.33	3.47	2.92	3.5	4.24	4.12	4.43	3.55	4.27	3.55	4
15	4.06	4.12	3.01	2.96	2.87	3.87	3.89	4.12	3.55	3.68	3.96	3.75
16	4.06	3.68	3.34	3.17	3.47	3.55	3.08	4.46	6.04	4.47	4.17	3.47
17	4.06	3.75	3.5	3.39	3.53	3.58	3.17	4.22	4.33	4.29	4.06	3.53
18	4.06	4.17	3.99	3.17	3.31	3.23	3.63	4.54	3.63	3.85	3.75	3.96
19	4.39	3.77	3.65	2.87	3.96	3.79	3.89	3.85	3.6	3.89	3.39	3.85
20	4.17	3.89	3.55	2.96	3.5	3.53	3.68	4.17	3.68	3.68	3.63	4.06
21	4.06	3.79	3.34	2.87	3.77	4.24	4.5	4.33	3.47	3.08	3.79	3.68
22	3.72	3.96	3.68	3.01	3.36	4.17	3.5	4.67	2.96	3.85	4.17	3.72
23	3.58	4.12	3.65	3.01	3.08	4.03	3.68	4	3.96	4.22	4.06	3.79
24	4.27	4.06	3.55	3.29	3.17	3.5	3.47	4.5	3.89	3.68	3.63	4
25	4.39	3.96	3.58	3.63	3.23	3.13	3.63	4.27	4.17	3.68	3.48	3.68
26	4.1	3.5	3.44	3.72	3.55	3.58	4.43	4.22	4.12	4.2	3.47	3.69
27	4.17	3.25	3.08	3.63	3.29	3.63	4	4.17	4.27	4.27	4.33	3.72
28	4.06	3.41	3.29	3.77	3.27	4.5	4.17	4.24	4.17	3.5	4.06	3.55
29	3.91	3.79	3.13	3.58	3.75	4.67	3.85	4.1	4.69	4.08	3.72	3.75
30	3.75		3.13	3.44	3.2	4.12	3.75	5.05	3.68	3.75	3.79	3.99
31	4.27		3.41		3.34		3.75	4.53		4.17		3.89

Extracted from [12]

Table 3 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 8 m above ground for January and February

Day	Mean Daily Speed	January's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	February's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	3.82	0.711	1.422	2.133	2.844	3.555	3.911	4.29	1.007	2.014	3.021	4.029	5.036	5.539
2	4.43	1.109	2.218	3.327	4.436	5.545	6.099	4.6	1.242	2.483	3.725	4.966	6.208	6.829
3	3.82	0.711	1.422	2.133	2.844	3.555	3.911	4.06	0.854	1.707	2.561	3.415	4.268	4.695
4	4.46	1.132	2.263	3.395	4.527	5.658	6.224	3.72	0.657	1.313	1.97	2.627	3.283	3.612
5	4	0.816	1.633	2.449	3.266	4.082	4.49	3.44	0.519	1.039	1.558	2.077	2.596	2.856
6	4.03	0.835	1.67	2.505	3.34	4.174	4.592	3.69	0.641	1.282	1.923	2.564	3.205	3.525
7	4.43	1.109	2.218	3.327	4.436	5.545	6.099	4.43	1.109	2.218	3.327	4.436	5.545	6.099
8	4.47	1.139	2.279	3.418	4.557	5.696	6.266	3.85	0.728	1.456	2.184	2.912	3.64	4.004
9	4.67	1.299	2.598	3.898	5.197	6.496	7.145	4.17	0.925	1.85	2.775	3.7	4.625	5.087
10	4.17	0.925	1.85	2.775	3.7	4.625	5.087	3.75	0.673	1.345	2.018	2.691	3.363	3.7
11	4.32	1.028	2.057	3.085	4.114	5.142	5.656	3.55	0.571	1.141	1.712	2.283	2.853	3.139
12	4.06	0.854	1.707	2.561	3.415	4.268	4.695	3.89	0.751	1.502	2.253	3.003	3.754	4.13
13	3.85	0.728	1.456	2.184	2.912	3.64	4.004	4.1	0.879	1.758	2.637	3.517	4.396	4.835
14	3.85	0.728	1.456	2.184	2.912	3.64	4.004	4.33	1.036	2.071	3.107	4.142	5.178	5.696
15	4.06	0.854	1.707	2.561	3.415	4.268	4.695	4.12	0.892	1.784	2.676	3.568	4.46	4.906
16	4.06	0.854	1.707	2.561	3.415	4.268	4.695	3.68	0.636	1.271	1.907	2.543	3.179	3.496
17	4.06	0.854	1.707	2.561	3.415	4.268	4.695	3.75	0.673	1.345	2.018	2.691	3.363	3.7
18	4.06	0.854	1.707	2.561	3.415	4.268	4.695	4.17	0.925	1.85	2.775	3.7	4.625	5.087
19	4.39	1.079	2.158	3.238	4.317	5.396	5.936	3.77	0.684	1.367	2.051	2.734	3.418	3.759
20	4.17	0.925	1.85	2.775	3.7	4.625	5.087	3.89	0.751	1.502	2.253	3.003	3.754	4.13
21	4.06	0.854	1.707	2.561	3.415	4.268	4.695	3.79	0.694	1.389	2.083	2.778	3.472	3.819
22	3.72	0.657	1.313	1.97	2.627	3.283	3.612	3.96	0.792	1.584	2.376	3.169	3.961	4.357
23	3.58	0.585	1.171	1.756	2.341	2.926	3.219	4.12	0.892	1.784	2.676	3.568	4.46	4.906
24	4.27	0.993	1.986	2.979	3.972	4.966	5.462	4.06	0.854	1.707	2.561	3.415	4.268	4.695
25	4.39	1.079	2.158	3.238	4.317	5.396	5.936	3.96	0.792	1.584	2.376	3.169	3.961	4.357
26	4.1	0.879	1.758	2.637	3.517	4.396	4.835	3.5	0.547	1.094	1.641	2.188	2.735	3.008
27	4.17	0.925	1.85	2.775	3.7	4.625	5.087	3.25	0.438	0.876	1.314	1.752	2.189	2.408
28	4.06	0.854	1.707	2.561	3.415	4.268	4.695	3.41	0.506	1.012	1.517	2.023	2.529	2.782
29	3.91	0.763	1.525	2.288	3.05	3.813	4.194	3.79	0.694	1.389	2.083	2.778	3.472	3.819
30	3.75	0.673	1.345	2.018	2.691	3.363	3.7							
31	4.27	0.993	1.986	2.979	3.972	4.966	5.462							

Table 4 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 8 m above ground for March and April

Day	Mean Daily Speed	March's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	April's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	4.06	0.854	1.707	2.561	3.415	4.268	4.695	3.41	8	1.012	1.517	2.023	2.529	2.782
2	4	0.816	1.633	2.449	3.266	4.082	4.49	3.55	0.571	1.141	1.712	2.283	2.853	3.139
3	4	0.816	1.633	2.449	3.266	4.082	4.49	3.23	0.43	0.86	1.29	1.719	2.149	2.364
4	4.17	0.925	1.85	2.775	3.7	4.625	5.087	3.25	0.438	0.876	1.314	1.752	2.189	2.408
5	4.32	1.028	2.057	3.085	4.114	5.142	5.656	3.85	0.728	1.456	2.184	2.912	3.64	4.004
6	4.33	1.036	2.071	3.107	4.142	5.178	5.696	3.91	0.763	1.525	2.288	3.05	3.813	4.194
7	3.89	0.751	1.502	2.253	3.003	3.754	4.13	4.12	0.892	1.784	2.676	3.568	4.46	4.906
8	3.5	0.547	1.094	1.641	2.188	2.735	3.008	3.89	0.751	1.502	2.253	3.003	3.754	4.13
9	3.91	0.763	1.525	2.288	3.05	3.813	4.194	3.29	0.454	0.909	1.363	1.817	2.271	2.498
10	3.85	0.728	1.456	2.184	2.912	3.64	4.004	3.53	0.561	1.122	1.683	2.244	2.805	3.086
11	3.89	0.751	1.502	2.253	3.003	3.754	4.13	3.25	0.438	0.876	1.314	1.752	2.189	2.408
12	3.79	0.694	1.389	2.083	2.778	3.472	3.819	3.75	0.673	1.345	2.018	2.691	3.363	3.7
13	3.68	0.636	1.271	1.907	2.543	3.179	3.496	3.36	0.484	0.968	1.452	1.935	2.419	2.661
14	3.47	0.533	1.066	1.599	2.132	2.665	2.931	2.92	0.318	0.635	0.953	1.27	1.588	1.747
15	3.01	0.348	0.696	1.044	1.391	1.739	1.913	2.96	0.331	0.662	0.992	1.323	1.654	1.82
16	3.34	0.475	0.951	1.426	1.901	2.376	2.614	3.17	0.406	0.813	1.219	1.625	2.032	2.235
17	3.5	0.547	1.094	1.641	2.188	2.735	3.008	3.39	0.497	0.994	1.491	1.988	2.485	2.733
18	3.99	0.81	1.621	2.431	3.241	4.051	4.457	3.17	0.406	0.813	1.219	1.625	2.032	2.235
19	3.65	0.62	1.241	1.861	2.481	3.101	3.412	2.87	0.302	0.603	0.905	1.206	1.508	1.659
20	3.55	0.571	1.141	1.712	2.283	2.853	3.139	2.96	0.331	0.662	0.992	1.323	1.654	1.82
21	3.34	0.475	0.951	1.426	1.901	2.376	2.614	2.87	0.302	0.603	0.905	1.206	1.508	1.659
22	3.68	0.636	1.271	1.907	2.543	3.179	3.496	3.01	0.348	0.696	1.044	1.391	1.739	1.913
23	3.65	0.62	1.241	1.861	2.481	3.101	3.412	3.01	0.348	0.696	1.044	1.391	1.739	1.913
24	3.55	0.571	1.141	1.712	2.283	2.853	3.139	3.29	0.454	0.909	1.363	1.817	2.271	2.498
25	3.58	0.585	1.171	1.756	2.341	2.926	3.219	3.63	0.61	1.22	1.83	2.441	3.051	3.356
26	3.44	0.519	1.039	1.558	2.077	2.596	2.856	3.72	0.657	1.313	1.97	2.627	3.283	3.612
27	3.08	0.373	0.745	1.118	1.491	1.864	2.05	3.63	0.61	1.22	1.83	2.441	3.051	3.356
28	3.29	0.454	0.909	1.363	1.817	2.271	2.498	3.77	0.684	1.367	2.051	2.734	3.418	3.759
29	3.13	0.391	0.782	1.173	1.565	1.956	2.151	3.58	0.585	1.171	1.756	2.341	2.926	3.219
30	3.13	0.391	0.782	1.173	1.565	1.956	2.151	3.44	0.519	1.039	1.558	2.077	2.596	2.856
31	3.41	0.506	1.012	1.517	2.023	2.529	2.782							

Table 5 Power in kWh per day for wind turbines' swept area of 10 m2 operating at height 8 m above ground for May and June

Day	Mean Daily Speed	May's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	June's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp=10 %	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	3.5	0.547	1.094	1.641	2.188	2.735	3.008	3.13	0.391	0.782	1.173	1.565	1.956	2.151
2	3.63	0.61	1.22	1.83	2.441	3.051	3.356	3.58	0.585	1.171	1.756	2.341	2.926	3.219
3	3.31	0.463	0.925	1.388	1.85	2.313	2.544	3.08	0.373	0.745	1.118	1.491	1.864	2.05
4	3.68	0.636	1.271	1.907	2.543	3.179	3.496	2.8	0.28	0.56	0.84	1.12	1.4	1.54
5	3.08	0.373	0.745	1.118	1.491	1.864	2.05	3.47	0.533	1.066	1.599	2.132	2.665	2.931
6	3.39	0.497	0.994	1.491	1.988	2.485	2.733	3.44	0.519	1.039	1.558	2.077	2.596	2.856
7	3.5	0.547	1.094	1.641	2.188	2.735	3.008	3.31	0.463	0.925	1.388	1.85	2.313	2.544
8	3.01	0.348	0.696	1.044	1.391	1.739	1.913	3.68	0.636	1.271	1.907	2.543	3.179	3.496
9	3.01	0.348	0.696	1.044	1.391	1.739	1.913	3.96	0.792	1.584	2.376	3.169	3.961	4.357
10	3.23	0.43	0.86	1.29	1.719	2.149	2.364	3.75	0.673	1.345	2.018	2.691	3.363	3.7
11	3.29	0.454	0.909	1.363	1.817	2.271	2.498	3.63	0.61	1.22	1.83	2.441	3.051	3.356
12	3.31	0.463	0.925	1.388	1.85	2.313	2.544	3.29	0.454	0.909	1.363	1.817	2.271	2.498
13	3.47	0.533	1.066	1.599	2.132	2.665	2.931	3.65	0.62	1.241	1.861	2.481	3.101	3.412
14	3.5	0.547	1.094	1.641	2.188	2.735	3.008	4.24	0.972	1.945	2.917	3.889	4.862	5.348
15	2.87	0.302	0.603	0.905	1.206	1.508	1.659	3.87	0.739	1.479	2.218	2.957	3.697	4.066
16	3.47	0.533	1.066	1.599	2.132	2.665	2.931	3.55	0.571	1.141	1.712	2.283	2.853	3.139
17	3.53	0.561	1.122	1.683	2.244	2.805	3.086	3.58	0.585	1.171	1.756	2.341	2.926	3.219
18	3.31	0.463	0.925	1.388	1.85	2.313	2.544	3.23	0.43	0.86	1.29	1.719	2.149	2.364
19	3.96	0.792	1.584	2.376	3.169	3.961	4.357	3.79	0.694	1.389	2.083	2.778	3.472	3.819
20	3.5	0.547	1.094	1.641	2.188	2.735	3.008	3.53	0.561	1.122	1.683	2.244	2.805	3.086
21	3.77	0.684	1.367	2.051	2.734	3.418	3.759	4.24	0.972	1.945	2.917	3.889	4.862	5.348
22	3.36	0.484	0.968	1.452	1.935	2.419	2.661	4.17	0.925	1.85	2.775	3.7	4.625	5.087
23	3.08	0.373	0.745	1.118	1.491	1.864	2.05	4.03	0.835	1.67	2.505	3.34	4.174	4.592
24	3.17	0.406	0.813	1.219	1.625	2.032	2.235	3.5	0.547	1.094	1.641	2.188	2.735	3.008
25	3.23	0.43	0.86	1.29	1.719	2.149	2.364	3.13	0.391	0.782	1.173	1.565	1.956	2.151
26	3.55	0.571	1.141	1.712	2.283	2.853	3.139	3.58	0.585	1.171	1.756	2.341	2.926	3.219
27	3.29	0.454	0.909	1.363	1.817	2.271	2.498	3.63	0.61	1.22	1.83	2.441	3.051	3.356
28	3.27	0.446	0.892	1.338	1.784	2.23	2.453	4.5	1.162	2.325	3.487	4.65	5.812	6.393
29	3.75	0.673	1.345	2.018	2.691	3.363	3.7	4.67	1.299	2.598	3.898	5.197	6.496	7.145
30	3.2	0.418	0.836	1.254	1.672	2.09	2.299	4.12	0.892	1.784	2.676	3.568	4.46	4.906
31	3.34	0.475	0.951	1.426	1.901	2.376	2.614							

Table 6 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 8 m above ground for July and August

Day	Mean Daily Speed	July's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	August's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	4.12	0.892	1.784	2.676	3.568	4.46	4.906	3.85	0.728	1.456	2.184	2.912	3.64	4.004
2	3.63	0.61	1.22	1.83	2.441	3.051	3.356	4	0.816	1.633	2.449	3.266	4.082	4.49
3	3.55	0.571	1.141	1.712	2.283	2.853	3.139	4.67	1.299	2.598	3.898	5.197	6.496	7.145
4	3.89	0.751	1.502	2.253	3.003	3.754	4.13	4.17	0.925	1.85	2.775	3.7	4.625	5.087
5	3.89	0.751	1.502	2.253	3.003	3.754	4.13	4.46	1.132	2.263	3.395	4.527	5.658	6.224

6	3.75	0.673	1.345	2.018	2.691	3.363	3.7	4.27	0.993	1.986	2.979	3.972	4.966	5.462
7	3.23	0.43	0.86	1.29	1.719	2.149	2.364	4.46	1.132	2.263	3.395	4.527	5.658	6.224
8	3.55	0.571	1.141	1.712	2.283	2.853	3.139	4.67	1.299	2.598	3.898	5.197	6.496	7.145
9	4.22	0.959	1.917	2.876	3.835	4.793	5.272	4.17	0.925	1.85	2.775	3.7	4.625	5.087
10	4.06	0.854	1.707	2.561	3.415	4.268	4.695	4.22	0.959	1.917	2.876	3.835	4.793	5.272
11	4.06	0.854	1.707	2.561	3.415	4.268	4.695	4.17	0.925	1.85	2.775	3.7	4.625	5.087
12	3.08	0.373	0.745	1.118	1.491	1.864	2.05	4.5	1.162	2.325	3.487	4.65	5.812	6.393
13	3.17	0.406	0.813	1.219	1.625	2.032	2.235	3.96	0.792	1.584	2.376	3.169	3.961	4.357
14	4.12	0.892	1.784	2.676	3.568	4.46	4.906	4.43	1.109	2.218	3.327	4.436	5.545	6.099
15	3.89	0.751	1.502	2.253	3.003	3.754	4.13	4.12	0.892	1.784	2.676	3.568	4.46	4.906
16	3.08	0.373	0.745	1.118	1.491	1.864	2.05	4.46	1.132	2.263	3.395	4.527	5.658	6.224
17	3.17	0.406	0.813	1.219	1.625	2.032	2.235	4.22	0.959	1.917	2.876	3.835	4.793	5.272
18	3.63	0.61	1.22	1.83	2.441	3.051	3.356	4.54	1.194	2.387	3.581	4.775	5.968	6.565
19	3.89	0.751	1.502	2.253	3.003	3.754	4.13	3.85	0.728	1.456	2.184	2.912	3.64	4.004
20	3.68	0.636	1.271	1.907	2.543	3.179	3.496	4.17	0.925	1.85	2.775	3.7	4.625	5.087
21	4.5	1.162	2.325	3.487	4.65	5.812	6.393	4.33	1.036	2.071	3.107	4.142	5.178	5.696
22	3.5	0.547	1.094	1.641	2.188	2.735	3.008	4.67	1.299	2.598	3.898	5.197	6.496	7.145
23	3.68	0.636	1.271	1.907	2.543	3.179	3.496	4	0.816	1.633	2.449	3.266	4.082	4.49
24	3.47	0.533	1.066	1.599	2.132	2.665	2.931	4.5	1.162	2.325	3.487	4.65	5.812	6.393
25	3.63	0.61	1.22	1.83	2.441	3.051	3.356	4.27	0.993	1.986	2.979	3.972	4.966	5.462
26	4.43	1.109	2.218	3.327	4.436	5.545	6.099	4.22	0.959	1.917	2.876	3.835	4.793	5.272
27	4	0.816	1.633	2.449	3.266	4.082	4.49	4.17	0.925	1.85	2.775	3.7	4.625	5.087
28	4.17	0.925	1.85	2.775	3.7	4.625	5.087	4.24	0.972	1.945	2.917	3.889	4.862	5.348
29	3.85	0.728	1.456	2.184	2.912	3.64	4.004	4.1	0.879	1.758	2.637	3.517	4.396	4.835
30	3.75	0.673	1.345	2.018	2.691	3.363	3.7	5.05	1.643	3.286	4.928	6.571	8.214	9.035
31	3.75	0.673	1.345	2.018	2.691	3.363	3.7	4.53	1.186	2.372	3.557	4.743	5.929	6.522

Table 7 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 8 m above ground for September and October

Day	Mean Daily Speed	September's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	October's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	3.63	0.61	1.22	1.83	2.441	3.051	3.356	4.12	0.892	1.784	2.676	3.568	4.46	4.906
2	3.47	0.533	1.066	1.599	2.132	2.665	2.931	3.89	0.751	1.502	2.253	3.003	3.754	4.13
3	4.33	1.036	2.071	3.107	4.142	5.178	5.696	3.68	0.636	1.271	1.907	2.543	3.179	3.496
4	3.96	0.792	1.584	2.376	3.169	3.961	4.357	3.39	0.497	0.994	1.491	1.988	2.485	2.733
5	4.24	0.972	1.945	2.917	3.889	4.862	5.348	3.29	0.454	0.909	1.363	1.817	2.271	2.498
6	4.27	0.993	1.986	2.979	3.972	4.966	5.462	4.24	0.972	1.945	2.917	3.889	4.862	5.348
7	3.89	0.751	1.502	2.253	3.003	3.754	4.13	4	0.816	1.633	2.449	3.266	4.082	4.49
8	4.17	0.925	1.85	2.775	3.7	4.625	5.087	4.33	1.036	2.071	3.107	4.142	5.178	5.696
9	4.22	0.959	1.917	2.876	3.835	4.793	5.272	4.22	0.959	1.917	2.876	3.835	4.793	5.272
10	3.75	0.673	1.345	2.018	2.691	3.363	3.7	3.79	0.694	1.389	2.083	2.778	3.472	3.819
11	4.1	0.879	1.758	2.637	3.517	4.396	4.835	3.63	0.61	1.22	1.83	2.441	3.051	3.356
12	3.79	0.694	1.389	2.083	2.778	3.472	3.819	3.79	0.694	1.389	2.083	2.778	3.472	3.819
13	3.91	0.763	1.525	2.288	3.05	3.813	4.194	3.96	0.792	1.584	2.376	3.169	3.961	4.357
14	3.55	0.571	1.141	1.712	2.283	2.853	3.139	4.27	0.993	1.986	2.979	3.972	4.966	5.462

15	3.55	0.571	1.141	1.712	2.283	2.853	3.139	3.68	0.636	1.271	1.907	2.543	3.179	3.496
16	6.04	2.811	5.622	8.432	11.243	14.054	15.459	4.47	1.139	2.279	3.418	4.557	5.696	6.266
17	4.33	1.036	2.071	3.107	4.142	5.178	5.696	4.29	1.007	2.014	3.021	4.029	5.036	5.539
18	3.63	0.61	1.22	1.83	2.441	3.051	3.356	3.85	0.728	1.456	2.184	2.912	3.64	4.004
19	3.6	0.595	1.19	1.785	2.381	2.976	3.273	3.89	0.751	1.502	2.253	3.003	3.754	4.13
20	3.68	0.636	1.271	1.907	2.543	3.179	3.496	3.68	0.636	1.271	1.907	2.543	3.179	3.496
21	3.47	0.533	1.066	1.599	2.132	2.665	2.931	3.08	0.373	0.745	1.118	1.491	1.864	2.05
22	2.96	0.331	0.662	0.992	1.323	1.654	1.82	3.85	0.728	1.456	2.184	2.912	3.64	4.004
23	3.96	0.792	1.584	2.376	3.169	3.961	4.357	4.22	0.959	1.917	2.876	3.835	4.793	5.272
24	3.89	0.751	1.502	2.253	3.003	3.754	4.13	3.68	0.636	1.271	1.907	2.543	3.179	3.496
25	4.17	0.925	1.85	2.775	3.7	4.625	5.087	3.68	0.636	1.271	1.907	2.543	3.179	3.496
26	4.12	0.892	1.784	2.676	3.568	4.46	4.906	4.2	0.945	1.89	2.835	3.78	4.725	5.198
27	4.27	0.993	1.986	2.979	3.972	4.966	5.462	4.27	0.993	1.986	2.979	3.972	4.966	5.462
28	4.17	0.925	1.85	2.775	3.7	4.625	5.087	3.5	0.547	1.094	1.641	2.188	2.735	3.008
29	4.69	1.316	2.632	3.948	5.264	6.58	7.238	4.08	0.866	1.733	2.599	3.465	4.332	4.765
30	3.68	0.636	1.271	1.907	2.543	3.179	3.496	3.75	0.673	1.345	2.018	2.691	3.363	3.7
31								4.17	0.925	1.85	2.775	3.7	4.625	5.087

Table 8 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 8 m above ground for November and December

Day	Mean Daily Speed	November's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	December's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	3.85	0.728	1.456	2.184	2.912	3.64	4.004	3.63	0.61	1.22	1.83	2.441	3.051	3.356
2	4	0.816	1.633	2.449	3.266	4.082	4.49	3.91	0.763	1.525	2.288	3.05	3.813	4.194
3	4.12	0.892	1.784	2.676	3.568	4.46	4.906	3.89	0.751	1.502	2.253	3.003	3.754	4.13
4	3.63	0.61	1.22	1.83	2.441	3.051	3.356	4.12	0.892	1.784	2.676	3.568	4.46	4.906
5	3.44	0.519	1.039	1.558	2.077	2.596	2.856	4.43	1.109	2.218	3.327	4.436	5.545	6.099
6	3.75	0.673	1.345	2.018	2.691	3.363	3.7	4.27	0.993	1.986	2.979	3.972	4.966	5.462
7	3.75	0.673	1.345	2.018	2.691	3.363	3.7	4.06	0.854	1.707	2.561	3.415	4.268	4.695
8	4	0.816	1.633	2.449	3.266	4.082	4.49	3.69	0.641	1.282	1.923	2.564	3.205	3.525
9	3.82	0.711	1.422	2.133	2.844	3.555	3.911	3.58	0.585	1.171	1.756	2.341	2.926	3.219
10	3.85	0.728	1.456	2.184	2.912	3.64	4.004	4.06	0.854	1.707	2.561	3.415	4.268	4.695
11	3.75	0.673	1.345	2.018	2.691	3.363	3.7	3.79	0.694	1.389	2.083	2.778	3.472	3.819
12	3.85	0.728	1.456	2.184	2.912	3.64	4.004	3.53	0.561	1.122	1.683	2.244	2.805	3.086
13	4.17	0.925	1.85	2.775	3.7	4.625	5.087	3.79	0.694	1.389	2.083	2.778	3.472	3.819
14	3.55	0.571	1.141	1.712	2.283	2.853	3.139	4	0.816	1.633	2.449	3.266	4.082	4.49
15	3.96	0.792	1.584	2.376	3.169	3.961	4.357	3.75	0.673	1.345	2.018	2.691	3.363	3.7
16	4.17	0.925	1.85	2.775	3.7	4.625	5.087	3.47	0.533	1.066	1.599	2.132	2.665	2.931
17	4.06	0.854	1.707	2.561	3.415	4.268	4.695	3.53	0.561	1.122	1.683	2.244	2.805	3.086
18	3.75	0.673	1.345	2.018	2.691	3.363	3.7	3.96	0.792	1.584	2.376	3.169	3.961	4.357
19	3.39	0.497	0.994	1.491	1.988	2.485	2.733	3.85	0.728	1.456	2.184	2.912	3.64	4.004
20	3.63	0.61	1.22	1.83	2.441	3.051	3.356	4.06	0.854	1.707	2.561	3.415	4.268	4.695
21	3.79	0.694	1.389	2.083	2.778	3.472	3.819	3.68	0.636	1.271	1.907	2.543	3.179	3.496
22	4.17	0.925	1.85	2.775	3.7	4.625	5.087	3.72	0.657	1.313	1.97	2.627	3.283	3.612

23	4.06	0.854	1.707	2.561	3.415	4.268	4.695	3.79	0.694	1.389	2.083	2.778	3.472	3.819
24	3.63	0.61	1.22	1.83	2.441	3.051	3.356	4	0.816	1.633	2.449	3.266	4.082	4.49
25	3.48	0.538	1.075	1.613	2.15	2.688	2.957	3.68	0.636	1.271	1.907	2.543	3.179	3.496
26	3.47	0.533	1.066	1.599	2.132	2.665	2.931	3.69	0.641	1.282	1.923	2.564	3.205	3.525
27	4.33	1.036	2.071	3.107	4.142	5.178	5.696	3.72	0.657	1.313	1.97	2.627	3.283	3.612
28	4.06	0.854	1.707	2.561	3.415	4.268	4.695	3.55	0.571	1.141	1.712	2.283	2.853	3.139
29	3.72	0.657	1.313	1.97	2.627	3.283	3.612	3.75	0.673	1.345	2.018	2.691	3.363	3.7
30	3.79	0.694	1.389	2.083	2.778	3.472	3.819	3.99	0.81	1.621	2.431	3.241	4.051	4.457
31								3.89	0.751	1.502	2.253	3.003	3.754	4.13

Table 9 Urban daily wind speed values obtained from Test Reference Year data for Armidale NSW, Australia at 9 m height in (m/s)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	3.92	4.41	4.16	3.5	3.6	3.21	4.23	3.95	3.72	4.23	3.95	3.72
2	4.54	4.72	4.1	3.64	3.72	3.67	3.72	4.1	3.56	4	4.1	4.02
3	3.92	4.16	4.1	3.31	3.4	3.16	3.64	4.79	4.45	3.77	4.23	4
4	4.57	3.82	4.28	3.33	3.77	2.87	4	4.28	4.06	3.48	3.72	4.23
5	4.1	3.53	4.44	3.95	3.16	3.56	4	4.57	4.35	3.38	3.53	4.54
6	4.13	3.79	4.45	4.02	3.48	3.53	3.85	4.38	4.38	4.35	3.85	4.38
7	4.54	4.54	4	4.23	3.6	3.4	3.31	4.57	4	4.1	3.85	4.16
8	4.59	3.95	3.6	4	3.09	3.77	3.64	4.79	4.28	4.45	4.1	3.79
9	4.79	4.28	4.02	3.38	3.09	4.06	4.33	4.28	4.33	4.33	3.92	3.67
10	4.28	3.85	3.95	3.62	3.31	3.85	4.16	4.33	3.85	3.89	3.95	4.16
11	4.44	3.64	4	3.33	3.38	3.72	4.16	4.28	4.21	3.72	3.85	3.89
12	4.16	4	3.89	3.85	3.4	3.38	3.16	4.62	3.89	3.89	3.95	3.62
13	3.95	4.21	3.77	3.45	3.56	3.74	3.25	4.06	4.02	4.06	4.28	3.89
14	3.95	4.45	3.56	3	3.6	4.35	4.23	4.54	3.64	4.38	3.64	4.1
15	4.16	4.23	3.09	3.04	2.94	3.97	4	4.23	3.64	3.77	4.06	3.85
16	4.16	3.77	3.43	3.25	3.56	3.64	3.16	4.57	6.19	4.59	4.28	3.56
17	4.16	3.85	3.6	3.48	3.62	3.67	3.25	4.33	4.45	4.41	4.16	3.62
18	4.16	4.28	4.09	3.25	3.4	3.31	3.72	4.66	3.72	3.95	3.85	4.06
19	4.5	3.87	3.74	2.94	4.06	3.89	4	3.95	3.69	4	3.48	3.95
20	4.28	4	3.64	3.04	3.6	3.62	3.77	4.28	3.77	3.77	3.72	4.16
21	4.16	3.89	3.43	2.94	3.87	4.35	4.62	4.45	3.56	3.16	3.89	3.77
22	3.82	4.06	3.77	3.09	3.45	4.28	3.6	4.79	3.04	3.95	4.28	3.82
23	3.67	4.23	3.74	3.09	3.16	4.13	3.77	4.1	4.06	4.33	4.16	3.89
24	4.38	4.16	3.64	3.38	3.25	3.6	3.56	4.62	4	3.77	3.72	4.1
25	4.5	4.06	3.67	3.72	3.31	3.21	3.72	4.38	4.28	3.77	3.58	3.77
26	4.21	3.6	3.53	3.82	3.64	3.67	4.54	4.33	4.23	4.31	3.56	3.79
27	4.28	3.33	3.16	3.72	3.38	3.72	4.1	4.28	4.38	4.38	4.45	3.82
28	4.16	3.5	3.38	3.87	3.35	4.62	4.28	4.35	4.28	3.6	4.16	3.64
29	4.02	3.89	3.21	3.67	3.85	4.79	3.95	4.21	4.82	4.19	3.82	3.85
30	3.85		3.21	3.53	3.28	4.23	3.85	5.18	3.77	3.85	3.89	4.09
31	4.38		3.5		3.43		3.85	4.65		4.28		4

Extracted from [12]

Table 10 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 9 m above ground for January and February

Day	Mean Daily Speed	January's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	February's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	3.92	0.768	1.537	2.305	3.073	3.842	4.226	4.41	1.094	2.188	3.282	4.376	5.47	6.017
2	4.54	1.194	2.387	3.581	4.775	5.968	6.565	4.72	1.341	2.683	4.024	5.365	6.707	7.377
3	3.92	0.768	1.537	2.305	3.073	3.842	4.226	4.16	0.918	1.837	2.755	3.673	4.592	5.051
4	4.57	1.217	2.435	3.652	4.87	6.087	6.696	3.82	0.711	1.422	2.133	2.844	3.555	3.911
5	4.1	0.879	1.758	2.637	3.517	4.396	4.835	3.53	0.561	1.122	1.683	2.244	2.805	3.086
6	4.13	0.899	1.797	2.696	3.594	4.493	4.942	3.79	0.694	1.389	2.083	2.778	3.472	3.819
7	4.54	1.194	2.387	3.581	4.775	5.968	6.565	4.54	1.194	2.387	3.581	4.775	5.968	6.565
8	4.59	1.234	2.467	3.701	4.934	6.168	6.784	3.95	0.786	1.572	2.358	3.145	3.931	4.324
9	4.79	1.402	2.804	4.206	5.608	7.01	7.711	4.28	1	2	3	4	5.001	5.501
10	4.28	1	2	3	4	5.001	5.501	3.85	0.728	1.456	2.184	2.912	3.64	4.004
11	4.44	1.117	2.233	3.35	4.466	5.583	6.141	3.64	0.615	1.23	1.846	2.461	3.076	3.384
12	4.16	0.918	1.837	2.755	3.673	4.592	5.051	4	0.816	1.633	2.449	3.266	4.082	4.49
13	3.95	0.786	1.572	2.358	3.145	3.931	4.324	4.21	0.952	1.904	2.855	3.807	4.759	5.235
14	3.95	0.786	1.572	2.358	3.145	3.931	4.324	4.45	1.124	2.248	3.372	4.496	5.62	6.182
15	4.16	0.918	1.837	2.755	3.673	4.592	5.051	4.23	0.965	1.931	2.896	3.862	4.827	5.31
16	4.16	0.918	1.837	2.755	3.673	4.592	5.051	3.77	0.684	1.367	2.051	2.734	3.418	3.759
17	4.16	0.918	1.837	2.755	3.673	4.592	5.051	3.85	0.728	1.456	2.184	2.912	3.64	4.004
18	4.16	0.918	1.837	2.755	3.673	4.592	5.051	4.28	1	2	3	4	5.001	5.501
19	4.5	1.162	2.325	3.487	4.65	5.812	6.393	3.87	0.739	1.479	2.218	2.957	3.697	4.066
20	4.28	1	2	3	4	5.001	5.501	4	0.816	1.633	2.449	3.266	4.082	4.49
21	4.16	0.918	1.837	2.755	3.673	4.592	5.051	3.89	0.751	1.502	2.253	3.003	3.754	4.13
22	3.82	0.711	1.422	2.133	2.844	3.555	3.911	4.06	0.854	1.707	2.561	3.415	4.268	4.695
23	3.67	0.631	1.261	1.892	2.522	3.153	3.468	4.23	0.965	1.931	2.896	3.862	4.827	5.31
24	4.38	1.072	2.144	3.216	4.287	5.359	5.895	4.16	0.918	1.837	2.755	3.673	4.592	5.051
25	4.5	1.162	2.325	3.487	4.65	5.812	6.393	4.06	0.854	1.707	2.561	3.415	4.268	4.695
26	4.21	0.952	1.904	2.855	3.807	4.759	5.235	3.6	0.595	1.19	1.785	2.381	2.976	3.273
27	4.28	1	2	3	4	5.001	5.501	3.33	0.471	0.942	1.413	1.884	2.355	2.591
28	4.16	0.918	1.837	2.755	3.673	4.592	5.051	3.5	0.547	1.094	1.641	2.188	2.735	3.008
29	4.02	0.829	1.657	2.486	3.315	4.143	4.558	3.89	0.751	1.502	2.253	3.003	3.754	4.13
30	3.85	0.728	1.456	2.184	2.912	3.64	4.004							
31	4.38	1.072	2.144	3.216	4.287	5.359	5.895							

Table 11 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 9 m above ground for March and April

Day	Mean Daily Speed	March's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	April's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	4.16	0.918	1.837	2.755	3.673	4.592	5.051	3.5	0.547	1.094	1.641	2.188	2.735	3.008
2	4.1	0.879	1.758	2.637	3.517	4.396	4.835	3.64	0.615	1.23	1.846	2.461	3.076	3.384
3	4.1	0.879	1.758	2.637	3.517	4.396	4.835	3.31	0.463	0.925	1.388	1.85	2.313	2.544
4	4.28	1	2	3	4	5.001	5.501	3.33	0.471	0.942	1.413	1.884	2.355	2.591
5	4.44	1.117	2.233	3.35	4.466	5.583	6.141	3.95	0.786	1.572	2.358	3.145	3.931	4.324
6	4.45	1.124	2.248	3.372	4.496	5.62	6.182	4.02	0.829	1.657	2.486	3.315	4.143	4.558
7	4	0.816	1.633	2.449	3.266	4.082	4.49	4.23	0.965	1.931	2.896	3.862	4.827	5.31
8	3.6	0.595	1.19	1.785	2.381	2.976	3.273	4	0.816	1.633	2.449	3.266	4.082	4.49
9	4.02	0.829	1.657	2.486	3.315	4.143	4.558	3.38	0.493	0.985	1.478	1.97	2.463	2.709
10	3.95	0.786	1.572	2.358	3.145	3.931	4.324	3.62	0.605	1.21	1.815	2.42	3.026	3.328
11	4	0.816	1.633	2.449	3.266	4.082	4.49	3.33	0.471	0.942	1.413	1.884	2.355	2.591
12	3.89	0.751	1.502	2.253	3.003	3.754	4.13	3.85	0.728	1.456	2.184	2.912	3.64	4.004
13	3.77	0.684	1.367	2.051	2.734	3.418	3.759	3.45	0.524	1.048	1.571	2.095	2.619	2.881
14	3.56	0.576	1.151	1.727	2.302	2.878	3.165	3	0.344	0.689	1.033	1.378	1.722	1.894
15	3.09	0.376	0.753	1.129	1.505	1.882	2.07	3.04	0.358	0.717	1.075	1.433	1.792	1.971
16	3.43	0.515	1.03	1.544	2.059	2.574	2.831	3.25	0.438	0.876	1.314	1.752	2.189	2.408
17	3.6	0.595	1.19	1.785	2.381	2.976	3.273	3.48	0.538	1.075	1.613	2.15	2.688	2.957
18	4.09	0.873	1.745	2.618	3.491	4.364	4.8	3.25	0.438	0.876	1.314	1.752	2.189	2.408
19	3.74	0.667	1.335	2.002	2.669	3.337	3.67	2.94	0.324	0.648	0.972	1.297	1.621	1.783
20	3.64	0.615	1.23	1.846	2.461	3.076	3.384	3.04	0.358	0.717	1.075	1.433	1.792	1.971
21	3.43	0.515	1.03	1.544	2.059	2.574	2.831	2.94	0.324	0.648	0.972	1.297	1.621	1.783
22	3.77	0.684	1.367	2.051	2.734	3.418	3.759	3.09	0.376	0.753	1.129	1.505	1.882	2.07
23	3.74	0.667	1.335	2.002	2.669	3.337	3.67	3.09	0.376	0.753	1.129	1.505	1.882	2.07
24	3.64	0.615	1.23	1.846	2.461	3.076	3.384	3.38	0.493	0.985	1.478	1.97	2.463	2.709
25	3.67	0.631	1.261	1.892	2.522	3.153	3.468	3.72	0.657	1.313	1.97	2.627	3.283	3.612
26	3.53	0.561	1.122	1.683	2.244	2.805	3.086	3.82	0.711	1.422	2.133	2.844	3.555	3.911
27	3.16	0.403	0.805	1.208	1.61	2.013	2.214	3.72	0.657	1.313	1.97	2.627	3.283	3.612
28	3.38	0.493	0.985	1.478	1.97	2.463	2.709	3.87	0.739	1.479	2.218	2.957	3.697	4.066
29	3.21	0.422	0.844	1.266	1.688	2.11	2.321	3.67	0.631	1.261	1.892	2.522	3.153	3.468
30	3.21	0.422	0.844	1.266	1.688	2.11	2.321	3.53	0.561	1.122	1.683	2.244	2.805	3.086
31	3.5	0.547	1.094	1.641	2.188	2.735	3.008							

Table 12 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 9 m above ground for May and June

Day	Mean Daily Speed	May's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	June's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp=30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	3.6	0.595	1.19	1.785	2.381	2.976	3.273	3.21	0.422	0.844	1.266	1.688	2.11	2.321
2	3.72	0.657	1.313	1.97	2.627	3.283	3.612	3.67	0.631	1.261	1.892	2.522	3.153	3.468
3	3.4	0.501	1.003	1.504	2.005	2.507	2.757	3.16	0.403	0.805	1.208	1.61	2.013	2.214
4	3.77	0.684	1.367	2.051	2.734	3.418	3.759	2.87	0.302	0.603	0.905	1.206	1.508	1.659
5	3.16	0.403	0.805	1.208	1.61	2.013	2.214	3.56	0.576	1.151	1.727	2.302	2.878	3.165
6	3.48	0.538	1.075	1.613	2.15	2.688	2.957	3.53	0.561	1.122	1.683	2.244	2.805	3.086
7	3.6	0.595	1.19	1.785	2.381	2.976	3.273	3.4	0.501	1.003	1.504	2.005	2.507	2.757
8	3.09	0.376	0.753	1.129	1.505	1.882	2.07	3.77	0.684	1.367	2.051	2.734	3.418	3.759
9	3.09	0.376	0.753	1.129	1.505	1.882	2.07	4.06	0.854	1.707	2.561	3.415	4.268	4.695
10	3.31	0.463	0.925	1.388	1.85	2.313	2.544	3.85	0.728	1.456	2.184	2.912	3.64	4.004
11	3.38	0.493	0.985	1.478	1.97	2.463	2.709	3.72	0.657	1.313	1.97	2.627	3.283	3.612
12	3.4	0.501	1.003	1.504	2.005	2.507	2.757	3.38	0.493	0.985	1.478	1.97	2.463	2.709
13	3.56	0.576	1.151	1.727	2.302	2.878	3.165	3.74	0.667	1.335	2.002	2.669	3.337	3.67
14	3.6	0.595	1.19	1.785	2.381	2.976	3.273	4.35	1.05	2.1	3.15	4.2	5.25	5.775
15	2.94	0.324	0.648	0.972	1.297	1.621	1.783	3.97	0.798	1.596	2.394	3.193	3.991	4.39
16	3.56	0.576	1.151	1.727	2.302	2.878	3.165	3.64	0.615	1.23	1.846	2.461	3.076	3.384
17	3.62	0.605	1.21	1.815	2.42	3.026	3.328	3.67	0.631	1.261	1.892	2.522	3.153	3.468
18	3.4	0.501	1.003	1.504	2.005	2.507	2.757	3.31	0.463	0.925	1.388	1.85	2.313	2.544
19	4.06	0.854	1.707	2.561	3.415	4.268	4.695	3.89	0.751	1.502	2.253	3.003	3.754	4.13
20	3.6	0.595	1.19	1.785	2.381	2.976	3.273	3.62	0.605	1.21	1.815	2.42	3.026	3.328
21	3.87	0.739	1.479	2.218	2.957	3.697	4.066	4.35	1.05	2.1	3.15	4.2	5.25	5.775
22	3.45	0.524	1.048	1.571	2.095	2.619	2.881	4.28	1	2	3	4	5.001	5.501
23	3.16	0.403	0.805	1.208	1.61	2.013	2.214	4.13	0.899	1.797	2.696	3.594	4.493	4.942
24	3.25	0.438	0.876	1.314	1.752	2.189	2.408	3.6	0.595	1.19	1.785	2.381	2.976	3.273
25	3.31	0.463	0.925	1.388	1.85	2.313	2.544	3.21	0.422	0.844	1.266	1.688	2.11	2.321
26	3.64	0.615	1.23	1.846	2.461	3.076	3.384	3.67	0.631	1.261	1.892	2.522	3.153	3.468
27	3.38	0.493	0.985	1.478	1.97	2.463	2.709	3.72	0.657	1.313	1.97	2.627	3.283	3.612
28	3.35	0.48	0.959	1.439	1.918	2.398	2.638	4.62	1.258	2.516	3.774	5.032	6.289	6.918
29	3.85	0.728	1.456	2.184	2.912	3.64	4.004	4.79	1.402	2.804	4.206	5.608	7.01	7.711
30	3.28	0.45	0.9	1.35	1.801	2.251	2.476	4.23	0.965	1.931	2.896	3.862	4.827	5.31
31	3.43	0.515	1.03	1.544	2.059	2.574	2.831							

Table 13 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 9 m above ground for July and August

Day	Mean Daily Speed	July's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	August's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	4.23	0.965	1.931	2.896	3.862	4.827	5.31	3.95	0.786	1.572	2.358	3.145	3.931	4.324
2	3.72	0.657	1.313	1.97	2.627	3.283	3.612	4.1	0.879	1.758	2.637	3.517	4.396	4.835
3	3.64	0.615	1.23	1.846	2.461	3.076	3.384	4.79	1.402	2.804	4.206	5.608	7.01	7.711
4	4	0.816	1.633	2.449	3.266	4.082	4.49	4.28	1	2	3	4	5.001	5.501
5	4	0.816	1.633	2.449	3.266	4.082	4.49	4.57	1.217	2.435	3.652	4.87	6.087	6.696
6	3.85	0.728	1.456	2.184	2.912	3.64	4.004	4.38	1.072	2.144	3.216	4.287	5.359	5.895
7	3.31	0.463	0.925	1.388	1.85	2.313	2.544	4.57	1.217	2.435	3.652	4.87	6.087	6.696
8	3.64	0.615	1.23	1.846	2.461	3.076	3.384	4.79	1.402	2.804	4.206	5.608	7.01	7.711
9	4.33	1.036	2.071	3.107	4.142	5.178	5.696	4.28	1	2	3	4	5.001	5.501
10	4.16	0.918	1.837	2.755	3.673	4.592	5.051	4.33	1.036	2.071	3.107	4.142	5.178	5.696
11	4.16	0.918	1.837	2.755	3.673	4.592	5.051	4.28	1	2	3	4	5.001	5.501
12	3.16	0.403	0.805	1.208	1.61	2.013	2.214	4.62	1.258	2.516	3.774	5.032	6.289	6.918
13	3.25	0.438	0.876	1.314	1.752	2.189	2.408	4.06	0.854	1.707	2.561	3.415	4.268	4.695
14	4.23	0.965	1.931	2.896	3.862	4.827	5.31	4.54	1.194	2.387	3.581	4.775	5.968	6.565
15	4	0.816	1.633	2.449	3.266	4.082	4.49	4.23	0.965	1.931	2.896	3.862	4.827	5.31
16	3.16	0.403	0.805	1.208	1.61	2.013	2.214	4.57	1.217	2.435	3.652	4.87	6.087	6.696
17	3.25	0.438	0.876	1.314	1.752	2.189	2.408	4.33	1.036	2.071	3.107	4.142	5.178	5.696
18	3.72	0.657	1.313	1.97	2.627	3.283	3.612	4.66	1.291	2.582	3.873	5.163	6.454	7.1
19	4	0.816	1.633	2.449	3.266	4.082	4.49	3.95	0.786	1.572	2.358	3.145	3.931	4.324
20	3.77	0.684	1.367	2.051	2.734	3.418	3.759	4.28	1	2	3	4	5.001	5.501
21	4.62	1.258	2.516	3.774	5.032	6.289	6.918	4.45	1.124	2.248	3.372	4.496	5.62	6.182
22	3.6	0.595	1.19	1.785	2.381	2.976	3.273	4.79	1.402	2.804	4.206	5.608	7.01	7.711
23	3.77	0.684	1.367	2.051	2.734	3.418	3.759	4.1	0.879	1.758	2.637	3.517	4.396	4.835
24	3.56	0.576	1.151	1.727	2.302	2.878	3.165	4.62	1.258	2.516	3.774	5.032	6.289	6.918
25	3.72	0.657	1.313	1.97	2.627	3.283	3.612	4.38	1.072	2.144	3.216	4.287	5.359	5.895
26	4.54	1.194	2.387	3.581	4.775	5.968	6.565	4.33	1.036	2.071	3.107	4.142	5.178	5.696
27	4.1	0.879	1.758	2.637	3.517	4.396	4.835	4.28	1	2	3	4	5.001	5.501
28	4.28	1	2	3	4	5.001	5.501	4.35	1.05	2.1	3.15	4.2	5.25	5.775
29	3.95	0.786	1.572	2.358	3.145	3.931	4.324	4.21	0.952	1.904	2.855	3.807	4.759	5.235
30	3.85	0.728	1.456	2.184	2.912	3.64	4.004	5.18	1.773	3.546	5.319	7.092	8.865	9.751
31	3.85	0.728	1.456	2.184	2.912	3.64	4.004	4.65	1.283	2.565	3.848	5.13	6.413	7.054

Table 14 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 9 m above ground for September and October

Day	Mean Daily Speed	September's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	October's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	3.72	0.657	1.313	1.97	2.627	3.283	3.612	4.23	0.965	1.931	2.896	3.862	4.827	5.31
2	3.56	0.576	1.151	1.727	2.302	2.878	3.165	4	0.816	1.633	2.449	3.266	4.082	4.49
3	4.45	1.124	2.248	3.372	4.496	5.62	6.182	3.77	0.684	1.367	2.051	2.734	3.418	3.759
4	4.06	0.854	1.707	2.561	3.415	4.268	4.695	3.48	0.538	1.075	1.613	2.15	2.688	2.957
5	4.35	1.05	2.1	3.15	4.2	5.25	5.775	3.38	0.493	0.985	1.478	1.97	2.463	2.709
6	4.38	1.072	2.144	3.216	4.287	5.359	5.895	4.35	1.05	2.1	3.15	4.2	5.25	5.775
7	4	0.816	1.633	2.449	3.266	4.082	4.49	4.1	0.879	1.758	2.637	3.517	4.396	4.835
8	4.28	1	2	3	4	5.001	5.501	4.45	1.124	2.248	3.372	4.496	5.62	6.182
9	4.33	1.036	2.071	3.107	4.142	5.178	5.696	4.33	1.036	2.071	3.107	4.142	5.178	5.696
10	3.85	0.728	1.456	2.184	2.912	3.64	4.004	3.89	0.751	1.502	2.253	3.003	3.754	4.13
11	4.21	0.952	1.904	2.855	3.807	4.759	5.235	3.72	0.657	1.313	1.97	2.627	3.283	3.612
12	3.89	0.751	1.502	2.253	3.003	3.754	4.13	3.89	0.751	1.502	2.253	3.003	3.754	4.13
13	4.02	0.829	1.657	2.486	3.315	4.143	4.558	4.06	0.854	1.707	2.561	3.415	4.268	4.695
14	3.64	0.615	1.23	1.846	2.461	3.076	3.384	4.38	1.072	2.144	3.216	4.287	5.359	5.895
15	3.64	0.615	1.23	1.846	2.461	3.076	3.384	3.77	0.684	1.367	2.051	2.734	3.418	3.759
16	6.19	3.025	6.051	9.076	12.102	15.127	16.64	4.59	1.234	2.467	3.701	4.934	6.168	6.784
17	4.45	1.124	2.248	3.372	4.496	5.62	6.182	4.41	1.094	2.188	3.282	4.376	5.47	6.017
18	3.72	0.657	1.313	1.97	2.627	3.283	3.612	3.95	0.786	1.572	2.358	3.145	3.931	4.324
19	3.69	0.641	1.282	1.923	2.564	3.205	3.525	4	0.816	1.633	2.449	3.266	4.082	4.49
20	3.77	0.684	1.367	2.051	2.734	3.418	3.759	3.77	0.684	1.367	2.051	2.734	3.418	3.759
21	3.56	0.576	1.151	1.727	2.302	2.878	3.165	3.16	0.403	0.805	1.208	1.61	2.013	2.214
22	3.04	0.358	0.717	1.075	1.433	1.792	1.971	3.95	0.786	1.572	2.358	3.145	3.931	4.324
23	4.06	0.854	1.707	2.561	3.415	4.268	4.695	4.33	1.036	2.071	3.107	4.142	5.178	5.696
24	4	0.816	1.633	2.449	3.266	4.082	4.49	3.77	0.684	1.367	2.051	2.734	3.418	3.759
25	4.28	1	2	3	4	5.001	5.501	3.77	0.684	1.367	2.051	2.734	3.418	3.759
26	4.23	0.965	1.931	2.896	3.862	4.827	5.31	4.31	1.021	2.043	3.064	4.085	5.106	5.617
27	4.38	1.072	2.144	3.216	4.287	5.359	5.895	4.38	1.072	2.144	3.216	4.287	5.359	5.895
28	4.28	1	2	3	4	5.001	5.501	3.6	0.595	1.19	1.785	2.381	2.976	3.273
29	4.82	1.428	2.857	4.285	5.714	7.142	7.856	4.19	0.938	1.877	2.815	3.753	4.692	5.161
30	3.77	0.684	1.367	2.051	2.734	3.418	3.759	3.85	0.728	1.456	2.184	2.912	3.64	4.004
31								4.28	1	2	3	4	5.001	5.501

Table 15 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 9 m above ground for November and December

Day	Mean Daily Speed	November's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	December's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp=1 0%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	3.95	0.786	1.572	2.358	3.145	3.931	4.324	3.72	0.657	1.313	1.97	2.627	3.283	3.612
2	4.1	0.879	1.758	2.637	3.517	4.396	4.835	4.02	0.829	1.657	2.486	3.315	4.143	4.558
3	4.23	0.965	1.931	2.896	3.862	4.827	5.31	4	0.816	1.633	2.449	3.266	4.082	4.49
4	3.72	0.657	1.313	1.97	2.627	3.283	3.612	4.23	0.965	1.931	2.896	3.862	4.827	5.31
5	3.53	0.561	1.122	1.683	2.244	2.805	3.086	4.54	1.194	2.387	3.581	4.775	5.968	6.565
6	3.85	0.728	1.456	2.184	2.912	3.64	4.004	4.38	1.072	2.144	3.216	4.287	5.359	5.895
7	3.85	0.728	1.456	2.184	2.912	3.64	4.004	4.16	0.918	1.837	2.755	3.673	4.592	5.051
8	4.1	0.879	1.758	2.637	3.517	4.396	4.835	3.79	0.694	1.389	2.083	2.778	3.472	3.819
9	3.92	0.768	1.537	2.305	3.073	3.842	4.226	3.67	0.631	1.261	1.892	2.522	3.153	3.468
10	3.95	0.786	1.572	2.358	3.145	3.931	4.324	4.16	0.918	1.837	2.755	3.673	4.592	5.051
11	3.85	0.728	1.456	2.184	2.912	3.64	4.004	3.89	0.751	1.502	2.253	3.003	3.754	4.13
12	3.95	0.786	1.572	2.358	3.145	3.931	4.324	3.62	0.605	1.21	1.815	2.42	3.026	3.328
13	4.28	1	2	3	4	5.001	5.501	3.89	0.751	1.502	2.253	3.003	3.754	4.13
14	3.64	0.615	1.23	1.846	2.461	3.076	3.384	4.1	0.879	1.758	2.637	3.517	4.396	4.835
15	4.06	0.854	1.707	2.561	3.415	4.268	4.695	3.85	0.728	1.456	2.184	2.912	3.64	4.004
16	4.28	1	2	3	4	5.001	5.501	3.56	0.576	1.151	1.727	2.302	2.878	3.165
17	4.16	0.918	1.837	2.755	3.673	4.592	5.051	3.62	0.605	1.21	1.815	2.42	3.026	3.328
18	3.85	0.728	1.456	2.184	2.912	3.64	4.004	4.06	0.854	1.707	2.561	3.415	4.268	4.695
19	3.48	0.538	1.075	1.613	2.15	2.688	2.957	3.95	0.786	1.572	2.358	3.145	3.931	4.324
20	3.72	0.657	1.313	1.97	2.627	3.283	3.612	4.16	0.918	1.837	2.755	3.673	4.592	5.051
21	3.89	0.751	1.502	2.253	3.003	3.754	4.13	3.77	0.684	1.367	2.051	2.734	3.418	3.759
22	4.28	1	2	3	4	5.001	5.501	3.82	0.711	1.422	2.133	2.844	3.555	3.911
23	4.16	0.918	1.837	2.755	3.673	4.592	5.051	3.89	0.751	1.502	2.253	3.003	3.754	4.13
24	3.72	0.657	1.313	1.97	2.627	3.283	3.612	4.1	0.879	1.758	2.637	3.517	4.396	4.835
25	3.58	0.585	1.171	1.756	2.341	2.926	3.219	3.77	0.684	1.367	2.051	2.734	3.418	3.759
26	3.56	0.576	1.151	1.727	2.302	2.878	3.165	3.79	0.694	1.389	2.083	2.778	3.472	3.819
27	4.45	1.124	2.248	3.372	4.496	5.62	6.182	3.82	0.711	1.422	2.133	2.844	3.555	3.911
28	4.16	0.918	1.837	2.755	3.673	4.592	5.051	3.64	0.615	1.23	1.846	2.461	3.076	3.384
29	3.82	0.711	1.422	2.133	2.844	3.555	3.911	3.85	0.728	1.456	2.184	2.912	3.64	4.004
30	3.89	0.751	1.502	2.253	3.003	3.754	4.13	4.09	0.873	1.745	2.618	3.491	4.364	4.8
31								4	0.816	1.633	2.449	3.266	4.082	4.49

Table 16 Urban daily wind speed values obtained from Test Reference Year data for Armidale NSW, Australia at 10 m height in (m/s)

Day	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
1	4.01	4.51	4.26	3.58	3.68	3.29	4.33	4.04	3.81	4.33	4.04	3.81
2	4.65	4.83	4.2	3.73	3.81	3.76	3.81	4.2	3.64	4.09	4.2	4.11
3	4.01	4.26	4.2	3.39	3.48	3.23	3.73	4.9	4.55	3.86	4.33	4.09
4	4.68	3.91	4.38	3.41	3.86	2.94	4.09	4.38	4.16	3.56	3.81	4.33
5	4.2	3.61	4.54	4.04	3.23	3.64	4.09	4.68	4.45	3.46	3.61	4.65
6	4.23	3.88	4.55	4.11	3.56	3.61	3.94	4.48	4.48	4.45	3.94	4.48
7	4.65	4.65	4.09	4.33	3.68	3.48	3.39	4.68	4.09	4.2	3.94	4.26
8	4.7	4.04	3.68	4.09	3.16	3.86	3.73	4.9	4.38	4.55	4.2	3.88
9	4.9	4.38	4.11	3.46	3.16	4.16	4.43	4.38	4.43	4.43	4.01	3.76

10	4.38	3.94	4.04	3.71	3.39	3.94	4.26	4.43	3.94	3.98	4.04	4.26
11	4.54	3.73	4.09	3.41	3.46	3.81	4.26	4.38	4.31	3.81	3.94	3.98
12	4.26	4.09	3.98	3.94	3.48	3.46	3.23	4.73	3.98	3.98	4.04	3.71
13	4.04	4.31	3.86	3.53	3.64	3.83	3.33	4.16	4.11	4.16	4.38	3.98
14	4.04	4.55	3.64	3.07	3.68	4.45	4.33	4.65	3.73	4.48	3.73	4.2
15	4.26	4.33	3.16	3.11	3.01	4.06	4.09	4.33	3.73	3.86	4.16	3.94
16	4.26	3.86	3.51	3.33	3.64	3.73	3.23	4.68	6.34	4.7	4.38	3.64
17	4.26	3.94	3.68	3.56	3.71	3.76	3.33	4.43	4.55	4.51	4.26	3.71
18	4.26	4.38	4.19	3.33	3.48	3.39	3.81	4.77	3.81	4.04	3.94	4.16
19	4.61	3.96	3.83	3.01	4.16	3.98	4.09	4.04	3.78	4.09	3.56	4.04
20	4.38	4.09	3.73	3.11	3.68	3.71	3.86	4.38	3.86	3.86	3.81	4.26
21	4.26	3.98	3.51	3.01	3.96	4.45	4.73	4.55	3.64	3.23	3.98	3.86
22	3.91	4.16	3.86	3.16	3.53	4.38	3.68	4.9	3.11	4.04	4.38	3.91
23	3.76	4.33	3.83	3.16	3.23	4.23	3.86	4.2	4.16	4.43	4.26	3.98
24	4.48	4.26	3.73	3.46	3.33	3.68	3.64	4.73	4.09	3.86	3.81	4.2
25	4.61	4.16	3.76	3.81	3.39	3.29	3.81	4.48	4.38	3.86	3.66	3.86
26	4.31	3.68	3.61	3.91	3.73	3.76	4.65	4.43	4.33	4.41	3.64	3.88
27	4.38	3.41	3.23	3.81	3.46	3.81	4.2	4.38	4.48	4.48	4.55	3.91
28	4.26	3.58	3.46	3.96	3.43	4.73	4.38	4.45	4.38	3.68	4.26	3.73
29	4.11	3.98	3.29	3.76	3.94	4.9	4.04	4.31	4.93	4.29	3.91	3.94
30	3.94		3.29	3.61	3.36	4.33	3.94	5.3	3.86	3.94	3.98	4.19
31	4.48		3.58		3.51		3.94	4.76		4.38		4.09

Extracted from [12]

Table 17 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 10 m above ground for January and February

Day	Mean Daily Speed	January's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	Friday's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	4.01	0.823	1.645	2.468	3.29	4.113	4.524	4.51	1.17	2.34	3.51	4.681	5.851	6.436
2	4.65	1.283	2.565	3.848	5.13	6.413	7.054	4.83	1.437	2.875	4.312	5.749	7.187	7.905
3	4.01	0.823	1.645	2.468	3.29	4.113	4.524	4.26	0.986	1.972	2.958	3.945	4.931	5.424
4	4.68	1.308	2.615	3.923	5.23	6.538	7.191	3.91	0.763	1.525	2.288	3.05	3.813	4.194
5	4.2	0.945	1.89	2.835	3.78	4.725	5.198	3.61	0.6	1.2	1.8	2.4	3.001	3.301
6	4.23	0.965	1.931	2.896	3.862	4.827	5.31	3.88	0.745	1.49	2.235	2.98	3.725	4.098
7	4.65	1.283	2.565	3.848	5.13	6.413	7.054	4.65	1.283	2.565	3.848	5.13	6.413	7.054
8	4.7	1.324	2.649	3.973	5.297	6.622	7.284	4.04	0.841	1.682	2.523	3.364	4.206	4.626
9	4.9	1.501	3.001	4.502	6.003	7.504	8.254	4.38	1.072	2.144	3.216	4.287	5.359	5.895
10	4.38	1.072	2.144	3.216	4.287	5.359	5.895	3.94	0.78	1.56	2.341	3.121	3.901	4.291
11	4.54	1.194	2.387	3.581	4.775	5.968	6.565	3.73	0.662	1.324	1.986	2.648	3.31	3.641
12	4.26	0.986	1.972	2.958	3.945	4.931	5.424	4.09	0.873	1.745	2.618	3.491	4.364	4.8
13	4.04	0.841	1.682	2.523	3.364	4.206	4.626	4.31	1.021	2.043	3.064	4.085	5.106	5.617
14	4.04	0.841	1.682	2.523	3.364	4.206	4.626	4.55	1.202	2.403	3.605	4.806	6.008	6.609
15	4.26	0.986	1.972	2.958	3.945	4.931	5.424	4.33	1.036	2.071	3.107	4.142	5.178	5.696
16	4.26	0.986	1.972	2.958	3.945	4.931	5.424	3.86	0.734	1.467	2.201	2.935	3.668	4.035
17	4.26	0.986	1.972	2.958	3.945	4.931	5.424	3.94	0.78	1.56	2.341	3.121	3.901	4.291
18	4.26	0.986	1.972	2.958	3.945	4.931	5.424	4.38	1.072	2.144	3.216	4.287	5.359	5.895
19	4.61	1.25	2.499	3.749	4.999	6.249	6.874	3.96	0.792	1.584	2.376	3.169	3.961	4.357
20	4.38	1.072	2.144	3.216	4.287	5.359	5.895	4.09	0.873	1.745	2.618	3.491	4.364	4.8
21	4.26	0.986	1.972	2.958	3.945	4.931	5.424	3.98	0.804	1.608	2.413	3.217	4.021	4.423
22	3.91	0.763	1.525	2.288	3.05	3.813	4.194	4.16	0.918	1.837	2.755	3.673	4.592	5.051
23	3.76	0.678	1.356	2.034	2.712	3.39	3.729	4.33	1.036	2.071	3.107	4.142	5.178	5.696

24	4.48	1.147	2.294	3.441	4.588	5.735	6.308	4.26	0.986	1.972	2.958	3.945	4.931	5.424
25	4.61	1.25	2.499	3.749	4.999	6.249	6.874	4.16	0.918	1.837	2.755	3.673	4.592	5.051
26	4.31	1.021	2.043	3.064	4.085	5.106	5.617	3.68	0.636	1.271	1.907	2.543	3.179	3.496
27	4.38	1.072	2.144	3.216	4.287	5.359	5.895	3.41	0.506	1.012	1.517	2.023	2.529	2.782
28	4.26	0.986	1.972	2.958	3.945	4.931	5.424	3.58	0.585	1.171	1.756	2.341	2.926	3.219
29	4.11	0.886	1.771	2.657	3.542	4.428	4.871	3.98	0.804	1.608	2.413	3.217	4.021	4.423
30	3.94	0.78	1.56	2.341	3.121	3.901	4.291							
31	4.48	1.147	2.294	3.441	4.588	5.735	6.308							

Table 18 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 10 m above ground for March and April

Day	Mean Daily Speed	March's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	April's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	4.26	0.986	1.972	2.958	3.945	4.931	5.424	3.58	0.585	1.171	1.756	2.341	2.926	3.219
2	4.2	0.945	1.89	2.835	3.78	4.725	5.198	3.73	0.662	1.324	1.986	2.648	3.31	3.641
3	4.2	0.945	1.89	2.835	3.78	4.725	5.198	3.39	0.497	0.994	1.491	1.988	2.485	2.733
4	4.38	1.072	2.144	3.216	4.287	5.359	5.895	3.41	0.506	1.012	1.517	2.023	2.529	2.782
5	4.54	1.194	2.387	3.581	4.775	5.968	6.565	4.04	0.841	1.682	2.523	3.364	4.206	4.626
6	4.55	1.202	2.403	3.605	4.806	6.008	6.609	4.11	0.886	1.771	2.657	3.542	4.428	4.871
7	4.09	0.873	1.745	2.618	3.491	4.364	4.8	4.33	1.036	2.071	3.107	4.142	5.178	5.696
8	3.68	0.636	1.271	1.907	2.543	3.179	3.496	4.09	0.873	1.745	2.618	3.491	4.364	4.8
9	4.11	0.886	1.771	2.657	3.542	4.428	4.871	3.46	0.528	1.057	1.585	2.114	2.642	2.906
10	4.04	0.841	1.682	2.523	3.364	4.206	4.626	3.71	0.651	1.303	1.954	2.606	3.257	3.583
11	4.09	0.873	1.745	2.618	3.491	4.364	4.8	3.41	0.506	1.012	1.517	2.023	2.529	2.782
12	3.98	0.804	1.608	2.413	3.217	4.021	4.423	3.94	0.78	1.56	2.341	3.121	3.901	4.291
13	3.86	0.734	1.467	2.201	2.935	3.668	4.035	3.53	0.561	1.122	1.683	2.244	2.805	3.086
14	3.64	0.615	1.23	1.846	2.461	3.076	3.384	3.07	0.369	0.738	1.107	1.476	1.845	2.03
15	3.16	0.403	0.805	1.208	1.61	2.013	2.214	3.11	0.384	0.767	1.151	1.535	1.919	2.11
16	3.51	0.552	1.103	1.655	2.206	2.758	3.034	3.33	0.471	0.942	1.413	1.884	2.355	2.591
17	3.68	0.636	1.271	1.907	2.543	3.179	3.496	3.56	0.576	1.151	1.727	2.302	2.878	3.165
18	4.19	0.938	1.877	2.815	3.753	4.692	5.161	3.33	0.471	0.942	1.413	1.884	2.355	2.591
19	3.83	0.717	1.433	2.15	2.867	3.583	3.942	3.01	0.348	0.696	1.044	1.391	1.739	1.913
20	3.73	0.662	1.324	1.986	2.648	3.31	3.641	3.11	0.384	0.767	1.151	1.535	1.919	2.11
21	3.51	0.552	1.103	1.655	2.206	2.758	3.034	3.01	0.348	0.696	1.044	1.391	1.739	1.913
22	3.86	0.734	1.467	2.201	2.935	3.668	4.035	3.16	0.403	0.805	1.208	1.61	2.013	2.214
23	3.83	0.717	1.433	2.15	2.867	3.583	3.942	3.16	0.403	0.805	1.208	1.61	2.013	2.214
24	3.73	0.662	1.324	1.986	2.648	3.31	3.641	3.46	0.528	1.057	1.585	2.114	2.642	2.906
25	3.76	0.678	1.356	2.034	2.712	3.39	3.729	3.81	0.705	1.411	2.116	2.822	3.527	3.88
26	3.61	0.6	1.2	1.8	2.4	3.001	3.301	3.91	0.763	1.525	2.288	3.05	3.813	4.194
27	3.23	0.43	0.86	1.29	1.719	2.149	2.364	3.81	0.705	1.411	2.116	2.822	3.527	3.88
28	3.46	0.528	1.057	1.585	2.114	2.642	2.906	3.96	0.792	1.584	2.376	3.169	3.961	4.357
29	3.29	0.454	0.909	1.363	1.817	2.271	2.498	3.76	0.678	1.356	2.034	2.712	3.39	3.729
30	3.29	0.454	0.909	1.363	1.817	2.271	2.498	3.61	0.6	1.2	1.8	2.4	3.001	3.301
31	3.58	0.585	1.171	1.756	2.341	2.926	3.219							

Table 19 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 10 m above ground for May and June

Day	Mean Daily Speed	May's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	June's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	3.68	0.636	1.271	1.907	2.543	3.179	3.496	3.29	0.454	0.909	1.363	1.817	2.271	2.498
2	3.81	0.705	1.411	2.116	2.822	3.527	3.88	3.76	0.678	1.356	2.034	2.712	3.39	3.729
3	3.48	0.538	1.075	1.613	2.15	2.688	2.957	3.23	0.43	0.86	1.29	1.719	2.149	2.364
4	3.86	0.734	1.467	2.201	2.935	3.668	4.035	2.94	0.324	0.648	0.972	1.297	1.621	1.783
5	3.23	0.43	0.86	1.29	1.719	2.149	2.364	3.64	0.615	1.23	1.846	2.461	3.076	3.384
6	3.56	0.576	1.151	1.727	2.302	2.878	3.165	3.61	0.6	1.2	1.8	2.4	3.001	3.301
7	3.68	0.636	1.271	1.907	2.543	3.179	3.496	3.48	0.538	1.075	1.613	2.15	2.688	2.957
8	3.16	0.403	0.805	1.208	1.61	2.013	2.214	3.86	0.734	1.467	2.201	2.935	3.668	4.035
9	3.16	0.403	0.805	1.208	1.61	2.013	2.214	4.16	0.918	1.837	2.755	3.673	4.592	5.051
10	3.39	0.497	0.994	1.491	1.988	2.485	2.733	3.94	0.78	1.56	2.341	3.121	3.901	4.291
11	3.46	0.528	1.057	1.585	2.114	2.642	2.906	3.81	0.705	1.411	2.116	2.822	3.527	3.88
12	3.48	0.538	1.075	1.613	2.15	2.688	2.957	3.46	0.528	1.057	1.585	2.114	2.642	2.906
13	3.64	0.615	1.23	1.846	2.461	3.076	3.384	3.83	0.717	1.433	2.15	2.867	3.583	3.942
14	3.68	0.636	1.271	1.907	2.543	3.179	3.496	4.45	1.124	2.248	3.372	4.496	5.62	6.182
15	3.01	0.348	0.696	1.044	1.391	1.739	1.913	4.06	0.854	1.707	2.561	3.415	4.268	4.695
16	3.64	0.615	1.23	1.846	2.461	3.076	3.384	3.73	0.662	1.324	1.986	2.648	3.31	3.641
17	3.71	0.651	1.303	1.954	2.606	3.257	3.583	3.76	0.678	1.356	2.034	2.712	3.39	3.729
18	3.48	0.538	1.075	1.613	2.15	2.688	2.957	3.39	0.497	0.994	1.491	1.988	2.485	2.733
19	4.16	0.918	1.837	2.755	3.673	4.592	5.051	3.98	0.804	1.608	2.413	3.217	4.021	4.423
20	3.68	0.636	1.271	1.907	2.543	3.179	3.496	3.71	0.651	1.303	1.954	2.606	3.257	3.583
21	3.96	0.792	1.584	2.376	3.169	3.961	4.357	4.45	1.124	2.248	3.372	4.496	5.62	6.182
22	3.53	0.561	1.122	1.683	2.244	2.805	3.086	4.38	1.072	2.144	3.216	4.287	5.359	5.895
23	3.23	0.43	0.86	1.29	1.719	2.149	2.364	4.23	0.965	1.931	2.896	3.862	4.827	5.31
24	3.33	0.471	0.942	1.413	1.884	2.355	2.591	3.68	0.636	1.271	1.907	2.543	3.179	3.496
25	3.39	0.497	0.994	1.491	1.988	2.485	2.733	3.29	0.454	0.909	1.363	1.817	2.271	2.498
26	3.73	0.662	1.324	1.986	2.648	3.31	3.641	3.76	0.678	1.356	2.034	2.712	3.39	3.729
27	3.46	0.528	1.057	1.585	2.114	2.642	2.906	3.81	0.705	1.411	2.116	2.822	3.527	3.88
28	3.43	0.515	1.03	1.544	2.059	2.574	2.831	4.73	1.35	2.7	4.05	5.4	6.749	7.424
29	3.94	0.78	1.56	2.341	3.121	3.901	4.291	4.9	1.501	3.001	4.502	6.003	7.504	8.254
30	3.36	0.484	0.968	1.452	1.935	2.419	2.661	4.33	1.036	2.071	3.107	4.142	5.178	5.696
31	3.51	0.552	1.103	1.655	2.206	2.758	3.034							

Table 20 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 10 m above ground for July and August

Day	Mean Daily Speed	July's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	August's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	4.33	1.036	2.071	3.107	4.142	5.178	5.696	4.04	0.841	1.682	2.523	3.364	4.206	4.626
2	3.81	0.705	1.411	2.116	2.822	3.527	3.88	4.2	0.945	1.89	2.835	3.78	4.725	5.198
3	3.73	0.662	1.324	1.986	2.648	3.31	3.641	4.9	1.501	3.001	4.502	6.003	7.504	8.254
4	4.09	0.873	1.745	2.618	3.491	4.364	4.8	4.38	1.072	2.144	3.216	4.287	5.359	5.895
5	4.09	0.873	1.745	2.618	3.491	4.364	4.8	4.68	1.308	2.615	3.923	5.23	6.538	7.191
6	3.94	0.78	1.56	2.341	3.121	3.901	4.291	4.48	1.147	2.294	3.441	4.588	5.735	6.308
7	3.39	0.497	0.994	1.491	1.988	2.485	2.733	4.68	1.308	2.615	3.923	5.23	6.538	7.191
8	3.73	0.662	1.324	1.986	2.648	3.31	3.641	4.9	1.501	3.001	4.502	6.003	7.504	8.254
9	4.43	1.109	2.218	3.327	4.436	5.545	6.099	4.38	1.072	2.144	3.216	4.287	5.359	5.895
10	4.26	0.986	1.972	2.958	3.945	4.931	5.424	4.43	1.109	2.218	3.327	4.436	5.545	6.099
11	4.26	0.986	1.972	2.958	3.945	4.931	5.424	4.38	1.072	2.144	3.216	4.287	5.359	5.895
12	3.23	0.43	0.86	1.29	1.719	2.149	2.364	4.73	1.35	2.7	4.05	5.4	6.749	7.424
13	3.33	0.471	0.942	1.413	1.884	2.355	2.591	4.16	0.918	1.837	2.755	3.673	4.592	5.051
14	4.33	1.036	2.071	3.107	4.142	5.178	5.696	4.65	1.283	2.565	3.848	5.13	6.413	7.054
15	4.09	0.873	1.745	2.618	3.491	4.364	4.8	4.33	1.036	2.071	3.107	4.142	5.178	5.696
16	3.23	0.43	0.86	1.29	1.719	2.149	2.364	4.68	1.308	2.615	3.923	5.23	6.538	7.191
17	3.33	0.471	0.942	1.413	1.884	2.355	2.591	4.43	1.109	2.218	3.327	4.436	5.545	6.099
18	3.81	0.705	1.411	2.116	2.822	3.527	3.88	4.77	1.384	2.769	4.153	5.538	6.922	7.614
19	4.09	0.873	1.745	2.618	3.491	4.364	4.8	4.04	0.841	1.682	2.523	3.364	4.206	4.626
20	3.86	0.734	1.467	2.201	2.935	3.668	4.035	4.38	1.072	2.144	3.216	4.287	5.359	5.895
21	4.73	1.35	2.7	4.05	5.4	6.749	7.424	4.55	1.202	2.403	3.605	4.806	6.008	6.609
22	3.68	0.636	1.271	1.907	2.543	3.179	3.496	4.9	1.501	3.001	4.502	6.003	7.504	8.254
23	3.86	0.734	1.467	2.201	2.935	3.668	4.035	4.2	0.945	1.89	2.835	3.78	4.725	5.198
24	3.64	0.615	1.23	1.846	2.461	3.076	3.384	4.73	1.35	2.7	4.05	5.4	6.749	7.424
25	3.81	0.705	1.411	2.116	2.822	3.527	3.88	4.48	1.147	2.294	3.441	4.588	5.735	6.308
26	4.65	1.283	2.565	3.848	5.13	6.413	7.054	4.43	1.109	2.218	3.327	4.436	5.545	6.099
27	4.2	0.945	1.89	2.835	3.78	4.725	5.198	4.38	1.072	2.144	3.216	4.287	5.359	5.895
28	4.38	1.072	2.144	3.216	4.287	5.359	5.895	4.45	1.124	2.248	3.372	4.496	5.62	6.182
29	4.04	0.841	1.682	2.523	3.364	4.206	4.626	4.31	1.021	2.043	3.064	4.085	5.106	5.617
30	3.94	0.78	1.56	2.341	3.121	3.901	4.291	5.3	1.899	3.798	5.697	7.596	9.495	10.445
31	3.94	0.78	1.56	2.341	3.121	3.901	4.291	4.76	1.376	2.751	4.127	5.503	6.879	7.567

Table 21 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 10 m above ground for September and October

Day	Mean Daily Speed	September's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	October's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	3.81	0.705	1.411	2.116	2.822	3.527	3.88	4.33	1.036	2.071	3.107	4.142	5.178	5.696
2	3.64	0.615	1.23	1.846	2.461	3.076	3.384	4.09	0.873	1.745	2.618	3.491	4.364	4.8
3	4.55	1.202	2.403	3.605	4.806	6.008	6.609	3.86	0.734	1.467	2.201	2.935	3.668	4.035
4	4.16	0.918	1.837	2.755	3.673	4.592	5.051	3.56	0.576	1.151	1.727	2.302	2.878	3.165
5	4.45	1.124	2.248	3.372	4.496	5.62	6.182	3.46	0.528	1.057	1.585	2.114	2.642	2.906
6	4.48	1.147	2.294	3.441	4.588	5.735	6.308	4.45	1.124	2.248	3.372	4.496	5.62	6.182
7	4.09	0.873	1.745	2.618	3.491	4.364	4.8	4.2	0.945	1.89	2.835	3.78	4.725	5.198
8	4.38	1.072	2.144	3.216	4.287	5.359	5.895	4.55	1.202	2.403	3.605	4.806	6.008	6.609
9	4.43	1.109	2.218	3.327	4.436	5.545	6.099	4.43	1.109	2.218	3.327	4.436	5.545	6.099
10	3.94	0.78	1.56	2.341	3.121	3.901	4.291	3.98	0.804	1.608	2.413	3.217	4.021	4.423
11	4.31	1.021	2.043	3.064	4.085	5.106	5.617	3.81	0.705	1.411	2.116	2.822	3.527	3.88
12	3.98	0.804	1.608	2.413	3.217	4.021	4.423	3.98	0.804	1.608	2.413	3.217	4.021	4.423
13	4.11	0.886	1.771	2.657	3.542	4.428	4.871	4.16	0.918	1.837	2.755	3.673	4.592	5.051
14	3.73	0.662	1.324	1.986	2.648	3.31	3.641	4.48	1.147	2.294	3.441	4.588	5.735	6.308
15	3.73	0.662	1.324	1.986	2.648	3.31	3.641	3.86	0.734	1.467	2.201	2.935	3.668	4.035
16	6.34	3.251	6.501	9.752	13.003	16.254	17.879	4.7	1.324	2.649	3.973	5.297	6.622	7.284
17	4.55	1.202	2.403	3.605	4.806	6.008	6.609	4.51	1.17	2.34	3.51	4.681	5.851	6.436
18	3.81	0.705	1.411	2.116	2.822	3.527	3.88	4.04	0.841	1.682	2.523	3.364	4.206	4.626
19	3.78	0.689	1.378	2.067	2.756	3.445	3.789	4.09	0.873	1.745	2.618	3.491	4.364	4.8
20	3.86	0.734	1.467	2.201	2.935	3.668	4.035	3.86	0.734	1.467	2.201	2.935	3.668	4.035
21	3.64	0.615	1.23	1.846	2.461	3.076	3.384	3.23	0.43	0.86	1.29	1.719	2.149	2.364
22	3.11	0.384	0.767	1.151	1.535	1.919	2.11	4.04	0.841	1.682	2.523	3.364	4.206	4.626
23	4.16	0.918	1.837	2.755	3.673	4.592	5.051	4.43	1.109	2.218	3.327	4.436	5.545	6.099
24	4.09	0.873	1.745	2.618	3.491	4.364	4.8	3.86	0.734	1.467	2.201	2.935	3.668	4.035
25	4.38	1.072	2.144	3.216	4.287	5.359	5.895	3.86	0.734	1.467	2.201	2.935	3.668	4.035
26	4.33	1.036	2.071	3.107	4.142	5.178	5.696	4.41	1.094	2.188	3.282	4.376	5.47	6.017
27	4.48	1.147	2.294	3.441	4.588	5.735	6.308	4.48	1.147	2.294	3.441	4.588	5.735	6.308
28	4.38	1.072	2.144	3.216	4.287	5.359	5.895	3.68	0.636	1.271	1.907	2.543	3.179	3.496
29	4.93	1.528	3.057	4.585	6.114	7.642	8.407	4.29	1.007	2.014	3.021	4.029	5.036	5.539
30	3.86	0.734	1.467	2.201	2.935	3.668	4.035	3.94	0.78	1.56	2.341	3.121	3.901	4.291
31								4.38	1.072	2.144	3.216	4.287	5.359	5.895

Table 22 Power in kWh per day for wind turbines' swept area of 10 m^2 operating at height 10 m above ground for November and December

Day	Mean Daily Speed	November's Daily Wind Power in kWh at 8 m Height						Mean Daily Speed	December's Daily Wind Power in kWh at 8 m Height					
	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%	m/s	Cp= 10%	Cp= 20%	Cp= 30%	Cp= 40%	Cp= 50%	Cp= 55%
1	4.04	0.841	1.682	2.523	3.364	4.206	4.626	3.81	0.705	1.411	2.116	2.822	3.527	3.88
2	4.2	0.945	1.89	2.835	3.78	4.725	5.198	4.11	0.886	1.771	2.657	3.542	4.428	4.871
3	4.33	1.036	2.071	3.107	4.142	5.178	5.696	4.09	0.873	1.745	2.618	3.491	4.364	4.8
4	3.81	0.705	1.411	2.116	2.822	3.527	3.88	4.33	1.036	2.071	3.107	4.142	5.178	5.696
5	3.61	0.6	1.2	1.8	2.4	3.001	3.301	4.65	1.283	2.565	3.848	5.13	6.413	7.054
6	3.94	0.78	1.56	2.341	3.121	3.901	4.291	4.48	1.147	2.294	3.441	4.588	5.735	6.308
7	3.94	0.78	1.56	2.341	3.121	3.901	4.291	4.26	0.986	1.972	2.958	3.945	4.931	5.424
8	4.2	0.945	1.89	2.835	3.78	4.725	5.198	3.88	0.745	1.49	2.235	2.98	3.725	4.098
9	4.01	0.823	1.645	2.468	3.29	4.113	4.524	3.76	0.678	1.356	2.034	2.712	3.39	3.729
10	4.04	0.841	1.682	2.523	3.364	4.206	4.626	4.26	0.986	1.972	2.958	3.945	4.931	5.424
11	3.94	0.78	1.56	2.341	3.121	3.901	4.291	3.98	0.804	1.608	2.413	3.217	4.021	4.423
12	4.04	0.841	1.682	2.523	3.364	4.206	4.626	3.71	0.651	1.303	1.954	2.606	3.257	3.583
13	4.38	1.072	2.144	3.216	4.287	5.359	5.895	3.98	0.804	1.608	2.413	3.217	4.021	4.423
14	3.73	0.662	1.324	1.986	2.648	3.31	3.641	4.2	0.945	1.89	2.835	3.78	4.725	5.198
15	4.16	0.918	1.837	2.755	3.673	4.592	5.051	3.94	0.78	1.56	2.341	3.121	3.901	4.291
16	4.38	1.072	2.144	3.216	4.287	5.359	5.895	3.64	0.615	1.23	1.846	2.461	3.076	3.384
17	4.26	0.986	1.972	2.958	3.945	4.931	5.424	3.71	0.651	1.303	1.954	2.606	3.257	3.583
18	3.94	0.78	1.56	2.341	3.121	3.901	4.291	4.16	0.918	1.837	2.755	3.673	4.592	5.051
19	3.56	0.576	1.151	1.727	2.302	2.878	3.165	4.04	0.841	1.682	2.523	3.364	4.206	4.626
20	3.81	0.705	1.411	2.116	2.822	3.527	3.88	4.26	0.986	1.972	2.958	3.945	4.931	5.424
21	3.98	0.804	1.608	2.413	3.217	4.021	4.423	3.86	0.734	1.467	2.201	2.935	3.668	4.035
22	4.38	1.072	2.144	3.216	4.287	5.359	5.895	3.91	0.763	1.525	2.288	3.05	3.813	4.194
23	4.26	0.986	1.972	2.958	3.945	4.931	5.424	3.98	0.804	1.608	2.413	3.217	4.021	4.423
24	3.81	0.705	1.411	2.116	2.822	3.527	3.88	4.2	0.945	1.89	2.835	3.78	4.725	5.198
25	3.66	0.625	1.251	1.876	2.502	3.127	3.44	3.86	0.734	1.467	2.201	2.935	3.668	4.035
26	3.64	0.615	1.23	1.846	2.461	3.076	3.384	3.88	0.745	1.49	2.235	2.98	3.725	4.098
27	4.55	1.202	2.403	3.605	4.806	6.008	6.609	3.91	0.763	1.525	2.288	3.05	3.813	4.194
28	4.26	0.986	1.972	2.958	3.945	4.931	5.424	3.73	0.662	1.324	1.986	2.648	3.31	3.641
29	3.91	0.763	1.525	2.288	3.05	3.813	4.194	3.94	0.78	1.56	2.341	3.121	3.901	4.291
30	3.98	0.804	1.608	2.413	3.217	4.021	4.423	4.19	0.938	1.877	2.815	3.753	4.692	5.161
31								4.09	0.873	1.745	2.618	3.491	4.364	4.8

Table 23 Power in kWh per month for wind turbines' swept area of 10 m^2 operating at heights (8 & 9) m above ground

Month	8m H						9m H					
	Cp=10 %	Cp=20 %	Cp=30 %	Cp=40 %	Cp=50 %	Cp=55 %	Cp=10 %	Cp=20 %	Cp=30 %	Cp=40 %	Cp=50 %	Cp=55 %
January	27.799	55.591	83.393	111.194	138.984	152.883	29.989	59.983	89.971	119.96	149.958	164.951
February	22.362	44.717	67.078	89.441	111.796	122.975	24.172	48.349	72.521	96.697	120.872	132.959
March	19.77	39.544	59.313	79.084	98.851	108.737	21.371	42.739	64.11	85.48	106.855	117.533
April	15.397	30.792	46.186	61.575	76.969	84.67	16.636	33.272	49.908	66.545	83.182	91.501
May	15.408	30.81	46.218	61.618	77.025	84.723	16.656	33.305	49.96	66.611	83.271	91.589
June	19.699	39.404	59.104	78.808	98.507	108.356	21.271	42.532	63.804	85.067	106.338	116.969
July	21.526	43.044	64.57	86.096	107.616	118.378	23.252	46.501	69.755	93.009	116.257	127.881
August	31.896	63.789	95.686	127.587	159.479	175.419	34.441	68.88	103.32	137.762	172.204	189.425
September	25.504	51.001	76.503	102.009	127.512	140.259	27.559	55.114	82.674	110.23	137.788	151.567
October	23.974	47.945	71.919	95.896	119.871	131.851	25.915	51.822	77.737	103.644	129.559	142.511
November	21.809	43.612	65.421	87.236	109.036	119.942	23.552	47.104	70.657	94.211	117.766	129.545
December	22.5	44.996	67.496	90	112.493	123.744	24.293	48.585	72.879	97.172	121.466	133.611
Total Annual	267.644	535.245	802.887	1070.544	1338.139	1471.937	289.107	578.186	867.296	1156.388	1445.516	1590.042

Table 24 Power in kWh per month for wind turbines' swept area of 10 m^2 operating at 10 m height above ground

Month	10m H					
	Cp=10%	Cp=20%	Cp=30%	Cp=40%	Cp=50%	Cp=55%
January	32.171	64.334	96.506	128.675	160.848	176.929
February	25.915	51.826	77.744	103.656	129.575	142.53
March	22.908	45.807	68.717	91.62	114.526	125.979
April	17.84	35.677	53.516	71.354	89.196	98.114
May	17.853	35.699	53.554	71.401	89.254	98.176
June	22.812	45.625	68.44	91.254	114.064	125.471
July	24.933	49.859	74.796	99.728	124.659	137.124
August	36.923	73.839	110.762	147.675	184.599	203.054
September	29.54	59.076	88.62	118.156	147.696	162.465
October	27.765	55.523	83.291	111.055	138.819	152.696
November	25.25	50.5	75.757	101.006	126.261	138.886
December	26.061	52.118	78.185	104.247	130.309	143.34
Total Annual	309.971	619.883	929.888	1239.827	1549.806	1704.764

V. CONCLUSION AND RECOMMENDATIONS

Predicting wind power could be generated is a sophisticated task. As wind has an intermittent nature, nobody can tell any specific moment whether there will wind nor not or what would the wind speed. This task is much more complicated when it comes to consider urban areas where wind speed decay because of buildings and trees, as well turns to be turbulent. This paper considered developing a realistic/reliable/creditable database of annual mead daily typical wind speed based on previously published generated wind speed at urban Armidale for heights (8, 9 &10) meters which has been based on wind speed meteorological test reference year published and generated earlier. Such consequent calculations justifies and enhance the reliability of generated wind power. It is a common issue that mostly new micro-turbines users gets very frustrated of their turbines under-performance, although the fact that they have overestimated the available wind speed, actually, there are misled by overestimated meteorological historically recorded wind speed at their towns or cities. This paper considered Armidale, the highest city in Australia, as a sample of Australian regional cities. As well, the selected heights (8, 9 & 10) meters were meant, considering that most buildings, in Armidale, of (5 to 7) meters height, by adding

another three meter for the micro-turbine installation, this would suit the selected heights in this study.
Needless to emphasise that, it is highly urged to base any wind power calculations or modelling on urban wind speeds. This would reflect the real picture of urban wind power potential and would save any disappointment of not reaching the expected energy generation which is usually misled by overestimation of wind speed due to the dependence on meteorological wind speed.

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