DISTRIBUTED POWER SYSTEMS – WIND POWER ENERGY – THE TODAY POSSIBILITIES AND OPPORTUNITIES IN THE CZECH REPUBLIC

Lucie Noháčová

ABSTRACT

This article presents the general information about the opportunities of renewable energy resources in the Czech Republic and the forecast to 2010 in power engineering.

The future for renewable energy resources in Czech Republic looks more promising then ever. The utilization of renewable resources as one of the possibilities of so-called "clean" energy is the priority of the energy industry of the EU.

1. INTRODUCTION

The future for renewable energy resources in Czech Republic looks more promising then ever. The experts agree that in the future the market for renewable energy resources will grow significantly. The utilization of renewable resources as one of the possibilities of so-called "clean" energy is the priority of the energy industry of the EU. Not every project will be successfully taken to completion. Some projects are delayed by slow planning approval; others may even fail due to a missing grid connection or insurmountable bureaucratic demands. Wind power is experiencing an upswing worldwide.

The development of wind farm takes several years. For that reason are good the internationally co-operation, which, for a various reasons, are interested in expanding wind energy use. This covers either the purchase of wind turbines or of completed wind farms.

The next are the co-operations in engineering and the sale of wind turbines or components to business partners. The technology often enables the partner companies to win out successfully over international competition in their respective home markets. As soon as wind turbine is up and running efficiently in a market which is to be entered, the chances rise of soon receiving follow-on orders (so-called "door-opening effect"). Offering long-running license agreements also boots sales and can keep customers with the company.

2. EXPECTANCE IN THE WIND ENERGY IN THE CZECH REPUBLIC

2. 1 The basic facts in the branch of wind energy

The Czech power companies are focusing mostly on utilization of wind energy. However, the utilization of wind energy is at the very beginning. Although in early 90^{th} the Czech

companies had a chance to belong among the prospective manufacturers, they have lost the foothold gradually. At present there are installed 22 large wind power plants in the Czech Republic. The total installed capacity is 8.7 MW; the wind power plants generate about 10 GWh. In consequence of the planned installation of new wind power plants, the production of 900 GWh can be expected in 2010.

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).

The wind power plant construction projects exceed above-mentioned assumptions markedly.

2. 2 Wind energy – jobs, added value and co-operation

The promise of jobs added value in the region can improve the acceptance of wind energy in politics and among the population. In some places a major participation by domestic companies is even demanded when higher unit volumes are being discussed. The production abroad can also increase added value in the home country. The same equally applies to the supplier externally sourced components.

For example, the high external supplier share of a wind turbine and a multi-coloured mosaic: A turbine delivered to Japan, for example, could consist of Danish rotor blades and an engine housing from the Czech Republic, into witch electrical and mechanical components from several European countries have been installed, with the work being carried out in Germany. The mast could be from Korea, while the foundation and installation work may by carried out by Japanese firms.

The Czech Republic is one of the countries in which interest in wind power is gradually groving. In Jindřichovice pod Smrkem an Enercon E-40 has been connected to the grid. The same is the case two-blade turbines next to MD 70 near Nová Ves v Horách. (see Fig. 1)

Fig. 1 – The wind power plants near Nová Ves v Horách (photo from 2005)

2. 3 Wind energy balance

In near future the big increase in production of electricity is expected. The next figures shows for example the economical balance of wind power plants in Jindřichovice pod Smrkem (XII/2004 and I/2005). (see Fig. 2-4)

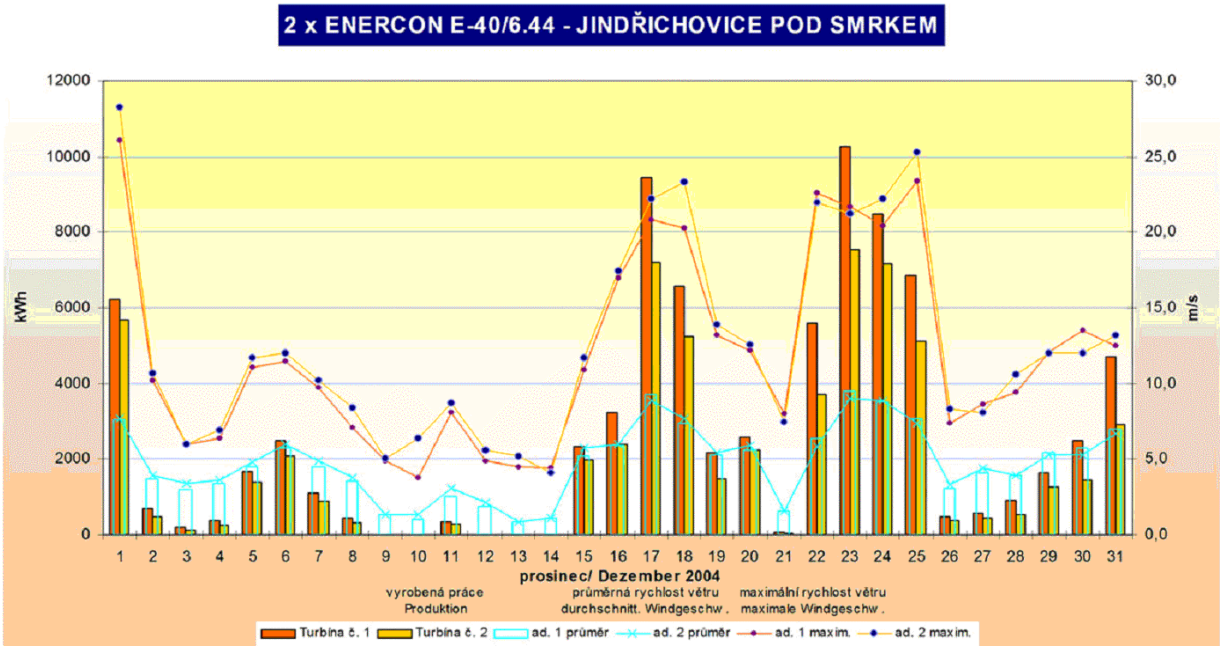

Fig. 2 – The balance of power plants Jindřichovice pod Smrkem (December 2004)

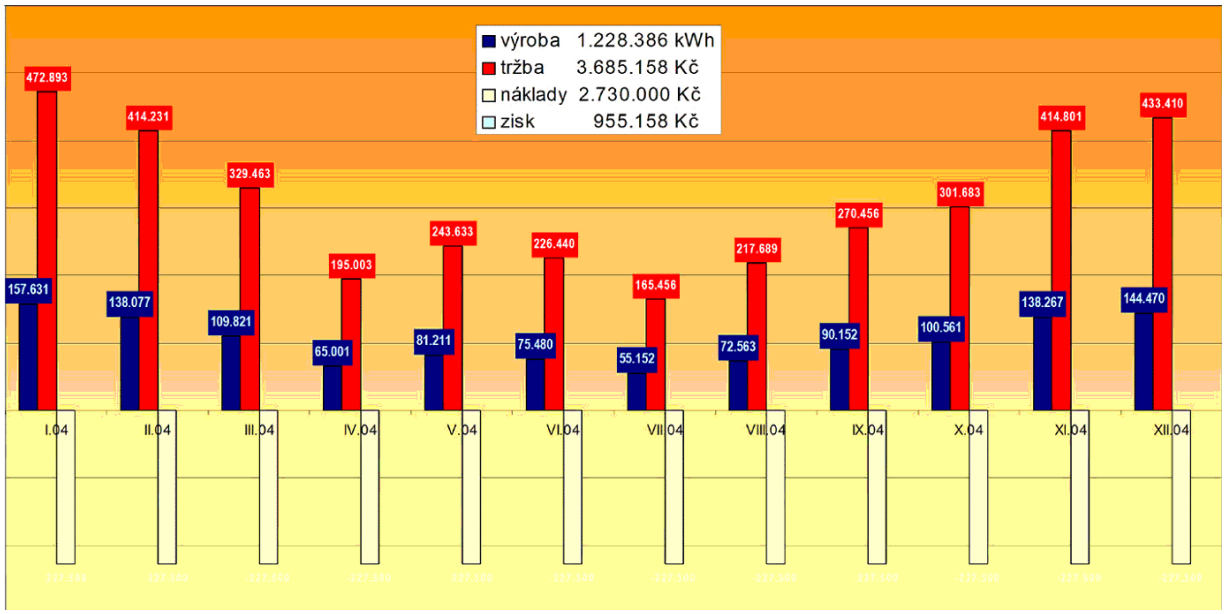

Fig. 3 – The economical balance of wind power plants Jindřichovice pod Smrkem (2004) (blue-production; red-revenue; yellow-costs; light blue-profit)

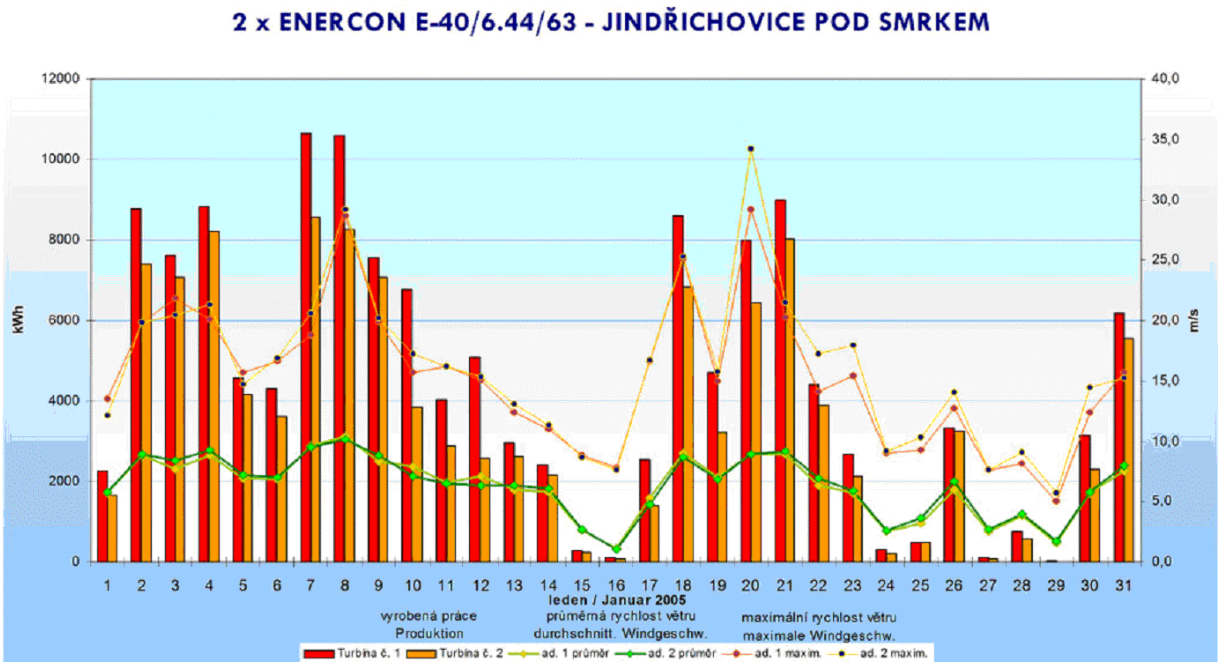

Fig. 4 – The balance of power plants Jindřichovice pod Smrkem (January 2005)

3. CONCLUSION

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

Electrical energy generation from renewable resources has become a global business. Wind turbines are in use at many of locations worldwide, their flexibility providing almost good opportunities. It is typical for the field of engineering in industrialised countries to have a high export share. Sharing of work among several countries generally brings economic advantages for all involved; new jobs and rising tax income. This would allow the target to be reached. Nonetheless, experts believe that the international co-operation will take time to have an effect.

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] Tesařová M., Noháčová L.: Voltage dip matrices – calculation, interpretation and using, 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
[9] 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

This paper was written within the solution of the ERASMUS SOCRATES Programm for education and culture – Intensive Programm “Distributed power systems”.

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 37763435