

Project:

Ulvemosen

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European Wind Farms Denmark a/s

Diplomvej 377

DK-2800 Kgs. Lyngby

+45 88 70 82 10

Bjarke Fuglsang Nielsen / BFN@EuropeanEnergy.dk

Calculated:

24-01-2014 18:52/2.9.269



## DECIBEL - Main Result

Calculation: 10x Vestas V117-3.3 MW+ all existing WTGs - værditab

### Noise calculation model:

Danish 2011

The calculation is based on the "Bekendtgørelse nr. 1284 af 15. december 2011" from the Danish Environmental Agency.

The noise impact from WTGs are not allowed to exceed the following limits: (Wind speeds in 10 m height)

1) At outdoor areas maximum 15 m from neighbor settlements in the open land.

a) 44 dB(A) at wind speed 8 m/s.

b) 42 dB(A) at wind speed 6 m/s.

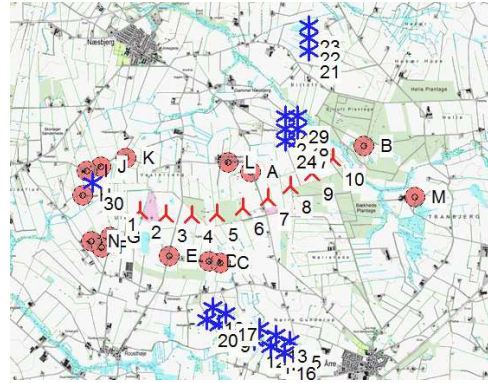
2) At outdoor areas in residential or recreational areas.

a) 39 dB(A) at wind speed 8 m/s in residential areas.

b) 37 dB(A) at wind speed 6 m/s in residential areas.

The low frequency noise impact from WTGs are not allowed to exceed 20 dB indoor at wind speeds 8 and 6 m/s

The limits are not to be taken into account for houses belonging to WTG owner



Scale 1:125.000  
 ▲ New WTG  
 ★ Existing WTG  
 ■ Noise sensitive area

### WTGs

UTM (north)-ETRS89 Zone: 32	East North Z			Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Noise data	Creator	Name	First wind speed [m/s]	LwaRef [dB(A)]	Last wind speed [m/s]	LwaRef [dB(A)]	Pure tones	
	East	North	Z																
1	474.321	6.161.556	23.3	VESTAS V117-3.3 MW 3300 11...	Yes	VESTAS	V117-3.3 MW-3.300	3.300	117,0	91,5	USER	Mode 2 - 104,5 dB - 2013-12-04	6,0	103,8	8,0	104,5	No		
2	474.762	6.161.414	25,4	VESTAS V117-3.3 MW 3300 11...	Yes	VESTAS	V117-3.3 MW-3.300	3.300	117,0	91,5	USER	Mode 0 - 107 dB - 2013-12-04	6,0	105,1	8,0	107,0	No		
3	475.243	6.161.338	27,4	VESTAS V117-3.3 MW 3300 11...	Yes	VESTAS	V117-3.3 MW-3.300	3.300	117,0	91,5	USER	Mode 0 - 107 dB - 2013-12-04	6,0	105,1	8,0	107,0	No		
4	475.709	6.161.322	28,8	VESTAS V117-3.3 MW 3300 11...	Yes	VESTAS	V117-3.3 MW-3.300	3.300	117,0	91,5	USER	Mode 0 - 107 dB - 2013-12-04	6,0	105,1	8,0	107,0	No		
5	476.185	6.161.358	29,0	VESTAS V117-3.3 MW 3300 11...	Yes	VESTAS	V117-3.3 MW-3.300	3.300	117,0	91,5	USER	Mode 0 - 107 dB - 2013-12-04	6,0	105,1	8,0	107,0	No		
6	476.661	6.161.458	29,9	VESTAS V117-3.3 MW 3300 11...	Yes	VESTAS	V117-3.3 MW-3.300	3.300	117,0	91,5	USER	Mode 5 - 104 dB - 2013-12-04	6,0	102,0	8,0	104,0	No		
7	477.118	6.161.626	30,0	VESTAS V117-3.3 MW 3300 11...	Yes	VESTAS	V117-3.3 MW-3.300	3.300	117,0	91,5	USER	Mode 5 - 104 dB - 2013-12-04	6,0	102,0	8,0	104,0	No		
8	477.533	6.161.850	28,0	VESTAS V117-3.3 MW 3300 11...	Yes	VESTAS	V117-3.3 MW-3.300	3.300	117,0	91,5	USER	Mode 5 - 104 dB - 2013-12-04	6,0	102,0	8,0	104,0	No		
9	477.936	6.162.083	25,3	VESTAS V117-3.3 MW 3300 11...	Yes	VESTAS	V117-3.3 MW-3.300	3.300	117,0	91,5	USER	Mode 0 - 107 dB - 2013-12-04	6,0	105,1	8,0	107,0	No		
10	478.320	6.162.361	20,0	VESTAS V117-3.3 MW 3300 11...	Yes	VESTAS	V117-3.3 MW-3.300	3.300	117,0	91,5	USER	Mode 0 - 107 dB - 2013-12-04	6,0	105,1	8,0	107,0	No		
11	476.954	6.159.254	20,0	570715000000034787: 660 kW ...	No	VESTAS	V47-660/200	660	47,0	45,0	EMD	Level 0 - measurement - 1997-06	6,0	99,1	8,0	99,8	No		
12	476.859	6.159.034	20,7	570715000000034794: 660 kW ...	No	VESTAS	V47-660/200	660	47,0	45,0	EMD	Level 0 - measurement - 1997-06	6,0	99,1	8,0	99,8	No		
13	477.243	6.159.128	23,0	570715000000034800: 660 kW ...	No	VESTAS	V47-660/200	660	47,0	45,0	EMD	Level 0 - measurement - 1997-06	6,0	99,1	8,0	99,8	No		
14	477.148	6.158.908	23,4	570715000000034817: 660 kW ...	No	VESTAS	V47-660/200	660	47,0	45,0	EMD	Level 0 - measurement - 1997-06	6,0	99,1	8,0	99,8	No		
15	477.500	6.159.016	25,8	570715000000034824: 660 kW ...	No	VESTAS	V47-660/200	660	47,0	45,0	EMD	Level 0 - measurement - 1997-06	6,0	99,1	8,0	99,8	No		
16	477.404	6.158.796	26,1	570715000000034831: 660 kW ...	No	VESTAS	V47-660/200	660	47,0	45,0	EMD	Level 0 - measurement - 1997-06	6,0	99,1	8,0	99,8	No		
17	476.322	6.159.530	22,2	570715000000035036: 750 kW ...	Yes	NEG MICON	NM48/750-750/200	750	48,2	45,0	USER	Måling, Ribe Amt, Roust-Høje, mølle 3	6,0	96,6	8,0	99,4	No		
18	476.094	6.159.629	23,1	570715000000035562: 750 kW ...	Yes	NEG MICON	NM48/750-750/200	750	48,2	45,0	USER	Måling, Ribe Amt, Roust-Høje, mølle 1	6,0	96,6	8,0	99,0	No		
19	476.202	6.159.321	20,7	570715000000035579: 750 kW ...	Yes	NEG MICON	NM48/750-750/200	750	48,2	45,0	USER	Måling, Ribe Amt, Roust-Høje, mølle 4	6,0	96,6	8,0	99,8	No		
20	475.973	6.159.421	21,6	570715000000035586: 750 kW ...	Yes	NEG MICON	NM48/750-750/200	750	48,2	45,0	USER	Måling, Ribe Amt, Roust-Høje, mølle 2	6,0	96,6	8,0	101,5	No		
21	477.888	6.164.329	20,0	570715000000063619: 900 kW ...	Yes	NEG MICON	NM52/900-900/200	900	52,0	44,0	EMD	8m/s 44m Man. 01-2002	6,0	101,0	b	8,0	103,9	b	No
22	477.891	6.164.564	20,0	570715000000063626: 900 kW ...	Yes	NEG MICON	NM52/900-900/200	900	52,0	44,0	USER	Level 0 - measurement - 2000/12	6,0	98,7	8,0	100,3	No		
23	477.890	6.164.800	20,0	570715000000063633: 900 kW ...	Yes	NEG MICON	NM52/900-900/200	900	52,0	44,0	USER	Level 0 - measurement - 2000/12	6,0	98,7	8,0	100,3	No		
24	477.448	6.162.686	20,0	570715000000063657: 900 kW ...	Yes	NEG MICON	NM52/900-900/200	900	52,0	44,0	USER	Level 0 - measurement - 2000/12	6,0	98,7	8,0	100,3	No		
25	477.449	6.162.911	20,0	570715000000063664: 900 kW ...	Yes	NEG MICON	NM52/900-900/200	900	52,0	44,0	USER	Level 0 - measurement - 2000/12	6,0	98,7	8,0	100,3	No		
26	477.450	6.163.135	20,0	570715000000063671: 900 kW ...	Yes	NEG MICON	NM52/900-900/200	900	52,0	44,0	USER	Level 0 - measurement - 2000/12	6,0	98,7	8,0	100,3	No		
27	477.674	6.162.686	20,0	570715000000063688: 900 kW ...	Yes	NEG MICON	NM52/900-900/200	900	52,0	44,0	USER	Level 0 - measurement - 2000/12	6,0	98,7	8,0	100,3	No		
28	477.676	6.162.910	20,0	570715000000063695: 900 kW ...	Yes	NEG MICON	NM52/900-900/200	900	52,0	44,0	USER	Level 0 - measurement - 2000/12	6,0	98,7	8,0	100,3	No		
29	477.677	6.163.134	20,0	570715000000063701: 900 kW ...	Yes	NEG MICON	NM52/900-900/200	900	52,0	44,0	USER	Level 0 - measurement - 2000/12	6,0	98,7	8,0	100,3	No		
30	473.893	6.161.939	20,3	570715000000034619: 600 kW ...	No	VESTAS	V44-600	600	44,0	45,0	USER	Level 0 - measurement - 1995-08	6,0	99,1	f	8,0	99,5	f	No
31	482.375	6.161.352	30,0	570715000000034572: 11 kW ...	Yes	GAIA WIND	GAIA 11 KW-11	11	13,0	18,0	EMD	8m/s Man. 24-01-96	6,0	93,2	b	8,0	95,1	b	No

f) From other hub height

b) Data from Danish Environmental Agency

### Calculation Results

#### Sound Level

Noise sensitive area	Name	UTM (north)-ETRS89 Zone: 32			Imission height	Wind speed	Noise	From WTGs	Distance to noise demand	Demands fulfilled ?
		East	North	Z						
A	Møgelbjergvej 16, Næsbjerg 6800 Varde	476.797	6.162.118	25,7	1,5	6,0	42,0	41,9	8	Yes
A						8,0	44,0	43,7	40	Yes

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**DECIBEL - Main Result****Calculation:** 10x Vestas V117-3.3 MW+ all existing WTGs - værditab

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Noise sensitive area		UTM (north)-ETRS89 Zone: 32				Demands		Sound Level		Demands fulfilled ?	
No.	Name	East	North	Z	Imission height	Wind speed	Noise	From WTGs	Distance to noise demand	Noise	Noise
				[m]	[m]	[m/s]	[dB(A)]	[dB(A)]	[m]		
B	Biltoftvej 32, Næsbjerg 6800 Varde	478.899	6.162.571	20,0	1,5	6,0	42,0	39,9	145	Yes	
B						8,0	44,0	41,7	156	Yes	
C	Egebjergvej 4, Rousthøje, 6818 Årre	476.235	6.160.441	26,6	1,5	6,0	42,0	39,6	313	Yes	
C						8,0	44,0	41,5	331	Yes	
D	Egebjergvej 6, Rousthøje, 6818 Årre	476.026	6.160.486	28,4	1,5	6,0	42,0	40,0	236	Yes	
D						8,0	44,0	41,9	252	Yes	
E	Egebjergvej 16, Rousthøje, 6818 Årre	475.294	6.160.576	29,1	1,5	6,0	42,0	40,6	140	Yes	
E						8,0	44,0	42,4	159	Yes	
F	Vardevej 36, Rousthøje, 6818 Årre	474.060	6.160.747	24,7	1,5	6,0	42,0	38,0	354	Yes	
F						8,0	44,0	39,3	402	Yes	
G	Vardevej 40, Rousthøje, 6818 Årre	474.207	6.160.927	25,0	1,5	6,0	42,0	40,4	124	Yes	
G						8,0	44,0	41,8	171	Yes	
H	Vardevej 46, Knoldeflod, 6818 Årre	473.714	6.161.705	20,5	1,5	6,0	42,0	41,8	12	Yes	
H						8,0	44,0	42,5	67	Yes	
I	Ulvemosevej 6, Knoldeflod, 6818 Årre	473.793	6.162.138	21,2	1,5	6,0	42,0	42,9	-27	No	
I						8,0	44,0	43,4	19	Yes	
J	Ulvemosevej 8, Knoldeflod, 6818 Årre	474.053	6.162.228	20,2	1,5	6,0	42,0	40,9	54	Yes	
J						8,0	44,0	41,7	110	Yes	
K	Ulvemosevej 9, Næsbjerg, 6800 Varde	474.510	6.162.379	21,0	1,5	6,0	42,0	38,6	329	Yes	
K						8,0	44,0	39,8	391	Yes	
L	Ulvemosevej 16, Næsbjerg, 6800 Varde	476.389	6.162.288	23,9	1,5	6,0	42,0	40,0	286	Yes	
L						8,0	44,0	41,7	312	Yes	
M	Kastanievej 2, Årre 6800 Varde	479.830	6.161.634	21,4	1,5	6,0	42,0	31,9	1.192	Yes	
M						8,0	44,0	33,5	1.203	Yes	
N	Vardevej 34, Rousthøje, 6818 Årre	473.865	6.160.859	23,8	1,5	6,0	42,0	37,6	374	Yes	
N						8,0	44,0	38,8	429	Yes	

**Distances (m)**

WTG	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	2539	4689	2215	2013	1381	850	639	625	786	723	844	2194	5509	833
2	2153	4296	1765	1568	993	968	738	1088	1210	1079	997	1847	5073	1055
3	1739	3858	1337	1157	764	1322	1115	1572	1656	1486	1273	1489	4596	1459
4	1348	3426	1026	894	854	1746	1553	2031	2083	1888	1598	1181	4133	1901
5	976	2973	918	887	1185	2211	2024	2495	2516	2303	1962	952	3655	2373
6	674	2499	1103	1161	1627	2696	2511	2957	2948	2719	2340	873	3174	2860
7	587	2016	1478	1579	2105	3182	2994	3405	3364	3124	2715	985	2712	3342
8	783	1545	1916	2033	2576	3644	3452	3822	3751	3500	3069	1225	2307	3800
9	1140	1080	2364	2490	3042	4100	3904	4239	4143	3886	3439	1561	1946	4251
10	1542	616	2834	2963	3513	4556	4356	4652	4532	4269	3810	1932	1676	4702
11	2869	3846	1388	1543	2122	3256	3216	4063	4279	4155	3967	3086	3733	3481
12	3085	4084	1539	1674	2197	3281	3258	4126	4363	4252	4088	3288	3948	3506
13	3023	3821	1655	1824	2428	3571	3529	4370	4578	4448	4247	3274	3602	3796
14	3230	4061	1784	1937	2494	3594	3567	4429	4657	4539	4360	3464	3824	3819
15	3181	3821	1906	2082	2702	3851	3807	4644	4847	4712	4500	3456	3505	4075
16	3377	4061	2018	2181	2761	3871	3842	4699	4920	4797	4606	3637	3734	4096
17	2632	3987	916	1001	1467	2568	2535	3396	3633	3525	3377	2759	4091	2793
18	2586	4065	824	860	1240	2321	2290	3158	3404	3305	3174	2675	4240	2546
19	2860	4224	1121	1179	1549	2573	2561	3446	3707	3615	3495	2973	4303	2798
20	2821	4300	1054	1067	1340	2328	2321	3212	3484	3401	3300	2897	4447	2552
21	2465	2028	4224	4270	4562	5242	5012	4930	4644	4372	3900	2532	3322	5312
22	2679	2233	4443	4484	4759	5407	5176	5061	4762	4492	4025	2726	3514	5471
23	2896	2447	4662	4699	4957	5576	5344	5197	4885	4619	4157	2926	3713	5633

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**DECIBEL - Main Result****Calculation:** 10x Vestas V117-3.3 MW+ all existing WTGs - værditab

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WTG	A	B	C	D	E	F	G	H	I	J	K	L	M	N
24	863	1456	2551	2619	3015	3903	3687	3860	3695	3425	2954	1131	2604	4022
25	1026	1490	2752	2811	3177	4020	3800	3924	3736	3464	2986	1229	2702	4130
26	1208	1555	2955	3007	3346	4146	3923	4000	3790	3516	3035	1357	2814	4246
27	1044	1231	2666	2749	3180	4101	3887	4079	3919	3649	3178	1345	2399	4224
28	1183	1269	2858	2932	3334	4213	3995	4141	3959	3686	3210	1429	2504	4328
29	1344	1346	3054	3120	3495	4333	4112	4212	4009	3735	3255	1540	2624	4439
30	2910	5046	2780	2581	1955	1203	1059	294	223	331	758	2521	5945	1080
31	5630	3683	6207	6408	7123	8337	8179	8668	8618	8368	7931	6058	2560	8524

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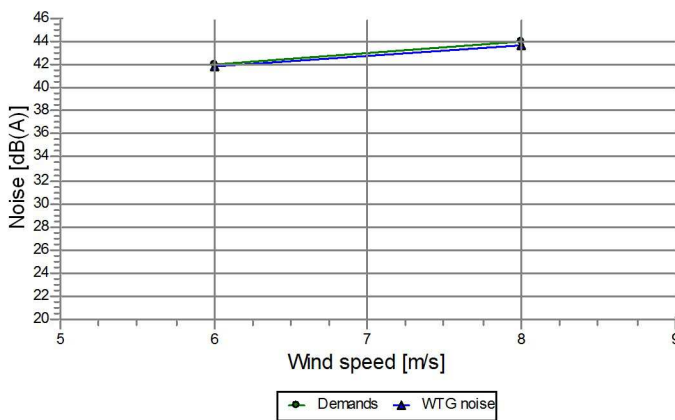
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**DECIBEL - Detailed results**

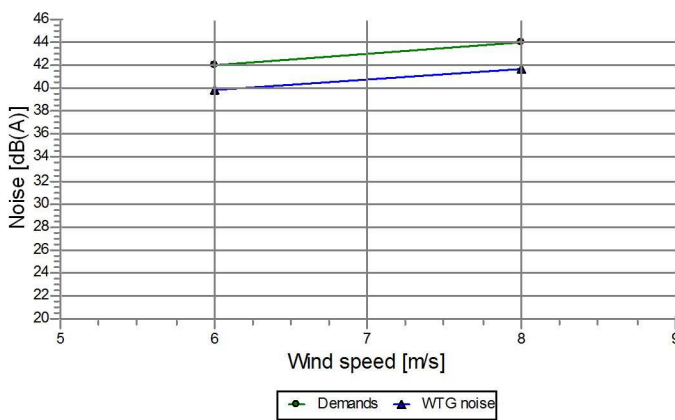
**Calculation: 10x Vestas V117-3.3 MW+ all existing WTGs - værditab Noise calculation model: Danish 2011**

**Møgelbjergvej 16, Næsbjerg 6800 Varde (A)**



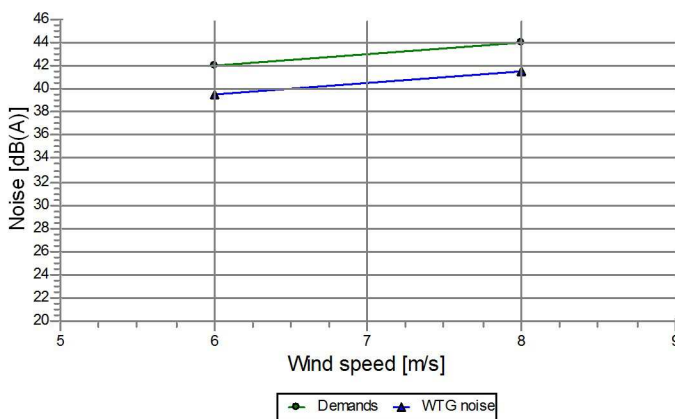
Wind speed [m/s]	Sound Level		Demands fulfilled ?
	Demands [dB(A)]	WTG noise [dB(A)]	
6,0	42,0	41,9	Yes
8,0	44,0	43,7	Yes

**Biltoftvej 32, Næsbjerg 6800 Varde (B)**



Wind speed [m/s]	Sound Level		Demands fulfilled ?
	Demands [dB(A)]	WTG noise [dB(A)]	
6,0	42,0	39,9	Yes
8,0	44,0	41,7	Yes

**Egebjergvej 4, Rousthøje, 6818 Årre (C)**



Wind speed [m/s]	Sound Level		Demands fulfilled ?
	Demands [dB(A)]	WTG noise [dB(A)]	
6,0	42,0	39,6	Yes
8,0	44,0	41,5	Yes

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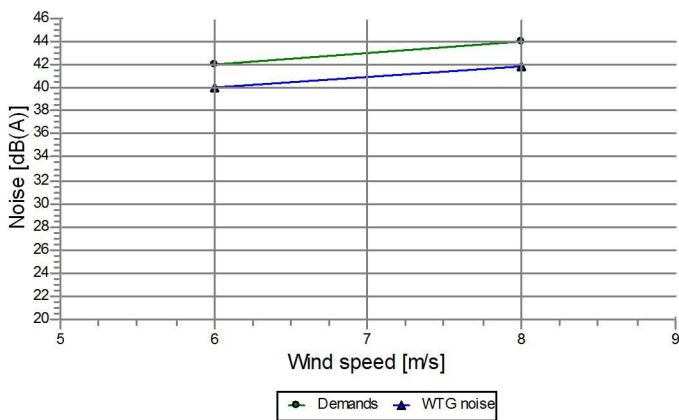


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**DECIBEL - Detailed results**

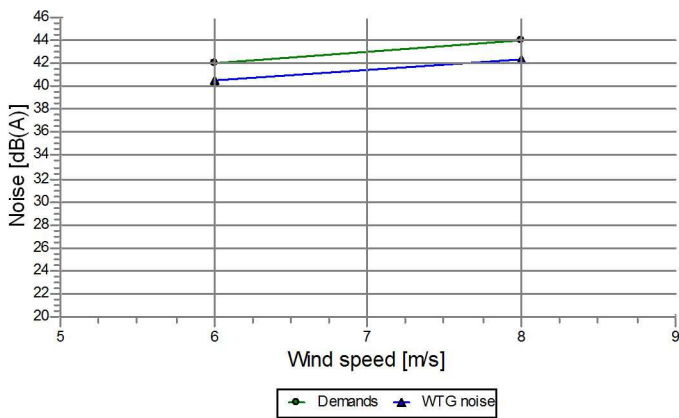
**Calculation: 10x Vestas V117-3.3 MW+ all existing WTGs - værditab Noise calculation model: Danish 2011**

**Egebjergvej 6, Rousthøje, 6818 Årre (D)**



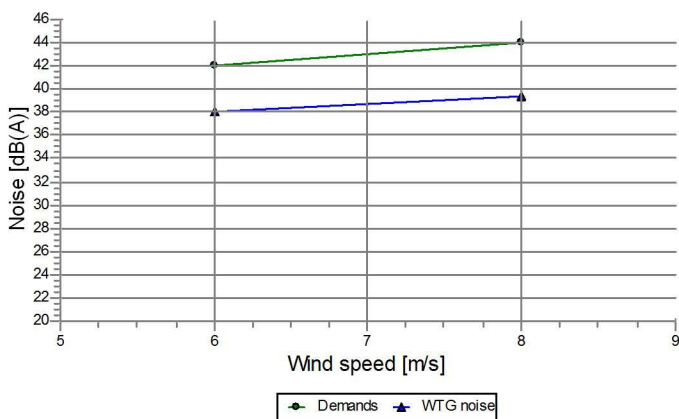
Wind speed [m/s]	Sound Level		Demands fulfilled ?
	Demands [dB(A)]	WTG noise [dB(A)]	
6,0	42,0	40,0	Yes
8,0	44,0	41,9	Yes

**Egebjergvej 16, Rousthøje, 6818 Årre (E)**



Wind speed [m/s]	Sound Level		Demands fulfilled ?
	Demands [dB(A)]	WTG noise [dB(A)]	
6,0	42,0	40,6	Yes
8,0	44,0	42,4	Yes

**Vardevej 36, Rousthøje, 6818 Årre (F)**



Wind speed [m/s]	Sound Level		Demands fulfilled ?
	Demands [dB(A)]	WTG noise [dB(A)]	
6,0	42,0	38,0	Yes
8,0	44,0	39,3	Yes

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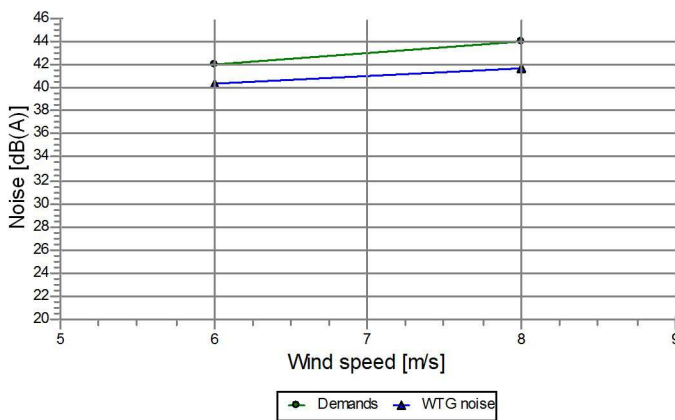


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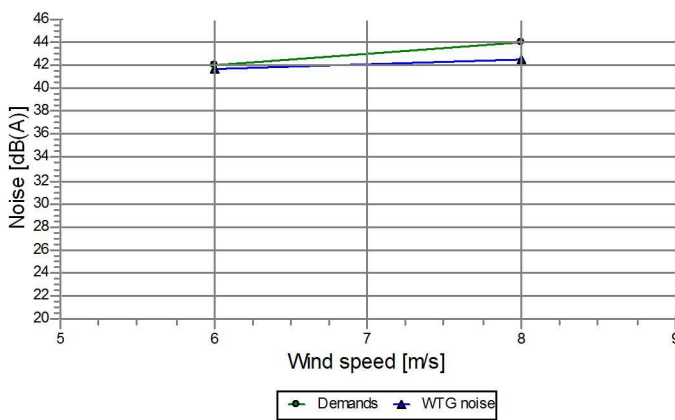
**Calculation: 10x Vestas V117-3.3 MW+ all existing WTGs - værditab Noise calculation model: Danish 2011**

**Vardevej 40, Rousthøje, 6818 Årre (G)**



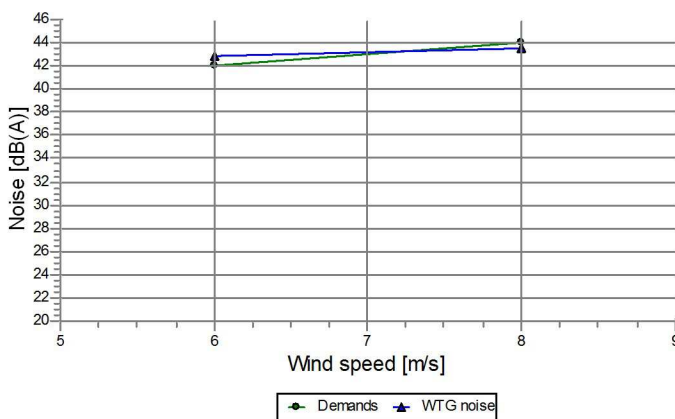
Wind speed [m/s]	Sound Level		Demands fulfilled ?
	Demands [dB(A)]	WTG noise [dB(A)]	
6,0	42,0	40,4	Yes
8,0	44,0	41,8	Yes

**Vardevej 46, Knoldeflod, 6818 Årre (H)**



Wind speed [m/s]	Sound Level		Demands fulfilled ?
	Demands [dB(A)]	WTG noise [dB(A)]	
6,0	42,0	41,8	Yes
8,0	44,0	42,5	Yes

**Ulvemosevej 6, Knoldeflod, 6818 Årre (I)**



Wind speed [m/s]	Sound Level		Demands fulfilled ?
	Demands [dB(A)]	WTG noise [dB(A)]	
6,0	42,0	<b>42,9</b>	<b>No</b>
8,0	44,0	43,4	Yes

Project:  
**Ulvemosen**

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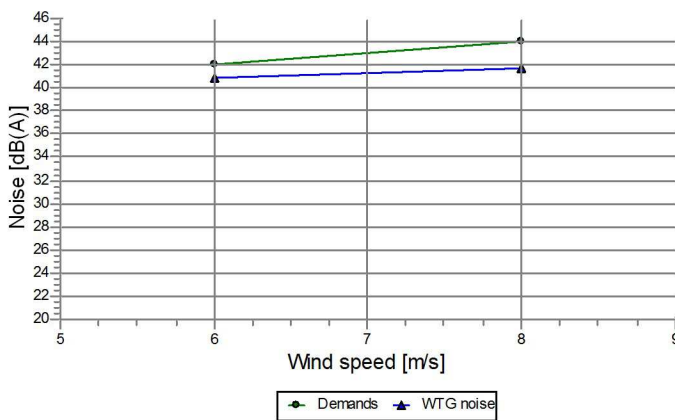
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**DECIBEL - Detailed results**

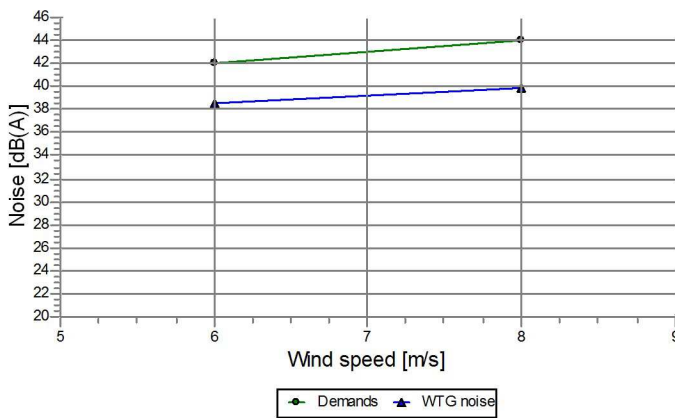
**Calculation: 10x Vestas V117-3.3 MW+ all existing WTGs - værditab Noise calculation model: Danish 2011**

**Ulvemosevej 8, Knoldeflod, 6818 Årre (J)**



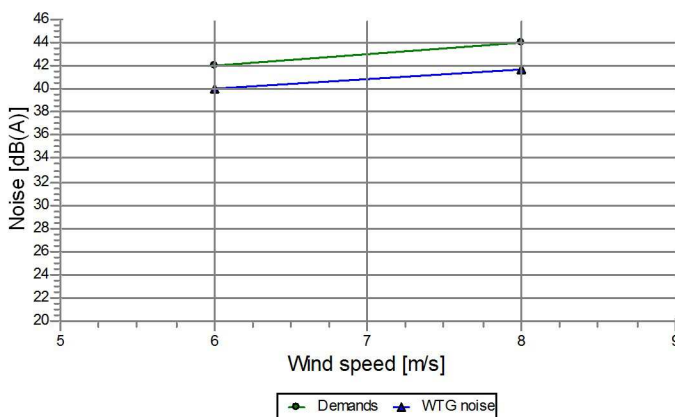
Wind speed [m/s]	Sound Level		Demands fulfilled ?
	Demands [dB(A)]	WTG noise [dB(A)]	
6,0	42,0	40,9	Yes
8,0	44,0	41,7	Yes

**Ulvemosevej 9, Næsbjerg, 6800 Varde (K)**



Wind speed [m/s]	Sound Level		Demands fulfilled ?
	Demands [dB(A)]	WTG noise [dB(A)]	
6,0	42,0	38,6	Yes
8,0	44,0	39,8	Yes

**Ulvemosevej 16, Næsbjerg, 6800 Varde (L)**



Wind speed [m/s]	Sound Level		Demands fulfilled ?
	Demands [dB(A)]	WTG noise [dB(A)]	
6,0	42,0	40,0	Yes
8,0	44,0	41,7	Yes



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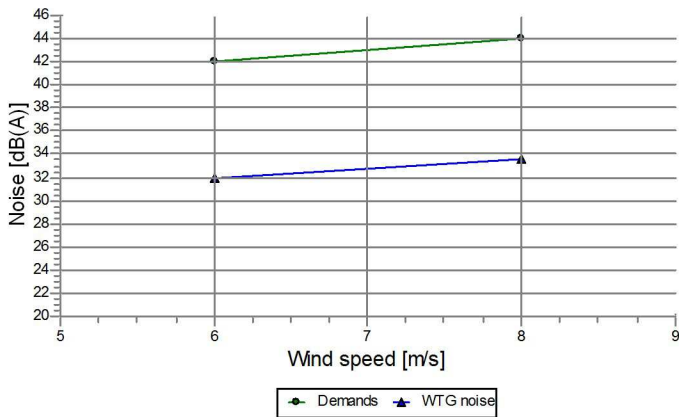
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**DECIBEL - Detailed results**

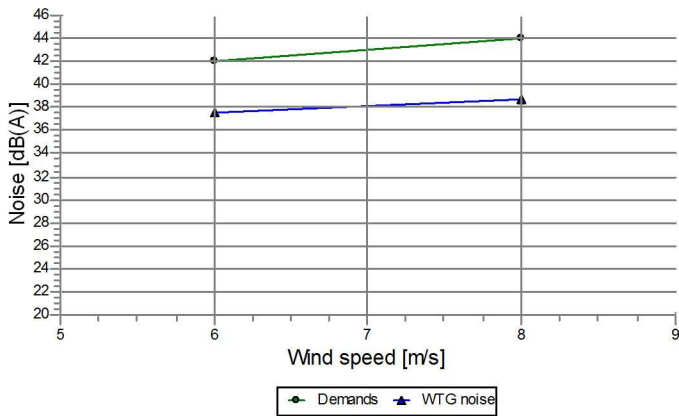
**Calculation:** 10x Vestas V117-3.3 MW+ all existing WTGs - værditab **Noise calculation model:** Danish 2011

**Kastanievej 2, Årre 6800 Varde (M)**



Sound Level				
Wind speed	Demands	WTG noise	Demands fulfilled ?	
[m/s]	[dB(A)]	[dB(A)]		
6,0	42,0	31,9	Yes	
8,0	44,0	33,5	Yes	

**Vardevej 34, Rousthøje, 6818 Årre (N)**



Sound Level				
Wind speed	Demands	WTG noise	Demands fulfilled ?	
[m/s]	[dB(A)]	[dB(A)]		
6,0	42,0	37,6	Yes	
8,0	44,0	38,8	Yes	



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**DECIBEL - Assumptions for noise calculation**

**Calculation:** 10x Vestas V117-3.3 MW+ all existing WTGs - værditab **Noise calculation model:** Danish 2011

**Noise calculation model:**

Danish 2011

**Wind speed:**

6,0 m/s - 8,0 m/s, step 2,0 m/s

**Terrain reduction:**

-1.5 dB(A) Onshore

**Meteorological coefficient, C0:**

0,0 dB

**Type of demand in calculation:**

1: WTG noise is compared to demand (DK, DE, SE, NL etc.)

**Noise values in calculation:**

All noise values are mean values (Lwa) (Normal)

**Pure tones:**

Pure tone penalty are added to demand: 5,0 dB(A)

**Height above ground level, when no value in NSA object:**

1,5 m Don't allow override of model height with height from NSA object

**Deviation from "official" noise demands. Negative is more restrictive, positive is less restrictive.:**

0,0 dB(A)

**Octave data required**

Air absorption

	63	125	250	500	1.000	2.000	4.000	8.000
[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]	[dB/km]
	0,1	0,4	1,0	2,0	3,6	8,8	29,0	104,5

**WTG:** VESTAS V117-3.3 MW 3300 117.0 !O!

**Noise:** Mode 2 - 104,5 dB - 2013-12-04

Source	Source/Date	Creator	Edited
0041-9012	27-11-2013	USER	18-12-2013 13:32

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data							
					63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	91,5	6,0	103,8	No	84,3	91,7	96,3	97,9	98,8	95,1	89,6	75,1
From Windcat	91,5	8,0	104,5	No	83,7	91,1	95,4	98,4	100,4	96,8	89,7	73,3

**WTG:** VESTAS V117-3.3 MW 3300 117.0 !O!

**Noise:** Mode 0 - 107 dB - 2013-12-04

Source	Source/Date	Creator	Edited
0041-9012	29-11-2013	USER	19-12-2013 14:46

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data							
					63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	91,5	6,0	105,1	No	84,5	92,2	96,7	99,1	100,5	96,8	90,4	74,4
From Windcat	91,5	8,0	107,0	No	85,6	93,4	97,8	101,0	102,9	99,1	91,8	74,7

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**DECIBEL - Assumptions for noise calculation****Calculation:** 10x Vestas V117-3.3 MW+ all existing WTGs - værditab **Noise calculation model:** Danish 2011**WTG:** VESTAS V117-3.3 MW 3300 117.0 !O!**Noise:** Mode 0 - 107 dB - 2013-12-04

Source	Source/Date	Creator	Edited
0041-9012	29-11-2013	USER	19-12-2013 14:46

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data							
					63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	91,5	6,0	105,1	No	84,5	92,2	96,7	99,1	100,5	96,8	90,4	74,4
From Windcat	91,5	8,0	107,0	No	85,6	93,4	97,8	101,0	102,9	99,1	91,8	74,7

**WTG:** VESTAS V117-3.3 MW 3300 117.0 !O!**Noise:** Mode 5 - 104 dB - 2013-12-04

Source	Source/Date	Creator	Edited
0041-9012	27-11-2013	USER	18-12-2013 13:32

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data							
					63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	91,5	6,0	102,0	No	83,3	90,2	94,7	95,9	96,9	93,5	88,3	74,5
From Windcat	91,5	8,0	104,0	No	83,5	90,9	95,2	97,9	99,7	96,1	89,3	73,4

**WTG:** VESTAS V47 660-200 47.0 !O!**Noise:** Level 0 - measurement - - 1997-06

Source	Source/Date	Creator	Edited
Acoustica	06-08-1997	EMD	01-05-2012 10:58
Case no. 35.4149.01			
Vestas item 943151.R0			

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data							
					63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	45,0	6,0	99,1	No	75,8	83,4	89,9	95,2	94,0	89,0	83,0	68,0
From Windcat	45,0	8,0	99,8	No	76,5	84,1	90,6	95,9	94,7	89,7	83,7	68,7

**WTG:** NEG MICON NM48/750 750-200 48.2 !O!**Noise:** Måling, Ribe Amt, Roust-Høje, mølle 3

Source	Source/Date	Creator	Edited
Møllestøjmålinger for Ribe Amt, 15.12.2000 af FGR	11-10-2013	USER	11-10-2013 14:03

Status	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data							
				63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	6,0	96,6	No	74,5	83,2	89,3	92,3	89,0	87,8	85,4	77,0
From Windcat	8,0	99,4	No	77,3	86,0	92,1	95,1	91,8	90,6	88,2	79,8

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## DECIBEL - Assumptions for noise calculation

**Calculation:** 10x Vestas V117-3.3 MW+ all existing WTGs - værditab **Noise calculation model:** Danish 2011

**WTG:** NEG MICON NM48/750 750-200 48.2 !O!

**Noise:** Måling, Ribe Amt, Roust-Høje, mølle 1

Source	Source/Date	Creator	Edited
Møllestøjmålinger for Ribe Amt, 15.12.2000 af FGR	11-10-2013	USER	11-10-2013 14:03

### Octave data

Status	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	6,0	96,6	No	74,5	83,2	89,3	92,3	89,0	87,8	85,4	77,0
From Windcat	8,0	99,0	No	76,9	85,6	91,7	94,7	91,4	90,2	87,8	79,4

**WTG:** NEG MICON NM48/750 750-200 48.2 !O!

**Noise:** Måling, Ribe Amt, Roust-Høje, mølle 4

Source	Source/Date	Creator	Edited
Møllestøjmålinger for Ribe Amt, 15.12.2000 af FGR	11-10-2013	USER	11-10-2013 13:51

### Octave data

Status	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	6,0	96,6	No	74,5	83,2	89,3	92,3	89,0	87,8	85,4	77,0
From Windcat	8,0	99,8	No	77,7	86,4	92,5	95,5	92,2	91,0	88,6	80,2

**WTG:** NEG MICON NM48/750 750-200 48.2 !O!

**Noise:** Måling, Ribe Amt, Roust-Høje, mølle 2

Source	Source/Date	Creator	Edited
Møllestøjmålinger for Ribe Amt, 15.12.2000 af FGR	11-10-2013	USER	11-10-2013 13:50

### Octave data

Status	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	6,0	96,6	No	74,5	83,2	89,3	92,3	89,0	87,8	85,4	77,0
From Windcat	8,0	101,5	No	79,4	88,1	94,2	97,2	93,9	92,7	90,3	81,9

**WTG:** NEG MICON NM52/900 900-200 52.0 !O!

**Noise:** 8m/s 44m Man. 01-2002

Source	Source/Date	Creator	Edited
Manufacturer	18-01-2002	EMD	11-10-2002 16:55

Official noise level for calculation purpose. Based on TIC 027-007, dated 18-01-2002

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data								
					63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]	
Data from Danish Environmental Agency	44,0	6,0	101,0	No	Generic data	79,4	88,3	92,4	95,1	95,2	93,1	91,1	81,7
Data from Danish Environmental Agency	44,0	8,0	103,9	No	Generic data	83,6	91,1	96,1	97,9	97,2	96,7	93,9	84,2

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## DECIBEL - Assumptions for noise calculation

**Calculation:** 10x Vestas V117-3.3 MW+ all existing WTGs - værditab **Noise calculation model:** Danish 2011

**WTG:** NEG MICON NM52/900 900-200 52.0 !O!

**Noise:** Level 0 - measurement - - 2000/12

Source Source/Date Creator Edited  
Acoustica 05-12-2000 USER 31-07-2012 16:13

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data							
					63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From Windcat	44,0	6,0	98,7	No	86,1	92,3	91,5	89,4	91,1	91,2	86,6	69,8
From Windcat	44,0	8,0	100,3	No	87,7	93,9	93,1	91,0	92,7	92,8	88,2	71,4

**WTG:** VESTAS V44 600 44.0 !O!

**Noise:** Level 0 - measurement - - 1995-08

Source Source/Date Creator Edited  
Acoustica 28-08-1995 USER 14-03-2012 15:16  
Acoustica report nr. P4.029.95  
Vestas Item 941614.R3

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data							
					63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]
From other hub height	45,0	6,0	99,1	No	76,2	84,8	89,9	93,9	94,3	91,3	85,0	70,9
From other hub height	45,0	8,0	99,5	No	76,6	85,2	90,3	94,3	94,7	91,7	85,4	71,3

**WTG:** GAIA WIND GAIA 11 KW 11 13.0 !O!

**Noise:** 8m/s Man. 24-01-96

Source Source/Date Creator Edited  
Manufacturer 24-01-1996 EMD 13-06-2001 17:28  
Informed by manufacturer

Status	Hub height [m]	Wind speed [m/s]	LwA,ref [dB(A)]	Pure tones	Octave data								
					63 [dB]	125 [dB]	250 [dB]	500 [dB]	1000 [dB]	2000 [dB]	4000 [dB]	8000 [dB]	
Data from Danish Environmental Agency	18,0	6,0	93,2	No	Generic data	69,7	73,9	86,3	87,9	87,1	85,9	80,1	71,3
Data from Danish Environmental Agency	18,0	8,0	95,1	No	Generic data	70,4	75,3	87,2	89,5	90,3	87,5	81,5	73,4

**NSA:** Møgelbjergvej 16, Næsbjerg 6800 Varde-A

**Predefined calculation standard:** Open land

**Imission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

6,0 [m/s] 8,0 [m/s]  
42,0 dB(A) 44,0 dB(A)

### Distance demand:

**NSA:** Biltøftvej 32, Næsbjerg 6800 Varde-B

**Predefined calculation standard:** Open land

**Imission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

6,0 [m/s] 8,0 [m/s]  
42,0 dB(A) 44,0 dB(A)

### Distance demand:

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## DECIBEL - Assumptions for noise calculation

**Calculation:** 10x Vestas V117-3.3 MW+ all existing WTGs - værditab **Noise calculation model:** Danish 2011

**NSA:** Egebjergvej 4, Rousthøje, 6818 Årre-C

**Predefined calculation standard:** Open land

**Imission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

6,0 [m/s] 8,0 [m/s]  
42,0 dB(A) 44,0 dB(A)

### Distance demand:

**NSA:** Egebjergvej 6, Rousthøje, 6818 Årre-D

**Predefined calculation standard:** Open land

**Imission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

6,0 [m/s] 8,0 [m/s]  
42,0 dB(A) 44,0 dB(A)

### Distance demand:

**NSA:** Egebjergvej 16, Rousthøje, 6818 Årre-E

**Predefined calculation standard:** Open land

**Imission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

6,0 [m/s] 8,0 [m/s]  
42,0 dB(A) 44,0 dB(A)

### Distance demand:

**NSA:** Vardevej 36, Rousthøje, 6818 Årre-F

**Predefined calculation standard:** Open land

**Imission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

6,0 [m/s] 8,0 [m/s]  
42,0 dB(A) 44,0 dB(A)

### Distance demand:

**NSA:** Vardevej 40, Rousthøje, 6818 Årre-G

**Predefined calculation standard:** Open land

**Imission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

6,0 [m/s] 8,0 [m/s]  
42,0 dB(A) 44,0 dB(A)

### Distance demand:

**NSA:** Vardevej 46, Knoldeflod, 6818 Årre-H

**Predefined calculation standard:** Open land

**Imission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

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## DECIBEL - Assumptions for noise calculation

**Calculation:** 10x Vestas V117-3.3 MW+ all existing WTGs - værditab **Noise calculation model:** Danish 2011

### Distance demand:

**NSA:** Ulvemosevej 6, Knoldeflod, 6818 Årre-I

**Predefined calculation standard:** Open land

**Imission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

6,0 [m/s]    8,0 [m/s]  
42,0 dB(A)   44,0 dB(A)

### Distance demand:

**NSA:** Ulvemosevej 8, Knoldeflod, 6818 Årre-J

**Predefined calculation standard:** Open land

**Imission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

6,0 [m/s]    8,0 [m/s]  
42,0 dB(A)   44,0 dB(A)

### Distance demand:

**NSA:** Ulvemosevej 9, Næsbjerg, 6800 Varde-K

**Predefined calculation standard:** Open land

**Imission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

6,0 [m/s]    8,0 [m/s]  
42,0 dB(A)   44,0 dB(A)

### Distance demand:

**NSA:** Ulvemosevej 16, Næsbjerg, 6800 Varde-L

**Predefined calculation standard:** Open land

**Imission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

6,0 [m/s]    8,0 [m/s]  
42,0 dB(A)   44,0 dB(A)

### Distance demand:

**NSA:** Kastanievej 2, Årre 6800 Varde-M

**Predefined calculation standard:** Open land

**Imission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

6,0 [m/s]    8,0 [m/s]  
42,0 dB(A)   44,0 dB(A)

### Distance demand:

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## DECIBEL - Assumptions for noise calculation

**Calculation:** 10x Vestas V117-3.3 MW+ all existing WTGs - værditab **Noise calculation model:** Danish 2011

**NSA:** Vardevej 34, Rousthøje, 6818 Årre-N

**Predefined calculation standard:** Open land

**mission height(a.g.l.):** Use standard value from calculation model

### Noise demand:

6,0 [m/s]    8,0 [m/s]

42,0 dB(A)    44,0 dB(A)

### Distance demand:



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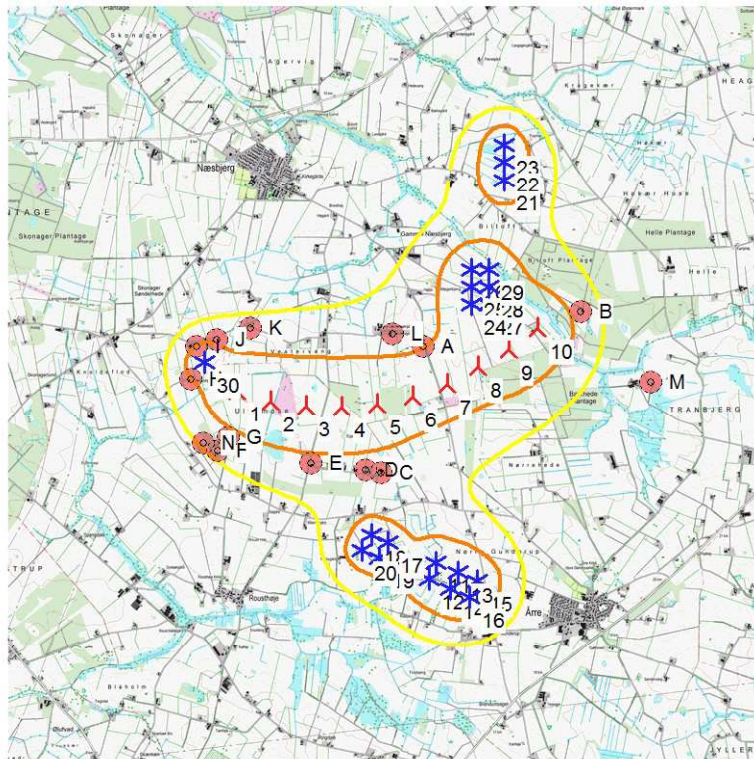
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+45 88 70 82 10  
Bjarke Fuglsang Nielsen / BFN@EuropeanEnergy.dk  
Calculated:  
24-01-2014 18:52/2.9.269



**DECIBEL - Map 6,0 m/s**

**Calculation:** 10x Vestas V117-3.3 MW+ all existing WTGs - værditab **Noise calculation model:** Danish 2011

Noise [dB(A)]	
	37
	42



Map: WindPRO map, Print scale 1:100.000, Map center UTM (north)-ETRS89 Zone: 32 East: 478.134 North: 6.161.798

New WTG

Existing WTG

Noise sensitive area

Noise calculation model: Danish 2011. Wind speed: 6,0 m/s  
Height above sea level from active line object

Project:  
**Ulvemosen**

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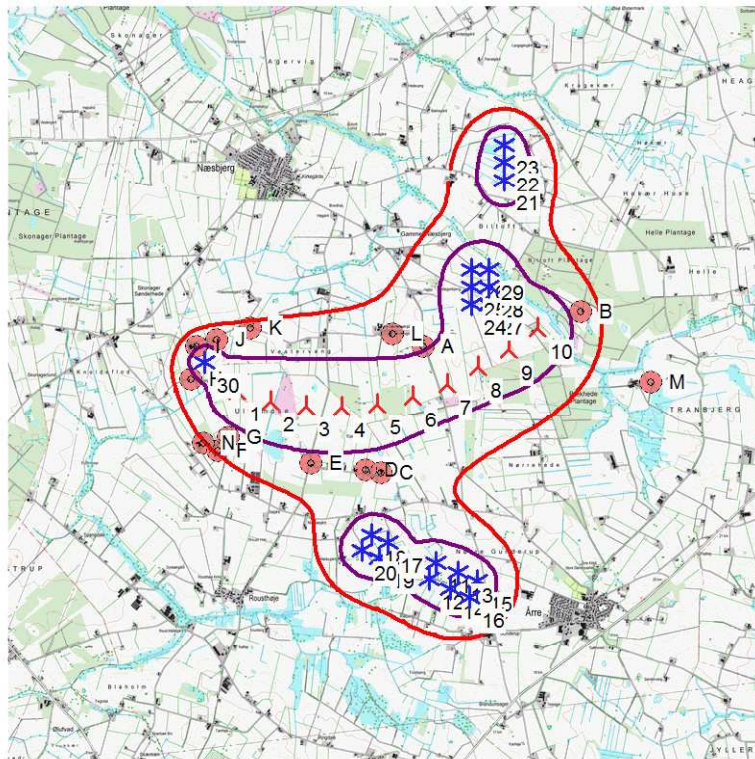
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Calculated:  
24-01-2014 18:52/2.9.269



**DECIBEL - Map 8,0 m/s**

**Calculation:** 10x Vestas V117-3.3 MW+ all existing WTGs - værditab **Noise calculation model:** Danish 2011

Noise [dB(A)]	
	39
	44



Map: WindPRO map, Print scale 1:100.000, Map center UTM (north)-ETRS89 Zone: 32 East: 478.134 North: 6.161.798

New WTG

Existing WTG

Noise sensitive area

Noise calculation model: Danish 2011. Wind speed: 8,0 m/s  
Height above sea level from active line object