



Grid Connected Solar Panel Installation at IYH Mysuru, Karnataka, India

Hostel Overview

IYH Mysuru is located in the city of Palace, Mysuru in the Karnataka state of Southern Part of India. IYH Mysuru is a state of art infrastructure built up in more than 40,000 Sq.ft area with a capacity to accommodate more than 160 youth at a time. It also offers a high tech conference hall for gathering well equipped with projector and PA system. The hostel also provides classrooms for any kind of training & teaching session. This hostel receives travellers from all over the world and enjoys the lively, secure, clean, peaceful and pollution free stay at Mysuru. For the easy mobility of the guests in the city, the hostel also provides geared bicycles on nominal rented basis whose money is used to maintain those bicycles and also offer motorbikes on nominal rental basis in collaboration with Bike Rent company. In addition, the hostel has also set up a badminton court for the outdoor sports for the guests and also provide the necessary equipment to play the game. For the relaxation of guests, the hostel also have an electronic massage chair which guests can use for relaxing their sour muscles. With Grid-connected solar connection, the hostel can demonstrate its commitment to sustainability and spread its awareness among its guests and also become economically viable.

Purpose/objectives of the project activity

The proposed 40kW solar panel installation at IYH Mysuru will:

- Reduce the carbon footprint of the hostel in terms of energy consumption
- Contribute to overall energy generated by the State Government by giving back the excess energy generated by the installed system.
- Reduce the monthly expenses of the hostel in terms of electricity bills
- Demonstrate our collective efforts to achieve and promote sustainability

The main objective of the project is to reduce the overall load of electricity from the main grid of Mysuru city and to contribute the generated excess renewable energy back to the main

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grid along with a reduction in the amount of monthly bill in terms of electricity. The project will also aid to mitigate 56 tonnes of CO₂ emissions annually which is actually double the amount of existing carbon footprint.

Additionally, the project will also facilitate the awareness to our guests about the benefits of going solar and will also motivate them to opt for this renewable and economically beneficial source of energy available. The comparison of pre and post-installation consumption data we will be able to exhibit the positive impact of going solar. Since this is the first project in the hostels of YHA India, its successful completion will encourage us to go solar in other hostels as well.

The Sustainable Development Goals that the project addresses and how

The project will address the following SDGs.



Goal 2 Zero Hunger

"End hunger, achieve food security and improved nutrition, and promote sustainable agriculture." (UN SDG 2). Since part of saved money from this project will be used in growing some organic vegetables to be consumed in the hostel, it will reduce the dependency and pressure on the market. This will come under intervention to protected farming.



Goal 7 Affordable and Clean Energy

"Ensure access to affordable, reliable, sustainable and modern energy to all." (UN SDG 7). This project addresses the goal directly by generating renewable energy using solar power. The data collected will be used in spreading information and awareness among guests about the impact and benefits of using green energy.



Goal 11 Sustainable Cities and Communities

"Make cities and human settlements inclusive, safe, resilient, and sustainable." (UN SDG 11). One of the main challenges of urban spaces is to reduce pollution and one-way to tackle this is adopting green and sustainable energy system. This project is for the same. By going solar the hostel not only will reduce the burden of getting electricity from the main grid but also giving the excess generated energy to the main grid. Thus, contributing a little to the National power generation. On the other hand, the project also plays a significant role in mitigating pollution by reducing its carbon footprint, thus contributing to the sustainability of Mysuru City.



Goal 13 Climate Action

"Take urgent action to combat climate change and its impacts by regulating emissions and promoting developments in renewable energy." (UN SDG 13). The existing annual consumption of electricity at the hostel is 34255 kWh from the conventional source. This generates a carbon footprint of **28tCO₂e**. The installation of **40kW** Grid-connected solar panel is expected to mitigate

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56tCO₂e. Any measure contributing to a reduction in CO₂e is part of the low-carbon economy which fulfil the commitment towards SDG 13.

Methodology

The project started by estimating the size of the solar power plant required to be installed in the hostel. Based upon the consumption it was estimated that the **40kW** solar panel will be sufficient to meet the required electricity demand of the hostel and to reduce the existing carbon footprint. Since this size of the solar plant is expected to generate approximately **60000kWh** energy annually and the excess production of energy remaining after consumption will be returned to the main grid. For all these following steps will be taken.

1. A sealed tender was called by giving notice in National as well as the local newspaper
2. Review of quotes and selection of the contractor
3. Process necessary documents and collected necessary permits
4. A superstructure was created on the roof of the building to provide shadow-free sunshine on the solar panels. The space under this superstructure will be used for other utility purposes.
5. The order was placed for solar panels and other necessary components and the installation proceeded.
6. The PV modules are guaranteed for the power output of 90% for the first 12 years and 80% for the next 13 years. The system is totally maintenance-free and just required an occasional cleaning of the solar panel to remove accumulated dust on it.
7. After reviewing the installation for maximum effectiveness the monitoring protocol will setup.
8. After the monitoring program begins, the communication strategy will be initiated to educate the guests about the impact and benefits of going solar.

Monitoring Plan

The monitoring plan involves the plugin of a GPRS Instrument with an activated SIM Card into the RS485 port in the inverter. This instrument will be linked to the server which will generate the following data.

1. Plant Profile
 - a. Day energy generation
 - b. Monthly energy generation
 - c. Yearly energy generation
2. Power generation overview
 - a. Real-time
 - b. Weekly

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- c. Monthly
- d. Annually

All data will be featured as a dashboard on a digital display with graphical representation.

- 3. Device working condition
- 4. Any error/fault will be indicated by an alarm
- 5. Plant information
- 6. Plant analysis
- 7. Detail of CO₂ mitigated

The sample dashboard can be seen in the Fig1 and Fig2

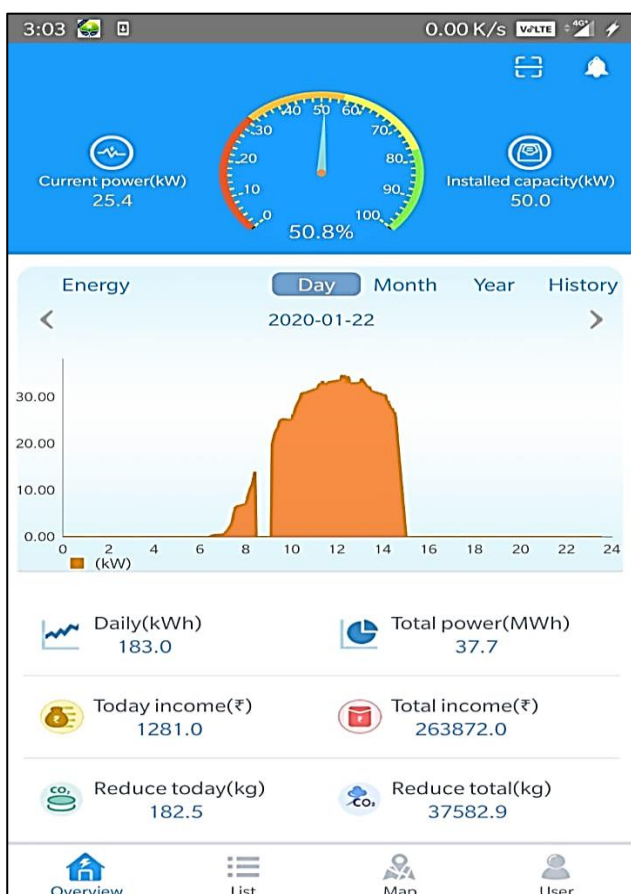


Fig1

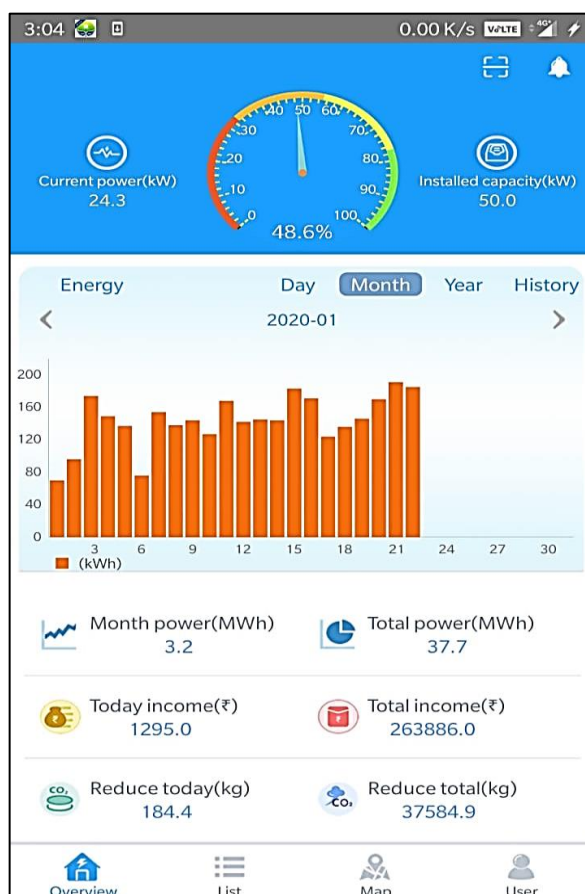
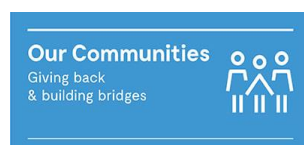


Fig2

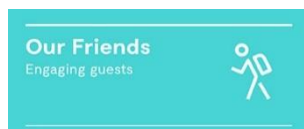
Another data set will be units consumed data from the meter. The comparison of these two data will provide a clear image of sustainable energy strategic plan and will also assist us in tracking performance.

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Contribution of the project activity to the ten areas



The grid-connected solar power installation will give back to the main grid the excess energy produced by it which will be used by other buildings of the city. It thus will build a bridge between the hostel and the State Electricity Board and contribute towards one area among other social sustainability areas of HI.



The installation of solar power will educate guests about the operation and benefits of going solar. The information given by data will make them understand the existing consumption, contribution to the main grid and the mitigation of CO₂ emission.



A part of saved money will be used in growing some organic vegetables to be consumed in the hostel. This will make a direct contribution to the area of **Consuming Sustainably** of HI.



IYH Mysuru will directly address this sustainability area of HI after the installation of 40kW solar power system which will mitigate **56tCO₂e** which is actually double the amount produced currently (**28tCO₂e**). Thus achieving carbon neutrality in terms of electricity generation and usage.



This electricity generated by this project will be used throughout the life of the hostel and with the help of saved money, the kitchen garden of the hostel will be established and improving continuously. Moreover, this project provides the base and motivates Indian Association of HI to use solar panel in other HI Hostels in India which has also provided the base for continuous improvement of the quality and sustainability of HI hostels of Indian Association.



This project is expected to reduce 12% annual expenses of the hostel in terms of the electricity bill. This saved amount will further be reinvested in the maintenance and further improvement of the hostel and to support an organic kitchen garden which will make this hostel a little self-sustained in terms of food production. Thus, the hostel addresses **Financial Sustainability** further investing the saved money in another sustainable activity for the hostel itself.

Environment, Social and Economic Impact

Environment Impact:

The existing annual consumption of electricity at the hostel is 34255 kWh from the conventional source. This generates a carbon footprint of **28tCO₂e**. The installation of **40kW** Grid-connected solar panel is expected to mitigate **56tCO₂e** which is actually double the amount of what this hostel is producing. Hence, a significant positive environmental impact.

Social Impact:

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Through this project, the excess energy produced will return back to the main grid. Thus, sharing its load of supplying electricity to the whole city. Thus, will build a bridge between the hostel and the State Electricity Board Moreover, The installation of solar power will educate guests about the operation and benefits of going solar. The information given by data will make them understand the existing consumption, contribution to the main grid and the mitigation of CO₂ emission.

Economic Impact:

The 40kW solar power installation is expected to displace approx. 60,000kWh of energy generated through conventional source annually. Resulting in an annual saving of approx. **₹468000** and in 25 years it's **₹11700000**. Further the project is expected to provide sufficient funds to support other sustainable activities of the hostel.

Estimation of emission reductions (CO₂ tonnes). Provide calculations and an estimate of how it will reduce the carbon footprint of the hostel.

The existing total consumption of electricity from the conventional source in one year in the hostel is **34255 kWh** with an average of **2855 units** consumed in one month. This much consumption generates a carbon footprint of **28tCO₂e**

The installation of 40kW grid-connected solar power system is expected to produce **60000kWh** annually whose carbon footprint is expected to be **56tCO₂e** annually (the equivalent of planting **2431 trees**) and **1398 tCO₂e** for 25 years.

Saved funds and return of investment (ROI). How much do you anticipate saving on bills after completion of the project? Provide calculations and where savings will be invested.

Project Cost	INR 28,00,000 (₹30281)
Current annual cost (electricity)	INR 5,28,680 (₹5718)
Anticipated annual savings	INR 4,68,000 (₹5061)
Investment recovery period (years)	5.9

The savings received from this installation will be reinvested into the maintenance and improving the hostel and also a part of it will be reinvested in growing some organic vegetables for the hostel.

Why should the project be funded ahead of others?

Mysuru City receives a good amount of sunlight throughout the year. The solar irradiance received in Mysuru City is such that among other 48 cities of the country it has become the part of 'Solar City' project initiated by Ministry of New and Renewable Energy (MNRE) in association with Karnataka Renewable Energy Development Limited (KREDL). The funding of this project not only allows us to take benefit of coming sunlight in the region throughout the year but also ensure our contribution to the National Project of 'Solar City' by giving back the excess energy produced to the National Grid.

The installation of **40kW** grid-connected solar panel not only benefited the hostel itself but also the environment by mitigating **56tCO₂e** annually which is very significant. This is our most significant step towards the Association's commitment to reducing CO₂ emissions by 30% by

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2030. Additionally, this project will also be a source of inspiration for our members and guests and also motivate us to extend this type of project to our other hostels and promote sustainability.

Outline a sustainable communication plan for guests and stakeholders: how will you ensure guests and stakeholders know you have won the competition and that the project is being implemented? Provide examples.

As the IYH Mysuru received hundreds of National and International visitors throughout the year the message of installed solar panels and the benefits of it will be given to them through a display which will depict the information generated by the monitoring device. The information regarding reduction in carbon footprint will also be imparted to the visitors and the due acknowledgement will be given to Hostelling International Sustainability Fund. This information will also be delivered through our social media platforms (Facebook, Instagram etc.) and will also be uploaded in the sustainability section of our website.

The achievement of carbon neutrality in terms of electricity consumption will also be our main area of focus while promoting the hostel through the website, social media and by all the other means of promotion. We will use this as a tool to reach guests and all the visitors in the hostel.

Additionally, the real-time display of the dashboard will also be available for viewing of guests on a screen will give a holistic view of the progress of installed solar panels. The sample can be seen in fig3.

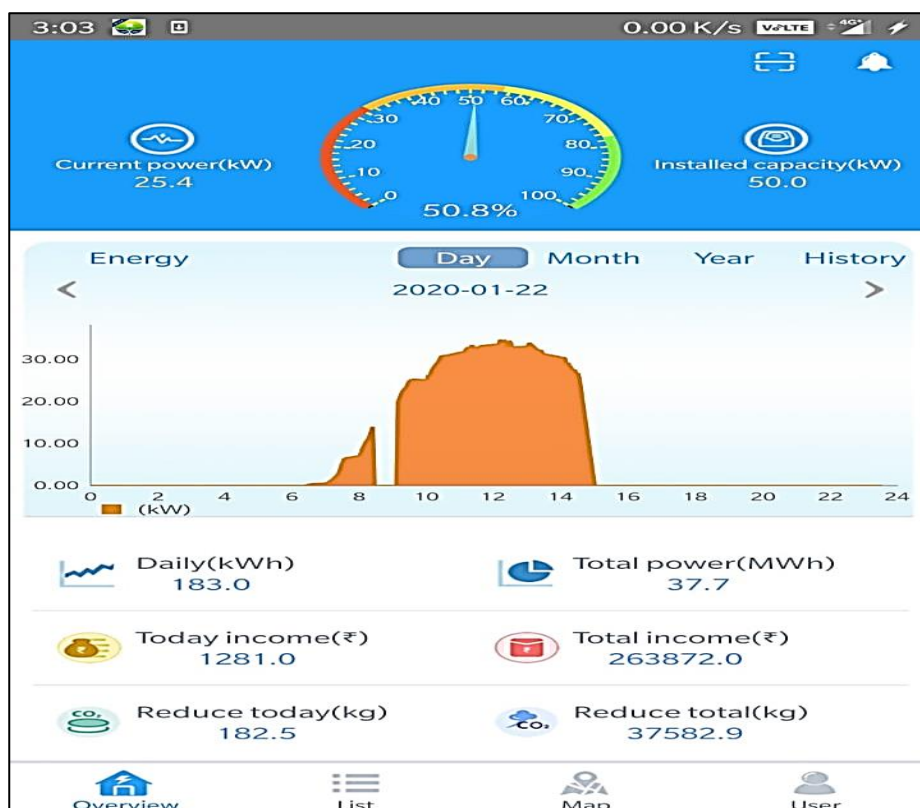


Fig 3 Holistic view of the progress of the installed solar panel

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