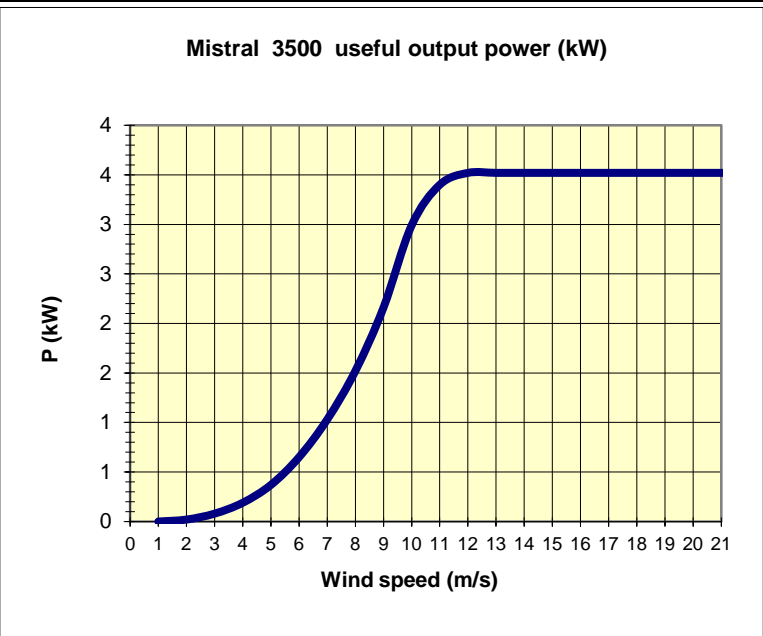


## IT ENERGY: Mistral 3500 Wind Turbine Performances

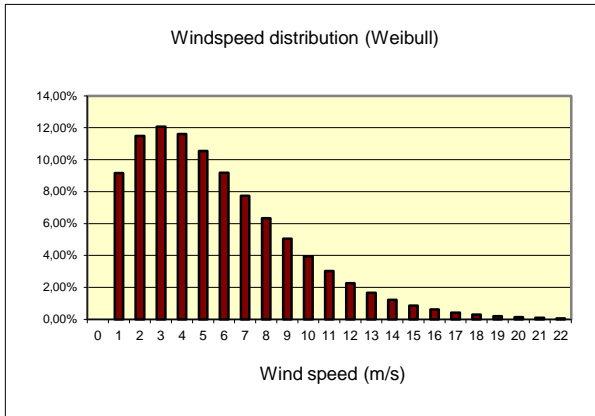
Wind (m/s)	P (kW)
1	0,00
2	0,02
3	0,08
4	0,19
5	0,37
6	0,65
7	1,03
8	1,52
9	2,16
10	2,99
11	3,40
12	3,52
13	3,52
14	3,52
15	3,52
16	3,52
17	3,52
18	3,52
19	3,52
20	3,52



### Predicted energy production depending of average wind speed

Input Parameters	
Average wind speed (m/s) =	5,5
Weibull factor K =	1,5
Site altitude (m) =	250
Wind shear exponent =	0,143
Anemometre height (m) =	12
Tower height (m) =	12
Turbulence factor =	5,0%

Calculated Parameters	
Average windspeed at hub height (m/s) =	5,50
Air density variation =	-2%
Percent operating time =	77,3%



**Input parameters :** (you can edit green data)

**Average windspeed :** Use annual or monthly average windspeed data.

**Weibull factor K :** if Weibull factor **K** is not known, use  $K = 2$  for inland site,  $K = 3$  for sea coast,  $K = 4$  for islands.

**Site Altitude :** inputs site altitude in meters above sea level.

**Wind shear exponent :** standard value is 0.143 , for high turbulence or rough site use 0.18 and for smooth terrain or open water use 0.11

**Anemometre height :** it is the height of the anemometer when measuring average wind speed. if unknown use 10m.

**Tower height :** height of the tower you plan to use.

**Turbulence factor :** derating factor used to take in account the impact of turbulence on efficiency. Use 10% à 15% most of the time. Using 0% will in most of the case tend to over estimate the performances.

**Results :**

**Average windspeed at hub height :** Corrected wind value at hub height. it is the value used to calculate Weibull distribution.

**Air density variation :** reduction of performance compared to sea level.

**Percent operating time :** percent of the time the turbine should produce some power

**Average output power :** Equivalent continuous output of the wind turbine.

**Daily energy production :** average energy produced per day.

**Monthly energy production :** Average energy produced per month.

**Annual energy production :** average energy produced per year.

RESULTS	
Predicted energy production	
Average output power	0,85 kW
Daily energy production	20,4 kW.h
Monthly energy production	619 kW.h
<b>Annual energy production</b>	<b>7.433 kW.h</b>

Warnings : These calculations uses a mathematical idealization of wind speed distribution, The validity of this is improved if period measurement of wind speed is large. This model will work better with annual or at least monthly average wind speed. Uses of this model with daily or weekly average wind speed is not recommended, because on short period of time the wind doesn't follow a Weibull distribution. In all cases it is important to understand that it is a simulation and that real performances may vary.

CLIENTE : .....

SITE LOCATION : .....

DATE: .....

AUTORE : .....



# Simulazione impianto eolico con turbina MISTRAL 3500 (regime di scambio sul posto e detrazione fiscale 50%)

## Dati ventosità sito impianto

Ventosità media (m/s):	5,5
Coefficiente di Weibull (K):	1,5
Coefficiente di rugosità (α):	0,143
Altitudine del sito (m):	250
Fattore di turbolenza (%):	5%
Potenza turbina (kW)	3,5

Energia prodotta annua (kwha) **7.433**

## Dati energetici utenza elettrica

Consumo annuo KWh	6.000
Autoconsumo istantaneo	75%
Costo medio energia (kwh)	€ 0,25
Valore energia scambio	80%
Valore eccedenza (€/kwh)	€ 0,050
Tasso di inflazione annua:	3%
Detrazione fiscale	50%

Costo impianto (iva inclusa) **€ 16.500**

## Costi di manutenzione e gestione (in valore % rispetto investimento)

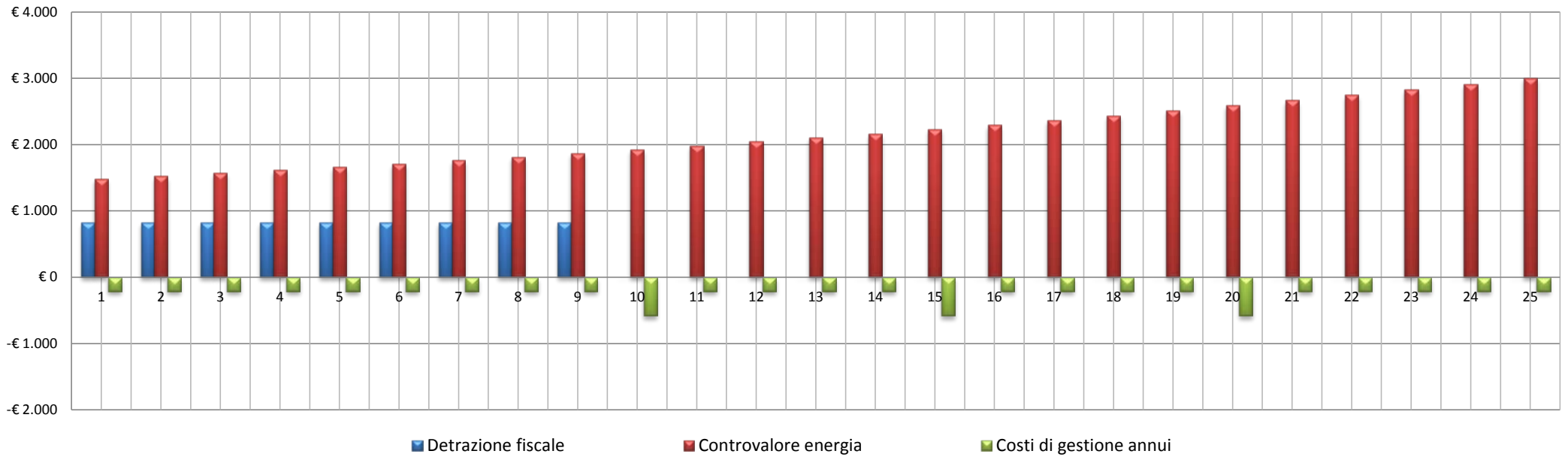
Manutenzione ordinaria	0,8%	€ 123,8
Manutenzione straordinaria	3,0%	€ 495,0
Premio assicurazione (€/kW)	€ 25,0	€ 87,5

## Risultati economici

Totale costi sostenuti	€ 6.411
Totale vantaggi economici	€ 62.033
Utile netto impianto 25 anni	<b>€ 39.123</b>

Anno	FLUSSO ENERGETICO IMPIANTO EOLICO				FLUSSO ECONOMICO DELL'IMPIANTO EOLICO PROPOSTO							
	Prodotta	Autonsumo	Scambio	Eccedenze	Detrazione	Risparmio	Scambio	Eccedenza	Tassa ecced.	Manutenzione	Assicurazione	Conto progressivo
0												-€ 16.500
1	7.433	4.500	1.500	1.433	€ 825	€ 1.125	€ 300	€ 72	€ 21	€ 124	€ 88	-€ 14.411
2	7.433	4.500	1.500	1.433	€ 825	€ 1.159	€ 309	€ 74	€ 22	€ 124	€ 88	-€ 12.278
3	7.433	4.500	1.500	1.433	€ 825	€ 1.194	€ 318	€ 76	€ 23	€ 124	€ 88	-€ 10.099
4	7.433	4.500	1.500	1.433	€ 825	€ 1.229	€ 328	€ 78	€ 23	€ 124	€ 88	-€ 7.874
5	7.433	4.500	1.500	1.433	€ 825	€ 1.266	€ 338	€ 81	€ 24	€ 124	€ 88	-€ 5.600
6	7.433	4.500	1.500	1.433	€ 825	€ 1.304	€ 348	€ 83	€ 25	€ 124	€ 88	-€ 3.276
7	7.433	4.500	1.500	1.433	€ 825	€ 1.343	€ 358	€ 86	€ 26	€ 124	€ 88	-€ 901
8	7.433	4.500	1.500	1.433	€ 825	€ 1.384	€ 369	€ 88	€ 26	€ 124	€ 88	€ 1.526
9	7.433	4.500	1.500	1.433	€ 825	€ 1.425	€ 380	€ 91	€ 27	€ 124	€ 88	€ 4.008
10	7.433	4.500	1.500	1.433	€ 825	€ 1.468	€ 391	€ 93	€ 28	€ 495	€ 88	€ 6.175
11	7.433	4.500	1.500	1.433		€ 1.512	€ 403	€ 96	€ 29	€ 124	€ 88	€ 7.946
12	7.433	4.500	1.500	1.433		€ 1.557	€ 415	€ 99	€ 30	€ 124	€ 88	€ 9.776
13	7.433	4.500	1.500	1.433		€ 1.604	€ 428	€ 102	€ 31	€ 124	€ 88	€ 11.667
14	7.433	4.500	1.500	1.433		€ 1.652	€ 441	€ 105	€ 32	€ 124	€ 88	€ 13.621
15	7.433	4.500	1.500	1.433		€ 1.702	€ 454	€ 108	€ 33	€ 495	€ 88	€ 15.270
16	7.433	4.500	1.500	1.433		€ 1.753	€ 467	€ 112	€ 33	€ 124	€ 88	€ 17.356
17	7.433	4.500	1.500	1.433		€ 1.805	€ 481	€ 115	€ 34	€ 124	€ 88	€ 19.511
18	7.433	4.500	1.500	1.433		€ 1.859	€ 496	€ 118	€ 36	€ 124	€ 88	€ 21.737
19	7.433	4.500	1.500	1.433		€ 1.915	€ 511	€ 122	€ 37	€ 124	€ 88	€ 24.036
20	7.433	4.500	1.500	1.433		€ 1.973	€ 526	€ 126	€ 38	€ 495	€ 88	€ 26.040
21	7.433	4.500	1.500	1.433		€ 2.032	€ 542	€ 129	€ 39	€ 124	€ 88	€ 28.492
22	7.433	4.500	1.500	1.433		€ 2.093	€ 558	€ 133	€ 40	€ 124	€ 88	€ 31.024
23	7.433	4.500	1.500	1.433		€ 2.156	€ 575	€ 137	€ 41	€ 124	€ 88	€ 33.638
24	7.433	4.500	1.500	1.433		€ 2.220	€ 592	€ 141	€ 42	€ 124	€ 88	€ 36.337
25	7.433	4.500	1.500	1.433		€ 2.287	€ 610	€ 146	€ 44	€ 124	€ 88	€ 39.123
<b>Totali</b>	<b>185.829</b>	112.500	37.500	35.829	€ 8.250,0	€ 41.016,7	€ 10.937,8	€ 2.612,6	€ 783,8	€ 4.215,3	€ 2.195,4	<b>€ 39.122,6</b>

## Flusso di cassa impianto eolico Mistral 3500



## Flusso di cassa cumulato impianto eolico Mistral 3500

