WIND POWER PLANTS IN THE AREA OF THE CZECH REPUBLIC

Lucie Noháčová

ABSTRACT

In the Czech Republic there appeared a unique phenomenon in the dynamics of wind energetics development after 1989. This article presents the current situation of distributed power systems in the Czech Republic, especially from the point of view of wind power energy.

1. INTRODUCTION

The current worldwide trend leads to consumption decrease of non renewable primary energy resources and their partly substitution with the renewable primary energy resources. The increase of wind energy utilization from wind power plants for the electric power generation in the last years is a proof of that. The power from wind power station is increasing with the third power of wind speed. From the point of view of operation efficiency the right choice of a good place for the building of wind power plants is very important. In comparison with the classic kinds of electrical energy generation, the wind power stations are representing no influences for the ecology and therefore contribute with this to decrease of content of gas products in the atmosphere. Our country produce the most exhalation of CO_2 from the member and joining countries of EU recalculated on one person and for that reason it cause most global climate changes. Wind power stations are clean energy sources without exhalation, waste and without landscape devastated with surface mines. This helps to decrease czech contribution to global climate changes and dependence on foreign sources.

2. WIND ENERGY- INSTALLATION OF WIND TURBINES

In the Czech Republic there appeared a unique phenomenon in the dynamics of wind energetics development after 1989.

The possibilities and opportunities of wind power energy in the Czech Republic, the possibilities of installation of wind turbines show the wind map.

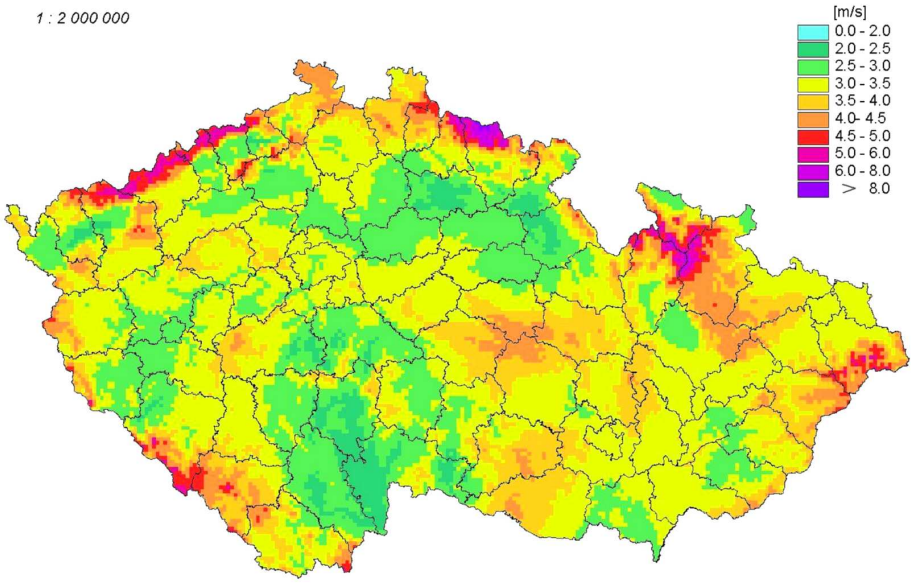

Fig. 1 – Possibilities and opportunities of wind power energy in the Czech Republic (speed of the wind 10 m height over terrain)

In Czech Republic is wind speed and wind direction measured in meteorological stations network. Measuring is usually realized in height of 10 m over a smooth terrain. Based on long-range a wind map of Czech Republic were build (see Fig. 1), which shows year average wind speed in all locations. Areas with average speed under 4 m/s are without greater importance for wind energy power use, because of most wind units are just only starting turning by this speed. It is evident, that good conditions will be in border mountain places.

The Table 1 contains wind power plants in operation in the Czech Republic.

No	Place	Type, production, origin	Nominal power	Finishing the construction	Owner
1.	Boží Dar, (Krušné Hory, former district of Karlovy Vary)	VE 75-1, Vítkovice, Czech Republic	75 kW	1992	Boží Dar town
2.	Mravenečník, (by Loučné n. Desnou, Hrubý Jeseník, former district of Šumperk)	Wind World, W 2500, Denmark	200 kW	1993	ČEZ, Inc., Prague
		EWT 315, Czech Republic	315 kW	1995	ČEZ, Inc., Prague
		EWT 630, Czech Republic	630 kW	1995	ČEZ, Inc., Prague
3.	Nová Ves v Horách, (Krušné Hory, former district of Most)	Medit 320, West, Italy	320 kW	1994	EKOENGINEERING, Inc. and the city of Brno
4.	Hostýn, (former district of Kroměříž)	Vestas 225, Denmark	225 kW	1994	Matice svatohostýnská, Bystřice p. Hostýnem

5.	Velká Kraš, (Žulovská pahorkatina, former district of Šumperk)	V 29-225 kW, Vestas, Denmark	225 kW	1994	Velká Kraš town
6.	Ostružná, (Hrubý Jeseník, former district of Šumperk)	V 39-500 kW, Vestas, Denmark	6 x 500 kW	1994	VE Ostružná limited
7.	Nový Hrádek, (Orlické Hory, former district of Náchod)	E-400, EKOV, Czech Republic	400 kW	1995	Východočeská energetika Inc.
8.	Mladoňov, (former district of Šumperk)	VE 315-1, Vítkovice, Czech Republic	315 kW	1996	R. Nuzník in 2002 sold the wind power plant
9.	Boží Dar - Neklid, (Krušné hory, former district of Karlovy Vary)	EWT 315, Energovars, Czech Republic	315 kW	2002	Projects ELEKTRO, limited Chrudim
10.	Protivanov, (Drahanská vrchovina, former district of Prostějov)	Furladneer, FL 100, Germany	100 kW	2002	Ortodox academy, Vilémov
11.	Jindřichovice pod Smrkem, (Frýdlant promontory, former district of Liberec)	Enercon, E 66, Germany	2 x 600 kW	2003	Jindřichovice pod Smrkem town
12.	Nová Ves v Horách, (Krušné Hory, former district of Most)	RE Power MD-70, Germany	1,5 MW	2003	WindTech, Inc., the city of Brno

Tab. 1 – Brief summary of wind power plants in operation in the Czech Republic

In the following figure shows the short overview of wind power plants in the Czech Republic build in years from 1990 to 2003 (Fig.2) and the next figure (Fig.3) shows the installed power of wind power plants in years from 1990 to 2003.

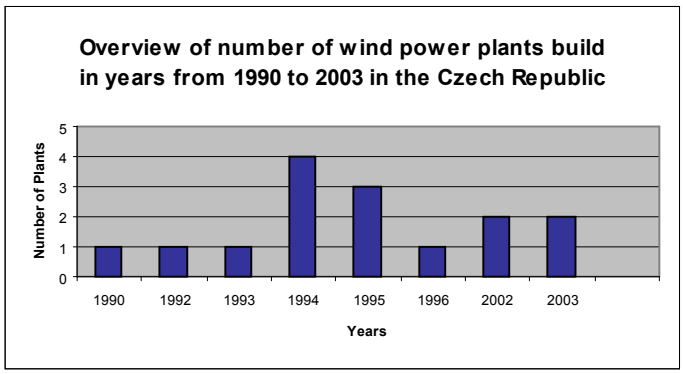

Fig. 2 – Number of wind power plants builds in years 1990 to2003 in Czech Republic

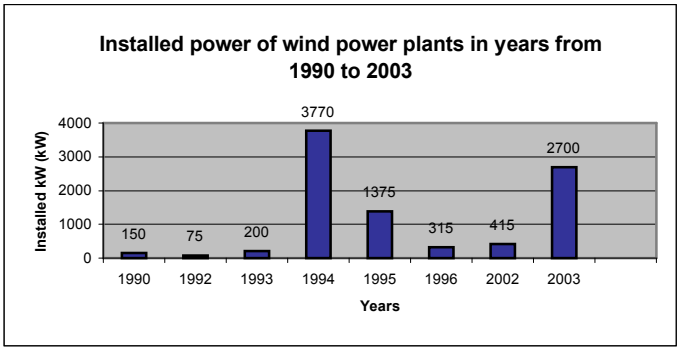

Fig. 3 – Installed power of wind power plants in years from 1990 to 2003

3. CONCLUSION

The utilization of renewable energy resources is the priority of the energy industry in the EU. Czech Republic is one of the countries in which interest in wind power is gradually growing. The energy policy of the EU concerning the utilization of renewable energy resources allowed for an increase from 4 TWh to 80 TWh, which corresponds with a share increase from 0.2 % to 2.8 % of expected total electrical energy generated in 2010 (output increase from 2.5 to 40 GW).

While in other European countries there is in progress the growth of annually installed powers of wind power plants by geometric progression, it was possible to watch similar trend in our country during 1900-1995. After this year (1995) the development curve has a decreasing tendency. 24 wind power plants (with the minimal power of 50 kW) with total immediate power of 8220 kW were built to the end of 1995. With the evaluation to the end of 2001, 5 wind power plants (Bílý Kříž, Frýdek-Místek, Hory-Jenišov, Strabenice, Boršice) with total power of 925 kW were dismantled and 11 wind power plants with the total power of 4920 kW were out of order.

Czech Republic for all that is lagging in use of wind energy. Thank to guaranteed prices of energy on market, produced from renewable energy sources, is building of wind power plants in many places prepared. In villages, where are wind power stations suggested, cause these plans intensive discussions. And opinions of local people have important role in decision of project realization. Many resistances in villages are caused on unsubstantiated informations and fear, which are rumoured about wind power stations. Main impacts of wind power plants on immediate environment are noise, design, danger for birds and flickered reflections of sun on blades. But none of these features is so intensive, like most people think.

These and many other problems with connection, expansion, financing, economic benefits and environmental aspects in using the potential of energy renewable resources have been and still are the topics of the discussions in the national and international conferences focusing on the issues of power engineering. Finally, they are the topics for follow-up discussions and expert meetings of individual energy companies not only in the EU countries but also over the world.

4. REFERENCES AND BIBLIOGRAPHY

[1] Mühlbacher J., Noháčová L.: Distribuované zdroje energie-možnosti využití obnovitelných zdrojů v ČR, article- The 2nd International Scientific Symposium "EE 2003 Elektroenergetika ", Stará Lesná 2003, Slovak Republic, 16.-18. 9. 2003 S. 1-5, Košice ISBN: 80-8906180-X

[2] Mühlbacher J., Noháč, K., Noháčová, L.: Distributed power systems, article-12th International Expert Meeting "Power Engineering 2003", Maribor 2003, Slovenia Republic, 7.-8. 5. 2003 S. 1-4, University of Maribor ISBN: 8643505447

[3] Kolcun M., Mühlbacher J., Haller: Mathematical analysis of electrical networks, specialized technical book 2004, Czech Republic, ISBN: 80-7300-098-9

[4] Krasl M., Tesařová M.: Technické využití supravodivosti v energetice, article-Meeting Racio 2002 Scientific-technical association of Westbohemia, Plzeň

[5] Noháčová L., Noháč K.: Some cases of distributed resources connected to the distribution network, article-13th International Expert Meeting "Power Engineering 2004", Maribor 2004, Slovenia Republic, 18.-20. 5. 2004 S. 1-6, University of Maribor ISBN: 86-435-0617-6

[6] Noháčová L., Tesařová M.: The utilization of renewable energy resources for electrical energy generation, article- 6th International Conference "Control of power systems 2004", Štrbské Pleso, Slovak Republic, 16.-18. 6. 2004, Slovak University of Technology in Bratislava, ISBN: 80-227-2059-3, S 1-4

[7] Martínek Z.: Plánování přenosu elektrické energie užitím kritéria spolehlivosti, Use of technical Measurements in solving Environmental Problems, ZČU Plzeň 2001, ISBN 80-7082-764-5, pp. 84-88

[8] Dvorský E., Hejtmánková P.: Economical evalution of combined heat and power decentralized sources operation, article- 6th International Conference "Control of power systems 2004", Štrbské Pleso, Slovak Republic, 16.-18. 6. 2004, Slovak University of Technology in Bratislava, ISBN: 80-227-2059-3, S 1-5

[9] Noháčová L.: Wind power energy in the Czech Republic, article-15th International Expert Meeting "Power Engineering 2006", Maribor 2006, Slovenia Republic, 9.-11. 5. 2006 S. 1-5, University of Maribor ISBN: 86-435-0772-5

5. ACKNOWLEDGEMENT

This paper was written under solving science project GAČR 102/06/0132

Authors' Address

Ing. Lucie Noháčová, Ph.D.

University of West Bohemia in Pilsen, Faculty of Electrical Engineering, Department of Electrical Power Engineering and Environmental Engineering

Establishment: Univerzitní 8, 306 14, Plzeň, Czech Republic

Tel: + 420 377634301 Fax: + 420 377634302

E-mail: nohacova@kee.zcu.cz Tel: + 420 377634358