Project:

Borkowo-Falenta

elektrownie wiatrowe o łącznej mocy znamionowej do 1,6 MW, wysokości wieży min. 73 m, średnicy śmigła do ok. 53 m;
- poziom mocy akustycznej pojedynczej turbiny wiatrowej wynosić będzie 102,5 dB (turbina 1, turbina 2)

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Enerko Przedsiebiorstwo Rozwoju Energii Odnawialnej Michal Kubecki
ul. Armii Krajowej 47a
PL-26060 Checiny
+48 41 301 00 23
ENERKO / biuro@enerko.pl
Calculated:
2014-04-28 12:41/2.8.552

DECIBEL - Main Result

Calculation: 2xe53 102,5dB

Noise calculation model:
ISO 9613-2 General
Wind speed:
8,0 m/s
Ground attenuation:
General, Ground factor: 0,9
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 and Impulse tone penalty are added to WTG source noise
Height above ground level, when no value in NSA object:
4,0 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)

Scale 1:40 000

New WTG Noise sensitive area

WTGs

	Geo [deg,min,sec]-WGS84				WTG type							Noise data					
	Longitude	Latitude	Z	Row data/Description	Valid	Manufact.	Type-generator	Power, rated	Rotor diameter	Hub height	Creator	Name	Wind speed	Status	LwA,ref	Pure tones	
			[m]					[kW]	[m]	[m]			[m/s]		[dB(A)]		
1	20°45'45,83" East	53°05'40,75" North	160,0	ENERCON E-53 800 53.0 !-! hub: 73...	Yes	ENERCON	E-53-800	800	53,0	73,0	EMD	Level 0 - man.spec. - Enercon - 05/2010	8,0	User value	102,5	0 dB	h
2	20°45'46,47" East	53°05'17,91" North	152,7	ENERCON E-53 800 53.0 !-! hub: 73...	Yes	ENERCON	E-53-800	800	53,0	73,0	EMD	Level 1 - man.spec. - 750kW/Rev.1.0 - 09/2010	8,0	User value	102,5	0 dB	h

h) Generic octave distribution used

Calculation Results

Sound Level

Noise sensitive area		Geo [deg,min,sec]-WGS84				Demands	Sound Level	Demands fulfilled ?
No.	Name	Longitude	Latitude	Z	Imission height	Noise	From WTGs	Noise
				[m]	[m]	[dB(A)]	[dB(A)]	
A	Noise sensitive point: (1)	20°45'26,79" East	53°05'52,60" North	160,0	4,0	45,0	36,0	Yes
B	Noise sensitive point: (2)	20°45'25,01" East	53°05'47,80" North	160,0	4,0	45,0	37,3	Yes
C	Noise sensitive point: (3)	20°45'41,13" East	53°05'06,59" North	150,0	4,0	45,0	39,0	Yes
D	Noise sensitive point: (4)	20°45'46,17" East	53°05'06,67" North	150,0	4,0	45,0	39,4	Yes
E	Noise sensitive point: (5)	20°46'30,10" East	53°05'09,53" North	150,0	4,0	45,0	31,4	Yes

Distances (m)

	WTG	
NSA	1	2
A	509	1133
B	444	1006
C	1059	364
D	1053	347
E	1268	852

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ul. Armii Krajowej 47a
PL-26060 Checiny
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ENERKO / biuro@enerko.pl

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DECIBEL - Detailed results

Calculation: 2xe53 102,5dB**Noise calculation model:** ISO 9613-2 General 8,0 m/s

Assumptions

Calculated L(DW) = LWA,ref + K + Dc - (Adiv + Aatm + Agr + Abar + Amisc) - Cmet
(when calculated with ground attenuation, then Dc = Domega)

LWA,ref:	Sound pressure level at WTG
K:	Pure tone
Dc:	Directivity correction
Adiv:	the attenuation due to geometrical divergence
Aatm:	the attenuation due to atmospheric absorption
Agr:	the attenuation due to ground effect
Abar:	the attenuation due to a barrier
Amisc:	the attenuation due to miscellaneous other effects
Cmet:	Meteorological correction

Calculation Results

Noise sensitive area: A Noise sensitive point: (1)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	509	514	**35,39**	102,5	0,00	65,22	-	-	0,00	0,00	-	0,00
2	1 133	1 134	**26,98**	102,5	0,00	72,09	-	-	0,00	0,00	-	0,00

Sum 35,98

- Data undefined due to calculation with octave data

Noise sensitive area: B Noise sensitive point: (2)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	444	450	**36,74**	102,5	0,00	64,06	-	-	0,00	0,00	-	0,00
2	1 006	1 008	**28,29**	102,5	0,00	71,07	-	-	0,00	0,00	-	0,00

Sum 37,32

- Data undefined due to calculation with octave data

Noise sensitive area: C Noise sensitive point: (3)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1 059	1 062	**27,71**	102,5	0,00	71,53	-	-	0,00	0,00	-	0,00
2	364	371	**38,66**	102,5	0,00	62,38	-	-	0,00	0,00	-	0,00

Sum 38,99

- Data undefined due to calculation with octave data

Noise sensitive area: D Noise sensitive point: (4)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1 053	1 056	**27,78**	102,5	0,00	71,47	-	-	0,00	0,00	-	0,00
2	347	355	**39,09**	102,5	0,00	62,00	-	-	0,00	0,00	-	0,00

Sum 39,40

- Data undefined due to calculation with octave data

Noise sensitive area: E Noise sensitive point: (5)

WTG **Wind speed: 8,0 m/s**

No.	Distance [m]	Sound distance [m]	Calculated [dB(A)]	LwA,ref [dB(A)]	Dc [dB]	Adiv [dB]	Aatm [dB]	Agr [dB]	Abar [dB]	Amisc [dB]	A [dB]	Cmet [dB]
1	1 268	1 271	**25,70**	102,5	0,00	73,08	-	-	0,00	0,00	-	0,00
2	852	855	**30,08**	102,5	0,00	69,64	-	-	0,00	0,00	-	0,00

Sum 31,43

- Data undefined due to calculation with octave data

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Enerko Przedsiebiorstwo Rozwoju Energii Odnawialnej Michal Kubecki
ul. Armii Krajowej 47a
PL-26060 Checiny
+48 41 301 00 23
ENERKO / biuro@enerko.pl

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DECIBEL - Assumptions for noise calculation

Calculation: 2xe53 102,5dB**Noise calculation model:** ISO 9613-2 General 8,0 m/s

Noise calculation model:
ISO 9613-2 General
Wind speed:
8,0 m/s
Ground attenuation:
General, Ground factor: 0,9
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 and Impulse tone penalty are added to WTG source noise
Height above ground level, when no value in NSA object:
4,0 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 [db/km]	125 [db/km]	250 [db/km]	500 [db/km]	1 000 [db/km]	2 000 [db/km]	4 000 [db/km]	8 000 [db/km]
0,1	0,4	1,0	1,9	3,7	9,7	32,8	117,0

WTG: ENERCON E-53 800 53.0 !-!
Noise: Level 0 - man.spec. - Enercon - 05/2010

Source	Source/Date	Creator	Edited
Enercon	2010-05-01	EMD	2012-07-13 16:49

According to specification SIAS-04-SPL E-53 OM I Rev1_0-ger-ger.doc

						Octave data							
Status	Hub height [m]	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]
User value	73,3	8,0	102,5	No	Generic data	84,1	91,1	94,5	97,1	96,9	94,0	89,2	79,7

WTG: ENERCON E-53 800 53.0 !-!
Noise: Level 1 - man.spec. - 750kW/Rev.1.0 - 09/2010

Source	Source/Date	Creator	Edited
Enercon	2010-09-01	EMD	2011-01-13 12:29

According to Enercon specification SIAS-04-SPL E-53 red Rev1_0-ger-ger.doc

						Octave data							
Status	Hub height [m]	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]
User value	73,0	8,0	102,5	No	Generic data	84,1	91,1	94,5	97,1	96,9	94,0	89,2	79,7

NSA: Noise sensitive point: (1)-A
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 45,0 dB(A)
Distance demand:

NSA: Noise sensitive point: (2)-B
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 45,0 dB(A)
Distance demand:

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Enerko Przedsiebiorstwo Rozwoju Energii Odnawialnej Michal Kubecki
ul. Armii Krajowej 47a
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DECIBEL - Assumptions for noise calculation

Calculation: 2xe53 102,5dB**Noise calculation model:** ISO 9613-2 General 8,0 m/s

NSA: Noise sensitive point: (3)-C
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 45,0 dB(A)
Distance demand:

NSA: Noise sensitive point: (4)-D
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 45,0 dB(A)
Distance demand:

NSA: Noise sensitive point: (5)-E
Predefined calculation standard:
Imission height(a.g.l.): Use standard value from calculation model

Noise demand: 45,0 dB(A)
Distance demand:

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Enerko Przedsiebiorstwo Rozwoju Energii Odnawialnej Michal Kubecki
ul. Armii Krajowej 47a
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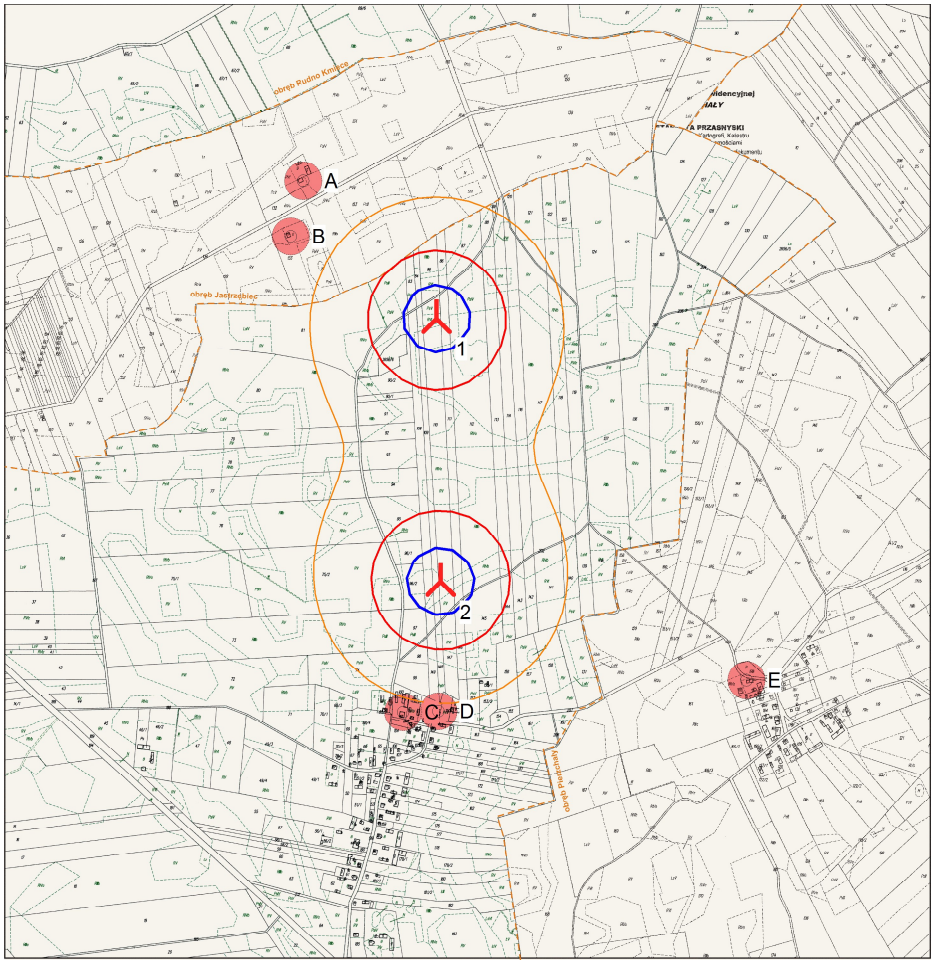
DECIBEL - Map 8,0 m/s

Calculation: 2xe53 102,5dB**Noise calculation model:** ISO 9613-2 General 8,0 m/s

Noise [dB(A)]
40 dB(A)
45 dB(A)
50 dB(A)
55 dB(A)



0 250 500 750 1000m

Map: mapa falenty , Print scale 1:20 000, Map center Geo WGS84 East: 20°45'46,21" East North: 53°05'29,31" North

New WTG
Noise sensitive area

Noise calculation model: ISO 9613-2 General. Wind speed: 8,0 m/s
Height above sea level from active line object