

DETAILED PROJECT REPORT
FOR
ROOF TOP SOLAR PV POWER PLANT
Prepared BY
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Executive Summery

REJOY NARAYAN MAHAVIDYALAYA

Energy is a necessary driver of growth and its per capita consumption is growing all across the world. The world already realises the need to switch over Renewable energy source to augment the energy needs.

We can't make more fossil fuels. Eventually, it will run out. The conventional sources of energy are still available on this earth but will not take much time in its depletion from the earth. And in such cases non-conventional sources of energy are the future of the earth. Solar power is the key alternative because it is abundant and offers a solution to fossil fuel emissions and global climate change.

Government, with its initiatives in the field of renewable energy is trying hard to secure the future of its coming generation to fulfill its energy needs.

Keeping the following key benefits in mind College administration has decided to go for Green Renewable energy sources (solar Power Plant) as a part of their over all development.

- First of all it's a proven way of serving the society and saving our mother earth.
- Electricity bill from conventional sources of energy can be adjusted with the solar power up to 80-90% of the consumption value on an average.
- Key aspect for NAAC accreditation and gradation
- Solar energy is not only sustainable, it is renewable and this means that we will never run out of it. It is about as natural a source of power as it is possible to generate electricity.
- Solar electricity power plants produce zero emissions during operation and it is in no way hazardous for the environment. Also it is helping in reducing Global Warming to great extent

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Introduction

Renewable Energy scenario in India

The Indian renewable energy sector is the fourth most attractive renewable energy market in the world as per the Renewable Energy Attractiveness Index 2018. India's installed renewable power (grid interactive) generation capacity (including hydropower) increased from 42.4 gigawatts (GW) in FY07 to 116.82 GW in July 2018, which is 33.72 per cent of the total installed capacity. Power generation from renewable energy sources in India reached 101.84 billion units in FY18 and 46.28 billion units in April-July 2018.

As of August 2018, India ranks fifth in terms of cumulative installed solar capacity and crossed 25 GW in installed solar capacity. India added record 11,788 MW of renewable energy capacity in 2017-18 and 1,832.26 MW (grid interactive and off-grid) in April-July 2018. Overall, India is expected to add up to 8.5 GW of renewable energy capacity in 2018-19. Large hydro projects form the largest source of renewable energy. Around 1,739.14 MW of wind power capacity was added in 2017-18.

The Ministry of New and Renewable Energy, Government of India, has formulated an action plan to achieve a total capacity of 60 GW from hydro power and 175 GW from other RES by March, 2022, which includes 100 GW of Solar power, 60 GW from wind power, 10 GW from biomass power and 5 GW from small hydro power.

Project Outcome

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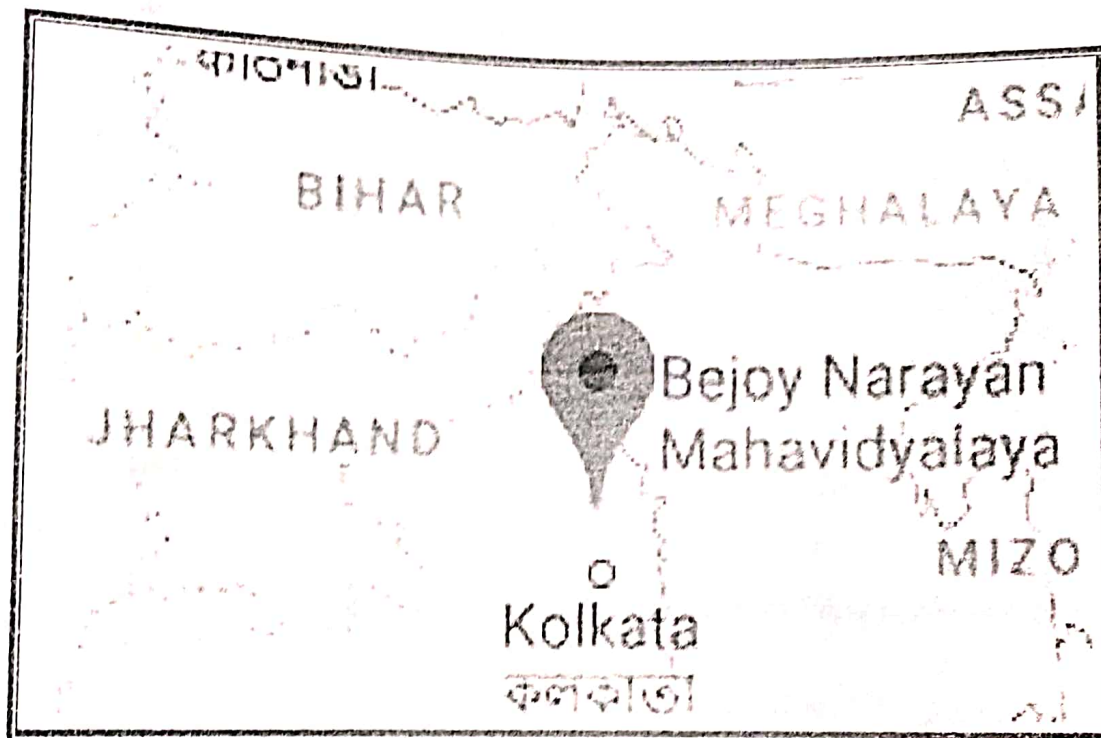
Project Features

Main Features of the Project

- ⇒ Project promoter:- Bejoy Narayan Mahavidyalaya
- ⇒ Project location:- Bejoy Narayan Mahavidyalaya
- ⇒ State:- West Bengal
- ⇒ Proposed technology:- Grid tied Solar Power Plant
- ⇒ Plant capacity:- 12-14 KVA
- ⇒ PV Module Type- Crystalline modules
- ⇒ PV Modules Required (area):- 800-1000 sq ft
- ⇒ Total Area Required: - 1300 sq ft (approximately)
- ⇒ Annual solar irradiance :- 4.6 kWh/m²/day
- ⇒ Annual average temperature :- 26.4° C
- ⇒ Annual Gross Output :- 14500 kWh approx
- ⇒ Miscellaneous PV array losses :- 1 %
- ⇒ Miscellaneous power conditioning losses :- 1 %
- ⇒ Expected CUF (Capacity Utilisation Factor) :- 18 %
- ⇒ Project implementation period:- 2.5-3 months
- ⇒ Estimated project cost :- Rs 10.50 lakhs
- ⇒ Site selection:- Site identified within college area and suitability confirmed

Project location and Site description

Bejoy Narayan Mahavidyala is located at Itachuna near Khanyan station in Hooghly district having four (4) big buildings and an area of..... Location of place on Earth 23.040° N, 88.309° E.

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Brief of important factors/considerations for the proposed project:

- ✓ Availability of adequate roof top space for Power Plant and green belt development
- ✓ Availability of water and power during construction
- ✓ Availability of labor force in the proximity
- ✓ Access to Grid connectivity
- ✓ Availability of in-house load centers (college and surrounding areas).
- ✓ Easy accessibility of the site of the plant

Ample opportunity is there to utilise their roof top area for setting up Solar Power Plant for power generation and protecting their roof tops.

Based on the following criterion proposed rooftop area is being selected.

- ✓ Sufficient area for the proposed capacity of the Power Plant
- ✓ Sufficient sunlight
- ✓ Condition of the rooftop area
- ✓ Accessibility of the proposed area

The technical authority of the college to consider the following philosophy for the proposed system. Solar panels mounted in the field generate DC electric power. The Power conditioning Units invert the direct current output from the solar array into grid compatible AC voltage, feeds it in to the utility grid system with proper protection and control. The grid connected Power conditioning Unit (GCI) range of Power conditioning Units should come with built-in transformer that ensures galvanic isolation of the DC side from the AC network. This is an important requirement that needs to be taken in to account for safety utilities to permit connection of solar panels on to the grid. The proposed system should automatically starts up in the morning and begins to export power to the grid provided there is sufficient solar energy and the grid voltage, frequency is within the range following the latest technology. If the grid goes out of range the Power conditioning Unit will be immediately disconnected and reconnected automatically at a pre determined time after the grid comes back within range. Idea is depicted below

