


Wind Farm Sinjajevina – Part 1

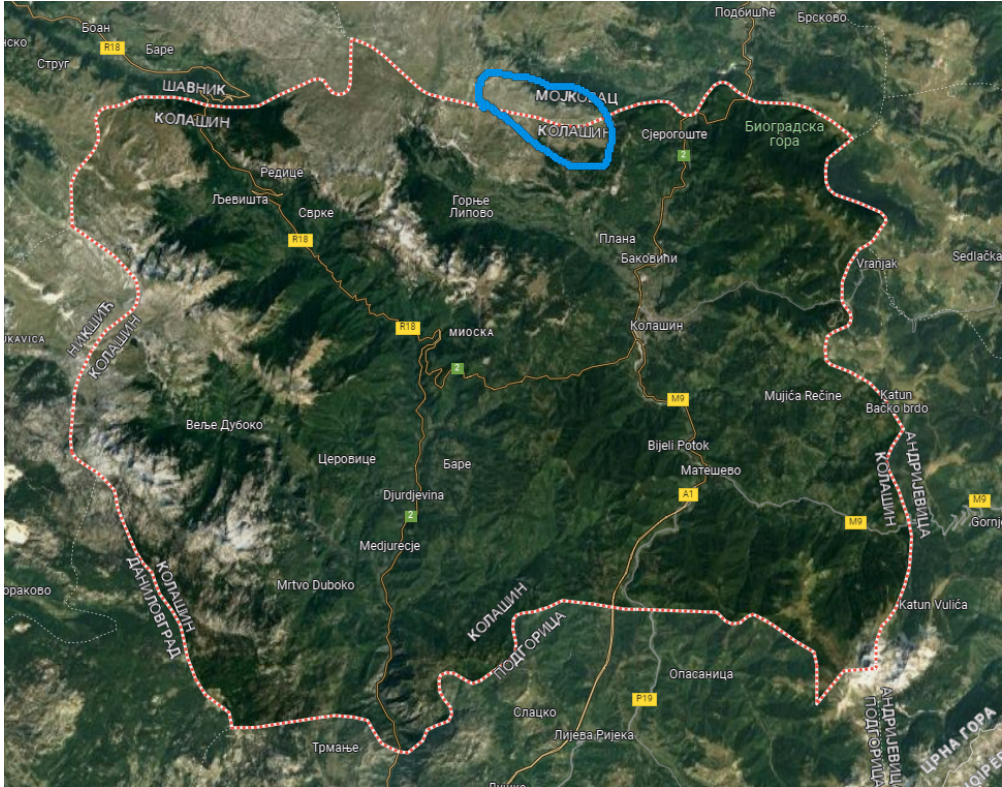


Location



Municipalities and largest cities and towns of Montenegro
Opštine i veći gradovi Crne Gore

Municipality of Kolašin
Montenegro



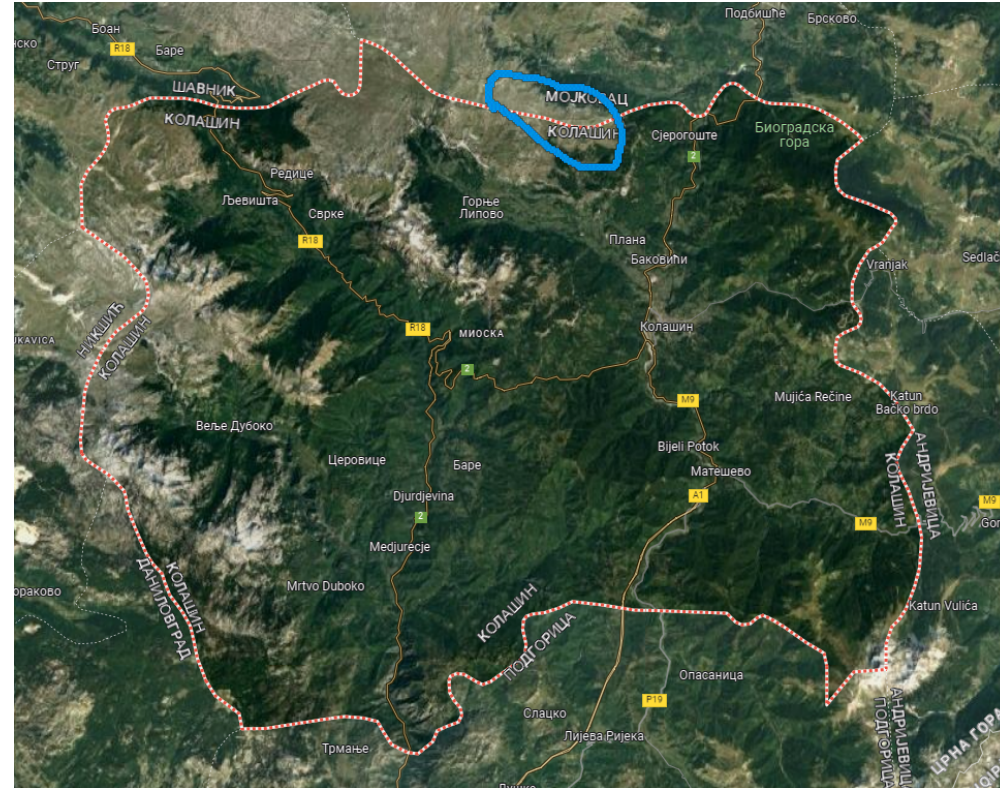
Latitude: 42°
Longitude: 19°
Elevation ≈ 1800 mnm



Municipalities and largest cities and towns of Montenegro
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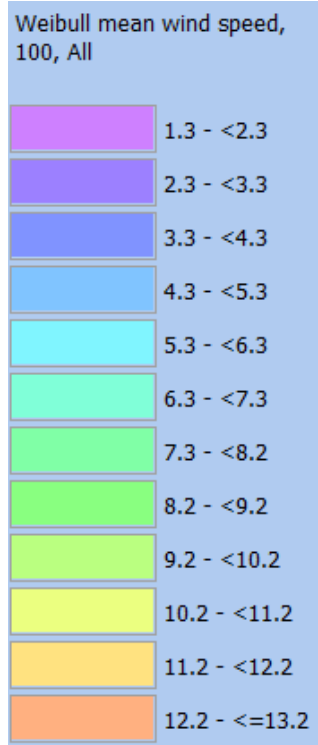


Latitude: 42°

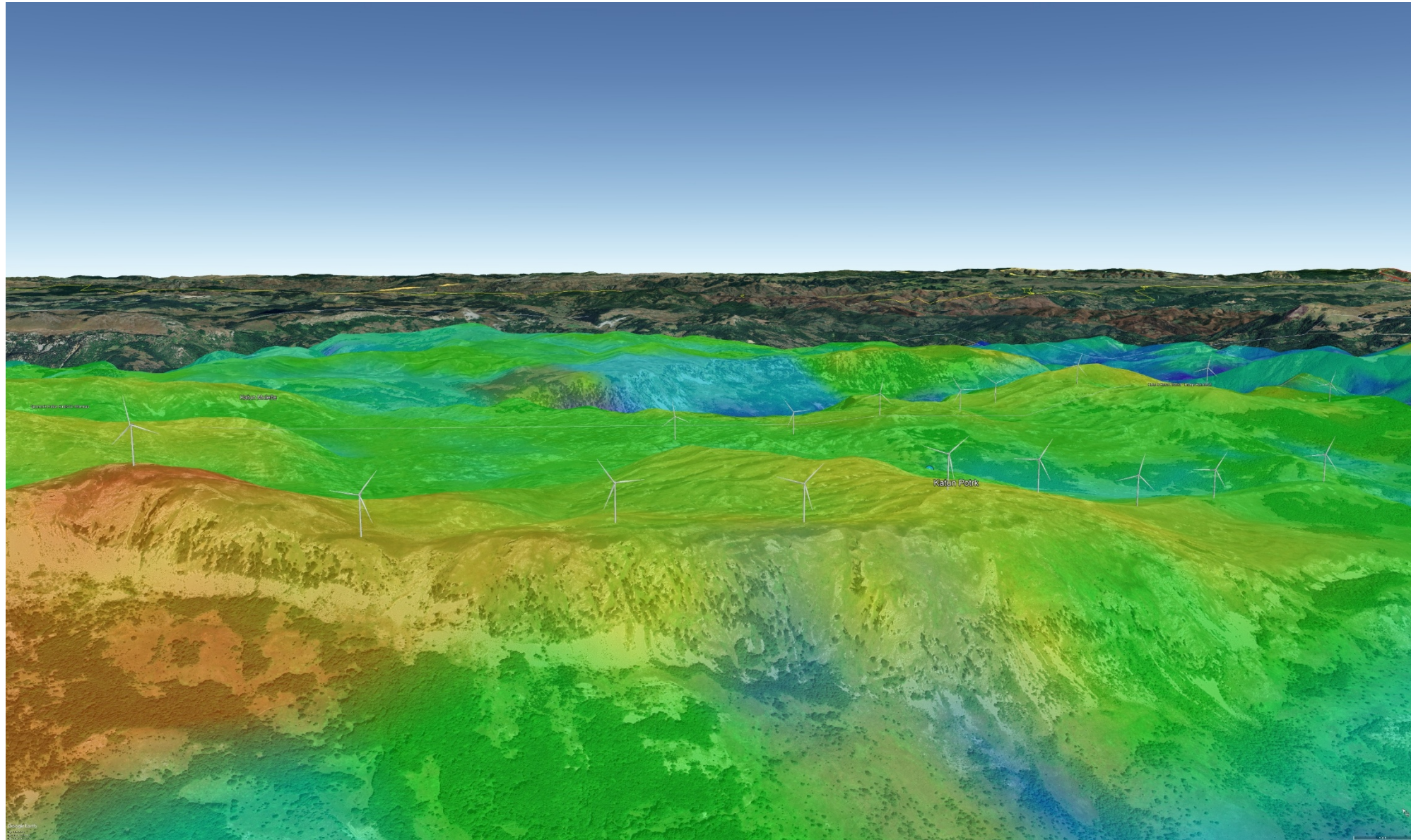
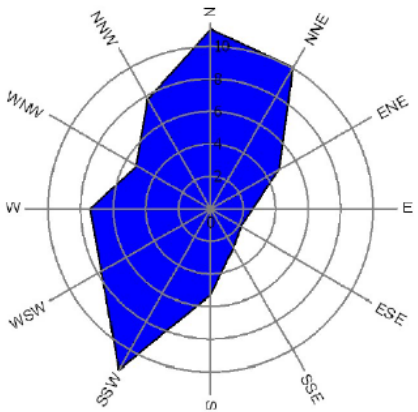
Longitude: 19°

Elevation \approx 1800 mnm

Wind potential at location



Mean wind speed (m/s)



Wind generator

Manufacturer	Siemens Gamesa	
Type/Version	SG 6.6-170	
Rated power	6,600.0	kW
Secondary generator		kW
Rotor diameter	170.0	m
Tower	!O! Tubular	
Grid connection	50/60 Hz	
Country (origin)	Denmark	
Blade type		
Generator type	Variable	
Rated	8.8	rpm
Initial	5.1	rpm
Default hub height	115.0	m
Alternative hub heights (m)	115.0	▲
	135.0	
	145.0	▼
	<input type="button" value="Add"/> <input type="button" value="Remove"/>	
Maximum blade width	4.50	m *)
Blade width for 90% radius	1.50	m *)



Map of Wind Power Plant

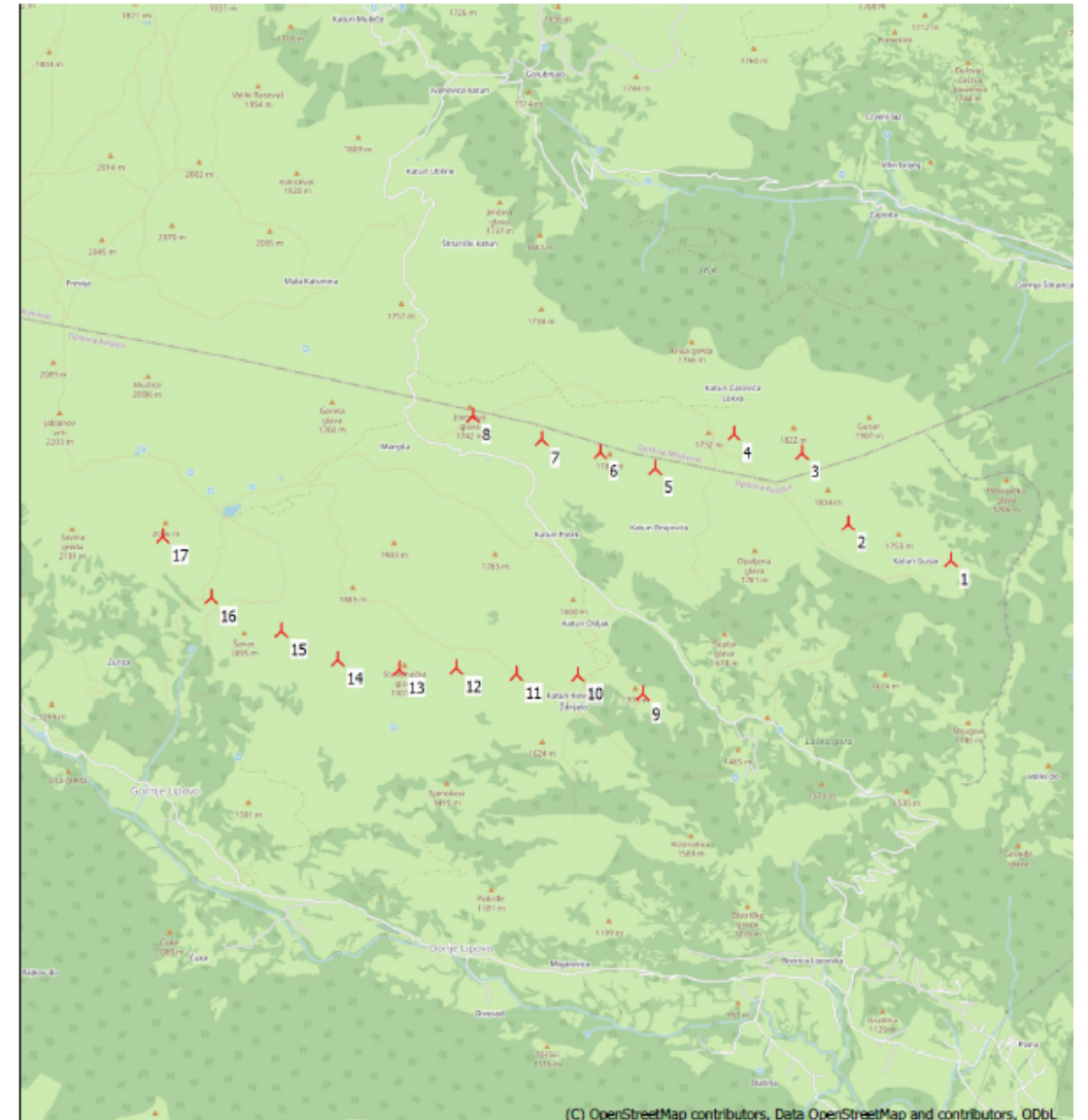
Number of wind generators: **17**

Unit power: **6.60 MW**

Total power: **112.20 MW**

Annual production: **391.654 GWh** (with 20% reduction)

The landowner of the entire area is the state of Montenegro



Production - WindPro 3.6



Calculated Annual Energy for Wind Farm

WTG combination	Result	Result-20.0%	GROSS (no loss)	Wake loss	Specific results ^{*)}			
	PARK [MWh/y]	[MWh/y]	Free WTGs [MWh/y]	[%]	Capacity factor [%]	Mean WTG result [MWh/y]	Full load hours [Hours/year]	Mean wind speed @hub height [m/s]
Wind farm	489,567.7	391,654.2	498,394.6	1.8	39.8	23,038.5	3,491	10.1

^{*)} Based on Result-20.0%

Calculated Annual Energy for each of 17 new WTGs with total 112.2 MW rated power

WTG type			Type-generator	Power, rated	Rotor diameter	Hub height	Power curve		Annual Energy			
Links	Valid	Manufact.					Creator	Name	Result	Result-20.0%	Wake loss	Free mean wind speed
				[kW]	[m]	[m]			[MWh/y]	[MWh/y]	[%]	[m/s]
1 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	27,778.8	22,223	0.2	9.05
2 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	29,343.0	23,474	0.7	9.83
3 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	29,021.8	23,217	1.4	9.95
4 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	27,863.6	22,291	2.3	9.65
5 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	27,881.6	22,305	2.8	9.56
6 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	28,453.4	22,763	2.5	9.74
7 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	26,841.5	21,473	2.4	9.00
8 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	26,118.0	20,894	1.9	8.64
9 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	25,383.5	20,307	2.7	8.46
10 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	27,106.2	21,685	3.1	9.16
11 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	28,340.4	22,672	2.9	9.81
12 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	30,018.6	24,015	2.7	10.73
13 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	30,978.2	24,783	2.1	11.28
14 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	30,476.2	24,381	1.3	11.25
15 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	31,041.0	24,833	1.0	11.86
16 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	31,288.6	25,031	0.5	11.70
17 A	Yes	Siemens Gamesa	SG 6.6-170-6,600	6,600	170.0	115.0	EMD	(AM 0, 6.6MW) - 1.225 kg/m3	31,633.4	25,307	0.2	12.58