

WindPRO version 2.9.250 Jul 2013

Project: Cronalaght demonstration	Description: The project has been modified to demonstrate the WindPRO functionalities.	Printed/Page: 14-08-2013 15:15 / 1
		Licensed user: EMD International A/S Niels Jernes Vej 10 DK-9220 Aalborg Ø +45 9635 4444 Karina Bredelle Calculated: 14-08-2013 15:14/2.9.250

OPTIMIZE - Optimize result

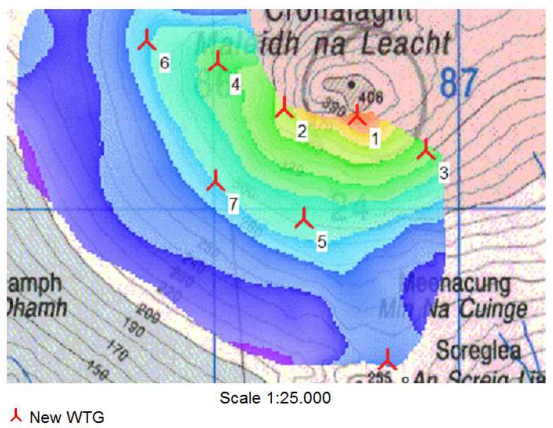
Wake Model N.O. Jensen (RISØ/EMD)

Calculation Settings
Air density calculation mode: Air density from power curve used

Wake Model Parameters
Wake Decay Constant: 0,075 Open farmland

Wake calculation settings
Angle [°] Wind speed [m/s]
start end step start end step
0,5 360,0 1,0 0,5 30,5 1,0

RSF File(s)
C:\... \Documents\WindPRO Data\Samples\Cronalaght_Ireland\Cronalaght demonstration_Res_10_Hub_90,0_0.rsf



WTG area

WTG areas (1)

Area	Max WTGs	Min distance			Angle, clock wise from north [°]
		Major semi axis [m]	Minor semi axis [m]		
WTG area	8	500	300	10,0	
Steepness threshold: 40%					
Steepness threshold: 40%					
Steepness threshold: 40%					
Steepness threshold: 40%					
Steepness threshold: 40%					
Steepness threshold: 40%					
Protected area 1					
Protected area 2					
Sum					

Calculated Annual Energy for Wind Farm

WTG combination	Result PARK [MWh/y]	Result-10,0% [MWh]	GROSS (no loss) Free WTGs [MWh/y]	Park efficiency [%]	Specific results ^{a)}			
					Capacity factor [%]	Mean WTG result [MWh/y]	Full load hours [Hours/year]	Mean wind speed @hub height [m/s]
Wind farm	119.826,9	107.844,2	124.181,6	96,5	61,5	13.480,5	5.392	11,7

^{a)} Based on Result-10,0%

Calculated Annual Energy for each of 8 new WTGs with total 20,0 MW rated power

WTG type	Valid	Manufact.	Type-generator	Power, rated [kW]	Rotor diameter [m]	Hub height [m]	Power curve Creator Name	Annual Energy		Park Efficiency [%]	Mean wind speed [m/s]
								Result [MWh]	Result-10,0% [MWh]		
1	Yes	NORDEX	N100-2.500	2.500	99,8	90,0	EMD Level 0 - Calculated - IEC IIa - 2010-11 15.526,1	13.973	13.973	95,59	12,84
2	Yes	NORDEX	N100-2.500	2.500	99,8	90,0	EMD Level 0 - Calculated - IEC IIa - 2010-11 15.215,0	13.694	13.694	95,48	12,29
3	Yes	NORDEX	N100-2.500	2.500	99,8	90,0	EMD Level 0 - Calculated - IEC IIa - 2010-11 15.196,8	13.677	13.677	96,62	11,88
4	Yes	NORDEX	N100-2.500	2.500	99,8	90,0	EMD Level 0 - Calculated - IEC IIa - 2010-11 15.005,1	13.505	13.505	95,68	11,74
5	Yes	NORDEX	N100-2.500	2.500	99,8	90,0	EMD Level 0 - Calculated - IEC IIa - 2010-11 14.726,2	13.254	13.254	96,26	11,45
6	Yes	NORDEX	N100-2.500	2.500	99,8	90,0	EMD Level 0 - Calculated - IEC IIa - 2010-11 14.891,0	13.402	13.402	97,35	11,26
7	Yes	NORDEX	N100-2.500	2.500	99,8	90,0	EMD Level 0 - Calculated - IEC IIa - 2010-11 14.665,0	13.199	13.199	96,39	11,31
8	Yes	NORDEX	N100-2.500	2.500	99,8	90,0	EMD Level 0 - Calculated - IEC IIa - 2010-11 14.601,7	13.142	13.142	98,77	11,02

WindPRO is developed by EMD International A/S, Niels Jernesvej 10, DK-9220 Aalborg Ø, Tel. +45 96 35 44 44, Fax +45 96 35 44 46, e-mail: windpro@emd.dk

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Optimizing a Wind Farm Layout



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WTG siting

	ITM			Row data/Description
	East	North	Z [m]	
1 New	586.597	924.374	392,9	NORDEX N100 2500 99.8 !O! hub: 90,0 m (TOT: 139,9 m) (37)
2 New	586.297	924.404	363,4	NORDEX N100 2500 99.8 !O! hub: 90,0 m (TOT: 139,9 m) (38)
3 New	586.877	924.234	348,0	NORDEX N100 2500 99.8 !O! hub: 90,0 m (TOT: 139,9 m) (39)
4 New	586.027	924.594	319,3	NORDEX N100 2500 99.8 !O! hub: 90,0 m (TOT: 139,9 m) (40)
5 New	586.377	923.954	302,6	NORDEX N100 2500 99.8 !O! hub: 90,0 m (TOT: 139,9 m) (41)
6 New	585.737	924.684	282,3	NORDEX N100 2500 99.8 !O! hub: 90,0 m (TOT: 139,9 m) (42)
7 New	586.017	924.104	292,8	NORDEX N100 2500 99.8 !O! hub: 90,0 m (TOT: 139,9 m) (43)
8 New	586.717	923.374	244,1	NORDEX N100 2500 99.8 !O! hub: 90,0 m (TOT: 139,9 m) (44)

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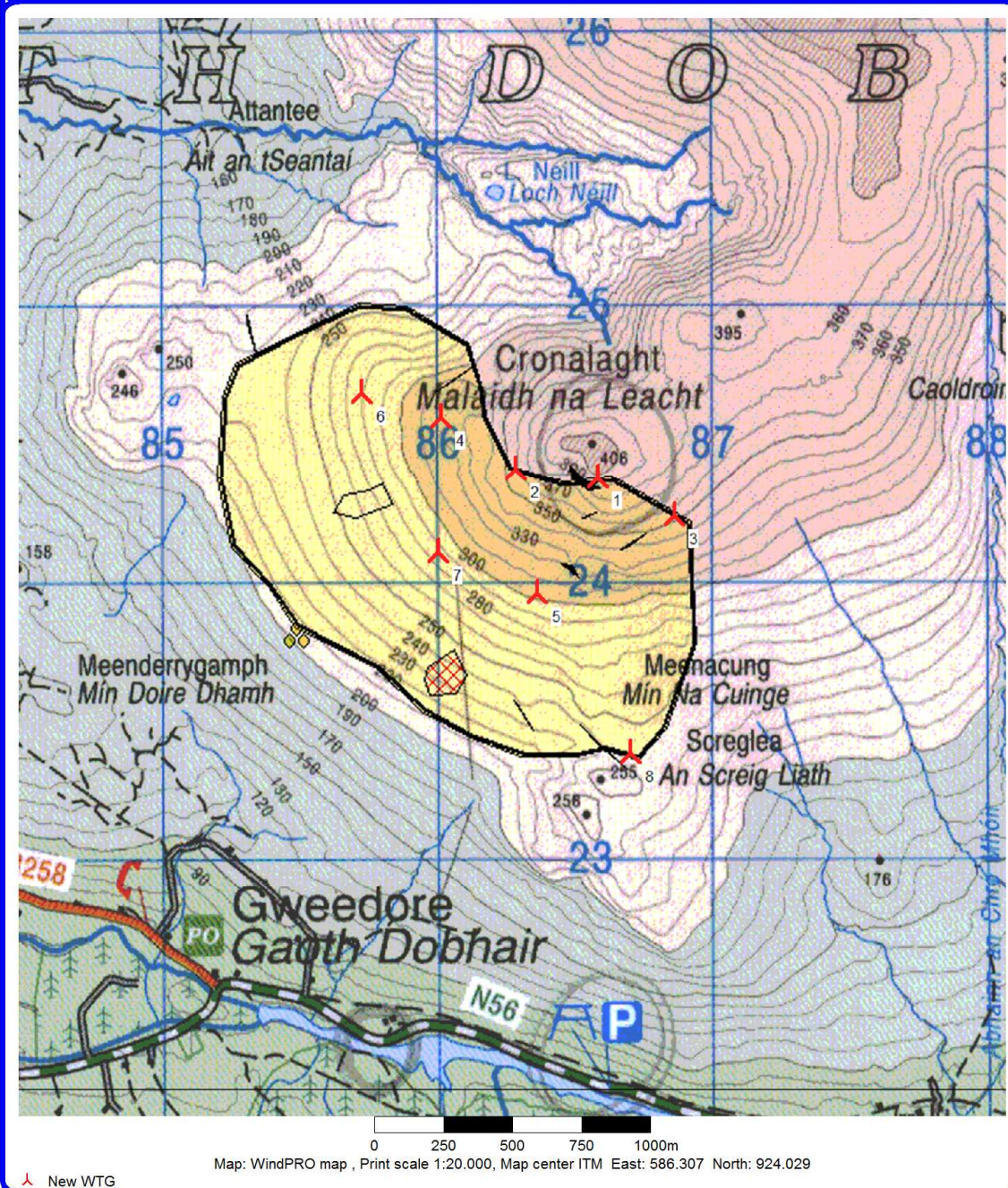
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OPTIMIZE - Map



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