



# Wind Power Ltd.

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## Content

- Background
- Business concept
- Market Analysis
- Financing concept
- Cost Calculations
- Conclusion

# Background

- The energy demand of the world rises
- Fossil energy will be depleted
- Renewable energy is the future
- The renewable energy type with the best level of efficiency and eminently suitable for Germany:

**Wind Power**



# Business concept

- Buying a piece of land
- Purchase of a 2,3 MW wind turbine, including transport and construction
- Generating electricity by wind energy
- Sale the converted power



# Market Analysis

**Location:** Meppen  
(North German lowlands)

Mean wind speed: 6,34 m/s

Mean wind capacity: 289,1 W/m<sup>2</sup>

Hours of full Throttle: 1781 h/a

Wind turbine: ENERCON E70

Max. plant capacity: 2,3 MW

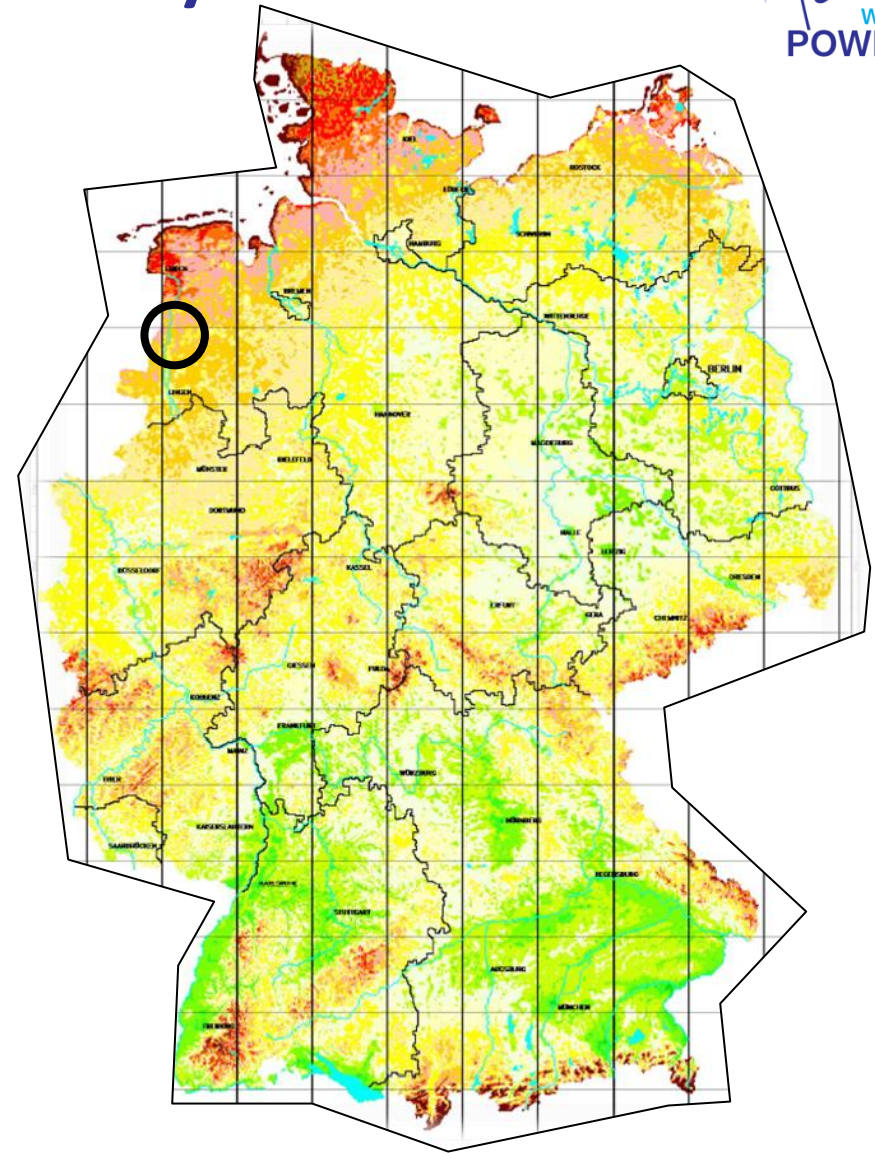
Mean plant capacity: 0,468 MW

**Total Production:** 4100000 kWh/a

**Selling price: [§29 EEG]**

9,20 Cent/kWh start-up remuneration in the first five years

5,02 Cent/kWh basic remuneration



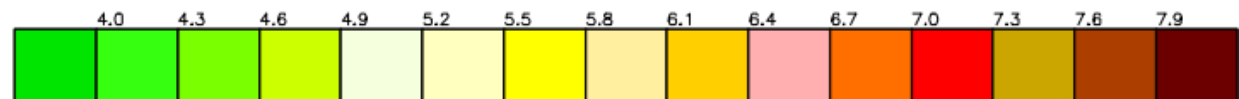
Herausgeber und Copyright:  
Deutscher Wetterdienst  
Abteilung Klima- und Umweltberatung  
Offenbach, 2004



Jahresmittel der Windgeschwindigkeit  
– 80 m über Grund –  
in der Bundesrepublik Deutschland

Statistisches Windfeldmodell (SWM)  
Bezugszeitraum : 1981 bis 2000  
Maßstab 1 : 2 500 000  
Landesgrenzen: schwarz, Gewässer: blau

WINDGESCHWINDIGKEIT (M/S)



# Financing concept

There are two parts:

- 1<sup>st</sup> Record a bank loan for 40% of the total investment with fixed interest rate out of 7%
- 2<sup>nd</sup> Find about 30 shareholders which invest ca. 70.000€ in this project



# Calculation of the investment and depreciation costs

	Investment expenditure	Depreciation (%)	Depreciation costs
<b>Plant</b>			
Cost of land	165.600 €	0%	- €
Enercon E70	953.235 €	8,33%	79.404 €
Transport	124.200 €	8,33%	10.346 €
Assembly	372.600 €	8,33%	31.038 €
Foundations	165.600 €	8,33%	13.794 €
Fence, lights, etc.	21.735 €	8,33%	1.811 €
Planning	62.100 €	8,33%	5.173 €
<b>Sum</b>	<b>1.865.070 €</b>		<b>141.566 €</b>
<b>Facilities</b>			
Grid connection	142.830 €	8,33%	11.898 €
Roads	62.100 €	8,33%	5.173 €
<b>Sum</b>	<b>204.930 €</b>		<b>17.071 €</b>
<b>Unexpected</b>			
	200.000 €		- €
<b>Circulation cost</b>			
	50.000 €		- €
<b>Total</b>	<b>2.320.000 €</b>		<b>158.637 €</b>



# Calculation of consumption costs



	1. Year	2. Year	3. - 20. Year
<b>Quantity in kWh</b>	2050000	4100000	4100000

<b>Variable costs per a</b>	1. Year	2. Year	3. - 20. Year
Maintenance contract	- €	- €	10.486 €
Insurance	8.102 €	8.102 €	8.102 €
Energy costs	477 €	477 €	477 €
Management	4.800 €	4.800 €	4.800 €
<b>SUM</b>	<b>13.379 €</b>	<b>13.379 €</b>	<b>23.865 €</b>

<b>Variable costs per kWh</b>	1. Year	2. Year	3. - 20. Year
Maintenance contract	- €	- €	0,0026 €
Insurance	0,0040 €	0,0020 €	0,0020 €
Energy costs	0,0002 €	0,0001 €	0,0001 €
Management	0,0023 €	0,0012 €	0,0012 €
<b>SUM</b>	<b>0,0042 €</b>	<b>0,0021 €</b>	<b>0,0046 €</b>

In the first two years maintenance will be paid by the manufacturer.

# Total of investment and financing

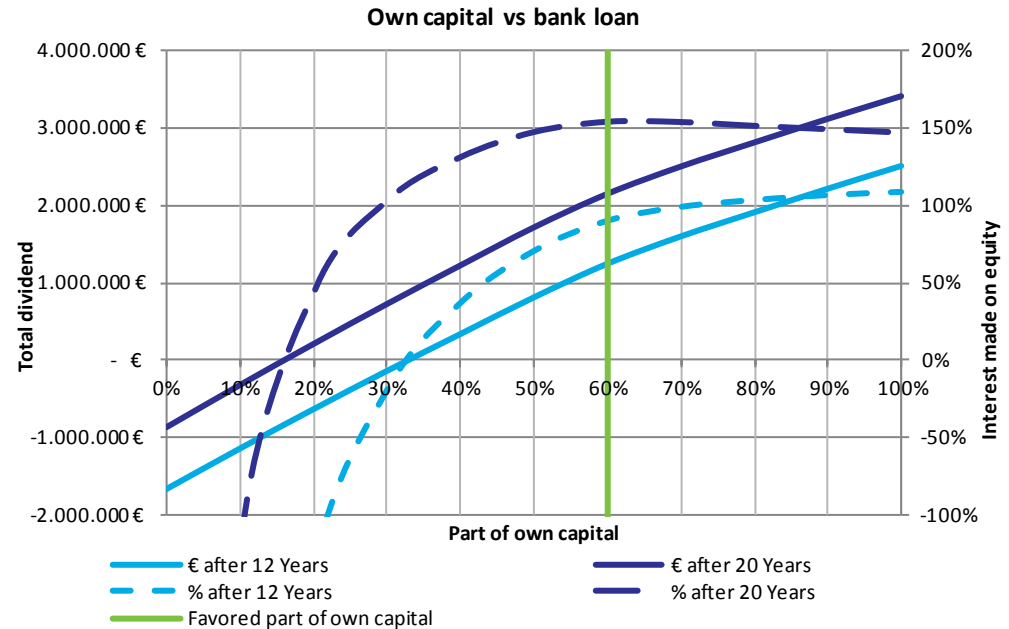
<b>Total investment</b>		<b>2.320.000 €</b>
Own capital funds	60%	1.392.000 €
Bank loan	40%	928.000 €

Number of shareholders	20
Shareholders equity	69.600 €

- Our economic efficiency is highly dependent on the ratio of own and external capital

- To increase the part of own capital we split it in 20 parts. Each shareholder can join our business for 69.600€.

- 40% of the total investment will be funded by external capital. We assume a bank loan especially for wind power plants with constant annual loan redemption and a 7% interest rate over 12 Years.





# Calculation of financing costs: Interest paid on debt

Year	Balance of dept	Interest rate (%)	Interest costs paid p.a.	Repayment / Paying back loan p.a.
1.	928.000 €	7%	64.960 €	77.333 €
2.	850.667 €	7%	59.547 €	77.333 €
3.	773.333 €	7%	54.133 €	77.333 €
4.	696.000 €	7%	48.720 €	77.333 €
5.	618.667 €	7%	43.307 €	77.333 €
6.	541.333 €	7%	37.893 €	77.333 €
7.	464.000 €	7%	32.480 €	77.333 €
8.	386.667 €	7%	27.067 €	77.333 €
9.	309.333 €	7%	21.653 €	77.333 €
10.	232.000 €	7%	16.240 €	77.333 €
11.	154.667 €	7%	10.827 €	77.333 €
12.	77.333 €	7%	5.413 €	77.333 €
<b>Total interest paid</b>			<b>422.240 €</b>	
<b>Total repayment</b>				<b>928.000 €</b>



# Self costs per kWh and calculation of turnover/revenue



Capacity p.a. **4100000 kWh**

	1.Year/per kWh	1.Year	2.Year	3.Year	4.Year	5.Year	6.Year	7.Year	8.Year	9.Year	10.Year	11.Year	12.Year
Utilization of capacity		50%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
Quantity in kWh		2050000	4100000	4100000	4100000	4100000	4100000	4100000	4100000	4100000	4100000	4100000	4100000

Costs	Costs per kWh	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.
Depreciation costs	0,0774 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €
Financing costs	0,0317 €	64.960 €	59.547 €	54.133 €	48.720 €	43.307 €	37.893 €	32.480 €	27.067 €	21.653 €	16.240 €	10.827 €	5.413 €
consumption costs	0,0042 €	8.579 €	8.579 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €
<b>SUM of costs</b>		<b>232.176 €</b>	<b>226.762 €</b>	<b>231.835 €</b>	<b>226.421 €</b>	<b>221.008 €</b>	<b>215.595 €</b>	<b>210.181 €</b>	<b>204.768 €</b>	<b>199.355 €</b>	<b>193.941 €</b>	<b>188.528 €</b>	<b>183.115 €</b>
<b>Costs per kWh</b>	<b>0,1133 €</b>	<b>0,1133 €</b>	<b>0,0553 €</b>	<b>0,0565 €</b>	<b>0,0552 €</b>	<b>0,0539 €</b>	<b>0,0526 €</b>	<b>0,0513 €</b>	<b>0,0499 €</b>	<b>0,0486 €</b>	<b>0,0473 €</b>	<b>0,0460 €</b>	<b>0,0447 €</b>

<b>Remuneration</b>	<b>0,0920 €</b>	<b>0,0920 €</b>	<b>0,0920 €</b>	<b>0,0920 €</b>	<b>0,0920 €</b>	<b>0,0920 €</b>	<b>0,0502 €</b>	<b>0,0502 €</b>	<b>0,0502 €</b>	<b>0,0502 €</b>	<b>0,0502 €</b>	<b>0,0502 €</b>	<b>0,0502 €</b>
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<b>Turnover/Revenue</b>		<b>188.600 €</b>	<b>377.200 €</b>	<b>377.200 €</b>	<b>377.200 €</b>	<b>377.200 €</b>	<b>205.820 €</b>	<b>205.820 €</b>	<b>205.820 €</b>	<b>205.820 €</b>	<b>205.820 €</b>	<b>205.820 €</b>	<b>205.820 €</b>
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	13.Year	14.Year	15.Year	16.Year	17.Year	18.Year	19.Year	20.Year
Utilization of capacity	100%	100%	100%	100%	100%	100%	100%	100%
Quantity in kWh	4100000	4100000	4100000	4100000	4100000	4100000	4100000	4100000

Costs	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.	Costs p.a.
Depreciation costs	- €	- €	- €	- €	- €	- €	- €	- €
Financing costs	- €	- €	- €	- €	- €	- €	- €	- €
consumption costs	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €
<b>SUM of costs</b>	<b>19.065 €</b>	<b>19.065 €</b>	<b>19.065 €</b>	<b>19.065 €</b>	<b>19.065 €</b>	<b>19.065 €</b>	<b>19.065 €</b>	<b>19.065 €</b>
<b>Costs per kWh</b>	<b>0,0046 €</b>	<b>0,0046 €</b>	<b>0,0046 €</b>	<b>0,0046 €</b>	<b>0,0046 €</b>	<b>0,0046 €</b>	<b>0,0046 €</b>	<b>0,0046 €</b>

<b>Remuneration</b>	<b>0,0502 €</b>	<b>0,0502 €</b>	<b>0,0502 €</b>	<b>0,0502 €</b>	<b>0,0502 €</b>	<b>0,0502 €</b>	<b>0,0502 €</b>	<b>0,0502 €</b>
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<b>Turnover/Revenue</b>	<b>205.820 €</b>	<b>205.820 €</b>	<b>205.820 €</b>	<b>205.820 €</b>	<b>205.820 €</b>	<b>205.820 €</b>	<b>205.820 €</b>	<b>205.820 €</b>
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# Computation of cash-flow

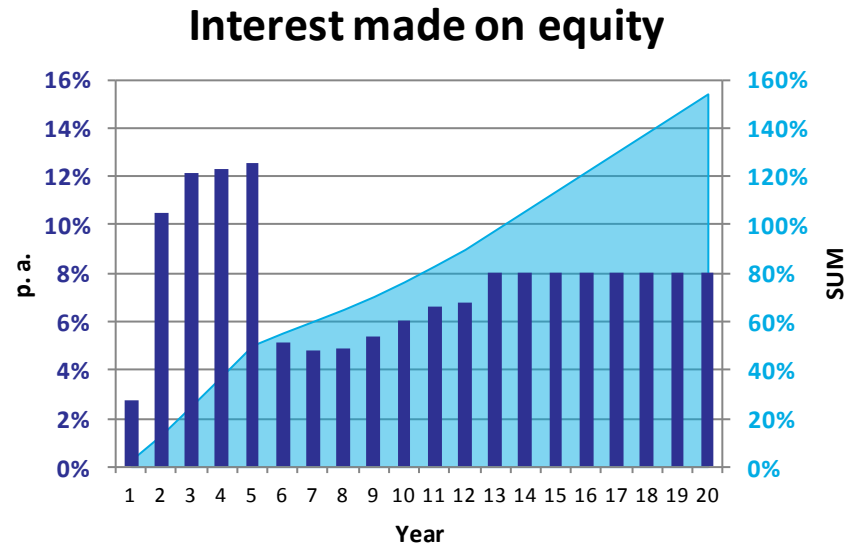
	1.Year	2.Year	3.Year	4.Year	5.Year	6.Year	7.Year	8.Year	9.Year	10.Year	11.Year	12.Year
Turnover/Revenue	188.600 €	377.200 €	377.200 €	377.200 €	377.200 €	205.820 €	205.820 €	205.820 €	205.820 €	205.820 €	205.820 €	205.820 €
Depreciation costs	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €	158.637 €
consumption costs	8.579 €	8.579 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €
Financing costs	64.960 €	59.547 €	54.133 €	48.720 €	43.307 €	37.893 €	32.480 €	27.067 €	21.653 €	16.240 €	10.827 €	5.413 €
Loss carried forward		- 43.576 €	- €	- €	- €	- €	- 9.775 €	- 14.136 €	- 13.084 €	- 6.618 €	- €	- €
<b>Profit before tax</b>	<b>- 43.576 €</b>	<b>106.862 €</b>	<b>145.365 €</b>	<b>150.779 €</b>	<b>156.192 €</b>	<b>- 9.775 €</b>	<b>- 14.136 €</b>	<b>- 13.084 €</b>	<b>- 6.618 €</b>	<b>5.261 €</b>	<b>17.292 €</b>	<b>22.705 €</b>
Taxes (40%)	- €	42.745 €	58.146 €	60.312 €	62.477 €	- €	- €	- €	- €	2.104 €	6.917 €	9.082 €
<b>Profit after taxes</b>	<b>- 43.576 €</b>	<b>64.117 €</b>	<b>87.219 €</b>	<b>90.467 €</b>	<b>93.715 €</b>	<b>- 9.775 €</b>	<b>- 14.136 €</b>	<b>- 13.084 €</b>	<b>- 6.618 €</b>	<b>3.156 €</b>	<b>10.375 €</b>	<b>13.623 €</b>
Cash-flow (net profit + depreciation costs)	115.061 €	222.754 €	245.856 €	249.104 €	252.352 €	148.862 €	144.501 €	145.553 €	152.018 €	161.793 €	169.012 €	172.260 €
Repyment credit	77.333 €	77.333 €	77.333 €	77.333 €	77.333 €	77.333 €	77.333 €	77.333 €	77.333 €	77.333 €	77.333 €	77.333 €
<b>Dividend</b>	<b>37.728 €</b>	<b>145.420 €</b>	<b>168.522 €</b>	<b>171.770 €</b>	<b>175.018 €</b>	<b>71.529 €</b>	<b>67.167 €</b>	<b>68.220 €</b>	<b>74.685 €</b>	<b>84.460 €</b>	<b>91.678 €</b>	<b>94.926 €</b>

	13.Year	14.Year	15.Year	16.Year	17.Year	18.Year	19.Year	20.Year
Turnover/Revenue	205.820 €	205.820 €	205.820 €	205.820 €	205.820 €	205.820 €	205.820 €	205.820 €
Depreciation costs	- €	- €	- €	- €	- €	- €	- €	- €
consumption costs	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €	19.065 €
Financing costs	- €	- €	- €	- €	- €	- €	- €	- €
Loss carried forward	- €	- €	- €	- €	- €	- €	- €	- €
<b>Profit before tax</b>	<b>186.755 €</b>	<b>186.755 €</b>	<b>186.755 €</b>	<b>186.755 €</b>	<b>186.755 €</b>	<b>186.755 €</b>	<b>186.755 €</b>	<b>186.755 €</b>
Taxes (40%)	74.702 €	74.702 €	74.702 €	74.702 €	74.702 €	74.702 €	74.702 €	74.702 €
<b>Profit after taxes</b>	<b>112.053 €</b>	<b>112.053 €</b>	<b>112.053 €</b>	<b>112.053 €</b>	<b>112.053 €</b>	<b>112.053 €</b>	<b>112.053 €</b>	<b>112.053 €</b>
Cash-flow (net profit + depreciation costs)	112.053 €	112.053 €	112.053 €	112.053 €	112.053 €	112.053 €	112.053 €	112.053 €
Repyment credit	- €	- €	- €	- €	- €	- €	- €	- €
<b>Dividend</b>	<b>112.053 €</b>	<b>112.053 €</b>	<b>112.053 €</b>	<b>112.053 €</b>	<b>112.053 €</b>	<b>112.053 €</b>	<b>112.053 €</b>	<b>112.053 €</b>



# Equity profitability

Year	Total			Interest made on equity	
	Equity	Profit after tax	Dividend	p.a.	SUM
1	1.392.000 €	- 43.576 €	37.728 €	2,7%	2,7%
2	1.392.000 €	64.117 €	145.420 €	10,4%	13,2%
3	1.392.000 €	87.219 €	168.522 €	12,1%	25,3%
4	1.392.000 €	90.467 €	171.770 €	12,3%	37,6%
5	1.392.000 €	93.715 €	175.018 €	12,6%	50,2%
6	1.392.000 €	- 9.775 €	71.529 €	5,1%	55,3%
7	1.392.000 €	- 14.136 €	67.167 €	4,8%	60,1%
8	1.392.000 €	- 13.084 €	68.220 €	4,9%	65,0%
9	1.392.000 €	- 6.618 €	74.685 €	5,4%	70,4%
10	1.392.000 €	3.156 €	84.460 €	6,1%	76,5%
11	1.392.000 €	10.375 €	91.678 €	6,6%	83,1%
12	1.392.000 €	13.623 €	94.926 €	6,8%	89,9%
13	1.392.000 €	112.053 €	112.053 €	8,0%	97,9%
14	1.392.000 €	112.053 €	112.053 €	8,0%	106,0%
15	1.392.000 €	112.053 €	112.053 €	8,0%	114,0%
16	1.392.000 €	112.053 €	112.053 €	8,0%	122,1%
17	1.392.000 €	112.053 €	112.053 €	8,0%	130,1%
18	1.392.000 €	112.053 €	112.053 €	8,0%	138,2%
19	1.392.000 €	112.053 €	112.053 €	8,0%	146,2%
20	1.392.000 €	112.053 €	112.053 €	8,0%	154,3%
<b>SUM after 12 years</b>			<b>1.251.124 €</b>		<b>89,9%</b>
<b>SUM after 20 years</b>			<b>2.147.550 €</b>		<b>154,3%</b>



**Total dividend cumulated over 20 years: 2.147.550€**

# Conclusion

- 1<sup>st</sup> Wind power is only profitable for long investments.
- 2<sup>nd</sup> The mean wind speed of the selected location is too low. It is essential that the plant is working to capacity most of the time.
- 3<sup>th</sup> Without an promotional program it will be difficult to find 30 shareholders. With the new remuneration values wind power plants are much less attractive as they had been for a long time.