Bati Energy Private Limited

CIN : U74120GJ2014PTC079341
IEC : 2414012919
GSTIN : 24AAFCB9023NIZ1

We have proudly provided Consultancy to : Airport Authority of India; Government of Ghana; Department of Energy, Faroe Islands

Customer : Welcome Hostel, Rotermanni Kvartal, Tallinn.

Date 21-07-2018

Location Lat 59.439
Lon 24.757

Solar Power Solution Generation Report without considering feed in tariff benefits

DNI= Direct Normal Insolation

This is how many DC KWh of power your 1KW system can generate per day on a 22yr average

Lat 59.439 Lon 24.757	Jan	Feb	Mrz	Apr	Mai	Jun	Jul	Aug	Sep	Okt	Nov	Dez	Annual Average
22-year Average	0.88	1.87	3.25	4.67	6.24	6.17	5.93	4.62	3.27	1.97	1.07	0.72	3.39

No Sun Days

This is number of days per year, when no generation will happen due to aggregate fully cloudy days on a 22 year average

Lat 59.439 Lon 24.757	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual Total
22-year Average	2.38	5.54	6.27	5.24	5.12	4.89	5.21	7.06	6.83	3.33	5.09	1.19	58.15

Power Generation Calculations For Grid Tied Solar Powe plant

DNI at location	3.39	KWh/sq.m./day	**1KW system can generate 4.61KWhdc per day at this location**
Avg. Total No Sun Days in a year	58	days	**1 KWh = 1 unit of power**
Annual usable full sun days	307	days	**deducting cloudy days at the location from 365 days**
Annual Generation per KW-DC	1040	KWh/year	
Annual Generation per KW-AC*	988	KWh/year	* DC to AC conversion Losses at lowest efficiency of 95%
Life time Generation per KW-AC*	21005	KWh/Life	* considering 25 year life and degradation factor of 0.85
Cost of power per KWh at site	0.12 €	per KWh	

Investment Required for proposed capacity

Power in KiloWatt	Investment in EUR	O & M Cost Life*	Lifetime Project Cost	AC power for life**	LCOE Power cost#
20KW	€ 17,990.00	€ 4,497.50	€ 22,487.50	€ 4,20,092.67	€ 0.054 /KWh
100KW	€ 68,990.00	€ 17,247.50	€ 86,237.50	€ 21,00,463.36	€ 0.041 /KWh

*** *AC Power generation value during lifetime from solar power plant**

*** O & M cost for life** — **Is about monthly checkup of wiring , cleaning of solar panels and preventive measures**

 # LCOE — **Is levellized cost of electricity calculated as total life time cost off power project devided by total power generated during life.**

Break-Even Period Calculation ! Total Life time of project = 25 years

Power in KiloWatt	Investment in EUR	Cost of power/KWh*	Generation/ year	Power Value/ year**	Break-Even Time#
20KW	€ 17,990.00	€ 0.12 /KWh	19769 KWh	€ 2,372.29	7.58 years
100KW	€ 68,990.00	€ 0.12 /KWh	98845 KWh	€ 11,861.44	5.82 years

*** present cost of power at given location**

**** Power Value** — **Annual Value of power generated at current cost of power**

 # Break-Even period — **Is= Investment in power plant / power value per year**

With Estonian Feed In Tariffs Offering around € 0.0537 per KWh , Break-even time will be less than 4 years

Source for FIT https://www.pv-magazine.com/features/archive/solar-incentives-and-fits/feed-in-tariffs-in-europe/#estonia

Savings per KWh

power in KiloWatt	Cost of power/KWh	LCOE Power cost / KWh	Savings / KWh
20KW	€ 0.12 /KWh	€ 0.054 /KWh	€ 0.066 /KWh
100KW	€ 0.12 /KWh	€ 0.041 /KWh	€ 0.079 /KWh

Property Investment Returns Vs Solar Investment Returns

Power in KiloWatt	Investment in EUR	Cost of power/KWh	Generation/ year	Property Return at 6.64% per year	Solar Return at present power cost	Solar Return % per year
20KW	€ 17,990.00	€ 0.12 /KWh	19769 KWh	€ 1,194.54	€ 2,372.29	13%
100KW	€ 68,990.00	€ 0.12 /KWh	98845 KWh	€ 4,580.94	€ 11,861.44	17%

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