

WIND ENERGY MARKET

YEARBOOK SERVICE, TECHNOLOGY & MARKETS

2011

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- + **WIND TURBINES:** Data sheets for more than 70 on- and offshore wind turbines
 - + **TRENDS IN TECHNOLOGY AND INNOVATION:** Quo vadis WEC technology?
 - + **INDEPENDENT SERVICE:** An overview of the leading service companies
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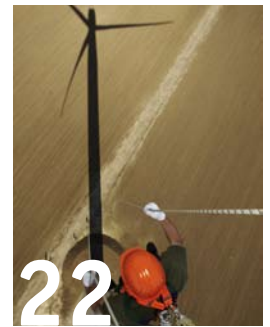


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21ST EDITION

Content



9 | German wind market: At 1999 levels

The German wind market was disappointing in 2010. The increase in capacity was at 1999 levels and failed to meet expectations by around a quarter. Apart from financing problems, there were delays in designating suitable areas for wind farms in many places, issues relating to height and spacing restrictions, and the uncertainty caused by the new grid requirements for wind turbines. The forecast for this year is equally cautious.

14 | Global wind market: New markets everywhere

The consequences of the financial and economic crisis sapped the momentum in the global wind market in 2010. But despite the increased difficulty in obtaining financing for projects, 35,802 megawatts of new capacity were put into operation around the world – the second highest figure ever achieved. The main source of this was the ongoing boom in China, which has forced the USA off the top spot. Some good news: new markets are taking shape around the world.

22 | Market trends: 3 MW as the new standard onshore

Turbines are getting bigger: Even onshore, turbines with 3 MW capacity and a rotor diameter of more than 100 metres are increasingly being installed. Alongside familiar companies like Vestas and REpower, some brand new names began to appear among manufacturers in 2010. Meanwhile Enercon is in a league of its own: calmly and quietly the Aurich-based firm is expanding its fleet of E 126 6 MW and 7.5 MW turbines.

26 | The continued operation of wind turbines

There are still many unanswered questions regarding the continued operation of older wind turbines after they have provided 20 years of remuneration. To date, there are no standardised technical or statutory regulations. This means that it is usually down to an individual inspection to determine whether operation should continue. The next question is then how to sell the wind power generated. This is a complex subject. When possible, turbine operators often opt for repowering.

30 | Feed-in management and SDL bonus

Feed-in management and SDL bonus – those are the catchphrases that have caused considerable strife between owners of wind turbines and grid operators. Many of the disagreements have been overcome, but some will most probably have to be settled in court – most likely through all the courts.

34 | INTERVIEW "EEG does not provide enough incentives for network expansion"

Thorsten Müller, lawyer at the University of Würzburg and chairman of the foundation for environmental energy legislation (Stiftung Umweltenergierecht) on the flaws of feed-in management.

37 | INTERVIEW "Wind energy can replace conventional power stations"

Kurt Rohrig, deputy director and renowned specialist in grid integration at IWES (Fraunhofer Institute for Wind Energy and Energy System Technology) in Kassel, urges that the true potential of SDL should be used consistently.



38 | Repowering: 13 per cent is not enough

In 2010 too, repowering did not progress as fast as many wind turbine operators were hoping. The same old reasons are to blame: height limitations, distance requirements, and often also the reluctance of operators to give up a wind turbine that has just become profitable. Only 13 per cent of the additional installations in 2010 came from repowering. According to BWE, this should have been 30 per cent. New impetus will now be provided by state regulations – especially in the state of North Rhine-Westphalia, which is governed by the SPD-Green Party coalition.

42 | Service providers: A trend towards full maintenance contracts

Even independent service providers are feeling the years of slow winds. But business is brisk enough – they are opening up new markets. The operators are asking for full-maintenance concepts. And doing business overseas is inevitable.

46 | Services offered by manufacturers and independent providers

56 | Technical Data explained

62 | Wind turbines – technical data

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Wind turbines ≤ 3.000 kW	Page 116 – 153
Wind turbines ≤ 5.000 kW	Page 154 – 157
Wind turbines > 5.000 kW	Page 158 – 160

150 | The wind year 2010: Just how bad is bad?

155 | Directory wind turbine manufactures

Wind Turbines – sorted by name (A – Z)

Type name	kW	Page	Type name	kW	Page	Type name	kW	Page
Acciona AW 1500	1,500	73	GE 1.6-82.5	1,600	84	REpower MM100	1,800	87
Acciona AW 3000	3,000	132	GE 2.5-100	2,500	115	REpower MM82	2,050	104
AV 928	2,500	113	GE 2.5-103	2,500	116	REpower MM92	2,050	105
AV 1010	2,300	108	GE 2.75-100	2,750	130	Schuler SDD 100	2,700	128
AV 1010 - Cross section		109	GE 2.75-103	2,750	131	Schuler SDD 100 - Cross section		129
D8 2000	2,000	90	K 82 - 2.0 MW	2,000	98	SWT-2.3-101	2,300	112
D8.2	2,000	92	K 82 - 2.0 MW - Cross section		99	SWT-3.0-101	3,000	137
D9.0	2,000	93	K 100 - 2.5 MW	2,500	117	SWT-3.6-120	3,600	144
D9.1	2,000	94	LEITWIND LTW70	1,700	86	VENSYS 100	2,500	127
D9.2	2,000	95	LEITWIND LTW77	1,000	72	VENSYS 77	1,500	80
E-33	330	62	LEITWIND LTW80	1,500	77	VENSYS 77 - Cross section		81
E-44	900	69	LEITWIND LTW86	1,500	78	VENSYS 82	1,500	82
E-48	800	63	LEITWIND LTW101	3,000	135	VENSYS 90	2,500	126
E-53	800	64	Multibrid M5000	5,000	145	Vestas V100 - 1.8 MW	1,800	88
E-70	2,300	110	Nordex N80/2500	2,500	118	Vestas V100 - 1.8 MW - Cross section		89
E-82 E2	2,000	97	Nordex N90/2500 HS	2,500	119	Vestas V112 - 3.0 MW	3,000	140
E-82 E2	2,300	111	Nordex N90/2500 LS	2,500	120	Vestas V112 - 3.0 MW - Cross section		141
E-82 E3	3,000	134	Nordex N100/2500	2,500	121	Vestas V52 - 850 kW	850	66
E-101	3,000	133	PowerWind 56	900	70	Vestas V52 - 850 kW - Cross section		67
E-126	7,500	148	PowerWind 56 - Cross section		71	Vestas V80 - 2.0 MW	2,000	100
e.n.o. 82 - 2.0	2,000	96	PowerWind 90	2,500	122	Vestas V80 - 2.0 MW - Cross section		101
e.n.o. 92 - 2.2	2,200	107	PowerWind 90 - Cross section		123	Vestas V90 - 2.0 MW	2,000	102
Fuhrländer FL MD 77	1,500	74	PowerWind 100	2,500	124	Vestas V90 - 2.0 MW - Cross section		103
Fuhrländer FL 2500	2,500	114	PowerWind 100 - Cross section		125	Vestas V90 - 3.0 MW	3,000	138
GE 1.5-77	1,500	75	REpower 3.2M114	3,200	142	Vestas V90 - 3.0 MW - Cross section		139
GE 1.5-82.5	1,500	76	REpower 3.4M104	3,400	143	Vestas V112 - 3.0 MW	3,000	152
GE 1.6-100	1,600	85	REpower 5M	5,075	146	Vestas V112 - 3.0 MW - Cross section	3,000	153
GE 1.6-77	1,600	83	REpower 6M	6,150	147			

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