

Documents and Guidelines

A. Documents Required for Online Application:

Please make sure you have soft copies of following proof before filling the online application:

a. Identity Proof(Any One):

- PAN Card (preferably)
- Passport
- Voter Card
- Aadhaar Card
- Driving License
- Identity Card issued by govt. department

a. Residence/Address Proof:

- AADHAR CARD and Any other document if address differ from AADHAR Card

a. Site Address Proof:

- Electricity Bill

a. For other than domestic sector:

- Registration Certificate
- Proof of being institute/social organisation

A. **GUIDELINES FOR INSTALLATION OF THE GRID CONNECTED ROOFTOP SOLAR POWER PLANT IN THE STATE (2017-18):**

The Ministry of New and Renewable Energy (MNRE), GOI vide its letter dated 04.03.2016 (Annexure-I) and 02.09.2016 (Annexure-II) has issued guidelines for the eligibility of the Central Financial Assistance (CFA) @ 30% of the benchmark cost for installation of grid connected rooftop solar power plant, of the capacity 1 kWp to 500 kWp, to the users of all types of residential, Institutional & Social sector excluding government sector and the Commercial & Industrial establishment in private sector.

Therefore, in the State, for the installation of Grid Connected Solar Power Plants, with or without net-metering facility, without battery bank (optional with small/least battery bank) as per technical specifications/standards of MNRE, Govt. of India/HAREDA, guidelines are as under:

1. Following categories are eligible for the subsidy:

| Sl. | Category | Covering of Buildings | Eligible for Subsidy or Not |
|-----|---|---|-----------------------------|
| i | Residential | All types of residential Buildings | Eligible |
| ii | Institutional | Schools, Health Institutions including Medical Colleges & Hospitals, Universities, Educational Institutions etc. [including those registered under the Society Registration Act 1860 and the Indian Trust Act 1882]. | Eligible |
| iii | Social Sector | Community Centres, Welfare Homes, Old Age Homes, Orphanages, common service centres, common workshops for artisans & craftsman, facilities for use of community, Trust/ NGOs/ Voluntary Organisations/ Training Institutions, any other establishments for common public use etc. [including those registered under the Society Registration Act 1860 and the Indian Trust Act 1882]. | Eligible |
| iv | Private, Commercial & Industrial Sector | <ul style="list-style-type: none"> a. Companies registered under Company Act 1956/2013 other than under section 25/8. b. Company/firms registered with central/state government authority (SIDC,DIC). c. Company registered under Limited Liability Partnership (LLPs) Act 2008. d. Shops and Establishment Act. e. Multi State Cooperative Society Act. f. SSI (Small Scale Industries g. Partner Firms | Not Eligible |

1. The Government is providing Financial Assistance for the installation of Grid Connected Rooftop Solar Power Plants at rate of 30% of the benchmark cost (including the Central Financial Assistance (CFA) of MNRE, if available) or Rs. 20000/- per kWp, whichever is less, for installation of the power plant ranging from 1 kWp to 500 kWp to the users of all eligible categories of users. The benchmark cost shall be taken as the prevailing cost of the system finalized by High Powered Purchase Committee for installation of the grid connected rooftop SPV power plants for government sector buildings or benchmark cost fixed by MNRE, Gol, whichever is lower and shall be conveyed to the District Offices from time to time.

1. All eligible users shall apply online on the portal www.hareda.gov.in of the New & Renewable Energy Department for installation of the grid connected rooftop Solar Power Plant, at specific site. After sanctioning of the project by Addl. Deputy Commissioner & Chief Project Officer of concerned District, they may install the system from any of the MNRE empanelled Channel Partner or by MNRE empanelled New Entrepreneurs by strictly meeting out the minimum technical specifications prescribed by MNRE/DNRE from time to time. The MNRE approved components shall be used in the plant. Minimum Technical Specifications are enclosed herewith. The plant not installed from the MNRE empanelled Channel Partner/ Entrepreneurs may not be eligible for the subsidy. No any processing fee or security shall be deposited by the user along with the application. No application shall be entertained offline.

1. Solar Power Plants which have been installed prior to the site visit of Project Officer of concerned district are not eligible for availing subsidy.

1. Following is the benchmark cost for releasing the subsidy to the projects installed after 17.3.2017:

| Sl. | Category of GCRT plants having | Benchmark cost for the projects installed after 17.3.2017 (Rs. Per watt) |
|-----|--------------------------------|---|
| 1 | Capacity 1-10 kWp | 70.00 |
| 2 | Capacity 11-50 kWp | 65.00 |
| 3 | Capacity 51-100 kWp | 60.40 |
| 4 | Capacity 101-500 kWp | 60.00 |

(Note: Benchmark cost may change without any notice to the public)

1. If the applicant has applied for the installation of GCRT projects without net meter, the project is eligible for CFA but with the Project Completion Report an undertaking is to be given by the User and the Supplier that the solar power generated will not be injected into the grid. Also, at the time of application the user has to give in writing that the solar power generated will not be injected into the grid.

1. If more than one user (project) are connected to a common energy meter then a Joint Undertaking (Copy attached) is to be provided allowing to connect more than one plant with the same energy meter. Such projects (if under eligible categories of users) are also eligible for the CFA on submitting the Joint Undertaking by the applicant and owner of the energy meter.

1. For completion of the project, five months time (150 days) shall be given while issuing the online sanctions. However, if the Applicant fails to install the plant within five months, then the sanction issued will be treated as cancelled. No request for extension of time period shall be entertained.

1. If the applicant fails to install the sanctioned project and sanction gets cancelled, then he will not be eligible for installation of the plant again upto one year of cancellation of the project.

1. The date of installation of the power plant, pending the installation of the net meter, may be treated as the date of installation for the purpose of calculation of subsidy.

1. The installation of the systems in Govt. buildings/institutions shall be got done through the rate contract finalized through High Power Purchase Committee of the State Govt. by the DNRE. For this all the departments shall send their requirements, on the prescribed format, to the DNRE. On finalization of the Rate Contract the copy of the same along with the detailed specifications shall be sent to the respective departments by NRE Department. The New & Renewable Energy Department will allot the project to firms on Rate Contract and work order shall be placed by the user department/organization to the firms allotted. The user department/organization shall submit the Project Completion Report on commissioning of the system. However, the Renewable Energy Department shall provide all necessary technical support to the Govt. Departments/Organizations in preparation of project proposal, cost estimates, installation of the plants. The achievement linked incentive amount, if received from MNRE, GOI, shall be released to concerned department/organization after due verification.

1. After completion of the project the user shall submit the project completion report online and upload relevant document. The Committee of Project Officer and APO/TA

or as nominated by Additional Deputy Commissioner-cum-Chief Project Officer of respective district shall verify the commissioning of the system and technical specifications of the system and issue provisional commissioning certificate for the purpose of installation of Bi-Directional meter and after installation of the Bi-directional Meter Joint Commissioning Report shall be issued on verifying the commissioning of the system, performance of the system and technical specifications of the system. The concerned Project Officer shall upload the Final JCR online before recommendation of the project for release of subsidy.

1. The cases where electric connection is in the name of Father/Son/Daughter/Mother/Spouse of applicant and the project is to be installed or installed by the Son/Daughter/ Father/Mother/Spouse, release of subsidy may also be allowed.

1. For best synchronization of the GCRT solar power plant with the grid power, three phase solar inverter shall be installed with the solar power plant if synchronized with the three phase grid supply. Similarly, single phase solar inverter shall be installed with the solar power plant if synchronized with the single phase grid supply. The Rated Capacity of the Inverter/PCU shall not be less than the solar PV array capacity subject to variation of 5%.

1. On recommendation of the project & uploading the final JCR, the Additional Deputy Commissioner-cum-Chief Project Officer of respective district shall sanction the release of subsidy. Thereafter the subsidy shall be released through NEFT/RTGS in the account of the user.

1. Following time lines shall be adhered for taking actions by various officers:

| Sl. | Action | Time Line |
|-----|---|---|
| 1 | Concerned Project Officer has to visit the site and to recommend/non-recommend the project online and to submit it on file to the ADC-CPO for sanction of subsidy | <i>Within 7 working Days of submitting application by the applicant.</i> |
| 2 | Concerned ADC-CPO has to sanction the project online. | <i>Within 3 working Days of submitting the file by PO for the sanction.</i> |
| 3 | After installation/commissioning of the system the User has to upload the Project Completion Report | <i>Within four months of the date of</i> |

| | | |
|---|--|---|
| | within specified time | <i>sanction.</i> |
| 4 | Concerned Project Officer has to visit the site and to recommend/non-recommend the PCR online after signing JCR. Thereafter, PO of concerned district has to submit it on file for sanction the release of subsidy. | <i>Within 10 working Days of submitting PCR by the user.</i> |
| 5 | Concerned ADC-CPO has to sanction/non-recommend the project online. | <i>Within 3 working Days of recommendation of PO.</i> |
| 6 | After approval of the ADC on file, Distt. PO/ Accounts Officer has to transfer the amount of subsidy in the bank account of user through RTGS/NEFT. | <i>Within 3 working days of sanction accorded by ADC on file.</i> |

1. The scheme shall be implemented online to maintain full transparency, the subsidy shall be released online through NEFT/RTGS in the account of the user after verification of the performance of the plant after commissioning of the plant.

These guidelines are applicable for projects applied under subsidy programme.

COST AND SUBSIDY:

Subsidy (Financial Assistance):

1. The Government is providing Financial Assistance for the installation of Grid Connected Rooftop Solar Power Plants at rate of 30% of the cost/benchmark cost (including the Central Financial Assistance (CFA) of MNRE, if available) or Rs. 20000/- per kWp, whichever is less, for installation of the grid connected rooftop solar power plant ranging from 1 kWp to 500 kWp to the eligible categories. The bench mark cost shall be taken as the cost of the system finalized for installation of the grid connected rooftop SPV power plants for government sector buildings.

- i. **Statistical estimations for installation of Solar PV Power Plant (without battery bank):**

| Capacity | 1KWp | 100 KWp | 500 KWp |
|--|------------|------------|------------|
| Approximate Cost of System (Rs.) | 75000 | 604000 | 30200000 |
| Financial Assistance | 20000 | 1812000 | 9060000 |
| Approximate User Cost (Rs.) | 55000 | 4228000 | 21140000 |
| Life (yrs.) | 25 | 25 | 25 |
| Electricity Generation (KWh) | 1500 | 150000 | 750000 |
| Approximate annual saving on energy (Rs.) (Tariff taken as Rs. 7.40 per unit) | 11250 | 112500 | 5625000 |
| Payback period (Yrs.)* | 4.9 | 3.8 | 3.8 |

* This payback period has been calculated assuming availability of subsidy.

C. FEATURES OF GRID CONNECTED ROOFTOP SOLAR POWER PLANT

1. Grid Connected Rooftop Solar Power Plant generates electricity during day time from the Solar Energy.
2. System can be installed with or without battery bank.
3. 1500 units/ kWp (Approx.) Annual generation.
4. 10 Sq.M per kWp shadow free space is required.
5. Payback period is 4-5 years.
6. Net-metering Regulations have been issued by the Haryana Electricity Regulatory Commission on 25.11.2014.
7. Under net- metering Regulations. Solar Power generated during the day time can be utilised for captive consumption and excess, if any, may be fed to the grid as long as grid is available.
8. The exported energy to the grid may be utilised during non-Sun hours during that financial year.
9. System equivalent to sanctioned load can be installed.
10. 90% of the total consumption may be met out from the solar power under net-metering Regulations.

D. ADVANTAGES/BENEFITS OF SOLAR POWER PLANT:

(i) General:

1. Free and Green Power
2. Reduces Electricity Bill.
3. Use of Open Space for producing Energy.
4. Payback Period is 4-5 years.
5. Preventing carbon emission to our atmosphere
6. Annual saving of coal.

7. Annual Saving of precious water.
8. Adds to Green Power Generation.
9. Preventing the environment degradation.
10. Savings in electrical line or T & D losses .
11. Contribute to solar capacity addition even by small individual consumers and thus leading to energy security.
12. Utilizing the available solar energy resource in the State.
13. Reduces line load, transmission & distribution losses.
14. To contribute to productive utilization of available rooftop space.

i. Environmental and Social benefits:

1. 1.50 Tones of annual carbon emission to our atmosphere will be prevented with the installation of 1 KW capacity Solar Power Plant.
2. There will be an annual saving of approx. 1.26 M.Ton of coal if 1 KW capacity Solar Power Plant is installed.
3. 8.30 K.Litres of precious water will annually be saved on installation of 1 KW capacity Solar Power Plant which gets consumed in generating equal quantity of electricity through a Thermal Power Plant.
4. Adds to Green Power Generation.
5. Preventing the environment degradation due to large hydro – stations: Due to construction of big hydroelectric dams, productive land & forest gets submerged & destroyed and large no. of people have to be rehabilitated posing serious & grave problems. This further causes numerous environmental issues which many a time become an impediment to the execution of the project and cause delays. SPV power plants create no such issues and hence are perfectly ‘people friendly’ technology.
6. Offset the need for setting up a coal based thermal power station
7. Large scale use of solar power in India can produce substantial reductions in green house gas emissions, particularly carbon dioxide.

i. Benefits to the Power Utilities:

1. Savings in electrical line losses: substantial Energy is lost in the transmission of power to customers due to the electrical impedance in the T&D system. If the total load doubles in the given system the losses increase by about four times. A PV Generating system being located on the consumer end itself, total power so generated comes to wholesome utilization with no T & D losses.
2. Voltage Support: The PV system can reduce the power drawn from Electricity Department grid and reduces the voltage drop. This helps when large power is consumed by air-conditioners and irrigation pumps from the grid (during switching on such loads the voltage dip may take place). In rural remote locations, at the end of the distribution systems where the voltages are known to be very low due to over loading and under sized grids, the solar power generating system would provide voltage support to the grid.

3. The quantum of electricity consumed by eligible consumer, who is not defined as obligated entity, from the solar photovoltaic power plant may qualify as deemed Renewable Purchase Obligation (RPO) for the distribution Licensee.

i. **Benefits to the State:**

1. To contribute to solar capacity addition even by small individual consumers and thus leading to energy security.
2. To optimally utilize the available solar energy resource in the State.
3. To help in reducing line load & transmission & distribution losses.
4. To contribute to productive utilization of available rooftop space.
5. To create public awareness and environment consciousness amongst the citizens.

E. FREQUENTLY ASKED QUESTIONS (FAQs) FOR SOLAR POWER PLANT

1. **What is a Solar Power Plant?**

A Solar Power Plant produces electricity directly from Sun by the interaction of sunlight with a solar panel made of semiconductor material. The power provided is direct current (DC) electricity. A Solar Power Plant consists of an array of modules generating DC electricity, an inverter and sometimes battery storage back up.

1. **What are the types of Solar Power Plant?**

a. **Stand Alone System:** It is off grid solar power plant which are further of two types

- i. Stand Alone System with Battery Bank and
- ii. Stand Alone System without Battery Bank

a. **Grid Connected SPV Plant:** It is grid connected solar power plant which are further of two types

- i. Grid Connected Hybrid System with Battery Bank and
- ii. Grid Connected System without Battery Bank

a. **Grid-Export System:** *It is a grid connected system with 100 % export to the Grid*

1. **In what capacities the Solar Power Plant is available/installed?**

Solar Power Plant of capacities ranging from 1kWp to 500 kWp may be installed under MNRE Scheme. However Solar Power Plant of any capacity can be installed.

1. **Where a Solar Power Plant can be installed?**

A Solar Power Plant can be installed in a shadow free area either in open ground or on the roof top.

1. How much space is required for installation of the Solar Power Plant?

For installation of Solar Power Plant shadow free area of about 9-10 square meter per kWp area is required. However area requirement depends on the capacity and quality of solar modules used.

1. Which Electrical devices/ gadgets can be operated on this plant?

Any electric operated devices/ gadgets can be operated from a Solar Power Plant depending on the capacity of the plant, however heavy load are not advisable to operate from a small capacity Solar Power Plant with battery bank.

1. How much electricity can be generated from a Solar Power Plant daily?

For every kWp power installed on a South facing rooftop, the system will generate around 1200 to 1600 units in a year. This reduces by around 20% for an East or West facing roof.

1. For how many hours electricity can be generated from a Solar Power Plant?

On clear sunny day a Solar Power Plant can generate electricity for 5-6 hours daily.

1. Can power is available during night or non-sunny hours from a Solar Power Plant?

Electric power may be available during non-sunny hours from the solar power plant if battery bank is installed.

1. Whether electricity produced from a Solar Power Plant can be used in combination with the grid power?

Yes, it can be used in combination with the grid power by installing a grid connected (with Net-metering facility) or grid tied (without Net-metering facility) Solar Power Plant.

1. Whether it will work when grid power (Electricity Supply) is not available?

Solar Power Plant with battery bank will work even when grid power (Electricity Supply) is not available but the power from solar power plant cannot be exported to grid in absence of grid power.

However, the Solar Power Plant without battery bank will not work or give the power in absence of grid power (Electricity Supply).

1. Can an existing inverter be attached with the Solar Power Plant ?

Yes, existing inverter can be attached with the Solar Power Plant for captive use as in the case of normal grid power.

1. From where a Solar Power Plant can be purchased?

The user may install the Solar Photovoltaic Power Plants either through the Channel Partners/ Entrepreneur empanelled by Ministry of New and Renewable Energy (MNRE), Government of India or through Renewable Energy Department, Haryana/ Haryana Renewable Energy Development Agency (HAREDA). However, for government departments/organizations of Haryana, Renewable Energy Department, Haryana/HAREDA is the approved source.

1. How much time it will take for installation Solar Power Plant?

Once material is supplied at site Solar Power Plant up to 50 kWp can be installed within 5 days. For larger capacity plants time of installation may take some longer time.

1. What is the tentative cost of a Solar Power Plant?

Tentative cost of Solar Power Plant without battery bank may be at the rate of Rs. 62-75 per watt while that of with battery bank may be @ Rs. 110-130 per watt, the cost depends on the type and capacity of battery bank.

1. Is any subsidy available on a Solar Power Plant, if yes, how much?

Yes. Financial Assistance (subsidy) upto 30% of the cost/benchmark cost of the system (orMaximum Rs. 20000/- per kWp) may be provided, as per the prescribed eligibility criteria from time to time on pre sanctioned cases and as per availability of funds from time to time. However, profit making institutions, commercial and industrial establishment are not eligible for the subsidy.

1. Where shall I contact for subsidies?

The subsidy may be provided through the Renewable Energy Department/HAREDAfor which the consumer shall contact the Addl. Deputy Commissioner-Chief Project Officer. Renewable Energy of the concerned district and may apply online before installation of the system. Prior sanction of MNRE/ Renewable Energy Department/HAREDAfor each plant is required.

1. What are the major parts of the Solar Power Plant?

Solar Panels/Modules, Power Conditioning Unit (PCU)/Inverter, Battery (in case system with battery bank) and cables are the major parts of the Solar Power Plant.

1. What is the working life & warrantee available on different parts of a Solar Power Plant?

The complete Solar Power Plant shall be guaranteed for 5 years while solar panels shall be guaranteed for 25 years for 80% power output as per the MNRE guidelines.

1. Can a Solar Power Plant installed already be transported/installed at any other place?

Solar Power Plant can be transported/ installed at any other place by technical person but not easily.

1. When during day time if loads are off where will the generated power go?

If system is grid connected, having net-metering facility, then the surplus power can be feeded into the grid through a Bi-Directional meter. In case of off grid system the surplus power after charging battery bank fully will go waste.

1. Can the surplus electricity generated from a Solar Power Plant be given to the power utilities?

Yes, in a net metering system surplus electricity generated from a Solar Power Plant be given to the power utilities which can be adjusted within the financial year.

1. What is a “grid-connected” Solar Power Plant?

The “**grid-connected**” **Solar Power Plant** may be connected to the grid power by installing bi-directional meter with the permission of power utilities under “Net Metering” regulations of the State.

1. What is net-metering?

Solar Power Plant can directly be connected from the Grid. The “Net Metering” allows you to feed the excess electricity to the grid when your system is generating more power than you are consuming. The power exported to the grid may be credited to his account and can be used by the consumer during the financial year. However carry forward beyond the financial year (i.e. after 31st of March) is not allowed under net metering regulations. Detailed Net-metering Regulations can be downloaded from the web site of HAREDA or HERC.

1. Solar panels of a Solar Power Plant are to be installed on roof, how these are safe from wind and hailstorms?

These are safe from wind for a wind velocity of about 150 KM per hour and also safe from hailstorms to a great extent, if installed properly, as per specifications of MNRE/HAREDA.

1. Do I need permission from the Municipal Authorities/HUDA?

The roof mounted Solar Power Plant do not need any permission from the Municipal Authorities/HUDA. However, there is a provision of increase of FAR (as incentive) for the buildings to be constructed on plot in HUDA/Municipal Area as per Model Building Codes.

1. Will my roof be strong enough?

Most roofs are strong enough to take a solar installation without any reinforcement. However, in case of larger systems, it is suggested to obtain the opinion of a qualified Structural Engineer.

1. Do I need to inform Power Utility (DISCOM)?

The roof mounted off grid Solar Power Plant no permission is required, however for a grid connected system permission is required from Power Utility.

1. Who is the Nodal Point of Contact?

The nodal point of contact for technical help for installation of Solar Power Plant is the office of Addl. Deputy Commissioner-cum Chief Project Officer at district level and the Director, Renewable Energy Department/HAREDA at state level.

1. What are the types of solar cells / technology?

Mainly the solar cells are of three types: (i) Monocrystalline; (ii) Polycrystalline and (iii) Thin film/ amorphous.

1. What is the difference between monocrystalline, polycrystalline and thin film PV panels?

Monocrystalline solar panels tend to be slightly more expensive than polycrystalline panels, however monocrystalline panels are having a higher efficiency than others. The degradation level is more in case of Thin film solar cells.

1. How much do the solar PV panels weigh?

Normally weight of a 250 Watt panel/Module about 22-26 kg.

1. Are the solar PV panels fragile?

Solar PV panels are very robust and can withstand the normal stresses subjected by nature.

1. What is an inverter or Power Conditioning Unit (PCU)?

There are two kinds of electricity, DC and AC. Homes that are connected to utility power use AC electricity. Flashlights, small radios and automobiles use DC electricity. In order to use solar power to operate the appliances in your home, an inverter will convert solar power from DC to AC. Inverters can be further classified as units that use batteries and those that use the utility grid as power storage (Grid-connected). For grid connected solar power plants with battery bank, (PCU) is required having various features, while for system without battery bank shall require inverter.

1. Who are the Vendors for installation of the system?

Approved Channel Partners of MNRE or Manufacturer/Supplier/System Integrator empanelled with MNRE are the vendors for installation of the system. While Renewable Energy Department, Haryana/ HAREDA is the state nodal agency for installation of the system. List of Channel Partners/Entrepreneurs empanelled by MNRE is available on the website www.mnre.gov.in and also on www.hareda.gov.in.

1. Are there any technical standards for various components of the system?

Yes, the various components of SPV system shall have IEC/ISI/BIS Certification and confirm to technical standards specified by MNRE/HAREDA. Detailed technical standards for various components of the system are given on the website of HAREDA www.hareda.gov.in.

1. What are the option in the Power Conditioning Unit (PCU)?

Following may be the options in the PCU:

A. Grid Export System *Hybrid PCU(Grid Connected with battery bank):*

Condition # 1:

SPV present, Grid available

Battery Charged through MPPT charger + mains & Load supplied through Grid

Condition # 2:

PV available, Battery charged, Grid available

surplus power exported to grid connected loads

Condition # 3:

SPV not available, Grid available,
Battery charging through Grid

Condition # 4:

SPV not available, Grid OFF,
Inverter supplying power to grid connected loads through Battery

Condition # 5:

SPV & Grid not available
Battery discharged. Start DG command
Battery charging through DG

A. Grid-Connected Power Plant (Having Net Metering facility)without battery bank:

Condition # 1:

PV present, Grid available

Load supplied through PV upto level of PV and draws more, if required, from Grid

Condition # 2:

PV available, Grid available

If load is less then PV available then surplus power exported to grid

Condition # 3:

PV not available, Grid available,
Load supplies from Grid.

Condition # 4:

PV available, Grid Not available

The power plant will not work

1. **What are the advantages and Limitations of Solar Power Plant?**

Advantages/Disadvantages of A Hybrid System (Grid Connected with battery bank):

Advantages:

- High level of reliability to Battery bank.
- Lesser battery discharge and hence longer life of battery.
- Reduced electricity bills.
- Highly reliable system and can be used in wide range of URBAN/Industrial/Institutional application.
- Also improves the quality of AC power and can be called solar UPS.

Disadvantages/Limitations:

- High Cost.
- High cost on maintenance
- Works on battery charge-discharge leadings to:
 - Wastage of precious PV power generated.
 - Reduced battery life.
- Does not ensure optimum yield from PV panels.

Thus Hybrid Solar Power Plant is suitable only for RURAL areas where Electricity Power from the Grid is not available at present and is not likely in near future.

Advantages/Disadvantages of Grid-Connected Power Plant without battery bank:

Advantages:

- High conversion efficiency of PV Power into usable AC power
- Simple system with longer life i.e. no battery life issue.

Disadvantages:

- Works only when grid power is available.