# PVWatts® Calculator: India

In the fall of 2013, the National Renewable Energy Laboratory (NREL) released the *PV Watts Calculator for India*, the first country-specific PVWatts Calculator for locations outside of the United States. The PVWatts Calculator is a web application that estimates the electricity production of a grid-connected roof- or ground-mounted crystalline silicon photovoltaic (PV) system based on a few simple inputs. The online, public tool calculates estimated values for the system's annual and monthly electricity production, and for the monetary value of the electricity. The PVWatts Calculator also generates estimated hourly electricity production (without monetary values) as a separate download.
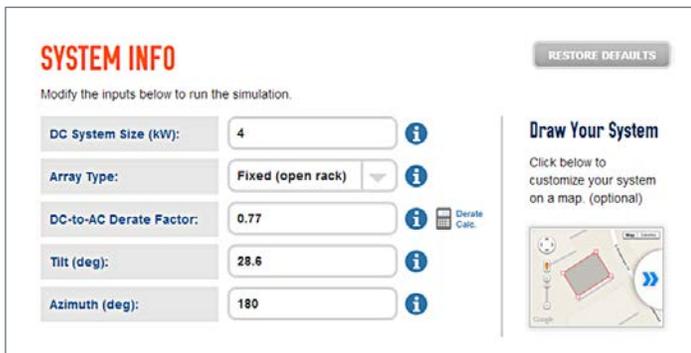

To use the calculator, the user simply provides the address or geographic coordinates of the system's location and specifies the system size and array orientation. PVWatts uses default values for the system information, but users are able to modify these to fit their specific PV system. PVWatts calculates the electricity production using an hour-by-hour simulation over a period of one year. PVWatts makes cost of electricity estimates based on whether the system is on a residential or commercial property, its installation cost, and the retail cost of electricity.

Once the system information is entered, PVWatts provides the annual and monthly energy production estimates, the monthly and annual average solar radiation, and the value of electricity generated in rupees per year on the Results Page. The results can be downloaded as text files with comma-separated values (CSV) for further analysis.

The PVWatts economic model assumes that the photovoltaic system is connected to the grid on a residential or commercial property, and that the system displaces purchases of electricity from an electricity service provider. PVWatts makes the simplifying assumption that the value per unit of electricity generated by the system is equal to a fixed retail price of electricity from the electricity service provider.

The solar resource data used by the PVWatts Calculator India is 10-km hourly data developed using weather-satellite measurements incorporated into a site-time specific model. The data is available at *http://www.nrel.gov/international/ra_india.html*.

The development of PVWatts Calculator India was funded by the U.S. Department of Energy under the U.S.-India Energy Dialogue. Go to *http://pvwattsbeta.nrel.gov/India/index.php* to try out the tool.
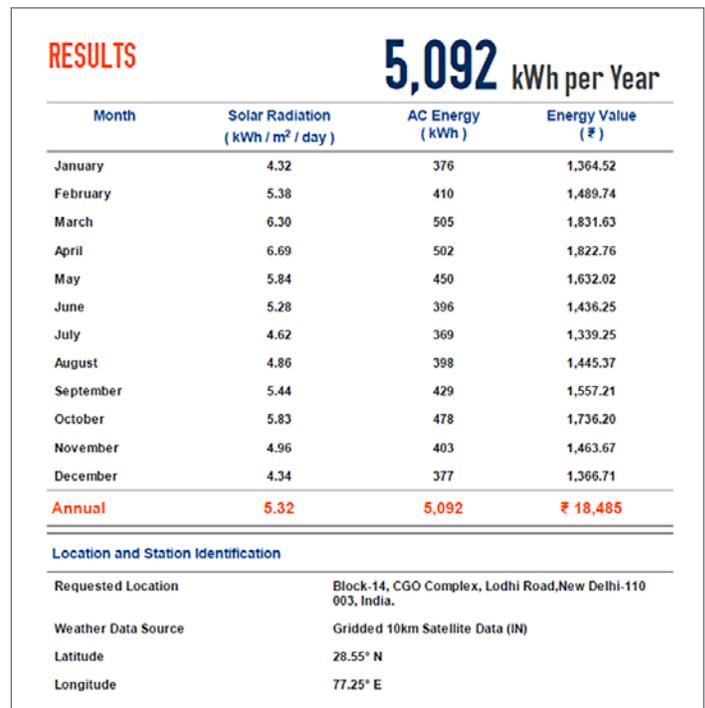
Month	Solar Radiation (kWh / m² / day)	AC Energy (kWh)	Energy Value (₹)
January	4.32	376	1,364.52
February	5.38	410	1,489.74
March	6.30	505	1,831.63
April	6.69	502	1,822.76
May	5.84	450	1,632.02
June	5.28	396	1,436.25
July	4.62	369	1,339.25
August	4.86	398	1,445.37
September	5.44	429	1,557.21
October	5.83	478	1,736.20
November	4.96	403	1,463.67
December	4.34	377	1,366.71
Annual	**5.32**	**5,092**	**₹ 18,485**

Location and Station Identification

Requested Location	Block-14, CGO Complex, Lodhi Road,New Delhi-110 003, India.
Weather Data Source	Gridded 10km Satellite Data (IN)
Latitude	28.55° N
Longitude	77.25° E

NREL is a national laboratory of the U.S. Department of Energy,
Office of Energy Efficiency and Renewable Energy, operated by the Alliance for Sustainable Energy, LLC.