

Wonderful Deliberation on the Economic Development of Wind Energy in Global Village

¹E. Sadegi-Toosi and ²A. Zati-Rostami

¹Department of Science, Islamic Azad University, Neka Branch, Neka, Iran

²Department of Science and Engineering, Islamic Azad University, Sari Branch, Sari, Iran

Abstract: As there are some areas in each country that has potential in production of wind electricity and for some concerns such as, concern for long wind field project in third world countries, the present fuss of developed countries in the part of energy supply for other countries (for example increase in oil cost in 1973), the digressive slop in energy production derived from nuclear power stations in the world as a preferable resource in pervious three decades for production of electricity energy (for high cost and long pollution), the crisis in utilization of nuclear power station in third world countries and the crisis of oil ending in many countries in next two decades, this study performed to explain about stabilized dependence of countries with permanent in energy supply (renewable wind energy) and the dependence of crisis with energy supply that is derived from fossil fuels. There are some important issues at the level of the region countries that caused to study about reasons of on the economic development of wind energy in global village in industrial and developed countries and in part independence in developing countries and independence of above issues to the third world countries. Some issues are increase in energy consumption in three month of year (because of agricultural applications), the stresses of derived from energy supply in three month duration, the far distance of many villages from cities and the ways of transportation of electrical energy and finally elimination of dependence of villages to cities in energy section.

Key word: Energy • Wind • Global village • Economic development • Renewable energy

INTRODUCTION

The history of growth in the use of renewable energy shows that the world community wants to use wind energy in the large parts of global village. So, the third world and developing countries should follow using of wind energy (for independence in energy supply section) after finishing of oil for large profits of free of charge wind energy [1-3].

The Future Analytical of Renewable Wind Energy: The history of growth in the use of renewable energy shows that the during next 30 year, the world demand in energy will increase with a considerably rate and the rate of demand in 2030 will be more than 60% of present demand; AS, only in the electricity section should be installed 4800 gig watt new capacity till that year. Than fact, itself needs 2trillion dollars investment in electricity production, 1.8 trillion dollars investment in distribution and transportation networks (Table 1).

One of the reasons and necessities of wind electricity development is contrast with climate changes of world than seriously threatens the world. Averagely, temperature of the world will be increased to 58 degrees of centigrade during next 100 years (IPCC) which can be followed phenomenon flood, drought and serious climate fluctuations. So decrease in dispersion of greenhouse gases has been known as a necessity of world.

At present, energy with growth average of more than 26% per year from and after 1990 has an upmost growth rate among different resources of energy. At the end 2005. The world capacity in wind energy production has been more than 59 gig watt mostly; the wind energy market has been under control of five countries of Germany, Spain, United States America, India and Denmark.

In 2003, wind electricity is considered as a second great renewable resource after great water electricity (International agency of Energy); and accordance to

Table 1: The history of development in utilization of wind power

Year	The revolution in utilization of wind energy
1987	Invention of first turbine for electricity production by Charlz Bush
1997	Puyol Lacur as a pioneer in production of wind power stations in Denmark
1973-1979	The oil crisis as was caused to increase in survey and development costs for substation energies
1980-1985	The first power station in California
1992	The convection of United nation about climatic changes which is signed in the land meeting in Rio
1996	The approval of renewable energies law in Germany
2001	The approval of Kyoto Treaty

Table 2: Groth rate and annually Average rate growth among developed countries about Wind potential energy (2001-2005)

Country	2001	2002	2003	2004	2005	Growth rate (%)	Annually Average rate growth (%)
Germany	8754	11994	14609	16629	18428	10.8	20.9
Spain	3337	4825	6203	8263	10027	21.3	31.9
United States	4275	4685	6374	6725	9149	36.0	21.8
India	1502	1702	2125	3000	4430	47.7	31.8
Denmark	2489	2889	3116	3118	3122	0.1	6.0
Italy	682	788	905	1265	1717	35.7	26.5
England	474	552	667	907	1353	49.2	30.6
China	400	468	567	764	1260	64.9	34.4
Netherlands	486	693	910	1079	1219	13.0	26.4
Spain	274	414	687	936	936	15.2	42.1
Sum	22673	29010	36163	42686	42686	21.3	23.0

world institution of wind energy till 2020, industry of wind electricity has capability of 67 billion dollars financial cycles per year.

The panted wind capacity of the will increase from 59 gig watt in 2005 worlds electricity supply to itself. The other issues such as technological modifying in decrease of cost of wind electricity production (equal to cost of electricity production in new power station of coal fuels and gas), deletion of economical effect in the risks that related to shaky cost of fossil fuel (in comparison with stabled and specified cost of wind electricity), the long term depreciation of wind electricity projects approve the necessity of performance wind electricity projects in all countries. At present, the countries of Germany, Spain United States of America, India, Denmark orderly with 18428, 10027, 1949, 4430 and 3122 planted capacity are at top of the countries that have wind electricity. The country such as Italy, Netherlands, China, Japan and Portugal also has their planted wind capacity to 1000 megawatts (Table 2).

According to anticipation, although share of Europe will be decreased with regard past but still, it will have the main market of wind energy. Although in 2005 Europe has had 55% of wind energy market which this rate as a regard to 72% of 2004 had been decreased, but the development trend of wind electricity in Europe will increased continually and based on anticipation with annual average growth, the planted capacity of 13.5% during 2006 to 2010 of Europe will have 49% of worlds

planted capacity. The total planted capacity of this continent should be reached to 77.6 gigawatts till 2010, which means that should be reached to 57% total planted capacity of world. Lads in market expansion of hyper coastal wind energy are caused to lengthen of development process of big fields in hyper coastal scale.

Nevertheless, the hyper coastal development of wind energy during next decade is caused to more and more move of Europe market. The structure and share of different European markets will change too. Although Spain and Germany still will be that most important markets of European wind energy but their importance will decrease because reinforcement of the other European countries. Annually, Spain should increase its wind capacity to 2000 megawatt and during that it increases its capacity more than 10 thousand megawatt during 2006-2010 and should reach 20 thousand megawatt capacity in 2010. Although, the next market of Germany will be encountered with decrease but it will have the second powerful market with 6600 megawatt extra capacity during 2006-2010 and the most planted capacity (25 thousand megawatt in 2010). According to anticipations, England, France and Portugal will be other important markets in Europe and during 2006-2010 that each one will increase their wind electricity capacity to approximately 4000 megawatt.

According to estimates the market of Nor then America, also will have an upmost growth. Based anticipations with average growth of 24.3 per year, the

planted capacity of this continent will reach from 9.8 gig watts in 2005 to 29.1 gig watt in 2010. The wind energy market of United States with average of 3000 gig watt per year will be the main world's national market during 2006-2010. Although the financial exemption of producers is finished at the end of 2007 but evidences show that this exemption is extended again. The increased number of states that encouraged wind electricity development will be warranted that the market will be growth powerful than past, so the wind capacity will go beyond 15 thousand megawatt and till 2010 United States will be equal to Germany in the sum of planted capacity. Canada. Also is one the countries that experience a considerable growth. It is anticipated that till 2010, the sum of planted capacity in this country will be to 5000 megawatt new capacity and this means that during 2006-2010 approximately 4300 megawatt new capacity will be installed in Canada and this country will be one of the five countries that prominent in development of wind electricity. Asia, also with 23.5 percent annual anticipated growth average during 2006-2010 will developed considerable share of market. Total planted capacity of Asia should reach from 7 gigwatt in 2010. Among them, India with anticipated planted capacity of 600 megawatt during 2006-2010 will be main country in Asia and is froth powerful country in the world. China as a second Asia country in the growth rate of wind electricity will have an anticipated of 3800 megawatt planted capacity. Japan with lower growth and with 1500 megawatt planted capacity is third and Korea and Taiwan will have third and forth ranks. In Latin America, the market has not properly made and in 2005 only little new capacity was installed. It is predicated that during 2006-2010, the wind electricity market of Latin America is developed by Brazil and Mexico and after that by some countries of Central America, Argentina and Chile. In spite of high potential of Latin America, this continent will not have any consider able share in market and it is expected that during next decade will be done more development in this continent.

The development of wind energy in Oceania has been begun by Australia and Switzerland. For the first time in 2005, Australia with 370 megawatt planted capacity was placed to ten preferable countries. In spite of some misgivings in the field of political structure in this country, it is anticipated that with installation of 1500 megawatt wind electricity during 2006-2010, will continue its development process and will place in the list of ten prominent countries.

In Switzerland, although hasn't done any extra capacity in 2005 but different projects are executing which

warn the 800 megawatt extra capacity till 2010. Africa still will have least rate of wind electricity development. Two countries of Egypt and Morocco has appeared as a pioneers in development of Africa electricity wind and it is predicted that of the wind electricity development in this two countries grows with a fast rate in comparison to past. Also, it is anticipated that all countries of Nor then Africa and Middle East with totally 1900 megawatt wind electricity increase the capacity of the continent.

We cannot expect considerably development in countries of previous soviet Republics.

Choose of Place for Wind Turbines: Selection of place for wind turbines that generate the electricity is done carefully for high investment of in comparison to wind turbines pump. Apparently, the installation place of wind generator must have a speedy, permanent and appropriate wind. So, the study of speed and the other parameters of wind are considered as a first and main step in evaluation of a region capacity for installation of wind power stations [3].

The parameters that can given from periods of wind measurements are following:

- The average speed of wind.
- The speed of wind as a function of wind direction.
- The distribution of alternate speed (function of direction and wind speed class).
- Vibol parameters as a function of wind direction.
- Instantaneous velocity of wind for day time.

Analytical Examination: With respect to the cost of electricity production between 1995 to 2005, we can find that the cost of electricity production which is derived from fuels of gas fossil and oil is increased under influence of world crisis (steep slope diagram for fuels of gas fossil and oil in 1999 for Afghanistan war and in 2003 for Iraq war confirmed this issue). On the other hand, among nuclear, coal and wind energy, the benefits of wind are completely known especially for non-pollution, non-crisis for third world countries, making stabilized development resource of energy supply and low cost. Many studies show that investment in use of wind energy can cause the long term and permanent development in the field of energy supply and some records indicate the independency of wind energy form world inflation and economic recessions [4-6].

CONCLUSION

In the present century, the only thing that can cause of crisis in any countries of global village is the deficiency or shortage of supply and distribution of energy, so developed countries have gone towards renewable energy such as nuclear energy and wind energy and by using this has decreased their dependence in the periods of energy crisis (derived from increase in decrease of energy cost or shortage in energy stock). For example in 1973 with establishment of OPEC and increase in oil price, most of the industrial and developed countries have gone towards renewable energy such as wind and from this way they increased their economic and scientific security and energy [5-6].

As the oil stocks are renewable, always has encouraged the programmers to recognize ability and changeability of renewable energy. For limited stock of fossil energy, increase in present level of use, prevention and stocks ending for exports in most of the countries that are members of OPEC (maximum till to next 25 years), we can not rely on existence energy resources [6].

Lack of programming between agents, especially in oil production countries for marking permanent welfare (with regard to additional incomes of oil in present era, extra aid and cases to crisis countries and ignoring to the energy supply of this and next generation), unconsciously makes the future generations go towards to utilization of wind energy. In the other hands nowadays, development of wind energy has change to an international economic activity [7-10].

Comparison between 1973 and 2006 years (simultaneous with increase in cost of fossil fuel) shows that most of the developed countries to go towards new energy such as wind and has given more independence in the field of energy (even more than countries which produce and export the fossil fuels). Comparison in planned budget of these countries shows that they see permanent development with looking at renewable energies such as wind.

REFERENCES

1. Energy In Finite World, 2002. A Global System Analysis: IIASA, Ballinger Countries Cambridge, Massachusetts, UAS.
2. The Potential of Renewable Energy, 1999. An Interlaboratory White paper US-DOE/SERf Golden, Colorado, USA, March.
3. Woolnough, P., 2006. Government policy could make for break the wind industry. Engineers Australia, August, pp: 20-25.
4. European Wind Energy Association and Greenpeace, 2003. Wind force, Report Number 12, May Version.
5. Swisher, R. and D.F. Ancona, 2006. Wind Energy Developments in the Americas. Proceedings Madrid ECWEC '90. HS. Stephens & Associates, Bedford, United Kingdom.
6. Electricity Supply Industry Planning Council of out Australia (ESILC), 2003. South Australia wind Power Study, March Version.
7. Jaras, T.F., 1987. Wind Energy, Wind Turbine Shipments and Applications Wind Data Center, Stadia, Inc., Great Falls, Virginia, USA.
8. Johnson, G.D., 2005. A review of bat mortality at wind-energy developments in the United States. Bat Research News, 46(2): 45-49.
9. Johnson, G.D., D.P. Young, Jr., W.P. Erickson, C.E. Derby, M.D. Strickland, R.E. Good and J.W. Kern, 2000. Wildlife Monitoring Studies: SeaWest Windpower Project, Carbon County, Wyoming, 1995-1999. Final report. Prepared by WEST, Inc., Cheyenne, WY, for SeaWest Energy Corporation, San Diego, CA and Bureau of Land Management, Rawlins District Office, Rawlins, WY.
10. The Balance Sheet of Energy, 2006. Force office, available at: www.dtf.wa.gov.au/cms/uploadedFiles/Part_12_Office_of_Energy.pdf.