



UNNAT BHARAT ABHIYAN CELL



Sardar Vallabhbhai National Institute of Technology, Surat

Presentation on “SURYA-Gujarat” (Surya Urja Rooftop Yojana)



Presentation created by

➤ Team SURYA (Sustainable Energy), UBA Cell, SVNIT, Surat

➤ **Guided by:** Dr. Khyati D. Mistry, Associate Professor, Electrical Engineering Department & Faculty Member, Unnat Bharat Abhiyan Cell, SVNIT, Surat

Source: Gujarat Urja Vikas Nigam Limited, Gujarat

Website Link For Subsidy: <https://suryagujarat.ahasolar.in/>

For Non Subsidy: <https://geda.gujarat.gov.in/>



Content of PPT

- Introduction of “SURYA-Gujara” Rooftop Yojana
- Step by step procedure for designing own solar power system
- Useful Website Information



INTRODUCTION OF “SURYA-GUJARAT” (SURYA URJA ROOFTOP YOJANA-GUJARAT)

1. **Target:** The target for installation of solar rooftops shall be to cater 2 lakh consumers during year 2019-20 and cumulatively 8 lakh consumers by the end of the financial year 2021-22, over and above the capacity commissioned as of 31/03/2019.
 2. **Operational Period:** The Policy operative period shall be up to the financial year 2021-22.
 3. **Subsidy:** State subsidy of 40 % shall be available for solar rooftop systems up to 3 kW; 20 % for solar rooftop systems beyond 3 kW up to 10 kW, installed and commissioned by private residential consumers.
- **The Mission Coordinator: Energy & Petrochemicals Department, Government of Gujarat**



3. Eligibility: All consumers of all DISCOMs (Distributor Companies like DGVCL, MGVCL, UGVCL, PGVCL, GEB, Torrent etc.) in the state having service connection under residential category of the DISCOM shall be eligible. (Refer enclosed file)

4. Nodal Agency: Gujarat Urja Vikas Nigam Limited (GUVNL)

Note: The applicant shall not be allowed to get any other benefit from any other scheme of the Central Government, for the same investment, and if found to have taken from any other scheme of the Government, the amount of subsidy shall be recovered forthwith.



- Power generated by PV system relies on the various size of the PV modules. The peak watt produced relies on size of the PV modules and site location climate which is required to generate the power needed for loads. Panel generation factor must consider which differ for distinct site places.
- Total watt peak rating for PV panel capacity = Total PV panel energy needed/ Panel generation factor.
- **Where, for Gujarat panel generation factor is 4.2**
- Total numbers of PV modules required are estimated by using the total watt peak rating required and the PV module peak rated output. Modules are available in 100 W, 200 W, 250 W, 300W etc.



DESIGN YOUR SOLAR SYSTEM

Step 1: Analyse your Electricity bill as given by your respective DISCOMs.

દક્ષિણ ગુજરાત વીજ કંપની લિમિટેડ
 રાષ્ટ્ર. અધિકાર : નાના વરદાન રોડ, કપોદરા, સુરત - ૩૯૫૦૦૬
 Web site : www.gpcvl.com

NOV, -DEC, 19 વીજ વપરાશ બીલ
 CIN No. U40102GJ2003GGC042909

સાબકીયાલ ડોળ નંબર
 ડેવલપ્મન્ટ નં. ૧૨૦૦૨૩૩૩૦૦૩
 GST No. 24AABCD8912C1Z3

COMP. GST IN : 24AABCD8912C1Z3
 CGST : 9.00%
 SGST : 9.00%

મુક અને રૂ કોડ 1703/18/129
 FEEDER CODE 0000
 FEEDER NAME 11 KV
 વીલ નંબર 749-30
 ડીમેન્ડ રકમ 108/01/2020
 વીલની તારીખ 108/01/2020

આઉટ નંબર	મીટર નંબર	સ્થિતિ	રેટ	બીલિંગ વીજભાર	ગુણક	ટેરીફ	મીટર ચાર્જ કોડ	લો.ખ./કિ.વો.	વોલ્ટની તારીખ
વે.ડબલ્યુ. એચ	રીએક્ટીવ/ઓર પીઠ	રાખી	કમંડ	વોલ્ટની વિકાસ					
લાલજી રોડકોડ	12592		૧	ફીક્સ ચાર્જ					
પાલવુ રોડકોડ	11845		૨	એન્ટી ચાર્જ					
વપરાશ	642		૩	બાદ ડિસ્કન્ટ					
શ્રીક શબ્દીકોડ	લોક દિવસો		૪	મીનીમ ચાર્જ					
કુલ વપરાશ	3781	કુલ કંપની ચાર્જ	22537	૫	રીએક્ટીવ ચાર્જ				
અરેરા વપરાશ	830	અરેરા વીજભાર		૬	કમ્પલ ચાર્જ				
પાણસો કુલ વપરાશ	77	પ્રોવીઝનલ વીલની રકમ	0.00	૭	વિમુક્ત મુક				
એડવાન્સ પેમેન્ટ		અરુપ્યમ રીએક્ટીવ ડીમેન્ડ	7737.00	૮	મીટર ચાર્જ				
એડવાન્સ નું વ્યાજ		એડવાન્સ વ્યાજની વારીખ		૯	કમ્પુટ પરચુર ચાર્જ				
		કુલ રકમ (૧ થી ૧૦ સુધી)		૧૦	વિલની સુવર્ણી ચાર્જ				
		પાણસ ત્રણ વીલની વિકાસ		૧૨	પ્રોવીઝનલ વીલ				
માસ				૧૩	કુલ રૂ. (૧૧-૧૨)				
વપરાશ				૧૪	પાણસી બંધો રકમ				
વીલની રકમ				૧૫	તા. 16-12-20				
				૧૬	કુલ રૂ. (૧૩ ± ૧૪)				
				૧૭	સરકારી સંકેત				
				૧૮	કુલ રૂ. (૧૫ ± ૧૬)				

બિલ નંબર : 108/01/2020
 ટ્રીફ નંબર : NOV-DEC-19
 રીડિંગ : 12592
 પ્રીવિયસ રીડિંગ : 108/01/2020
 રીડિંગ ડિફરન્સ : 00011845
 ટ્રીફ : 17/3/18/129
 એવરેજ : RGR
 ડીમેન્ડ : 330.00
 લોડ : 30.00
 ટીએસ : 1.00

બિલિંગ ડેટ : 108/01/2020
 પ્રીવિયસ રીડિંગ : 12592
 રીડિંગ ડિફરન્સ : 00011845
 ટ્રીફ : 17/3/18/129
 એવરેજ : RGR
 ડીમેન્ડ : 330.00
 લોડ : 30.00
 ટીએસ : 1.00

ફિક્સ ચાર્જ : 30.00
 ટ્રીફ ચાર્જ : 2450.30
 ડીમેન્ડ ચાર્જ : 286.67
 એક્ટીવ ચાર્જ : 1358.70
 રીએક્ટીવ ચાર્જ : 0.00
 ઇલેક્ટ્રિક ડ્યુટી : 571.36
 મીટર રેન્ટ : 0.00
 ડીમેન્ડ ચાર્જ : 2.34
 ડીમેન્ડ મિસ. ચાર્જ : 0.00
 પ્રોવ. અમાઉન્ટ : 0.00
 બિલ અમાઉન્ટ : 4669.36
 પ્રેપેર ડેટ : 16/12/2019
 પ્રેપેર : 0.62

NET AMOUNT : 4669.98
 Due Date : 18/01/2020

મીટર : 2.0 Htr Reader

4669

Step 2: Analyse the 2-month reading of previous 3 months as given in bill at below left corner. (Strong recommendation to use bill given at end of June for calculation)

Sr. No.	Months	Bill Units kW (Total of 60 days)	Bill Amount	Rate
1	May – June	822	6,038	7.34
2	July – August	879	6,614	7.52
3	September – October	790	5,821	7.36
Total (for 6 month)			18,473	
Average Monthly Bill			3,078.83	



Step 3: Calculation of system size


$$\begin{aligned}\text{Required System Size} &= \text{Maximum unit during summer} \times \text{Energy loss factor} \\ &= 879 \text{ kW} \times 1.3 \\ &= 1142.7 \text{ kW (for 60 days)} \\ &= 19.045 \text{ kW (per day) (} 1142.7 / 60 \text{)}\end{aligned}$$

➤ **1 kW Set of Solar Panel System generate = total 4.2 kWh Units in 1 day
(Annual average rating in Gujarat State)**

➤ Required Solar Panel = $19.045 / 4.2$
 ≈ 4.5 (4.5 nos. of Set of 1kW)

➤ **1 metre x 2 metre Polycrystalline Solar PV Panel rated = 300W**
(Note: Size is varying as per manufacture)

No. of Polycrystalline Solar PV Panel rated of 300W (Size 1 metre x 2 metre)
= $(4.5 \times 1000) / 300$
= **15 Panels are required and**
= **$15 \times 300 = 4500 \text{ W} = 4.5 \text{ kW Solar System Required}$**



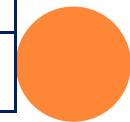
Step 4: Economical calculation:

Note: The below rates provided by registered agency, Surat

Sr. No.	Solar capacity kW	Cost per kW (₹)
1	2 kW	46,555
2	3 kW	46,337
3	4 kW	45,738
4	5 kW	45,030
5	6 kW	44,006
6	7 – 10 kW	43,005
7	10 – 25 kW	38,000

➤ **Subsidy provided by the State Government of Gujarat**

Sr. No.	Solar System Capacity	%
1	1 – 3 kW	40
2	3 – 10 kW	20
3	> 10 kW	0



Total Solar System required = 4.5 kW (3kW + 1.5kW)

Solar System cost of 4.5 kW = 4.5 x ₹ 45,738
= ₹ 2,05,821

Less Subsidy (1kW to 3kW) = - ₹ 54,885.6
(- 0.4 x 3 x ₹ 45,738)) {40 % for 3kW}

Less Subsidy (3kW to 10kW) = - ₹ 13,721.4
(- 0.2 x 1.5 x ₹ 45,738) {20 % for 3kW to 10kW}

Total Cost of Solar System (A) = ₹ 1,37,214 /-



B) Structure Cost:

Height of Structure	Cost of Structure per kW (₹)
1 Ft to 4 Ft	3,000
4 Ft to 7 Ft	4,000
Above 7 Ft	4,500

Note: Structure cost varies by installation agencies

**Let the structure height is 6Ft, then structure cost = $4.5 \times 4,000$
= ₹ 18,000 /-**

Total Solar System Cost including Structure = ₹ 1,55,214 /-
(Cost A+B)



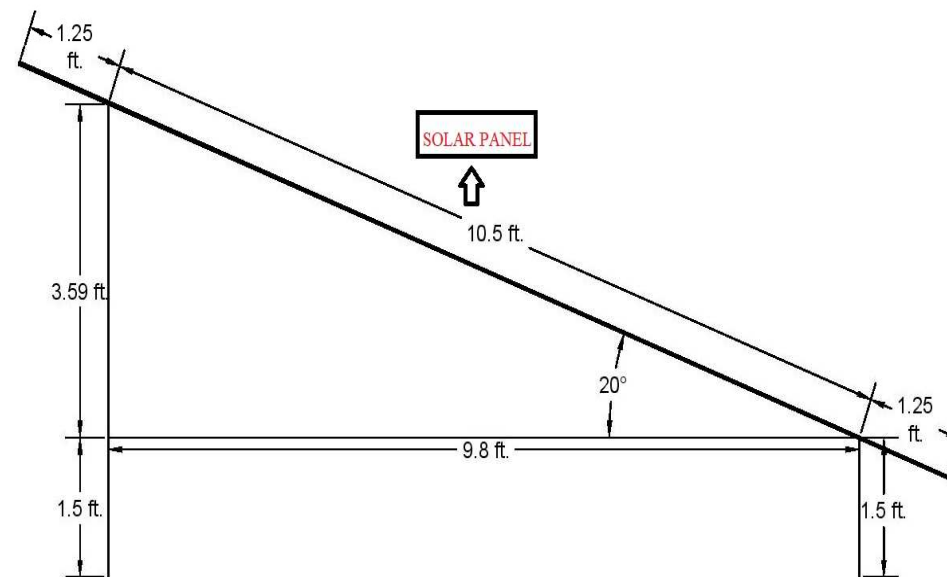
Step 5: Calculation of Pay Back Time

- 5.1) Total Solar System Installation Cost = ₹ 1,55,214 /-
- 5.2) Average Monthly Electricity Bill = ₹ 3,078.83 /-
- 5.3) Payback Time in Months (5.1 / 5.2) = 50.41 months
= 4 Year 2 Month and 12 Days



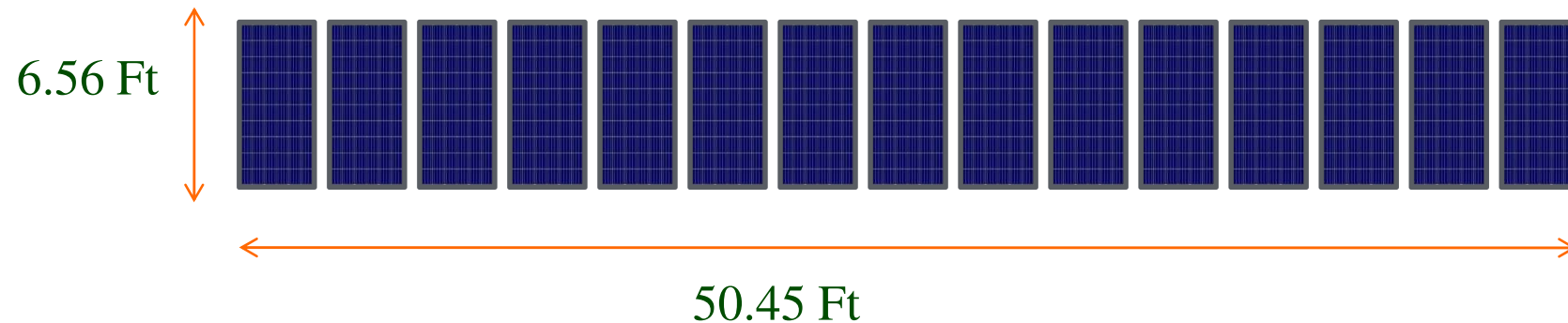
Step 6: Structural Design of Solar PV Panel

- Size 300W PV solar panel = 1 metre Width x 2 metre Length
(Varies by maker) = 3.28 Ft x 6.56 Ft
- Solar panel tilt angle = Between 19° to 23°
(Optimum output for Surat City region)
- Sample orientation of solar panel



Step 7: Check the available space on rooftop / terrace & best Calculation of Space required on terrace (rooftop) & feasible layout option.

Layout Option 1: All 15 panels of size 3.28 Ft (width) x 6.56 Ft (Length) by single in a single row with 1 Inch space between each panel



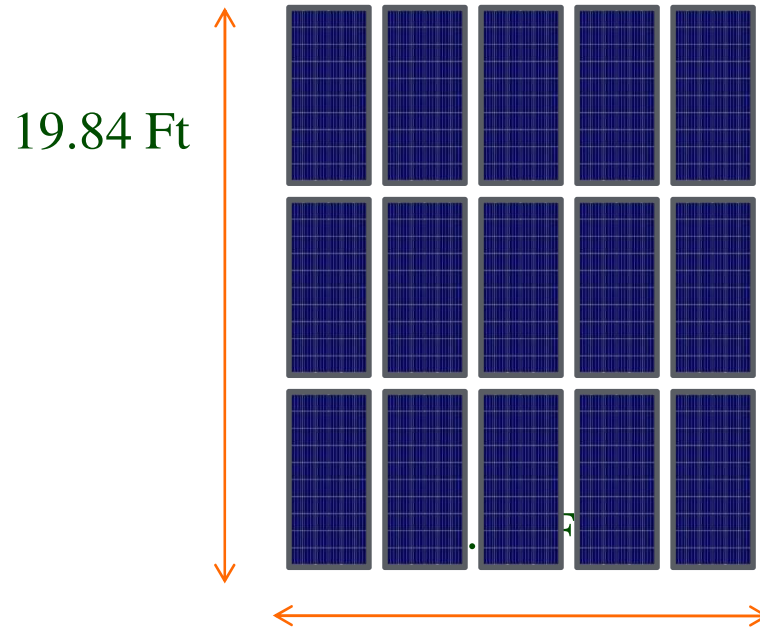
In this layout, the required open terrace size is 6.56 Ft x 50.45 Ft without any Shadows.



Reference photo of Layout Option 1:



Layout Option 2: All 15 panels of size 3.28 Ft (width) x 6.56 Ft (Length) by 3 raw with 1 Inch space between each panel with same structure.



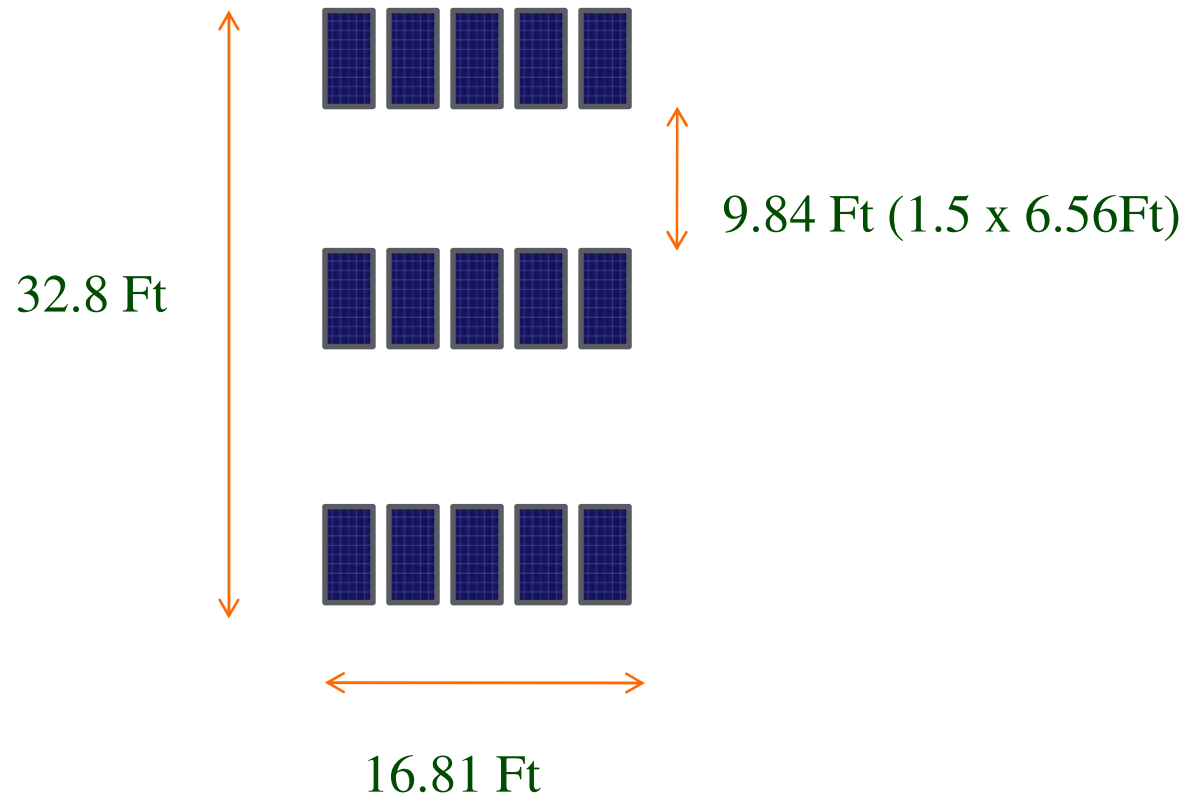
In this layout, the required open terrace size is 16.81 Ft x 19.84 Ft without any Shadows.



Reference photo for Layout Option 2.



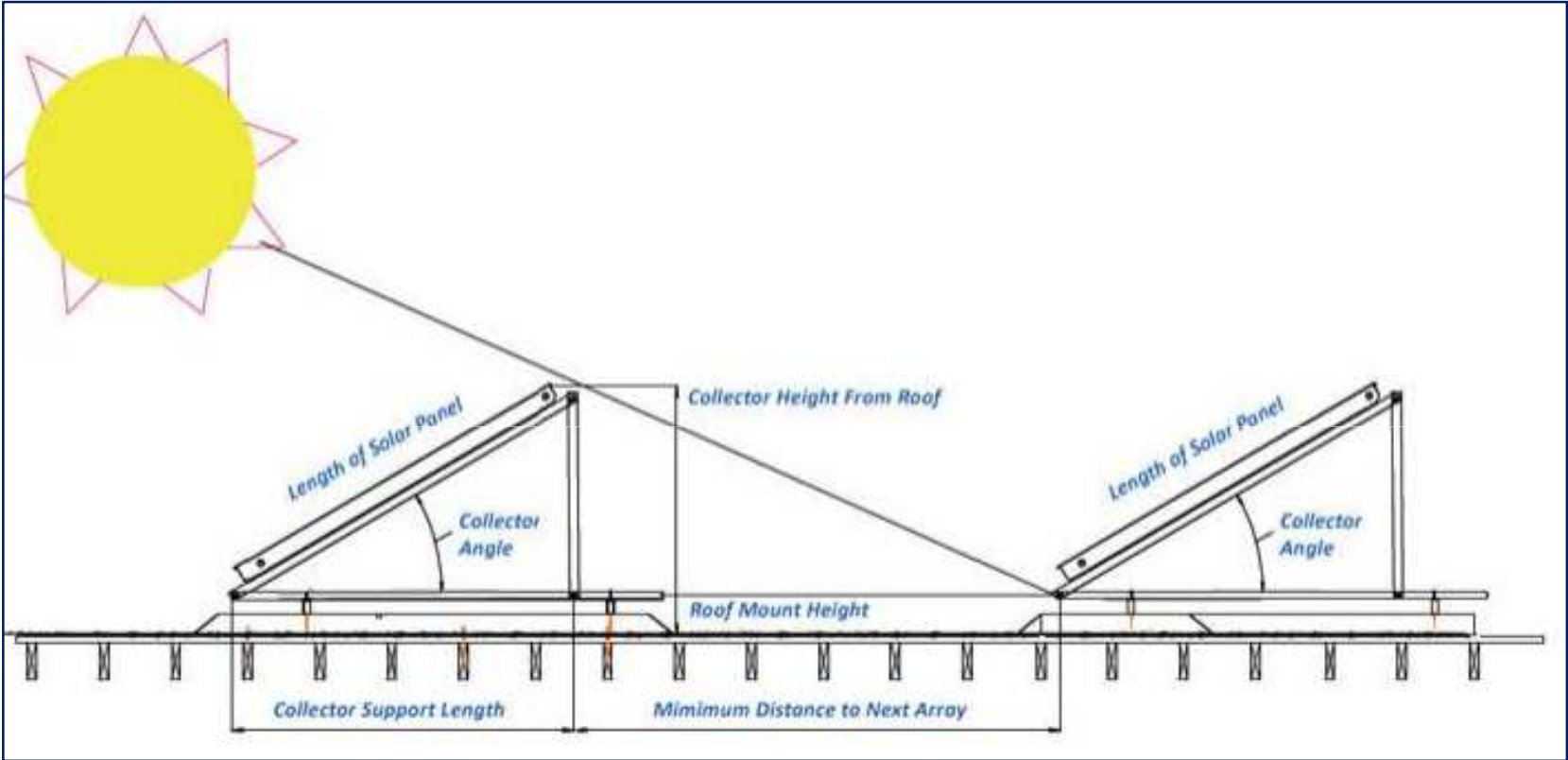
Layout Option 3: All 15 panels of size 3.28 Ft (width) x 6.56 Ft (Length) by 3 raw with 1 Inch space between each panel and 1.5 x times to length of panel space between each raw for separate raw layout structure.



In this layout, the required open terrace size is 16.81 Ft x 32.8 Ft without any Shadows.



Explaining for Layout Option 3.



Reference photo for Layout Option 3.



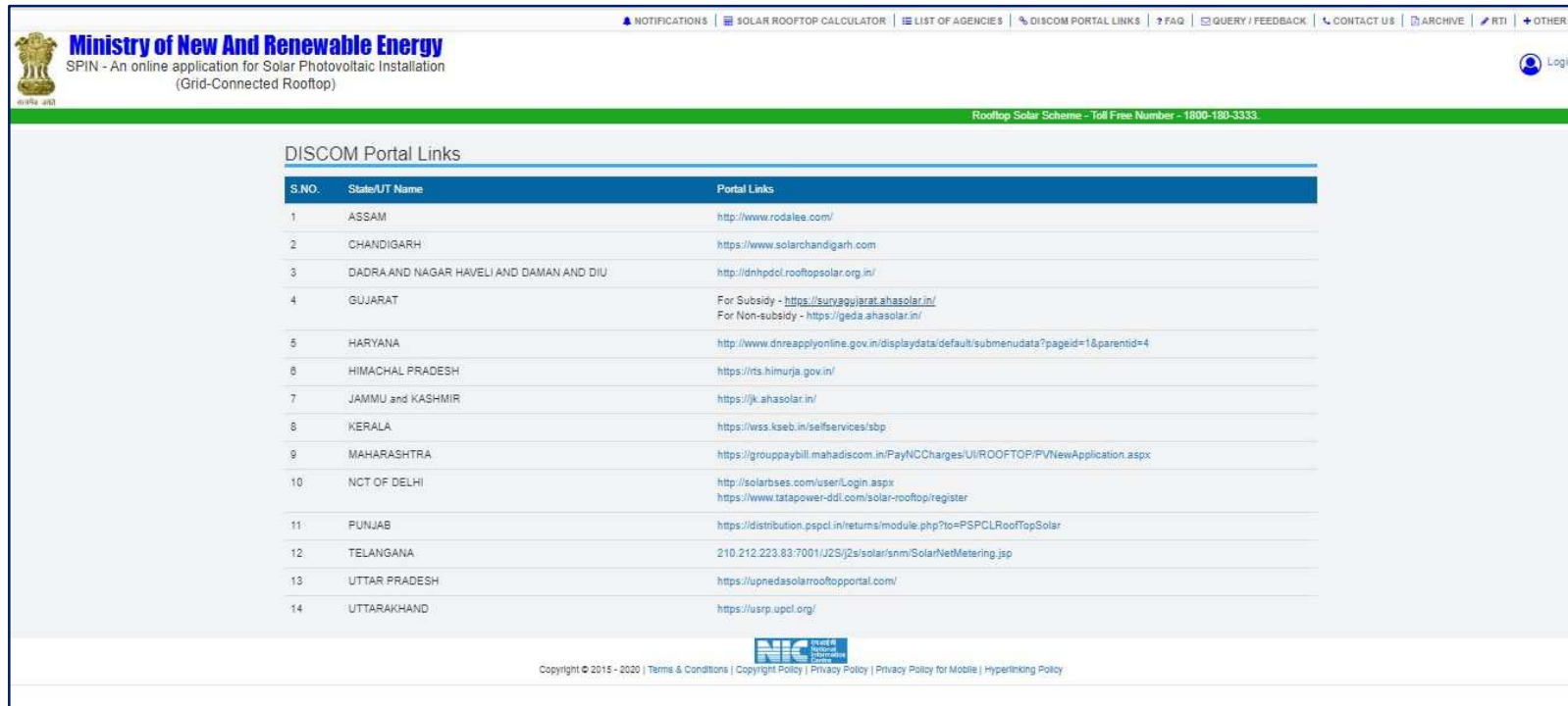
USEFUL WEBSITE LINK

1) Ministry of New & Renewable Energy, Government of India

Surya Rooftop MNRE, Government of India

Website link: <https://solarrooftop.gov.in/>

List of State wise DISCOM



The screenshot shows the website of the Ministry of New And Renewable Energy. The header includes the ministry's name, the SPIN application description, and a navigation menu with links for notifications, solar rooftop calculator, list of agencies, DISCOM portal links, FAQ, query/feedback, contact us, archive, RTI, and others. A green banner below the header displays the 'Rooftop Solar Scheme - Toll Free Number - 1800-180-3333'. The main content area is titled 'DISCOM Portal Links' and contains a table with 14 rows, each representing a state or union territory with its corresponding portal link.

S.NO.	State/UT Name	Portal Links
1	ASSAM	http://www.rodalee.com/
2	CHANDIGARH	https://www.solarchandigarh.com
3	DADRA AND NAGAR HAVELI AND DAMAN AND DIU	http://dnhpdcl.rooftopsolar.org.in/
4	GUJARAT	For Subsidy - https://survagjarat.ahasolar.in/ For Non-subsidy - https://geda.ahasolar.in/
5	HARYANA	http://www.dnreapplyonline.gov.in/displaydata/default/submenudata?pageid=1&parentid=4
6	HIMACHAL PRADESH	https://rts.himurja.gov.in/
7	JAMMU and KASHMIR	https://jk.ahasolar.in/
8	KERALA	https://vss.kseb.in/selfservices/sbp
9	MAHARASHTRA	https://groupypbill.mahadiscom.in/PayNCCharges/UI/ROOFTOP/PV/NewApplication.aspx
10	NCT OF DELHI	http://solarbsees.com/user/Login.aspx https://www.tatapower-ddl.com/solar-rooftop/register
11	PUNJAB	https://distribution.pspcl.in/returns/module.php?to=PSPCLRooftopSolar
12	TELANGANA	210.212.223.83:7001/J2S/J2s/solar/snrm/SolarNetMetering.jsp
13	UTTAR PRADESH	https://upnedasolarrooftopportal.com/
14	UTTARAKHAND	https://usrp.upcl.org/

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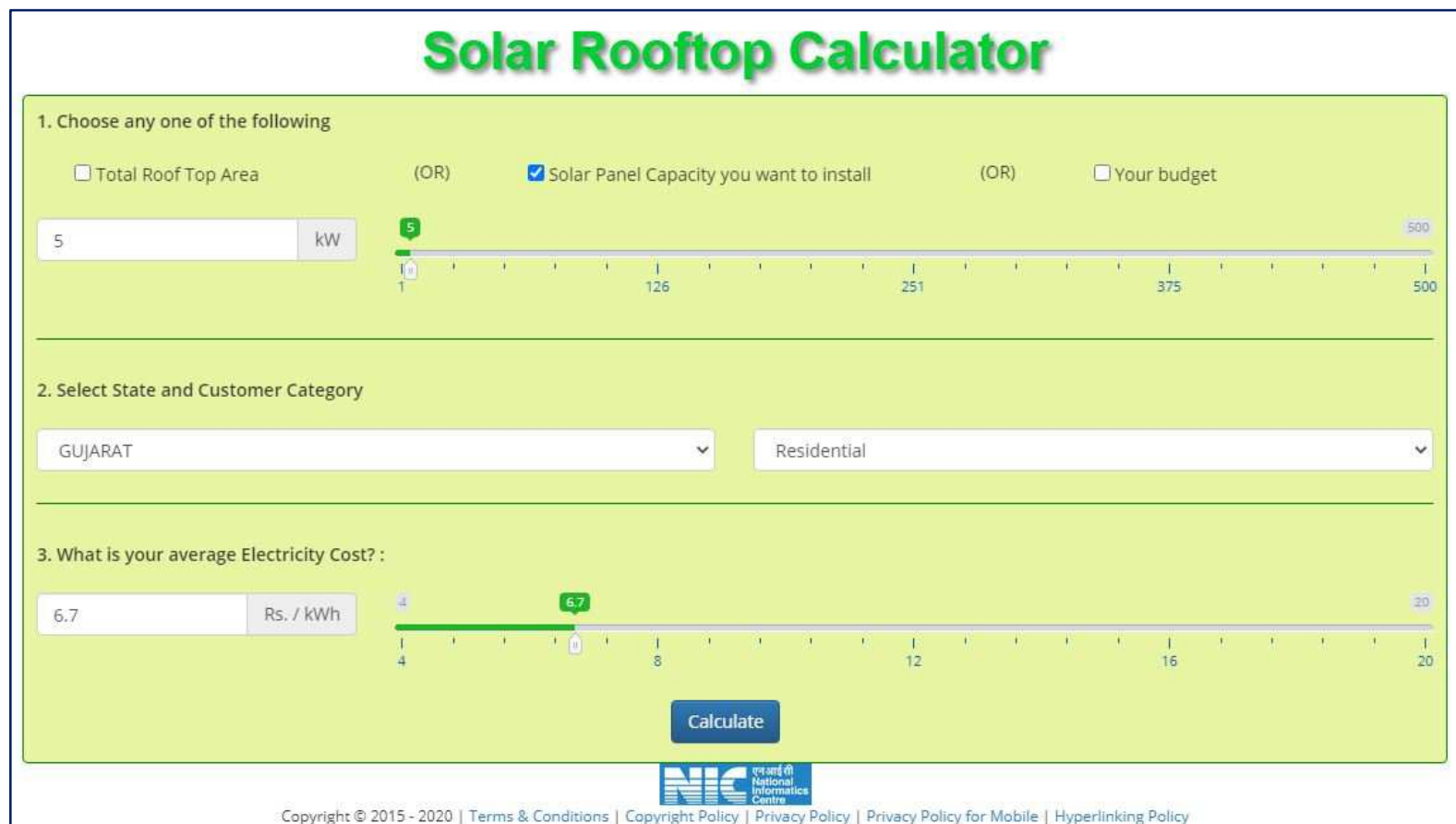
USEFUL WEBSITE LINK

1) Ministry of New & Renewable Energy, Government of India

Surya Rooftop MNRE, Government of India

Solar Calculator:

Website link: https://solarrooftop.gov.in/rooftop_calculator



Solar Rooftop Calculator

1. Choose any one of the following

Total Roof Top Area (OR) Solar Panel Capacity you want to install (OR) Your budget

5 kW

1 126 251 375 500

2. Select State and Customer Category

GUJARAT Residential

3. What is your average Electricity Cost? :

6.7 Rs. / kWh

4 8 12 16 20

Calculate

NIC National Informatics Centre

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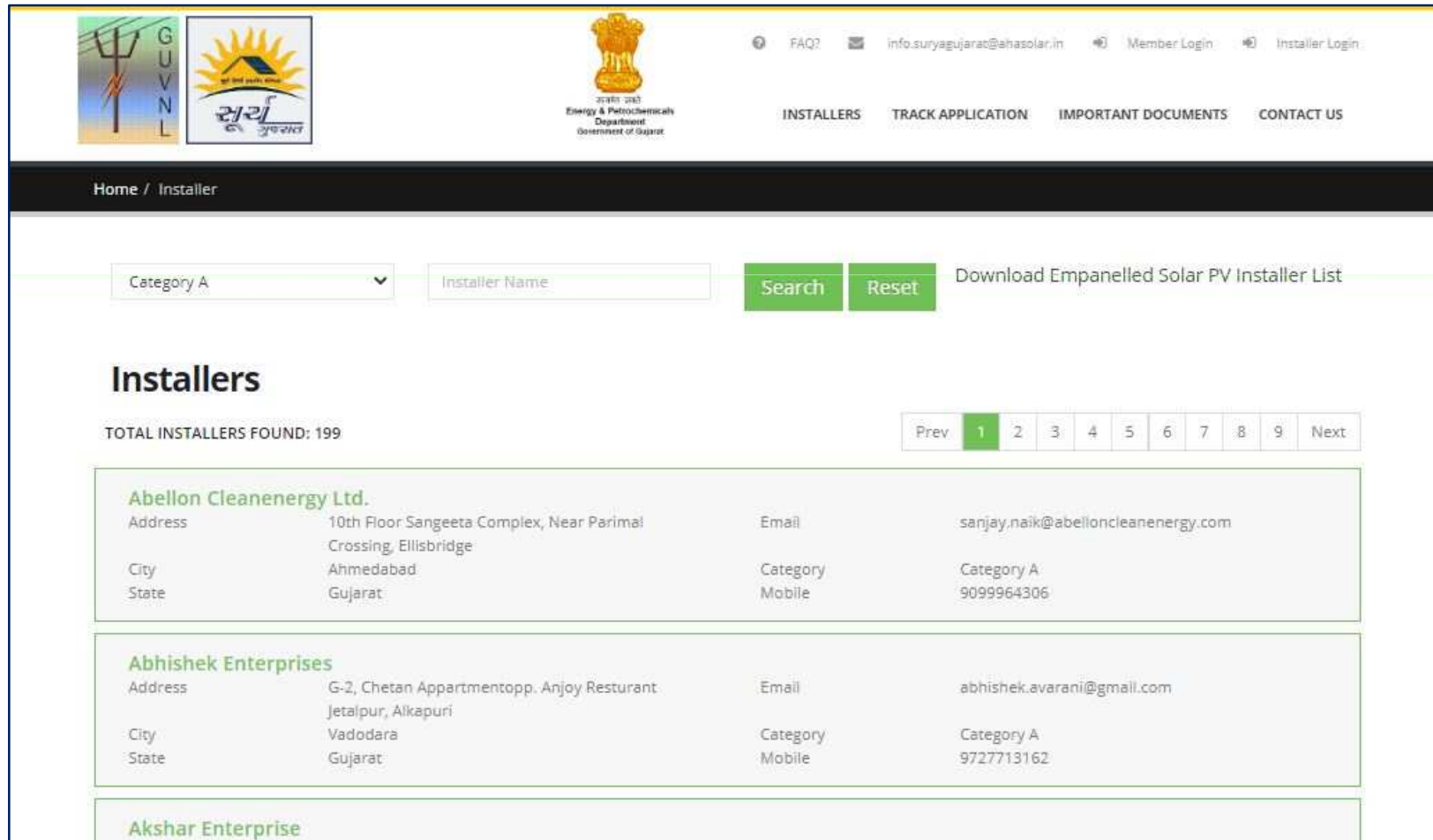


USEFUL WEBSITE LINK

2) Gujarat Urja Vikas Nigam Ltd. (For Subsidy)

Website Link: <https://suryagujarat.ahasolar.in>

The list of Installer is available on website (PDF Enclosed)



The screenshot displays the website interface for Gujarat Urja Vikas Nigam Ltd. At the top, there are logos for GUVNL and the organization, along with the Government of Gujarat emblem and the Energy & Petrochemicals Department logo. Navigation links include FAQ?, info.suryagujarat@ahasolar.in, Member Login, and Installer Login. A secondary menu contains INSTALLERS, TRACK APPLICATION, IMPORTANT DOCUMENTS, and CONTACT US. The breadcrumb trail shows 'Home / Installer'. Below this is a search form with a dropdown menu set to 'Category A', an input field for 'Installer Name', and 'Search' and 'Reset' buttons. A link to 'Download Empanelled Solar PV Installer List' is also present. The main content area is titled 'Installers' and shows 'TOTAL INSTALLERS FOUND: 199'. A pagination control shows 'Prev', '1' (selected), '2', '3', '4', '5', '6', '7', '8', '9', and 'Next'. Three installer entries are visible:

Abellon Cleanenergy Ltd.			
Address	10th Floor Sangeeta Complex, Near Parimal Crossing, Ellisbridge	Email	sanjay.naik@abelloncleanenergy.com
City	Ahmedabad	Category	Category A
State	Gujarat	Mobile	9099964306

Abhishek Enterprises			
Address	G-2, Chetan Appartmentopp. Anjoy Resturant, Jetalpur, Alkapuri	Email	abhishek.avarani@gmail.com
City	Vadodara	Category	Category A
State	Gujarat	Mobile	9727713162

Akshar Enterprise			
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ROLE OF UNNAT BHARAT ABHIYAN PARTICIPATING INSTITUTE

- **Step 1:** Study of Solar Rooftop System and how it works with help of Installer agencies available within the District
- **Step 2:** Knowledge sharing to UBA Villagers of “SURYA-Gujarat” Scheme (Surya Urja Rooftop Yojana) and benefits from Subsidy.
- **Step 3:** Work with Gram Panchayat & Taluka Pnachayat / District Panchayat Department for implementation of “SURYA-Gujarat” scheme in adopted UBA Village cluster.



The details are also available in following document:

1. Annexure I:

SURYA_-GUJARAT_Surya_Urja_Rooftop_Yojana-_Gujarat

2. Annexure II:

Surya Gujarat Installer List



CONTACT INFORMATION

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Dr. Krupesh A. Chauhan

UBA Coordinator

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Website: [http://svnit.ac.in/Unnat Bharat/](http://svnit.ac.in/Unnat_Bharat/)

Ph.: 0261 220 4303

Address: 307, New CRC, SVNIT, Ichchhanath, Dumas Road, Surat



THANK YOU

UNNAT HO !!!

