

# Discussion on Distributed Solar Rooftop program in West Bengal: Problem & Perspective



**Tofay's Theme**  
**Climate Responsive Technologies**

**at National Institute of Technical Teachers' Training and Research**  
**25th June 2023**

**Presentation**  
**BY**

**Organized by (FOSET)**

**MR. RAKESH NASKAR**

**Director**


**SARN Solar Solution Pvt. Ltd.**



**SARN SOLAR SOLUTION PRIVATE LIMITED**  
**ISO 14001:2015 CERTIFIED COMPANY**



**The sunlight we receive for just an hour is enough to generate energy for one year for the whole world. Although the Earth receives around 173 petawatts of energy continuously, we are able to harness merely 0.0001% of this vast amount.**

 9831289698/9432689034

 [sarnsolar@gmail.com](mailto:sarnsolar@gmail.com)  
[contact@sarnsolar.in](mailto:contact@sarnsolar.in)

 [www.sarnsolar.in](http://www.sarnsolar.in)

ॐ सूर्याय नमः



**LET THERE BE LIGHT, LET THERE BE POWER.....**

# Problem & Perspective



## 5 Problems With Rooftop Solar:

### 1. Roof Position, Structure, and Tilt

The perfect example is sunflowers....

Sunflowers' position always faces the sun as it moves throughout the day. Your roof sadly, does not have this option.



### Solution:

- 1) **The Solar Fence** is both a good alternative and a complement to existing rooftop solar power systems. Houses that were previously unable to install efficient rooftop solar because of their roof orientation, now have the option to forego the roof altogether.
- 2) **Reposition your roof / rebuild your house** to be able to install solar panels
- 3) To offset tilt problems **Invest in mounting frames** which will give, the solar panel system a better angle to increase efficiency, but at the cost of increased weight stress to your roof, and an additional expense.



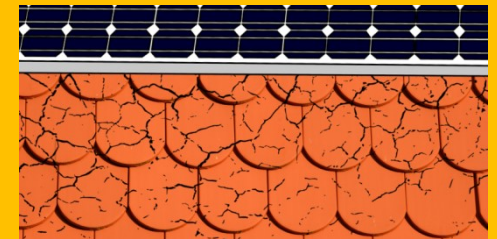
# Problem & Perspective



## 5 Problems With Rooftop Solar:

### 2. Roof Strength and Leaking

#### Problem:



Solar panels can be quite heavy, with 40 – 60 pounds of weight (20-30 kg) per panel.

Older, weaker roofs or roofs exposed to heavy snowfall may depreciate faster due to the added stress and any possible cracks suffered during the course of the system's lifetime.

Moreover, holes must be drilled into the roof, causing possible leakage in the long term.

#### Solution:

The Solar Fence is a stand-alone unit, causing no extra stress anywhere.

# Problem & Perspective



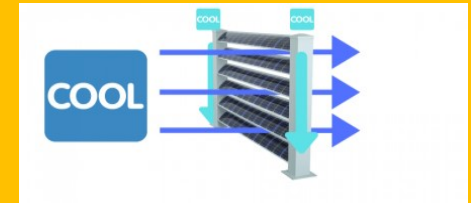
## 5 Problems With Rooftop Solar: 3. Cleaning / Efficiency / Overheating



### Problem:

- The efficiency of your solar panels can be dramatically reduced if the panels get dirty or are seasonally covered in snow. Even something as small as a single bird dropping can affect the energy production of the entire unit, and accessing your roof to clean them can be difficult and dangerous.

Rooftops can also get quite hot and the panels are exposed to a drop in efficiency due to overheating, which can also be dangerous.



### Solution:

- 1) **The Solar Fence** is located at ground level and enables you to easily clean the panels on a daily basis if needed, without much hassle and effort. Moreover, greater airflow through the fence and the aluminum material it's made of provide a natural heat sink, decreasing efficiency loss due to overheating.
- 2) **Solar Panel Cleaners** are professionals specializing in accessing rooftop solar power plants and cleaning them for a fee. Some providers may offer you annual plans (depending on the contractor).

# Problem & Perspective



## 5 Problems With Rooftop Solar:

### 4. Fire Hazard

#### Problem:

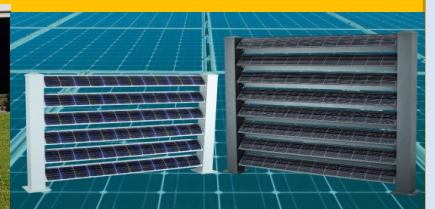
Generally, it's a bad idea to put a fire hazard on top of everything you own. Yet, we're doing exactly this with rooftop solar installations, which could combust due to a manufacturing error, installation error, or damage over time.



An additional problem is, that if the rooftop solar array combusts into flames, you may not notice the problem until it's too late. When the firemen finally arrive, they will fill your house with water/extinguishing foam, since there is no other option, causing you secondary damage to your possessions in addition to roof repair and solar power plant loss.

#### Solution:

1. **The Solar Fence** is a distance away from your property, so there is more time to extinguish a potential fire and a greater chance that you will catch the fire before it spread to a disastrous scale.



# Problem & Perspective



## 5 Problems With Rooftop Solar:

### 5. Space



#### **Problem:**

Unless you have heaps of land to spare, most residences prefer their front and back yards to be free for family fun in the summertime, a future pool, or a precious gnome collection.

#### **Solution:**

- 1) The **Solar Fence** saves you heaps of space by stacking solar cells vertically at greater efficiency due to the smart shadow management system. The total power output might be less than a giant ground-mounted system, however, this configuration enables you to have the best of both worlds, space, and power!
- 2) **Install Rooftop Solar**, providing your roof is spacious enough for your energy needs and our other points haven't convinced you yet.

# SOLAR PV SYSTEMS

- **Small decentralized SPV systems**  
SL, SLS, HLS, Power packs  $\leq 1\text{kWp}$
- **Stand-alone/ Off-grid SPV power plants**  $> 1\text{kWp}$   
(with local distribution line)
- **SPV Rooftop Systems for abatement of diesel for power generation (grid/off-grid)** 10-100kWp
- **Grid-connected SPV power plants** MW-scale

\*\*Home lighting systems (**HLS**), solar street lighting systems (**SLS**), solar lanterns (**SL**)





# Options:

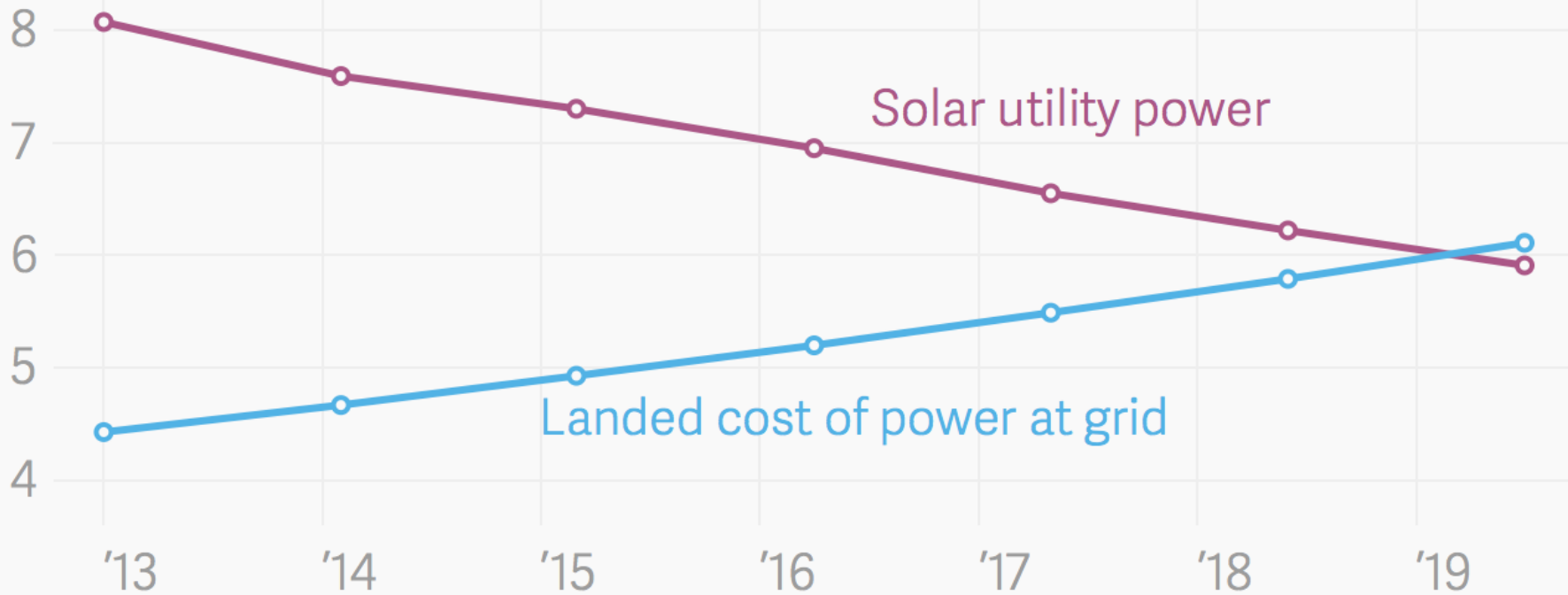
- Roof top systems
- Independent system
- On grid
- Off grid

## Commercials ....

- Solar panel cost(INR): 30-45/W
  - Charge controller(INR): 400-400000  
(depending upon the rating)
  - Battery(INR): 15-22/W hour (15% of total solar system installation cost)
  - Invertor (INR): 12.4- 31/W
  - Miscellaneous (INR): 30-60/W
  - TOTAL MINIMUM COST/W is: 91/W
- FOR 1KW COST IS APPROXIMATELY 1.2-1.8L

# Grid parity projection in India

Rs9/kilowatt-hour



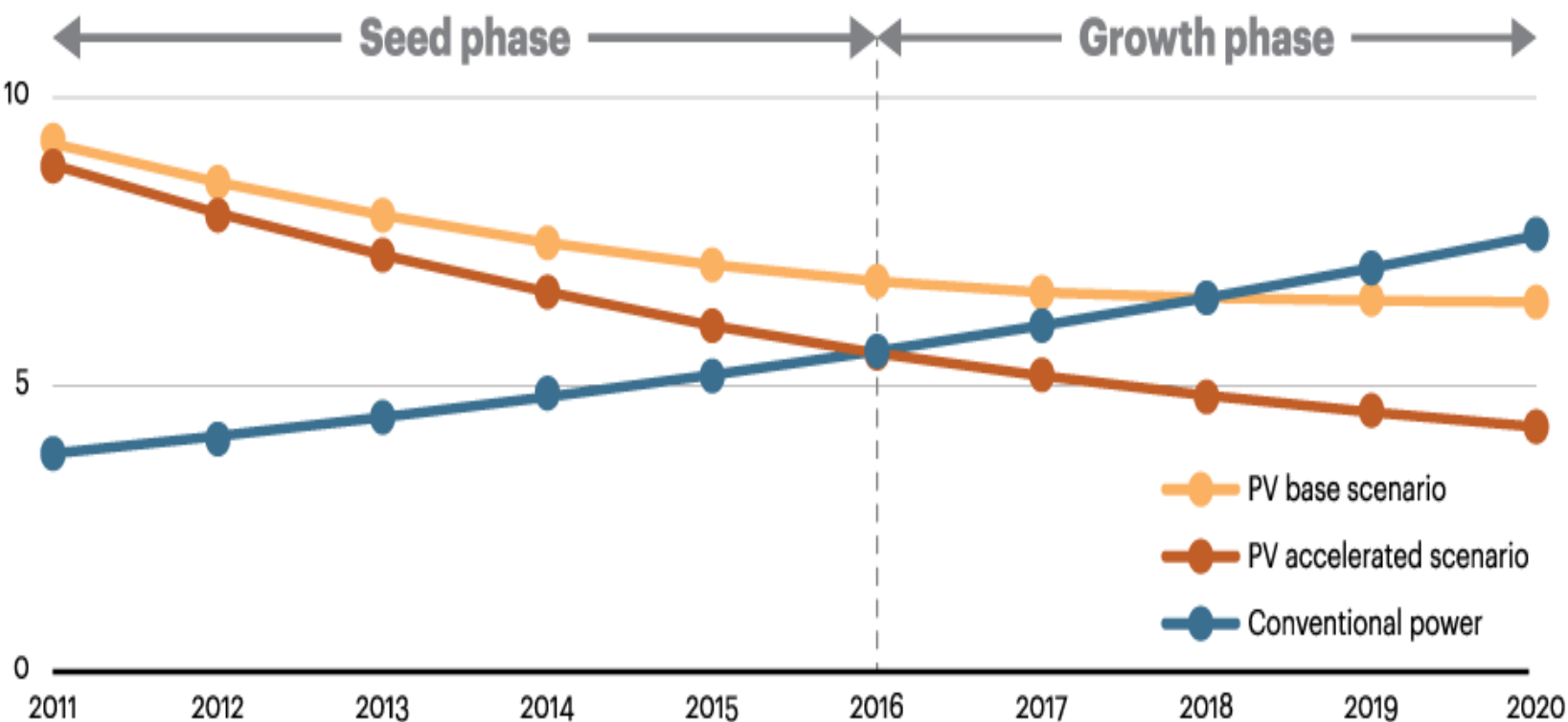
△ T L △ S | Data: KPMG

Figure 1

# Solar power will achieve grid parity with conventional power between 2016 and 2018



Energy costs (rupees per kilowatt hour)



Notes: PV base scenario is a 6 percent yearly cost decrease, and the accelerated scenario is 8 percent. Conventional price assumes 8 percent yearly increase. PV is photovoltaic.

Source: A.T. Kearney analysis



# How a Solar Rooftop Project is Executed!!!

1. Site Survey with Total Connected Load Analysis
2. Annual Electric Bill Analysis
3. 7 days means a Calendar week day time and nighttime load analysis for Hybrid System.
4. Suggestion for a Suitable Solar Plant with shadow-free space consideration.
5. The Proposal with various parameters consideration like AC & DC Cable length, Structure type rooftop or tin shed Structure, Poly/ Mono Module, Inverter Brand, Earthing Consideration
6. After receiving the work order with 30% advance PV Syst Analysis done for details analysis of the solar plant.
7. Sketch up view
8. BOS Materials list
9. Structure design
10. \*\*\*\*\*SLD (Single Line Diagram)
11. Materials Order & Delivery Within 15 days from the work order with advance payment received date.
12. 50% advance just after delivery of all materials and before starting of Installation work
13. Installation complete as per design and SLD.
14. Installation Completion handover form with all documents like warranty certificates and claim of remaining 20% by Tax Invoice Generation.
15. Documentation of Government liasoning for Net Meter approval.
16. Project Insurance copy handover after completion of payment.
17. Net meter Installed and tension free for 25 years.



**\*\*Sample project file will Execute at Seminar Hall if necessary\*\***





# BODHISUKHA SCHOOL 50 kW ON GRID SOLAR POWER PLANT: Kathor Rd, Barasat, Kolkata, West Bengal 700128





# Serampore Girls' College 5kW on-grid Solar Power Plant: 13, T.C, KL Goswami Street, Serampore, West Bengal 712201



**5 kW ROOFTOP GRID-CONNECTED SOLAR PHOTOVOLTAIC POWER PLANT**

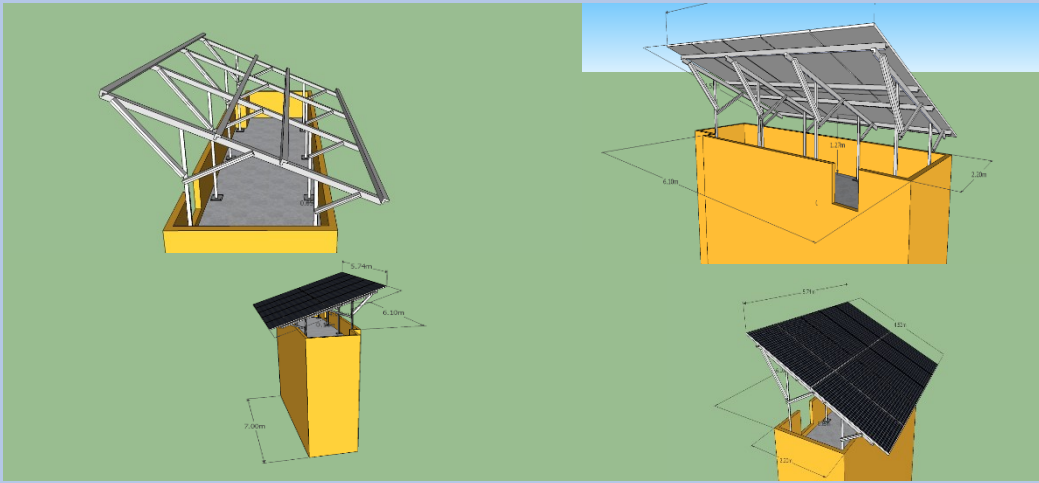
AT  
**Serampore Girls' College**  
13, T.C, KL Goswami Street, Serampore,  
West Bengal 712201  
Work Order Reference No: 11/23 on dated 09/06/2023

&  
Executed by Solar EPC Contractor  
**SARN Solar Solution Pvt. Ltd.**

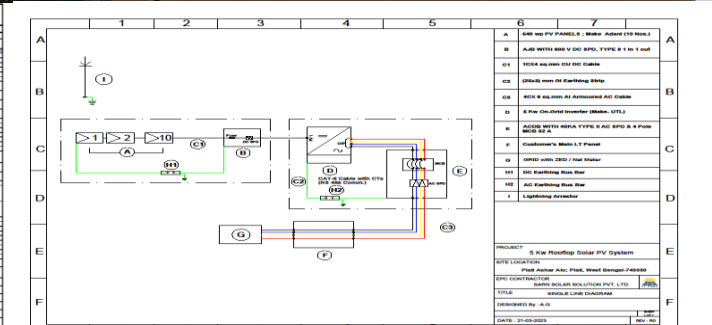
"Swapa Neer" Apartment, 1st Floor, R.N.C Road, Subhasgram  
Kolkata - 700147, West Bengal, INDIA  
Phone Number - +91 9432689035 / 7003792405  
Email Address - sarnsolar@gmail.com / contact@sarnsolar.in  
17/06/2023



# Piali Ashar Alo School 5kW on-grid Solar Power Plant: Piali Rd, Solgohalia, West Bengal 743330



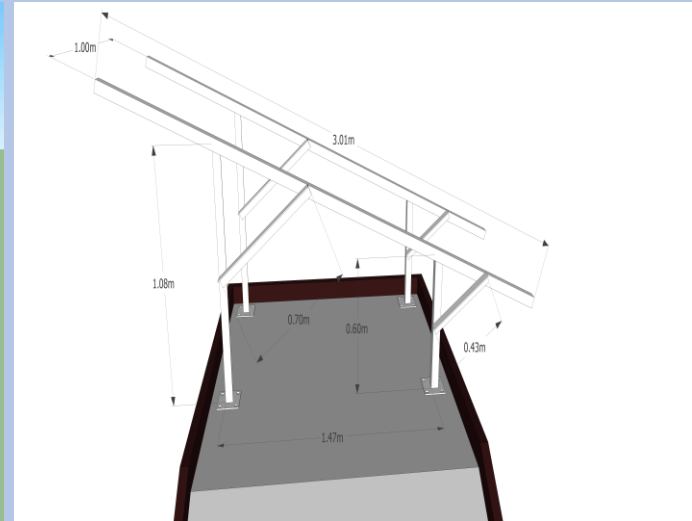
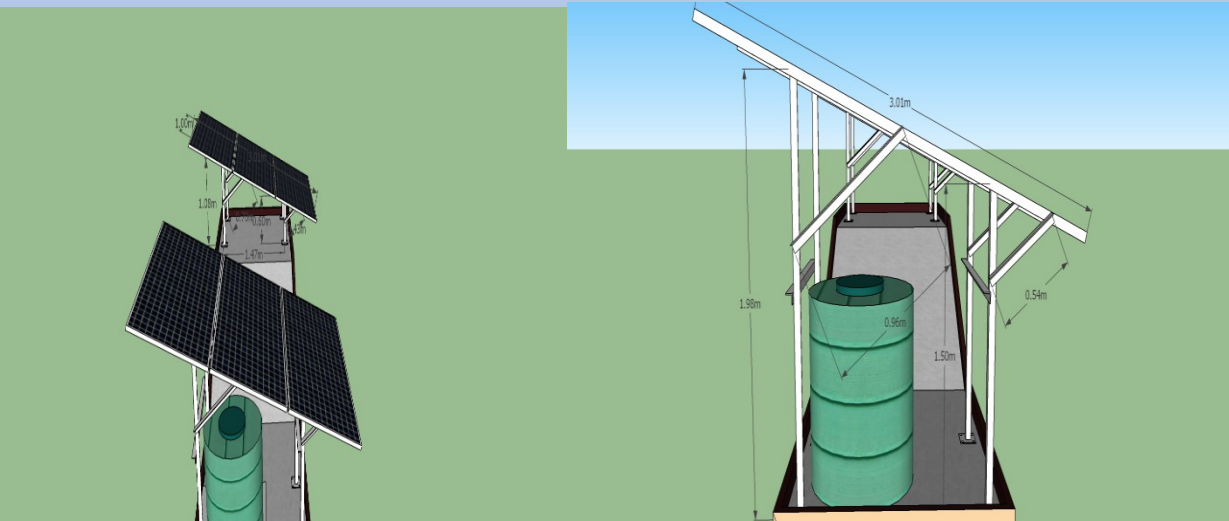
SARN SOLAR SOLUTION PVT LTD	
Project Name: Piali Ashar Alo School 5kW on-grid Solar Power Plant	
Date: 11.03.2023	
1. Site Survey & Feasibility Study	10%
2. Design & Engineering	20%
3. Procurement of Materials & Equipment	30%
4. Installation & Commissioning	20%
5. Operation & Maintenance	10%
6. Training & Handover	10%
7. Warranty & Support	10%
8. Total Project Cost	100%





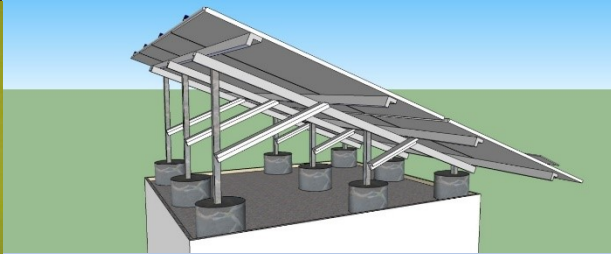
# Domestic 2kW Hybrid Solar Power Plant:

Piyari Kabiraj Lane, Word No:18 South 24 Pgs, WB Kolkata-700148





# OUR UNIQUE PROJECTS:





# OUR OTHER PROJECTS:





# VARIOUS WEBINARS FOR AWARENESS:



**GREATER KOLKATA COLLEGE OF ENGINEERING AND MANAGEMENT**  
Baruipur, Near Phultala, South 24 PGS-743387  
www.gkcem.ac.in

ORGANIZED BY DEPARTMENT OF BASIC SCIENCE & HUMANITIES

**TOPIC**  
**APPLICATIONS OF SOLAR CELL & JOB OPPORTUNITY IN WEST BENGAL**

**LIVE WEBINAR**  
**22ND MAY, 2021**  
**11 AM ONWARDS**

**Mr. Rakesh Naskar**  
Director SARN Solar Solution Pvt. Ltd.

SCAN HERE TO JOIN MEETING  
MEETING ID: 979 5197 2431 | PASSCODE: 935969

**Gargi Memorial Institute of Technology**

**LIVE WEBINAR**

**"A Potential Source of Renewable Energy & Related Job Opportunity in West Bengal"**

**TUES DAY | JAN 26 | 3:00 PM**

**Mr. Rakesh Naskar**  
Director,  
SARN Solar Solution Pvt. Ltd.

**REGISTER**  
<https://forms.gle/fSSGF76g9nKBaMxMA>  
**Last Date of Registration 25.01.2021 @ 5:00 PM**

Organized By, EE Dept., GMIT  
Convener, Mr. Sajjan Kumar



*Ms. Kamalika Ghosh, M. Tech. (Engg.)*

Director - School of Illumination  
Science, Engg. and Design  
Jadavpur University  
188, Raja Subodh Mallick Road  
Kolkata - 700 032, India

Date : 19.8.2020

### TO WHOM IT MAY CONCERN

This is to certify that Mr. Rakesh Naskar, Director M/s. SARN Solar Solution Pvt. Ltd has given Technical presentation titled "A Potential Source of Renewable Energy and related Job Opportunity in West Bengal" delivered on 19<sup>th</sup> August 2020 through visual meeting Platform.

He has enriched our M.Tech. students through detail discussion on the subject.

By this letter, we appreciate his expertise on the subject and express gratitude for his presentation.

Thanks and Regards

KAMALIKA GHOSH

Director - School of Illumination Science, Engg. and Design  
Jadavpur University, Kolkata

Email : [dir.illumination@jadavpuruniversity.in](mailto:dir.illumination@jadavpuruniversity.in)/[kamalika.ghosh4@gmail.com](mailto:kamalika.ghosh4@gmail.com), Mob: +91 9432091432

**GMIT**  
it's campuslife

**JIS GROUP**  
Educational Initiatives

**Mr. Rakesh Naskar**

A Token of Gratitude to  
*Mr. Rakesh Naskar*

"For Being the Invited Speaker at Webinar Series GMIT - EE"

**GREATER KOLKATA COLLEGE OF ENGINEERING AND MANAGEMENT**

*gratefully acknowledges*

**Mr. Rakesh Naskar**  
Director  
Sarn Solar Solution Pvt. Ltd.

for his enlightening session  
*On*  
**Applications of Solar Cell & Job Opportunity in West Bengal**

Date: 22-05-2021

**PAILAN Technical Campus** | **PAILAN Group of Institutions** | **PAILAN College of Management & Technology**

**CERTIFICATE OF APPRECIATION**

This certificate is presented to  
**Mr. Rakesh Naskar**  
Director,  
SARN Solar Solution Private Limited, West Bengal

For Participation as a Speaker in One Day Webinar  
Organized by  
Pailan Technical Campus & Pailan College of Management & Technology

4<sup>th</sup> September 2020

Dr. Bivas Roy  
Signature of Principal  
Pailan Technical Campus

Dr. Ratul Kr Majumdar  
Signature of Principal,  
Pailan College of Management & Technology

**Webinar On**  
**"Solar Energy Application with it's sustainability & potential and Related Job Opportunity in West Bengal"**

**RESOURCE PERSON:**

**Mr. Rakesh Naskar**  
Director  
SARN Solar Solution Pvt Ltd

**DEPARTMENT OF ELECTRICAL ENGINEERING  
REGENT EDUCATION & RESEARCH FOUNDATION  
GROUP OF INSTITUTIONS**

**Last Date of Registration: 5<sup>th</sup> August, 2021**

**Register Here**

7<sup>th</sup> August, 2021  
11AM onwards

Platform  
GOOGLE MEET

E-Certificate will be provided on sending the Feedback Form

**GMIT** | **GARGI MEMORIAL INSTITUTE OF TECHNOLOGY**  
it's campuslife | "Approved by AICTE, Affiliated to MAKAUT" | Balarampur, Mouza Beralia, Baruipur, Kolkata - 700 144

**Certificate of Appreciation**

Gargi Memorial Institute of Technology Expresses its Appreciation to  
*Mr. Rakesh Naskar, Director, Sarn Solar Solution Pvt. Ltd.,*

for sharing his valuable knowledge as a Guest Speaker during this webinar titled **"A Potential Source of Renewable Energy & Related Job Opportunity in West Bengal"**, held on **26<sup>th</sup> January, 2021**, organized by, Department of Electrical Engineering, Gargi Memorial Institute of Technology, Kolkata - 700144.

Dr. Sajjan Kumar | Mr. Amartya Roy | Dr. Syed Samser Ali | Dr. Parasar Bandyopadhyay  
Convener - Webinar | TIC - EE Dept., | Principal, | Director,  
GMIT, Kolkata - 700144. | GMIT, Kolkata - 700144. | GMIT, Kolkata - 700144. | GMIT, Kolkata - 700144.



# A Genuine Approach to Understanding Return on Investment



## Case Study:

Considering a Solar Photovoltaic Installation of a 100 kW system

The present cost of Installation is Rs. 48, 000, 00/- (approx.)

Now, by means of approximation, it appears that 1 kw installation generates the energy annually, 1200 units (kwh).

For 100 kW installation generates the energy annually, 1, 20,000 units (kWh).

For commercial users, it appears from the tariff rate the cost of per unit energy is Rs.10/-

Therefore the total cost of energy consumed annually is approximately equivalent to Rs. 12, 00,000/-

Considering the Project life cycle is 20 years, it is obvious that the total equivalent money that will generate is Rs.2, 40, 000, 00/- (2.4 cores)

This shows a high Return on Investment.

Note: 1. As per the present rule 10% of energy has to be consumed from WBSEDCL or CESC

2. Excess generation feeding to the grid will not earn any payback (it is under real optimization process)

Rate of a unit of WBSEDCL

6% increase every year..

And one percent (.8 %) system efficiency decreases every year.

48 lakh invest for 20 years then gain in interest under ITR Return

So

Net profit from interest (fixed deposit at the bank) is very less than this projected value....

**No investment--- 1 crore above saves from electricity bill amount for 25 years**

**For 100kw, 48 lac (30% subsidy also available) proportional investment----- 3 crore save from electricity bill amount for 25 years**





- So, Go SOLAR...
- Build a green Environment for future generation.....
- **One social contribution:**
- CO<sub>2</sub> emissions are about 1.12 (kg/kWh) as the Singrauli coal has 50.2 % carbon. Dadri, Chandrapur, and Dahanu plants emit about 0.82, 1.02, and 0.85 kg/kWh
- So, approx
- Think 1kg CO<sub>2</sub> per Unit generation we can save.....
- Also estimated that emit about 33 g/kWh SO<sub>2</sub>, whereas Kahalgaon plant emits only 2.72 g/kWh SO<sub>2</sub> as the sulfur content in the coal used at this plant is only 0.17%. NO emissions per unit of electricity
- Reference paper:
- “Estimates of Emissions from Coal Fired Thermal Power Plants in India” Moti L. Mittal



Consider 5 kw 3ph system minimum as per wbseb Rules

Price: 3.1 lac

Roughly 3 lacs

Invest fixed deposit at 8% rate gain 24000 /-

System will provide  $1200 \times 5 = 6000$  unit\* 7 = 42000/- for 25 years as per system warranty

After upto 60 years also you will gain (panel degradation 80% to 30% )

Your ROI



invest ment	1 <sup>st</sup> yr	2 <sup>nd</sup> yr	3 <sup>rd</sup> yr	4 <sup>th</sup> yr	5 <sup>th</sup> yr	6 <sup>th</sup> yr	7 <sup>th</sup> yr	8 <sup>th</sup> yr	25 <sup>th</sup> yr As per Panel warranty and after 25 <sup>th</sup> yr generation going on...
3lac	-42000 = 258000	-42000 = 216000	-42000 = 174000	-42000 = 132000	-42000 = 90000	-42000 = 48000	-42000 = 6000	36000	Total $42000 \times 25 = 10,50,000$ / & going on....

***Sustainability determines the ways we think  
Renewability determines the ways never end.***

***So Determination of thinking never became end.....***



## SOLAR ENERGY ECONOMICS



**No Investment to full investment various scheme present**

**100 kw aspect**

**---No Investment then 1 Corer Save**

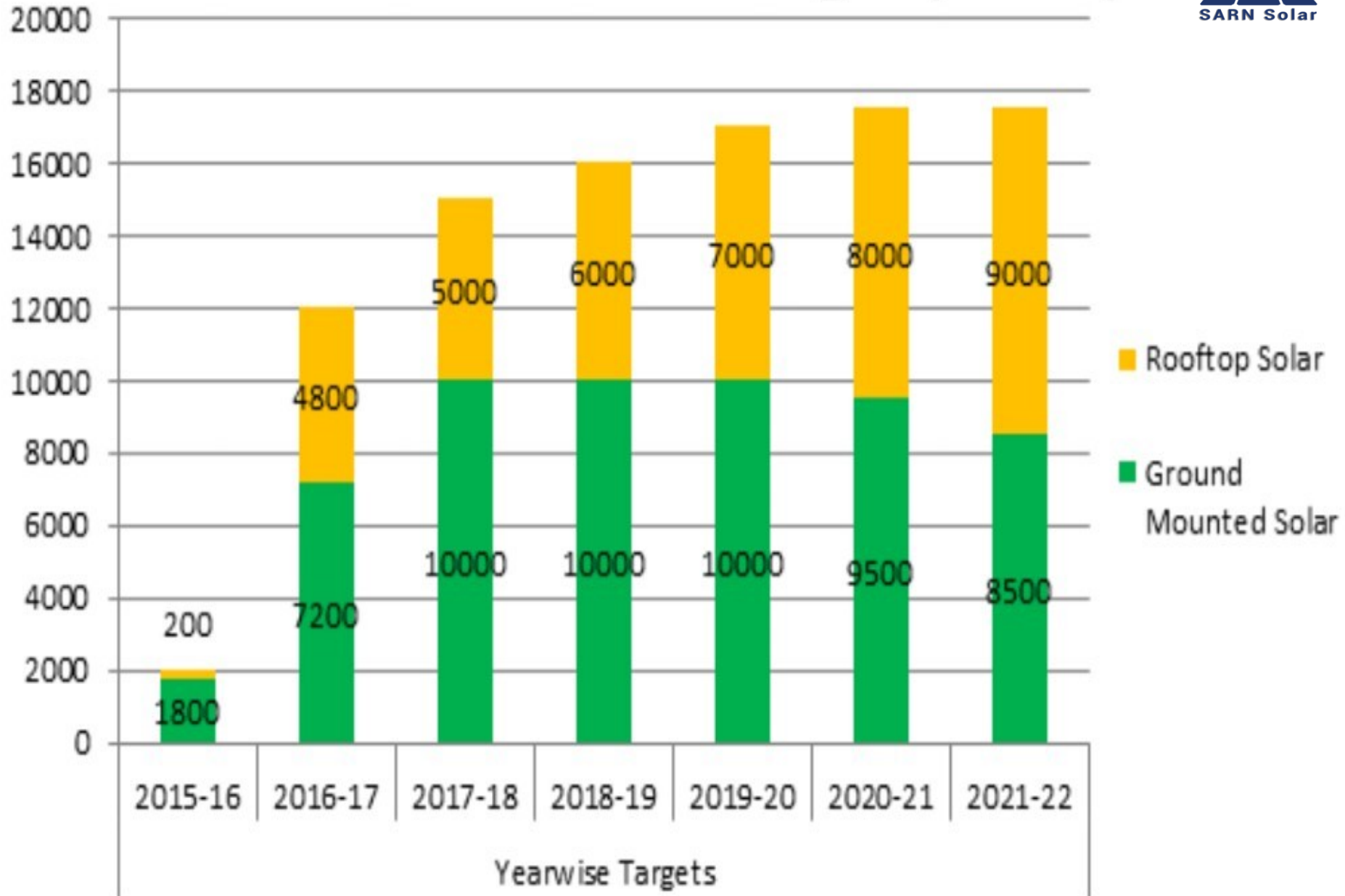
**-----Full Investment then 3 Corer Save from Electric bill.**

**Social Contribution: Huge amount CO<sub>2</sub> Emissions reduction by Solar Application**

**To know more, Call 7003792405**

Solar Plant Capacity (KWp)	5	10	20	50	100	200
Type	Grid Connected: where any surplus power generated goes to the Grid and you get adjustment for it in your own consumption through Net Metering as a Govt. Approved project.					
Payback period	4-5 years					
Life of solar Plant	25 years					
Solar Module warranty	25 years performance warranty					
Expected <b>Assured</b> Annual Electricity generation	6000	12000	24000	60000	120000	240000
Area Required(Sq.ft)	500	1000	2000	5000	10000	20000
System Price (Rs.)	300000	550000	1000000	2300000	4400000	8500000
Power cost Per Unit (Rs.)	2.00	1.83	1.66	1.53	1.46	1.41

# MNRE Year-wise Solar Targets (in MW)



# Case Study of a Solar House: Design

- Annual Energy Requirement = 8000 KWh
- Daily Requirement =  $(8000/365) = 21.90$  KWh
- Looking at the Solar irradiation Charts, At west bengal it average  $4.5 \text{ Wh/ m}^2$  but now consider approx  $4 \text{ Wh/ m}^2$
- Solar PV System Size (AC Side) =  $21.90/4 = 5.475$  KWp
- Plant Efficiency = 0.92
- Solar PV System Size (DC Side) =  $5.475 / 0.92 = 5.9511$  KWp
- (Optional) For Effective Long Lasting Design-
- Considering Module ageing effects of 1% per year for first 10 years
- Safe PV Capacity -  $5.9511 / 0.9 = 6.61$  KWp  
 $\approx 7$  KWp system





WHERE AS SOLAR WILL GIVE  
**16%**  
GURANTEED RETURNS

# 1kw – One Day – 5 Units

5 Units × 30 Days

150 Units

Per Unit – Rs. 6/-

$150 \times 6 = 900/$  month

12 months × 900 = Rs 10,800/-

1kw = 75,000/-

Return on Investement (ROI) = 16 %



# 3kw – One Day – 15 Units

15 Units × 30 Days

450 Units

Per Unit – Rs. 6/-

$450 \times 6 = 2700/$  month

12 months × 2700 = Rs 32,400/-

3kw = 2,25,000/-

Return on Investment (ROI) = 16 %



*We don't want to melt the polar, so we should  
all use solar.*



# SARN Solar Solution Private Limited

ISO 14001:2015 Certified, MSME & Start Up India Registered Organization  
Registered under Government of India

CIN: U80901WB2019PTC230256

GSTIN: 19ABBCS5489G1ZV



Registered Under.....



**Office Address:**  
**Subhasgram , South 24**  
**Parganas, West Bengal,**  
**Kolkata-700147 (Follow**  
**GPS)**

**CONTACT NUMBER:**  
**7003792405 / 9432689034 /**  
**70038 72702 / 9874119954**

**WhatsApp No.:**  
**9432689034 / 9874119954**

**WEBSITE:**  
**www.sarnsolar.in**

**Mail ID:**  
**sarn.solar@gmail.com /**  
**sarnsolar.info@gmail.com /**  
**contact@sarnsolar.in /**  
**hr@sarnsolar.in**

# SOLAR VARIOUS APPLIANCES



## • SOLAR DEEP FREEZER

- DC operated with low voltage like 12 volts /24 volts and achieving temperature up to -15 degrees Celsius, they can directly run on battery without inverter, so there are no conversion loss of electricity, where battery can be charged by solar panels or grid power, or boat engine, battery back-up is of 12 to 14 hours and cooling can be maintained up to more 5 to 6 hours , they are portable and can be easily used on fishing boats , electric vehicle, manual cart, small shops, street hawkers, they are available in capacity from 100 litres to 2 tons , being run on solar and consuming very less power, they are efficient and helpful to store fish for longer duration thus increasing the lively hood of fisherman community.



SOLAR DEEP FREEZER



## Solar freezer on E rickshaw

- Solar freezer on E rickshaw
- These are battery operated e rickshaws fitted with solar panel roof to run the dc freezers fitted on that, capacity of freezers can be any as per sales requirement in the locality, advantage of e rickshaw is that in one charge it can cover distance up to 70 to 75 kms, the running cost thus comes to nearly 50 paise per km, according to electricity consumed to charge the batteries, thereby helping the vendor to cover larger area for marketing without any additional infrastructure, also the arrangement of passenger sitting is made in the rickshaw so the owner can ferry passenger's when he is off season for fish, so increasing his income and livelihood.





## Solar paddle wheel aerators



- Solar paddle wheel aerators.
- Mostly traditional fish farms are far from locality making them difficult to get uninterrupted electricity 24 hours, to get rid of such problems use of solar powered aerators with battery back-up is useful, this can minimise the use of diesel engine and thereby reducing the running cost and harmful gas emission's near fish pond's.

# Submersible Pumps



## DC submersible pumps

These are dual driven i.e solar power and battery driven pumps with high discharge capacity of water, they can be used in boats to dewater during high tide waves, also can be used in fishing ponds for water circulations, working on solar power so have no operational cost resulting in savings of the community.

**Our others projects are Solar RO Water Purifiers, Solar Cooler, Solar Street Light, Solar Water Heating systems, etc.....**

# Solar Street Light

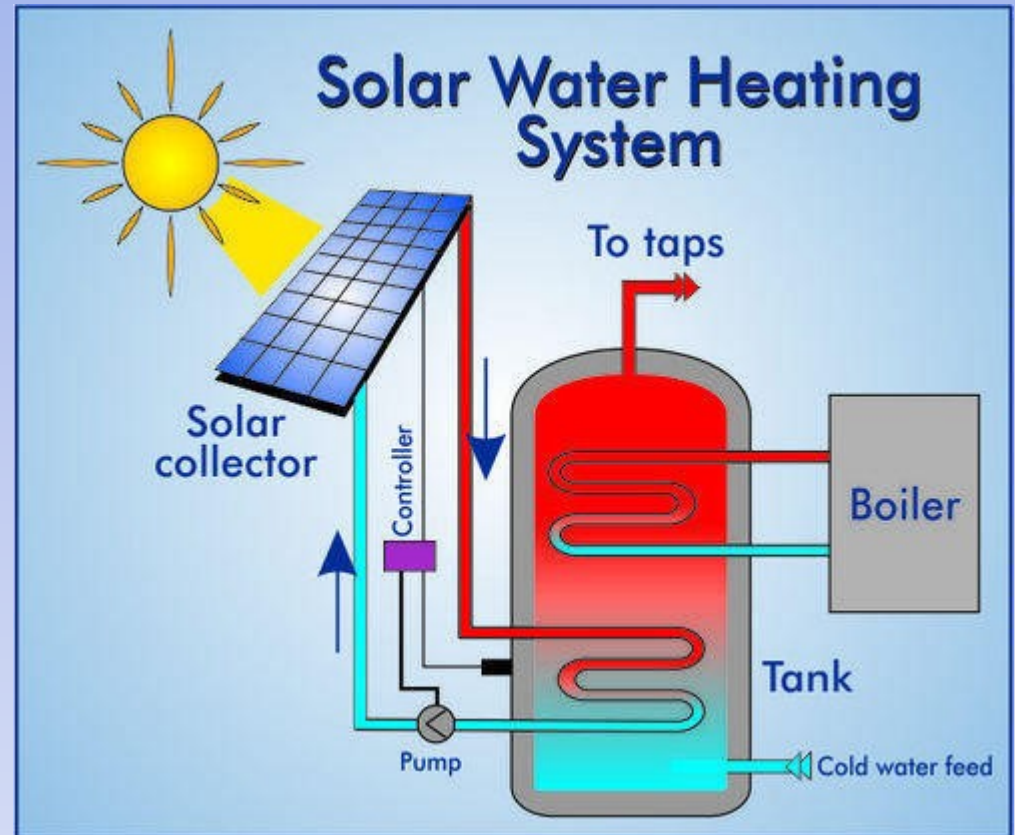




# Solar RO Water Purifier



# Solar Water Heating System



# Solar Cooker





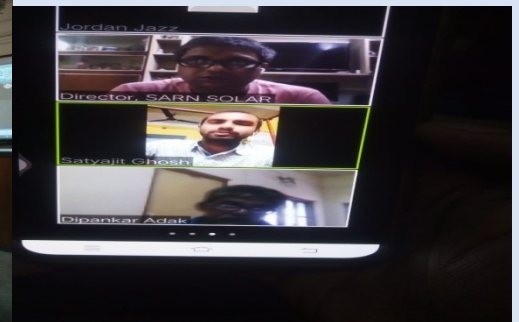
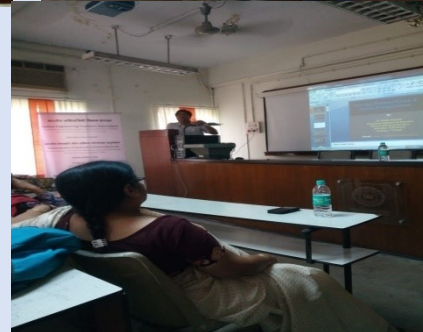
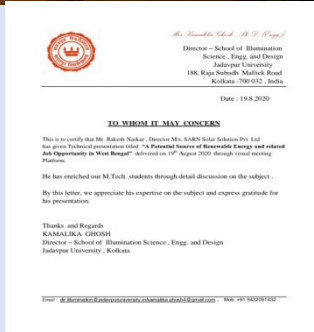
# Solar Air Conditioner







# SARN Solar Solution Pvt. Ltd. Various Awareness Program



1. Delivered as a guest invited speaker of One-day Seminar on “Reduce Fossil-fuel Energy, Save Earth and Use Solar Energy: A Potential Source of Renewable Energy and related Job Opportunity in West Bengal” at Department of Physics in Collaboration with the IQAC at Purash-Kanpur Haridas Nandi Mahavidyalaya, Howrah, on the topic of ‘Solar Energy as a Potential Source of Renewable Energy and Related job opportunity in West Bengal as dated on 29th February,2020.
2. Delivered as a guest speaker of One-day Seminar on “APPLICATION OF SOLAR ENERGY & IT’S BUSINESS OPPORTUNITY AT BENGAL” (ASEBOB 2019) at APJ Abdul Kalam Seminar Hall, organized by Department of Physics & Internal Quality Assurance Cell, Bhairab Ganguly College, Belgharia, Kolkata-56 (Reaccredited Grade ‘A’ by NAAC) on 28th NOV (THURSDAY), Time: 11.30am, 2019.
3. Delivered invited speaker as Special Speech on “Renewable Energy” at School of energy studies, Jadavpur University organized by IETA Kolkata chapter Program& Eminent Association of Philosophers in Science & Technology (EAPST forum License No: 114487.) on 31st of May 2019.
4. Delivered invited speaker on “Convergence of Emerging Technologies To Address The Challenges of The 21st Century” at IETA Kolkata chapter Inauguration Program 16th February 2019 at Ricoh - Webel More Salt Lake Sector-V, Kolkata.
5. Delivered invited speaker on “Solar Energy & Systems” at Shaktigarh High School, Jadavpur Kolkata-32 this initiated by Convolution Educare, 7th Jan., 2018.



# SARN Solar Solution Pvt. Ltd.

(Sensitive Awareness through Revolution Network)

[Solar Appliances & Project Service Company]



**Contact : 9432689034 / 7003792405**

**SARN Solar Solution Pvt. Ltd. Registered under.....**



**“SWAPNA NEER” Apartment, 1<sup>st</sup> Floor. R.N.C Road. Subhas gram, Kolkata – 700147 (Follow GPS)**



**www.sarnsolar.in**



**sarnsolar@gmail.com  
contact@sarnsolar.in**



Thank you!

