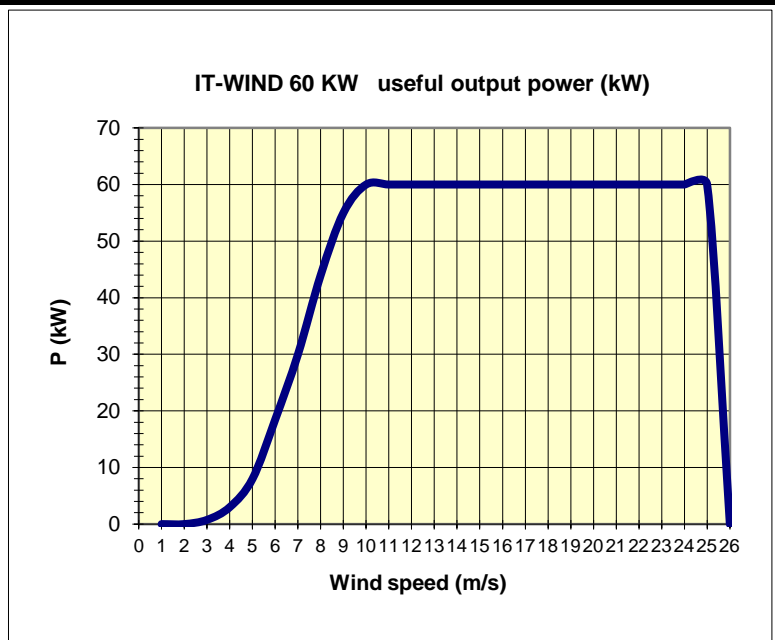


IT ENERGY: IT-WIND 60 KW Wind Turbine Performances

Wind (m/s)	P (kW)
1	0,00
2	0,00
3	0,75
4	3,00
5	8,00
6	18,50
7	30,00
8	44,00
9	55,00
10	60,00
11	60,00
12	60,00
13	60,00
14	60,00
15	60,00
16	60,00
17	60,00
18	60,00
19	60,00
20	60,00



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 =	0,148
Anemometre height (m) =	24
Tower height (m) =	24
Turbulence factor =	5,0%

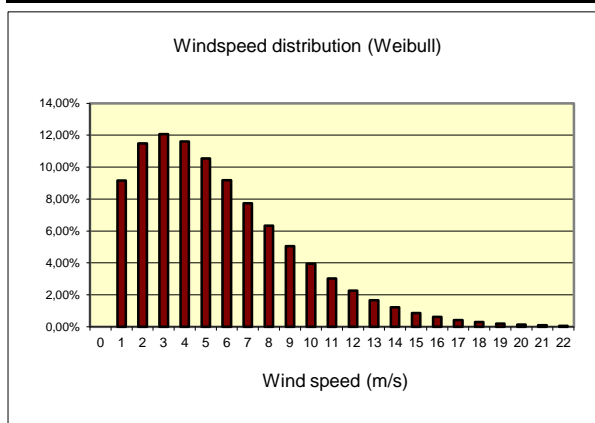
Input parameters : (you can edit green data)

- 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.

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

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	18,33 kW
Daily energy production	439,9 kW.h
Monthly energy production	13.380 kW.h
Annual energy production	160.559 kW.h

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 IT-WIND 60 KW

Stima della produzione e resa dell'impianto in regime di tariffa onnicomprensiva

Ventosità media (m/s):	5,5
Coefficiente di Weibull (K):	1,5
Coefficiente di rugosità (α):	0,148
Altitudine del sito (m):	250
Altezza installazione (m):	24
Fattore di turbolenza (%):	5%
Potenza nominale impianto (kW)	60

Costi di manutenzione espressi in % costo impianto

Ordinaria annua	1,0%	€ 2.250,00
Straordinaria 5°	3,0%	€ 6.750,00
Straordinaria 10°	3,0%	€ 6.750,00
Straordinaria 15°	3,0%	€ 6.750,00
Straordinaria 20°	3,0%	€ 6.750,00

Resa annua in kWh: **160.599**

Costo impianto (IVA esclusa):	€ 225.000
Costo attuale energia:	0,22
Valore in vendita attuale:	0,09
Tasso di inflazione annua:	3%
Tariffa onnicomprensiva:	0,285

Premio annuo assicurazione (€kW)

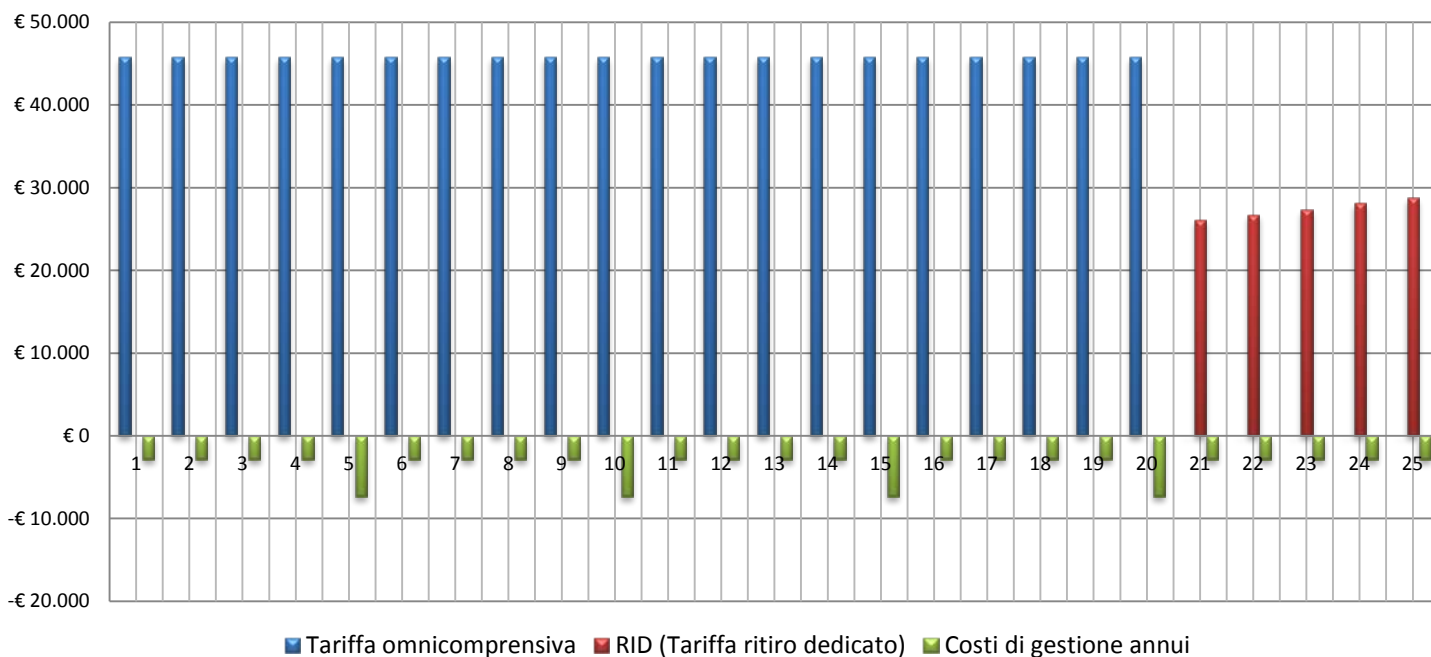
Costo €/kw	€ 10,00	€ 600,00
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STIMA RENDIMENTO ECONOMICO DELL'INVESTIMENTO CON TARIFFA ONNICOMPENSIVA

Anno	KW prodotti	Tariffa onnicomprensiva	Conto vendita	Manutenzione	Assicurazione	Conto progressivo
0						-€ 225.000
1	160.599	€ 45.771	0	€ 2.250	€ 600	-€ 182.079
2	160.599	€ 45.771	0	€ 2.251	€ 600	-€ 139.159
3	160.599	€ 45.771	0	€ 2.251	€ 600	-€ 96.240
4	160.599	€ 45.771	0	€ 2.252	€ 601	-€ 53.322
5	160.599	€ 45.771	0	€ 6.750	€ 601	-€ 14.902
6	160.599	€ 45.771	0	€ 2.253	€ 601	€ 28.015
7	160.599	€ 45.771	0	€ 2.253	€ 601	€ 70.931
8	160.599	€ 45.771	0	€ 2.254	€ 601	€ 113.846
9	160.599	€ 45.771	0	€ 2.255	€ 601	€ 156.761
10	160.599	€ 45.771	0	€ 6.750	€ 602	€ 195.180
11	160.599	€ 45.771	0	€ 2.255	€ 602	€ 238.094
12	160.599	€ 45.771	0	€ 2.256	€ 602	€ 281.006
13	160.599	€ 45.771	0	€ 2.257	€ 602	€ 323.918
14	160.599	€ 45.771	0	€ 2.257	€ 602	€ 366.829
15	160.599	€ 45.771	0	€ 6.750	€ 603	€ 405.247
16	160.599	€ 45.771	0	€ 2.258	€ 603	€ 448.157
17	160.599	€ 45.771	0	€ 2.259	€ 603	€ 491.066
18	160.599	€ 45.771	0	€ 2.259	€ 603	€ 533.974
19	160.599	€ 45.771	0	€ 2.260	€ 603	€ 576.882
20	160.599	€ 45.771	0	€ 6.750	€ 603	€ 615.299
21	160.599		€ 26.105	€ 2.261	€ 604	€ 638.540
22	160.599		€ 26.758	€ 2.262	€ 604	€ 662.433
23	160.599		€ 27.427	€ 2.262	€ 604	€ 686.993
24	160.599		€ 28.113	€ 2.263	€ 604	€ 712.239
25	160.599		€ 28.815	€ 2.264	€ 604	€ 738.187
Totali	4.014.975	€ 915.414	€ 137.218,4	€ 74.392,0	€ 15.054,1	€ 738.186,6

Totale energia venduta	€ 1.052.633	Investimento iniziale	€ 225.000
Totale costi sostenuti	€ 89.446	Utile netto impianto 25 anni	€ 738.187

Flusso di cassa impianto eolico IT-WIND 60 kW



Flusso di cassa cumulato impianto eolico IT-WIND 60 kW

