

BEEP-RE Renewable Energy Assessment Tool

<http://beep-re.iiec-india.org/tools>

Name of User	test
Organisation	trest
Date & Time	05-09-2023

This is a computer-generated report developed through BEEP-RE Renewable Energy Assessment Tool to share your feedback or report any discrepancies please get in touch at beep-re@iiec.org To know more about the BEEP-RE project “Integration of Renewable Energy in Buildings” please visit beep-re.iiec-india.org/

Step 1 Building And Location

Select the Climatic Condition	Select the type of building	Energy Performance Index (EPI)																
<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Climatic Condition <div style="text-align: center;">Composite</div> </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">State</td> <td>Haryana</td> </tr> <tr> <td>District</td> <td>Ambala</td> </tr> <tr> <td>Latitude of the location (Nearest)</td> <td>30.25</td> </tr> <tr> <td>Longitude of the location (Nearest)</td> <td>76.75</td> </tr> </table>	State	Haryana	District	Ambala	Latitude of the location (Nearest)	30.25	Longitude of the location (Nearest)	76.75	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Building type <div style="text-align: center;">Hotels upto 3 star</div> </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Connected load (kW)</td> <td>152</td> </tr> </table>	Connected load (kW)	152	<div style="border: 1px solid black; padding: 5px; margin-bottom: 10px;"> Type of epi <div style="text-align: center;">Actual or estimated EPI</div> </div> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Actual Epi (kWh/m²/year)</td> <td>154</td> </tr> <tr> <td>Builtup area</td> <td>213</td> </tr> <tr> <td>Electricity Demand (kWh/year)</td> <td>32802</td> </tr> </table>	Actual Epi (kWh/m ² /year)	154	Builtup area	213	Electricity Demand (kWh/year)	32802
State	Haryana																	
District	Ambala																	
Latitude of the location (Nearest)	30.25																	
Longitude of the location (Nearest)	76.75																	
Connected load (kW)	152																	
Actual Epi (kWh/m ² /year)	154																	
Builtup area	213																	
Electricity Demand (kWh/year)	32802																	

Step 2 Input

Solar PV, Solar PV-Thermal & BIPV	Bio-methanation (Biogas)				
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Shade free area for solar PV (m²)</td> <td>1545</td> </tr> </table>	Shade free area for solar PV (m ²)	1545	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%;">Cooking gas demand(kg/day)</td> <td>855</td> </tr> </table>	Cooking gas demand(kg/day)	855
Shade free area for solar PV (m ²)	1545				
Cooking gas demand(kg/day)	855				

Step 3

Data Output

Electricity Demand (kWh/year)	32,802
--	---------------

Solar Energy			
	Size of Installation (kWe)	Estimated Energy generation (kWh/year)	% of total electricity demand met
Solar photovoltaic (Rooftop)	155	245,655	749%
Building Integrated Photovoltaic (vertical installation on façade)	452	359,420	1096%

Solar Energy: Cost and payback analysis			
Capital (INR)	Operational expenditure (INR/year)	Operational cost of energy from renewable source (INR/kWh)	Simple Payback (years)
9,270,000	200,850	0.818	4.6
67815000	587730	1.635	>20

Solar PVT (Electricity+Hot Water)			
Solar hybrid (Hot water) (L/year)	9,270,000		
Hot water requirement (L/year)	215		
% of hot water demand met	4311627.91%		
Estimated electricity savings (kWh/year)	5		
% of total electricity demand met	0%		
	Size of Installation (kWe)	Estimated Electricity Generation (kWh/year)	% of total electricity demand met
Solar hybrid (Electricity)	155	245,655	749%

Solar Energy: Cost and payback analysis			
Capital (INR)	Operational expenditure (INR/year)	Operational cost of energy from renewable source (INR/kWh)	Simple Payback (years)
11,587,500	200,850	0.818	5.8

Small Wind Turbine	
Number of ROWS of wind turbines	318
Number of COLUMNS of wind turbines	614
Total number of turbines	195,252
Size of Installation (kWe)	195,252
Estimated Energy generation (kWh/year)	73,012,023
% of total electricity demand met	222,584%

Small Wind Turbine: Cost and payback analysis			
Capital (INR)	Operational expenditure (INR/year)	Operational cost of energy from renewable source (INR/kWh)	Simple Payback (years)
15,620,160,000	195,252,000	2.67	>20

Fuel Cell power system (Solid Oxide Fuel Cells)

Capacity of Fuel cell power pack based on % of connected load (kW)	152
Probable capacity of fuel cells power pack based on biogas availability	28
Total installed capacity	28
Number of operating days in a year	365
Gas supply required(kg/day)	196
Gas supply required(kg/year)	71,376
Energy generated (kWh/year)	214129
% of total electricity demand met	653%

Fuel cells: Cost and payback analysis

Capital (INR)	Operational expenditure (INR/year)	Operational cost of energy from renewable source (INR/kWh)	Simple Payback (years)
19,667,586	63,453,691	296	NA

Step 4

RE Selection

Estimation

Renewable Energy Technology	Estimated Capacity	Energy produced	Demand that can be met	Payback time (years)
Rooftop Photovoltaic (RTPV)	155(KW)	245,655 (kWh/year)	748.9 % of total electricity	4.6
Building Integrated Photovoltaic (BIPV)	452(KW)	359,420 (kWh/year)	1095.72 % of total electricity	>20
Solar Photovoltaic and Thermal (PVT)	155(KW)	245,660 (kWh/year)	749.01 % of total electricity	5.8
Small Wind Turbine	195,252(KW)	73,012,023 (kWh/year)	222584.06 % of total electricity	>20
Biomethanation (Biogas)	1,552(kg/day)	39,653 (kg/year)	13.61 % of cooking gas	0.29
Solid Oxide Fuel cell (SOFC)	28 (KW)	214,129 (kWh/year)	652.79 % of total electricity	0
Energy demand		32,802		

Verification

	Enter the installed capacity values here ?		Enter the the actual energy generation here ?	
	Installed Capacity (kW) /For biogas plant it is kg/day	Verification message	Actual energy generation (kWh/year)	Verification message
Rooftop Photovoltaic (RTPV)	0	No Data	0	No Data
Building Integrated Photovoltaic (BIPV)	0	No Data	0	No Data

Disclaimer:

The BEEP-RE tool is developed for informational purposes only with an intent to provide the preliminary understanding of performance of different renewable energy technologies . This report should not be construed as professional advice regarding the integration of renewable energy technologies in buildings. Calculations and outcomes produced by the tool are based solely on user-inputs and inherent assumptions. The tool and its report is not a substitute for professional expertise, and users are encouraged to seek personalized advice before making decisions on renewable energy integration in buildings.

The results produced from this tool shall not be used for documenting the compliance under any regulation or certification.

The developers disclaim all liability for any direct, indirect, incidental, special, consequential, or punitive damages arising out of or in connection with the use or misuse of the Tool, including but not limited to loss of profits, loss of data, or any other economic or personal losses.

Indemnification: By using the BEEP-RE Tool, you agree to indemnify and hold harmless the developers, their affiliates, officers, directors, employees, and agents from any and all claims, liabilities, damages, losses, expenses, and costs arising from or related to Your use of the Tool, including any decisions, actions, or outcomes resulting from the use of the Too

Date :- 05-09-2023

Name :- test

Organisation :- trest