

# Wind energy a clean renewable energy: a scenario of Ahmednagar district

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## ABSTRACT

For sustainable development of mankind renewable energy will become key for unlocked resources and sustainable development solution. Basic aim of this paper is to understand the current situation of the wind energy in Ahmednagar district. Wind energy is one of the best form energy which can easily harness from blowing wind and ecofriendly for environment. Today worldwide production of the wind electricity is 5,00,000. MW, India is the produces 40,000 MW and secure fifth rank in the world after the US, China, Spain, and Germany. Maharashtra with 1065 MW stood third position in exploring wind energy. In Ahmednagar District the leeward slope of these sub ranges are very favorable for wind power generation and wind power density is between 119 to 131 Watts per sq mt. with 413 windmills it produces 386.80 MW electricity. Geographical location of Ahmednagar is conducive for wind power harnessing. Its typical platue location gives more suitable situation for wind power generation.

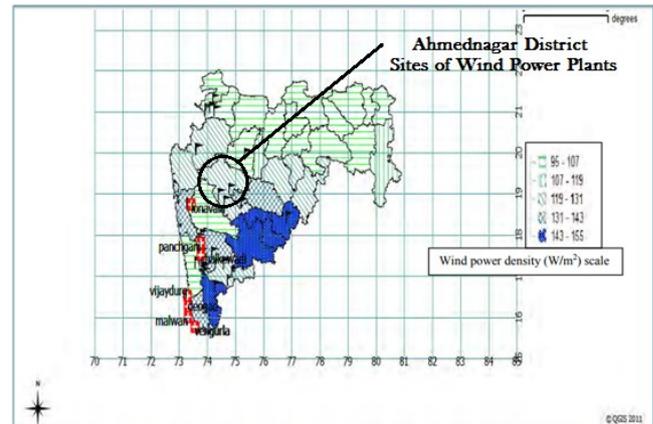
**Keywords:** Windmill, Wind Power Density, Sustainable Development, Renewable Energy.

## INTRODUCTION

In simple language, Energy is a form of power which is necessary to perform work. The whole universe is abided with invisible form of energy. Energy is one of the most important forces for economic growth and human development. Stages of human evolution are evidenced by energy consumption which had made miracles and revolution in his life style. Invention of fire is one of them which has transform human life and made it easier than earlier. Human being use different modes and means to generate power from Coal, petroleum, Natural gas, Solar, Wind, Biogas, Bio Fuel, hydroelectricity etc. Among these all Petroleum and Coal are limited, expensive and harmful to environment. Therefore, for sustainable development of mankind renewable energy will become key for unlocked resources and sustainable solution. Wind energy is one of the best form energy which can easily harness from blowing wind and ecofriendly for environment. To understand the current situation of the wind energy in Ahmednagar district it is important aim of this paper. In this regard certain attempt has been done by some scholars. Ramachandra and Shruthi [1] have estimated the wind energy potential of Karnataka using GIS technology. Sen [2] has used CSV (Cumulative Semi-Variogram) approach to predict the solar irradiation at any point from a given set of known data points. This paper provides a framework for analyzing the status of renewable energy for Ahmednagar District of Maharashtra state of India.

## STUDY AREA

Ahmednagar is one of the Largest district of the Maharashtra state rest on Deccan traps which is made by the volcanic lava flow in the Eocene age. (3) Mostly rock is Basaltic. It is partly occupied by Sahyadri Mountain in west and rest by platue. Most of the soil of this district is a Black and red soil. Godavari, (Pravara, Adula, Mula, Dhora) and Sina River are important rivers in district. Entire topography and climate of district is much conducive for wind energy productions. This research paper is tries to study the wind energy of Ahmednagar district.



Location Map : Ahmednagar District

## GENERATION OF WIND ELECTRICITY

Wind is simply horizontal movement of air caused by spatial different between pressure. First attempt of wind electricity was done by Prof. James Blyth (1887) in Scotland. It is kinetic energy which converted in the electrical energy. Group of the windmill is known as the wind farm. Wind turbine converts the kinetic energy in electricity. There are two basic type of wind turbine on the basis of axis are Horizontal axis and Vertical axis and location offshore and onshore. Today worldwide production of the wind electricity is 5,00,000. MW, India is the produces 40,000 MW and secure fifth rank in the world after the US, China, Spain, and Germany. India is sixth largest nation in the power generation of the world. In India, there are the 237 Station for the economically good for the electricity.

In our state Tamilnadu is largest producer of wind power. Muppanddal wind farm (Kanyakumari) in Tamilnadu is largest wind farm in State which has capacity of 1500 MW. Cape Comorine (Kanyakumari) and Kayathar Subhas (Kaythar) are major wind power plants having capacity 33 MW and 30 MW respectively. Second rank in wind power harnessing is secured by Rajsthan.It produces 1065 MW power through wind in Jaisalmer Wind Park (Jaisalmer), Dangiri Wind farm (Jaisalmer).Maharashtra with 1065 MW stood third position in exploring wind energy. Brahmanwel wind farm (528 MW, Dhule), Dhalgaon (278 MW, Sangli), Vankusawade (259 MW, Satara) are the major wind farms in Maharashtra. Oddisha (99MW) and Karnataka (56.1) are next to Maharashtra.

## DISTRICTWISE WIND POWER SCENARIO IN MAHARASHTRA

**Table 1:** Site wise Wind Farm Installations in Maharashtra (31/03/17)

Sr.No.	District	Site	No. of Wind Turbine	Total Capacity (in MW)
1	Sindhudurga	Deogad, Vijaydurga	35	12.69
2	Satara	Thoseghar, Chalakwadi, Vankusavade, Marewadi, Sadawaghpur, Agaswadi Chavneswar, Kas.	1872	1503.65
3	Sangli	Gudepachgani Vaspeth, Dhalgaon, Jath, Mendhegiri, bhud, Jadhavwadi	1055	1499.6
4	Kolhapur	Bhendawade	51	67.5
5	Ahmednagar	Kavadya Dongar, Panchpatta, Khandke, Jamgaon	413	386.8
6	Beed	Gangadevi Sautada	160	192.7
7	Dhule	Brahmanwel	566	581.5
8	NandurBar	Chakala	230	315.6
9	Amaravati	Motha	4	4
10	Nasik	Aundhewadi	48	61.1
11	Yavatmal	Isapur	7	31
12	Pune	Andhralake	133	106.4
<b>Total</b>			<b>4431</b>	<b>4769.21</b>

Source: MEDA 2017

According to MEDA (Maharashtra Energy Development Agency) wind energy potential of our country is 1,02,788 MW Out of that, state has potential of 9400MW. Largest wind power project in Maharashtra of capacity 581 MW is located in Brahmanvel Dhule district. In the Maharashtra, there is Suzlon, Enercon, Vestas, Regan wind energy manufacturing organization. In Maharashtra largest windmills were planted in Satara District (1872) which has capacity of 1503.65 MW. Sangli district stood second with 1055 windmills and capacity of 1499.60 MW. Dhule District have capacity of 581 MW wind energy with 588 wind mills. Ahmednagar District ranks fourth in wind power harnessing 413 windmills in district produces 386.80 MW electricity.

### WIND POWER IN AHMEDNAGAR DISTRICT

Geographical location of Ahmednagar is conducive for wind power harnessing. Its typical plateau location gives more suitable situation for wind power generation. It is connected to Sahyadri Mountain from Akole Tehsil. The crestline of Sahyadri is observed in

Akole tehsil. The average elevation of crestline of Sahyadri within tehsil is about 1300 mt. Kalsubai and Adula, Baleshwar and Harishchandra are main sub ranges passes through district.

Baleshwar and Harishchandra sub ranges very close go through Sangamner, Parner and Nagar Tehsil. The leeward slope of these sub ranges are very favorable for wind power generation and wind power density is between 119 to 131 Watts per sq mt. become more suitable for the wind energy therefore district is one of the pioneer district for the wind energy. Out of the total wind electricity of the Maharashtra, 10% of the electricity is occur in this district.<sup>3</sup>

Potential sites for the wind from in Ahmednagar are Kavda Donger, Khandke, Kolgaon, Pachpatta Dongar. Wind Power Project at the Khandke, there was project started in 2006 with capacity of 50 MW. Second power plant is running smoothly under SJVNL (Satluj Jal Vidyut Nigam ltd) with 56 Wind Power turbines which is generating 47 MW electricity at Khivire (Akola). Third project is situated near Supa in Parner tehsil. This is operated by Suzlon.

**Table 2:** Wind Energy Scenario of Ahmednagar District

Name of Site	District	No. of Wind Turbines	Wind Turbine Make	Capacity KW per Turbine	Total Capacity MW
Kavadya Dongar (Near Supa)	A'Nagar	57	Suzlon Energy	1000	57.000
		6	Suzlon Energy	1250	7.500
<b>Sub-total</b>		<b>63</b>			<b>64.500</b>
Panchpatta Dongar (Akole)	A'nagar & Nashik	24	Suzlon Energy	1500	36.000
		65	Enercon India	800	52.000
		2	Suzlon Energy	2100	4.200
		55	Gamesa	850	46.750
<b>Sub-total</b>		<b>146</b>			<b>138.950</b>
Khandke (Near Ahmednagar)	A'nagar	192	Enercon India	800	153.600
<b>Sub-total</b>		<b>192</b>			<b>153.600</b>
Nandur Pathar (Parner)	A'nagar	4	Kenersys	2625	10.500
		8	Kenersys	2400	19.200
<b>Sub-total</b>		<b>12</b>			<b>29.700</b>
<b>Grand total</b>		<b>413</b>		<b>13325</b>	<b>386.75</b>

Source: MEDA 2017

## CONCLUSION

Wind energy is renewable energy. It is clean energy sources and available ubiquitous in nature. As coal, Natural gas and petroleum will come to end in coming future in such energy crisis era it will work as a great remedy for energy need fulfillment. But Wind energy is available in certain topographic and climatic conditions only, In this concern Ahmednagar District has boon of plateau and mountainous relief. More than half of district having including Parner, Jamkhed, Nagar, Shrigonda, Sangamner, Akole tehsil have plateau and hill location which is conducive to more energy production and it will bring energy in economic development of district in coming years.

**Conflicts of interest:** The authors stated that no conflicts of interest.

## REFERENCES

- Ramachandra TV, Shruthi BV. Wind energy potential mapping in Karnataka, India, using GIS, *Energy conversion and management*, 2005, pp 1561-1578
- Zekai Sen, Ahmet D. Sahin, Spatial interpolation and estimation of solar irradiation by cumulative semivariograms, *Solar energy*, 2001, pp 11-21.
- Fakir SZ, Bhalsing RR. Geographical Study of Wind Energy Resources in Ahmednagar District *International Journal of Scientific and Research Publications*, 6(8) August 2016, pp267-268.
- Economic survey of Maharashtra 2009-10, directorate of economics and statistics, planning department, government of Maharashtra, Mumbai.
- Anna and Mani, Wind energy resource survey in India, Department of non-conventional energy sources, New Delhi, India, edition 1995.
- Renewable energy atlas cd, MEDA.
- World wind Energy Report- 2015.
- Maharashtra Energy Development Agency, <http://www.mahaurja.com>