SOLAR CALCULATOR ANDRIOD APP

A step to preserve Earth by इससे ांडान्च

Space Applications Centre | Indian Space Research Organisation

What is Solar Calculator ?

- Space Applications Centre, ISRO has developed a Android based solar calculator app and Solar Calculator on Web at the behest of Ministry of New & Renewable Energy, Govt. of India.
- It is useful for calculating solar energy potential and related parameters at any given location (entered Longitude and Latitude value). The solar energy potential of a location is measured in $k W h/m^2$.
- Information is available in form of Table, Charts and Maps.
- It can facilitate users to set up solar photovoltaic cells and thermal power plants at given location.
- This solar potential is calculated using data processed from Indian satellites, Kalpana [2013-2015] and INSAT-3D 2016 onwards.

The Solar calculator APP



Key features -

- A detailed report for any given location can be exported and shared as a .pdf file. The data can be viewed in three ways, as a table, as a graph, and as a map.
- In the map view, the direct satellite imagery is overlaid on the map along with the calculations of solar potential.

Download the solar calculator APP from https://vedas.sac.gov.in
Downloads
Android Apps Solar Calculator

The Solar calculator APP – Summary View

- Desired latitude & longitude can be obtained by entering the values or through GPS / NaVIC by clicking on *Get Location*. Click on *Calculate* button to get results.
- Summary view displays the latitude ,latitude, country ,Day Length , Global Horizontal Irradiance ,average minimum and maximum temperatures ,Optimum Tilt Angle for Solar PV. along with Power Production of PV.



Note:- GHI parameters are provided by NIWE, MNRE.

The Solar calculator APP – Table View

- Desired latitude & longitude can be obtained by entering the values or through GPS / NaVIC by clicking on *Get Location*. Click on *Calculate* button to get results.
- Table view displays the, monthly insolation of current and previous year maximum ,minimum and maximum temperatures along with Optimum Tilt Angle for Solar PV.
- It also enumerates parameters like :-Annual Energy Production (AEP) Capacity Utilization Factor (CUF) Global Horizontal Irradiance (GHI) Direct Normal Irradiance (DNI) Diffused Horizontal Irradiance (DHI)
 Note:- AEP CUE GHI DNI DHI parameters are provided by

Note:- AEP,CUF,GHI,DNI,DHI parameters are $% \left({{{\rm{P}}} \right)$ provided by NIWE, MNRE.

	Table			1	8		1
Lathude / Longitude : Annual Global Insolution Tith Angle for Solar PV : NIWE (MNRE) Statig Annual Energy Productio Capacity Utilization Fact Capacity Utilization Fact Capacity Utilization Fact Capacity Utilization Fact Diffused Horizontal Irradia	21 32 33 15 15 15 16 16 16 17 17 16 17 17 17 17 17 17 17 17 17 17 17 17 17	527646 / 70 528- 10 % / 20.1 % 22 (Wh/mi/year) / 17490 XWh/m 2 % 42 XWh/m ² /year 70 XWh/m ² /year	119				
Menth	Satar Insolation (2009 - 2019)			Previous Year	Current Year	Temperature (°C)	
	Min	Avg	Max	2018	2019	Min	Ma
January	120	126	129	123	104	11.9	28
February	135	145	152	135	r.*	13.7	30
March	175	186	191	179	•	17.4	3
April	189	196	202	195		21.1	34
May	192	199	203	192	<u></u>	24.6	35
June	98	153	196	153	•	26.3	34
July	71	118	194	98		25.2	31
August	115	157	210	182		24.4	29
September	123	151	177	155	81	23.3	30
October	147	155	161	150		21.2	33
November	105	121	130	121		17.6	32
December	104	116	122	109		14	29
		100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100 - 100	NO.	1	C	02244	(

* Solar Insolation has been generated using Indian Satellite data (Kalpana [2009-2015] and INSAT-3D 2016 onwards) # GHI, DNI, DHI, CUF, AEP have been generated by NIWE (MINRE) using long term satellite and ground data [1999-2014].

The Solar calculator APP – Chart View

- First Chart depicts the insolation and temperature trends throughout the year in simple yet intuitive format.
- Second Chart displays the Daily Average Insolation(2014-17)along with Temperatures.
- Third chart showcase depicts the Sun Path over the year along with the obstruction observed calculated using DEM (shown with grey colour).
- The Charts also allows user to interact by zooming in & out and displaying info at the specific month, when selected.



The Solar calculator APP – Chart View

- Fourth Chart depicts Sun Path over the year .
- Fifth Chart depicts the Solar Heat Map For Shadow Analysis.
- The Charts also allows user to interact by zooming in & out and displaying info at the specific month, when selected.



The Solar calculator APP – Map View

- MAP view locates selected longitude and latitude on the map overlaid with Cartosat satellite imagery and Indian Administrative Boundary.
- Different satellite imagery can be overlaid on the map using layer switcher (+ icon on rightside of the map)



The Solar calculator APP – Forecast View

 Forecast View displays the 72 Hours Forecast of Solar insolation at 15 minutes of interval from current date and time along with Global Irradiance in simple yet intuitive format.



The Solar calculator App- Align Solar Panel

- Align Solar panel help us to attain the maximum solar potential by setting the PV panel at particular Elevation(slope or tilt)angle and Azimuth angle.
- When Target Azimuth reaches current Azimuth and Target Slope(Elevation) reaches to current Slope(Elevation) the column will change its colour from blue to green.
- By clicking on Arrow button compass will show its directions.
- When light blue panel overlaps on the fixed dark blue panel it depicts the best Elevation angle for solar PV.



