

**REPORT  
ON  
GREEN AUDIT**

**AT**



**SHRI M. D. SHAH MAHILA COLLEGE OF ARTS AND COMMERCE  
B.J. PATEL ROAD, MALAD (WEST), MUMBAI**



**BY**



**NATIONAL PRODUCTIVITY COUNCIL  
RD, NOVELTY CHAMBERS, 7<sup>TH</sup> FLOOR  
GRANT ROAD, MUMBAI - 400 007.**

**Phone: 23071322/23002924; Email: [npcmum@vsnl.net](mailto:npcmum@vsnl.net)**

**AUGUST, 2017**

## ACKNOWLEDGEMENT

National Productivity Council places on record its sincere thanks to the progressive management of **Shri. M. D. Shah Mahila College of Arts and Commerce, Mumbai**, for entrusting the task of carrying out Green Audit at their college campus. We are grateful to **Dr. Shri Mohanbhai Patel (President, Janseva Samita)** and **Dr. Deepa Sharma (Principle)** for their fruitful interactions and for extending all the co-operation during the Green Audit exercise.

We sincerely thank Ms. Diksha Trivedi (Registrar), Shri Bhavin Joshi and their team for their excellent co-ordination in field measurements and for providing all the relevant data required for the Green Audit.

Place : Mumbai  
Date : 11.08.2017

  
**T.S.NARAYANAN**  
for **Regional Director**



## **C O N T E N T S**

	<u><b>Page Number</b></u>
<b>SUMMARY OF SAVINGS</b>	
<b>1. INTRODUCTION</b>	<b>1</b>
<b>2. ENERGY SYSTEM</b>	<b>4</b>
<b>3. ENERGY USAGE PATTERN</b>	<b>8</b>
<b>4. ENERGY CONSERVATION OPPORTUNITIES</b>	<b>17</b>
<b>5. WATER CONSERVATION OPPORTUNITIES</b>	<b>20</b>
<b>6. GREEN INITIATIVES</b>	<b>22</b>
<b>ANNEXURES</b>	<b>23</b>

**LIST OF ANNEXURES**

<b>Sr. No.</b>	<b>Name</b>	<b>Page Number</b>
1	Electrical Bill details of all service connections	23
2	Existing Solar Photo-Voltaic (SPV) system details	26
3	On line power measurement details	27
4	Energy saving in lighting	28
5	Energy saving in Ceiling Fans	29
6	Energy saving in Air Conditioners	30
7	Budgetary Estimate for Water Flow regulator washer	31
8	Budgetary Estimate for Solar Photo-voltaic System	34

## SUMMARY OF SAVINGS

**PART A – RECOMMENDATION:** The following energy conservation measures can be implemented to reduce overall energy consumption and cost with marginal investment.

Sl. No.	Energy Conservation Option	Annual Savings		Investment (Rs.)
		Units kWh	(Rs.)	
1	Providing energy efficient LED lamps in place of 36 watt fluorescent tube lights (380 numbers)	19380	2,61,630	1,33,000
2	Providing energy efficient ceiling fans place of old ceiling fans (280 numbers)	19125	2,58,188	7,50,000
3	Replacement of inefficient window and split air conditioners (14 numbers)	8725	1,17,794	4,20,000
4	Installing occupancy sensors for reading room and library	2200	29,600	20,000
	<b>TOTAL</b>	<b>49,430</b>	<b>6,67,212</b>	<b>13,23,000</b>

**PART B – SUGGESTION:** Considering the energy saving potential and also to promote green energy, the Shri MD Shah Mahila College Management can implement the following capital investment project for further reducing energy cost. Installing one 50 kWp **Solar Photo-Voltaic (SPV)** system will meet 40% energy requirement and require 500 Sq.mtr area. The estimated power generation will be 50,000 kWh for 250 sunny days in year and average generation of 4kWh per installed kWp.

Sl. No.	ENCON Option	Annual Savings		Investment (Rs. Lakhs)
1	Installation of 50 kWp SPV panel	50000 kWh	6,75,000 Rs.	27.0

The budgetary estimate for 65 kWp SPV panel installation submitted by channel partner M/s. Solgen Greentech (MNRE approved agency) is enclosed for reference in **Annexure 8**. The management may also collect similar budgetary quotations from other MNRE channel partners.

*The Green Audit exercise revealed annual energy savings potential of **49,430 kWh** by installation of energy efficient equipments. The identified energy saving potential is equivalent of **25%** of present energy consumption. The annual energy cost reduction potential is **Rs.6.67 lakhs**. The total investment envisaged to achieve the same is **Rs. 13.23 lakhs**.*

*The investment required for **50kWp SPV** renewable energy power generation is **Rs. 27 lakhs** with **50000 kWh** power generation and annual cost reduction potential of **Rs. 6.75 lakhs**.*

***With installation of SPV system and energy efficient equipments total annual electricity cost can be reduced by 50%.***

## **1. INTRODUCTION**

**1.1** With a view to enlighten and empower women to become instrumental in enhancing the quality of society. Shri M. D. Shah Mahila College of Arts and Commerce is taking meticulous strides in offering quality education to women students' residing in the suburbs of Mumbai. Established in 1968 by Janseva Samiti and affiliated to one of the few famous women's Universities in India - SNDT Women's University, Shri M. D. Shah Mahila College is a premium women's Institution reaching out to a large number of students with its core strength of being a girls' college and imparting education in four mediums.

It was established with the sole purpose of providing accessible and affordable education and carried the mantle of offering graduating facilities in Arts, Commerce, Management Studies, Computer Applications, Mass Media and Master's degree in Commerce, Hindi Economics and History. The college emphasizes on innovative thinking that has resulted in designing a course in Bachelor's in Accounts, Finance and Insurance - a first of its kind in the affiliating University. Apart from regular courses, various value added and UGC approved Career Oriented programmes are offered to students. The institution also provides capacity building courses like Communication development, 100 hours of computer course and Entrepreneurial skills. In its journey of building globally competent, confident and positively inclined individuals, the college gives equal emphasis to revering and conserving cultural identity and heritage amongst its

students, provides opportunities to them for training with corporate houses and collaborates with companies for placements.

Tenure of 48 years of service to society has created a space for interaction, exchange and ingestion of knowledge seen in the multifarious activities of the college.

The visibility of the institution has enhanced with the receipt of the Indian Merchant's Chamber's Ramkrishna Bajaj National Quality Award (IMCRBNQA) for excellence in services, State-level Jagar Janivancha trophies for gender sensitization, NCC VC University banner, International linkage through Leadership Training Lecture Series in collaboration with Dowling College, New York; Iona College, New York; Panameicana University, Mexico via Blackboard technology; and Indo-Danish Students Cultural Exchange programme.

Following courses are being offered at Shri M.D. Shah Mahila College of Arts & Commerce:

- XI Arts, Commerce, M.C.V.C.
- XII Arts, Commerce, M.C.V.C.
- Bachelor of Arts (B.A.)
- Bachelor of Commerce (B.Com)
- Bachelor of Management Studies (B.M.S.)
- Bachelor of Computer Application (B.C.A.)
- Bachelor of Mass Media (B.M.M., B.A.F., B.A.F.I.)
- Master of Arts (M.A.) with Economics
- Master of Arts (M.A.) with Hindi
- Master of Arts (M.A.) with History

- Master of Commerce (M.Com)
- Master of Commerce with Marketing
- Career Oriented Programme (C.O.P.)
  - a. Fashion Designing
  - b. Interior Designing
  - c. Travel and Tourism Management
  - d. Entrepreneurship
- Vocational Courses
  - a. One / Two Year Diploma Course
  - b. Short Term Courses

**1.2** The progressive management of the Shri M.D. Shah Mahila College has taken several energy conservation measures to reduce the electricity costs. The major energy conservation projects implemented in the college are as follow:-

- Installation of LED lamps,
- Star rated air conditioners,
- Flat monitors for computers and
- Small 592Wp SPV system.

In order to further augment their efforts in conserving energy and utilize resources efficiently the management has entrusted the task of conducting Green Audit to National Productivity Council (NPC), Mumbai.

**1.3** National Productivity Council, Mumbai carried out Green Audit in July, 2017. The green audit findings are discussed in this report.

## **2. ENERGY SYSTEM**

**2.1** The details of infrastructure at Shri M.D. Shah Mahila College are as follow:-

<b>Sr. No</b>	<b>Item Reference</b>	<b>Data</b>
1	Total campus area	5630.90 Sq-m
2	Total Built-up area	4940.333 Sq-m
3	Number of buildings	03
4	Building Number 1	G+3 floors (35 class rooms)
5	Building Number 2	G+2 floors (6 class rooms)
6	Building Number 3	UG + G + 1 floors (5 class rooms)
7	Auditorium – AC Hall	
8	A.V. Room	60 seating capacity
9	Number of tube light	380
10	Number of LED	300
11	Number of ceiling fan	280
12	Number window / split air conditioners	55
13	Number of PC's	170
10	Water Pumps	02
11	Number of water taps	106
12	Combustible wastage (Paper)	633 Kg/year

## 2.2 Electricity and Supply

The college campus is receiving electricity supply from Tata Power Ltd and Reliance Energy Ltd with LT (II A) - Commercial tariff. There are ten numbers service connections. Nine numbers service connections are from Tata Power and one service connection is from Reliance Energy. The electricity consumption details at different service connections are given below:-

Consumer Number	Load Reference	Variation in electricity consumption during last 20 months (Dec. 2015 – July 2017)	Avg. cost (Rs./Kwh)
900000192547	Moti Pustakalay	111 to 1200 kWh	13.93
900000192502	Junior College	473 to 1360 kWh	13.34
900000192581	Junior College	1018 to 2688 kWh	13.18
900000192563	Junior College	1817 to 6199 kWh	13.09
900000192467	Degree College	5 to 45 kWh	20.53
900000192520	Degree College	3566 to 6467 kWh	13.09
900000192533	Decorators	44 to 638 kWh	14.29
900000192483	Self Finance Dept	1445 to 5113 kWh	11.65
900000236757	Canteen	276 to 393 kWh	13.67
151326814	Gymkhana	129 to 1299 kWh*	-
	<b>TOTAL</b>		

*\*Data available only for June 2016 to April 2017 period.*

The total electricity consumption per year is 1,98,232 Units (August 2016 to July 2017). Refer Annexure – 1. The estimated electricity cost for the college campus is Rs. 26.76 Lakh/Year.

**2.3** The college has installed star labeled split air conditioners in selected areas such as in principal's cabin, office, computer labs, staff room, auditorium and other important office cabins which is less than 20% of the total built-up area. The energy indicator for the college is 40.12 kWh/Sq.mtr/year

- 2.4** The Shri M. D. Shah Mahila college has installed 16 numbers of small Solar Photo-Voltaic (SPV) panels ranging from 5 watts to 120 watts at several locations with total SPV capacity of 592 watts. The details of installed solar Panel is given in **Annexure – 2**.
- 2.5** Including all three buildings the college has total 46 numbers classrooms and typically every class room has fans and tube lights. Large size class rooms typically have 08 numbers tube lights, 06 numbers ceiling fans. All the fans are having only direct switch control and without any speed control regulators.
- 2.6** The total connected lighting load of the college is 21.6 kW. The lighting load consists of FTL and LED lamps. The total connected ceiling fan load of the college is 19kW.
- 2.7** The drinking water requirement is supplied by Bombay Municipal Corporation (BMC). College has two service connections from BMC. First the incoming BMC water is stored in two numbers underground tanks one at main building and other is at Gymkhana building. From underground tank the water is pumped to various overheads tanks through pumps. The pump room has two pumps, one 7 HP new pump which is usually operated and one stand-by old pump. The 7 HP new pump is operated 2-3 hours daily as per requirement.

The Water consumption details for **three months** (one billing cycle) are as follows:-

<b>Service Connection Number</b>	<b>Water Consumption (Cum.)</b>	<b>Total Water Charges (Rs.)</b>	<b>Water Charges (Rs./cum)</b>	<b>Sewerage quantity (Cum.)*</b>	<b>Total sewerage charges (Rs.)</b>	<b>Additional Charges (Rs.)</b>
PND477004	2074	9665	4.66	1452	6766	822
PN@0391260	73	3405	46.64	51	2384	238

*\*Sewerage quantity is estimated by BMC as 70% of total water supplied by BMC to college.*

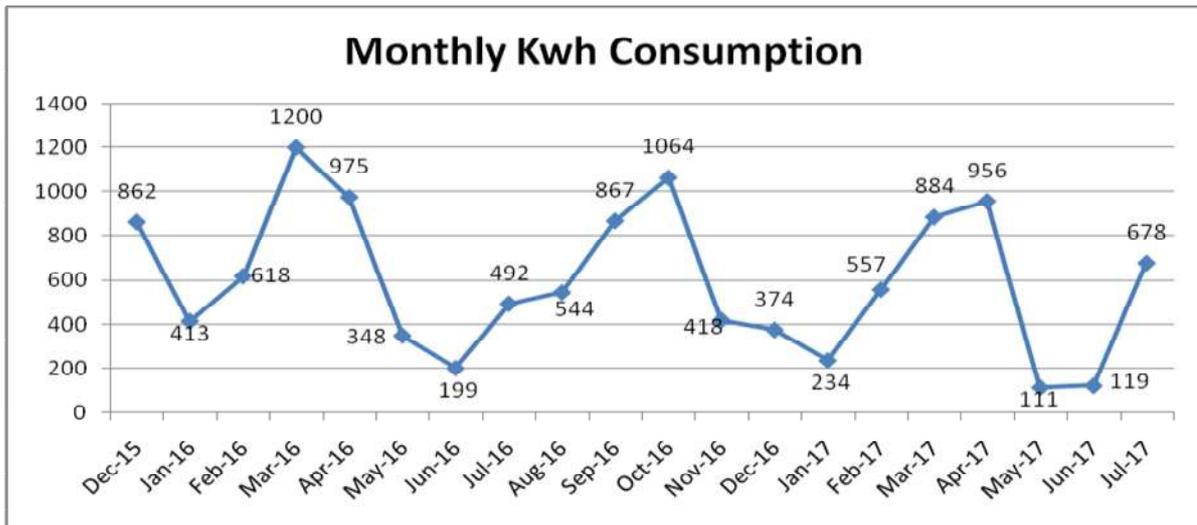
The estimated annual total water and sewerage charges for college campus are Rs. 93000/Year.

- 2.8** The college also has one bore-well and the bore-well water is used for toilets and washrooms through overhead tank. The sewage coming from toilets and washrooms is discharged into municipal sewage network.

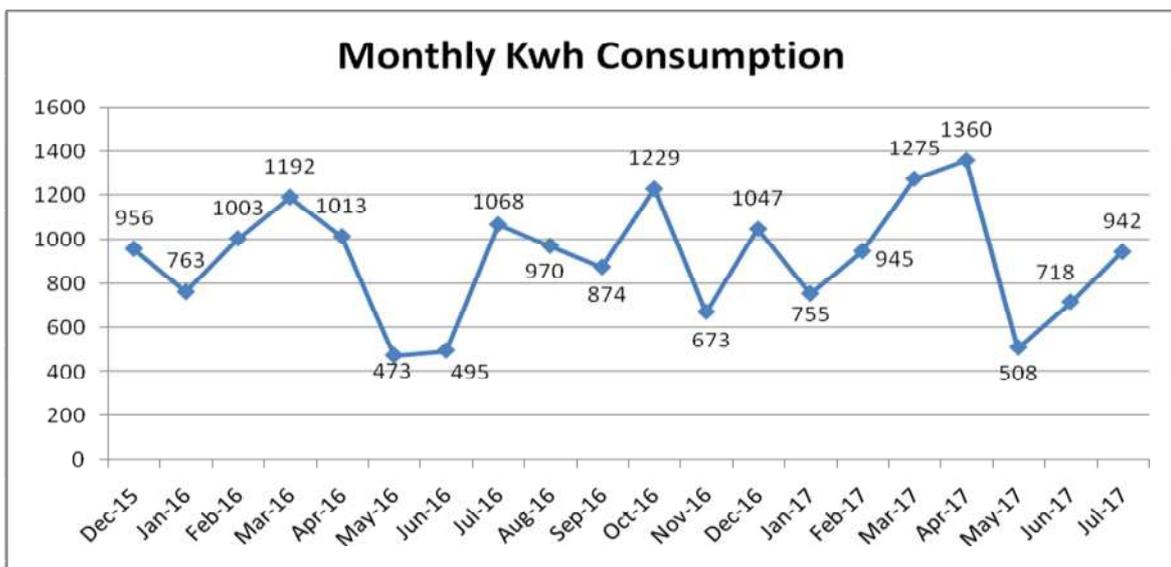
### 3. ENERGY USAGE PATTERN

3.1 Energy consumption variation during last twelve months of different service connections are given below (Refer **Annexure 1** for details):-

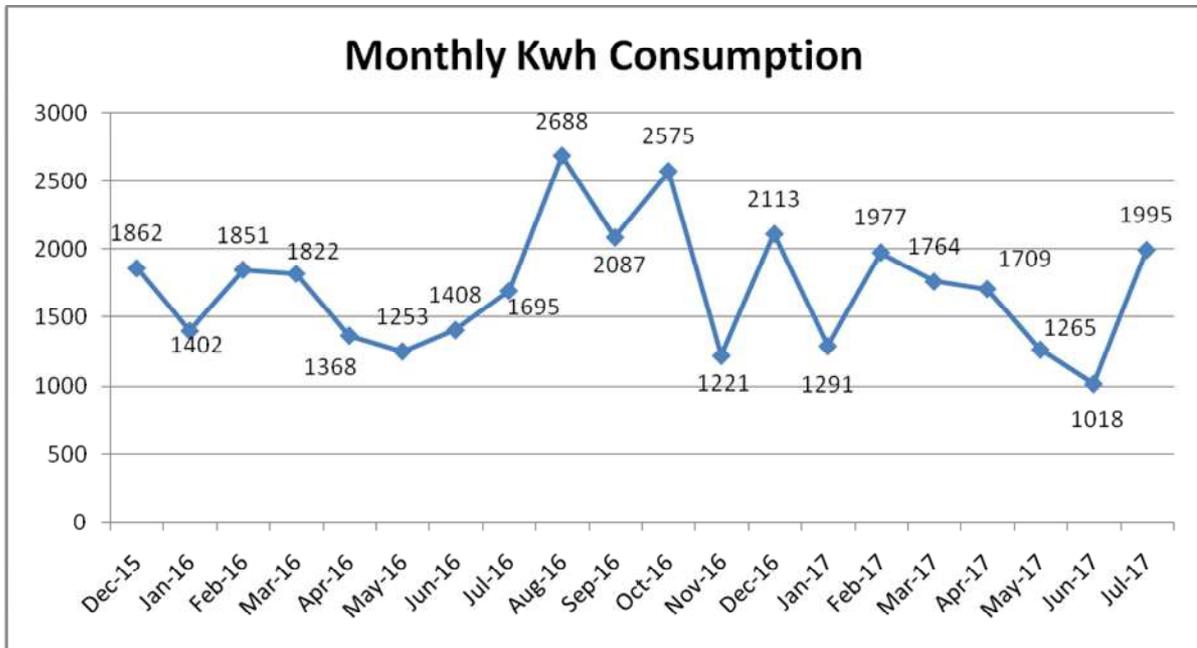
#### 3.1.a Consumer Number - 900000192547 - Moti Pustakalay



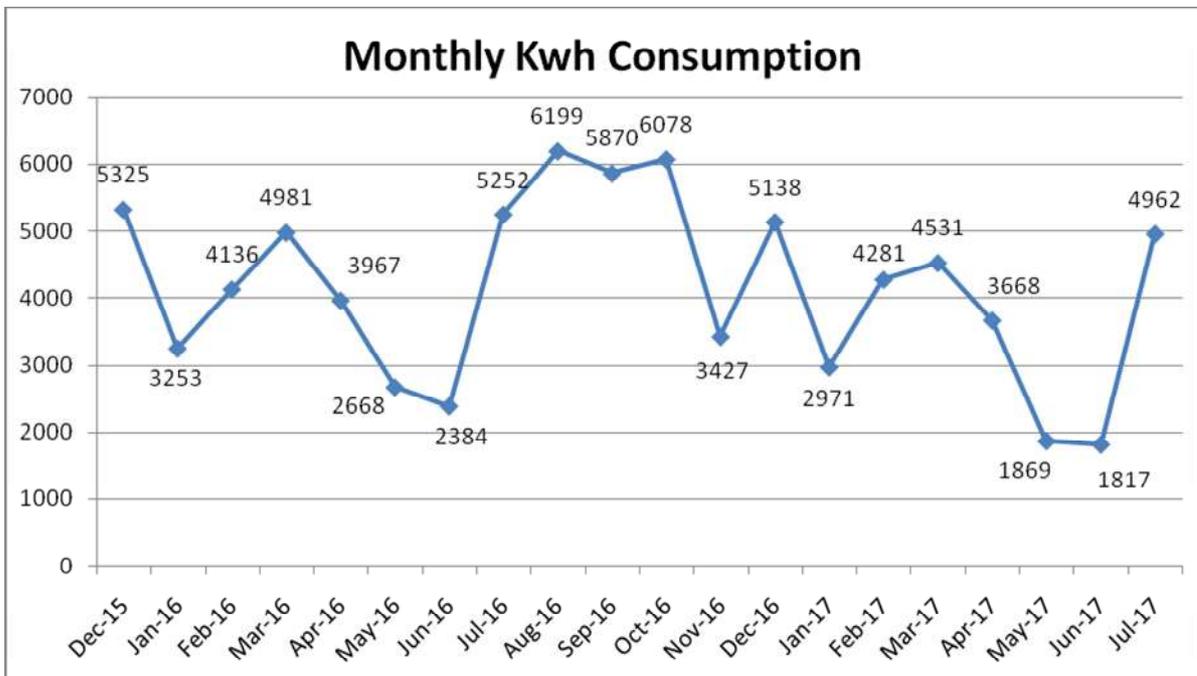
#### 3.1.b Consumer Number - 900000192502 - Junior College



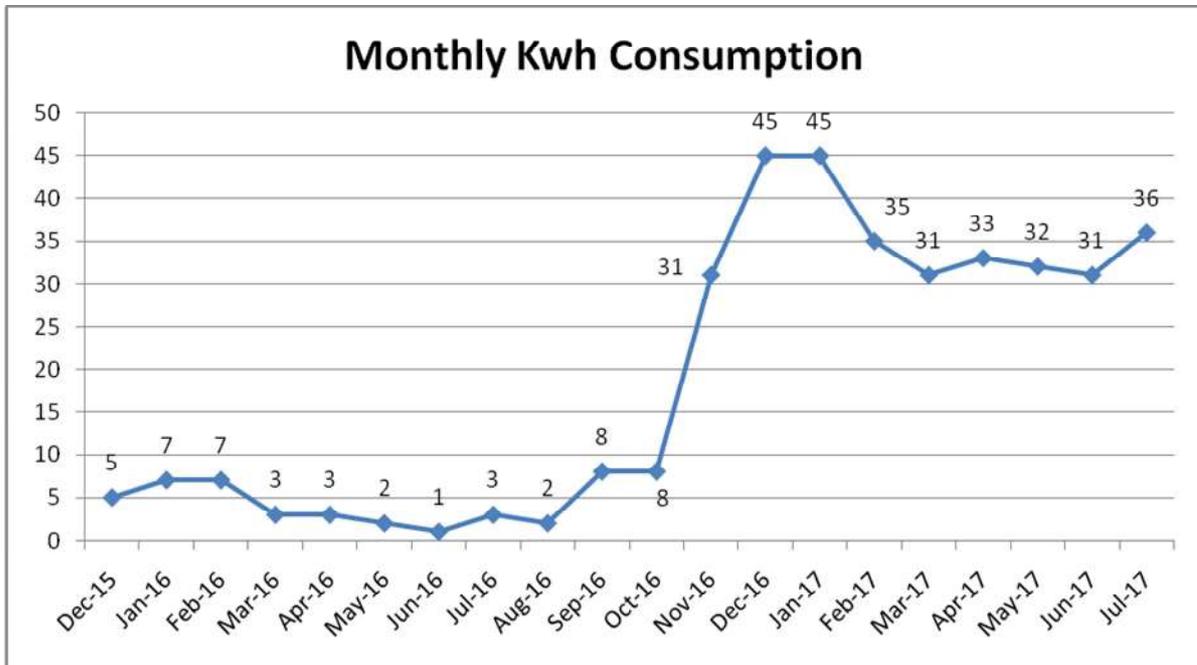
**3.1.c Consumer Number - 90000192581 - Junior College**



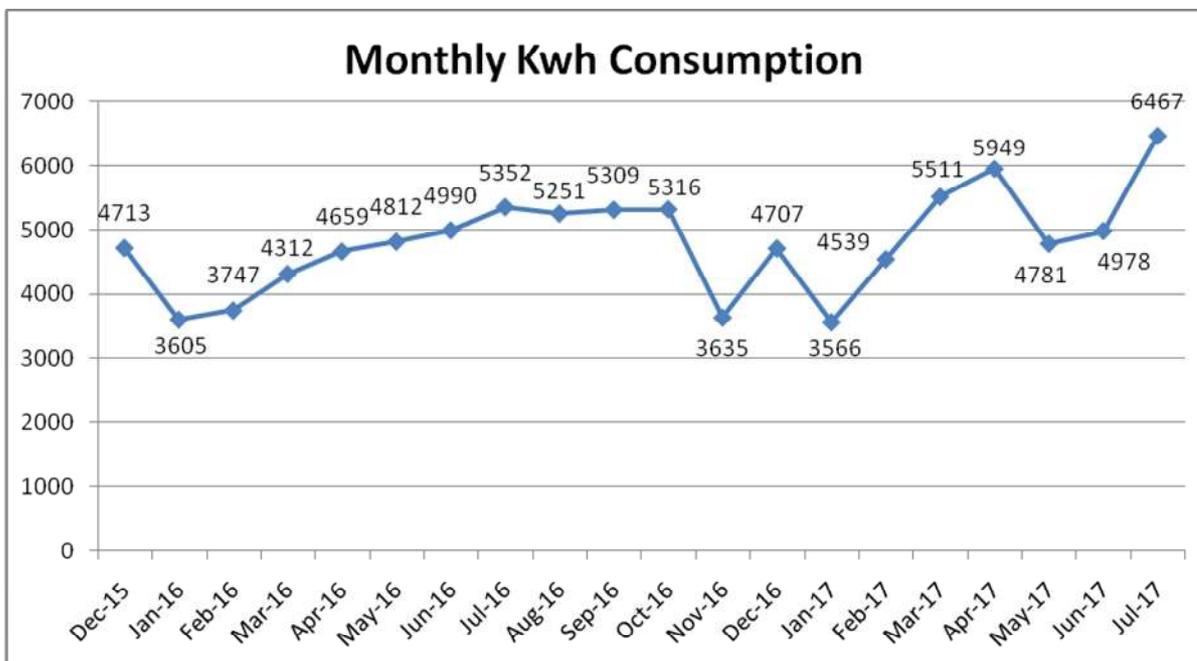
**3.1.d Consumer Number - 90000192563 - Junior College**



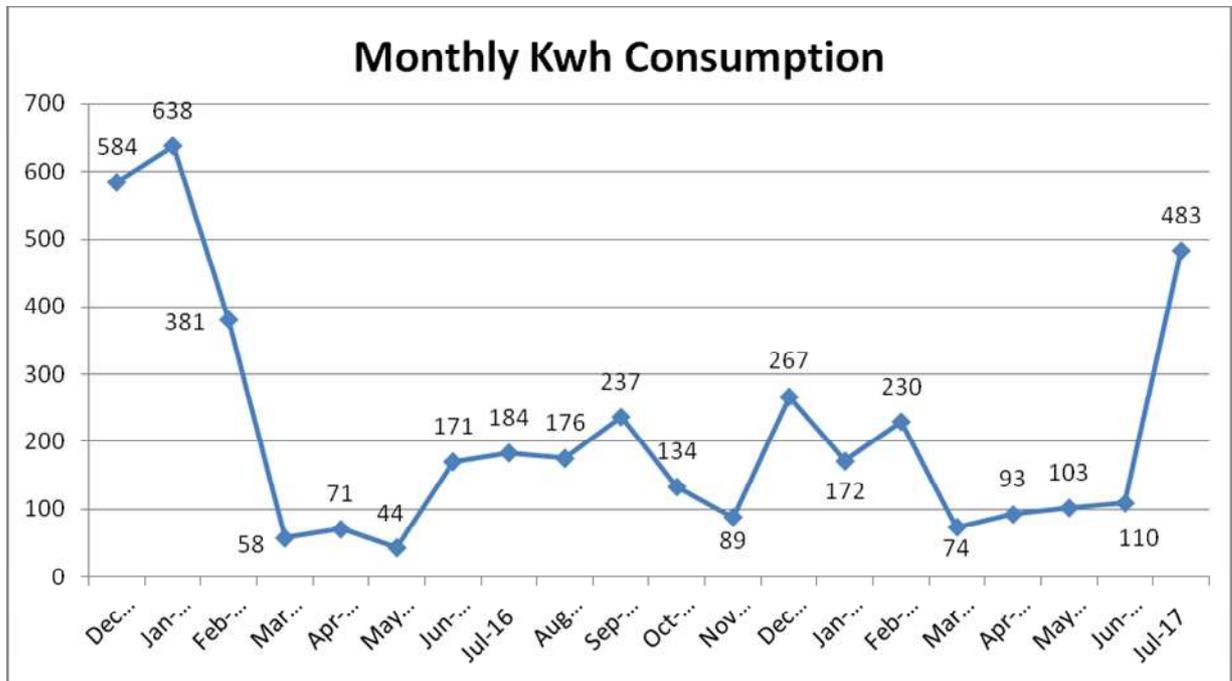
**3.1.e Consumer Number - 900000192467 - Degree College**



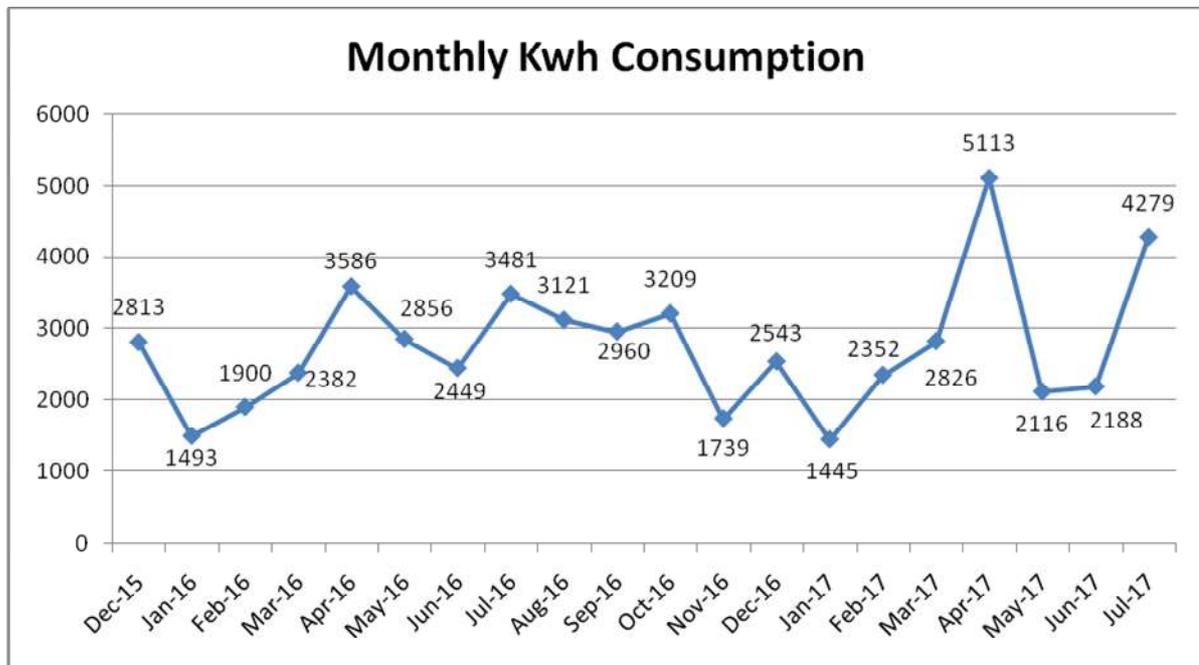
**3.1.f Consumer Number - 900000192520 - Degree College**



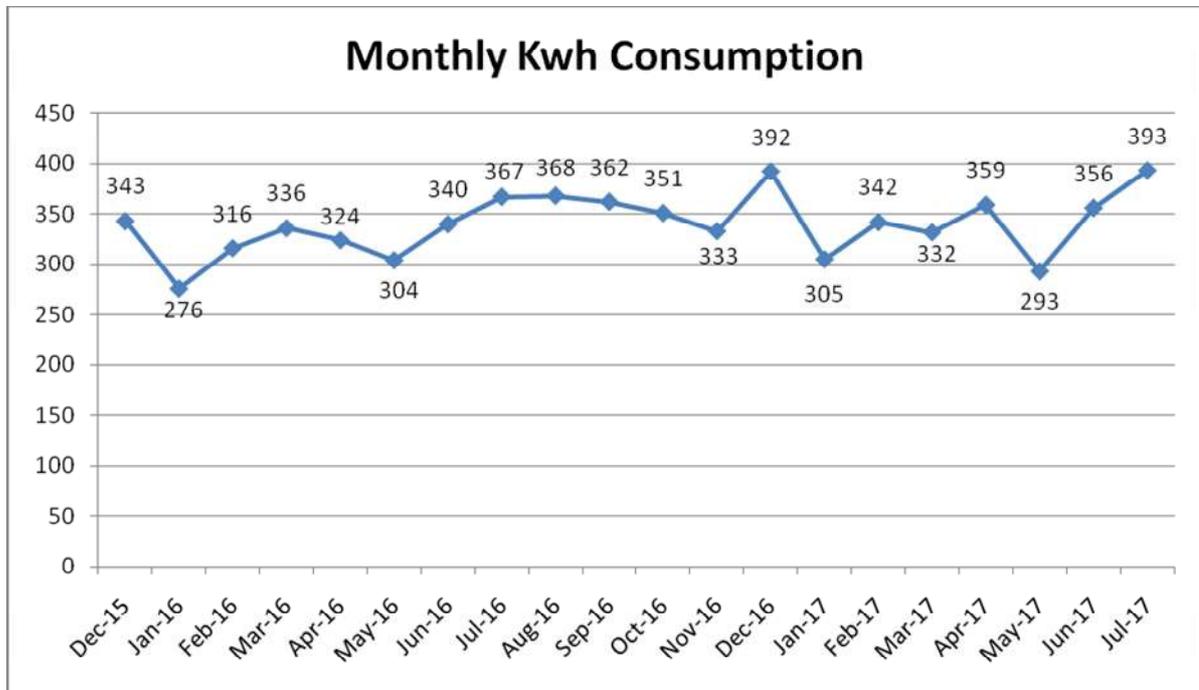
**3.1.g Consumer Number - 900000192533 - Decorators**



**3.1.h Consumer Number - 900000192483 – Self Finance Department**

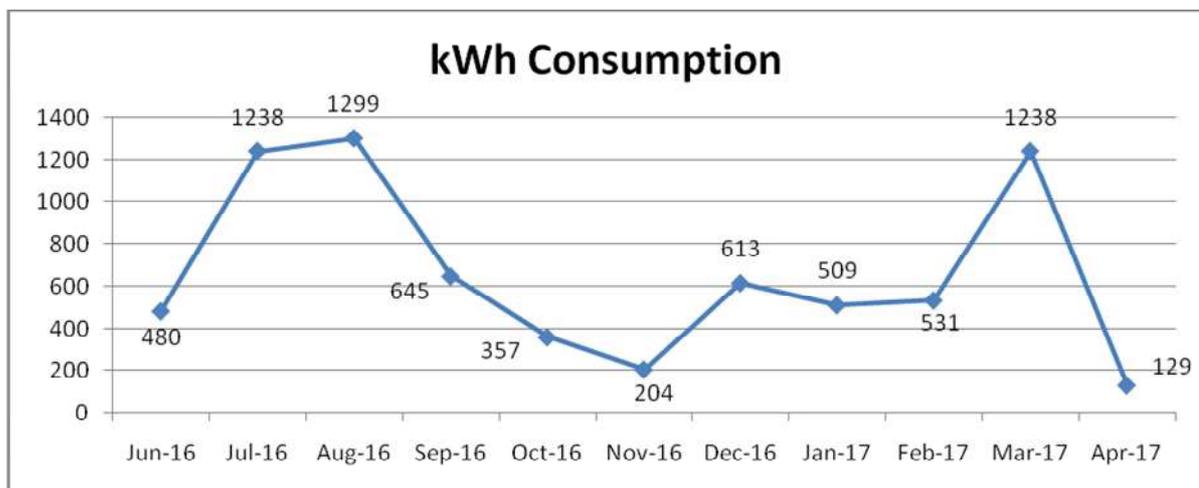


**3.1.i Consumer Number - 900000236757 – Canteen\***



\*Canteen energy bill is directly paid by canteen contractor

**3.1.j Consumer Number - 151326814 – Gymkhana**



### 3.2 Attributions from above electricity consumption pattern –

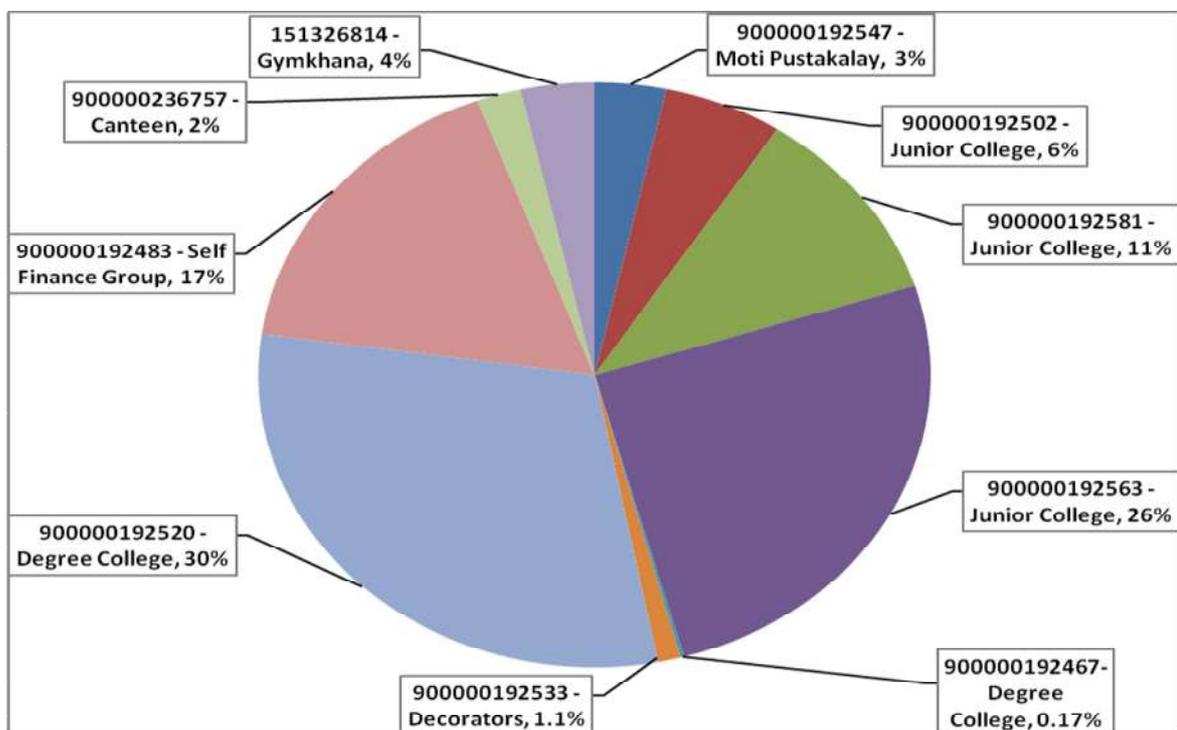
- During annual summer vacation (May & June Month) the electricity consumption reduces and as college start after vacation the consumption pattern progressively increases. The monthly variation in average electricity consumption pattern for major four numbers service connections which is contributing 84% of college energy usage were analysed and details are given below:-

<b>Consumer Number</b>	<b>Average monthly energy consumption in vacation (For May &amp; June 2017)</b>	<b>Average monthly electricity consumption during regular college working (For July 2016 to March 2017)</b>	<b>Analysis of energy usage and comments</b>
	<b>kWh/month</b>	<b>kWh/month</b>	
900000192520 Degree college	4879	4913	There is no much difference in consumption pattern during vacation. College should review for energy usage in vacation period.
900000192563 Junior college	1843	4741	Energy consumed during vacation is 39%
900000192581 Junior college	1141	1912	Energy consumed during vacation is 60%
900000192483 Self finance group	2152	2878	Energy consumed during vacation is 75%. College should review for energy usage in vacation period.

- For Consumer Number – 900000192467 – Degree College, the electricity consumption pattern shows increase from November 2016 month but still the consumption is very less (average monthly consumption is 36 kWh for last 8 months) compared to other service connections. The average per unit cost for Consumer Number 900000192467 is Rs. 22.4/kWh and other degree college consumer Number 900000192520 is Rs 13/kWh. Hence it is advised that the electricity supply to Consumer Number 900000192467 areas can be provided from consumer Number 900000192520 to reduce the cost.

### 3.3 Percentage wise electrical consumption of all service connections:-

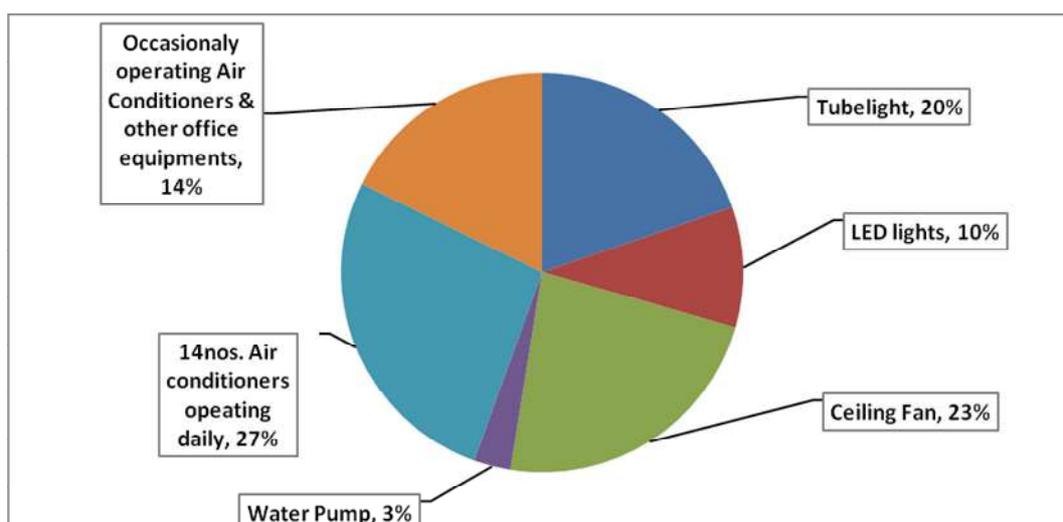
Following chart shows the contribution of each service connection in annual electricity consumption for period 12 months (August 2016 to July 2017).



As per above chart the 56% of electricity is consumed by only two service connections i.e. consumer Number 900000192520 Degree college and consumer Number 900000192563 Junior college. Also as shown in point Number 3.1, in both service connections the maximum amount of electricity is consumed in the month of July, August, September and October.

**3.3** Following table shows estimated power consumption for a day by different equipments

Sr. No.	Equipment	kWh/day	%
1	Tube Light	130	20%
2	LED lights	65	10%
3	Ceiling Fan	152	23%
4	Water Pump	20	3%
5	14numbers Air conditioners operating daily	177	27%
6	Occasionally operating Air Conditioners such as in auditorium, A/V room and other office equipments	117	18%
	<b>Total</b>	<b>661</b>	<b>100%</b>



- 3.4** The online power measurement of various energy consuming equipment are measured and the details are given in **Annexure – 3**.

#### **4. ENERGY CONSERVATION OPPORTUNITIES**

**4.1** The Shri M D Shah Mahila College lighting system consists of mainly 38 W fluorescent tube lights and 24W LED tube lights. The total lighting load is 21.6 kW. The inventory of lighting system is given below:-

<b>Types of Lamp</b>	<b>Tube light (38W)</b>	<b>LED tubes (24W)</b>
Quantity (Numbers)	380	300
Load in kW	14.44	7.2

**4.2** In building number 1 first and second floor, the management has replaced the 38W fluorescent tube lights with 24W LED tubes (total 300 numbers). As college operates in two shifts and considering the longer operating hours of lighting it is suggested to install LED tubes in all three buildings.

**4.3** The estimated annual savings for replacing 380 numbers for 38W fluorescent tube lights with 24W LED tubes will be 19380 KWH / annum and the monetary savings will be Rs. 2.61 lakhs / annum. Investment required will be Rs. 1.33 lakhs. Refer **Annexure – 4**.

**4.4** It is observed during the study that in library and student reading room the tube lights were ON though there is minimum occupancy; hence it is recommended to install the occupancy sensor in library and reading room area to save the electricity consumption. The total power consumed in library is 1.831 kWh/hour and in reading room is 1.824 kWh/hour. By installing the occupancy sensors the 30% of energy consumption can be saved in library and reading room. The estimated annual savings will be 2200kWh and the monetary saving will be Rs. 29600/-. Investment required for occupancy sensors shall be approx. Rs. 20000/- .

**4.5** It is also observed that each Wash Room is provided with tube lights which are continuously in operation. Considering the energy cost the management may review installation of occupancy sensors in the wash rooms. This will further reduce energy consumption in the building.

**4.6** College has total 46 numbers classrooms in its three buildings. Typically in one classroom has 6 to 7 numbers ceiling fans depending on class room size. In total there are 280 numbers of ceiling fans in college campus each ceiling fan is of 60W capacity. Energy saving can be achieved by replacing the old ceiling fans with new energy efficient fans with electronic regulators. Installing fans with regulators will further reduce energy consumption in fans.

The estimated annual savings for replacing 280 numbers for 60W old ceiling fans with 35W energy efficient fans will be 19125 KWH / annum and the monetary savings will be Rs. 2.58 lakhs / annum. Investment required will be Rs. 7.5 lakhs. Refer **Annexure – 5**.

**4.7** Out of total 55 numbers air conditioners installed in college, around 14 numbers air conditioners are operating average 8 hours per day with limited thermostat control operation. It is suggested to replace the existing 3 star 14 numbers old air conditioners with 5 star rated air conditioners to have energy saving. The estimated annual power savings will be 8725 kWh and monetary savings shall be Rs.1,17,794 per year. Total investment required will be Rs.4.20 lakhs. Considering the capital requirement the college may replace the air conditioners in phased manner. Refer **Annexure 6**.

**4.8** Sample power measurement of air conditioners indicates that some of the air conditioners are not delivering the full capacity resulting in lower power consumption. Due to poor performance of air conditioners, temperature maintained in the office area is higher than the comfort level. (To meet the comfort level the temperature in the room shall be maintained at 25°C)

**4.9** For Consumer Number – 900000192467 - Degree College, the electricity consumption pattern shows increase from November 2016 month but still the consumption is very less (average monthly consumption is 36 kWh for last 8 months) compared to other service connections. Average per unit cost for Consumer Number 900000192467 is Rs. 22.4/kWh and other degree college consumer Number 900000192520 is Rs 13/kWh. Hence it is advised that the electricity supply to Consumer Number 900000192467 areas can be provided from consumer Number 900000192520 to reduce the cost and service connection associated with Consumer Number 900000192467 can be disconnected. The estimated annual cost saving shall be Rs. 4060/year.

**4.10** To promote Green Energy and considering cost saving potential, the Shri MD Shah Mahila College Management can implement the grid connected solar photovoltaic (SPV) system for further reducing energy cost. To start with the college can install one 50 kWp Solar system which will meet 40% energy requirement and require 500 Sq.mtr area. Considering the available terrace area the college can install maximum 65kWp SPV system.

Sr. No.	Particulate	Annual Savings		Estimated Investment (Rs. Lakhs)
		kWH	Rs.	
1	Installation of 50 kWp SPV panel	50000	6,75,000	27.0

The college has following terrace areas available for installation of SPV System:-

Terrace Area	Size	Sq mtr
Gymkhana Building	9mtr X 8.7 mtr	78.3
Main Building 1	36mtr X 12 mtr	432
Main Building 2	21mtr X 12 mtr	252

## **5. WATER CONSERVATION OPPORTUNITIES**

- 5.1** The water is supplied by Bombay Municipal Corporation. The College has two water service connections from BMC. The water from BMC is stored in underground water tank and pumped to overhead water tanks located on terrace. There are two water pumps located at ground floor for main college building, in which one is old stand-by pump and other is 7 HP pump (new) which is operated as per the requirement. The new 7 HP pump is operated average 3 hours daily. Based on BMC bills the estimated daily water usage is 23000 Litres/day. The estimated total water and sewerage charges for college campus are Rs. 93000/Year. The sewage coming from toilets and washrooms is discharged into municipal drain.
- 5.2** When the water level in overhead tanks goes down pump is started manually and when the tanks overflow the pump is stopped manually. The pump ON/OFF operation is not regularized or controlled which leads to considerable water loss due to tank overflow. It is suggested to install level controller in overhead tank connected with pump ON/OFF operation so that tanks will not overflow and water can be saved. By effective and controlled working, 15 minutes of pump operation can be saved. The investment required for auto control is approx. Rs. 10,000/-
- 5.3** The college has total 106 numbers drinking water taps which when fully open gives water flow 5 liter per minute. The water can be saved by installing the flow regulator washers in taps so the flow rate will be regulated to 1.9 liters per minute. With installation of water flow regulator college can save 8900Litre of water per day with estimated annual cost saving of Rs.10,500/-. The investment required for water flow regulator washer shall be Rs. 19,000/- . The budgetary cost for water flow regulator has been attached in **Annexure 7**.

- 5.4** The sewerage water coming from toilets and wash basins is discharged to municipal drain and the BMC collect sewerage charges along with water bill of the college. In college water bill, BMC estimate sewerage quantity as 70% of total water supplied by BMC. From college water bill it is estimated that the daily sewage quantity is approx. 16 Cum./Day and BMC's annual sewerage charges are approx Rs.40,000. The installation, operation and maintenance of packaged sewage treatment plant is economically not viable for college due to very low sewage quantity generated per day and standard sewage treatment plant available in the market.
- 5.5** As mentioned above BMC is charging 70% of water supply as sewage water quantity, however presently college is supplying bore-well water to wash rooms and toilets. In order to reduce water consumption in washroom flushes it is suggested to go for water saving flush system. The old flushes used to consume water 18-20 litre per flush. However the new flush system will consume 6-12 litre per flush. The flush water consumption will be reduced by installing new flush system.

## **6. GREEN INITIATIVE RECOMMENDATIONS**

College has taken several measures to reduce the carbon foot prints, to further augment their efforts towards green initiative the college management may consider following activities:-

- Use of papers made out of bagasse and other renewable energy products.
- Procurement of biodegradable office files and other stationary items.
- Use of computers, internet and intranet to reduce the paper usage for communications to students and staff.
- Promoting use of biodegradable products in college canteen e.g. paper cups, plates etc.
- All E-waste such as computers, old printers, servers, discs and other electrical & electronics equipments to be disposed through government approved / recognized E-waste recyclers such as M/s.
- Awareness programs on green initiative, environment protection through students and teaching staff on regularly basis with annual targets.
- College may use the kitchen waste and other biodegradable waste generated on campus for small compost project.
- Targeted tree plantation programs can be initiated by the college and plantation shall be carried out in other educational institutes or government offices / premises.

**Annexure – 1**

**ELECTRICITY BILL DETAILS OF ALL SERVICE CONNECTIONS**

Month	Monthly Kwh Consumption (Billed Units)		
	Consumer Number - 900000192547 – Moti Pustakalay	Consumer Number - 900000192502 – Junior College	Consumer Number – 900000192581 – Junior College
Jul-17	678	942	1995
Jun-17	119	718	1018
May-17	111	508	1265
Apr-17	956	1360	1709
Mar-17	884	1275	1764
Feb-17	557	945	1977
Jan-17	234	755	1291
Dec-16	374	1047	2113
Nov-16	418	673	1221
Oct-16	1064	1229	2575
Sep-16	867	874	2087
Aug-16	544	970	2688
Jul-16	492	1068	1695
Jun-16	199	495	1408
May-16	348	473	1253
Apr-16	975	1013	1368
Mar-16	1200	1192	1822
Feb-16	618	1003	1851
Jan-16	413	763	1402
Dec-15	862	956	1862
<b>Total</b>	<b>11913</b>	<b>18259</b>	<b>34364</b>

**Annexure – 1 Cont..**

<b>Month</b>	<b>Monthly Kwh Consumption (Billed Units)</b>		
	<b>Consumer Number - 900000192563 – Junior College</b>	<b>Consumer Number – 900000192467 – Degree College</b>	<b>Consumer Number – 900000192520 – Degree College</b>
Jul-17	4962	36	6467
Jun-17	1817	31	4978
May-17	1869	32	4781
Apr-17	3668	33	5949
Mar-17	4531	31	5511
Feb-17	4281	35	4539
Jan-17	2971	45	3566
Dec-16	5138	45	4707
Nov-16	3427	31	3635
Oct-16	6078	8	5316
Sep-16	5870	8	5309
Aug-16	6199	2	5251
Jul-16	5252	3	5352
Jun-16	2384	1	4990
May-16	2668	2	4812
Apr-16	3967	3	4659
Mar-16	4981	3	4312
Feb-16	4136	7	3747
Jan-16	3253	7	3605
Dec-15	5325	5	4713
<b>Total</b>	<b>82777</b>	<b>368</b>	<b>96199</b>

**Annexure – 1 Cont..**

Month	Monthly Kwh Consumption (Billed Units)			
	Consumer Number - 900000192533 – Decorators	Consumer Number - 900000192483 – Self Finance Department	Consumer Number - 900000236757 – Canteen	Consumer Number - 151326814 - Gymkhana
Jul-17	483	4279	393	-
Jun-17	110	2188	356	-
May-17	103	2116	293	-
Apr-17	93	5113	359	129
Mar-17	74	2826	332	1238
Feb-17	230	2352	342	531
Jan-17	172	1445	305	509
Dec-16	267	2543	392	613
Nov-16	89	1739	333	204
Oct-16	134	3209	351	357
Sep-16	237	2960	362	645
Aug-16	176	3121	368	1299
Jul-16	184	3481	367	1238
Jun-16	171	2449	340	480
May-16	44	2856	304	-
Apr-16	71	3586	324	-
Mar-16	58	2382	336	-
Feb-16	381	1900	316	-
Jan-16	638	1493	276	-
Dec-15	584	2813	343	-
<b>Total</b>	<b>4299</b>	<b>54851</b>	<b>6792</b>	<b>7243</b>

**Annexure – 2**

**EXISTING SOLAR PHOTO-VOLTAIC (SPV) SYSTEM DETAILS**

**Approximate reference Summary of Solar Street Lights installed at Shri M.D. Shah Mahila College, Malad.**

<b>Sr. Number</b>	<b>LED Luminary</b>	<b>Solar Panel</b>	<b>Battery</b>	<b>Location</b>
1.	18 wp	120 wp	12v 100 Ah	Gymkhana
2.	18 wp	120 wp	12v 100 Ah	Gymkhana
3.	18 wp	80 wp	12v 42 Ah	Canteen Tree
4.	18 wp	80 wp	12v 42 Ah	Canteen Front
5.	12 wp	40 wp	12v 42 Ah	Front Wall
6.	12wp	40 wp	12v 42 Ah	Front Wall
7.	12wp	40 wp	12v 42 Ah	Side Wall
8.	12wp	40 wp	12v 42 Ah	Security Wall
9.	3wp	3wp	6v 4.5 Ah	Ground Floor
10.	3wp	3wp	6v 4.5 Ah	First Floor
11.	3wp	3 wp	6v 4.5 Ah	Second Floor
12.	3 wp	5wp	6v 4.5 Ah	Third Floor
13.	3wp	3wp	6v 4.5 Ah	Mandap Side
14.	3wp	5 wp	6v 4.5 Ah	Extra in Mandap
15.	3wp	5wp	6v 4.5 Ah	Front Wall
16.	3wp	5wp	6v 4.5 Ah	Security Side

Annexure – 3

**ON-LINE POWER MEASUREMENT DETAILS**

Sr. Number	Location	Volt	Amp	PF	Power consumption	
					Reading	Unit
1	Office AC Number 1	235	6.12	0.98	1.4	kW
2	Office AC Number 2	228	10.68	0.98	2.4	kW
3	Office AC Number 3	225	7.24	0.99	1.62	kW
4	Library Fan – 1	230	0.29	0.99	68	Watt
5	Library Fan – 2	230	0.29	0.99	67	Watt
6	Library LED Light	231	0.109	0.93	24	Watt
7	<b>Library (Total in book shelf area)</b>					
a.	R	239	3	0.99	715	Watt
b.	Y	234	3.53	0.99	819	Watt
c.	B	233	1.36	0.94	297	Watt
	<b>Total</b>				1831	Watt
8	<b>Library Reading Room</b>					
a.	R	239	3	0.99	715	Watt
b.	Y	237	1.62	0.98	370	Watt
c.	B	236	3.14	0.99	739	Watt
	<b>Total</b>				1824	Watt
9	<b>2nd Floor class room</b>					
a.	Total (08 numbers tube lights + 06 numbers fans + 01number Small fan)	232	3.59	0.89	740	Watt
b.	Fan (small fan above stage)	231	0.24	0.98	54	Watt
c.	Light	231	0.266	0.99	38	Watt

**Annexure – 4**

**ENERGY SAVINGS IN LIGHTING**

**Tube Light Replacement with LED Bulb / LED Tubes**

Existing tube lightening numbers	380
Wattage	38
Suggested Wattage	18
savings (Watt)	20
Total saving in kW	7.6
Annual operating hours (255 working days and 10 hours daily working)	2550
Annual Energy saving in kWh	19380
Average Energy cost Rs./kWh	13.5
Annual monetary savings (Rs.)	261630
Investment per fitting (Rs.)	350
Total investment (Rs.)	133,000
Payback period (Months)	6

**Annexure – 5**

**ENERGY SAVINGS IN CEILING FAN REPLACEMENT**

**Replacement of Existing Ceiling Fans with Energy Efficient Fans**

Existing ceiling Fan numbers	250
Average Wattage	65
Suggested Wattage of energy efficient ceiling fan	35
Savings in Watt	30
Total saving in kW	<b>7.5</b>
Annual operating hours (255 working days and 10 hours daily working)	2550
Annual Energy saving in kWh	<b>19125</b>
Average Energy cost Rs./kWh	13.5
Annual monetary savings in Rs.	<b>2,58,188</b>
Investment per fitting (ceiling fan)in Rs.	3000
Total investment in Rs.	<b>750,000</b>
Payback period in Months	<b>35</b>

**Annexure – 6**

**ENERGY SAVINGS IN AIR CONDITIONERS REPLACEMENT**

**List of Air Conditioners Running Average 8 hours/day**

<b>Location</b>	<b>Numbers</b>
Office	4
Principal's Cabin	2
Staff Room	5
Computer Room near staff room	1
Supervisor Room	1
HSC Vocational Office	1
<b>Total</b>	<b>14</b>

Capacity of air conditioner in Tonn	1.5
3 Star air rated conditioner's EER	2.91
5 Star air rated conditioner's EER	3.5
Existing 3 Star rated air conditioner power input, kW	1.81
5 Star rated air conditioner estimated power input, kW	1.51
Power Saving, kW	0.31
Total power savings for 14 nos. AC, kW	4.28
Annual operating hours	2040
Avg. Energy cost Rs./kWh	13.5
Estimated annual power Saving, kWh	8,725
Estimated annual Monetary Savings, Rs./year	117,794
Investment per fitting (ceiling fan)in Rs.	30000
Total investment in Rs.	<b>420,000</b>
Payback period in Months*	<b>43</b>

\* College may replace air conditioners in phased manner as initial capital investment is high.

**Annexure – 7**

**Estimation of Water Saving Opportunity with Installation of Water Flow Regulator Washers in Drinking Water Taps**

Numbers of drinking water taps in college	106	Numbers
average 1 min flow per tap	5	Litre/min
Average water tap open time per day	40	min/day
Per day per single tap water consumption	200	Litre/day
Total water consumption for all taps Per day	21200	Litre/day
Water tap flow with new regulator per minute	2	Litre/min
Total water consumption for all taps Per day with new flow regulator	8480	Litre/day
Total water saving per day	12720	Litre/day
Numbers of water taps operating	70	%
Total water saving per day considering 70%water saving	8904	Litre/day
Average water cost per KL	4.66	Rs./KL
Annual water cost saving (Considering 255 working days)	10581	Rs./Year
Investment per water flow regulator in Rs.	180	Rs.
Total investment in Rs.	<b>19,080</b>	Rs.
Payback period in Months	<b>22</b>	Months

**Annexure – 7 Contd...**



**Ref:** IRA/WSA/2017-7-31/601

**Email:** gaurav.rkadam@gmail.com

**Date:** July 31, 2017

**Client:** National Productivity Council, Mumbai

**Kind Attn:** Mr. Gaurav Kadam

**Sub:** Water Saving Aerators Offer for Educational Institute in Malad, Mumbai .

**Dear Sir,**

With reference to the discussion we had with you & based on the requirement of Water Saving Aerators, we are pleased to submit our competitive offer.

Attached below is the tentative estimate of the Project.

- Cost Components
- Terms & Conditions

Kindly refer the same.

We would be happy to visit you to discuss the technical as well as commercial details at your convenience.

We hope you will find our offer in line with your requirement. Please feel free to call in case of any doubt.

Thanking you and assuring you our best services at all times.

Sincerely,

For **ira** Sustainable Water Solutions,

**Swapnil Potdar** | +91 777 606 3331

**Udyam Gokhale** | +91 777 606 3336

[www.irawater.com](http://www.irawater.com)

[info@irawater.com](mailto:info@irawater.com)

 **Rainwater Harvesting**

**Design. Build. Maintain**

B 703, Supreme Estado, Baner, Pune 411 045 | +91 777 806 3322/44 | [irasws@gmail.com](mailto:irasws@gmail.com) | [info@irawater.com](mailto:info@irawater.com)  
[www.irawater.com](http://www.irawater.com)

Annexure – 7 Contd...



WATER SAVING AERATORS OFFER										
Sr No	Product		Item	Flow Rate (lpm)	Application	Unit	Qty	Rate	Total (In Rs.)	
1			PCA SLC Spray (Make : NEOPERL)	1.9	Wash Basin	no.s	106	165	17,490	
A									<b>BASIC TOTAL</b>	<b>17,490</b>
B									GST (@18% on Item 'A')	3148
C									<b>TOTAL AMOUNT</b>	<b>20,638</b>

*(All figs. In Rs.)*

**TERMS AND CONDITIONS**

**Payment Terms**

- 50% of the **Offer Cost** will have to be paid as an **Advance** along with a Purchase Order.
- 50% of the remaining amount to be paid within 7 days after the delivery of material and installation.
- Material costs quoted are as of **31.7.17** (valid for 60 days from this date). After that, prevalent material costs will be charged as per market conditions.
- Freight Charges inclusive for the quantity indicated in the Offer.
- Date of supply will be decided after communication with the client.

**Other Terms**

- Material will be supplied in **8 working days** from the date of Purchase Order.
- Offer includes **Material Supply only**. Installation would be in Client Scope.
- In case of cancellation of Work Order (after issuance), **5% Cancellation Charges** (of Offer Value) will be levied.
- **Warranty** – 1 year from the date of purchase against any manufacturing defects.

**We are authorized channel partner of “MNRE” under  
“New Entrepreneurs”**

We are government approved Electrical Contract  
License Holder

We are the most experienced vendor in Net Meter  
Implementation in Mumbai



SOLGEN GREENTECH LLP: PROPOSAL TO M D SHAH  
MAHILA COLLEGE OF ARTS & COM





# Study of Your Electricity Bills and How Solar System fits as an alternative thinking for your existing electricity needs



# Existing Billing Details of Your Premises

We have done the study of your electricity bill and the details are as below;

Account No	Units	Amount	Rate	Sanction Load	MONTH
ST060698	442	6,490	14.7	9.92	17-Jul
L0089187	621	8,971	14.7	1	17-Jul
ST060696	1,826	25,710	14.1	5	17-Jul
ST063817	4,542	63,425	14.0	5	17-Jul
TAT20744	360	3,005	8.3	1	17-Jul
TAT20743	33	809	24.5	2	17-Jul
ST004576	5,919	82,553	13.9	2.24	17-Jul
ST004580	3,917	54,744	14.0	7	17-Jul
RI7659627	862	12,324	14.3	19.1	17-Jul
Total	18,522	258,031	13.9	52.26	

We have studied electricity bill for the purpose of solar power plant feasibility. As shown in above table, average electricity bill rate is Rs. 13.9 per unit and average monthly unit consumption is 18500 kWh. The Solar PV System will definitely help the building to reduce the rate substantially.

As measured on the terrace, we understand that the school has approx. 700 Sqmtr shadow free space and we can put around 65 kWp Solar Power Plant in the required space. 65 kWp Solar Power Plant will generate 7800 units per month.

The benefits, payback and technical specification of the system is given in the subsequent slides

# Why we need Solar & its Benefits

## Why We need Solar?

How long would you be able to burn the coal for your electricity need? DISCOM will increase the price every year to set off their losses

Do you want to continue with the flow or think some new technology for your energy need.

Our Alternative Thinking – Solar Photovoltaic Power Plant

Generate your energy requirement through Solar and get benefit life long – Renewable Energy Harvesting and Green and Clean Energy Generation

## Benefits for Using Solar As Your Alternative Energy Source

- Per unit cost for solar electricity is approx. Rs 3-4 per unit as against grid cost of Rs. 13-15 per unit
- Hedge against inflation and increasing electricity prices as solar installation is one off costs
- Longevity - solar panels can last over twenty five years
- Low maintenance - solar panels require minimum maintenance (Only dust cleaning of panels)
- Portrays and build image of Green Energy, invites attention of regulatory body
- Contribution towards green environment

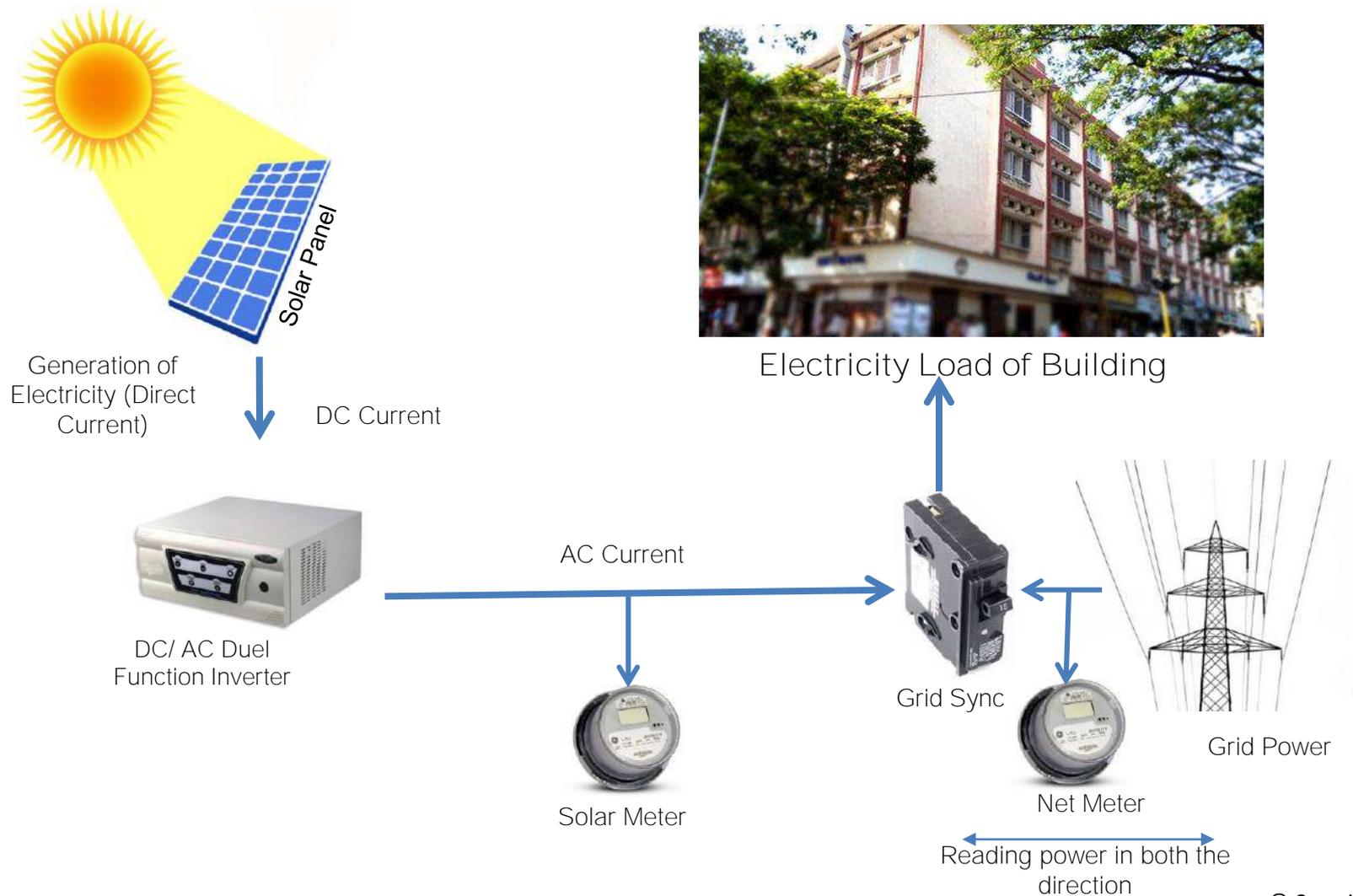




# Our Solar PV Solution for You



# On Grid Solar Solution for Your Electricity Load



# On Grid Solar PV Solution - Benefits

- No load restriction: Solar energy is fed to grid either of 33kV / 11kV three phase lines or of 440/ 220 Volt three/single phase line on the capacity of the system installed at institution /commercial establishment or residential complex.
- Electricity generation at the consumption level center and hence saving in transmission and distribution loss
- Low gestation time
- Improvement of tail-end voltages and reduction in system congestion with higher self-consumption of solar electricity
- Net metering / Import – Export of Power
- Space requirement: 1 kWp = 100 Sqft.
- Maintenance Free



# Our Solution to You

- **System Requirement:** Based on the current and historical consumption and space available on rooftop, we suggest 65kWp solar pv system in order to minimize the electricity bill.
- Total space required for above solar plants: 700 Sqmtr shadow free area for 65 kWp SPV Plant
- We suggest following systems:
  - Solar (on) Grid Connected System: Solar Photovoltaic System generates DC power and it is fed to the grid connected inverter and DC power is converted to AC Power. AC Power generated through Solar is synchronized to your mains supply (supply through TATA) so it will cater entire load of your unit. There is an advantage of Net Metering Policy which you can take for this system. Advantage of Net Metering is explained in subsequent slide of this presentation.
  - Drawback of this system is that whenever there is no electricity, solar power will also stop due to islanding protection in inverter.
  - We suggest to convert 40 watt conventional tube light into 18 watt LED lights which will also help you to reduce your electricity cost.



# Solgen has achieved 1<sup>st</sup> Net Meter in Mumbai

Net metering is an agreement that allows the solar PV system owner to sell excess solar energy to the DISCOM (TATA) or buy deficit energy from the DISCOM using a meter to track this energy exchange.

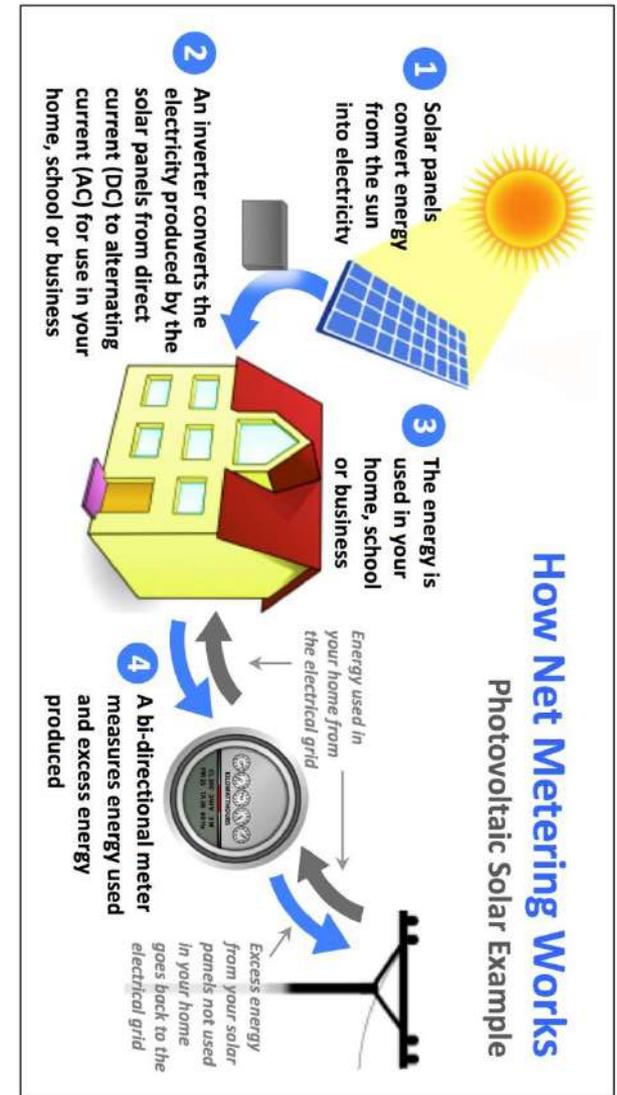
Case 1: If at any moment of time, if solar energy generation (kWh) is less than the load requirement at that time, the difference of energy is taken from the main grid and the meter runs forward, as usual. In this case, the system owner is charged for the units (kWh) consumed from the main grid. Eg. During early morning or during late evening/night.

Case 2: If at any moment of time, if solar energy generation (kWh) is more than the load requirement at that time, the excess solar energy is fed back to the main grid and the meter now runs backward. In this case, the system owner gets credit for the units (kWh) fed back to the main grid. Eg. During peak sunshine hours (afternoon)

Thus, at the end of the billing period:

If case 1 > case 2, then the owner is charged for the difference of units as per usual retail tariff

If case1 < case 2, then the difference of units is either carried forward to the next billing period or the owner is paid for the difference of units as per the tariff decided by the concerned DISCOM.







# Scope of Work, BOQ and Commercials



# Scope of Work

## Scope of Work Inclusion:

- Supply, Installation and Commissioning of solar photo voltaic system at your premises
- Loading and unloading of material
- Installation of entire pv system till LT panel of the premises
- Liasioning with government authorities for Net Meter
- Applying cash subsidy on behalf of the client, if applicable

## Scope Exclusion

- All taxes and duties are excluded.
- This scope is for agreed timelines and in accordance with other provisions and obligations of each Party. Unless specifically agreed by us in writing, no other supply or services shall be considered as part of our scope/ deliverable /obligation.
- Any delay in projects due to any kind of government approval will not be our responsibility.
- **Providing water and electricity during installation would be in client's responsibility**
- Proper rooftop space with proper structural strength will be provided by the customer for the installation. If any civil modifications are to be done to strengthen the roof/ installation area then the additional cost for this work will be given by client.



# Solar PV BOQ

Make	Specification	Quantity	Warranty	Quality Assurance
Solar PV Modules				
Solar –300 Wp Poly-Crystalline PV Modules  Make: Vikram / Equivalent	Module Efficiency at STC: 15.63% Vmp (Volts): 37.28 Imp (Amp): 8.05 NOCT: 46 +/- 2 Degree Weight: 20.5 KG Connector: MC4	As per BOQ	Product Warranty: 5 Years Performance Warranty: Linear power warranty for 25 years	IEC 61215, 61730, MNRE Approved Specification, TUV
Inverter and MMS				
Kaco (German Make) or Equivalent	50 KVA or Equivalent No of MPPT = 1 Efficiency=97% Protection: Input disconnection, Ground Fault, DC reverse polarity, DC Over Voltage and Current Limitation, AC Short Circuit, AC Over Voltage and Current Limitation, DC/AC SPD	As per BOQ	5 Years	IEC/CE/VDE/BDEW
Solgen	Hot Dip Galvanized channels and angles along with SS NUT and BOLT	As per BOQ	10 Years	

# Solar PV BOQ

Balance of System				
Cables				
DC Cables - Polycab	Solar DC Cables, 4 /6 Sq MM (with pin type and ring type lugs) MC4 Connectors 10 Sq MM Earthing Cables	As per BOQ	5 Years	TUV Certified, ISO 9001:2008, IS
Protectors				
ACDB DCDB Grid Interactive Panel Box	Schneider/ Citel / Honeywell / Chint	As per BOQ	5 Years	
AC Cables				
AC Cables and Protectors - Polycab	16 Sqmm, 4 core AC cables Earthing Cable: 10 Sqmm Proper Conduiting with PVC Pipe, Saddle and cable tie and tray	As per BOQ	5 Years	Applicable standards
Earthing	1. Chemical Earthing for AC (GI Earthing) 2. Chemical Earthing for DC (Cu Earthing) 3. Lightning Arrestor  Installation would be as per MERC Norms			



# Differentiator of Our Modules

- We supply PID resistance Modules (As it uses Anti-PID Cells and EVA).
- Our Modules are always with positive tolerance up to 5W.
- Modules are produced with 100% in-line Electroluminescence (EL) inspected thereby assuring no hair cracks.
- We uses IP67 Junction Boxes and its Aluminium Frames are of 42mm width with proper drainage arrangement.
- It provides 1.25 mtr each Cable length (Male & Female) for ease of installation problems which is total of 0.5mtr additional length.
- All Modules are manufactured out of European line with state of the art facility including the final Sun simulator testing in AAA Class LED based Sun Simulator.
- Modules are certified for IEC-61215, IEC-61730-1&2 & IEC-61701(Severity 6) and MNRE approved.



# Financial Advantage

**Benefit No. 1 #** As per Notification No. 5/34/2013-14/RT dated 19<sup>th</sup> November, 2015, 30% Central Finance Assistance (CFA) of benchmark cost will be applied to Residential and Education Buildings – For Commercial Building, this is not applicable

**Benefit No. 2 #** As per section 32 IA of Income Tax Act, there is 60% accelerated depreciation allowed on 1<sup>st</sup> year of investment in solar power generating unit. – This is applicable to business income holder only

**Benefit No. 3 #** Per unit cost of solar generated unit is around Rs 4 per unit as against Rs 14 per unit.

**Benefit No. 4 #** Hedging against increase in price by TATA for unit generated through solar power



## Structure Details (Normal Structure)



**Our structure comes with stradd report of 160 KMPH wind speed sustainability**

# ROI - For 65 kWp Solar PV System

- Solar Power Plant Capacity: 65 kWp
- Space Requirement on Rooftop: 700 Sq. Mtr.
- kW-hr (Units) generated through Solar in a Year: 95000 kW-hr
- Current rate of electricity: Rs. 14 per kW-hr (unit)
- Following are the calculation for illustrative purpose

Payback in 3  
years



Cost Benefit Analysis	2017-18	2018-19	2019-20	2020-2021
Investment Amount / Opening Balance in INR	3,575,000	2,496,650	1,342,816	108,213
Electricity Rate (Rs / kWh)	14.00	14.00	14.00	14.00
Unit generation from Solar Power Plant in a year in kW-hr	94,900	94,900	94,900	94,900
Approximate Value of Solar Units in a year in INR	1,328,600	1,328,600	1,328,600	1,328,600
Interest on investment at reducing rate @ 7%	250,250	174,766	93,997	7,575
Closing Balance in INR	2,496,650	1,342,816	108,213	(1,212,813)

Recovery of Investment is in 3.5 Years of the System. Per Unit rate for Solar Energy would be around Rs 4 per kW-hr

# Commercial Terms

Description	Price (INR)
SITC of Solar Grid Tie System of capacity 65 kWp to be installed at roof top. This is with normal roof surface mounted structures.	RS 35,75,000 (Thirty Five Lacs Seventy Five Thousand only)
Reliance : Change Over and Net Meter Charges	Rs.30000 /- (Thirty Thousand Only) per meter
Reliance : Meter Merging Cost	<b>At Actual. In Client's scope</b>

## General Terms and conditions:-

\* Pricing are exclusive of taxes and other statutory levies

Payment Terms: Our standard terms are as below

1. 50% advance on awarding of project
2. 30% on receipt of material at site
3. 10% on commissioning of project
4. 10% on commissioning of net meter

Installation time; 2 Months

## Warranty Terms:

Solar Panel: Product Warranty: 5 Years

Performance Warranty: Linear power warranty for 25 years

On Grid Inverter : 5 Years

Mounting Structure: 10 Years

5% GST is applicable as per rates for solar power generating system

Since it is a change over case, you need to convert this to original DISCOM i.e. Reliance Infra. Also, You need to merge the meters in order to increase the load to 70kW so that we can inject 65 kWp Solar Power Plant Electricity.

# Solar PV Recent Experience



# Our Certification

- Maharashtra Electrical Contractor License Holder
- Registered under Micro, Small and Medium Enterprises (MSME)
- ISO 9001:2015 Certified Installer
- IIT, Bombay – Solar PV Training for Master Technician
- **MNRE Empanelled Channel Partner under “New Entrepreneurs” scheme**



## Some Innovative Installations



Elevated Structure at 8 feet height



Structure on parapet wall between two wall of the building



Structure on metal sheets



Structure on parapet wall with support from outside wall of the building

# Solgen Greentech Experience of 2015-16

1. I&C: 200 kWp at warehouse in Madhavaram, Chennai
2. I&C: 230 kWp at Savitha College in Chennai
3. I&C: 180 kWp at Oxygen Building in Perumbakam, Chennai
4. BOS & I&C: 130 kWp at Juliet Products Pvt Ltd, Talaja MIDC, Thane
5. BOS & I&C: 150 kWp at Aarti Industries, Mulund, Mumbai
6. BOS & I&C: 150 kWp at Lakhani Dystuff, Ambernath
7. BOS & I&C: 65 kWp at Mehta API Pvt Ltd, Boiser
8. **EPC: 65 kWp at SVIS School, Kandivali (On Going)**
9. BOS & I&C: 80 kWp at Mantra House, Andheri MIDC, Mumbai with net meter
10. BOS & I&C: 30 kWp Reserve Bank of India at Amar Building, Fort, Mumbai with net meter
11. EPC: 30 kWp Vanson Engineering Pvt Ltd, Vasai, Mumbai with net meter
12. BOS & I&C: 45 kWp Reliance Energy, Andheri, Mumbai with net meter
13. **EPC: 60 kWp at Children's Academy School in Kandivali East, Mumbai**
14. EPC: 26 kWp at Gandipet and Masab Tank at Hyderabad
15. EPC: 33 kWp at Mahaveer Temple, Mumbai
16. BOS & I&C: 20 kWp at GPO, Mumbai
17. EPC: 15 kWp at Vasant Marvel Glory, Mumbai
18. EPC: 10 kWp Reserve Bank of India at Vasant Vihar, Mumbai with net meter
19. EPC: 10 kWp Arkade Bhoomi Heights, Kandivali West, Mumbai
20. EPC: 12 kWp Rock Enclave, Charkop, Kandivali West, Mumbai
21. EPC: 12 kWp Bhoomi Arkade, Kandivali East, Mumbai
22. EPC: 12 kWp at commercial building at Goregaon West, Mumbai
23. EPC: 12 kWp at Savli Hotel near Chiplun

Please check photographs of our installation. Few below 50kW projects not included in this slide.

<http://www.solarpv.in/installations.html>



Please visit <http://www.solarpv.in/news.html> for news coverage of Solgen Greentech

# Disclaimer

**This document contains confidential material proprietary to Solgen Greentech LLP (“SGL”).** The tools, material, ideas, strategies, plans and concepts contained herein are proprietary and are to be used solely and exclusively to evaluate the capabilities of SGL in providing assistance to you. The contents of this proposal are intended for your use and shall not be distributed to third parties. This document does not constitute an agreement between SGL and you and receipt of this document by you does not create an supplier-client relationship. Any product or services provided to you by SGL will be governed by the terms of a separate written agreement to be signed by you and SGL.

You acknowledge and agree that all the proprietary rights in the information received shall remain the property of SGL. The modification, reproduction, redistribution, display and transmission of any information contained herein or deriving commercial use or benefit from the proposal is strictly prohibited. SGL shall accept no liability for any damages, claims or losses of any nature, arising indirectly or directly from use of the data or material in this document or otherwise howsoever arising.



Contact Person:  
Mr. Amit Shah: 99202 88031

Email: [amit.shah@solgengreentech.com](mailto:amit.shah@solgengreentech.com)  
Website: [www.solgengreentech.com](http://www.solgengreentech.com); [www.solarpv.in](http://www.solarpv.in);  
[www.indiamart.com/solgengreentech](http://www.indiamart.com/solgengreentech)

SOLGEN GREENTECH is a Limited Liability Partnership Firm registered in India.

Mumbai Office:  
702, IJMIMA Complex, Link Road, Malad West, Mumbai 400064; Mobile: 99202 88031

Vadodara Office:  
714, 7<sup>th</sup> Floor, Yash Kamal Building, Sayaji Gunj, Vadodara 390005; Mobile 940 950 6789