

# Wind Power Vs National Energy Grid

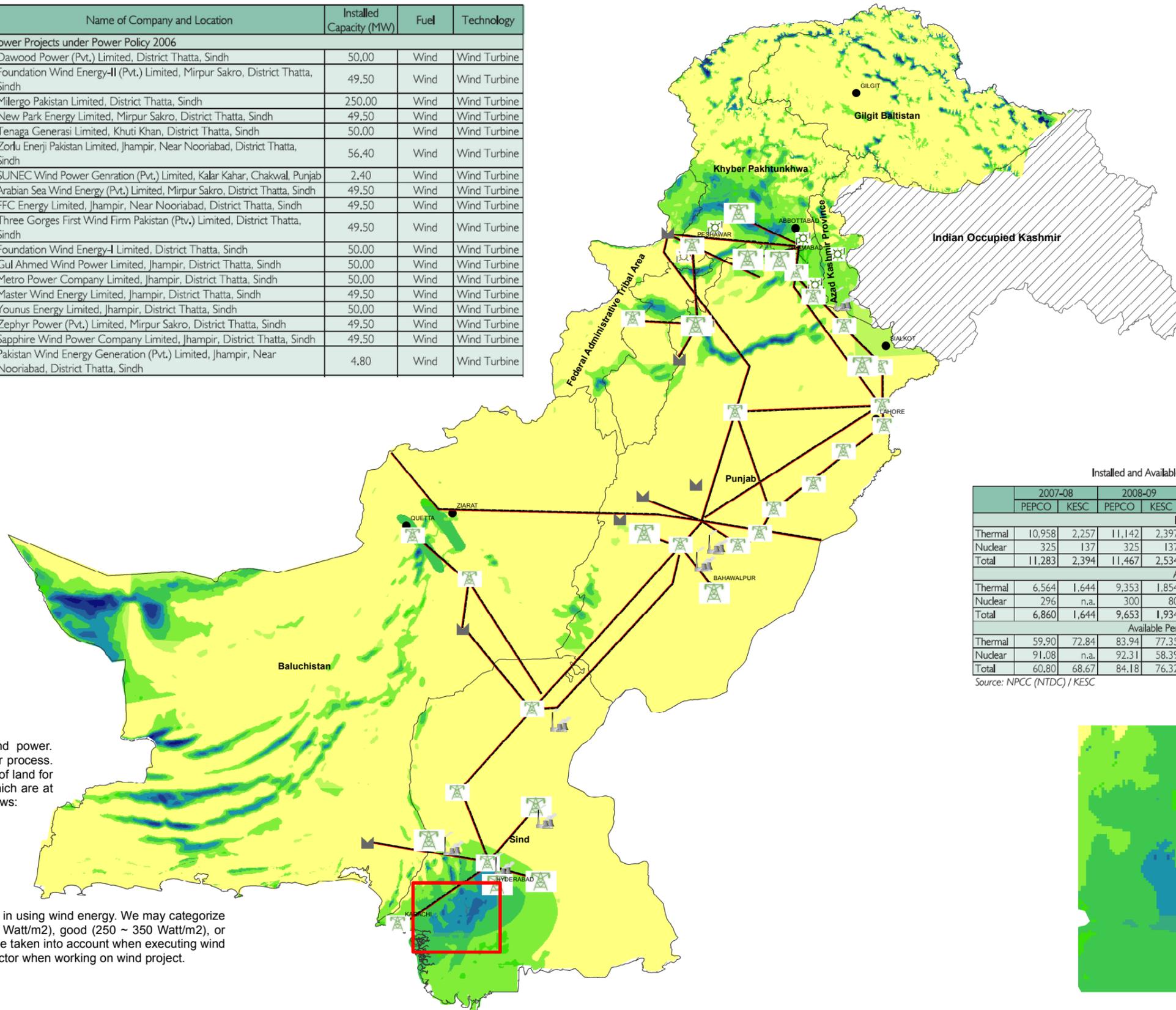
## Legend

-  Diesel/M-F Power Station
-  Hydro Power Station
-  Sub-Station
-  Sub-Station 500 KV
-  Thermal Power Station
-  Transmission line
-  Wind Farm
-  Capital
-  Major Cities
-  Provincial/Regional Boundary

## Wind Power Density W/m<sup>2</sup>

-  28 - 156
-  157 - 227
-  228 - 275
-  276 - 324
-  325 - 376
-  377 - 428
-  429 - 493
-  494 - 584
-  585 - 726
-  727 - 979

S. No.	Name of Company and Location	Installed Capacity (MW)	Fuel	Technology
<b>Wind Power Projects under Power Policy 2006</b>				
1	Dawood Power (Pvt.) Limited, District Thatta, Sindh	50.00	Wind	Wind Turbine
2	Foundation Wind Energy-II (Pvt.) Limited, Mirpur Sakro, District Thatta, Sindh	49.50	Wind	Wind Turbine
3	Milergo Pakistan Limited, District Thatta, Sindh	250.00	Wind	Wind Turbine
4	New Park Energy Limited, Mirpur Sakro, District Thatta, Sindh	49.50	Wind	Wind Turbine
5	Tenaga Generasi Limited, Khuti Khan, District Thatta, Sindh	50.00	Wind	Wind Turbine
6	Zorlu Enerji Pakistan Limited, Jhampir, Near Nooriabad, District Thatta, Sindh	56.40	Wind	Wind Turbine
7	SUNEC Wind Power Generation (Pvt.) Limited, Kalar Kahar, Chakwal, Punjab	2.40	Wind	Wind Turbine
8	Arabian Sea Wind Energy (Pvt.) Limited, Mirpur Sakro, District Thatta, Sindh	49.50	Wind	Wind Turbine
9	FFC Energy Limited, Jhampir, Near Nooriabad, District Thatta, Sindh	49.50	Wind	Wind Turbine
10	Three Gorges First Wind Firm Pakistan (Pvt.) Limited, District Thatta, Sindh	49.50	Wind	Wind Turbine
11	Foundation Wind Energy-I Limited, District Thatta, Sindh	50.00	Wind	Wind Turbine
12	Gul Ahmed Wind Power Limited, Jhampir, District Thatta, Sindh	50.00	Wind	Wind Turbine
13	Metro Power Company Limited, Jhampir, District Thatta, Sindh	50.00	Wind	Wind Turbine
14	Master Wind Energy Limited, Jhampir, District Thatta, Sindh	49.50	Wind	Wind Turbine
15	Younus Energy Limited, Jhampir, District Thatta, Sindh	50.00	Wind	Wind Turbine
16	Zephyr Power (Pvt.) Limited, Mirpur Sakro, District Thatta, Sindh	49.50	Wind	Wind Turbine
17	Sapphire Wind Power Company Limited, Jhampir, District Thatta, Sindh	49.50	Wind	Wind Turbine
18	Pakistan Wind Energy Generation (Pvt.) Limited, Jhampir, Near Nooriabad, District Thatta, Sindh	4.80	Wind	Wind Turbine



**Installed and Available Power Generation Capacity (MW)**

	2007-08		2008-09		2009-10		2010-11		2011-12	
	PEPCO	KESC								
<b>Installed Capacity</b>										
Thermal	10,958	2,257	11,142	2,397	12,067	2,530	13,448	2,447	13,028	3,007
Nuclear	325	137	325	137	325	137	650	137	650	137
<b>Total</b>	<b>11,283</b>	<b>2,394</b>	<b>11,467</b>	<b>2,534</b>	<b>12,392</b>	<b>2,667</b>	<b>14,098</b>	<b>2,584</b>	<b>13,678</b>	<b>3,144</b>
<b>Available Capacity</b>										
Thermal	6,564	1,644	9,353	1,854	10,411	2,018	11,865	1,787	11,271	2,287
Nuclear	296	n.a.	300	80	300	82	615	84	615	84
<b>Total</b>	<b>6,860</b>	<b>1,644</b>	<b>9,653</b>	<b>1,934</b>	<b>10,711</b>	<b>2,100</b>	<b>12,480</b>	<b>1,871</b>	<b>11,886</b>	<b>2,371</b>
<b>Available Percentage of Installed Capacity</b>										
Thermal	59.90	72.84	83.94	77.35	86.28	79.76	88.23	73.03	86.51	76.06
Nuclear	91.08	n.a.	92.31	58.39	92.31	59.85	94.62	61.31	94.62	61.31
<b>Total</b>	<b>60.80</b>	<b>68.67</b>	<b>84.18</b>	<b>76.32</b>	<b>86.43</b>	<b>78.74</b>	<b>88.52</b>	<b>72.41</b>	<b>86.90</b>	<b>75.41</b>

Source: NPCC (NTDC) / KESC

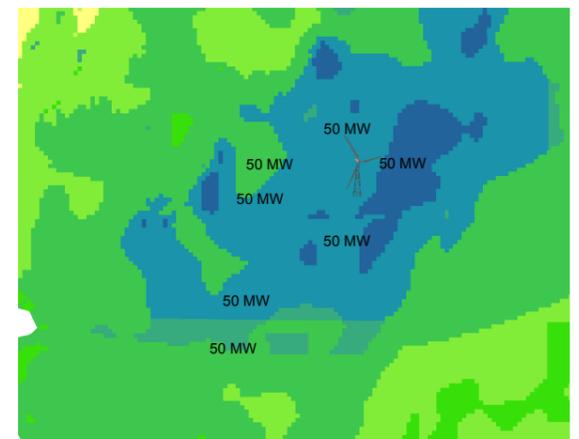
## Current Status of Wind Projects

Private sector has been triggered to invest in wind power. Currently 48 projects of around 32,00 MW are under process. Government of Sindh has leased around 26,00 acres of land for 18 projects with a cumulative capacity of 906 MW which are at various stages of development. Abr account is as follows:

- Under construction: 156 MW
- Financial closure (expected) during 2012: 200 MW
- Financial closure by 2013: 550 MW

## Wind Power Density Categories

Wind power density directly determines cost efficiency in using wind energy. We may categorize the density as poor (< 150 Watt/m<sup>2</sup>), fair (150 ~ 250 Watt/m<sup>2</sup>), good (250 ~ 350 Watt/m<sup>2</sup>), or excellent (> 350 Watt/m<sup>2</sup>). Local topography, should be taken into account when executing wind energy applications as topography is very important factor when working on wind project.



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Data: wind speed and wind power data, 50m above the ground surface  
Source: www.nrel.gov



Projection/Datum: WGS84

