REGIONAL DISTRIBUTION OF WIND ENERGY USE IN FRANCE - STATUS 31/08/2002

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Summary

As of 31/08/2002, 351 wind turbines with a related power of about 131,5 MW were installed in France. The Languedoc-Roussillon region is at the top with a share of about 44% of the total power installed. Since February 2000, date of liberation of electricity market in France and since the decision of 8 June 2001, which fixed the conditions of purchase of electric production installation using mechanical energy, an annual growth of about 30% of newly installed power is observed. This situation must be confirmed for the next two years regarding the projects under study (about 430 MW), and the number of demands for connection to electrical grid. With 34% of the total installed power, Nordex is at the top of the French market shares of wind turbine suppliers, followed by Vestas with 18%, Bonus with 16%. The French industry totalize 15% of the market share, 11% for Vergnet, specialized in small wind turbines, with 14,2 MW, and 4% for Jeumont industry with 4,5 MW.

Introduction

Since the beginning of the industrial development of wind power, the market has always been largely dependent upon political policies and intentions. The recent engagement of the European Union to promote renewable energy (with respect to Kyoto protocol, white paper, green paper, liberation of energy market...), the sector is now in the process of freeing itself from these constraints.

In matter of wind energy, France possesses the second most important European resource reserve after that of Great Britain. The national Eole 2005 program (1997-2000) has constituted a leverage for the emergence of a national business sector in this field (in December 2000 about 60 MW were installed with 48,5 MW in the frame work of Eole 2005 program)

The idea of this study is to have basic data to follow the evolution of wind energy use in France, to gather the most basic information about the regional distribution and the development of power installed, the characteristics of wind turbines and the French market shares of wind turbine suppliers since 1991.

1. Regional Distribution

Until September 2002, 351 wind turbines (WTs) with a related power of about 131,5 MW were installed in France. Reference [1] is to be considered as the major source of information regarding the regional distribution of installed power. Table 1 gives the regional distribution of wind energy use in France.

The Languedoc-Roussillon region is at the top of the list with a share of 44%. More than 50% of WTs (198), are small WTs, with a total installed power of 17,16 MW, mainly installed in the overseas departments and territories (DOM.-TOM.).

REGION	No. Of WTs	Installed capacity MW	%	Average Installed power per WT (kW)
LANGUEDOC ROUSSILLON	**71**	**57,82**	**44**	**814**
MIDI-PYRENEES	**12**	**15,6**	**11,9**	**1300**
CORSE	**22**	**13,8**	**10,5**	**627**
BRETAGNE	**20**	**12**	**9,1**	**600**
NORD	**21**	**11,03**	**8,4**	**525**
RHONES-ALPES	**5**	**3**	**2,3**	**600**
P.A.C.A.	**1**	**0,85**	**0,6**	**850**
PICARDIE	**1**	**0,25**	**0,2**	**250**
D.O.M., T.O.M.	**198**	**17,16**	**13**	**87**
ALSACE				
AQUITAINE				
AUVERGNE				
BASSE NORMANDIE				
BOURGOGNE				
CENTRE				
CHAMPAGNE ARDENNE				
FRANCHE COMTE				
HAUTE NORMANDIE				
ILE DE FRANCE				
LIMOUSIN				
LORRAINE				
PAYS DE LA LOIRE				
POITOU CHARENTE				
Total	**351**	**131,51 MW**		

Tab. 1: Regional distribution of wind energy use in France

Many new regions have already their own projects (Haute Normandie,…). These projects have already obtained their construction permits, the realization of these wind energy farms is mainly stopped by associations owing to syndrome of NIMBY (Not In My Back Yard). Others will see their first WTs soon (Champagne Ardenne, Basse Normandie, Ile de France…).

2. Development of WTs and Installed Power

Figure 1 shows the development of the yearly installed and cumulated number of wind turbines and power in France. The French wind energy program may be characterized by three major periods. A development of small power wind turbines, constitute the first period (1993-1996), particularly installed in the DOM-TOM, about 135 WTs were installed during this period with a total power of 23 MW).

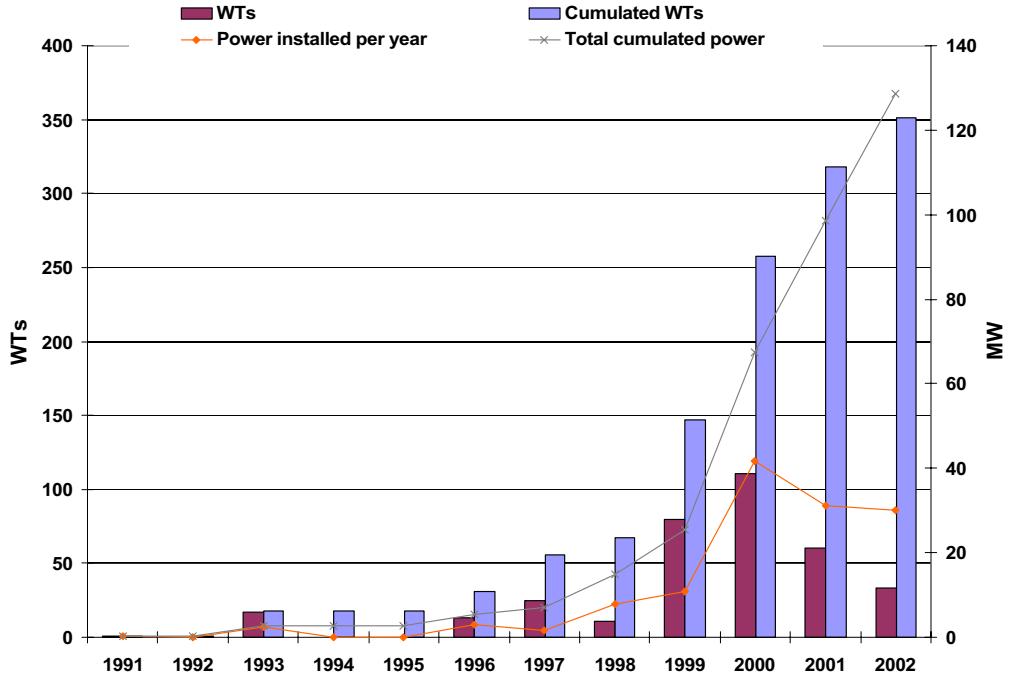

Fig. 1: Yearly installed and cumulated number of wind turbines and power in France.

The execution of EOLE 2005 program constitutes the second period (1996 till the end of 1999), 135 WTs were installed during this period with a total power of 48,5 MW [2]. The major part are installed in the Longuedoc-Roussillon region. Since February 2000, date of the liberation of electricity market in France followed by the decision of 8 June 2001, which fixed the conditions of purchase of electric production installation using mechanical energy, constitute the third period of this evolution.

3. Shares of WTs Power Groups and Rotor Diameter

Shares of WT of Different Power Groups

Table 2 shows the WTs power group in France. Approximately 44% WTs is situated in the first groupe (5-80 kW) with 7% of the total installed power. The DOM-TOM have a particularly large share in this distribution. The group of unit size 750-1500 kW totalise more than 50% of the power installed.

Unit size	WT	%	MW	%
5-80 kW	155	44	9,44	7
80,1-130 kW	0	0	0	0
130,1-310 kW	68	19	13,99	11
310,1-749,9 kW	60	17	36,98	28
750,0-1449,9 kW	68	19	71,1	54
1500,0-3100 kW	0	0	0	0

Tab. 2: Shares of WTG installed power groups

In matter of WTs size groups, table 3 gives the details of WTs size groups according to rotor diameter: small WTs group for rotor diameter up to 16 meter, medium WTs size group for rotor diameter between 16,1 meter and 45 meter and large size group for rotor diameter above 45 meter.

SMALL		**MEDIUM**		**LARGE**	
Diameter, m	No. of WTs	Diameter, m	No. of WTs	Diameter, m	No. of WTs
0,0-8	0	16,1-22	1	45,1-64	82
8,1-11	12	22,1-32	58	64,1-90	0
11,1-16	151	32,1-45	47	90,1-128	0
Total	163		106		82

Tab. 3: Division of WTs in size groups according to rotor diameter D

4. French Market Shares of WTs Suppliers Status 31/08/2002

Table 4 shows that during the first eight months of 2002, 29,2 MW are newly installed power with the trend towards larger wind turbines (1,3 MW and 1,5 MW). This value corresponds to about 30% growth rate of the installed power since 1991. This trend must be confirmed during 2003 and 2004 regarding the projects under study (about 430 MW)[2] and the number of demands for connection to electrical grid.

Manufacturer	Power installed / end 2001 in MW	In 2002 MW	Total cumulated MW
Vergnet	14,2	0	14,2
Jeumont	4,5	0	4,5
Nordex	20,05	27,7	47,75
Vestas	22,73	0	22,73
Windmaster	10,2	1,5	11,7
Bonus	20,8	0	20,8
Neg-Micon	6	0	6
Lagerwey	3,83	0	3,83
Total	**102,31**	**29,20**	**131,51**

Tab: 4: French market shares of WTs suppliers-status 31/08/2002

Figure 2 shows the shares of the suppliers in the French market in percent of the installed rated power since 1991. With 34% of the installed power, Nordex is at the top of the market share in France, followed by Vestas with 18%, Bonus with 16%. The French industry totalize 15% of the market share, 11% for Vergnet with 14,2 MW and 4% for Jeumont industry with 4,5 MW installed power.

Conclusion

In view of its excellent growth figures and its economic success, wind power is playing a leading role in the development of renewable energies. The technological progress made in wind turbines over the last few years has been tremendous [4].

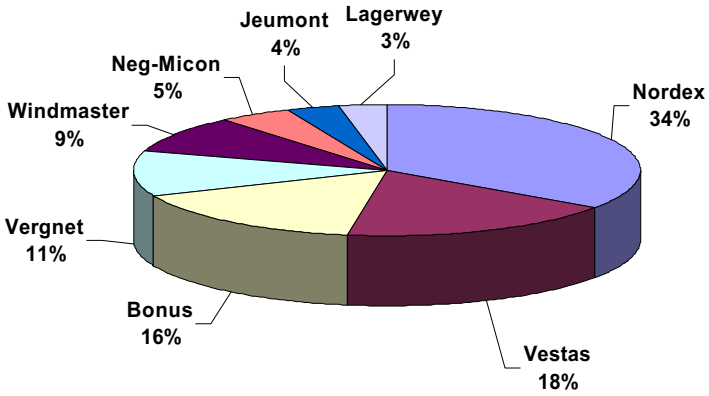

Fig. 2: Shares of the suppliers in the French market since 1991

In spite of specific social, economic, administrative and industrial problems regarding wind energy use, the French market will experience in the near future a large development if we judge by the numerous sites under study, numerous demands for connection to electrical grid, and the number of installations since the decision of 8 June 2001, which fixed the conditions of purchase of electric production installation using mechanical energy.

References

[1] http://www.suivi-eolien.com
[2] Publication : ADEME
[3] Système Solaire no. 147, 2002
[4] EUROBSERV'ER 37, Overview Barometer - April 2002