



- NAAC Accredited "A" Grade Institute.
- Best Institute Award by Savitribai Phule Pune University, Pune.
- Recognized U/S 2 (f) & 12 (B) of UGC Act 1956, New Delhi.
- Approved by AICTE, New Delhi.
- Permanently Affiliated to the Savitribai Phule Pune University, Pune.
- Recipient of the 21<sup>st</sup> Dewang Mehta B School Award for the Educational Leadership 2013.



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**Criterion 7-Institutional Values and Best Practices**  
**Key Indicator - 7.1 Institutional Values and Social Responsibilities**

**7.1.3 -The Institution has facilities and initiatives for**

*7.1.3- Quality audits on environment and energy regularly undertaken by the Institution. The institutional environment and energy initiatives are confirmed through the following*

1. *Green audit / Environment audit*
2. *Energy audit*
3. *Clean and green campus initiatives*
4. *Beyond the campus environmental promotion activities*



*Sanjay*  
Dr Sanjay Dharmadhikari  
Director



## **CERTIFICATE**

This is to *certify that* Dr. Vithalrao Vikhe Patil Foundation's "Institute of Business Management and Rural Development" (IBMRD), Ahmednagar has undertaken the green audit at their campus and the same has been conducted by Kailash Tarde (Certified Energy Auditor – Bureau of Energy Efficiency Reg. no. 0989), SAI ENERGY SERVICES, during year 2022-23 for the purpose of NAAC accreditation.

The campus has been found green and eco-friendly, has the campus is in the hilly region and institute has planted trees in the campus area. This makes atmosphere enriched with oxygen and pleasant. Also, institute has installed solar PV system for renewable power generation and use.

The green measures carried out by the institute are found to be satisfactory and the efforts taken by the management towards environment are highly appreciated and commendable.

Kailash Tarde  
Certified Energy Auditor  
Bureau of Energy Efficiency, Ministry of Power, Govt. of India  
(Registration No. 0989)

For Sai Energy Services

SAI ENERGY SERVICES, *Tarde*  
KATRAJ, PUNE, Proprietor

DATE OF ISSUE : 25/04/2023



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## CERTIFICATE

This is to *certify that* Dr. Vithalrao Vikhe Patil Foundation's "Institute of Business Management and Rural Development" (IBMRD), Ahmednagar has undertaken the green audit at their campus and the same has been conducted by Kailash Tarde (Certified Energy Auditor – Bureau of Energy Efficiency Reg. no. 0989), SAI ENERGY SERVICES during October 2021 to November 2021 for the purpose of NAAC accreditation.

The green audit report has been prepared based on input data submitted by the institute and the observations complemented with auditor's best capacity of expertise in Energy auditing and Green building.

The green measures carried out by the institute are found to be satisfactory and the efforts taken by the management towards environment are highly appreciated and commendable. The general recommendations are rendered to further reinforce recognition of organization's efforts for sustainable development.

Kailash Tarde  
Certified Energy Auditor  
Bureau of Energy Efficiency, Ministry of Power, Govt. of India  
(Registration No. 0989)

SAI ENERGY SERVICES,  
KATRAJ, PUNE

For Sai Energy Services  
*Tarde*  
Proprietor

DATE OF ISSUE : 15/11/2021



**REPORT OF ENERGY AUDIT  
(Green Certification Assessment)  
CARRIED OUT AT**



**Dr. Vithalrao Vikhe Patil Foundation's  
Institute of Business Management and  
Rural Development  
(IBMRD)**

**Vadgaon Gupta (Vilad Ghat), MIDC, Ahmednagar-414111**

**October 2021**



**BY  
SAI ENERGY SERVICES**

**Katraj, Pune-46**





## **ACKNOWLEDGEMENT**

We are very much thankful to the management of Dr.VithalraoVikhePatil Foundation Ahmednagar, for giving us an opportunity to conduct the energy audit study for reducing the energy costs of the Institute of Business Management and Rural Development (IBMRD). Audit has been carried out with aid of measures for water conservation, waste management, environmental quality and green campus initiatives. We have suggested various measures for reducing energy costs and application of solar energy and initiatives for clean and green campus of Institute of Business Management and Rural Development. The report has been prepared as per the observation on site visit and inputs given by the institute.

Our special thanks to the team of IBMRD, staff members involved with this energy audit study. We trust that the findings of this study will help the management in improving the performance of electrical utilities and help reduce energy consumption and costs in a sustained manner.

**SAI ENERGY SERVICES**

**KailashTarde (Certified Energy Auditor)**



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## 1. INTRODUCTION

Dr. Vithalrao Vikhe Patil Foundation Ahmednagar is one of the best organizations in the field of education in Ahmednagar; it is the best campus in terms of clean and green environment. It has various institutes like the Medical College and Hospital, Nursing College, College of Physiotherapy, College of Pharmacy, CBSE School, College of Engineering, Agricultural College and IBMRD, is having lush greenery surrounding the Campus with plantation of trees along the road, open area around grounds and on the sides of the Institute buildings. Institute of Business Management and Rural Development (IBMRD) was established in the year 1986, it's offering AICTE approved courses like MBA and MCA, it is affiliated to Savitribai Phule Pune University.

The Energy audit is conducted at the **Institute of Business Management and Rural Development (IBMRD)** Ahmednagar, the campus building has two floors dedicated to different departments includes academic area like class rooms, library and computer labs and administrative area like main office and director cabin. The Energy audit is conducted for performance monitoring of electrical Utilities and exploring the energy saving opportunities and Use of Renewable energy.

Assessment includes past activities done for energy efficiency improvement and conservation of resources like water; energy and maintaining Green Campus (with plantation of trees) for Green Certification.





## 2. ELECTRICITY CONSUMPTION and BILL

The electricity bill of the MBA College was analysed for last 6 months for electricity consumption and billing pattern.

There is common connection for four premises (Engineering College, Agriculture College, IBMRD (MBA/MCA) and Junior College. The total electricity bill is for this common connection.

There is HT supply of 11 kV with HT metering and then it is stepped down to 11 kV/440 V with transformer of 450 kVA. There is Solar rooftop system of 300 kW installed on Engineering College for this supply with net metering.

There is sub meter installed to the IBMRD for energy consumption and billing purpose.

The details of energy consumption for IBMRD( MBA Building )are given below:

Months	Electricity consumption( sub meter )	Cost Rs. @ Rs.12/kWh
Apr-21	1695	20340
May-21	2203	26436
Jun-21	1630	19560
Jul-21	1626	19512
Aug-21	2203	26436
Sep-21	2105	25260
<b>Avg.</b>	<b>1910</b>	<b>22924</b>
<b>Annual</b>	<b>22924</b>	<b>275088</b>

Total For IBMRD building energy consumption and energy cost is given below:

Particulars	MBA		MCA		Total	
	Electricity Consumption	Amount Rs.	Electricity Consumption	Amount Rs.	Electricity Consumption	Amount Rs.
2018 - 19	21662.83	259954	10831.42	129977	32494.25	389931
2019 -20	29347.75	352173	17359.33	208312	46707.08	560485
2020 -21	13849.25	166191	4619.75	55437	18469.00	221628

The avg. energy consumption for IBMRD (MBA) was 2445 kWh/month in year 2019-20, and it is reduced in year 2020-21 to 1154 kWh/month due to COVID-19 situation only office working with online classes. For IBMRD (MCA) the energy consumption was 1446 kWh/month in year 2019-20 and it is reduced to 385 kWh/month in 2020-21 due to COVID-19 situation.

The total energy consumption for IBMRD building was 46707 kWh in year 2019-20 and amount is Rs. 589832/- ( For 2020-2021 it is reduced to 18469 kWh and amount is Rs. 221628 due to online classes and only office working)





## Premises Electricity Bill

For Common electricity bill of Engineering, IBMRD, Agriculture and Junior College with net metering of solar roof top system of 300 kW is provided below:

Consumer Name: M/S C. Ex. Officer Engg & College, Vilad Ghat, Ahmednagar

Sanctioned Load: 450 kW

Connected Load : 450 kW

Contract Demand: 350 kVA

60% of Contract Demand: 216 kVA

Tariff : HT - VIII B

Months	solar generation kWh	Export kWh	Inhouse consumption from Solar	Import kWh	Total consumption	Adjusted kWh	KW billed	Electricity Bill Rs.	Avg. unit charge of MSEDCL	Banked unit
Sep-21	30712	18438	12274	12580	24854	8901	3671	162210	44.18	9537

The electricity charged units are 3671 kWh and amount is Rs. 162210 , which is very high due to minimum demand charges of Rs. 432/kvA which is charged for 60% of Contract demand. This can be observed in regular working of college, how much is contract demand reached and based on that value of Contract demand can be selected , which will reduce the demand charges. The banked unit charges are refunded back @ Rs. 3.50 / kWh

Power factor is maintained to unity with APFC panel at LT side.

Premises are taking advantage of mostly Solar energy for consumption, as export is more than import of electricity from the grid and is using green energy.



### 3. LOAD DISTRIBUTION

The electrical load distribution for each floor (Room) of the IBMRD building was taken

The details of load are given below:

AREA	ROOM	LED	TFL	FAN	PC /Printer / Projector / Others		
		(WATT* No.)	(WATT* No.)	(WATT* No.)	(WATT*No.)		
Ground Floor	General Office	20 W x1	40 W x 14	75 W x 10	100 W x 23	Printer 100 W x 9no)	
	Corridor		40 W x 11			Water cooler 1.5 kW x 1 nos.	
	Library	20 W x3	40 W x 11	75 W x 9	100 W x 11	500 W x 1 ( Xerox)/ Printer 100 W x 1no)	
	Toilet	20 W x 3 nos.				1 exhaust (50W)	
	Board Room		40 W x 6		100 W x 11	Projector 300 W x1	
	Class Room 1		40 W x 4	75 W x 4			
	Class Room 2		40 W x 4	75 W x 5			
	Director Office		40 W x 12	75 W x 4	100 W x 11	AC 1.2 kW x 2nos ( 1 TR)	
	Pantry					Oven1- 500 W , Freeze 1 - 500 W	
	Computer Lab1		40 W x 6	75 W x 7	100 W x 24	AC 1.5 kW x 2nos ( 1.5 TR)	
	Computer Lab2		40 W x 6	75 W x 6	-		
	<b>First Floor</b>						
		Corridor		40 W x 7			
	Common Class room1		40 W x 6	75 W x 6		Projector 300 W x1	
	Seminar Hall	20 W x 2 nos	40 W x 9	75 W x 5		Projector 300 W x1	
	Faculty room		40 W x 3	75 W x 3	100 W x 2	Printer 100 W x 1	
	Class room 2		40 W x 4	75 W x 3		Projector 300 W x1	
	Class room 3		40 W x 4	75 W x 3		Projector 300 W x1	
	UPS room		40 W x 1	75 W x 10			
	Computer Lab	20 W x 3 nos	40 W x 7	75 W x 9	100 W x 127	Projector 300 W x1 , AC 1.5 kW x 4nos ( 1.5 TR)	
	Common area					500 W RO water	
	Toilet		40 W x 3			1 exhaust (50W)	





## 4. CLASSIFICATION OF LOAD

The classification of loads based on the type like Tubes, Fans, PC, Projector, Printer, AC in the class rooms, Offices, and Library is given below:

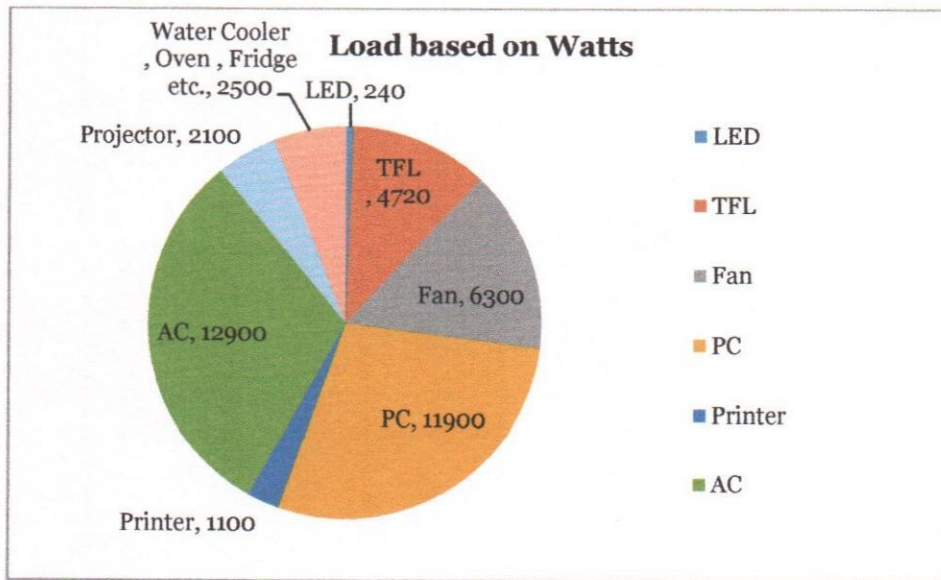
	LED		Total
	Ground Floor	First Floor	Watts
Watt	20	20	
Number	7	5	
	140	100	<b>240</b>
	<b>TFL</b>		
Watt	40	40	
Number	74	44	
	2960	1760	<b>4720</b>
	<b>Fan</b>		
Watt	75	75	
Number	45	39	
	3375	2925	<b>6300</b>
	<b>PC</b>		
Watt	100	100	
Number	80	39	
	8000	3900	<b>11900</b>
	<b>Printer</b>		
Watt	100	100	
Number	10	1	
	1000	100	<b>1100</b>
	<b>AC</b>		
Watt	1200 , 1500	1500	
Number	1.2 kW x 2nos., 1.5 kW x 3 nos.	4	
	6900	6000	<b>12900</b>
	<b>Projector</b>		
Watt	300	300	
Number	1	6	
	300	1800	<b>2100</b>
	Water Cooler , Oven , Fridge etc.		
Watt	500 W x 1, 500 W x 1	1.5 kW x 1	
Number	1000	1500	<b>2500</b>
	<b>Total</b>		<b>41760</b>



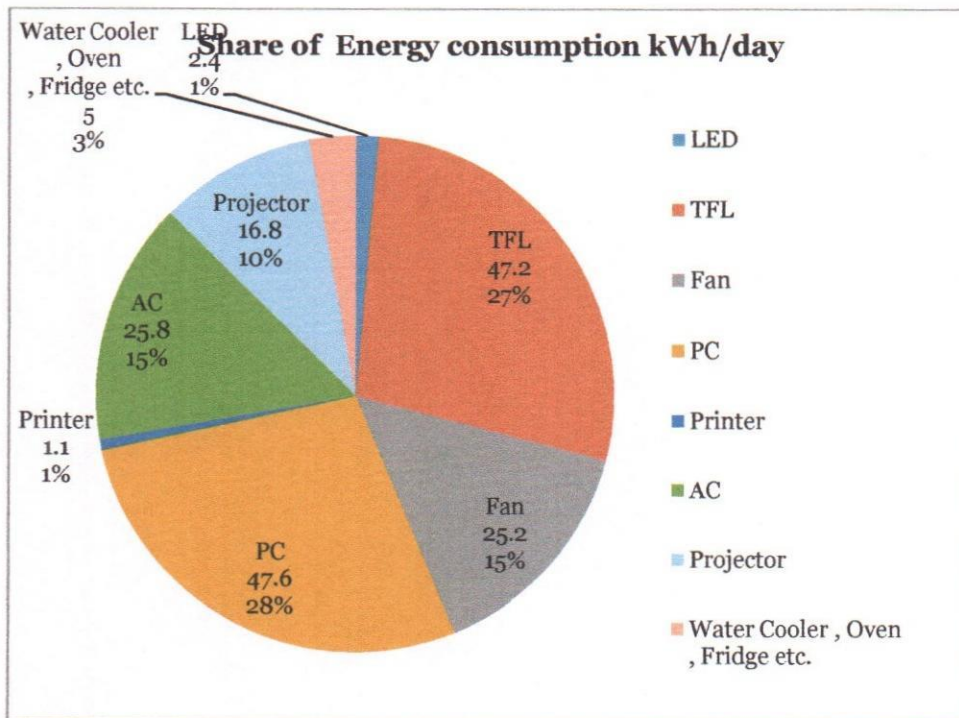
## 5. LOAD DISTRIBUTION AND SHARE OF CONSUMPTION

Load distribution is given based on their wattage and on number of working hours and energy consumption per day

Load	Watts	Normal working hours	Energy consumption kWh/day
LED	240	10	2.4
TFL	4720	10	47.2
Fan	6300	4	25.2
PC	11900	4	47.6
Printer	1100	1	1.1
AC	12900	2	25.8
Projector	2100	8	16.8
Water Cooler , Oven , Fridge etc.	2500	2	5
<b>Total</b>			<b>171.1</b>







**Observations:**

Maximum energy consumption is for Computers 28% with avg. 4 hours of working in day.

Tubes of 40 W consumes 27% of energy per day which is high, can be reduced with use of LED lights

Already campus has started shift to LED lighting, and is replacing LED tubes based on failure.






Fans consume 15% of the total energy with avg. 4 hours working and can be replaced with BLDC fans to reduce the energy consumption



## 6. Recommendations for Energy Savings

1. 40 W TFL should be replaced with energy efficient LED light of 20 W. This will give around 50% saving compared to currently installed Fluorescent tube light
  - ✓ Annual saving will be 7080 kWh and Rs. 84960/-
  - ✓ Investment for 118 LED tubes will be Rs. 35000/- ( Rs.300/tube)
  - ✓ Simple payback period is 5 months
  
2. Energy efficient fans can be installed having watt rating up to 35 W. This will give saving around 50% compared to currently installed fans
  - ✓ Annual saving will be 4032 kWh and Rs. 48384/-
  - ✓ Investment for 84fans will be Rs. 252000/-
  - ✓ Simple payback period is 5 years ( Fans can be replaced based on failure and aging )

Energy saving Fans typical examples (Payback depends on no. of hours of operation)

	Conventional Fan	Energlo n eSAVE34
 Power Consumption	75W	34W
 Hours of Usage per day	16	16
 KWhr Units per day (Power x Hour/ 100)	1.2	6.5
 Electricity bill per day (₹) @₹ 6.5 / unit	7.8	3.54
 Electricity bill per annum*	2,850	1,300
<b>Annual Savings for 1 Fan: Rs.1550</b>		
<b>Annual Savings for 4 Fans: Rs.6200</b>		

\*Rounded to the nearest 50





## 7. Water Consumption

Treated Water is supplied by MIDC to IBMRD building premises. The details of water consumption are given below:

Months	Water consumption	Cost Rs.
Apr-21	485	72750
May-21	475	71250
Jun-21	480	72000
Jul-21	480	72000
Aug-21	491	73650
Sep-21	515	77250
<b>Avg.</b>	<b>487.67</b>	<b>73150</b>
<b>Annual</b>	<b>5852</b>	<b>877800</b>

Water is presently billed at rate of Rs. 150 /M<sup>3</sup>

The water is used for drinking and Wash rooms on each floor and Pantry.

There are septic tanks installed behind the wash rooms for water collection and then overflow water is sent to the trees planted near the ground.

Also due to location of college there is lot of natural water in rainy season which is going to gardens and trees in the area.

The College surrounding and grounds are maintained with greenery & trees.

Water saving taps can be installed in the wash rooms with spray for water conservation



## 8. Renewable Energy – Solar Rooftop

For common College Electricity Connection, Solar rooftop system is installed on the Engineering College Premises of 300 kW.

With net metering the institute is availing benefit of solar energy export to the grid

Monthly solar energy generation is 30000 to 40000 kWh per month

The energy consumption of premises of ( four colleges – IBMRD, Engineering , Agri and Junior College ) is 24000 to 50000 kWh.

So maximum consumption is from solar energy and remaining energy in morning hours and evening hours is taken from Grid.

Day time extra Solar energy generation is exported to the grid



300 kW Roof top Solar system at Dr.VithalraoVikhePatil Foundation  
(Engineering, IBMRD, Junior, Agri College Feeder)

