

PREFACE

Energy Audit Report

**Vignan's Foundation for Science, Technology and Research
(Deemed to be University) - Vadlamudi.**

This file includes Energy Audit report of VFSTR campus from 2015 to 2020 on annual basis certified by m/s Vigneswara Power controls & m/s SSG Power Solutions. The Solar energy generation and Carbon foot prints savings on yearly basis are included in this file. The detailed analysis of energy consumption on monthly and yearly basis in all buildings VFSTR campus is also included.

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Energy Audit

An **energy audit** is an inspection survey and an analysis of energy flows for energy conservation in a building. It may include a process or system to reduce the amount of energy input into the system without negatively affecting the output. In commercial and industrial real estate, an energy audit is the first step in identifying opportunities to reduce energy expense and carbon footprint. The object of study is an occupied building then reducing energy consumption while maintaining or improving human comfort, health and safety are of primary concern. Beyond simply identifying the sources of energy use, an energy audit seeks to prioritize the energy uses according to the greatest to least cost effective opportunities for energy savings.

According to the definition in the ISO 50002 standard, an energy audit is a systematic analysis of energy use and energy consumption within a defined energy audit scope, in order to identify, quantify and report on the opportunities for improved energy performance. Therefore, an energy audit is an energy assessment. This evaluation analyses energy flows in a building, processor system to reduce the amount of energy input into the system whilst maintaining or improving human comfort, health and safety. The level of detail of this evaluation determines the type of audit.

Energy Audit Committee:

Energy Audit Committee visits the campus and audit the safety checkup of all electrical structures in campus, Energy consumptions & savings of campus. Committee gives the grade/status of particular parameter in the view safety and energy savings. The members of the committee are constituted as followed:

- External member with well known experience in electrical structures/ electrical safety with A-Grade contact
- Internal Member – Dean:
- Senior Faculty member from EEE department.
- Electrical Maintenance I/c.

The Energy audit committee consisting of External & internal members perform an audit of files i.e. verify the Eart pits maintenance, street lights, generators ,panel boards, ups, solar plant ,lightning arresters

Audit verification parameter/areas:

1. Earthpits maintenance

Audit committee will check the cleaning condition, Earth pit resistance value, nuts& bolts condition and provide grading .

2. Street Lights

Audit committee check the earthing connection of lights, cable status, light working condition and will give the grading.

3.500KVA Generator

Audit committee check the cleaning, engine oil level, fuel level, fuel leak, radiator cleaning, battery condition, exhaust system and provide grading

4.200 KVA Generator

Audit committee check the cleaning, engine oil level, fuel level, fuel leak, radiator cleaning, battery condition, exhaust system and provide grading

5.Distribution panel

Audit committee check the cleaning, voltage, current, Mccb condition, bus bar terminals, cable terminals, earthing, panel doors and provide grading

6.Solar power plant Generation

The share of renewable sources in campus loading is key parameter in the view of global warming. Hence Audit committee assess the generation of solar plant and energy consumption in all blocks. As well as, the committee will check MMS tightness solar panel, Earthing status, Civil Foundation, Inverter working condition and provide grading

7. UPS Maintenance

Audit committee check the all UPS voltage, battery voltage, earthing, cable condition and provide grading

8.Lightning arresters

Audit committee check the all strip condition, position etc and provide grading



DEPT. OF ELECTRICAL & ELECTRONICS ENGINEERING
VFSTR UNIVERSITY

Vadlamudi – 522 213, Guntur Dist., A.P., India

HT line Power connection Details

Description	Transformer details	Loaction
HT line UniversityPower connection	11KV/440V,950KVA Transformer	A-Block(Bhuvana Vijayam)
Total	950 KVA	

Generator Backup

Description	Generators details	Location
University Generator Back up	500KVA Generator	A-Block(Bhuvana Vijayam)
	200KVA Generator	Guest House(Athidhi devo bhava)
	250KVA Generator	Ladies Hostel
Total back up	1050 KVA	

1MW - Solar PV Plant

Description	Details
Plant Capacity	1 MW
Installed area	10,000 Sq.m (all building's roof top area)
Plant model	Roof-Top , Grid Connected with Net metering system
Photovoltaic Modules	3191 panels - each 315 Wp
Present Generation	4,000 – 5,000 units per day
Date of installation	November - 2017

Campus Electricity Details:**Substation: 11KV/440V Outdoor Substation****Connected Blocks/Building Details:**

s.no	Block
1	A-Block(Bhuvana Vijayam)
2	H-block(Visvesvaraya)
3	Library(NTR Library)
4	Boys Hostel(Vignan Vihar)
5	Pharmacy(J.C.Bose)
6	U-block(Aryabhatta)

Energy Audit

- Energy Audit 2019-20
- Energy Audit 2018-19
- Energy Audit 2017-18
- Energy Audit 2016-17
- Energy Audit 2015-16

ENERGY AUDIT
(2019-2020)



VIGNAN'S

Foundation for Science, Technology & Research

(Deemed to be UNIVERSITY)

-Estd. u/s 3 of UGC Act 1956



Date: 30-05-2020

To
P.V.N.Chari
Vigneswara Power Controls,
Flat: 2, Sri Sai Nilayam, Nagaluru,
Guntur, Andhra Pradesh.
522034.

Respected Sir,

Sub: Request to conduct Energy Audit & Safety Audit of Vignan's Foundation for Science, Technology & Research (Deemed to be University) ---- Reg.

-oOo-

It is to inform you that, **Vignan's Foundation for Science, Technology & Research (Deemed to be University)** organization is planned to conduct energy audit by external agency with external experts along with our internal audit committee members. So we are inviting you to conduct energy audit in our VFSTR University (Deemed to be) from 15/6/2020 to 16/6/2020. Please give your concern to conduct energy audit in our campus.

Waiting for your response

Head of the Department (EEE),
VFSTR University,
Vadlamudi, Guntur, AP

GSTNO: 37AMGPN6552J1ZM

Cell: 9441316830, 7989367414

E-mail: charipvn@gmail.com



VIGNESWARA POWER CONTROLS

Door No: 133-5-808 ,Flat N o. 2, Sri Sai Nilayam, Near ID Hospital Nagaralu, GUNTUR -522034

Date: 02.06.2020

F.NO: VRPC/EA/19-20/06/31

To
Head of the Department
Department of EEE
VFSTR university,
Vadlamudi, Guntur, A.P.

Respected Sir,

Sub: Energy Audit conduction – Reg.

We convey sincere thanks to choose us to conduct energy audit.

We inform you that we are accepting your request to conduct Energy audit in your campus. With this regard our experts will visit from 15/6/20 to 16/6/20 your campus. The payment for whole process of auditing is 40,000/-. The payment can be done after submission of audit report.

For Vigneshwara power control

P. V. N. Choy

Authorized Signatory

Transformer, HT/LT Motors, Breakers & Protection Relays Testing & Commissioning



SIEMENS



Schneider
Electric

**VIGNAN'S**

Foundation for Science, Technology & Research

(Deemed to be UNIVERSITY)

-Estd. u/s 3 of UGC Act 1956



Date: 06-06-2020

To

P.V.N.Chari

The Vigneswara Power Controls,

Flat: 2, Sri Sai Nilayam, Nagaluru,

Guntur, Andhra Pradesh.

522034.

Respected Sir,

Sub: Confirmation to conduct Energy Audit of Vignan's Foundation for Science, Technology & Research (Deemed to be University) ---- Reg.

-oOo-

In connection with our previous communication regarding Energy Audit in Vignan's Foundation for Science, Technology & Research (Deemed to be University), we are agreeing to pay the remuneration of 40,000/-. The following internal Audit committee members will involve in the energy audit from 15/6/2020 to 16/6/2020.

S.No	Name of the faculty	Designation	Signature
1	Dr. G.Srinivasa Rao	Professor, EEE	
2	Dr. M.Subba Rao	Associate professor, EEE	
3	Mr. Ch. Umamaheswara Rao	Electrical Maintenance Incharge	

Thanking you,

Head of the Department (EEE),
VFSTR University,
Vadlamudi, Guntur, AP,

GSTNO: 37AMGPN6552J1ZM

Cell: 9441316830, 7989367414

E-mail: charipvn@gmail.com

VIGNESWARA POWER CONTROLS

Door No: 133-5-808 ,Flat N o. 2, Sri Sai Nilayam, Near ID Hospital Nagaralu, G UNTUR -522034



Date: 20.06.2020

To
Head of the Department
Department of EEE
VFSTR university,
Vadlamudi, Guntur, A.P.

Respected Sir,

Sub: Submission of Final Report on 'Energy Audit' – Reg.

Energy Audit of Vignan's Foundation for Science, Technology and Research (Deemed to be University) is conducted and the report is attached. Refer the following pages of report of Energy Audit for 2019-20 duration of your campus. Feel free to contact us for any clarifications on this subject.

For Vigneshwara power controls


Authorized Signatory

Transformer, HT/LT Motors, Breakers & Protection Relays Testing & Commissioning



SIEMENS



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Electric



PROCEEDINGS OF THE REGISTRAR

F.No.:VFSTR/RO/A4/30/2019-20/39

Dt: 26.05.2020

Sub: VFSTR – Sanction of amount for Energy audit– amount – sanctioned – orders – Issued.

Read: Letter dated 25.05.2020 of Dr. G. Srinivasa rao, HOD of EEE.

* * *

ORDER

With reference to the letter read above, sanction is hereby accorded for the payment of Rs.40,000/-(Rupees Thirty thousand only) to Mr. P.V.N. Chari (Vigneswara Power Controls),Guntur towards remuneration to Conduction of Energy audit.

The above budget sanctioned amount is debitale to the budget available under Major head: Staff Payments & Benefits (200) and Minor head: honorarium (212) for the Financial Year 2019-20.

REGISTRAR

**VIGNAN'S FOUNDATION
FOR SCIENCE, TECHNOLOGY AND RESEARCH
(Deemed to be University)
VADLAMUDI-522 213
GUNTUR (DISTRICT), A.P. INDIA**

To:

The Finance Officer,
HOD, EEE,
The Electrical Maintenance Incharge

Copy to

PA to the Vice Chancellor
Master file

Energy Audit and Safety Audit Report

Visited the following areas in your campus:

1. 11 kV Substation at two different locations each having 1 No. Stepdown Transformer (11 kV / 433 volts)
 - a. 950 kVA Transformer presently Supporting following buildings: A – Block / H – Block / Hostels – Blocks / Pharmacy & Library.
 - b. The Backup power is supported by 1 x 500 kVA DG set (Kirloskar Green)
 - c. Supported by 1 x 200 kVA DG set (Cummins)
 - d. Earthing systems are normal, as per IS -3043
 - e. APFC panel, 1 x 100 kVAr is functional, which is connected to 950 kVA system.
2. **Solar Generation:** State of art solar generation is adopted at roof top. Total generation is **1MWp** which is grid interactive.
3. **UPS System:** Visited various labs, which are having stand-alone UPS, of different make, with SMF batteries. Total UPS installed capacity is around **820-kVA**.
4. **Lightening protection system:** Presently each building is having Spike type lightning arrestors.


Authorized Signatory

VIGNESHWARA POWER CONTROLS

ANNEXURE

INSTITUTE POWER PATTERN:

- Total connected load of the institution = 2408 kw
- Transformers available in the institution = 950 KVA
- Diesel generator set capacity = 500KVA+200KVA
- Diesel consumption of the DG Set = 1920 liters for full day power shedding
- Power met through Renewable sources = 1600 kwh

ENERGY CONSERVATION OPPORTUNITIES FOR ENERGY EFFICIENCY

Recommendations for better energy efficiency:

- ✓ Based on the analysis of the power consumption data, certain steps have been recommended for improving energy
- ✓ efficiency of the campus. Complete cost analysis of implementation of recommended measures has been performed wherever necessary. Also, a number of general measures for energy efficiency have been listed.
 - Described below are some important recommendations for better energy efficiency:

1. Power savings through the usage of LEDs:

Dominant light source at most places in the campus is traditional bulbs with LED lights which consumes 20W in addition to the 40W. The campus has 2489 in total conventional bulbs and 1832 LEDs. If these conventional bulbs are replaced by LEDs, 20 W power can be saved per bulb

- Total No. of conventional bulbs in Campus = 2489
- Average Power of conventional bulbs = 99.56 4kW
- Average Power of electronic Ballast FTL = 40W
- Power saved per bulb = 20 W
- Total Power saving = 49.78kW/h
- Average Use of bulbs per day = 2489X9h=22401 h
- Average Use of bulbs per year = 8064360 h
- Total Energy saved per day = 49780 WX9h = 448.02KWh
- Total Energy saved per year = 161287.2 KWh
- saving in Rs. Per year = 161287.2X10= Rs.1612872
- Average Cost of Replacing each bulb = Rs.290
- Total Cost of Replacing all Conventional Ballast FTLs = Rs.721810
- Capital Cost Recovery time = (721810)/ (1612872) = 0.44 Years
- Hence, the capital cost recovery time for replacing all conventional Ballast FTLs of the campus is around 0.44 years.

2. Smart sensing system for Air Conditioners:

I touch Manager:

Intelligent touch Manager maximizes the advantages of VRV features iTM Plus Adaptor Up to 7 Adaptors Up to 650 management points Di/Pi Line BACnet / IP 3rd party BACnet controller Air Handling Unit Air Conditioning Network Service System Automatic control System settings Operation management 2 Designed for simplicity, this menu provides a quick view of overall status and essential information in a list format. Using the sorting function, VRV system operating under the same conditions and status are indented for comparison and assessment. List view Layout view ON Filter sign OFF Error A special feature utilizes building room plans to provide a visual representation of VRV system. Users can visually locate VRV indoor units on the room plan. Easy engineering The system conjuration can be done through preset tool off-site then imported to the intelligent touch Manager via the USB port at the site. This feature makes engineering easier and more manageable. Intelligent touch Manager is an advanced multi-zone controller that provides the most cost-effective way to control and monitor the Daikin VRV system. The 10.4" LCD touch screen is easy to use with three different screen views to include the room plan layout view, icon view and list view and menus for system conjurations. It is also easy to use with standardized remote Web Access from your PC. It can manage a total of 650 management points consisting of up to 512 Daikin indoor unit groups (up to 1024 indoor units) along with building equipment control / monitoring with Digital Inputs / Output (Di/Dio) , Analog Inputs / Output (Ai/Ao) and Pulse input (Pi) optional devices.

3. Minimizing Repair Works in Fans:

During data collection, the repaired fans have been found to be consuming very high power as compared to the rated power. Fans repaired once and twice were consuming 85 W and 70 W more than the average consumption of new fans respectively. Thus, effort should be made to minimize the repairing of fans and also repair work should be Supervised properly.

4. Better Practices for AC:

The institute has in total 220 VRV cassette, 218 cassette type ACs, 145 split ACs, 10 Tower ACs, which make a very large part of total energy consumption of the campus. But, at many places it was found that AC is not used with best recommended practices. Even simple things, such as insulation. Also at certain places ACs were found to be used without keeping curtains.

These poor practices account for increase in AC load and thus consumption.

Summarized below are some guidelines for most efficient use of ACs:

- **Proper Insulation** – Good quality insulation must be maintained in the air conditioned rooms by keeping all doors and windows closed properly so as to prevent cool air go out and hot air come in.
- **Curtains** – Always keep curtains on windows to prevent direct sunlight inside the room to avoid heating of cooled air. This reduces AC load significantly.
- **Maintenance** – Proper maintenance and cleaning of ACs is required at regular intervals to make it work at highest efficiency. Any dirt in filter may reduce efficiency of AC very significantly.
- **Operating** – The ACs should be switched on 15 minutes before actual use and should be switched off before leaving the room.

Suggestions to be considered:

1. New LED lights installed in H-Block which gives 20% of total lighting load Only and Suggested to implement for whole campus.
2. The premises of Earth pit and its pit wall to be cleaned.
3. There is voltage fluctuation problem in street light cable of 16 sqmm armoured. But a Separate cable for street lights is better option to minimize the fluctuations.
4. Exhaust and radiator systems to be remodeled for 500 kva Generator will give the solution to tripping of generator problem.
5. Digital display board to be replaced in 200 KVA generator
6. New PT/CT to be place in A- block outdoor substation of rating 11000V/440V, 50Hz.
APFC (Automatic Power factor control) panel with P.F. bank to be added in U-Block panel board.
7. Solar Generation is good and suggested to add some more plant area to improve the energy saving.
8. UPS backup with centralized scheme to be implemented in all Blocks.


Authorized Signatory



(To be filled up by Experts)

Summary Sheet

S.No.	Parameters of Evaluation	Page No.	Grade
1	Earth pits maintenance	8	A
2	Street Lights	9	A
3	Power back up :500KVA Generator Maintenance	10	B
4	Power back up : 200KVA Generator Maintenance	11	B
5	Distribution Panel Boards	12	A
6	Solar Power plant generation	13	A
7	UPS Maintenance	14	A
8	Lightning arresters in A,H & U Blocks	15	A

Grading System

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement

1. Earth Pits Maintenance

S.No.	Sub-parameter	Grade
1	Resistance value	A
2	Cleaning	B
3	Nuts & Bolts Condition	A
TOTAL		A

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 Authorized Signatory

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2. Street Lights

S.No.	Sub-parameter	Grade
1	Voltage profile	A
2	Earthing	A
3	Cable Statues (Damages any)	C
4	Light Working Condition	A
TOTAL		A

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 Authorized Signatory

3. Power Back up: 500KVA Generator Maintenance

S.No.	Sub-parameter	Grade
1	Generator Cleaning	B
2	Shed Cleaning	B
3	Engine oil level	A
4	Fuel tank level	A
5	Fuel leaks	B
6	Radiator condition	B
7	Battery connections	A
8	Battery voltage	A
9	Exhaust system condition	B
10	All tools availability	B
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 Authorized Signatory

4. Power Back up: 200KVA Generator Maintenance

S.No.	Sub-parameter	Grade
1	Generator Cleaning	B
2	Shed Cleaning	B
3	Engine oil level	A
4	Fuel tank level	A
5	Fuel leaks	B
6	Radiator condition	B
7	Battery connections	B
8	Battery voltage	A
9	Exhaust system condition	A
10	All tools availability	A
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


Authorized Signatory

5. Distribution Panel

S.No.	Sub-parameter	Grade
1	Cleaning	A
2	Voltage	A
3	Current	A
4	MCCB condition	A
5	Bus Bar terminals	B
6	Cable terminals	B
7	Earthing	A
8	Panel Door (Closed or opened)	B
TOTAL		A

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


P. V. N. Chari
 Authorized Signatory

6. Solar Power Plant Generation

S.No.	Sub-parameter	Grade
1	MMS Tightning	A
2	Civil Foundation	A
3	Earthing	A
4	Modules Cleaning	B
5	Inverter maintenance	A
TOTAL		A

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


Authorized Signatory



7. UPS Maintenance

S.No.	Sub-parameter	Grade
1	UPS Input Voltage	A
2	Battery Bank Voltage At no Load	B
3	Battery Bank Voltage At Full Load	B
4	Earthing	A
5	UPS Condition Cable	A
6	Batteries Condition	B
7	Cable terminals(nuts&bolts)	B
TOTAL		A

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 P. V. N. S. R.
 Authorized Signatory

8. Lightning Arresters

S.No.	Sub-parameter	Grade
1	Earthing strip condition	A
2	Lightning arrester condition	A
3	Nuts&Bolts Condition	B
TOTAL		A

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement



P. V. N. Chay

 Authorized Signatory



Energy Audit Report

Academic Year : 2019-20

Name of the Department : EEE

1. Name of the Member : Dr. G.Srinivasa Rao

Designation : Professor & Head

Address : Department of EEE, VFSTR

2. Name of the Member : Dr. M.Subba Rao

Designation : Associate Professor

Address : Department of EEE, VFSTR

3. Name of the Member : Mr. Ch.Umamaheswara Rao

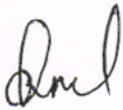
Designation : Electrical Maintenance I/c.

Address : Department of EEE, VFSTR

Signature of Audit Committee:

1. 

2. 

3. 

ENERGY SAVINGS FOR THE MONTHS(2019-2020)

S.No	MONTH	ENERGY CONSUMPTION (Kwhr)	ENERGY SAVINGS (kWhr)				TARIFF (Rs)
			Solar	LED lights	Total	% savings	
1	JULY	269089	44122	8756	52878	19.6	528780
2	AUGUST	228090	46611	9561	56172	24.6	561720
3	SEPTEMBER	223282	45106	9576	54682	24.4	546820
4	OCTOBER	200521	47011	8561	55572	27.7	555720
5	NOVEMBER	190402	45388	8789	54177	28.4	541770
6	DECEMBER	149253	40776	8956	49732	33.3	497320
7	JANUARY	137201	46574	9245	55819	40.6	558190
8	FEBRUARY	157332	49683	9356	59039	37.5	590390
9	MARCH	150461	51230	9625	60855	40.4	608550
10	APRIL	64779	45912	8875	54787	84.5	547870
11	MAY	81640	45451	9123	54574	66.8	545740
12	JUNE	90625	40569	8756	49582	17.6	495820


Electrical Maintenance I/c

ELECTRICAL MAINTENANCE I/c
Department of EEE
VFSTR Deemed to be University
VADLAMUDI - 522 213.

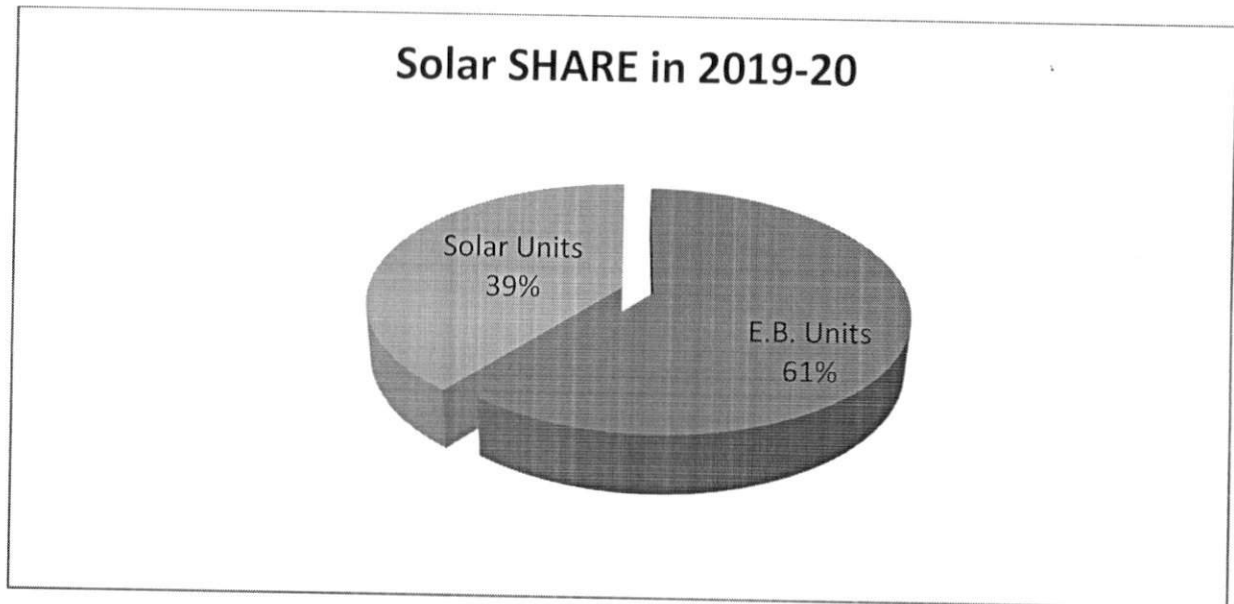
ENERGY SAVINGSTHROUGH RENEWABLE SOURCES (2019-2020)

S.No	Block	Total Consumption	Power generated through renewable source	Power met through renewable source	Wheeling to grid	% of savings	Operation in days
1	A-Block	741480	94398	82912	11485	12.7	12 Months
2	H-Block	529629	207181	188038	19142	27.9	12 Months
3	Pharma cy Block	317777	201700	171072	30627	27.2	12 Months
4	Boys Hostel	423703	89359	74045	15313	12	12 Months
5	U- BLOCK	486256	256854	228200	28654	29.6	12 Months

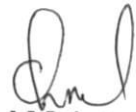

Electrical Maintenance I/c
ELECTRICAL MAINTENANCE I/c
 Department of EEE
 VFSTR Deemed to be University
 VADLAMUDI - 522 213.

Analysis of Energy consumption in VFSTR

Solar energy contribution in campus total Energy consumption



- The modes of energy utilisation in VFSTR campus is shown in Figure. The diagram shows the VFSTR utilises 39% of energy from 1MW solar PV Power plant and 61% energy from grid supply.
- It is observed that there is an increase in solar energy utilisation share is about 1% as compared to the year of 2018-19.

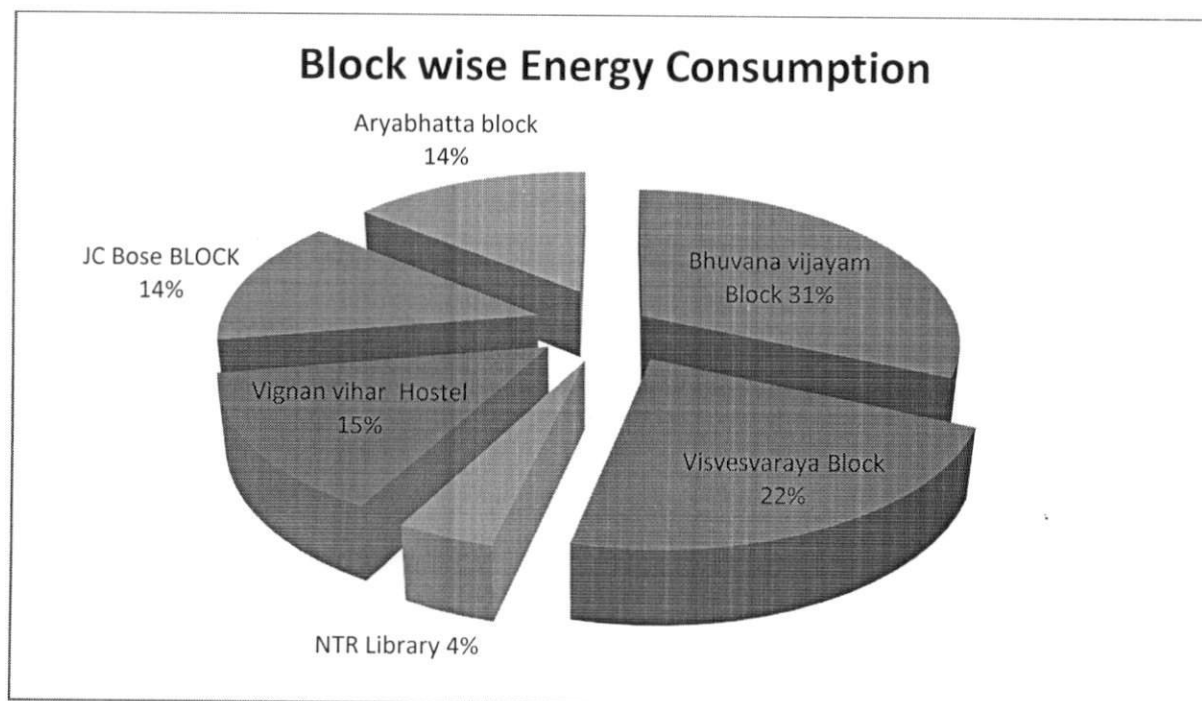

Electrical Maintenance I/c
ELECTRICAL MAINTENANCE I/c
Department of EEE
VFSTR Deemed to be University
VADLAMUDI - 522 213.

Analysis of Carbon Foot print in VFSTR campus


Parameter	Details
Solar PV plant Generated Units in a 2019-20 academic year	1115097 Kwh
Cost of 1 Unit from Grid	Rs. 10 (Base price + Demand charges)
Saved Money	Rs. 11150970
Capital Investment done in 2018	Rs. 6.5
Present year saving in the capital investment	17.15%
IPCC emission factor for Indian power generation [11]	0.944 tCO ₂ /MWh
Reduced CO ₂ Emissions	115Mwhr * 0.944 = 1056 Tons of CO ₂


Electrical Maintenance I/c
ELECTRICAL MAINTENANCE I/c
 Department of EEE
 VFSTR Deemed to be University
 VADLAMUDI - 522 213.

Block wise energy consumption in campus

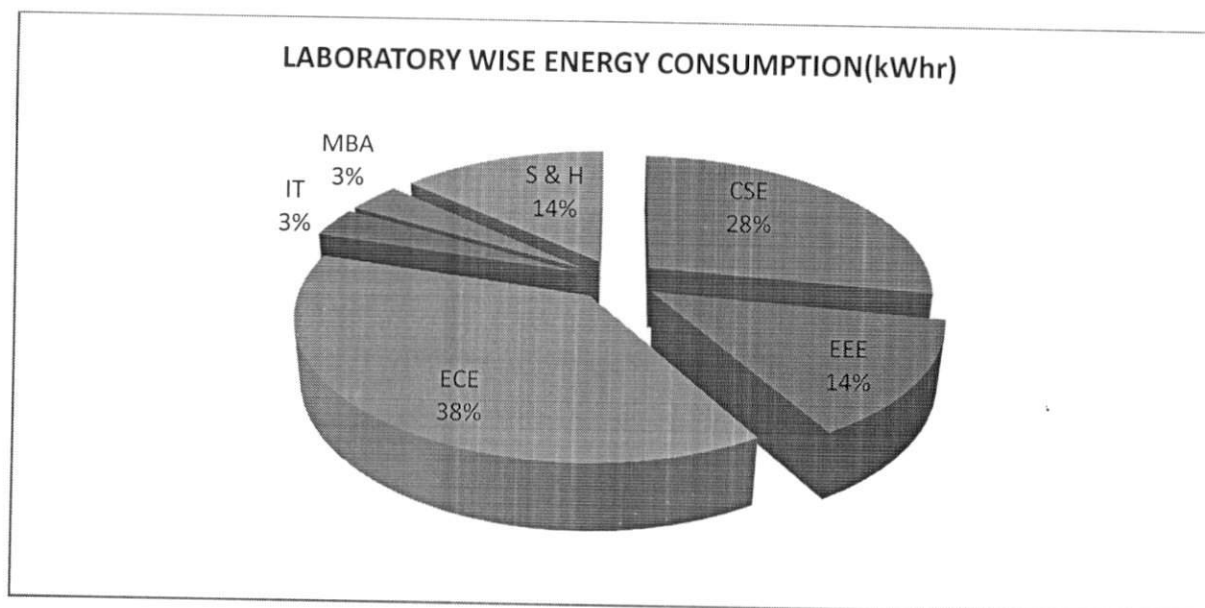


The block wise energy consumption of the university is shown in above Fig. The total annual energy consumption of the campus is 2414770 Kwh, of which 31% is from Bhuvana vijayam Block, 22% from Visvesvaraya Block, 14 % from Aryabhata Block, 15 % from hostel, 14% from jc Bose block, 4% from library. The highest energy consumption is obtained from Bhuvan vijayam Block followed by different blocks in the campus.


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The department's Laboratory wise energy consumption in campus

S.No	Department	Type of laboratory	Total load (kW)	Running hours per day	Unit consumption per day (kWhr)
1	Computer Science and Engineering	8 computer labs	118.4	5	592
2	Electrical and Electronics	4 labs	59.2	5	296
3	Electrical and Communication	11 labs	162.8	5	814
4	Information Technology	1 lab	14.8	5	74
5	MBA	computer lab	15	5	75
6	S & H	4 labs	59.2	5	296




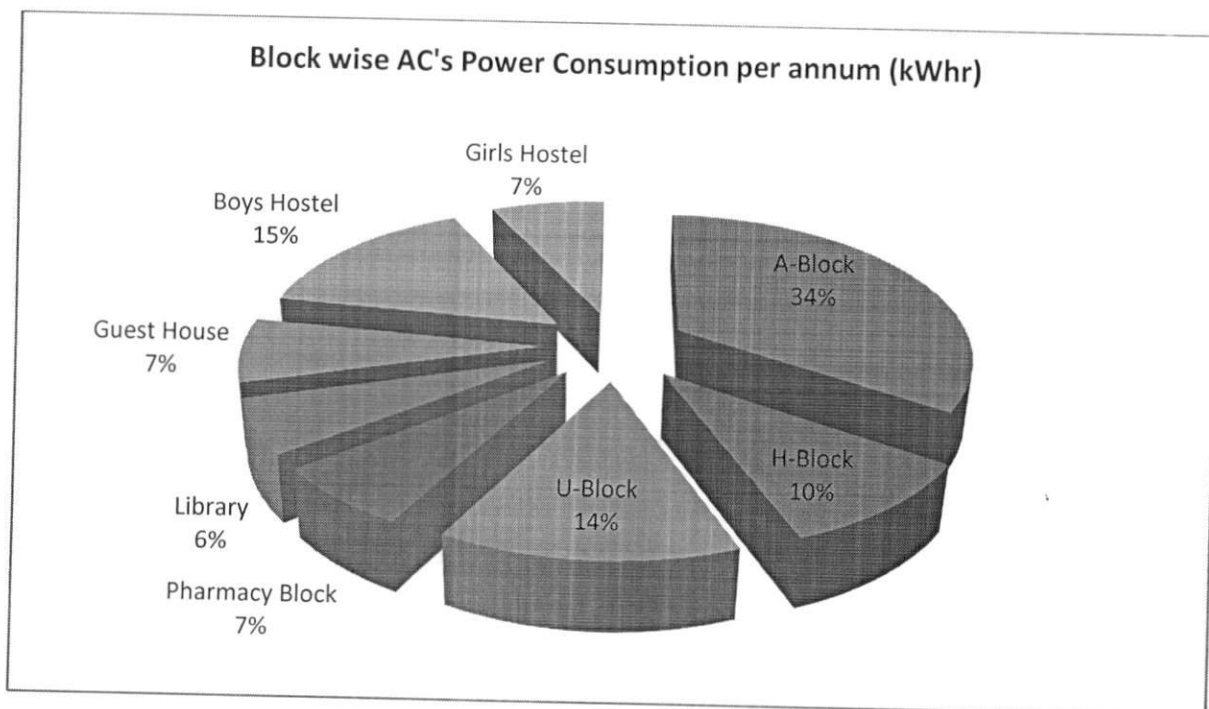
The department's Laboratory wise power consumption of the Computer Laboratory is shown in above figure. The diagram shows the ECE department consumes high energy of 38% and CSE department consumes 28% of energy on daily basis. EEE and S&H departments consume 14% each. The power consumption of the IT and MBA consume each is 3%

AC's consumption analysis with block wise in the campus


EQUIPMENT WISE ENERGY CONSUMPTION FOR AC's

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWWhr)
1	A-Block	air conditioner	846	63	53298
2	H-Block	air conditioner	253.8	63	15989
3	U-Block	air conditioner	343	63	21609
4	Pharmacy Block	air conditioner	167.1	63	10527
5	Library	air conditioner	135.45	70	9481
6	Guest House	air conditioner	162.24	70	11356
7	Boys Hostel	air conditioner	343	70	24010
8	Girls Hostel	air conditioner	165.15	70	11560


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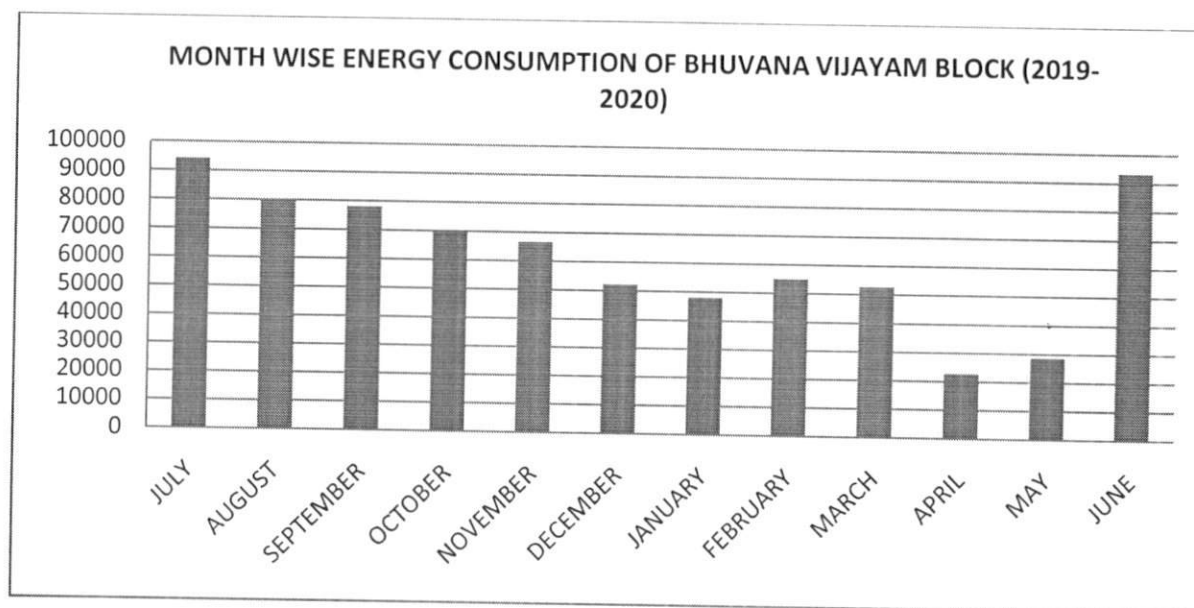
The block wise power consumption by ACs is shown in above figure. 34% of energy consumption is from A-Block, 10% of energy consumption is from H-Block, 14% of energy consumption is from U-Block, 7% of energy consumption is from pharmacy block, 15% of energy consumption is from boy's hostels, 7% of energy consumption is from Girls hostel, 7% of energy consumption is from guest house, 6% of energy consumption is from library. The highest energy consumption is obtained in A-Block followed by different blocks in the campus.


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Analysis of energy consumption in Bhuvana Vijayam block on monthly basis:

**ENERGY CONSUMPTION OF THE INSTITUTION IN BHUVANA VIJAYAM
BLOCK(2019-2020)**

S.No	MONTH	Bhuvana vijayam Block(unit consumption)	Cost	Tariff
1	JULY	94181	720485.7	941810
2	AUGUST	79831	610710.9	798310
3	SEPTEMBER	78148	597837.5	781480
4	OCTOBER	70182	536894.9	701820
5	NOVEMBER	66640	509801.3	666400
6	DECEMBER	52238	399624.9	522380
7	JANUARY	48020	367355.6	480200
8	FEBRUARY	55066	421256.4	550660
9	MARCH	52661	402859.3	526610
10	APRIL	22672	173445.7	226720
11	MAY	28574	218591.1	285740
12	JUNE	93263	713465.3	932630



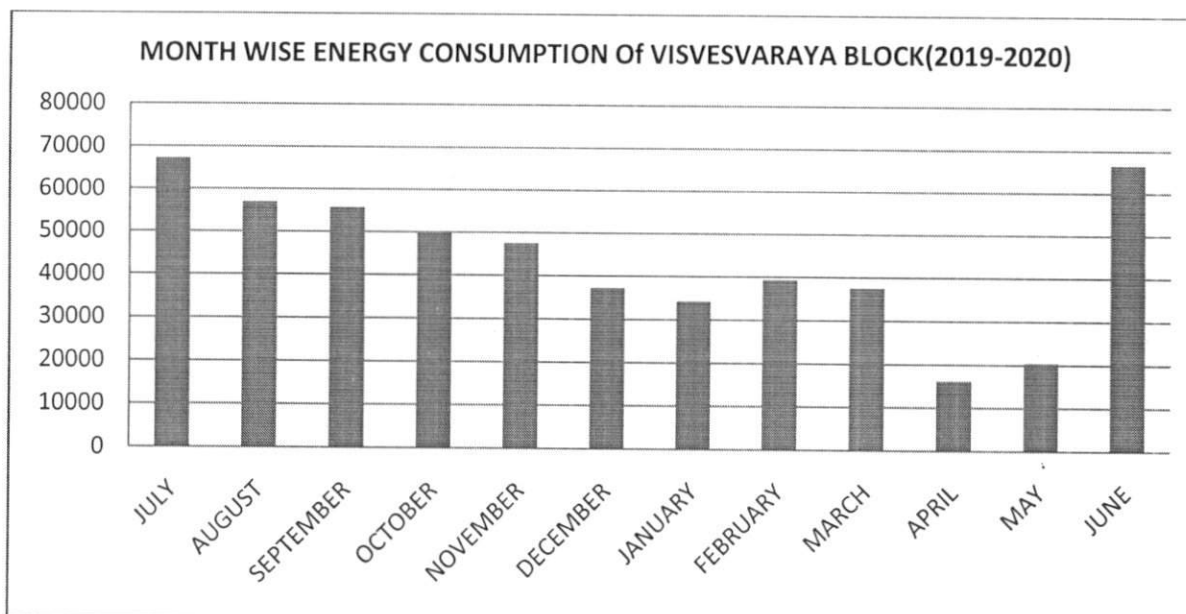
The monthly wise power consumption of the BHUVANA VIJAYAM BLOCK for the duration of 2019-2020 is shown in Figure. The total annual energy consumption during 2019-20 is 741476 Kwh or units. Peak consumption is observed in the month of July with 94181 units. The average monthly consumption for BHUVANA VIJAYAM BLOCK recorded is 61790 units.


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Analysis of energy consumption in VISVESVARAYA block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN VISVESVARAYA BLOCK(2019-2020)

S.No	MONTH	Visvesvaraya Block(unit consumption)	Cost	Tariff
1	JULY	67272	514632.7	672720
2	AUGUST	57022	436222.1	570220
3	SEPTEMBER	55820	427026.8	558200
4	OCTOBER	50130	383496.4	501300
5	NOVEMBER	47600	364143.8	476000
6	DECEMBER	37313	285446.3	373130
7	JANUARY	34300	262396.9	343000
8	FEBRUARY	39333	300897.4	393330
9	MARCH	37615	287756.6	376150
10	APRIL	16194	123889.8	161940
11	MAY	20410	156136.5	204100
12	JUNE	66616	509618.1	666160



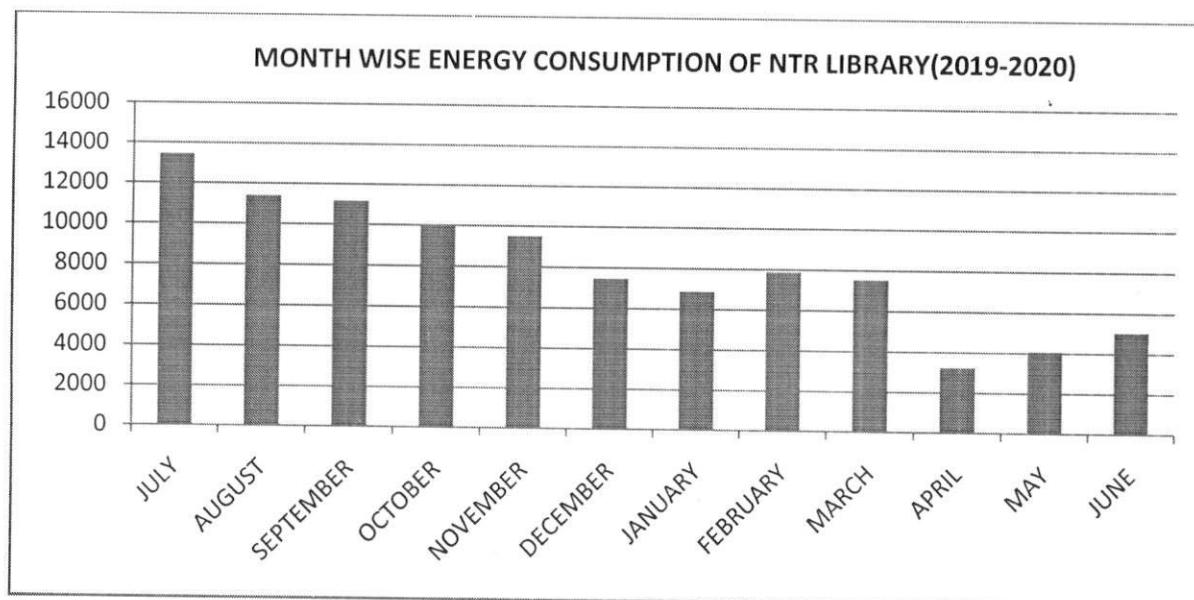
The monthly wise power consumption of the VISVESVARAYA BLOCK for the duration of 2019-2020 is shown in Figure. The total annual energy consumption during 2019-20 is 529625 Kwh or units. Peak consumption is observed in the month of July with 67272 units. The average monthly consumption for VISVESVARAYA BLOCK recorded is 44135 units.


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Analysis of energy consumption in NTR LIBRARY on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN NTR LIBRARY(2019-2020)

S.No	MONTH	NTR Library(unit consumption)	Cost	Tariff
1	JULY	13454	102926.5	134540
2	AUGUST	11404	87244.4	114040
3	SEPTEMBER	11164	85405.3	111640
4	OCTOBER	10026	76699.2	100260
5	NOVEMBER	9520	72828.7	95200
6	DECEMBER	7462	57089.2	74620
7	JANUARY	6860	52479.3	68600
8	FEBRUARY	7866	60179.4	78660
9	MARCH	7523	57551.3	75230
10	APRIL	3238	24777.9	32380
11	MAY	4082	31227.3	40820
12	JUNE	5048	38617.1	50480



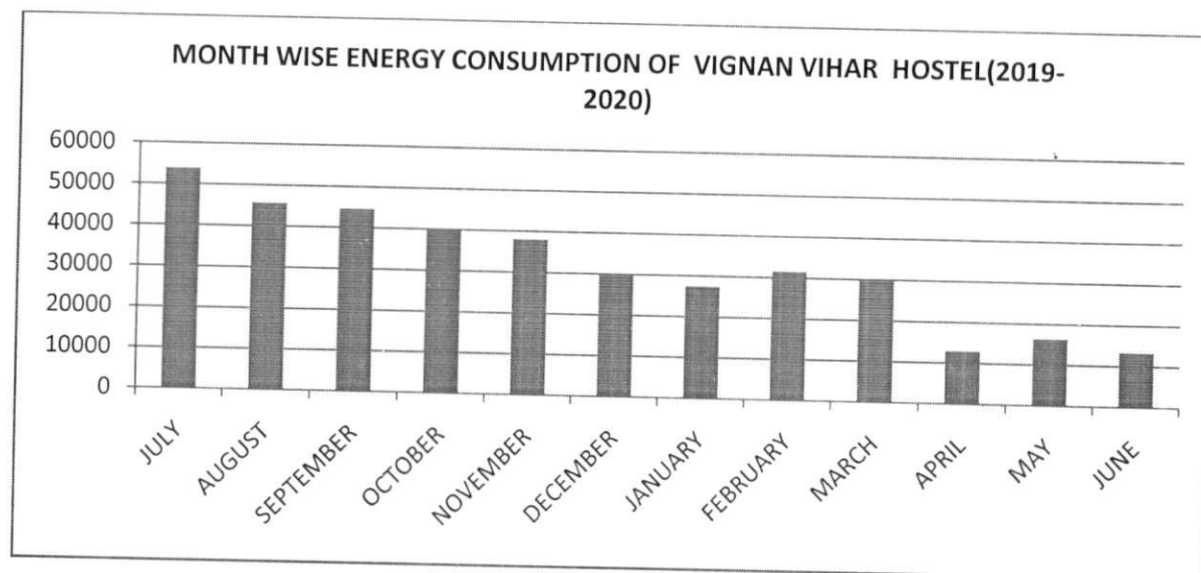
The monthly wise power consumption of the NTR LIBRARY for the duration of 2019-2020 is shown in Figure. The total annual energy consumption during 2019-20 is 97647 Kwh or units. Peak consumption is observed in the month of July with 13454 units. The average monthly consumption for NTR LIBRARY recorded is 8137 units.


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Analysis of energy consumption in VIGNAN VIHAR HOSTEL on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN VIGNAN VIHAR HOSTEL(2019-2020)

S.No	MONTH	Vignan vihar Hostel(unit consumption)	Cost	Tariff
1	JULY	53817	411706.17	538170
2	AUGUST	45618	348977.7	45610
3	SEPTEMBER	44656	341621.46	446560
4	OCTOBER	40104	306797.13	401040
5	NOVEMBER	38080	291315.06	380800
6	DECEMBER	29850	228357.09	298500
7	JANUARY	27440	209917.53	274400
8	FEBRUARY	31466	240717.96	314660
9	MARCH	30092	230205.33	300920
10	APRIL	12955	99111.87	129550
11	MAY	16328	124909.2	163280
12	JUNE	13293	101694.51	132930



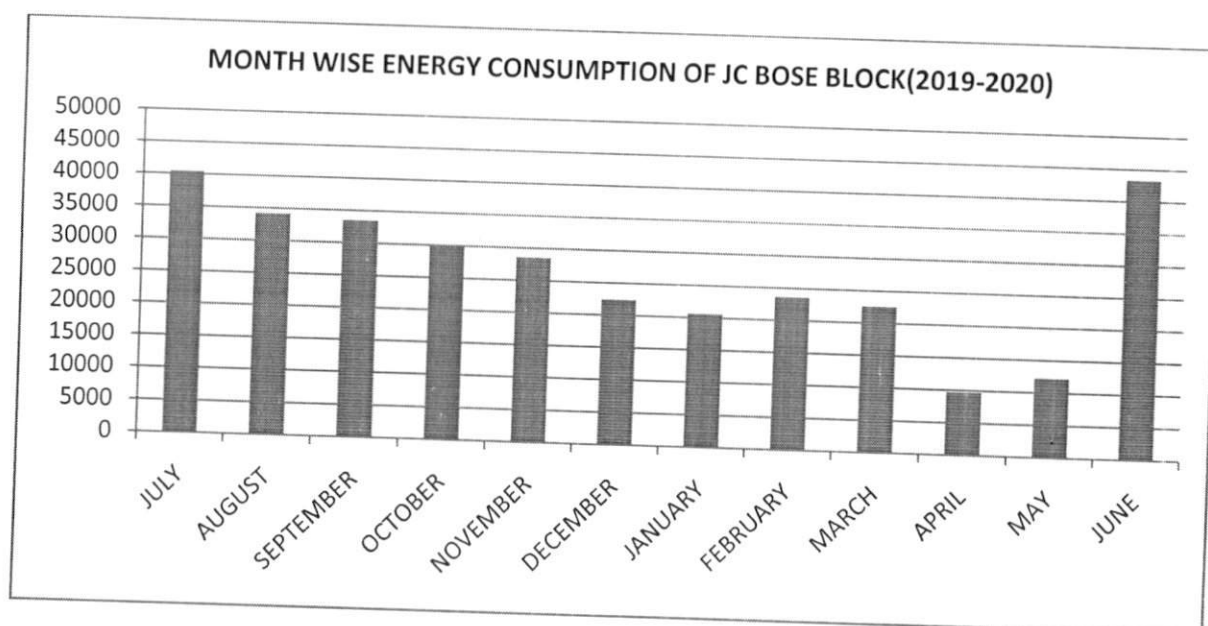
The monthly wise power consumption of the VIGNAN VIHAR HOSTEL for the duration of 2019-2020 is shown in Figure. The total annual energy consumption during 2019-20 is 383699 Kwh or units. Peak consumption is observed in the month of July with 53817 units. The average monthly consumption for VIGNAN VIHAR HOSTEL recorded is 31974 units.


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Analysis of energy consumption in JC BOSE block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN JC BOSE (2019-2020)

S.No	MONTH	JC Bose BLOCK (unit consumption)	Cost	Tariff
1	JULY	40363	308779	403630
2	AUGUST	34213	261733	342130
3	SEPTEMBER	33492	256216	334920
4	OCTOBER	30078	230097	300780
5	NOVEMBER	28560	218486	285600
6	DECEMBER	22387	171267	223870
7	JANUARY	20580	157438	205800
8	FEBRUARY	23599	180538	235990
9	MARCH	22569	172653	225690
10	APRIL	9716	74333	97160
11	MAY	12246	93681	122460
12	JUNE	43293	331624	432930



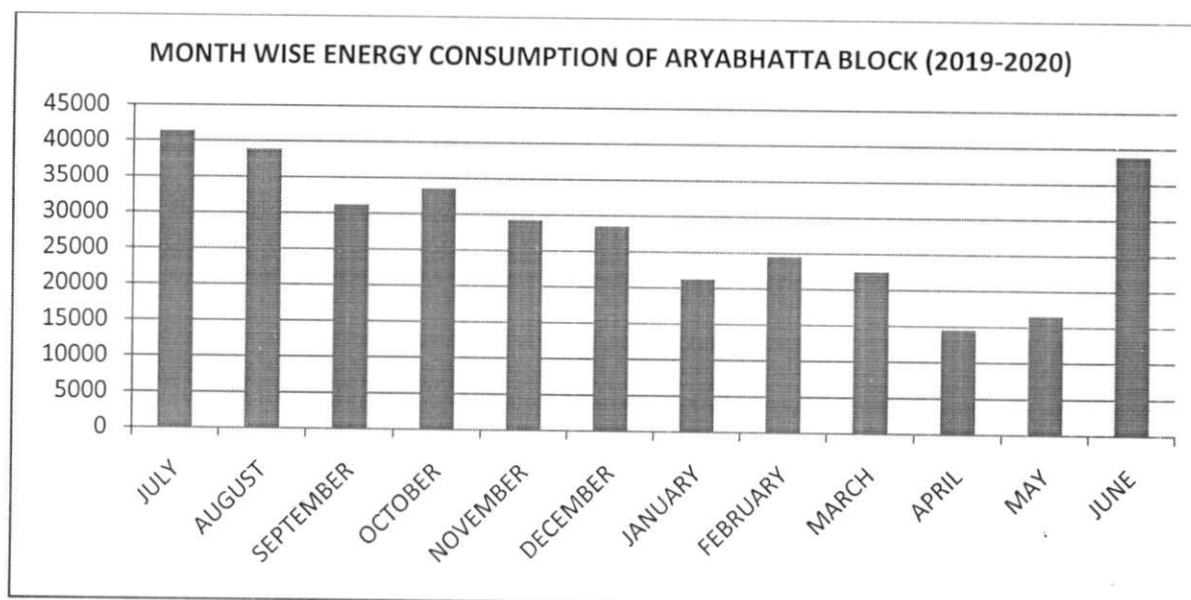
The monthly wise power consumption of the JC BOSE BLOCK for the duration of 2019-2020 is shown in Figure. The total annual energy consumption during 2019-20 is 321096 Kwh or units. Peak consumption is observed in the month of June with 43293 units. The average monthly consumption for JC BOSE BLOCK recorded is 26758 units.


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Analysis of energy consumption in ARYABHATTA block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN ARYABHATTA BLOCK
(2019-2020)

S.No	MONTH	Aryabhata block(unit consumption)	Cost	Tariff
1	JULY	41363	316426	413630
2	AUGUST	38865	297317	388650
3	SEPTEMBER	31235	238947	312350
4	OCTOBER	33564	256764	335640
5	NOVEMBER	29256	223808	292560
6	DECEMBER	28568	218545	285680
7	JANUARY	21256	162608	212560
8	FEBRUARY	24528	187639	245280
9	MARCH	22569	172652	225690
10	APRIL	14569	111598	145690
11	MAY	16589	127071	165890
12	JUNE	38865	335567	438650

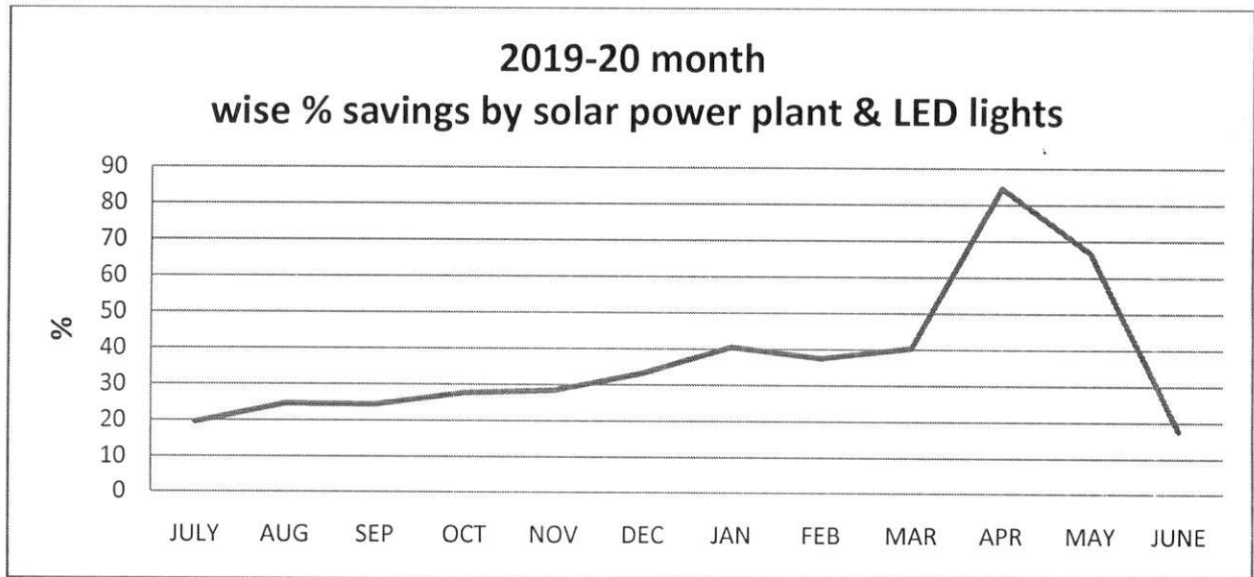


The monthly wise power consumption of the ARYABHATTA BLOCK for the duration of 2019-2020 is shown in Figure. The total annual energy consumption during 2019-20 is 341227 Kwh or units. Peak consumption is observed in the month of July with 41363 units. The average monthly consumption for ARYABHATTA BLOCK recorded is 28435 units.

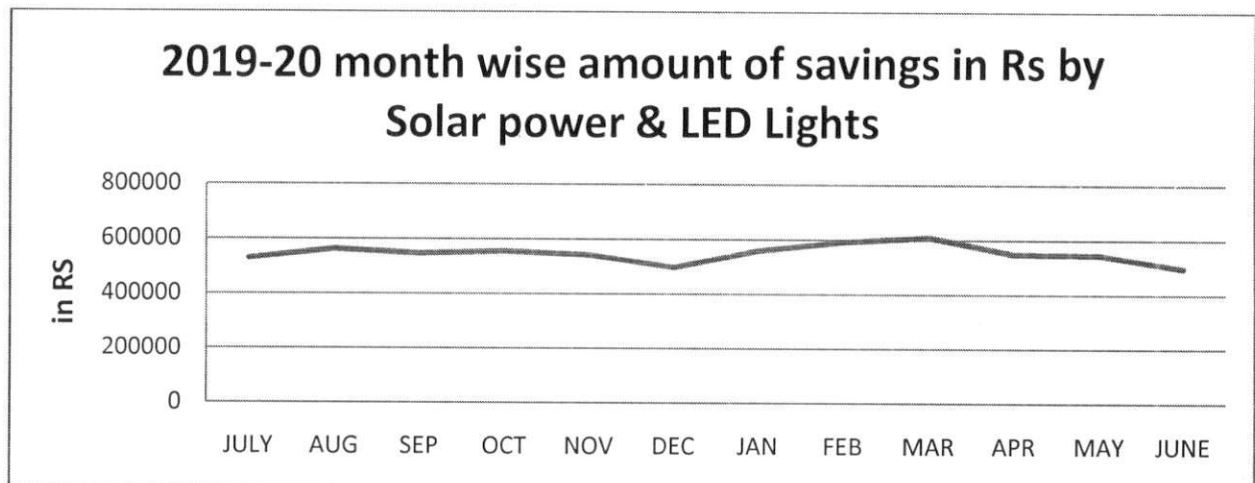

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Analysis of Energy Savings in VFSTR


Analysis of month energy savings by SOLAR Plant & LED Lights



It is observed that the peak saving of 84.5% happened because the all loads are almost shutdown due to pandemic Covid - 19 Lockdown. From the month of June the load consumption was keep on increased so the % savings came to the normal level.



Month wise saving in Rupees our campus for the duration of 2018-2019 is shown in Figure. The total amount savings is Rs 6544070.


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EQUIPMENT WISE ENERGY CONSUMPTION FOR COMPUTERS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	computers	165.76	63	10442
2	H-Block	computers	198.2	63	12486
3	U-Block	computers	45.56	63	2870
4	Pharmacy Block	computers	125.3	63	7893
5	Library	computers	16.934	70	1185


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EQUIPMENT WISE ENERGY CONSUMPTION FOR LIGHTS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Lights	12.191	63	768
2	H-Block	Lights	31.64	63	1993
3	U-Block	Lights	46.36	63	2920
4	Pharmacy Block	Lights	7.8	63	491
5	Library	Lights	4.365	70	305
6	Guest House	Lights	10.6	77	816
7	Boys Hostel	Lights	20.24	77	1558
8	Girls Hostel	Lights	15.3	77	1178
9	Canteen	Lights	1	70	70


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EQUIPMENT WISE ENERGY CONSUMPTION FOR FANS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Fans	32.64	63	2056
2	H-Block	Fans	40.24	63	2535
3	U-Block	Fans	40.7	63	2564
4	Pharmacy Block	Fans	26.3	63	1656
5	Library	Fans	5.44	70	380
6	Guest House	Fans	2.2	77	169
7	Boys Hostel	Fans	40.8	77	3141
8	Girls Hostel	Fans	5.76	77	443
9	Canteen	Fans	0.48	70	33


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EQUIPMENT WISE ENERGY CONSUMPTION FOR LAB & OTHER EQUIPMENT

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	Lab Equipments & Others	25	63	1575
2	H-Block	Lab Equipments & Others	35.9	63	2261
3	U-Block	Lab Equipments & Others	163.6	63	10306
4	Library	Lab Equipments & Others	1.6	70	112
5	Boys Hostel	Lab Equipments & Others	5	77	385
6	Girls Hostel	Lab Equipments & Others	3.6	77	277
7	Canteen	Lab Equipments & Others	4.6	70	322


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EQUIPMENT WISE ENERGY CONSUMPTION FOR PRINTER

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW/hr)
1	A-Block	printer	9.45	63	595
2	H-Block	printer	5.04	63	317
3	U-Block	printer	7.56	63	476
4	Pharmacy Block	printer	1.89	63	119
5	Library	printer	0.63	70	44
6	Guest House	printer	0.63	77	48
7	Boys Hostel	printer	0.63	77	48
8	Girls Hostel	printer	0.63	77	48


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EQUIPMENT WISE ENERGY CONSUMPTION FOR REFRIGERATOR&PUMPS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	Refrigerators & Water Pumps	16.5	168	2772
2	H-Block	Refrigerators & Water Pumps	22.9	168	3847
3	U-Block	Refrigerators & Water Pumps	3.6	168	604
4	Library	Refrigerators & Water Pumps	1.6	168	268
5	Guest House	Refrigerators & Water Pumps	5.2	168	873
6	Boys Hostel	Refrigerators & Water Pumps	35.8	168	6014
7	Girls Hostel	Refrigerators & Water Pumps	11	168	1848
8	Canteen	Refrigerators & Water Pumps	2.6	168	436


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EQUIPMENT WISE ENERGY CONSUMPTION LCD PROJECTOR

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	LCD projectors	7.924	42	332.808
2	H-Block	LCD projectors	7.358	42	309.036
3	U-Block	LCD projectors	8.49	42	356.58
4	Pharmacy Block	LCD projectors	3.113	42	130.746
5	Library	LCD projectors	0.566	42	23.772


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EQUIPMENT WISE ENERGY CONSUMPTION FOR XEROX MACHINE

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Xerox Machines	1.26	70	88
2	H-Block	Xerox Machines	0.63	70	44
3	U-Block	Xerox Machines	0.63	70	44
4	Pharmacy Block	Xerox Machines	0.63	70	44
5	Boys Hostel	Xerox Machines	0.63	70	44
6	Girls Hostel	Xerox Machines	0.63	70	44


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ENERGY AUDIT
(2018-2019)



VIGNAN'S

Foundation for Science, Technology & Research

(Deemed to be UNIVERSITY)

-Estd. u/s 3 of UGC Act 1956



Date: 29-04-2019

To

S.S. Ganguly

"MAHAVEER CEDAR" FLAT # 506

Chiksandra village, Off Hesarghata Main Road

Yeswantpur Hobli. North Bangalore - 560090

(Karnataka) INDIA.

Respected Sir,

Sub: Request to conduct Energy Audit & Safety Audit of Vignan's Foundation for Science, Technology & Research (Deemed to be University) ---- Reg.

-oOo-

It is to inform you that, **Vignan's Foundation for Science, Technology & Research (Deemed to be University)** organization is planned to conduct energy audit by external agency with external experts along with our internal audit committee members. So we are inviting you to conduct energy audit in our VFSTR University (Deemed to be) from 04/6/2019 to 05/6/2019. Please give your concern to conduct energy audit in our campus.

Head of the Department (EEE),
VFSTR University,
Vadlamudi, Guntur, AP

GSTNO: 29KAGPN7221J1Z1

Cell: 9448072558

S.S.G. POWER SOLUTIONS

Mahaveer Cedar, Flat No.:506, Chiksandra Village,
Off : Heserghata Main Road, Yeswantpur Hobli, North Bangalore – 560090 , Karnataka, India.
E-mail:ssganguly58@gmail.com



Date: 03.05.2019

F.NO: SSGP/EL/19/06/06

To
Head of the Department
Department of EEE
VFSTR university,
Vadlamudi, Guntur, A.P.

Respected Sir,

Sub: Energy Audit conduction – Reg.

We convey sincere thanks to choose us to conduct energy audit.

We inform you that we are accepting your request to conduct Energy audit in your campus. With this regard our experts will visit from 04/6/19 to 05/6/20 your campus. The payment for whole process of auditing is 40,000/-. The payment can be done after submission of audit report



Authorized Signatory

**VIGNAN'S**

Foundation for Science, Technology & Research

(Deemed to be UNIVERSITY)

-Estd. u/s 3 of UGC Act 1956



Date: 23-05-2019

To

S.S. Ganguly

"MAHAVEER CEDAR" FLAT # 506

Chiksandra village, Off Hesarhata Main Road

Yeswantpur Hobli. North Bangalore - 560090

(Karnataka) INDIA.

Respected Sir,

Sub: Confirmation to conduct Energy Audit of Vignan's Foundation for Science, Technology & Research (Deemed to be University) ---- Reg.

-oOo-

In connection with our previous communication regarding Energy Audit in Vignan's Foundation for Science, Technology & Research (Deemed to be University), we are agreeing to pay the remuneration of 40,000/-. The following internal Audit committee members will involve in the energy audit from 04/6/2019 to 05/6/2019.

S.No	Name of the faculty	Designation	Signature
1	Dr.G.Srinivasa Rao	Professor, EEE	
2	Dr.K.Mercy Rosalina	Associate professor, EEE	
3	Mr. Ch. Umamaheswara Rao	Electrical Maintenance Incharge	

Thanking you,

Head of the Department (EEE),
VFSTR University,
Vadlamudi, Guntur, AP,

GSTNO: 29KAGPN7221J1Z1

Cell: 9448072558

S.S.G. POWER SOLUTIONS

Mahaveer Cedar, Flat No.:506, Chiksandra Village,
Off : Hesarghata Main Road, Yeswantpur Hobli, North Bangalore – 560090 , Karnataka, India.
E-mail: ssganguly58@gmail.com



Date: 08.06.2019

To
Head of the Department
Department of EEE
VFSTR university,
Vadlamudi, Guntur, A.P.

Respected Sir,

Sub: Submission of Final Report on 'Energy Audit' – Reg.

Energy Audit of Vignan's Foundation for Science, Technology and Research (Deemed to be University) is conducted and the report is attached. Refer the following pages of report of Energy Audit for 2018-19 duration of your campus. Feel free to contact us for any clarifications on this subject.



Authorized Signatory



PROCEEDINGS OF THE REGISTRAR

F.No.:VFSTR/RO/A4/30/2018-19/62

Dt: 24.04.2019

Sub: VFSTR – Sanction of amount for Energy audit– amount – sanctioned – orders – Issued.

Read: Letter dated 23.04.2019 of Dr. G. Srinivasa rao, HOD of EEE.

* * *

ORDER

With reference to the letter read above, sanction is hereby accorded for the payment of Rs.40,000/-(Rupees Thirty thousand only) to Mr. S.S. Ganguly (S.S.G. Power Solution), Bangalore towards remuneration to Conduction of Energy audit.

The above budget sanctioned amount is debitable to the budget available under Major head: Staff Payments & Benefits (200) and Minor head: honorarium (212) for the Financial Year 2018-19.

REGISTRAR

**VIGNAN'S FOUNDATION
FOR SCIENCE, TECHNOLOGY AND RESEARCH
(Deemed to be University)
VADLAMUDI-522 213
GUNTUR (DISTRICT), A.P. INDIA**

To:

The Finance Officer,
HOD, EEE,
The Electrical Maintenance Incharge

Copy to

PA to the Vice Chancellor
Master file

Energy Audit and Safety Audit Report

Visited the following areas in your campus:

1. 11 kV Substation at two different locations each having 1 No. Stepdown Transformer (11 kV / 433 volts)
 - a. 950 kVA Transformer presently Supporting following buildings: A – Block / H – Block / Hostels – Blocks / Pharmacy & Library.
 - b. The Backup power is supported by 1 x 500 kVA DG set (Kirloskar Green)
 - c. Supported by 1 x 200 kVA DG set (Cummins)
 - d. Earthing systems are normal, as per IS -3043
 - e. APFC panel, 1 x 100 kVAr is functional, which is connected to 950 kVA system.
2. **Solar Generation:** State of art solar generation is adopted at roof top. Total generation is **1MWp** which is grid interactive.
3. **UPS System:** Visited various labs, which are having stand-alone UPS, of different make, with SMF batteries. Total UPS installed capacity is around **745-kVA**.
4. **Lightening protection system:** Presently each building is having Spike type lightning arrestors.


Authorized Signatory



S.S.G. POWER SOLUTION

ANNEXURE

INSTITUTE POWER PATTERN:

- Total connected load of the institution = 2119 kw
- Transformers available in the institution = 950 KVA+200 KVA
- Diesel generator set capacity =500KVA
- Diesel consumption of the DG Set =1920 liters for full day power shedding
- Power met through Renewable sources =1600 kwh

ENERGY CONSERVATION OPPORTUNITIES FOR ENERGY EFFICIENCY

Recommendations for better energy efficiency:

- ✓ Based on the analysis of the power consumption data, certain steps have been recommended for improving energy
- ✓ efficiency of the campus. Complete cost analysis of implementation of recommended measures has been performed wherever necessary. Also, a number of general measures for energy efficiency have been listed.
 - Described below are some important recommendations for better energy efficiency:

1. Power savings through the usage of LEDs:

Dominant light source at most places in the campus is traditional bulbs with LED lights which consumes 20W in addition to the 40W. The campus has 3229 in total conventional bulbs and 1092 LEDs. If these conventional bulbs are replaced by LEDs, 20 W power can be saved per bulb

- Total No. of conventional bulbs in Campus = 3229
- Average Power of conventional bulbs = 129.16 4kW
- Average Power of electronic Ballast FTL = 40W
- Power saved per bulb = 20 W
- Total Power saving = 64.58 kW/h
- Average Use of bulbs per day = 3229X9h=29061 h
- Average Use of bulbs per year =10461960 h
- Total Energy saved per day = 64580 WX9h = 581.22 KWh
- Total Energy saved per year =209239.2 KWh
- saving in Rs. Per year = 209239.2X10= Rs.2092392
- Average Cost of Replacing each bulb = Rs.340
- Total Cost of Replacing all Conventional Ballast FTLs = Rs. 1097860
- Capital Cost Recovery time = (1097860)/ (2092392) = 0.52 Years
- Hence, the capital cost recovery time for replacing all conventional Ballast FTLs of the campus is around 0.52 years.

2. Minimizing Repair Works in Fans:

During data collection, the repaired fans have been found to be consuming very high power as compared to the rated power. Fans repaired once and twice were consuming 85 W and 70 W more than the average consumption of new fans respectively. Thus, effort should be made to minimize the repairing of fans and also repair work should be supervised properly.

3. Better Practices for AC:

The institute has in total 220 VRV cassette, 218 cassette type ACs, 119 split ACs, 18 Tower ACs, which make a very large part of total energy consumption of the campus. But, at many places it was found that AC is not used with best recommended practices. Even simple things, such as insulation. Also at certain places ACs were found to be used without keeping curtains.

These poor practices account for increase in AC load and thus consumption. Summarized below are some guidelines for most efficient use of ACs:

- **Proper Insulation** – Good quality insulation must be maintained in the air conditioned rooms by keeping all doors and windows closed properly so as to prevent cool air go out and hot air come in.
- **Curtains** – Always keep curtains on windows to prevent direct sunlight inside the room to avoid heating of cooled air. This reduces AC load significantly.
- **Maintenance** – Proper maintenance and cleaning of ACs is required at regular intervals to make it work at highest efficiency. Any dirt in filter may reduce efficiency of AC very significantly.
- **Operating** – The ACs should be switched on 15 minutes before actual use and should be switched off before leaving the room.

Suggestions based on information

1. VRV-3 ACS control unit is proposed to place in A-BLOCK. The temperature control and timer control to be added to all Acs in A block to improve the energy saving.

It is recommended to place Thermography sensors in major MCB spots in LT panel boards in all blocks of campus. It is observable to find any internal faults in MCbs and major equipment.

It is proposed to install LED lights in place of conventional tube lights. This will give large amount of energy saving all blocks.

2. The Guntur area during rainy season is prone to lightning problems. It is recommended to place lightning arrestors in the major blocks of university.

3. The generator dynamo problem and service is required.

4. Transformer oil in 950KVA TRANSFORMER is needed to be changed even its functioning is good.

5. It is recommended to place Automatic tap changers to the 950KVA transformer behind the A block in outdoor substation. The terminal voltage at different timings of VFSTRU load cycle is varying and sometimes crossing healthy voltage level. So it is needed to place Online tap changer.

6. Solar generation is up to mark.

7. Better to place 25KV ups instead of small ups like 1 kva.

8. Some Batteries in series of battery bank are get damaged in CSE dept due to sunrays falling on it. It is better to place in shaded area to avoid overheating and unbalance of battery voltages.

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(To be filled up by Experts)

Summary Sheet

S.No.	Parameters of Evaluation	Page No.	Grade
1	Earth pits maintenance	8	A
2	Street Lights	9	A
3	Power back up :500KVA Generator Maintenance	10	B
4	Power back up : 200KVA Generator Maintenance	11	B
5	Distribution Panel Boards	12	A
6	Solar Power plant generation	13	A
7	UPS Maintenance	14	A
8	Lightning arresters in A,H & U Blocks	15	A


Grading System

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement

1. Earth Pits Maintenance

S.No.	Sub-parameter	Grade
1	Resistance value	A
2	Cleaning	B
3	Nuts & Bolts Condition	B
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement




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2. Street Lights

S.No.	Sub-parameter	Grade
1	Voltage profile	A
2	Earthing	B
3	Cable Statues (Damages any)	B
4	Light Working Condition	A
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement






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3. Power Back up: 500KVA Generator Maintenance

S.No.	Sub-parameter	Grade
1	Generator Cleaning	C
2	Shed Cleaning	C
3	Engine oil level	B
4	Fuel tank level	A
5	Fuel leaks	B
6	Radiator condition	C
7	Battery connections	A
8	Battery voltage	A
9	Exhaust system condition	B
10	All tools availability	A
TOTAL		B



Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement



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4. Power Back up: 200KVA Generator Maintenance

S.No.	Sub-parameter	Grade
1	Generator Cleaning	B
2	Shed Cleaning	B
3	Engine oil level	A
4	Fuel tank level	A
5	Fuel leaks	C
6	Radiator condition	B
7	Battery connections	B
8	Battery voltage	A
9	Exhaust system condition	A
10	All tools availability	A
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


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5. Distribution Panel

S.No.	Sub-parameter	Grade
1	Cleaning	A
2	Voltage	A
3	Current	A
4	MCCB condition	A
5	Bus Bar terminals	A
6	Cable terminals	A
7	Earthing	A
8	Panel Door (Closed or opened)	A
TOTAL		A

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement



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6. Solar Power Plant Generation

S.No.	Sub-parameter	Grade
1	MMS Tightning	A
2	Civil Foundation	A
3	Earthing	A
4	Modules Cleaning	A
5	Inverter maintenance	A
TOTAL		A

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement





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7. UPS Maintenance

S.No.	Sub-parameter	Grade
1	UPS Input Voltage	A
2	Battery Bank Voltage At no Load	A
3	Battery Bank Voltage At Full Load	A
4	Earthing	A
5	UPS Condition Cable	A
6	Batteries Condition	B
7	Cable terminals(nuts&bolts)	C
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement

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8. Lightning Arresters

S.No.	Sub-parameter	Grade
1	Earthing strip condition	A
2	Lightning arrester condition	A
3	Nuts&Bolts Condition	A
TOTAL		A

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement




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Foundation for Science, Technology & Research

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-Estd. u/s 3 of UGC Act 1956

Energy Audit Report

Academic Year : 2018-19

Name of the Department : EEE

1. Name of the Member : Dr. G.Srinivasa Rao

Designation : Professor & Head

Address : Department of EEE, VFSTR

2. Name of the Member : Dr. K.Mercy Rosalina

Designation : Associate Professor

Address : Department of EEE, VFSTR

3. Name of the Member : Mr. Ch.Umamaheswara Rao

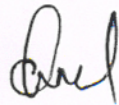
Designation : Electrical Maintenance I/c.

Address : Department of EEE, VFSTR

Signature of Audit Committee:

1. 

2. 

3. 

ENERGY SAVINGS FOR THE MONTHS(2018-2019)

S.No	MONTH	ENERGY CONSUMPTION (Kwhr)	ENERGY SAVINGS (kWhr)			% savings	TARIFF (Rs)
			Solar	LED lights	Total		
1	JULY	220965	36420	5868	42288	19.1	422880
2	AUGUST	196748	36182	5758	41940	21.3	419400
3	SEPTEMBER	232833	46977	5789	52766	22.6	527660
4	OCTOBER	196991	41399	5967	47366	24	473660
5	NOVEMBER	178322	50087	6156	56243	31.5	562430
6	DECEMBER	136281	44013	5896	49909	36.6	499090
7	JANUARY	118596	46827	5764	52591	44.3	525910
	FEBRUARY	154510	50422	6026	56448	36.5	564480
9	MARCH	211538	64456	6125	70581	33.3	705810
10	APRIL	240680	56534	6259	62793	26	627930
11	MAY	289359	55983	6156	62139	21.4	621390
12	JULY	266467	49402	9942	59343	22.2	593430


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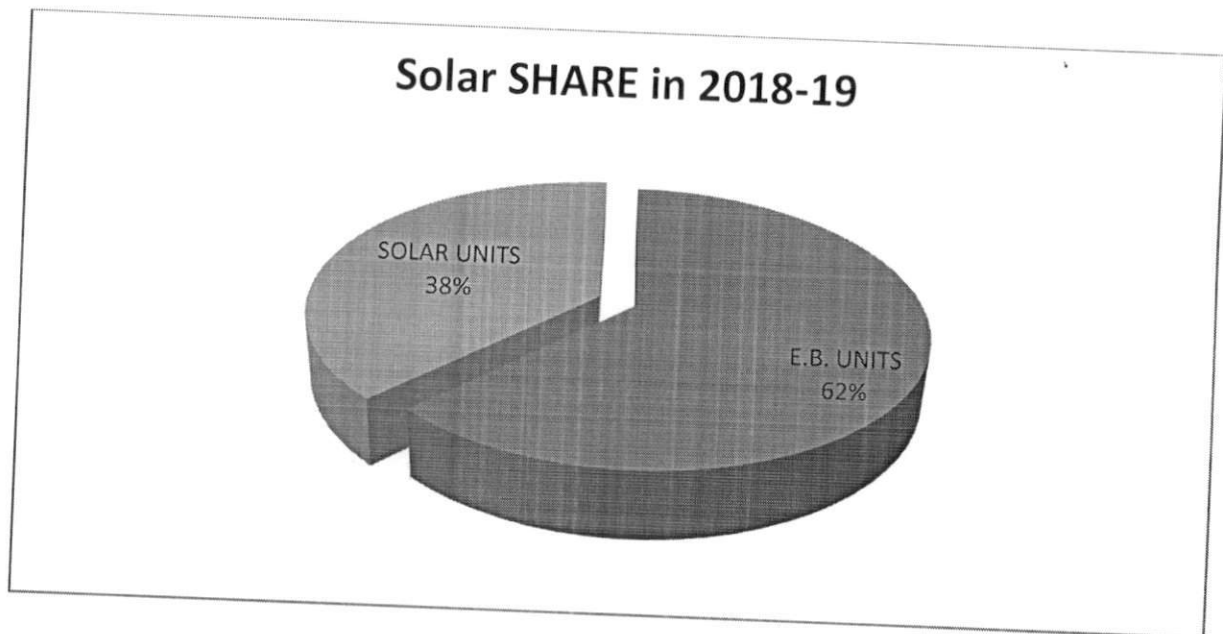
ENERGY SAVINGS THROUGH RENEWABLE SOURCES(2018-2019)

S.No	Block	Total Consumption	Power generated through renewable source	Power met through renewable source	Wheeling to grid	% of savings	Operation in days
1	A-Block	825020	89880	87501	2379	10.8	12 Months
2	H-Block	589300	200245	191257	8988	24.2	12 Months
3	Pharmacy Block	353580	197565	186727	10838	23.9	12 Months
4	Boys Hostel	471440	86562	82333	4229	10.4	12 Months
5	U-BLOCK	415854	245645	230621	15024	26.9	12 Months


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Analysis of Energy consumption in VFSTR

Solar energy contribution in campus total Energy consumption



- The modes of energy utilisation in VFSTR campus is shown in Figure. The diagram shows the VFSTR utilises 38% of energy from 1MW solar PV plant and 62% energy from grid supply.
- It is observed that there is increase in solar energy utilisation share is about 23% as compared to the year of 2017-18.

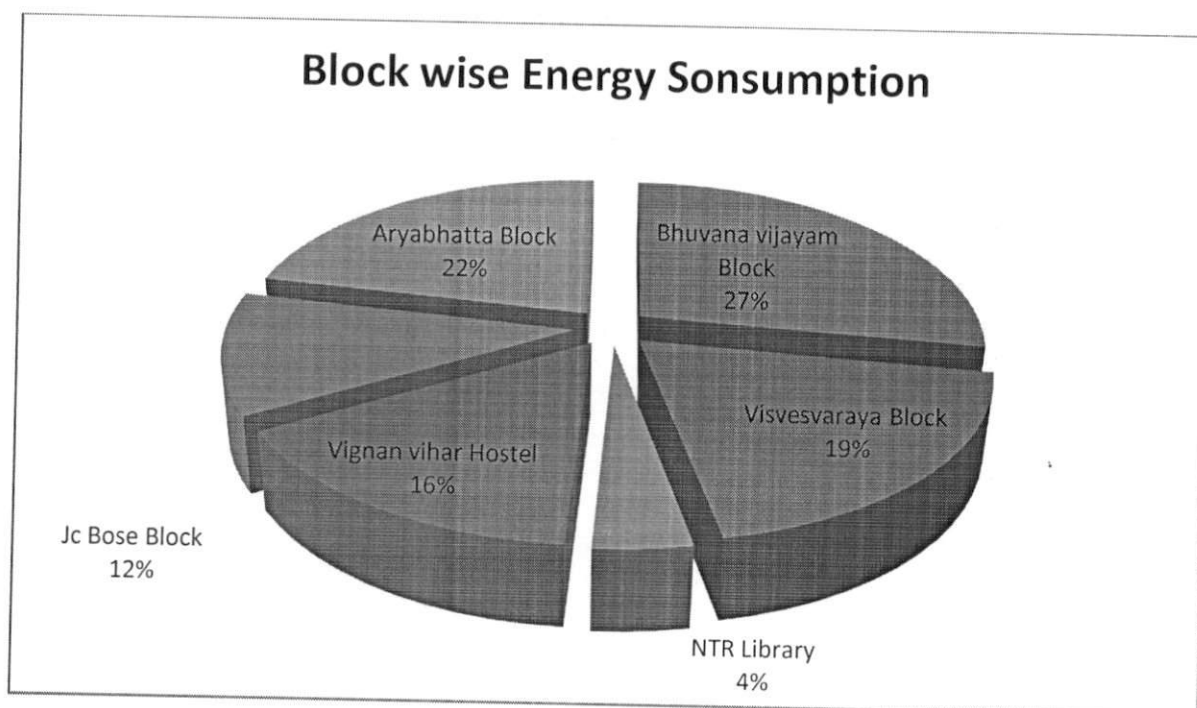

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Analysis of Carbon Foot print in VFSTR campus

Parameter	Details
Solar PV plant Generated Units in a 2018-19 academic year	1126818 Kwh
Cost of 1 Unit from Grid	Rs. 10 (Base price + Demand charges)
Saved Money	Rs. 11268180
Capital Investment done in 2018	Rs. 6.5
Present year saving in the capital investment	17.33%
IPCC emission factor for Indian power generation [11]	0.944 tCO ₂ /MWh
Reduced CO ₂ Emissions	1126.8 Mw hr * 0.944 = 1063 Tons of CO ₂


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Block wise energy consumption in campus



The block wise energy power consumption of the university is shown in above Fig. The total annual energy consumption of the campus is 3134603 Kwh, of which 27% is from Bhuvana vijayam Block, 19% from Visvesvaraya Block, 22 % from Aryabhata Block, 16 % from hostel, 12% from jc Bose bloc, 4% from library. The highest energy consumption is obtained from Bhuvan vijayam Block followed by different blocks in the campus.

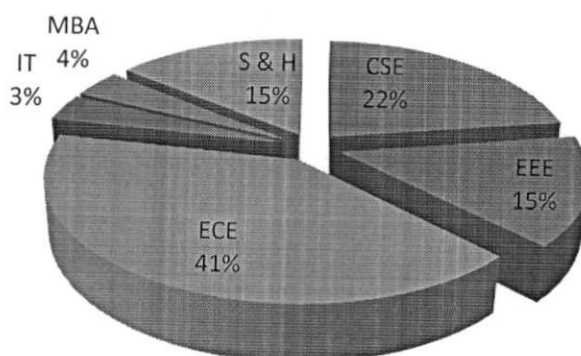

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The department's Laboratory wise energy consumption in campus

LABORATORY WISE ENERGY CONSUMPTION

S.No	Department	Type of laboratory	Total load (kW)	Running hours per day	Unit consumption per week (kWhr)
5	Computer Science and Engineering	6 computer labs	88.8	5	444
6	Electrical and Electronics	4 labs	59.2	5	296
7	Electrical and Communication	11 labs	162.8	5	814
8	Information Technology	1 lab	14.8	5	74
10	MBA	1 computer lab	15	5	75
11	S & H	4 labs	59.2	5	296

LABORATORY WISE ENERGY CONSUMPTION(KWH)



The department wise power consumption of the Computer Laboratory is shown in above figure. The diagram shows the ECE department consumes high energy of 41% and CSE department consumes 22% of energy on daily basis. EEE and S&H departments consume 15% each. The power consumption of the IT and MBA consume each is 3% and 4%.


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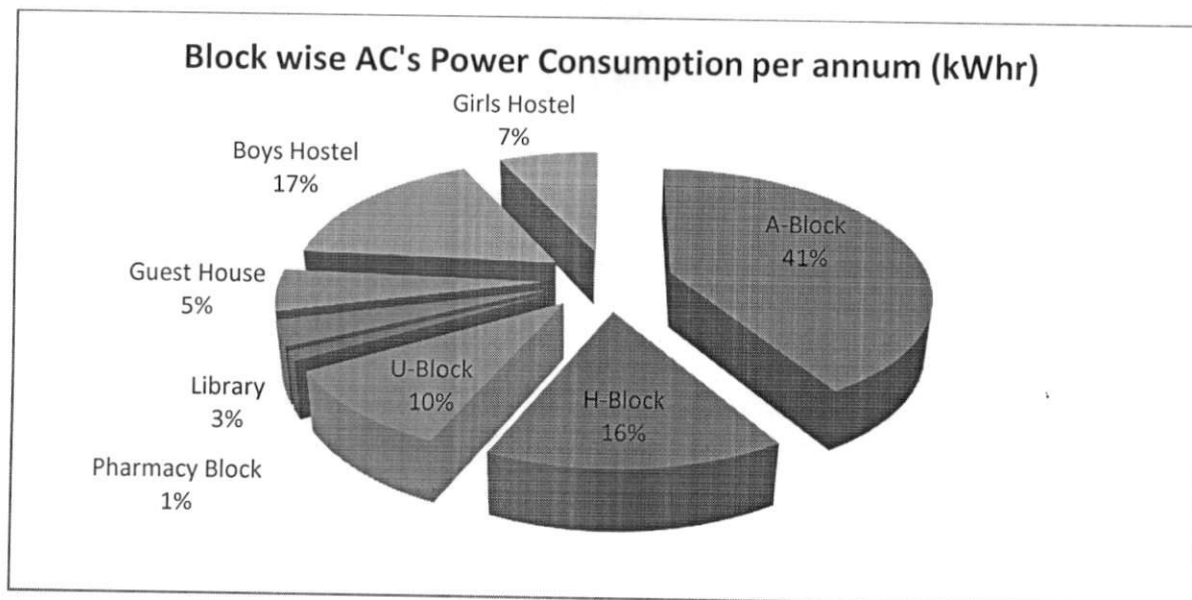
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AC's consumption analysis with block wise in the campus


EQUIPMENT WISE ENERGY CONSUMPTION FOR AC's

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	air conditioner	846	63	53298
2	H-Block	air conditioner	318	63	20034
3	U-Block	air conditioner	207	63	13041
4	Pharmacy Block	air conditioner	24	63	1512
5	Library	air conditioner	60	70	4200
6	Guest House	air conditioner	97.5	70	6825
7	Boys Hostel	air conditioner	309	70	21630
8	Girls Hostel	air conditioner	135	70	9450


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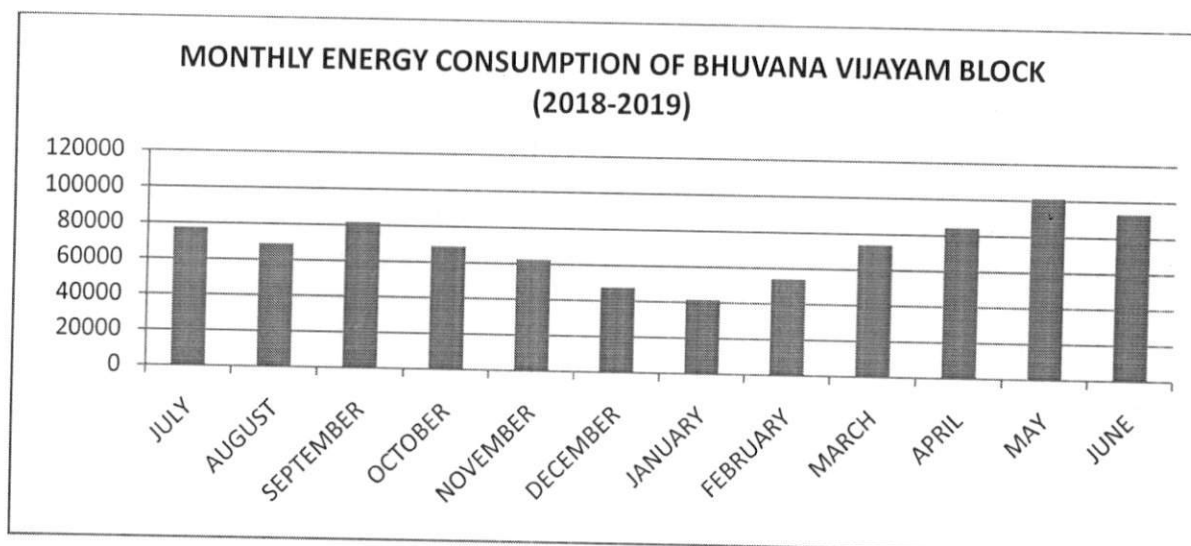
The block wise power consumption by ACs is shown in above figure. 41 % of energy consumption is from A-Block, 16% of energy consumption is from H-Block, 10% of energy consumption is from U-Block, 1% of energy consumption is from pharmacy block, 17% of energy consumption is from boy's hostels, 7% of energy consumption is from Girls hostel, 5% of energy consumption is from guest house, 3% of energy consumption is from library. The highest energy consumption is obtained in A-Block followed by different blocks in the campus.


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Analysis of energy consumption in Bhuvana Vijayam block on monthly basis:

**ENERGY CONSUMPTION OF THE INSTITUTION IN BHUVANA VIJAYAM
BLOCK(2018-2019)**

S.No	MONTH	Bhuvana vijayam Block(unit consumption)	Cost	Tariff
1	JULY	77337	591633.7	773370
2	AUGUST	68861	526792.7	688610
3	SEPTEMBER	81491	623410.3	814910
4	OCTOBER	68946	527443.4	689460
5	NOVEMBER	62412	477457.1	624120
6	DECEMBER	47698	364892.3	476980
7	JANUARY	41508	317540.7	415080
8	FEBRUARY	54078	413700.5	540780
9	MARCH	74038	566392.9	740380
10	APRIL	84238	644420.7	842380
11	MAY	101275	774758.7	1012750
12	JUNE	93263	713465.3	932630



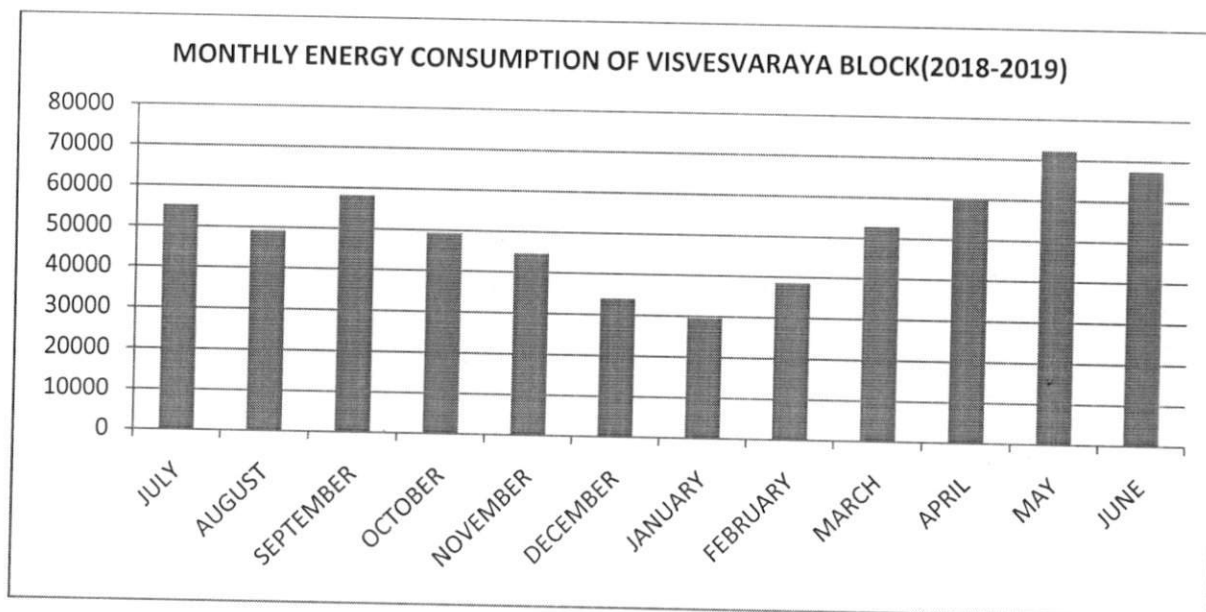
The monthly wise power consumption of the BHUVANA VIJAYAM BLOCK for the duration of 2018-2019 is shown in Figure. The total annual energy consumption during 2018-19 is 855145 Kwh or units. Peak consumption is observed in the month of May with 101275 units. The average monthly consumption for BHUVANA VIJAYAM BLOCK recorded is 71262 units.


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Analysis of energy consumption in VISVESVARAYA block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN VISVESVARAYA BLOCK(2018-2019)

S.No	MONTH	Visvesvaraya Block(unit consumption)	Cost	Tariff
1	JULY	55241	422595.5	552410
2	AUGUST	49187	376280.5	491870
3	SEPTEMBER	58208	445293.1	582080
4	OCTOBER	49247	376745.2	492470
5	NOVEMBER	44580	341040.8	445800
6	DECEMBER	34070	260637.4	340700
7	JANUARY	29649	226814.8	296490
8	FEBRUARY	38627	295500.3	386270
9	MARCH	52884	404566.4	528840
10	APRIL	60170	460300.5	601700
11	MAY	72339	553399	723390
12	JUNE	67586	517708.7	675860



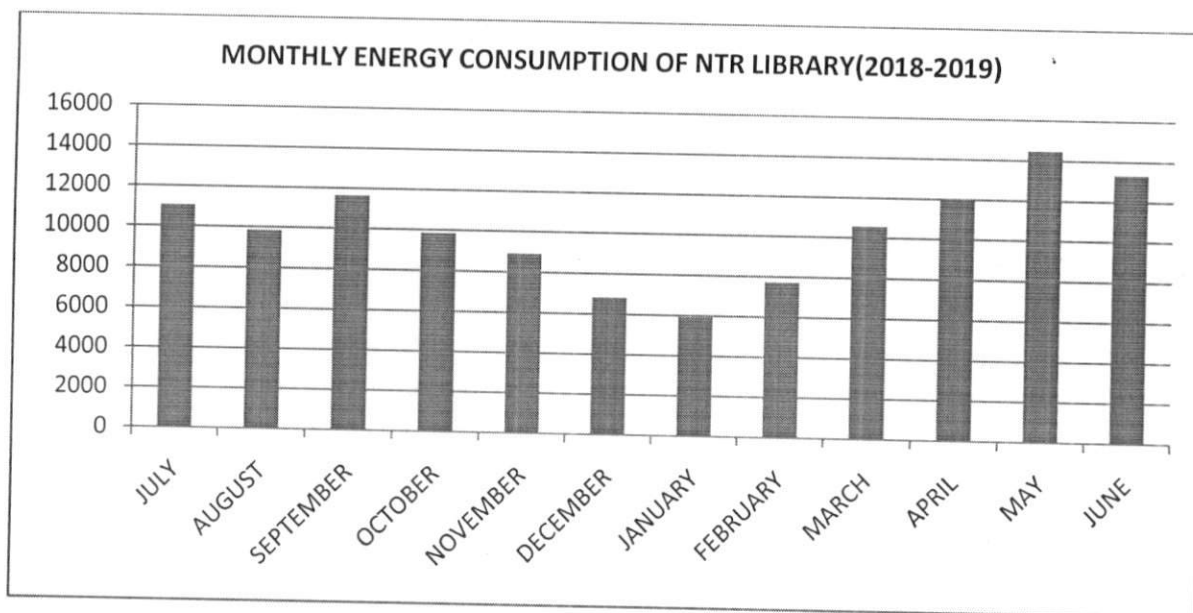
The monthly wise power consumption of the VISVESVARAYA BLOCK for the duration of 2018-2019 is shown in Figure. The total annual energy consumption during 2018-19 is 611788 Kwh or units. Peak consumption is observed in the month of May with 72339 units. The average monthly consumption for VISVESVARAYA BLOCK recorded is 50982 units.

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Analysis of energy consumption in NTR LIBRARY on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN NTR LIBRARY(2018-2019)

S.No	MONTH	NTR Library(unit consumption)	Cost	Tariff
1	JULY	11048	84519.1	110480
2	AUGUST	9837	75256.1	98370
3	SEPTEMBER	11641	89058.6	116410
4	OCTOBER	9849	75349	98490
5	NOVEMBER	8916	68208.1	89160
6	DECEMBER	6814	52127.4	68140
7	JANUARY	5929	45362	59290
8	FEBRUARY	7725	59100	77250
9	MARCH	10576	80913.2	105760
10	APRIL	12034	92060.1	120340
11	MAY	14467	110679.8	144670
12	JUNE	13323	101923.6	133230



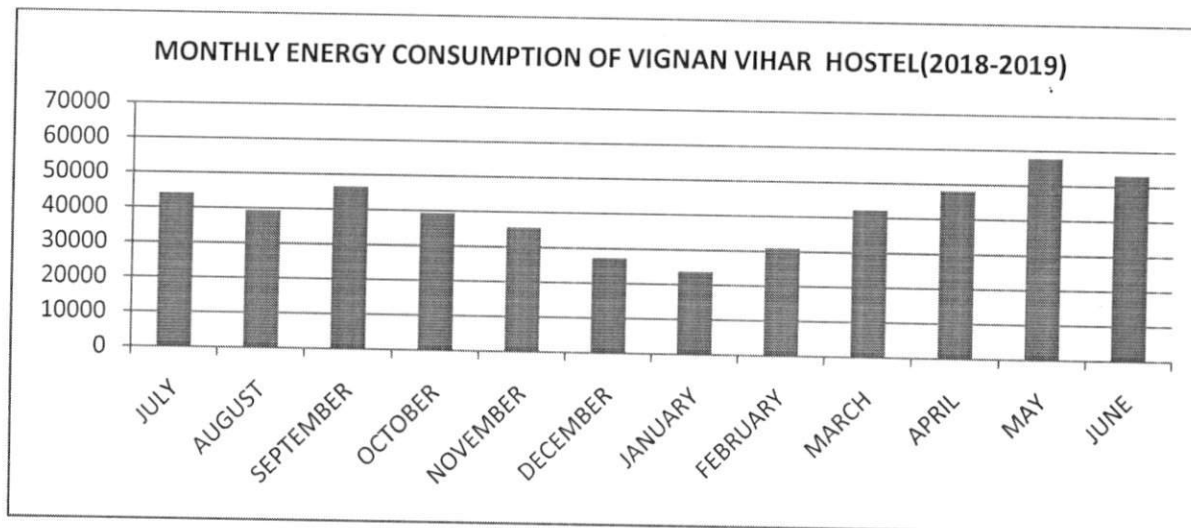
The monthly wise power consumption of the NTR LIBRARY for the duration of 2018-2019 is shown in Figure. The total annual energy consumption v during 2018-19 is 122159 Kwh or units. Peak consumption is observed in the month of May with 14467 units. The average monthly consumption for NTR LIBRARY recorded is 10179 units.


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Analysis of energy consumption in VIGNAN VIHAR HOSTEL on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN VIGNAN VIHAR HOSTEL(2018-2019)

S.No	MONTH	Vignan vihar Hostel(unit consupntion)	Cost	Tariff
1	JULY	44193	338076.4	441930
2	AUGUST	39349	301024.4	393490
3	SEPTEMBER	46566	356234.4	465660
4	OCTOBER	39398	301396.2	393980
5	NOVEMBER	35664	272832.6	356640
6	DECEMBER	27256	208509.9	272560
7	JANUARY	23719	181451.8	237190
8	FEBRUARY	30902	236400.3	309020
9	MARCH	42307	323653.1	423070
10	APRIL	48136	368240.4	481360
11	MAY	57871	442719.2	578710
12	JUNE	53293	407694.51	532930



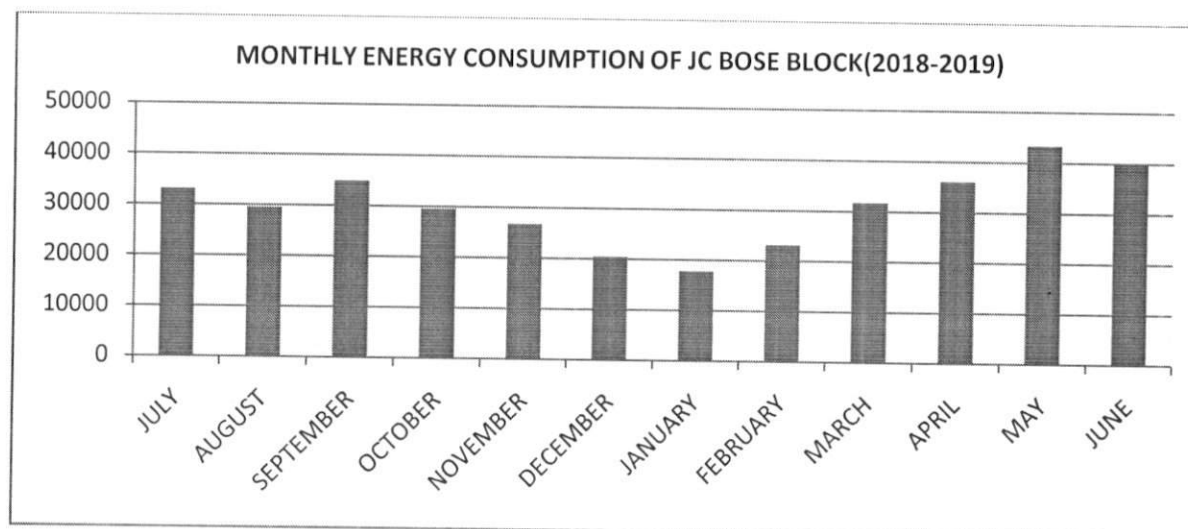
The monthly wise power consumption of the VIGNAN VIHAR HOSTEL for the duration of 2018-2019 is shown in Figure. The total annual energy consumption during 2018-19 is 488654 Kwh or units. Peak consumption is observed in the month of May with 57871 units. The average monthly consumption for VIGNAN VIHAR HOSTEL recorded is 40721 units.


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Analysis of energy consumption in JC BOSE block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN JC BOSE BLOCK (2018-2019)

S.No	MONTH	Jc Bose Block(unit consumption)	Cost	Tariff
1	JULY	33144	253557.3	331440
2	AUGUST	29512	225768	295120
3	SEPTEMBER	34924	267175.8	349240
4	OCTOBER	29548	226047.1	295480
5	NOVEMBER	26748	204624.4	267480
6	DECEMBER	20442	156382.4	204420
7	JANUARY	17789	136088.9	177890
8	FEBRUARY	23176	177300.2	231760
9	MARCH	31730	242739.8	317300
10	APRIL	36102	276180.3	361020
11	MAY	43403	332039.4	434030
12	JUNE	39970	305770	399700



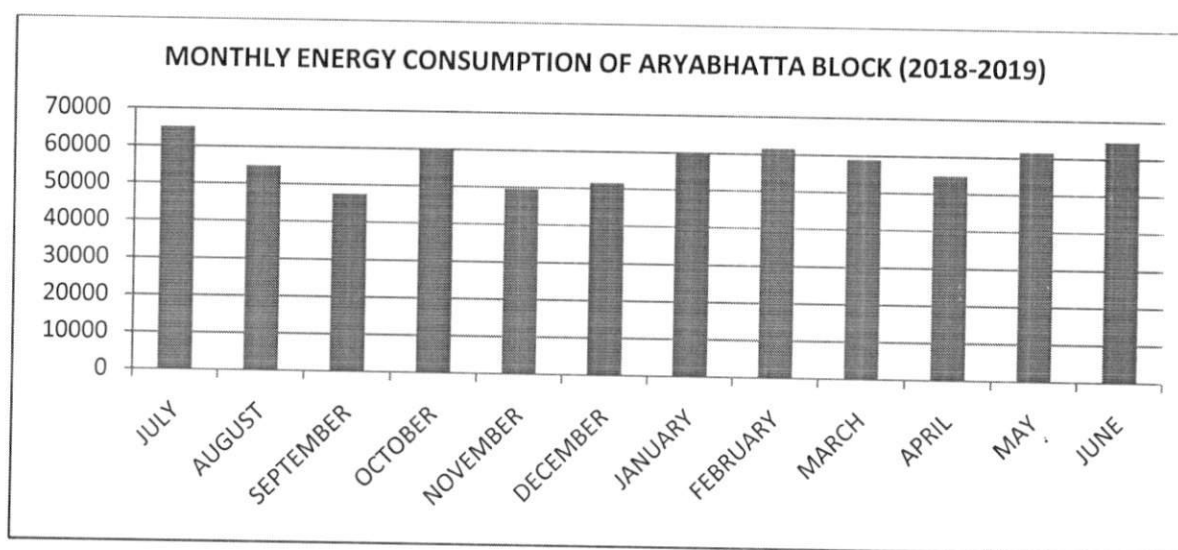
The monthly wise power consumption of the JC BOSE BLOCK for the duration of 2018-2019 is shown in Figure. The total annual energy consumption during 2018-19 is 366488 Kwh or units. Peak consumption is observed in the month of MAY with 43404 units. The average monthly consumption for JC BOSE BLOCK recorded is 30540 units.


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Analysis of energy consumption in ARYABHATTA block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN ARYABHATTA BLOCK(2018-2019)

S.No	MONTH	Aryabhata Block(unit consumption)	Cost	Tariff
1	JULY	65158	499110.28	651580
2	AUGUST	54856	420196.96	548560
3	SEPTEMBER	47586	364508.76	475860
4	OCTOBER	60215	461246.9	602150
5	NOVEMBER	49578	379767.48	495780
6	DECEMBER	51548	394857.68	515480
7	JANUARY	59875	458642.5	598750
8	FEBRUARY	61578	471687.48	615780
9	MARCH	58954	451587.64	589540
10	APRIL	54859	420219.94	548590
11	MAY	61582	471718.12	615820
12	JUNE	64580	494682.8	645800

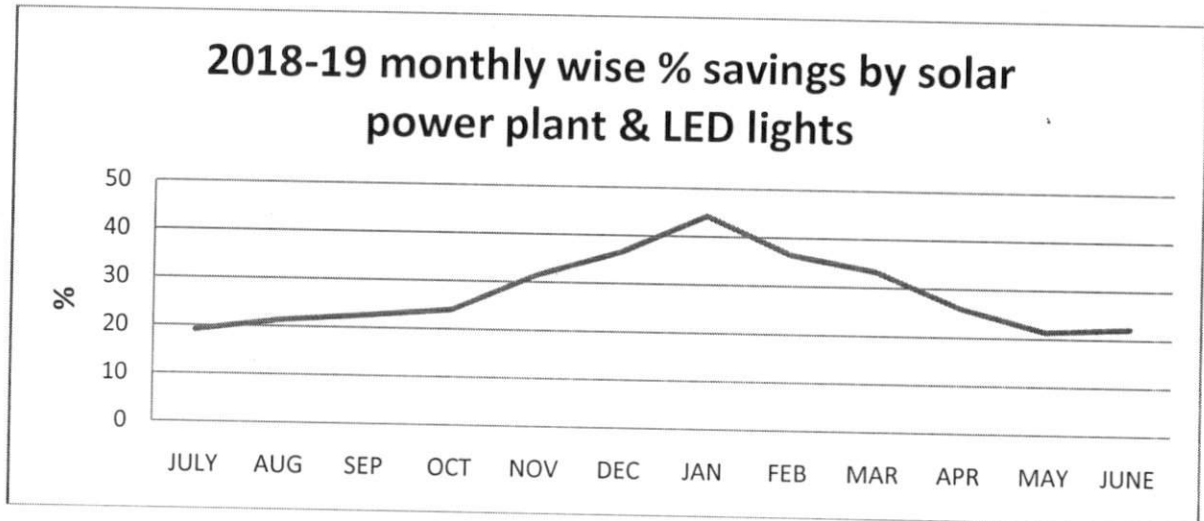


The monthly wise power consumption of the ARYABHATTA BLOCK for the duration of 2018-2019 is shown in Figure. The total annual energy consumption during 2018-19 is 690369 Kwh or units. Peak consumption is observed in the month of July with 65158 units. The average monthly consumption for ARYABHATTA BLOCK recorded is 57530 units.


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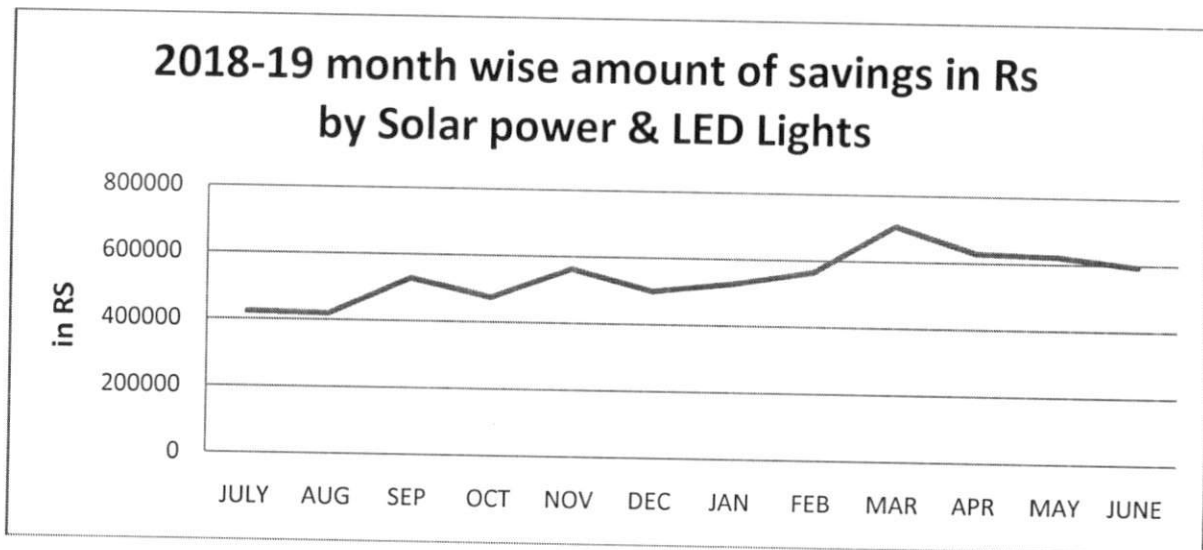
Analysis of Energy Savings in VFSTR

Analysis of month energy savings by SOLAR Plant & LED Lights




Month wise saving % in the campus for the duration of 2018-2019 is shown in Figure. The total savings

Of annual energy is 654407 Kwh or units. It is observed that the % savings improvement up to 43.3 % in the month of January.




Month wise saving in Rupees our campus for the duration of 2018-2019 is shown in Figure. The total amount savings is Rs 6544070.


Electrical Maintenance I/c
ELECTRICAL MAINTENANCE I/c
Department of EEE
VFSTR Deemed to be University
VADLAMUDI - 522 213.

EQUIPMENT WISE ENERGY CONSUMPTION FOR COMPUTERS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	computers	172.05	63	10839
2	H-Block	computers	202.5	63	12757
3	U-Block	computers	43.7	63	2753
4	Pharmacy Block	computers	95.5	63	6016
5	Library	computers	3.9	70	273


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EQUIPMENT WISE ENERGY CONSUMPTION FOR LIGHTS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	Lights	11.351	63	715
2	H-Block	Lights	29.16	63	1837
3	U-Block	Lights	42.68	63	2688
4	Pharmacy Block	Lights	7.08	63	446
5	Library	Lights	4	70	280
6	Guest House	Lights	8.8	77	677
7	Boys Hostel	Lights	18.44	77	1419
8	Girls Hostel	Lights	14.1	77	1085
9	Canteen	Lights	1	70	70


Electrical Maintenance I/C
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EQUIPMENT WISE ENERGY CONSUMPTION FOR FANS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	Fans	29.376	63	1850
2	H-Block	Fans	36.6184	63	2306
3	U-Block	Fans	32.56	63	2051
4	Pharmacy Block	Fans	23.67	63	1491
5	Library	Fans	4.8	70	336
6	Guest House	Fans	2	77	154
7	Boys Hostel	Fans	34.68	77	2670
8	Girls Hostel	Fans	4.5504	77	350
9	Canteen	Fans	1	70	70


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EQUIPMENT WISE ENERGY CONSUMPTION FOR LAB & OTHER
EQUIPMENT

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Lab Equipments & Others	21.75	63	1370
2	H-Block	Lab Equipments & Others	31.233	63	1967
3	U-Block	Lab Equipments & Others	143.968	63	9069
4	Pharmacy Block	Lab Equipments & Others	1.28	63	80
5	Library	Lab Equipments & Others	4	70	280
6	Guest House	Lab Equipments & Others	2.88	70	201
7	Boys Hostel	Lab Equipments & Others	3.68	77	283
8	Girls Hostel	Lab Equipments & Others	3.6	77	277
9	Canteen	Lab Equipments & Others	4.6	70	322


Electrical Maintenance I/C
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 Department of EEE
VESTU Deemed to be University
VADLAMUDI - 522 213.


EQUIPMENT WISE ENERGY CONSUMPTION FOR PRINTER

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	printer	8.316	63	523
2	H-Block	printer	4.4856	63	282
3	U-Block	printer	6.5772	63	414
4	Pharmacy Block	printer	0.63	63	39
5	Library	printer	0.63	70	44
6	Guest House	printer	0.63	77	48
7	Boys Hostel	printer	0.63	77	48
8	Girls Hostel	printer	0.63	77	48


Electrical Maintenance I/C
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Department of EEE
VFSTR Deemed to be University
VADLAMUDI - 522 213.


EQUIPMENT WISE ENERGY CONSUMPTION FOR REFRIGERATOR&PUMPS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWWhr)
1	A-Block	Refrigerators & Water Pumps	15.18	63	2550
2	H-Block	Refrigerators & Water Pumps	21.068	63	3539
3	U-Block	Refrigerators & Water Pumps	3.312	63	556
4	Library	Refrigerators & Water Pumps	4.784	63	803
5	Guest House	Refrigerators & Water Pumps	33.294	63	5593
6	Boys Hostel	Refrigerators & Water Pumps	2.6	63	436
7	Girls Hostel	Refrigerators & Water Pumps	2.6	63	436
8	Canteen	Refrigerators & Water Pumps	2.6	63	436


Electrical Maintenance I/C
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Department of EEE
VFSTR Deemed to be University
VADLAMUDI - 522 213.

EQUIPMENT WISE ENERGY CONSUMPTION LCD PROJECTOR

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	LCD projectors	7.4	42	312
2	H-Block	LCD projectors	6.7	42	284
3	U-Block	LCD projectors	7.8	42	331
4	Pharmacy Block	LCD projectors	2.8	42	118
5	Library	LCD projectors	0.4	42	20


Electrical Maintenance I/C
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Department of EEE
VFSTR Deemed to be University
VADLAMUDI - 522 213.

ENERGY AUDIT
(2017-2018)



VIGNAN'S
Foundation for Science, Technology & Research
UNIVERSITY
(Estd u/s 3 of UGC Act of 1956)

(ACCREDITED BY NAAC WITH 'A' GRADE)

Date: 23-04-2018

To
P.V.N. Chari
Vigneswara Power Controls,
Flat: 2, Sri Sai Nilayam, Nagaluru,
Guntur, Andhra Pradesh.
522034.

Respected Sir,

Sub: Request to conduct Energy Audit & Safety Audit of **Vignan's Foundation for Science, Technology & Research (Deemed to be University)** ---- Reg.

-oOo-

It is to inform you that, **Vignan's Foundation for Science, Technology & Research (Deemed to be University)** organization is planned to conduct energy audit by external agency with external experts along with our internal audit committee members. So we are inviting you to conduct energy audit in our VFSTR University (Deemed to be) from 18/5/2018 to 19/5/2018. Please give your concern to conduct energy audit in our campus.

Waiting for your response

Head of the Department (EEE),
VFSTR University,
Vadlamudi, Guntur, AP

GSTNO: 37AMGPN6552J1ZM

Cell: 9441316830, 7989367414

E-mail: charipvn@gmail.com

VIGNESWARA POWER CONTROLS

Door No: 133-5-808, Flat N o. 2, Sri Sai Nilayam, Near ID Hospital Nagaralu, G UNTUR -522034



Date: 02.05.2018

F.NO: VRPC/EA/17-18/05/11

To
Head of the Department
Department of EEE
VFSTR university,
Vadlamudi, Guntur, A.P.

Respected Sir,

Sub: Energy Audit conduction – Reg.

We convey sincere thanks to choose us to conduct energy audit.

We inform you that we are accepting your request to conduct Energy audit in your campus. With this regard our experts will visit from 18/5/18 to 19/5/18 your campus. The payment for whole process of auditing is 30,000/-. The payment can be done after submission of audit report.

For Vigneshwara power controls


Authorized Signatory

Transformer, HT/LT Motors, Breakers & Protection Relays Testing & Commissioning



SIEMENS



Schneider
Electric



VIGNAN'S
Foundation for Science, Technology & Research
UNIVERSITY
(Estd u/s 3 of UGC Act of 1956)

(ACCREDITED BY NAAC WITH 'A' GRADE)

Date: 05-05-2018



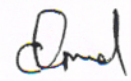
To
P.V.N. Chari
Vigneswara Power Controls,
Flat: 2, Sri Sai Nilayam, Nagaluru,
Guntur, Andhra Pradesh.
522034.

Respected Sir,

Sub: Confirmation to conduct Energy Audit of Vignan's Foundation for Science, Technology & Research (Deemed to be University) ---- Reg.

-oOo-

In connection with our previous communication regarding Energy Audit in Vignan's Foundation for Science, Technology & Research (Deemed to be University), we are agreeing to pay the remuneration of 30,000/-. The following internal Audit committee members will involve in the energy audit from 18/5/2018 to 19/5/2018.

S.No	Name of the faculty	Designation	Signature
1	Dr.G.Srinivasa Rao	Professor, EEE	
2	Mr.M.Subba Rao	Associate professor, EEE	
3	Mr. Ch. Umamaheswara Rao	Electrical Maintenance Incharge	

Thanking you,



Head of the Department (EEE),
VFSTR University,
Vadlamudi, Guntur, AP,

GSTNO: 37AMGPN6552J1ZM

Cell: 9441316830, 7989367414

E-mail: charipvn@gmail.com



VIGNESWARA POWER CONTROLS

Door No: 133-5-808, Flat N o. 2, Sri Sai Nilayam, Near ID Hospital Nagaralu, G UNTUR -522034

Date: 22.05.2018


To
Head of the Department
Department of EEE
VFSTR university,
Vadlamudi, Guntur, A.P.

Respected Sir,

Sub: Submission of Final Report on 'Energy Audit' – Reg.

Energy Audit of Vignan's Foundation for Science, Technology and Research (Deemed to be University) is conducted and the report is attached. Refer the following pages of report of Energy Audit for 2017-18 duration of your campus. Feel free to contact us for any clarifications on this subject.

For Vigneshwara power controls


Authorized Signatory

Transformer, HT/LT Motors, Breakers & Protection Relays Testing & Commissioning



SIEMENS



Schneider
Electric



PROCEEDINGS OF THE REGISTRAR

F.No.:VFSTR/RO/A4/30/2017-18/10

Dt: 15.04.2018

Sub: VFSTR – Sanction of amount for Energy audit– amount – sanctioned – orders – Issued.

Read: Letter dated 12.04.2018 of Dr. G. Srinivasa rao, HOD of EEE.

* * *

ORDER

With reference to the letter read above, sanction is hereby accorded for the payment of Rs.30,000/- (Rupees Thirty thousand only) to Mr. P.V.N. Chari (Vigneshwara Power Controls), Guntur towards remuneration to Conduction of Energy audit.

The above budget sanctioned amount is debitable to the budget available under Major head: Staff Payments & Benefits (200) and Minor head: honorarium (212) for the Financial Year 2017-18.

To:
The Finance Officer,
HOD, EEE,
The Electrical Maintenance Incharge

Copy to:
PA to the Vice Chancellor
Master file

Registrar

VIGNAN'S FOUNDATION
FOR SCIENCE, TECHNOLOGY AND RESEARCH
(Declared to be Deemed University U/S 3 of UGC Act 1956)
VADLAMUDI-622 213.
A.P. INDIA

Energy Audit and Safety Audit Report

Visited the following areas in your campus:

1. 11 kV Substation at two different locations each having 1 No. Stepdown Transformer (11 kV / 433 volts)
 - a. 950 kVA Transformer presently Supporting following buildings: A – Block / H – Block / Hostels – Blocks / Pharmacy & Library.
 - b. The Backup power is supported by 1 x 500 kVA DG set (Kirloskar Green)
 - c. Supported by 1 x 200 kVA DG set (Cummins)
 - d. Earthing systems are normal, as per IS -3043
 - e. APFC panel, 1 x 100 kVAr is functional, which is connected to 950 kVA system.
2. **Solar Generation:** State of art solar generation is adopted at roof top. Total generation is **1MWp** which is grid interactive.
3. **UPS System:** Visited various labs, which are having stand-alone UPS, of different make, with SMF batteries. Total UPS installed capacity is around **620-kVA**.
4. **Lightening protection system:** Presently each building is having Spike type lightning arrestors.


Authorized Signatory



VIGNESHWARA POWER CONTROLS

ANNEXURE

INSTITUTE POWER PATTERN:

- Total connected load of the institution = 1854 kw
- Transformers available in the institution = 950 KVA
- Diesel generator set capacity = 500KVA +200KVA
- Diesel consumption of the DG Set = 1920 liters for full day power shedding
- Power met through Renewable sources = 1600 kwh

ENERGY CONSERVATION OPPORTUNITIES FOR ENERGY EFFICIENCY

Recommendations for better energy efficiency:

- ✓ Based on the analysis of the power consumption data, certain steps have been recommended for improving energy
- ✓ efficiency of the campus. Complete cost analysis of implementation of recommended measures has been performed wherever necessary. Also, a number of general measures for energy efficiency have been listed.
 - Described below are some important recommendations for better energy efficiency:

1. Power savings through the usage of LEDs:

Dominant light source at most places in the campus is traditional bulbs with LED lights which consumes 20W in addition to the 40W. The campus has 3349 in total conventional bulbs and 972 LEDs. If these conventional bulbs are replaced by LEDs, 20 W power can be saved per bulb

- Total No. of conventional bulbs in Campus = 3349
- Average Power of conventional bulbs = 133.96 kW
- Average Power of electronic Ballast FTL = 40W
- Power saved per bulb = 20 W
- Total Power saving = 66.98 kW/h
- Average Use of bulbs per day = $3349 \times 9h = 30141$ h
- Average Use of bulbs per year = 10850760 h
- Total Energy saved per day = $66980 \text{ W} \times 9h = 602.82 \text{ KWh}$
- Total Energy saved per year = 217015.2 KWh
- saving in Rs. Per year = $217015.2 \times 10 = \text{Rs.} 2170152$
- Average Cost of Replacing each bulb = Rs.340
- Total Cost of Replacing all Conventional Ballast FTLs = Rs.1138660
- Capital Cost Recovery time = $(1138660) / (2170152) = 0.52 \text{ Years}$
- Hence, the capital cost recovery time for replacing all conventional Ballast FTLs of the campus is around 0.52 years.

2. Minimizing Repair Works in Fans:

During data collection, the repaired fans have been found to be consuming very high power as compared to the rated power. Fans repaired once and twice were consuming 85 W and 70 W more than the average consumption of new fans respectively. Thus, effort should be made to minimize the repairing of fans and also repair work should be Supervised properly.

3. Better Practices for AC:

The institute has in total 220 VRV cassette, 218 cassette type ACs, 115 split ACs, 16 Tower ACs, which make a very large part of total energy consumption of the campus. But, at many places it was found that AC is not used with best recommended practices. Even simple things, such as insulation. Also at certain places ACs were found to be used without keeping curtains.

These poor practices account for increase in AC load and thus consumption. Summarized below are some guidelines for most efficient use of ACs:

- **Proper Insulation** – Good quality insulation must be maintained in the air conditioned rooms by keeping all doors and windows closed properly so as to prevent cool air go out and hot air come in.
- **Curtains** – Always keep curtains on windows to prevent direct sunlight inside the room to avoid heating of cooled air. This reduces AC load significantly.
- **Maintenance** – Proper maintenance and cleaning of ACs is required at regular intervals to make it work at highest efficiency. Any dirt in filter may reduce efficiency of AC very significantly.
- **Operating** – The ACs should be switched on 15 minutes before actual use and should be switched off before leaving the room.

Suggestions based on information

1. Solar Power plant with Roof top model is proposed to install in all blocks in the campus.
2. Campus loadings are 1-phase loads mostly. So the load on 3 phase supply system is getting unbalance which causing more heating problem in Generator. While installing any new equipment, it is mandatory to follow the load balancing among the 3 phases wiring in each block.
3. LT panel board in H block switches fitting problem. It is recommended to change entire panel board.
4. Joint kit for the cable 240 sq mm, 440V in U block to be placed immediately.
5. Earth pits to be serviced with fresh rock salt and coal with high size.


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(To be filled up by Experts)

Summary Sheet

S.No.	Parameters of Evaluation	Page No.	Grade
1	Earth pits maintenance	7	B
2	Street Lights	8	B
3	Power back up :500KVA Generator Maintenance	9	B
4	Power back up : 200KVA Generator Maintenance	10	B
5	Distribution Panel Boards	11	B
6	Solar Power plant generation	12	A
7	UPS Maintenance	13	B
8	Lightning arresters in A,H & U Blocks	14	B

Grading System

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement

1. Earth Pits Maintenance

S.No.	Sub-parameter	Grade
1	Resistance value	A
2	Cleaning	B
3	Nuts & Bolts Condition	C
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement



 P. V. N. Choudhary

 Authorized Signatory

2. Street Lights

S.No.	Sub-parameter	Grade
1	Voltage profile	A
2	Earthing	A
3	Cable Statues (Damages any)	B
4	Light Working Condition	A
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 P. V. N. Chetty
 Authorized Signatory

3. Power Back up: 500KVA Generator Maintenance

S.No.	Sub-parameter	Grade
1	Generator Cleaning	B
2	Shed Cleaning	B
3	Engine oil level	A
4	Fuel tank level	A
5	Fuel leaks	B
6	Radiator condition	B
7	Battery connections	A
8	Battery voltage	A
9	Exhaust system condition	B
10	All tools availability	A
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 Authorized Signatory

4. Power Back up: 200KVA Generator Maintenance

S.No.	Sub-parameter	Grade
1	Generator Cleaning	B
2	Shed Cleaning	B
3	Engine oil level	A
4	Fuel tank level	A
5	Fuel leaks	B
6	Radiator condition	B
7	Battery connections	A
8	Battery voltage	A
9	Exhaust system condition	C
10	All tools availability	A
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 PUNJAB POWER GENERATION CORPORATION LIMITED
 Authorized Signatory

5. Distribution Panel

S.No.	Sub-parameter	Grade
1	Cleaning	A
2	Voltage	B
3	Current	B
4	MCCB condition	A
5	Bus Bar terminals	B
6	Cable terminals	B
7	Earthing	A
8	Panel Door (Closed or opened)	B
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 P. V. M. Chari
 Authorized Signatory

6. Solar Power Plant Generation

S.No.	Sub-parameter	Grade
1	MMS Tightning	A
2	Civil Foundation	A
3	Earthing	A
4	Modules Cleaning	A
5	Inverter maintenance	A
TOTAL		A

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 Authorized Signatory

7. UPS Maintenance

S.No.	Sub-parameter	Grade
1	UPS Input Voltage	A
2	Battery Bank Voltage At no Load	B
3	Battery Bank Voltage At Full Load	B
4	Earthing	A
5	UPS Condition Cable	C
6	Batteries Condition	B
7	Cable terminals(nuts&bolts)	B
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


P. V. N. Chetty
 Authorized Signatory

8. Lightning Arresters

S.No.	Sub-parameter	Grade
1	Earthing strip condition	C
2	Lightning arrester condition	C
3	Nuts&Bolts Condition	B
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


P. V. N. Chetty
 Authorized Signatory



Energy Audit Report

Academic Year : 2017-18

Name of the Department : EEE

1. Name of the Chairman : Dr. G.Srinivasa Rao

Designation : Professor & Head

Address : Department of EEE, VFSTR

2. Name of the Member : Mr. M.Subba Rao

Designation : Associate Professor

Address : Department of EEE, VFST

3. Name of the Member : Mr. Ch.Umamaheswara Rao

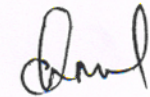
Designation : Electrical Maintenance I/c.

Address : Department of EEE, VFSTR

Signature of Audit Committee:

1. 

2. 

3. 

ENERGY SAVINGS FOR THE MONTHS(2017-2018)

S.No	MONTH	ENERGY CONSUMPTION (Kwhr)	ENERGY SAVINGS (kWhr)			% savings	TARIFF (Rs)
			Solar	LED lights	Total		
1	JULY	169458		5346	5346	3.1	53460
2	AUGUST	144609		5679	5679	3.9	56790
3	SEPTEMBER	170164		5126	5126	3	51260
4	OCTOBER	184902		5367	5367	2.9	53670
5	NOVEMBER	131958		5689	5689	4.3	56890
6	DECEMBER	78118		5812	5812	7.4	58120
7	JANUARY	118711	55891	5756	61647	51.9	616470
8	FEBRUARY	129690	55350	4935	60285	46.4	602850
9	MARCH	187436	61656	4896	66552	35.5	665520
10	APRIL	197676	58959	4956	63915	32.3	639150
11	MAY	204411	58205	5645	63850	31.2	638500
12	JUNE	180379	44952	6242	51194	28.3	511940


Electrical Maintenance I/c
 ELECTRICAL MAINTENANCE I/c
 Department of EEE
 VFSTR Deemed to be University
 VADLAMUDI - 522 213.

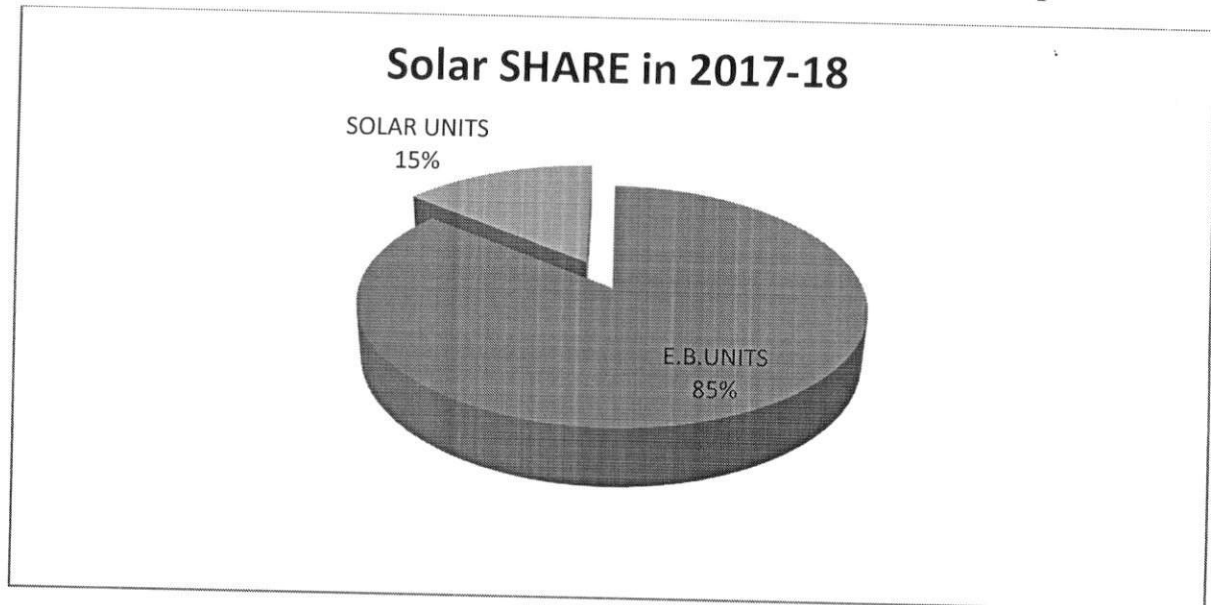
ENERGY SAVING STHROUGH RENEWABLE SOURCES (2017-2018)

S.No	Block	Total Consumption	Power generated through renewable source	Power met through renewable source	Wheeling to grid	% of savings	Operation in days
1	A-Block	642967	44409	37155	7254	6.9	6 Months
2	H-Block	459262	99420	94239	5181	15.4	6 Months
3	Pharmacy Block	275557	97620	94512	3108	15.1	6 Months
4	Boys Hostel	367409	48610	44465	4145	7.5	6 Months
5	U-BLOCK	486956	88560	83296	5264	17.3	6 Months


Electrical Maintenance I/c
ELECTRICAL MAINTENANCE I/c
Department of EEE
VFSTR Deemed to be University
VADLAMUDI - 522 213.

Analysis of Energy consumption in VFSTR

1. Solar energy contribution in campus total Energy consumption



- The modes of energy utilisation in VFSTR campus is shown in Figure. The diagram shows the VFSTR utilises 15 % of energy from 1MW solar PV plant and 85% energy from grid supply.

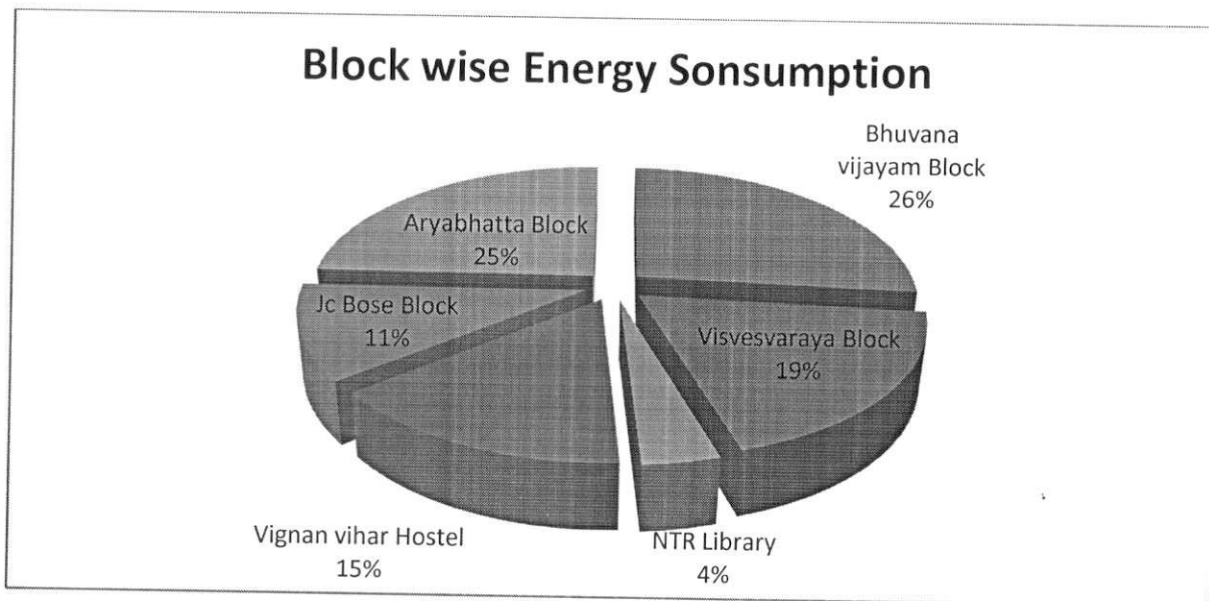

Electrical Maintenance I/c
ELECTRICAL MAINTENANCE I/c
Department of EEE
VFSTR Deemed to be University
VADLAMUDI - 522 213.

Analysis of Carbon Foot print in VFSTR campus


Parameter	Details
Solar PV plant Generated Units in a 2017-18 academic year	650797 Kwh
Cost of 1 Unit from Grid	Rs. 10 (Base price + Demand charges)
Saved Money	Rs. 6507970
Capital Investment done in 2018	Rs. 6.5
Present year saving in the capital investment	10.0%
IPCC emission factor for Indian power generation [11]	0.944 tCO ₂ /MWh
Reduced CO ₂ Emissions	$650 \text{ Mwhr} * 0.944 = 614 \text{ Tons of CO}_2$


Electrical Maintenance I/c
ELECTRICAL MAINTENANCE I/c
 Department of EEE
VFSTR Deemed to be University
 VADLAMUDI - 522 213.

Block wise energy consumption in campus



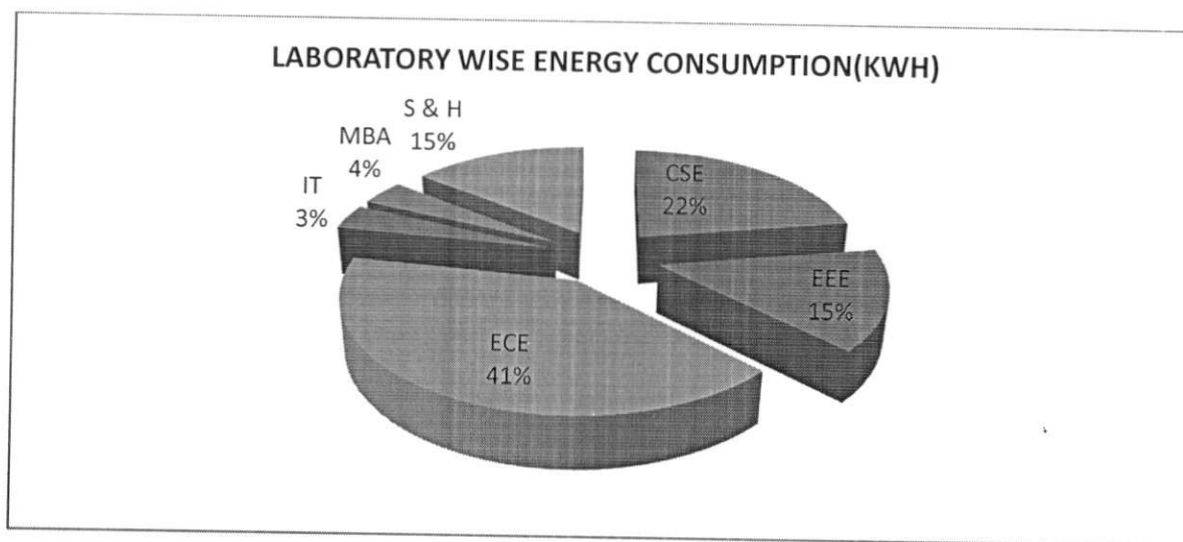
The block wise energy power consumption of the university is shown in above Fig. The total annual energy consumption of the campus is 2521323 Kwh, of which 26% is from Bhuvana vijayam Block, 19% from Visvesvaraya Block, 25 % from Aryabhata Block, 15 % from hostel, 11% from jc Bose blocl, 4% from library. The highest energy consumption is obtained from Bhuvan vijayam Block followed by different blocks in the campus


Electrical Maintenance I/c
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Department of EEE
VFSTR Deemed to be University
VADLAMUDI - 522 213.

The department's Laboratory wise energy consumption in campus

LABORATORY WISE ENERGY CONSUMPTION

S.No	Department	Type of laboratory	Total load (kW)	Running hours per day	Unit consumption per day (kWhr)
5	Computer Science and Engineering	6 computer labs	88.8	5	444
6	Electrical and Electronics	4 labs	59.2	5	296
7	Electrical and Communication	11 labs	162.8	5	814
8	Information Technology	1 lab	14.8	5	74
10	MBA	computer lab	15	5	75
11	S & H	4 labs	59.2	5	296



The department wise power consumption of the Computer Laboratory is shown in above figure. The diagram shows the ECE department consumes high energy of 41% and CSE department consumes 22% of energy on daily basis. EEE and S&H departments consume 15% each. The power consumption of the IT and MBA consume each is 3% and 4%.

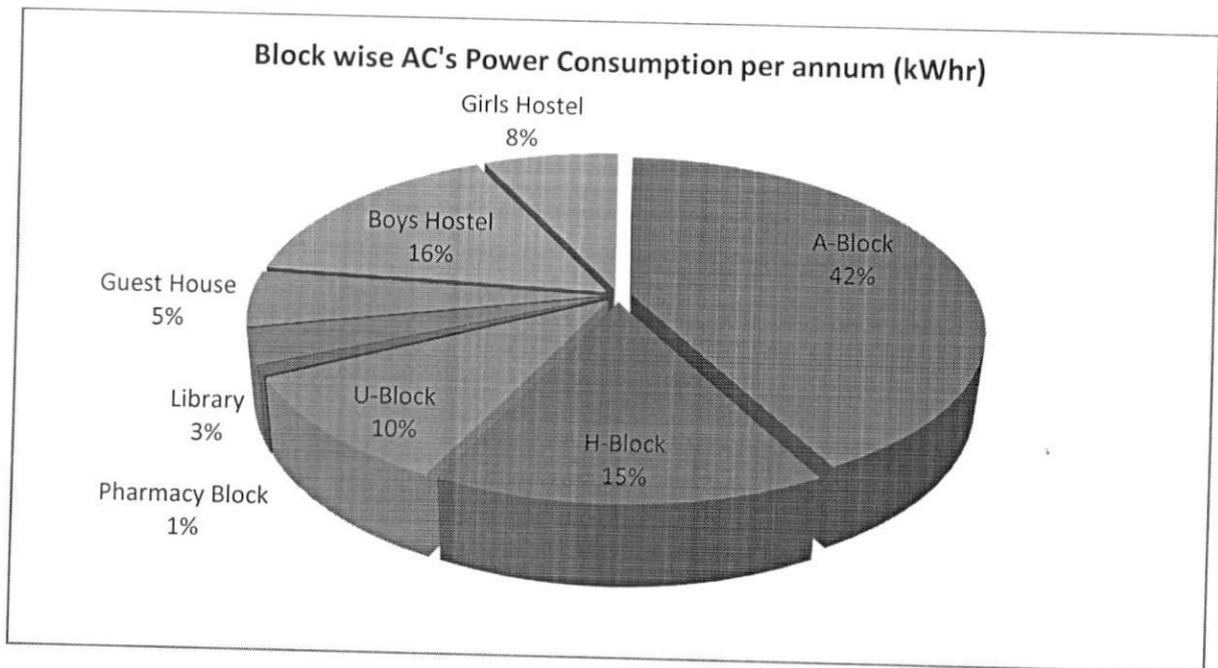

Electrical Maintenance I/c
ELECTRICAL MAINTENANCE I/c
 Department of EEE
 VFSTR Deemed to be University
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AC's consumption analysis with block wise in the campus

EQUIPMENT WISE ENERGY CONSUMPTION FOR AC's

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	air conditioner	846	63	53298
2	H-Block	air conditioner	306	63	19278
3	U-Block	air conditioner	207	63	13041
4	Pharmacy Block	air conditioner	18	63	1134
5	Library	air conditioner	60	70	4200
6	Guest House	air conditioner	97.5	70	6825
7	Boys Hostel	air conditioner	291	70	20370
8	Girls Hostel	air conditioner	135	70	9450


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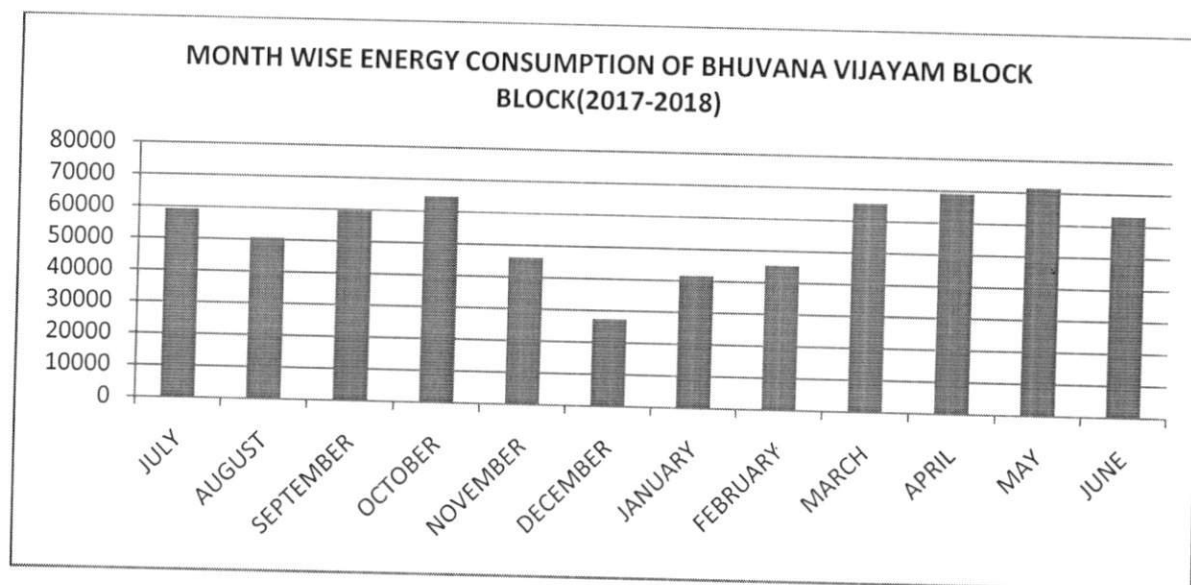
The block wise power consumption by ACs is shown in above figure. 42 % of energy consumption is from A-Block, 15% of energy consumption is from H-Block, 10% of energy consumption is from U-Block, 1% of energy consumption is from pharmacy block, 16% of energy consumption is from boy's hostels, 8% of energy consumption is from Girls hostel, 5% of energy consumption is from guest house, 3% of energy consumption is from library. The highest energy consumption is obtained in A-Block followed by different blocks in the campus.


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Analysis of energy consumption in Bhuvana Vijayam block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN BHUVANA VIJAYAM BLOCK(2017-2018)

S.No	MONTH	Bhuvana vijayam Block(unit consumption)	Cost	Tariff
1	JULY	59310	453723.7	593100
2	AUGUST	50613	387190.5	506130
3	SEPTEMBER	59557	455614.1	595570
4	OCTOBER	64715	495075.1	647150
5	NOVEMBER	46185	353317.5	461850
6	DECEMBER	27341	209160.9	273410
7	JANUARY	41548	317848.7	415480
8	FEBRUARY	45391	347244.9	453910
9	MARCH	65602	501859.8	656020
10	APRIL	69186	529277.4	691860
11	MAY	71545	547310.4	715450
12	JUNE	63132	482964.7	631320



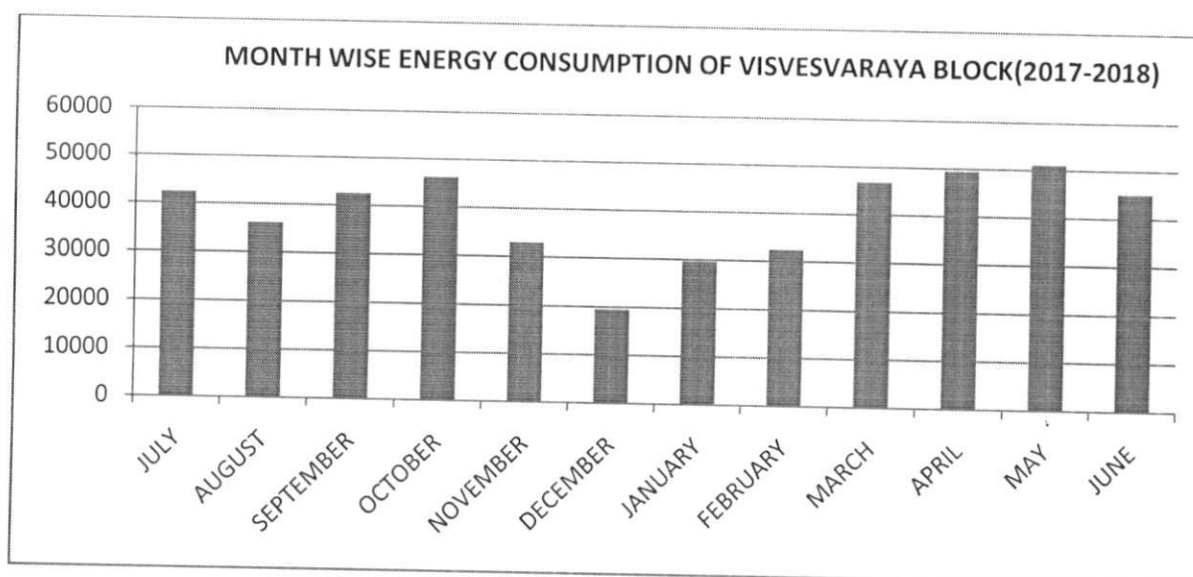
The monthly wise power consumption of the BHUVANA VIJAYAM BLOCK for the duration of 2017-2018 is shown in Figure. The total annual energy consumption during 2017-18 is 664125 Kwh or units. Peak consumption is observed in the month of May with 71545 units. The average monthly consumption for BHUVANA VIJAYAM BLOCK recorded is 55343 units.

[Signature]
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 Department of EEE

Analysis of energy consumption in VISVESVARAYA block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN VISVESVARAYA BLOCK(2017-2018)

S.No	MONTH	Visvesvaraya Block(unit consumption)	Cost	Tariff
1	JULY	42364	324088.4	423640
2	AUGUST	36152	276564.7	361520
3	SEPTEMBER	42541	325438.6	425410
4	OCTOBER	46225	353625	462250
5	NOVEMBER	32989	252369.6	329890
6	DECEMBER	19529	149400.6	195290
7	JANUARY	29677	227034.7	296770
8	FEBRUARY	32422	248032.1	324220
9	MARCH	46859	358471.3	468590
10	APRIL	49419	378055.3	494190
11	MAY	51102	390936	511020
12	JUNE	45094	344974.8	450940



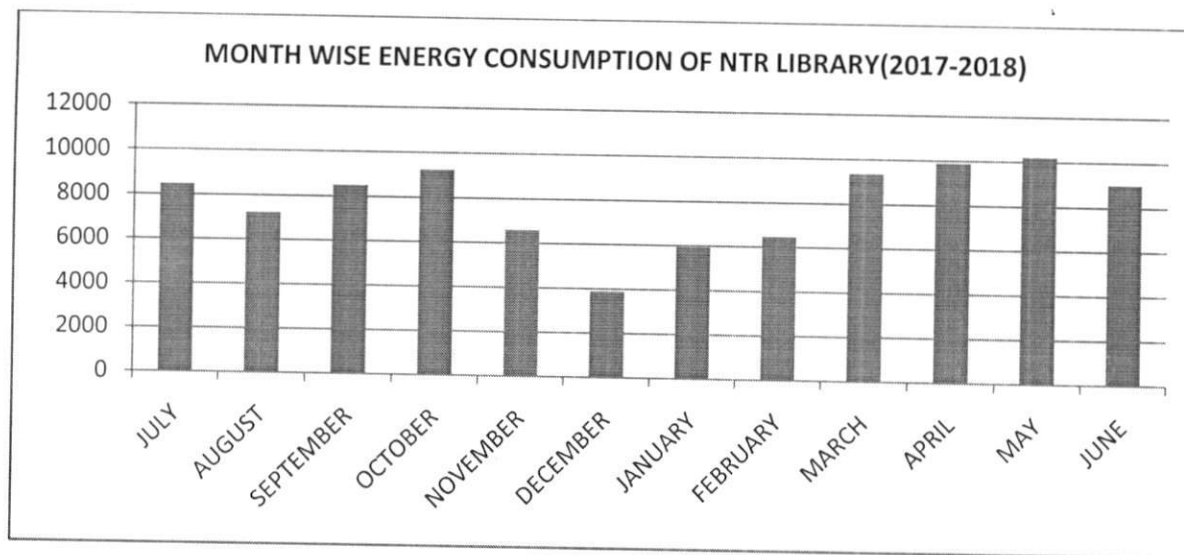
The monthly wise power consumption of the VISVESVARAYA BLOCK for the duration of 2017-2018 is shown in Figure. The total annual energy consumption during 2017-18 is 474373 Kwh or units. Peak consumption is observed in the month of May with 51102 units. The average monthly consumption for VISVESVARAYA BLOCK recorded is 39531 units.


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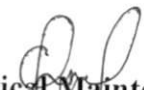
Analysis of energy consumption in NTR LIBRARY on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN NTR LIBRARY (2017-2018)

S.No	MONTH	NTR Library(unit consumption)	Cost	Tariff
1	JULY	8472	64817.6	84720
2	AUGUST	7230	55312.9	72300
3	SEPTEMBER	8508	65087.7	85080
4	OCTOBER	9245	70725	92450
5	NOVEMBER	6597	50473.9	65970
6	DECEMBER	3905	29880.1	39050
7	JANUARY	5935	45406.9	59350
8	FEBRUARY	6484	49606.4	64840
9	MARCH	9371	71694.2	93710
10	APRIL	9883	75611	98830
11	MAY	10220	78187.2	102200
12	JUNE	9018	68994.9	90180



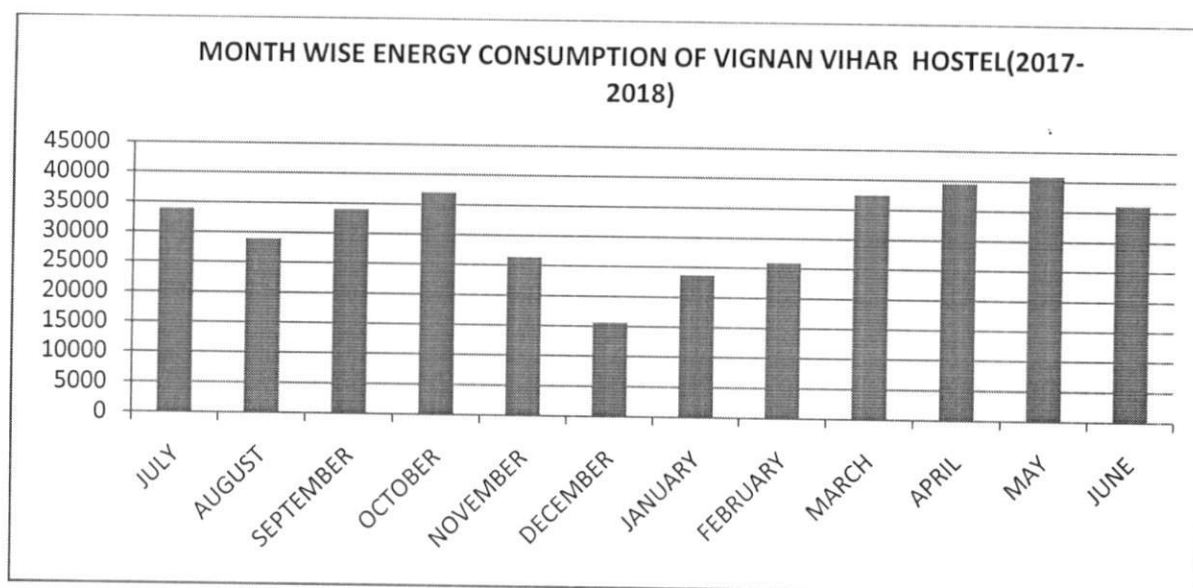
The monthly wise power consumption of the NTR LIBRARY for the duration of 2017-2018 is shown in Figure. The total annual energy consumption during 2017-18 is 10220 Kwh or units. Peak consumption is observed in the month of May with 14467 units. The average monthly consumption for NTR LIBRARY recorded is 7905 units.


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Analysis of energy consumption in VIGNAN VIHAR HOSTEL on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN VIGNAN VIHAR HOSTEL(2017-2018)

S.No	MONTH	Vignan vihar Hostel(unit consumption)	Cost	Tariff
1	JULY	33891	259270.7	338910
2	AUGUST	28921	221251.7	289210
3	SEPTEMBER	34032	260350.9	340320
4	OCTOBER	36980	282900	369800
5	NOVEMBER	26391	201895.7	263910
6	DECEMBER	15623	119520.5	156230
7	JANUARY	23742	181627.8	237420
8	FEBRUARY	25938	198425.7	259380
9	MARCH	37487	286777	374870
10	APRIL	39535	302444.2	395350
11	MAY	40882	312748.8	408820
12	JUNE	36075	275979.8	360750



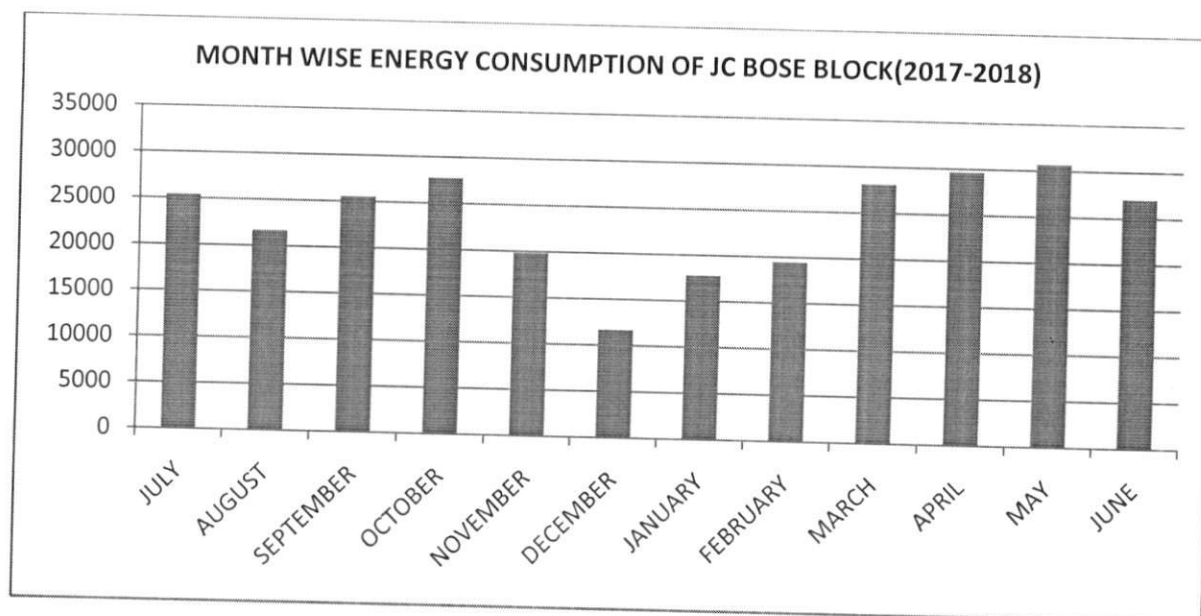
The monthly wise power consumption of the VIGNAN VIHAR HOSTEL for the duration of 2017-2018 is shown in Figure. The total annual energy consumption during 2017-18 is 379497 Kwh or units. Peak consumption is observed in the month of May with 40882 units. The average monthly consumption for VIGNAN VIHAR HOSTEL recorded is 31624units.


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Analysis of energy consumption in JC BOSE block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN JC BOSE BLOCK (2017-2018)

S.No	MONTH	Jc Bose Block(unit consumption)	Cost	Tariff
1	JULY	25418	194453	254180
2	AUGUST	21691	165938.8	216910
3	SEPTEMBER	25524	195263.1	255240
4	OCTOBER	27735	212175	277350
5	NOVEMBER	19793	151421.8	197930
6	DECEMBER	11717	89640.4	117170
7	JANUARY	17806	136220.8	178060
8	FEBRUARY	19453	148819.2	194530
9	MARCH	28115	215082.8	281150
10	APRIL	29651	226833.2	296510
11	MAY	30661	234561.6	306610
12	JUNE	27056	206984	270560



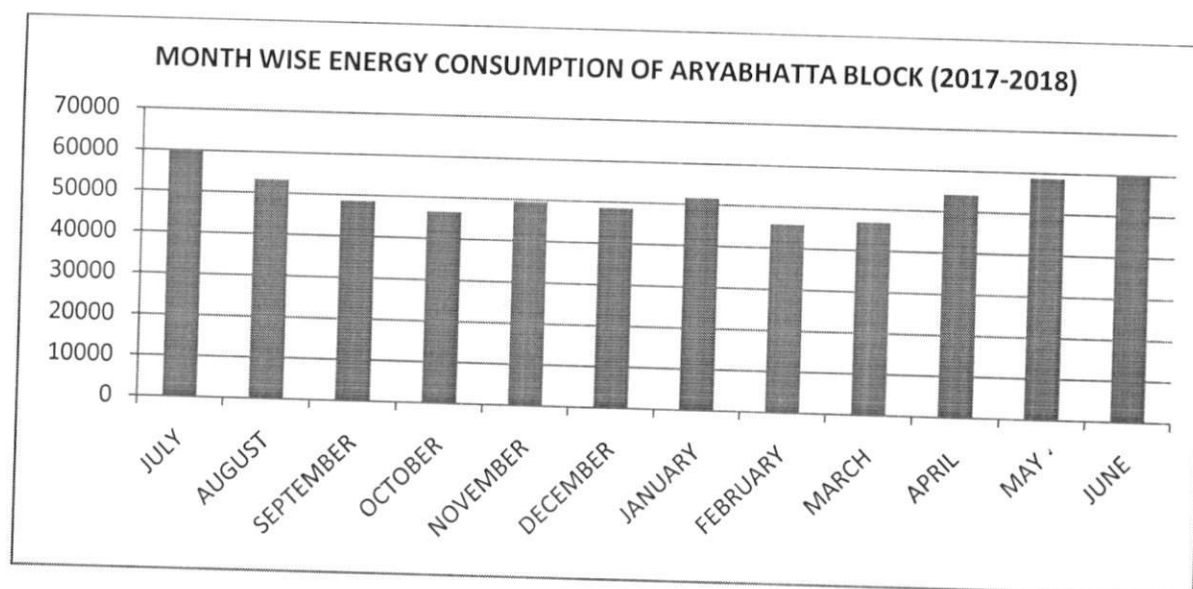
The monthly wise power consumption of the JC BOSE BLOCK for the duration of 2017-2018 is shown in Figure. The total annual energy consumption during 2017-18 is 284620 Kwh or units. Peak consumption is observed in the month of MAY with 30661 units. The average monthly consumption for JC BOSE BLOCK recorded is 23718 units.


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Analysis of energy consumption in ARYABHATTA block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN ARYABHATTA BLOCK(2017-2018)

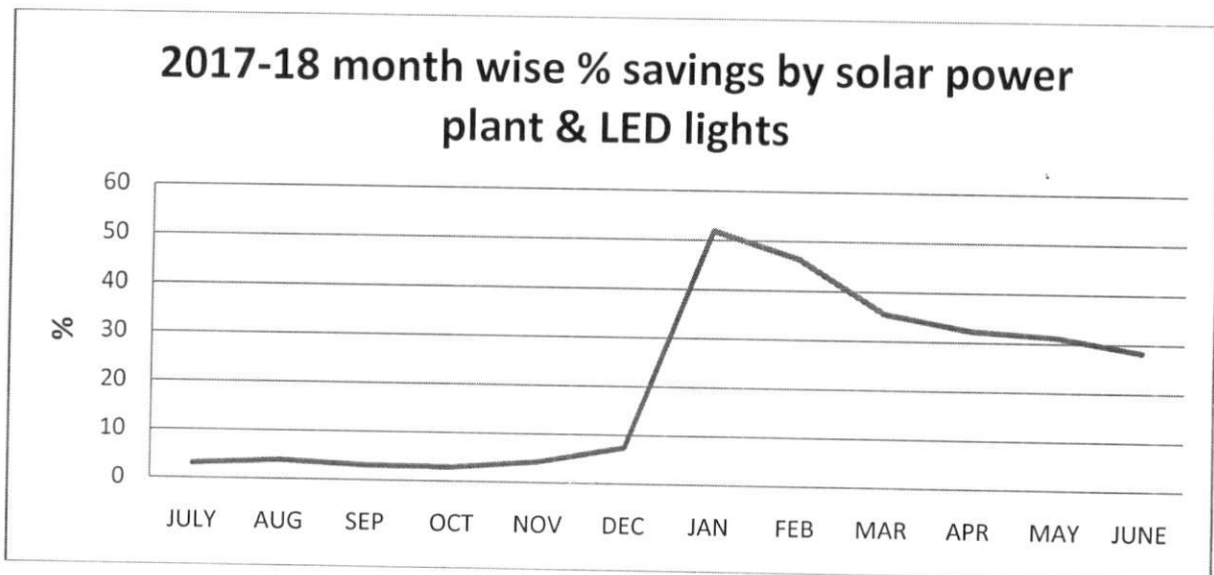
S.No	MONTH	ARYABHATTA Block(unit consumption)	Cost	Tariff
1	JULY	59856	458496.96	598560
2	AUGUST	53256	407940.96	532560
3	SEPTEMBER	48596	372245.36	485960
4	OCTOBER	46581	356810.46	465810
5	NOVEMBER	49568	379690.88	495680
6	DECEMBER	48598	372260.68	485980
7	JANUARY	51578	395087.48	515780
8	FEBRUARY	45862	351302.92	458620
9	MARCH	46859	358939.94	468590
10	APRIL	54152	414804.32	541520
11	MAY	58689	449557.74	586890
12	JUNE	60245	461476.7	602450



The monthly wise power consumption of the JC BOSE BLOCK for the duration of 2017-2018 is shown in Figure. The total annual energy consumption during 2017-18 is 623840 Kwh or units. Peak consumption is observed in the month of June with 60245 units. The average monthly consumption for JC BOSE BLOCK recorded is 51986 units.

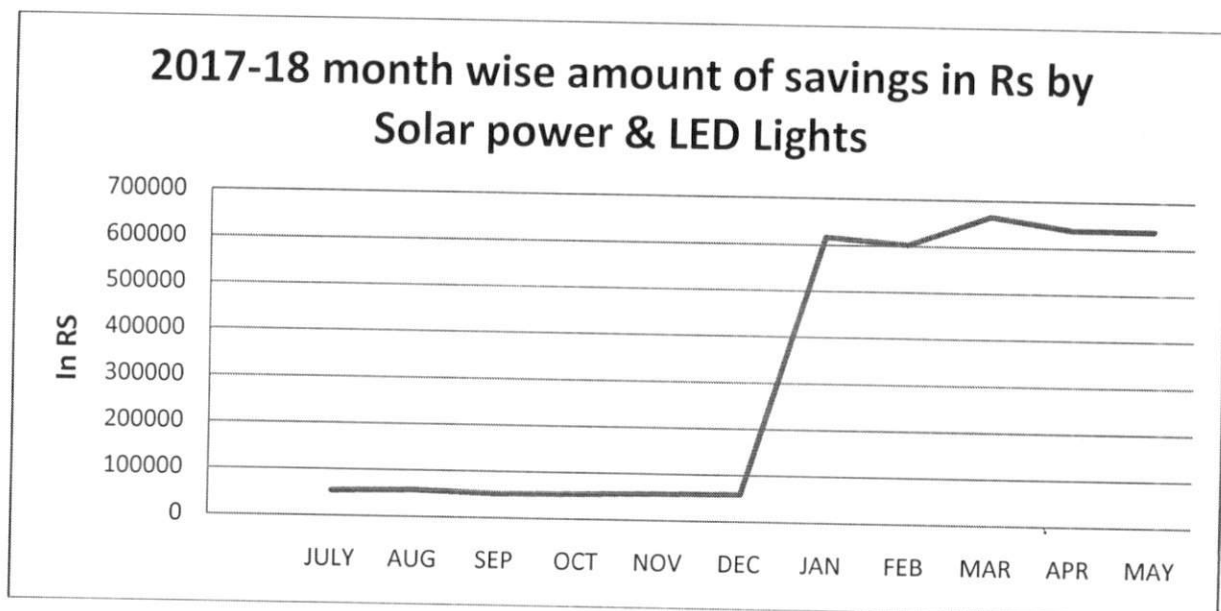

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Analysis of month energy savings by SOLAR Plant & LED Lights



Month wise saving % in the campus for the duration of 2017-2018 is shown in Figure. The total savings

Of annual energy is 400462 Kwh or units. It is observed that the % savings improvement up to 51.9 % in the month of January.




Month wise saving in Rupees our campus for the duration of 2017-2018 is shown in Figure. The total amount savings is Rs 4004620.


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EQUIPMENT WISE ENERGY CONSUMPTION FOR COMPUTERS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW/hr)
1	A-Block	computers	159.1	63	10023
2	H-Block	computers	195.7	63	12332
3	U-Block	computers	43.1	63	2718
4	Pharmacy Block	computers	94.5	63	5953
5	Library	computers	3.7	70	263


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EQUIPMENT WISE ENERGY CONSUMPTION FOR LIGHTS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Lights	10.8	63	684
2	H-Block	Lights	28.2	63	1778
3	U-Block	Lights	41.7	63	2630
4	Pharmacy Block	Lights	7.08	63	446
5	Library	Lights	4	70	280
6	Guest House	Lights	8.8	77	677
7	Boys Hostel	Lights	18.4	77	1419
8	Girls Hostel	Lights	13.6	77	1051
9	Canteen	Lights	0.6	70	42


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EQUIPMENT WISE ENERGY CONSUMPTION FOR FANS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Fans	28.7	63	1809
2	H-Block	Fans	35	63	2205
3	U-Block	Fans	28.4	63	1794
4	Pharmacy Block	Fans	23.6	63	1491
5	Library	Fans	4.4	70	312
6	Guest House	Fans	1.7	77	135
7	Boys Hostel	Fans	30.6	77	2356
8	Girls Hostel	Fans	3.9	77	306
9	Canteen	Fans	0.4	70	28


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EQUIPMENT WISE ENERGY CONSUMPTION FOR LAB & OTHER EQUIPMENT

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Lab Equipments & Others	22.2	63	1401
2	H-Block	Lab Equipments & Others	31.2	63	1967
3	U-Block	Lab Equipments & Others	143.9	63	9069
4	Pharmacy Block	Lab Equipments & Others	1.2	63	80
5	Library	Lab Equipments & Others	4	70	280
6	Guest House	Lab Equipments & Others	2.8	70	201
7	Boys Hostel	Lab Equipments & Others	3.6	77	283
8	Girls Hostel	Lab Equipments & Others	4.8	77	369
9	Canteen	Lab Equipments & Others	4.6	70	322


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EQUIPMENT WISE ENERGY CONSUMPTION FOR PRINTER

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	printer	8.3	63	523
2	H-Block	printer	4.4	63	282
3	U-Block	printer	6.5	63	414
4	Pharmacy Block	printer	0.63	63	39
5	Library	printer	0.63	70	44
6	Guest House	printer	0.63	77	48
7	Boys Hostel	printer	0.63	77	48
8	Girls Hostel	printer	0.63	77	48


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EQUIPMENT WISE ENERGY CONSUMPTION FOR REFRIGERATOR&PUMPS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Refrigerators & Water Pumps	14.52	168	2439
2	H-Block	Refrigerators & Water Pumps	20.1	168	3385
3	U-Block	Refrigerators & Water Pumps	3.2	168	538
5	Library	Refrigerators & Water Pumps	1.4	168	241
6	Guest House	Refrigerators & Water Pumps	4.6	168	786
7	Boys Hostel	Refrigerators & Water Pumps	32.2	168	5412
8	Girls Hostel	Refrigerators & Water Pumps	2.6	168	436
9	Canteen	Refrigerators & Water Pumps	2.6	168	436


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EQUIPMENT WISE ENERGY CONSUMPTION LCD PROJECTOR

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	LCD projectors	7.1	42	299
2	H-Block	LCD projectors	6.6	42	278
3	U-Block	LCD projectors	7.6	42	320
4	Pharmacy Block	LCD projectors	2.8	42	118
5	Library	LCD projectors	0.4	42	20


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EQUIPMENT WISE ENERGY CONSUMPTION FOR XEROX MACHINE

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	Xerox Machines	1.26	70	88
2	H-Block	Xerox Machines	0.63	70	44
3	U-Block	Xerox Machines	0.63	70	44
4	Pharmacy Block	Xerox Machines	0.63	70	44
5	Boys Hostel	Xerox Machines	0.63	70	44
6	Girls Hostel	Xerox Machines	0.63	70	44


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ENERGY AUDIT
(2016-2017)



VIGNAN'S
Foundation for Science, Technology & Research
UNIVERSITY
(Estd u/s 3 of UGC Act of 1956)

(ACCREDITED BY NAAC WITH 'A' GRADE)

Date: 27-04-2017

To
P.V.N. Chari
Vigneswara Power Controls,
Flat: 2, Sri Sai Nilayam, Nagaluru,
Guntur, Andhra Pradesh.
522034.

Respected Sir,

Sub: Request to conduct Energy Audit & Safety Audit of Vignan's Foundation for Science, Technology & Research (Deemed to be University) ---- Reg.

-oOo-

It is to inform you that, **Vignan's Foundation for Science, Technology & Research (Deemed to be University)** organization is planned to conduct energy audit by external agency with external experts along with our internal audit committee members. So we are inviting you to conduct energy audit in our VFSTR University (Deemed to be) from 22/5/2017 to 23/5/2017. Please give your concern to conduct energy audit in our campus.

Waiting for your response

Head of the Department (EEE),
VFSTR University,
Vadlamudi, Guntur, AP

GSTNO: 37AMGPN6552J1ZM

Cell: 9441316830, 7989367414

E-mail: charipvn@gmail.com

VIGNESWARA POWER CONTROLS

Door No: 133-5-808 ,Flat N o. 2, Sri Sai Nilayam, Near ID Hospital Nagaralu, G UNTUR -522034



Date: 01.05.2017

F.NO: VRPC/EA/16-17/33/08

To,
Head of the Department
Department of EEE
VFSTR university,
Vadlamudi, Guntur, A.P.

Respected Sir,

Sub: Energy Audit conduction – Reg.

We convey sincere thanks to choose us to conduct energy audit.

We inform you that we are accepting your request to conduct Energy audit in your campus. With this regard our experts will visit from 22/5/17 to 23/5/17 your campus. The payment for whole process of auditing is 30,000/-. The payment can be done after submission of audit report.

For Vigneshwara power controls

P. V. N. Chay
Authorized Signatory

Transformer, HT/LT Motors, Breakers & Protection Relays Testing & Commissioning



SIEMENS



Schneider
Electric



VIGNAN'S
Foundation for Science, Technology & Research
UNIVERSITY
(Estd u/s 3 of UGC Act of 1956)

(ACCREDITED BY NAAC WITH 'A' GRADE)

Date: 05-05-2017


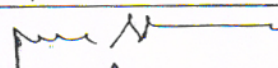
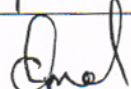
To
P.V.N.Chari
Vigneswara Power Controls,
Flat: 2, Sri Sai Nilayam, Nagaluru,
Guntur, Andhra Pradesh.
522034.

Respected Sir,

Sub: Confirmation to conduct Energy Audit of Vignan's Foundation for Science, Technology & Research (Deemed to be University) ---- Reg.

-oOo-

In connection with our previous communication regarding Energy Audit in Vignan's Foundation for Science, Technology & Research (Deemed to be University), we are agreeing to pay the remuneration of 30,000/-. The following internal Audit committee members will involve in the energy audit from 22/5/2017 to 23/5/2017

S.No	Name of the faculty	Designation	Signature
1	Dr.G.Srinivasa Rao	Associate Professor, EEE	
2	Mr.P.V.S.Sobhan	Associate Professor, EEE	
3	Mr .Ch. Umamaheswara Rao	Electrical Maintenance Incharge	

Thanking you,



Head of the Department (EEE),
VFSTR University,
Vadlamudi, Guntur, AP,

GSTNO: 37AMGPN6552J1ZM

Cell: 9441316830, 7989367414

E-mail: charipvn@gmail.com



VIGNESWARA POWER CONTROLS

Door No: 133-5-808 ,Flat N o. 2, Sri Sai Nilayam, Near ID Hospital Nagaralu, G UNTUR -522034

Date: 10.06.2017


To
Head of the Department
Department of EEE
VFSTR university,
Vadlamudi, Guntur, A.P.

Respected Sir,

Sub: Submission of Final Report on 'Energy Audit' – Reg.

Energy Audit of Vignan's Foundation for Science, Technology and Research (Deemed to be University) is conducted and the report is attached. Refer the following pages of report of Energy Audit for 2016-17 duration of your campus. Feel free to contact us for any clarifications on this subject.

For Vigneshwara power controls


Authorized Signatory

Transformer, HT/LT Motors, Breakers & Protection Relays Testing & Commissioning



SIEMENS



Schneider
Electric

PROCEEDINGS OF THE REGISTRAR

F.No.:VFSTR/RO/A4/30/2016-17/07

Dt: 15.04.2017

Sub: VFSTR – Sanction of amount for Energy audit– amount – sanctioned – orders – Issued.

Read: Letter dated 14.04.2017 of Dr. G. Srinivasa rao, HOD of EEE.

* * *

ORDER

With reference to the letter read above, sanction is hereby accorded for the payment of Rs.30,000/-(Rupees Thirty thousand only) to Mr. P.V.N. Chari (Vigneswara Power Controls),Guntur towards remuneration to Conduction of Energy audit.

The above budget sanctioned amount is debit to the budget available under Major head: Staff Payments & Benefits (200) and Minor head: honorarium (212) for the Financial Year 2016-17.

To:
The Finance Officer,
HOD, EEE,
The Electrical Maintenance Incharge

Copy to:
PA to the Vice Chancellor
Master file



Registrar
VIGNAN'S FOUNDATION
FOR SCIENCE, TECHNOLOGY AND RESEARCH
(Declared to be Deemed University U/S 3 of UGC Act 1956)
VADLAMUDI-622 213.
A.P. INDIA

Energy Audit and Safety Audit Report

Visited the following areas in your campus:

1. 11 kV Substation at two different locations each having 1 No. Step down Transformer (11 kV / 433 volts)
 - a. 950 kVA Transformer presently Supporting following buildings: A – Block / H – Block / Hostels – Blocks / Pharmacy & Library.
 - b. The Backup power is supported by 1 x 500 kVA DG set (Kirloskar Green)
 - c. Supported by 1 x 200 kVA DG set (Cummins)
 - d. Earthing systems are normal, as per IS -3043
 - e. APFC panel, 1 x 100 kVAr is functional, which is connected to 950 kVA system.
2. **UPS System:** Visited various labs, which are having stand-alone UPS, of different make, with SMF batteries. Total UPS installed capacity is around 350-kVA.
3. **Lightening protection system:** Presently each building is having Spike type lightning arrestors.


Authorized Signatory

VIGNESHWARA POWER CONTROLS

ANNEXURE

INSTITUTE POWER PATTERN:

- Total connected load of the institution = 1709 kw
- Transformers available in the institution = 950 KVA
- Diesel generator set capacity = 500KVA +200 KVA
- Diesel consumption of the DG Set = 1920 liters for full day power shedding

ENERGY CONSERVATION OPPORTUNITIES FOR ENERGY EFFICIENCY

Recommendations for better energy efficiency:

- ✓ Based on the analysis of the power consumption data, certain steps have been recommended for improving energy
- ✓ efficiency of the campus. Complete cost analysis of implementation of recommended measures has been performed wherever necessary. Also, a number of general measures for energy efficiency have been listed.
 - Described below are some important recommendations for better energy efficiency:

1. Power savings through the usage of LEDs:

Dominant light source at most places in the campus is traditional bulbs with LED lights which consumes 20W in addition to the 40W. The campus has 3409 in total conventional bulbs and 912 LEDs. If these conventional bulbs are replaced by LEDs, 20 W power can be saved per bulb

- Total No. of conventional bulbs in Campus = 3409
- Average Power of conventional bulbs = 136.36kW
- Average Power of electronic Ballast FTL = 40W
- Power saved per bulb = 20 W
- Total Power saving = 68.18 kW/h
- Average Use of bulbs per day = 3409X9h=30861 h
- Average Use of bulbs per year = 11109960 h
- Total Energy saved per day = 68180 WX9h = 613.62 KWh
- Total Energy saved per year = 220903.2 KWh
- saving in Rs. Per year = 220903.2x10 = Rs. 2209032
- Average Cost of Replacing each bulb = Rs.340
- Total Cost of Replacing all Conventional Ballast FTLs = Rs.1159060
- Capital Cost Recovery time = (1159060)/ (2209032) = 0.52 Years
- Hence, the capital cost recovery time for replacing all conventional Ballast FTLs of the campus is around 0.50 years.

2. Minimizing Repair Works in Fans:

During data collection, the repaired fans have been found to be consuming very high power as compared to the rated power. Fans repaired once and twice were consuming 85 W and 70 W more than the average consumption of new fans respectively. Thus, effort should be made to minimize the repairing of fans and also repair work should be supervised properly.

3. Better Practices for AC:

The institute has in total 146 VRV cassette, 218 cassette type ACs, 106 split ACs, 14 Tower ACs, which make a very large part of total energy consumption of the campus. But, at many places it was found that AC is not used with best recommended practices. Even simple things, such as insulation. Also at certain places ACs were found to be used without keeping curtains.

These poor practices account for increase in AC load and thus consumption.

Summarized below are some guidelines for most efficient use of ACs:

- **Proper Insulation** – Good quality insulation must be maintained in the air conditioned rooms by keeping all doors and windows closed properly so as to prevent cool air go out and hot air come in.
- **Curtains** – Always keep curtains on windows to prevent direct sunlight inside the room to avoid heating of cooled air. This reduces AC load significantly.
- **Maintenance** – Proper maintenance and cleaning of ACs is required at regular intervals to make it work at highest efficiency. Any dirt in filter may reduce efficiency of AC very significantly.
- **Operating** – The ACs should be switched on 15 minutes before actual use and should be switched off before leaving the r

Suggestions based on information

1. 2.5 Sqmm Copper conductor is laid for the earthing purpose for some earth pits in U-Block. It is strictly recommend to use the copper strip with following details:

10 Gauge copper strip, 0.5 mm thickness.

2. 32Sqmm cable is laid for the street lights in campus and it is needed to make underground cable model with separate trench.

3. LOP (Low oil pressure) sensor is in bypass condition due to non working and it is to be replaced in 500KVA generator.

4. Fuel level guage in 200KVA generator is not working and it is compulsory to replace with new sensor.

5. LT panel board in power house behind A-block condition is good. The ACB service is needed to give better switching. It is giving problem while tripping and Switching ON.


P. V. Chetty
Authorized Signatory

(To be filled up by Experts)

Summary Sheet

S.No.	Parameters of Evaluation	Page No.	Grade
1	Earth pits maintenance	7	B
2	Street Lights	8	B
3	Power back up :500KVA Generator Maintenance	9	B
4	Power back up : 200KVA Generator Maintenance	10	B
5	Distribution Panel Boards	11	B
6	UPS Maintenance	12	B
7	Lightning arresters in A,H & U Blocks	13	C

Grading System

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement

1. Earth Pits Maintenance

S.No.	Sub-parameter	Grade
1	Resistance value	B
2	Cleaning	B
3	Nuts & Bolts Condition	B
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


P. V. N. Chetty
 Authorized Signatory

2. Street Lights

S.No.	Sub-parameter	Grade
1	Voltage profile	B
2	Earthing	B
3	Cable Statues (Damages any)	C
4	Light Working Condition	B
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 Authorized Signatory

3. Power Back up: 500KVA Generator Maintenance

S.No.	Sub-parameter	Grade
1	Generator Cleaning	B
2	Shed Cleaning	B
3	Engine oil level	C
4	Fuel tank level	B
5	Fuel leaks	B
6	Radiator condition	B
7	Battery connections	C
8	Battery voltage	C
9	Exhaust system condition	C
10	All tools availability	C
Total		B


Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


P. V. Chandra
 Authorized Signatory

4. Power Back up: 200KVA Generator Maintenance

S.No.	Sub-parameter	Grade
1	Generator Cleaning	B
2	Shed Cleaning	C
3	Engine oil level	C
4	Fuel tank level	A
5	Fuel leaks	B
6	Radiator condition	B
7	Battery connections	C
8	Battery voltage	B
9	Exhaust system condition	C
10	All tools availability	B
Total		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 P. V. N. Chait
 Authorized Signatory

5. Distribution Panel

S.No.	Sub-parameter	Grade
1	Cleaning	B
2	Voltage	C
3	Current	B
4	MCCB condition	B
5	Bus Bar terminals	B
6	Cable terminals	C
7	Earthing	B
8	Panel Door (Closed or opened)	B
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 P. V. N. Chai
 Authorized Signatory

6. UPS Maintenance

S.No.	Sub-parameter	Grade
1	UPS Input Voltage	B
2	Battery Bank Voltage At no Load	C
3	Battery Bank Voltage At Full Load	C
4	Earthing	B
5	UPS Cable	B
6	Batteries Condition	B
7	Cable terminals(nuts&bolts)	B
Total		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


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7. Lightning Arresters

S.No.	Sub-parameter	Grade
1	Earthing strip condition	C
2	Lightning arrester condition	C
3	Nuts&Bolts Condition	C
Total		C

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


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VIGNAN'S
Foundation for Science, Technology & Research
UNIVERSITY
(Estd u/s 3 of UGC Act of 1956)

Energy Audit Report

Academic Year : 2016-17

Name of the Department : EEE

2. Name of the Chairman : Dr. G.Srinivasa Rao

Designation : Associate Professor & Head

Address : Department of EEE, VFSTR

3. Name of the Member : Mr. P.V.S.Sobhan

Designation : Associate Professor

Address : Department of EEE, VFSTR

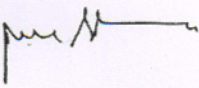
4. Name of the Member : Mr. Ch.Umamaheswara Rao

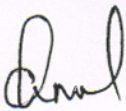
Designation : Electrical Maintenance I/c.

Address : Department of EEE, VFSTR

Signature of Audit Committee:


1. 

2. 

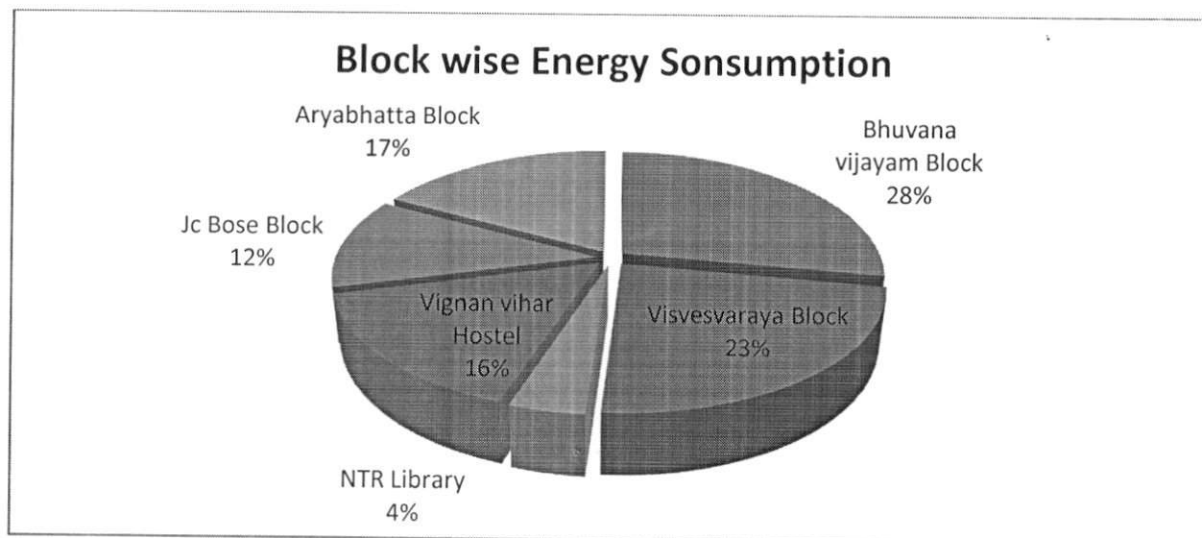
3. 

ENERGY SAVINGS FOR THE MONTHS(2016-2017)

S.No	MONTH	ENERGY CONSUMPTION (Kwhr)	ENERGY SAVINGS (kWhr)			TARIFF (Rs)
			LED lights	Total	% savings	
1	JULY	142914	3865	3865	2.7	38650
2	AUGUST	108972	4268	4268	3.9	42680
3	SEPTEMBER	150168	4698	4698	3.1	46980
4	OCTOBER	143442	3589	3589	2.5	35890
5	NOVEMBER	121206	3485	3485	2.8	34850
6	DECEMBER	96714	3458	3458	3.5	34580
7	JANUARY	97386	4259	4259	4.3	42590
8	FEBRUARY	101850	4628	4628	4.5	46280
9	MARCH	171240	3865	3865	2.2	38650
10	APRIL	175794	4152	4152	2.3	41520
11	MAY	188262	4356	4356	2.3	43560
12	JUNE	119916	5860	5860	4.8	58560


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Block wise energy consumption in campus



The block wise energy consumption of the university is shown in above Fig. The total annual energy consumption of the campus is 2048046 Kwh, of which 28% is from Bhuvana vijayam Block, 23% from Visvesvaraya Block, 17 % from Aryabhata Block, 16 % from hostel, 12% from jc Bose blocl, 4% from library. The highest energy consumption is obtained from Bhuvan vijayam Block followed by different blocks in the campus.

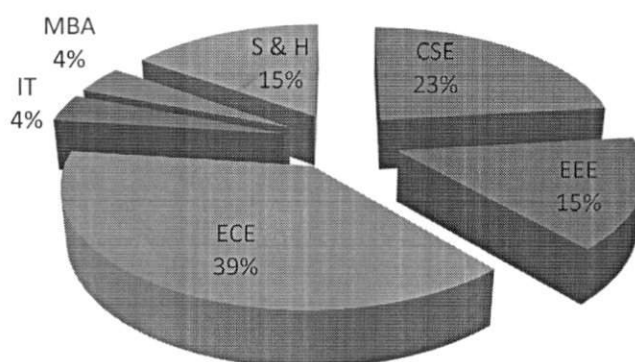

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The department's Laboratory wise energy consumption in campus

LABORATORY WISE ENERGY CONSUMPTION

S.No	Department	Type of laboratory	Total load (kW)	Running hours per day	Unit consumption per day (kWhr)
5	Computer Science and Engineering	6 computer labs	88.8	5	444
6	Electrical and Electronics	4 labs	59.2	5	296
7	Electrical and Communication	10 labs	148	5	740
8	Information Technology	1 lab	14.8	5	74
10	MBA	computer lab	15	5	75
11	S & H	4 labs	59.2	5	296

LABORATORY WISE ENERGY CONSUMPTION(KWH)



The department wise power consumption of the Computer Laboratory is shown in above figure. The diagram shows the ECE department consumes high energy of 39% and CSE department consumes 23% of energy on daily basis. EEE and S&H departments consume 15% each. The power consumption of the IT and MBA consume each is 4%.

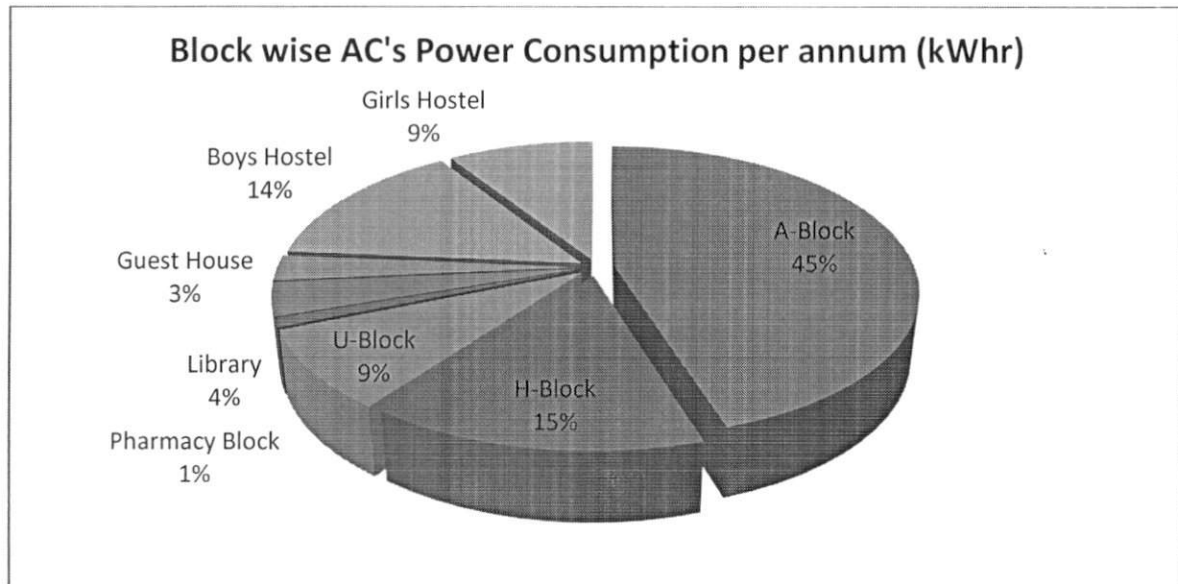

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AC's consumption analysis with block wise in the campus

EQUIPMENT WISE ENERGY CONSUMPTION FOR AC's

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	air conditioner	697.5	63	43942
2	H-Block	air conditioner	234	63	14742
3	U-Block	air conditioner	135	63	8505
4	Pharmacy Block	air conditioner	15	63	945
5	Library	air conditioner	60	60	3600
6	Guest House	air conditioner	97.5	28	2730
7	Boys Hostel	air conditioner	201	70	14070
8	Girls Hostel	air conditioner	129	70	9030


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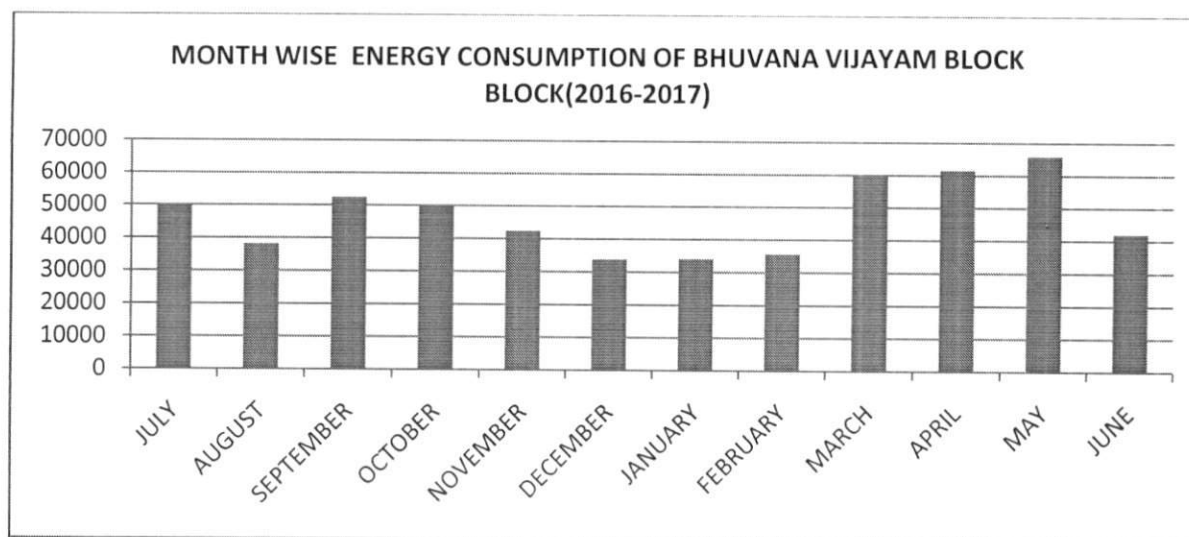
The block wise power consumption by ACs is shown in above figure. 45 % of energy consumption is from A-Block, 15% of energy consumption is from H-Block, 9 % of energy consumption is from U-Block, 1% of energy consumption is from pharmacy block, 14% of energy consumption is from boy's hostels, 9% of energy consumption is from Girls hostel, 3% of energy consumption is from guest house, 4% of energy consumption is from library. The highest energy consumption is obtained in A-Block followed by different blocks in the campus.


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Analysis of energy consumption in Bhuvana Vijayam block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN BHUVANA VIJAYAM BLOCK(2016-2017)

S.No	MONTH	Bhuvana vijayam Block(unit consumption)	Cost	Tariff
1	JULY	50019	382645.3	500190
2	AUGUST	38140	291771	381400
3	SEPTEMBER	52558	402068.7	525580
4	OCTOBER	50204	384060.6	502040
5	NOVEMBER	42422	324528.3	424220
6	DECEMBER	33849	258944.8	338490
7	JANUARY	34085	260750.2	340850
8	FEBRUARY	35647	272699.5	356470
9	MARCH	59934	458495.1	599340
10	APRIL	61527	470681.5	615270
11	MAY	65891	504066.1	658910
12	JUNE	41970	321075	419700



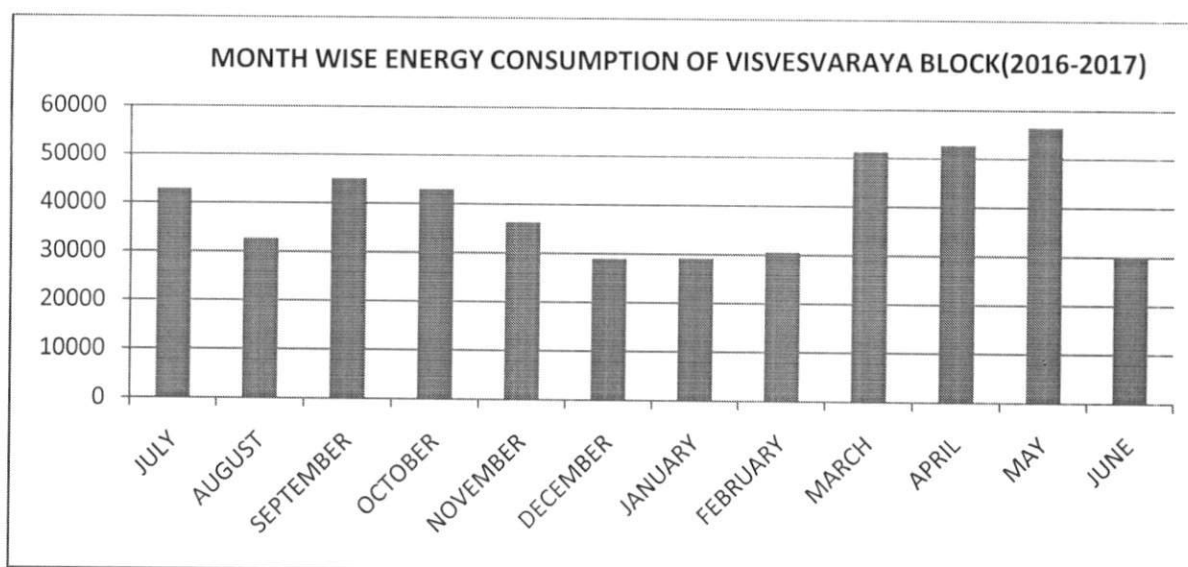
The monthly wise power consumption of the BHUVANA VIJAYAM BLOCK for the duration of 2016-2017 is shown in Figure. The total annual energy consumption during 2016-17 is 566246 Kwh or units. Peak consumption is observed in the month of May with 65891 units. The average monthly consumption for BHUVANA VIJAYAM BLOCK recorded is 47187 units.


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Analysis of energy consumption in VISVESVARAYA block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN VISVESVARAYA BLOCK(2016-2017)

S.No	MONTH	Visvesvaraya Block(unit consumption)	Cost	Tariff
1	JULY	42874	328414.84	428740
2	AUGUST	32691	250413.06	326910
3	SEPTEMBER	45050	345083	450500
4	OCTOBER	43032	329625.12	430320
5	NOVEMBER	36361	278525.26	363610
6	DECEMBER	29014	222247.24	290140
7	JANUARY	29215	223786.9	292150
8	FEBRUARY	30555	234051.3	305550
9	MARCH	51372	393509.52	513720
10	APRIL	52738	403973.08	527380
11	MAY	56478	432621.48	564780
12	JUNE	29979	229639.14	299790



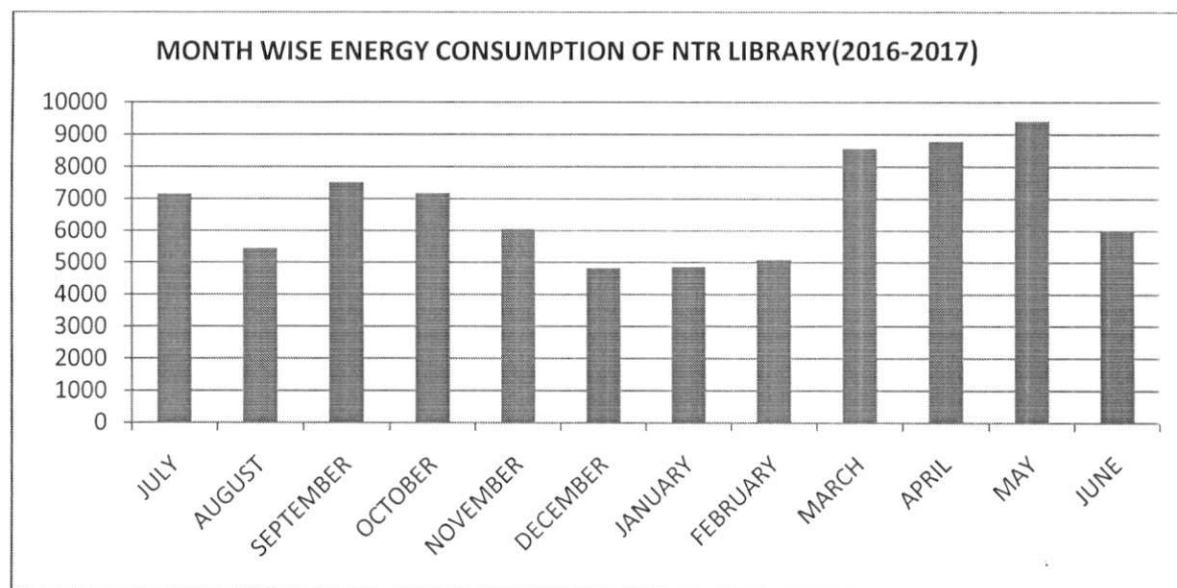
The monthly wise power consumption of the VISVESVARAYA BLOCK for the duration of 2016-2017 is shown in Figure. The total annual energy consumption during 2016-17 is 479359 Kwh or units. Peak consumption is observed in the month of May with 56478 units. The average monthly consumption for VISVESVARAYA BLOCK recorded is 399946 units


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Analysis of energy consumption in NTR LIBRARY on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN NTR LIBRARY(2016-2017)

S.No	MONTH	NTR Library(unit consumption)	Cost	Tariff
1	JULY	7145	54659.2	71450
2	AUGUST	5448	41677.2	54480
3	SEPTEMBER	7508	57436.2	75080
4	OCTOBER	7172	54865.8	71720
5	NOVEMBER	6060	46359	60600
6	DECEMBER	4835	36987.7	48350
7	JANUARY	4869	37247.8	48690
8	FEBRUARY	5092	38953.8	50920
9	MARCH	8562	65499.3	85620
10	APRIL	8789	67235.8	87890
11	MAY	9413	72009.4	94130
12	JUNE	5995	45867.8	59950



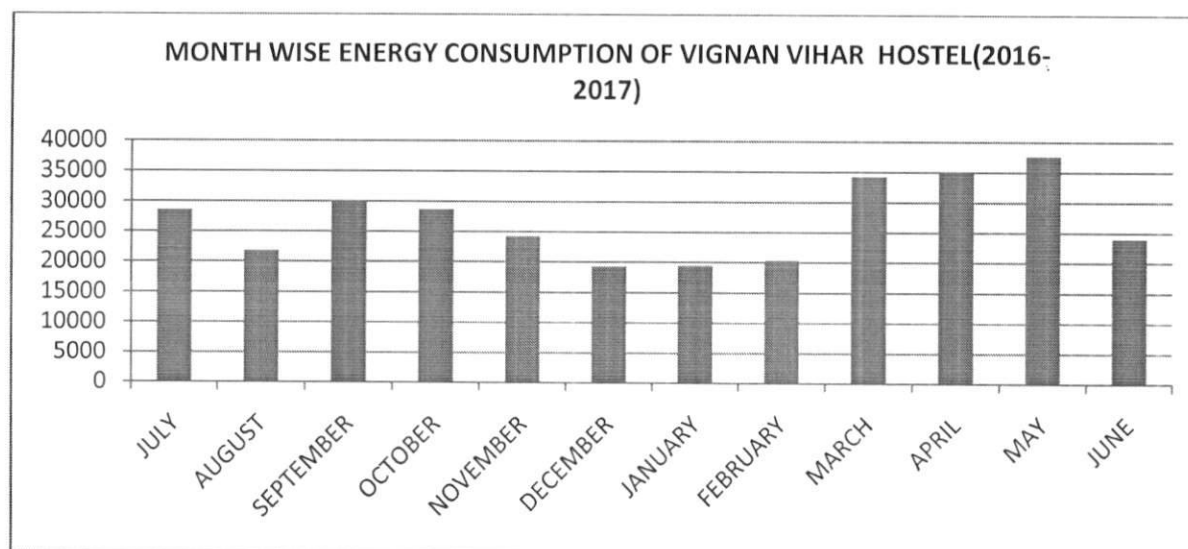
The monthly wise power consumption of the NTR LIBRARY for the duration of 2016-2017 is shown in Figure. The total annual energy consumption during 2016-17 is 80888 Kwh or units. Peak consumption is observed in the month of May with 9413 units. The average monthly consumption for NTR LIBRARY recorded is 6740 units.


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Analysis of energy consumption in VIGNAN VIHAR HOSTEL on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN VIGNAN VIHAR HOSTEL(2016-2017)

S.No	MONTH	Vignan Vihar Hostel(unit consumption)	Cost	Tariff
1	JULY	28582	218652.3	285820
2	AUGUST	21794	166724.1	217940
3	SEPTEMBER	30033	229752.4	300330
4	OCTOBER	28688	219463.2	286880
5	NOVEMBER	24241	185443.6	242410
6	DECEMBER	19342	147966.3	193420
7	JANUARY	19477	148999.05	194770
8	FEBRUARY	20370	155830.5	203700
9	MARCH	34248	261997.2	342480
10	APRIL	35158	268958.7	351580
11	MAY	37652	288037.8	376520
12	JUNE	23983	183471.4	239830



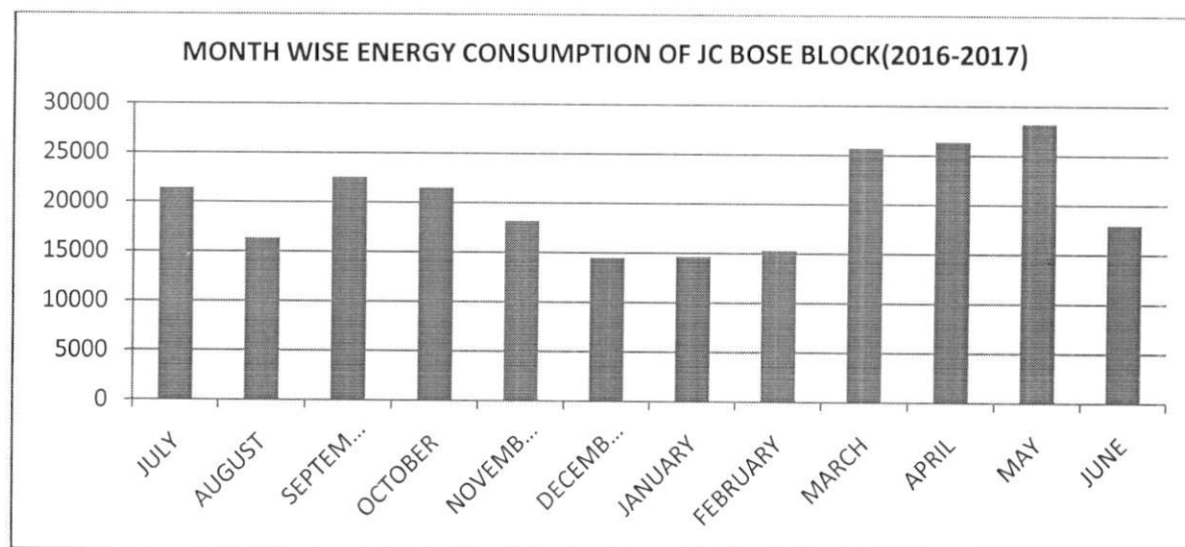
The monthly wise power consumption of the VIGNAN VIHAR HOSTEL for the duration of 2016-2017 is shown in Figure. The total annual energy consumption during 2016-17 is 323568 Kwh or units. Peak consumption is observed in the month of May with 37652 units. The average monthly consumption for VIGNAN VIHAR HOSTEL recorded is 26964 units.


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Analysis of energy consumption in JC BOSE block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN JC BOSE BLOCK(2016-2017)

S.No	MONTH	Jc Bose Block(unit consumption)	Cost	Tariff
1	JULY	21437	163993.8	214370
2	AUGUST	16345	125045.3	163450
3	SEPTEMBER	22525	172317.7	225250
4	OCTOBER	21516	164599.6	215160
5	NOVEMBER	18180	139083.8	181800
6	DECEMBER	14507	110979.3	145070
7	JANUARY	14607	111750.4	146070
8	FEBRUARY	15277	116872.8	152770
9	MARCH	25686	196497.9	256860
10	APRIL	26369	201723.6	263690
11	MAY	28239	216030.6	282390
12	JUNE	17987	137603.6	179870



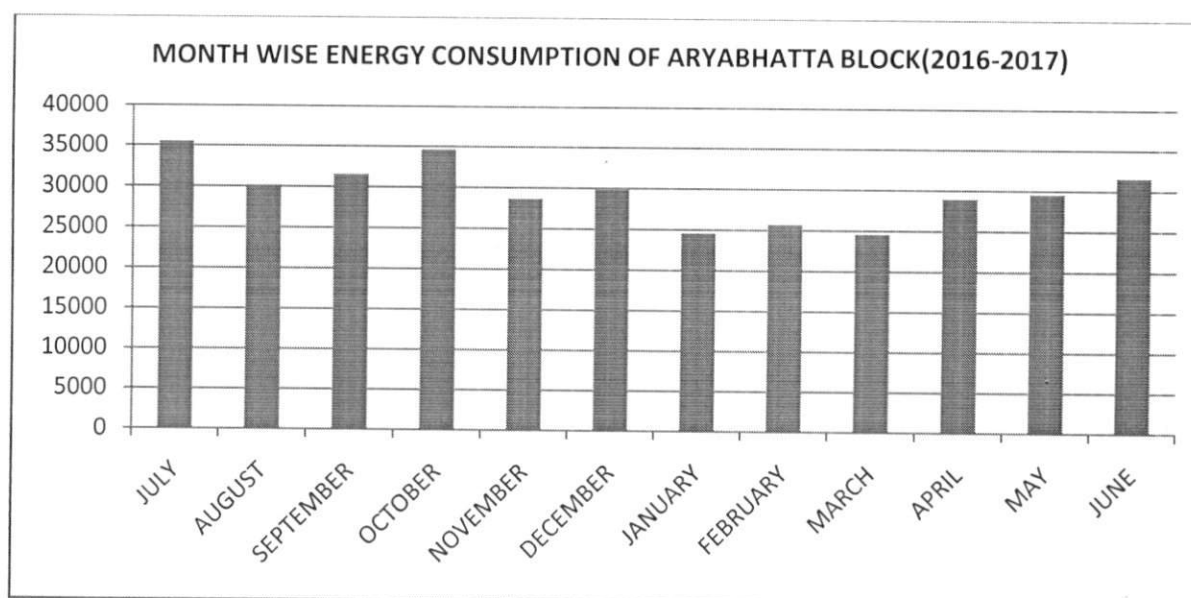
The monthly wise power consumption of the JC BOSE BLOCK for the duration of 2016-2017 is shown in Figure. The total annual energy consumption during 2016-17 is 242675 units. Peak consumption is observed in the month of MAY with 28239 units. The average monthly consumption for JC BOSE BLOCK recorded is 20222 units.


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Analysis of energy consumption in ARYABHATTA block on monthly basis:

**ENERGY CONSUMPTION OF THE INSTITUTION IN ARYABHATTA
BLOCK(2016-2017)**

S.No	MONTH	Aryabhata Block(unit consumption)	Cost	Tariff
1	JULY	35484	271807.44	354840
2	AUGUST	30158	231010.28	301580
3	SEPTEMBER	31548	241657.68	315480
4	OCTOBER	34586	264928.76	345860
5	NOVEMBER	28695	219803.7	286950
6	DECEMBER	29865	228765.9	298650
7	JANUARY	24586	188328.76	245860
8	FEBRUARY	25689	196777.74	256890
9	MARCH	24586	188328.76	245860
10	APRIL	28945	221718.7	289450
11	MAY	29586	226628.76	295860
12	JUNE	31582	241918.12	315820

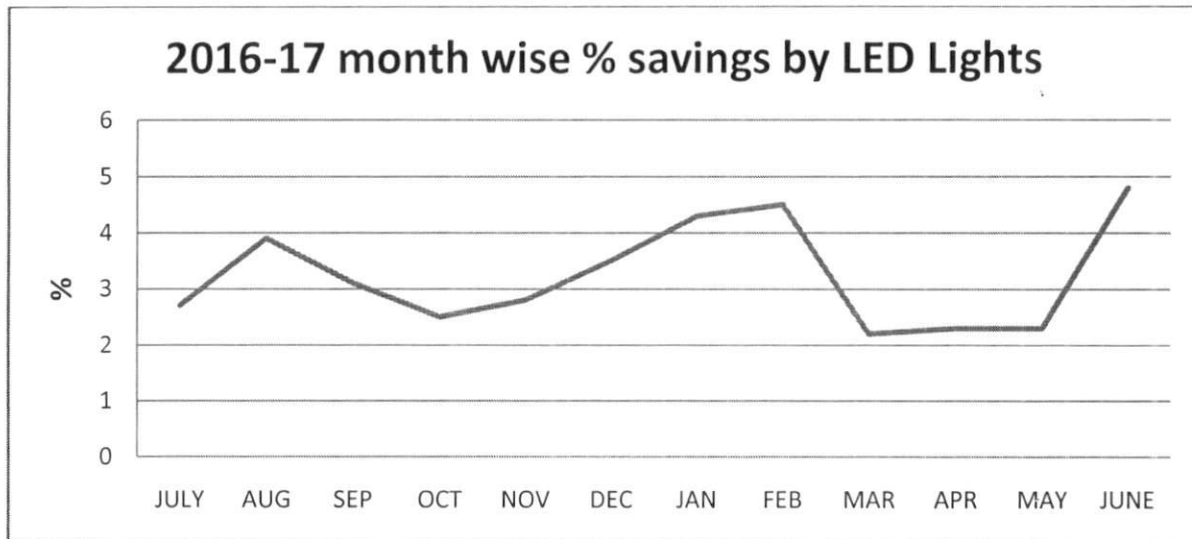


The monthly wise power consumption of the JC BOSE BLOCK for the duration of 2016-2017 is shown in Figure. The total annual energy consumption during 2016-17 is 355310 units. Peak consumption is observed in the month of July with 35484 units. The average monthly consumption for JC BOSE BLOCK recorded is 29609 units.

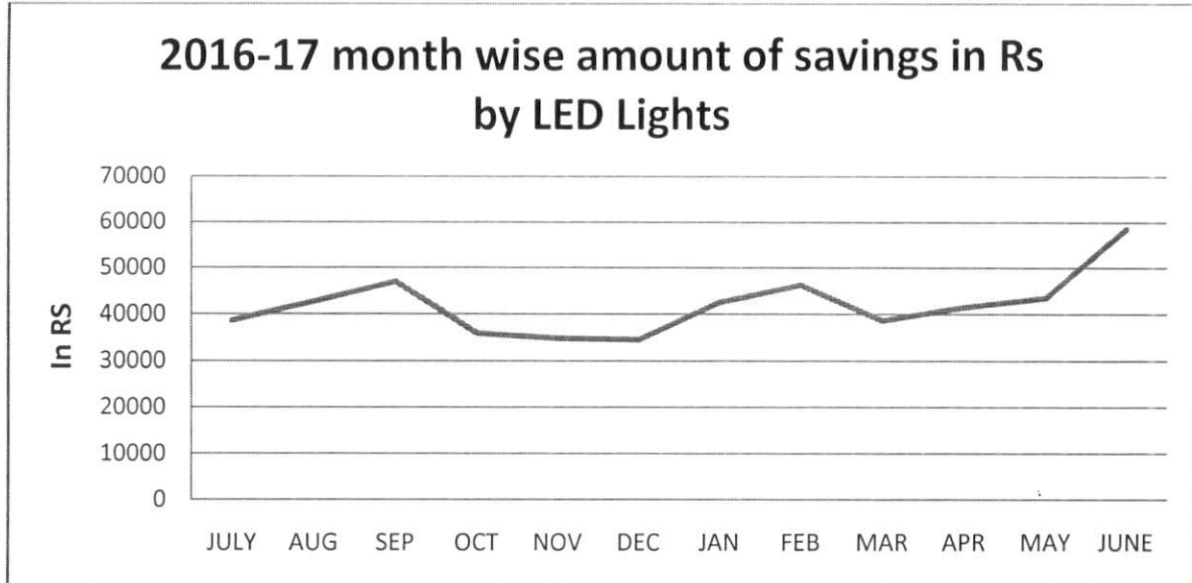

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Analysis of Energy Savings in VFSTR


Analysis of month energy savings by LED Lights



Month wise saving % in the campus for the duration of 2016-2017 is shown in Figure. The total savings of annual energy is 50479 Kwh or units. It is observed that the % savings improvement up to 4.8 % in the month of June.




Month wise saving in Rupees our campus for the duration of 2016-2017 is shown in Figure. The total amount savings is Rs 504790.


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EQUIPMENT WISE ENERGY CONSUMPTION FOR COMPUTERS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	computers	155.4	63	9790
2	H-Block	computers	189	63	11907
3	U-Block	computers	42.15	63	2655
4	Pharmacy Block	computers	92	63	5796
5	Library	computers	3.5	70	249


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EQUIPMENT WISE ENERGY CONSUMPTION FOR LIGHTS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Lights	10.5	63	662
2	H-Block	Lights	27.6	63	1739
3	U-Block	Lights	40.3	63	2543
4	Pharmacy Block	Lights	6.6	63	415
5	Library	Lights	3.6	70	255
6	Guest House	Lights	8.6	77	662
7	Boys Hostel	Lights	17.6	77	1358
8	Girls Hostel	Lights	13	77	1004
9	Canteen	Lights	0.45	70	31


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EQUIPMENT WISE ENERGY CONSUMPTION FOR FANS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW/hr)
1	A-Block	Fans	27.4	63	1727
2	H-Block	Fans	32.9	63	2078
3	U-Block	Fans	20.3	63	1282
4	Pharmacy Block	Fans	22.3	63	1408
5	Library	Fans	4.3	70	304
6	Guest House	Fans	1.7	77	135
7	Boys Hostel	Fans	24.4	77	1884
8	Girls Hostel	Fans	3.4	77	266
9	Canteen	Fans	0.48	70	33


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EQUIPMENT WISE ENERGY CONSUMPTION FOR LAB & OTHER EQUIPMENT

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Lab Equipments & Others	21.5	63	1354
2	H-Block	Lab Equipments & Others	29.7	63	1877
3	U-Block	Lab Equipments & Others	135.7	63	8554
4	Pharmacy Block	Lab Equipments & Others	1.2	63	80
5	Library	Lab Equipments & Others	4	70	280
6	Guest House	Lab Equipments & Others	2.8	77	221
7	Boys Hostel	Lab Equipments & Others	3.6	77	283
8	Girls Hostel	Lab Equipments & Others	3.6	77	277
9	Canteen	Lab Equipments & Others	4.6	70	322


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EQUIPMENT WISE ENERGY CONSUMPTION FOR PRINTER

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	printer	7.8	63	494
2	H-Block	printer	4.2	63	266
3	U-Block	printer	6.1	63	390
4	Pharmacy Block	printer	0.63	63	39
5	Library	printer	0.63	70	44
6	Guest House	printer	0.63	77	48
7	Boys Hostel	printer	0.63	77	48
8	Girls Hostel	printer	0.63	77	48


Electrical Maintenance I/c
ELECTRICAL MAINTENANCE I/c
Department of EEE
VFSTR Deemed to be University
VADLAMUDI - 522 213.

EQUIPMENT WISE ENERGY CONSUMPTION FOR REFRIGERATOR&PUMPS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW/hr)
1	A-Block	Refrigerators & Water Pumps	13.5	168	2273
2	H-Block	Refrigerators & Water Pumps	19.2	168	3231
3	U-Block	Refrigerators & Water Pumps	2.9	168	501
4	Library	Refrigerators & Water Pumps	1.2	168	215
5	Guest House	Refrigerators & Water Pumps	4.1	168	698
6	Boys Hostel	Refrigerators & Water Pumps	29.7	168	4991
7	Girls Hostel	Refrigerators & Water Pumps	9.2	168	1552
8	Canteen	Refrigerators & Water Pumps	2.6	168	436


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 Department of EEE
VFSTR Deemed to be University
VADLAMUDI - 522 213.

EQUIPMENT WISE ENERGY CONSUMPTION FOR XEROX MACHINE

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	Xerox Machines	1.26	70	88.2
2	H-Block	Xerox Machines	0.63	70	44.1
3	U-Block	Xerox Machines	0.63	70	44.1
4	Pharmacy Block	Xerox Machines	0.63	70	44.1
5	Boys Hostel	Xerox Machines	0.63	70	44.1
6	Girls Hostel	Xerox Machines	0.63	70	44.1


Electrical Maintenance I/c
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Department of EEE
VFSTR Deemed to be University
VADLAMUDI - 522 213.

ENERGY AUDIT
(2015-2016)



VIGNAN'S
Foundation for Science, Technology & Research
UNIVERSITY
(Estd u/s 3 of UGC Act of 1956)

(ACCREDITED BY NAAC WITH 'A' GRADE)

Date: 12-04-2016

To
P.V.N. Chari
Vigneswara Power Controls,
Flat: 2, Sri Sai Nilayam, Nagaluru,
Guntur, Andhra Pradesh.
522034.

Respected Sir,

Sub: Request to conduct Energy Audit & Safety Audit of **Vignan's Foundation for Science, Technology & Research (Deemed to be University)** ---- Reg.

-oOo-

It is to inform you that, **Vignan's Foundation for Science, Technology & Research (Deemed to be University)** organization is planned to conduct energy audit by external agency with external experts along with our internal audit committee members. So we are inviting you to conduct energy audit in our VFSTR University (Deemed to be) from 19/5/2016 to 20/5/2016. Please give your concern to conduct energy audit in our campus.

Waiting for your response

Head of the Department (EEE),
VFSTR University,
Vadlamudi, Guntur, AP

GSTNO: 37AMGPN6552J1ZM

Cell: 9441316830, 7989367414

E-mail: charipvn@gmail.com

VIGNESWARA POWER CONTROLS

Door No: 133-5-808 ,Flat N o. 2, Sri Sai Nilayam, Near ID Hospital Nagaralu, G UNTUR -522034



Date: 18.04.2016

F.NO: VRPC/EA/15-16/04/12

To
Head of the Department
Department of EEE
VFSTR university,
Vadlamudi, Guntur, A.P.

Respected Sir,

Sub: Energy Audit conduction – Reg.

We convey sincere thanks to choose us to conduct energy audit.

We inform you that we are accepting your request to conduct Energy audit in your campus. With this regard our experts will visit from 19/5/16 to 20/5/16 your campus. The payment for whole process of auditing is 30,000/-. The payment can be done after submission of audit report.

For Vigneshwara power controls

Authorized Signatory

Transformer, HT/LT Motors, Breakers & Protection Relays Testing & Commissioning



SIEMENS



Schneider
Electric



VIGNAN'S
Foundation for Science, Technology & Research
UNIVERSITY
(Estd u/s 3 of UGC Act of 1956)

(ACCREDITED BY NAAC WITH 'A' GRADE)

Date: 22-04-2016


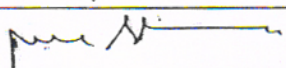
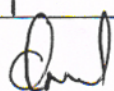
To
P.V.N. Chari
Vigneswara Power Controls,
Flat: 2, Sri Sai Nilayam, Nagaluru,
Guntur, Andhra Pradesh.
522034.

Respected Sir,

Sub: Confirmation to conduct Energy Audit of Vignan's Foundation for Science, Technology & Research (Deemed to be University) ---- Reg.

-oOo-

In connection with our previous communication regarding Energy Audit in Vignan's Foundation for Science, Technology & Research (Deemed to be University), we are agreeing to pay the remuneration of 30,000/-. The following internal Audit committee members will involve in the energy audit from 19/5/2016 to 22/5/2016.

S.No	Name of the faculty	Designation	Signature
1	Dr.G.Srinivasa Rao	Associate Professor, EEE	
2	Mr.P.V.S.Sobhan	Associate Professor, EEE	
3	Mr. Ch. Umamaheswara Rao	Electrical Maintenance Incharge	

Thanking you,



Head of the Department (EEE),
VFSTR University,
Vadlamudi, Guntur, AP,

GSTNO: 37AMGPN6552J1ZM

Cell: 9441316830, 7989367414

E-mail: charipvn@gmail.com

VIGNESWARA POWER CONTROLS

Door No: 133-5-808 ,Flat N o. 2, Sri Sai Nilayam, Near ID Hospital Nagaralu, G UNTUR -522034



Date: 06.08.2016

To
Head of the Department
Department of EEE
VFSTR university,
Vadlamudi, Guntur, A.P.

Respected Sir,

Sub: Submission of Final Report on 'Energy Audit' – Reg.

Energy Audit of Vignan's Foundation for Science, Technology and Research (Deemed to be University) is conducted and the report is attached. Refer the following pages of report of Energy Audit for 2015-16 duration of your campus. Feel free to contact us for any clarifications on this subject.

For Vigneshwara power controls

P. V. N. Chai

Authorized Signatory

Transformer, HT/LT Motors, Breakers & Protection Relays Testing & Commissioning



SIEMENS



Schneider
Electric

PROCEEDINGS OF THE REGISTRAR

F.No.:VFSTR/RO/A4/30/2015-16/16

Dt: 06.04.2016

Sub: VFSTR – Sanction of amount for Energy audit– amount – sanctioned – orders – Issued.

Read: Letter dated 04.04.2016 of Dr. G. Srinivasa rao, HOD of EEE.

* * *

ORDER

With reference to the letter read above, sanction is hereby accorded for the payment of Rs.30,000/-(Rupees Thirty thousand only) to Mr. P.V.N. Chari (Vigneswara Power Controls),Guntur towards remuneration to Conduction of Energy audit.

The above budget sanctioned amount is debitabale to the budget available under Major head: Staff Payments & Benefits (200) and Minor head: honorarium (212) for the Financial Year 2015-16.

To:
The Finance Officer,
HOD, EEE,
The Electrical Maintenance Incharge

Copy to:
PA to the Vice Chancellor
Master file



Registrar
VIGNAN'S FOUNDATION
FOR SCIENCE, TECHNOLOGY AND RESEARCH
(Declared to be Deemed University U/S 3 of UGC Act 1956)
VADLAMUDI-622 213.
A.P. INDIA

Energy Audit and Safety Audit Report

Visited the following areas in your campus:

1. 11 kV Substation at two different locations each having 1 No. Stepdown Transformer (11 kV / 433 volts)
 - a. 950 kVA Transformer presently Supporting following buildings: A – Block / H – Block / Hostels – Blocks / Pharmacy & Library.
 - b. The Backup power is supported by 1 x 500 kVA DG set (Kirloskar Green)
 - c. Supported by 1 x 200 kVA DG set (Cummins)
 - d. Earthing systems are normal, as per IS -3043
 - e. APFC panel, 1 x 100 kVAr is functional, which is connected to 950 kVA system.
2. **UPS System:** Visited various labs, which are having stand-alone UPS, of different make, with SMF batteries. Total UPS installed capacity is around 125-kVA.
3. **Lightening protection system:** Presently each building is having Spike type lightning arrestors.


Authorized Signatory

VIGNESHWARA POWER CONTROLS

ANNEXURE

INSTITUTE POWER PATTERN:

- Total connected load of the institution = 1637 kw
- Transformers available in the institution = 950 KVA
- Diesel generator set capacity = 500KVA +200KVA
- Diesel consumption of the DG Set = 1920 liters for full day power shedding

ENERGY CONSERVATION OPPORTUNITIES FOR ENERGY EFFICIENCY

Recommendations for better energy efficiency:

- ✓ Based on the analysis of the power consumption data, certain steps have been recommended for improving energy
- ✓ Efficiency of the campus. Complete cost analysis of implementation of recommended measures has been performed wherever necessary. Also, a number of general measures for energy efficiency have been listed.
 - Described below are some important recommendations for better energy efficiency:

1. Power savings through the usage of LEDs:

Dominant light source at most places in the campus is traditional bulbs with LED lights which consumes 20W in addition to the 40W. The campus has 3510 in total conventional bulbs and 817 LEDs. If these conventional bulbs are replaced by LEDs, 20W power can be saved per bulb

- Total No. of conventional bulbs in Campus = 3510
- Average Power of conventional bulbs = 140.4kW
- Average Power of electronic Ballast FTL = 40W
- Power saved per bulb = 20 W
- Total Power saving = 70.2kW/h
- Average Use of bulbs per day = 3510X9h=31590 h
- Average Use of bulbs per year = 11372400 h
- Total Energy saved per day = 70200X9h = 631.8 KWh
- Total Energy saved per year = 227448 KWh
- saving in Rs. Per year = 227448 X10= Rs.2274480
- Average Cost of Replacing each bulbs = Rs.350
- Total Cost of Replacing all Conventional Ballast FTLs = Rs.1228500
- Capital Cost Recovery time = (1228500)/(2274480) = 0.54 Years
- Hence, the capital cost recovery time for replacing all conventional Ballast FTLs of the campus is around 0.54 years.

2. Minimizing Repair Works in Fans:

During data collection, the repaired fans have been found to be consuming very high power as compared to the rated power. Fans repaired once and twice were consuming 85 W and 70 W more than the average consumption of new fans respectively. Thus, effort should be made to minimize the repairing of fans and also repair work should be Supervised properly.

3. Better Practices for AC:

The institute has in total 102 VRV cassette, 218 cassette type ACs, 92 split ACs, 10 Tower ACs, which make a very large part of total energy consumption of the campus. But, at many places it was found that AC is not used with best recommended practices. Even simple things, such as insulation. Also at certain places ACs were found to be used without keeping curtains.

These poor practices account for increase in AC load and thus consumption.

Summarized below are some guidelines for most efficient use of ACs:

- **Proper Insulation** – Good quality insulation must be maintained in the air conditioned rooms by keeping all doors and windows closed properly so as to prevent cool air go out and hot air come in.
- **Curtains** – Always keep curtains on windows to prevent direct sunlight inside the room to avoid heating of cooled air. This reduces AC load significantly.
- **Maintenance** – Proper maintenance and cleaning of ACs is required at regular intervals to make it work at highest efficiency. Any dirt in filter may reduce efficiency of AC very significantly.
- **Operating** – The ACs should be switched on 15 minutes before actual use and should be switched off before leaving the room.

Suggestions based on information

1. Few more earth pits to be added. The healthy earth potential can reach in H block if earth pits are added.
2. The available lumens of light are not sufficient so needed to be added few more street lights.
3. The dynamo/alternator windings 500KVA generator rewounded due to short circuit fault. Now the condition is good and turns shorting problem is completely solved.
4. The Battery condition of 200 KVA generator is in discharging state and better to replace with new battery.
5. Over Head lines exist in the campus which prone more risk in academic institutions with more than 4000 students. The Over head line from Guest house to U-block was laid and needed to be replaced by underground cable with suitable sq.mm.

The technical details: 440V, 300SQmm, 4 Core, Armored cable to be laid.

6. Solar power plant proposal to be initiated to improve the energy saving in the campus.
Plant model may be roof top or ground mounted type with grid interaction type.


P. V. Chay
Authorized Signatory

(To be filled up by Experts)

Summary Sheet

S.No.	Parameters of Evaluation	Page No.	Grade
1	Earth pits maintenance	7	B
2	Street Lights	8	B
3	Power back up :500KVA Generator Maintenance	9	C
S4	Power back up : 200KVA Generator Maintenance	10	C
5	Distribution Panel Boards	11	C
6	UPS Maintenance	12	C
7	Lightning arresters in A,H & U Blocks	13	C

Grading System

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement

1. Earth Pits Maintenance

S.No.	Sub-parameter	Grade
1	Resistance value	B
2	Cleaning	B
3	Nuts & Bolts Condition	B
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 Authorized Signatory

2. Street Lights

S.No.	Sub-parameter	Grade
1	Voltage profile	C
2	Earthing	C
3	Cable Statues (Damages any)	B
4	Light Working Condition	B
TOTAL		B

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 Authorized Signatory

3. Power Back up: 500KVA Generator Maintenance

S.No.	Sub-parameter	Grade
1	Generator Cleaning	C
2	Shed Cleaning	C
3	Engine oil level	B
4	Fuel tank level	C
5	Fuel leaks	B
6	Radiator condition	B
7	Battery connections	C
8	Battery voltage	C
9	Exhaust system condition	B
10	All tools availability	A
TOTAL		C

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 Authorized Signatory

4. Power Back up: 200KVA Generator Maintenance

S.No.	Sub-parameter	Grade
1	Generator Cleaning	C
2	Shed Cleaning	B
3	Engine oil level	C
4	Fuel tank level	C
5	Fuel leaks	B
6	Radiator condition	B
7	Battery connections	B
8	Battery voltage	B
9	Exhaust system condition	C
10	All tools availability	D
TOTAL		C

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 P. V. Chait
 Authorized Signatory

5. Distribution Panel

S.No.	Sub-parameter	Grade
1	Cleaning	B
2	Voltage	C
3	Current	B
4	MCCB condition	C
5	Bus Bar terminals	B
6	Cable terminals	B
7	Earthing	C
8	Panel Door (Closed or opened)	C
TOTAL		C

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 Authorized Signatory

6. UPS Maintenance

S.No.	Sub-parameter	Grade
1	UPS Input Voltage	B
2	Battery Bank Voltage At no Load	B
3	Battery Bank Voltage At Full Load	B
4	Earthing	C
5	UPS Condition Cable	C
6	Batteries Condition	B
7	Cable terminals(nuts&bolts)	B
TOTAL		C

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 Authorized Signatory

7. Lightning Arresters

S.No.	Sub-parameter	Grade
1	Earthing strip condition	D
2	Lightning arrester condition	C
3	Nuts&Bolts Condition	C
Total		C

Grade	Details
A	Excellent
B	Very Good
C	Good
D	Needs Improvement


 Authorized Signatory



VIGNAN'S
Foundation for Science, Technology & Research
UNIVERSITY
(Estd u/s 3 of UGC Act of 1956)

Energy Audit Report

Academic Year : 2015-16

Name of the Department : EEE

1. Name of the Chairman : Dr. G.Srinivasa Rao

Designation : Associate Professor & Head

Address : Department of EEE, VFSTR

2. Name of the Member : Mr. P.V.S.Sobhan

Designation : Associate Professor

Address : Department of EEE, VFSTR

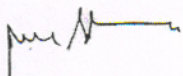
3. Name of the Member : Mr. Ch.Umamaheswara Rao

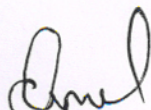
Designation : Electrical Maintenance I/c, Assistant Professor

Address : Department of EEE, VFSTR

Signature of Audit Committee:

1. 

2. 

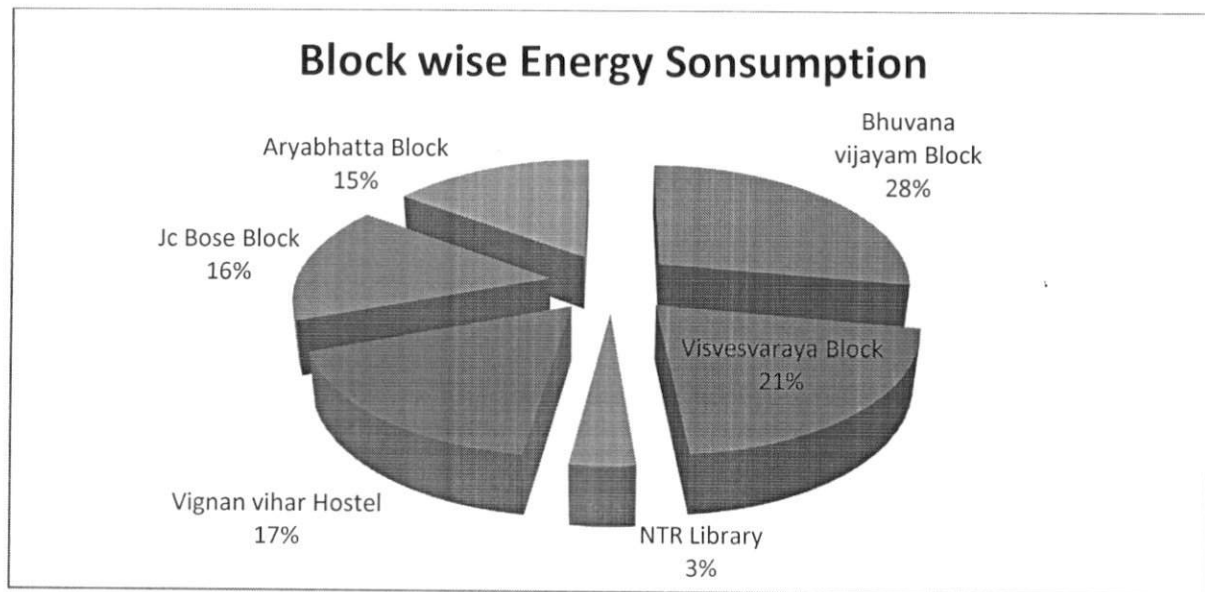
3. 

ENERGY SAVINGS FOR THE MONTHS(2015-2016)

S.No	MONTH	ENERGY CONSUMPTION (Kwhr)	ENERGY SAVINGS (kWhr)			TARIFF (Rs)
			LED lights	Total	% savings	
1	JULY	149954	4102	4102	2.7	41020
2	AUGUST	159840	3658	3658	2.2	36580
3	SEPTEMBER	167832	3895	3895	2.3	38950
4	OCTOBER	140520	3258	3258	2.3	32580
5	NOVEMBER	112410	4256	4256	3.7	42560
6	DECEMBER	107100	3756	3756	3.5	37560
7	JANUARY	148518	4135	4135	2.7	41350
8	FEBRUARY	138840	4406	4406	3.1	44060
9	MARCH	147856	4068	4068	2.7	40680
10	APRIL	163698	3856	3856	2.3	38560
11	MAY	154494	3658	3658	2.3	36580
12	JUNE	114618	4924	4924	4.2	49240


Electrical Maintenance I/c
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 Department of EEE
VFSTR Deemed to be University
VADLAMUDI - 522 213.

Block wise energy consumption in campus



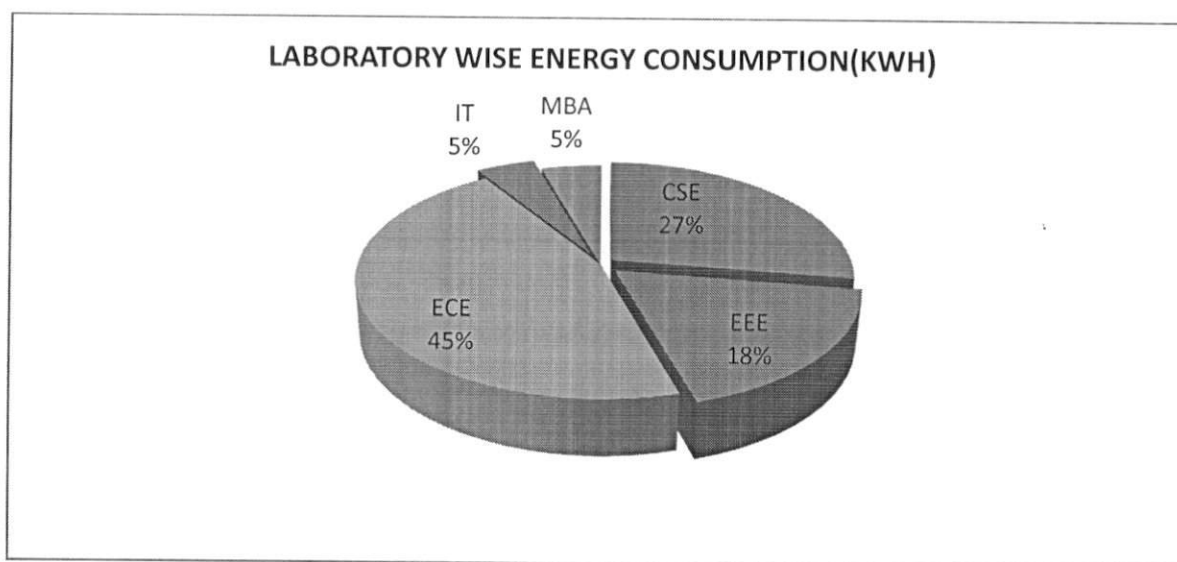
The block wise energy consumption of the university is shown in above Fig. The total annual energy consumption of the campus is 2446579 Kwh, of which 31% is from Bhuvana vijayam Block, 22% from Visvesvaraya Block, 14 % from Aryabhata Block, 15 % from hostel, 14% from jc Bose blocl, 4% from library. The highest energy consumption is obtained from Bhuvan vijayam Block followed by different blocks in the campus.


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AMUDI - 522 213.


The department's Laboratory wise energy consumption in campus

LABORATORY WISE ENERGY CONSUMPTION

S.No	Department	Type of laboratory	Total load (kW)	Running hours per day	Unit consumption per day (kWhr)
1	Computer Science and Engineering	6 computer labs	88.8	5	444
2	Electrical and Electronics	4 labs	59.2	5	296
3	Electrical and Communication	10 labs	148	5	740
4	Information Technology	1 lab	14.8	5	74
5	MBA	1 computer lab	15	5	75




The department wise power consumption of the Computer Laboratory is shown in above figure. The diagram shows the ECE department consumes high energy of 45% and CSE department consumes 27% of energy on daily basis. EEE departments consume 18%. The power consumption of the IT and MBA consume each is 5%.

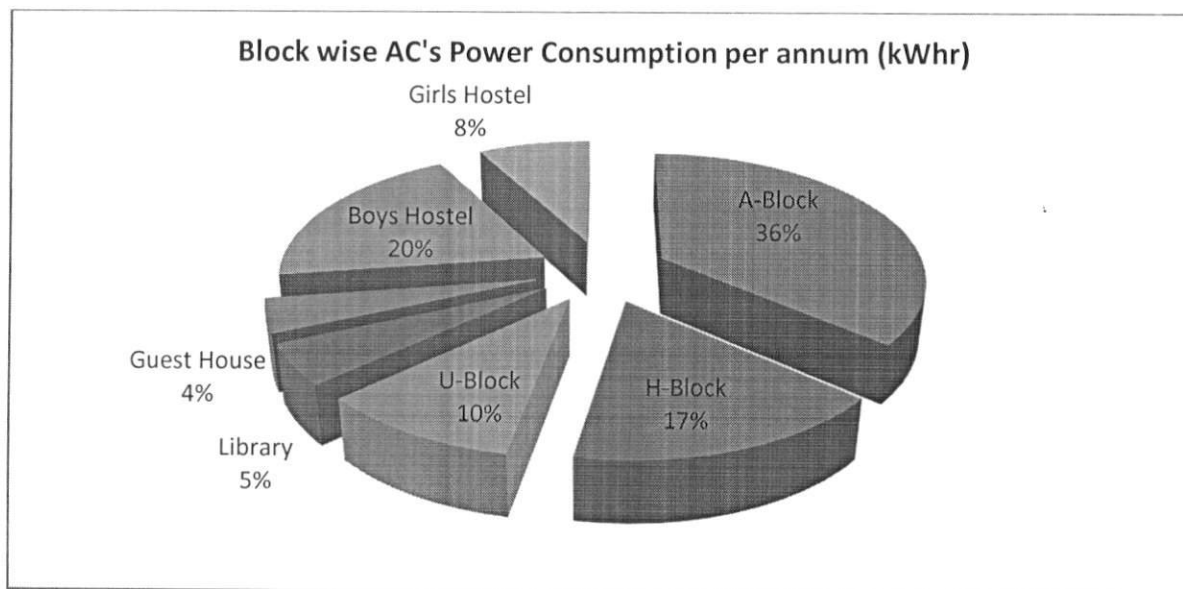

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 Department of EEE
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 Page 17

AC's consumption analysis with block wise in the campus

EQUIPMENT WISE ENERGY CONSUMPTION FOR AC's

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	air conditioner	564	63	35532
2	H-Block	air conditioner	261	63	16443
3	U-Block	air conditioner	162	63	10206
4	Library	air conditioner	72	70	5040
5	Guest House	air conditioner	60	70	4200
6	Boys Hostel	air conditioner	273	70	19110
7	Girls Hostel	air conditioner	114	70	7980


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Department of EEE
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VADLAMUDI - 522 213.



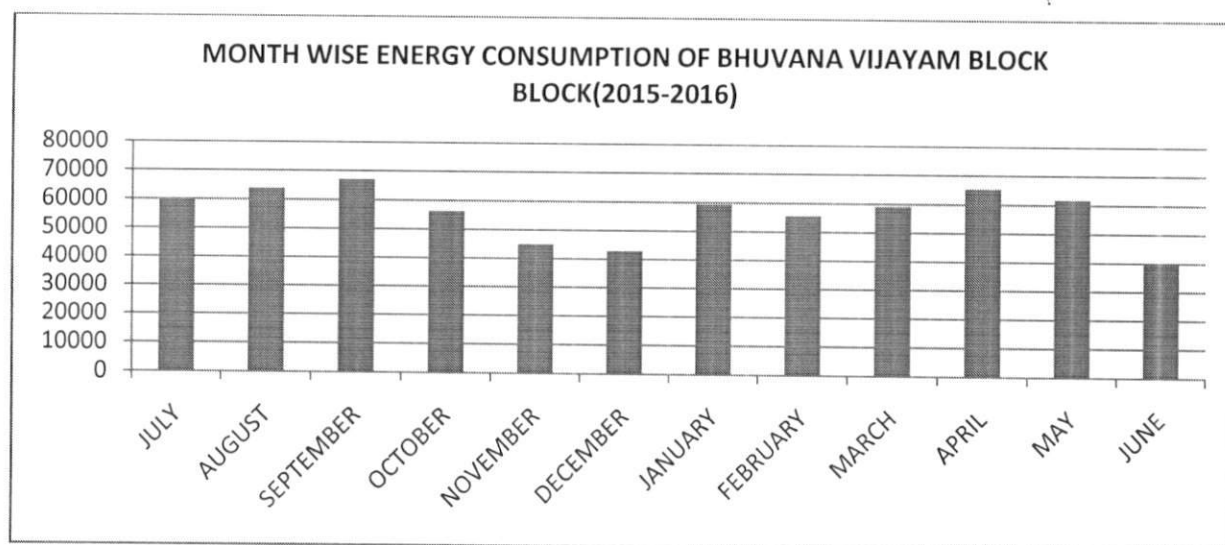
The block wise power consumption by ACs is shown in above figure. 36 % of energy consumption is from A-Block, 15% of energy consumption is from H-Block, 10 % of energy consumption is from U-Block, 20% of energy consumption is from boy's hostels, 8% of energy consumption is from Girls hostel, 4% of energy consumption is from guest house, 5% of energy consumption is from library. The highest energy consumption is obtained in A-Block followed by different blocks in the campus.


Electrical Maintenance I/c
 ELEC. MAINTENANCE I/c
 Department of EEE
 VFSTR Deemed to be University
 VADLAMUDI - 522 213.

Analysis of energy consumption in Bhuvana Vijayam block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN BHUVANA VIJAYAM BLOCK(2015-2016)

S.No	MONTH	Bhuvana vijayam block(unit consumption)	Cost	Tariff
1	JULY	59981	459454.46	599810
2	AUGUST	63936	489110.4	639360
3	SEPTEMBER	67132	513559.8	671320
4	OCTOBER	56208	429991.2	562080
5	NOVEMBER	44964	343974.6	449640
6	DECEMBER	42840	327726	428400
7	JANUARY	59407	454463.55	594070
8	FEBRUARY	55536	424850.4	555360
9	MARCH	59142	452436.3	591420
10	APRIL	65479	500914.35	654790
11	MAY	61797	472747.05	617970
12	JUNE	40116	306887.4	401160



The monthly wise power consumption of the BHUVANA VIJAYAM BLOCK for the duration of 2015-2016 is shown in Figure. The total annual energy consumption during 2019-20 is 676538 Kwh or units. Peak consumption is observed in the month of September with 67132 units. The average monthly consumption for BHUVANA VIJAYAM BLOCK recorded is 56378 units.

[Signature]
Electrical Maintenance I/c

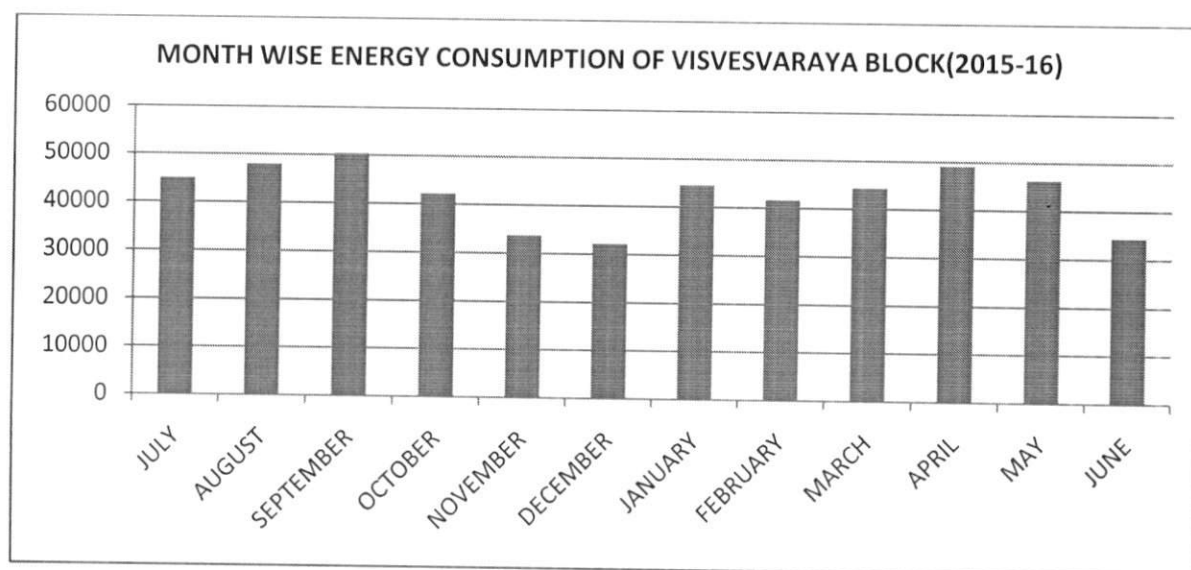
ELL... I/M... ..

Department of EEE

Analysis of energy consumption in VISVESVARAYA block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN VISVESVARAYA BLOCK(2015-16)

S.No	MONTH	VISVESVARAYA BLOCK(unit consumption)	Cost	Tariff
1	JULY	44986	344142.9	449860
2	AUGUST	47952	366832.8	479520
3	SEPTEMBER	50349	385169.85	503490
4	OCTOBER	42156	322493.4	421560
5	NOVEMBER	33723	257980.95	337230
6	DECEMBER	32130	245794.5	321300
7	JANUARY	44555	340845.75	445550
8	FEBRUARY	41652	318637.8	416520
9	MARCH	44356	339323.4	443560
10	APRIL	49109	375683.85	491090
11	MAY	46348	354562.2	463480
12	JUNE	34385	263048.3	343850



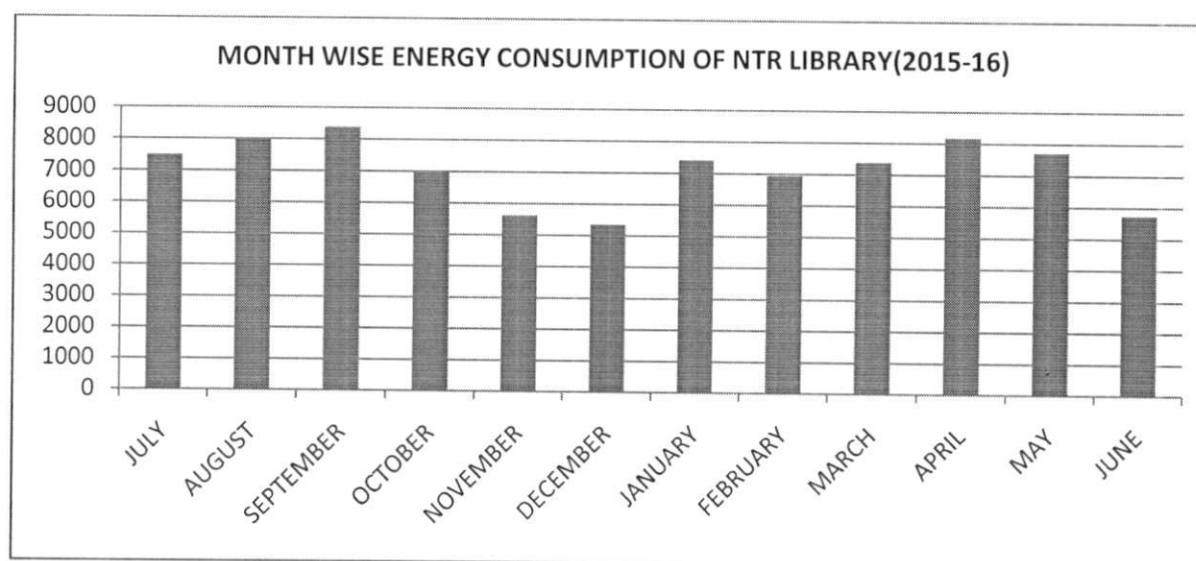
The monthly wise power consumption of the VISVESVARAYA BLOCK for the duration of 2015-2016 is shown in Figure. The total annual energy consumption during 2019-20 is 511701 Kwh or units. Peak consumption is observed in the month of September with 50349 units. The average monthly consumption for VISVESVARAYA BLOCK recorded is 42641 units.


Electrical Maintenance I/c
ELECTRICAL MAINTENANCE I/c
 Department of EEE


Analysis of energy consumption in NTR LIBRARY on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN NTR LIBRARY(2015-16)

S.No	MONTH	NTR Library(unit consumption)	Cost	Tariff
1	JULY	7497	57357.4	74977
2	AUGUST	7992	61138.8	79920
3	SEPTEMBER	8391	64195.7	83916
4	OCTOBER	7026	53748.9	70260
5	NOVEMBER	5620	42996.8	56205
6	DECEMBER	5355	40965.7	53550
7	JANUARY	7425	56808.1	74259
8	FEBRUARY	6942	53106.3	69420
9	MARCH	7392	56554.9	73928
10	APRIL	8184	62614.4	81849
11	MAY	7724	59093.9	77247
12	JUNE	5730	43834.5	57300



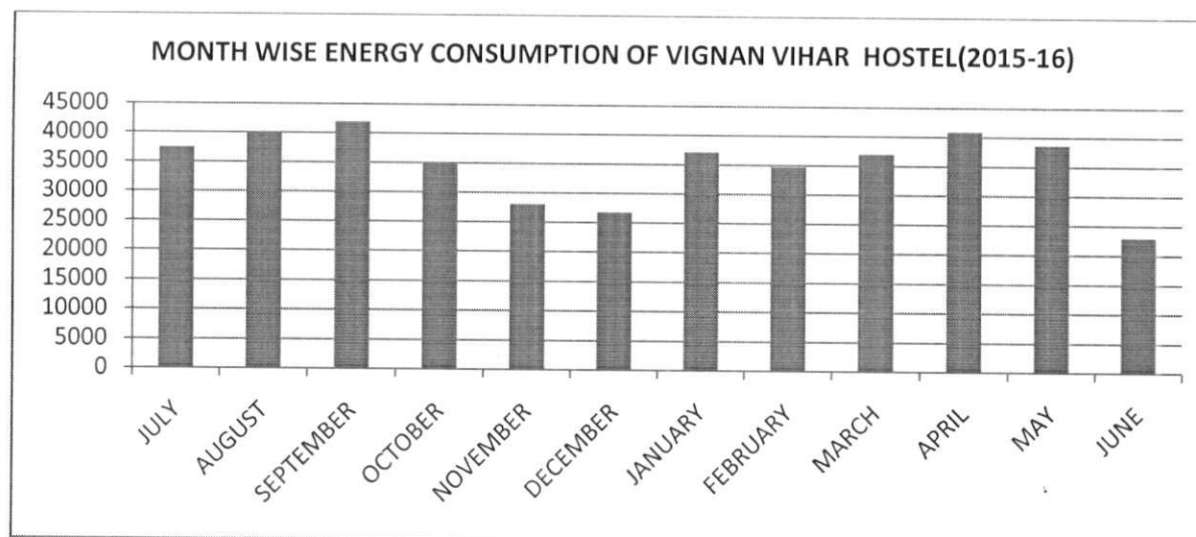
The monthly wise power consumption of the NTR LIBRARY for the duration of 2015-2016 is shown in Figure. The total annual energy consumption during 2019-20 is 85278 Kwh or units. Peak consumption is observed in the month of September with 8391 units. The average monthly consumption for NTR LIBRARY recorded is 7106 units.


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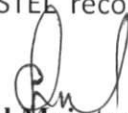
Analysis of energy consumption in VIGNAN VIHAR HOSTEL on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN VIGNAN VIHAR HOSTEL(2015-16)

S.No	MONTH	Vignan vihar Hostel(unit consumption)	Cost	Tariff
1	JULY	37488	286787	374885
2	AUGUST	39960	305694	399600
3	SEPTEMBER	41958	320978.7	419580
4	OCTOBER	35130	268744.5	351300
5	NOVEMBER	28102	214984.1	281025
6	DECEMBER	26775	204828.7	267750
7	JANUARY	37129	284040.6	371295
8	FEBRUARY	34710	265531.5	347100
9	MARCH	36964	282774.6	369640
10	APRIL	40924	313072.4	409245
11	MAY	38623	295469.7	386235
12	JUNE	22923	175360.9	229230



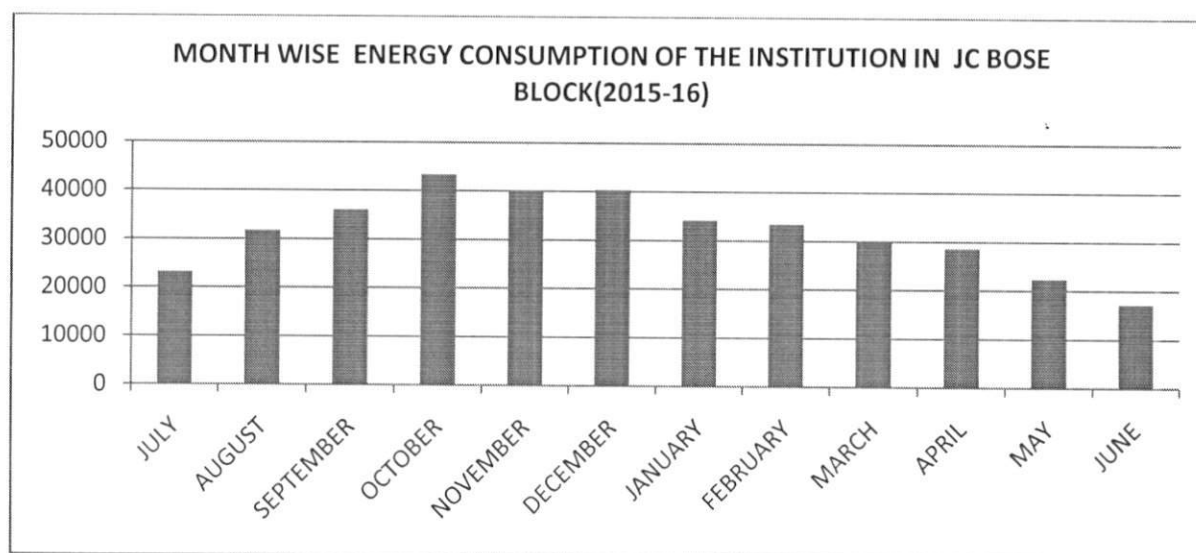
The monthly wise power consumption of the VIGNAN VIHAR HOSTEL for the duration of 2015-2016 is shown in Figure. The total annual energy consumption during 2019-20 is 420686 Kwh or units. Peak consumption is observed in the month of September with 41958 units. The average monthly consumption for VIGNAN VIHAR HOSTEL recorded is 35057 units.


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Analysis of energy consumption in JC BOSE block on monthly basis:

ENERGY CONSUMPTION OF THE INSTITUTION IN JC BOSE BLOCK(2015-16)

S.No	MONTH	Jc Bosc Block(unit consupcion)	Cost	Tariff
1	JULY	23176	177296.4	231760
2	AUGUST	31730	242734.5	317300
3	SEPTEMBER	36102	276180.3	361020
4	OCTOBER	43403	332032.9	434030
5	NOVEMBER	39970	305770.5	399700
6	DECEMBER	40363	308776.9	403630
7	JANUARY	34213	261729.4	342130
8	FEBRUARY	33492	256213.8	334920
9	MARCH	30078	230096.7	300780
10	APRIL	28560	218484	285600
11	MAY	22387	171260.5	223870
12	JUNE	17192	131524.1	171927



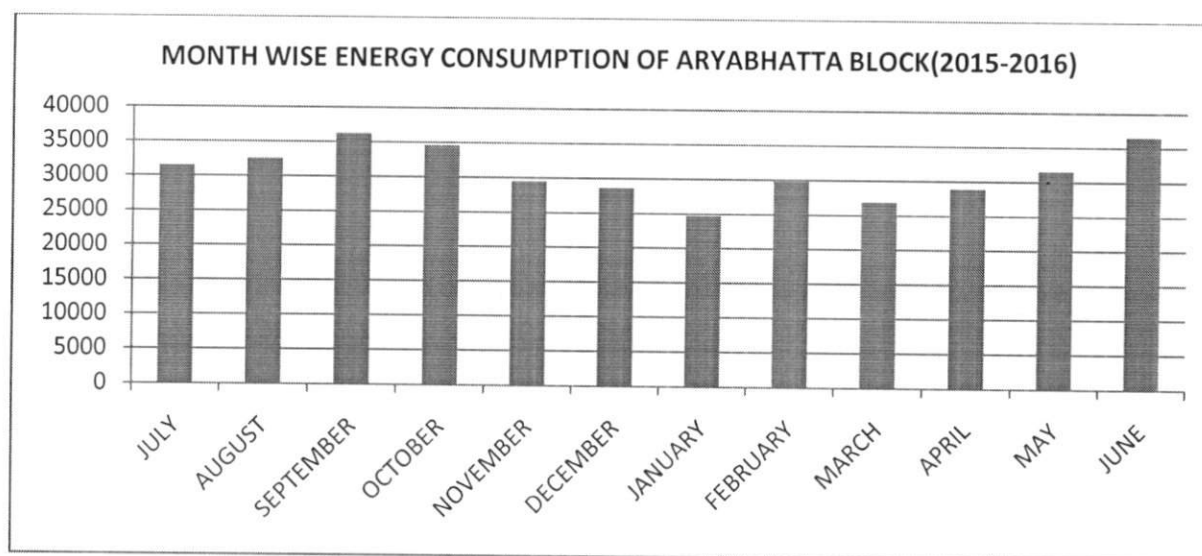
The monthly wise power consumption of the JC BOSE BLOCK for the duration of 2015-2016 is shown in Figure. The total annual energy consumption during 2019-20 is 380666 units. Peak consumption is observed in the month of October with 43403 units. The average monthly consumption for JC BOSE BLOCK recorded is 31722 units.


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Analysis of energy consumption in ARYABHATTA block on monthly basis:

**ENERGY CONSUMPTION OF THE INSTITUTION IN ARYABHATTA
BLOCK(2015-16)**

S.No	MONTH	Aryabhata Block(unit consumption)	Cost	Tariff
1	JULY	31528	241189.2	315280
2	AUGUST	32568	249145.2	325680
3	SEPTEMBER	36258	277373.7	362580
4	OCTOBER	34582	264552.3	345820
5	NOVEMBER	29568	226195.2	295680
6	DECEMBER	28658	219233.7	286580
7	JANUARY	24685	188840.25	246850
8	FEBRUARY	29846	228321.9	298460
9	MARCH	26895	205746.75	268950
10	APRIL	28954	221498.1	289540
11	MAY	31586	241632.9	315860
12	JUNE	36582	279852.3	365820

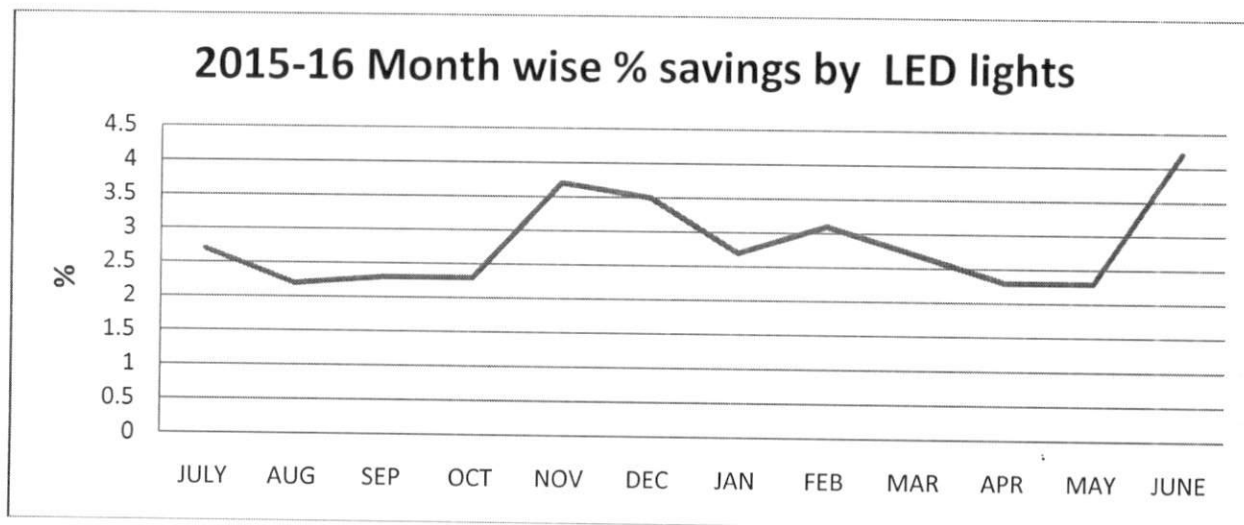


The monthly wise power consumption of the JC BOSE BLOCK for the duration of 2015-2016 is shown in Figure. The total annual energy consumption during 2019-20 is 371710 units. Peak consumption is observed in the month of June with 36582 units. The average monthly consumption for JC BOSE BLOCK recorded is 30975 units

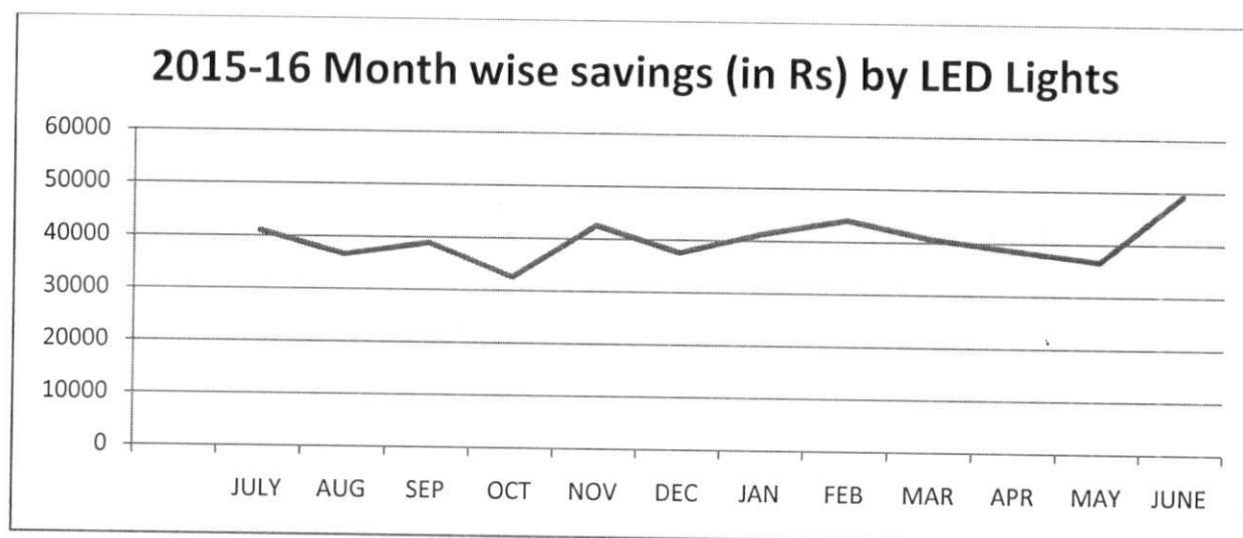
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Analysis of Energy Savings in VFSTR


Analysis of month energy savings by LED Lights



Month wise saving % in the campus for the duration of 2015-2016 is shown in Figure. The total savings of annual energy is 47972 Kwh or units. It is observed that the % savings improvement up to 4.2 % in the month of June.



Month wise saving in Rupees our campus for the duration of 2015-2016 is shown in Figure. The total amount savings is Rs 479720.


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EQUIPMENT WISE ENERGY CONSUMPTION FOR COMPUTERS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	computers	148	63	9324
2	H-Block	computers	180	63	11340
3	U-Block	computers	27.2	63	1713
4	Library	computers	16	70	1120


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EQUIPMENT WISE ENERGY CONSUMPTION FOR LIGHTS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Lights	9.791	63	616
2	H-Block	Lights	25.44	63	1602
3	U-Block	Lights	37.16	63	2341
4	Pharmacy Block	Lights	6.2	63	390
5	Library	Lights	3.565	70	249
6	Guest House	Lights	8.6	77	662
7	Boys Hostel	Lights	16.24	77	1250
8	Girls Hostel	Lights	12.3	77	947
9	Canteen	Lights	0.45	70	31


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EQUIPMENT WISE ENERGY CONSUMPTION FOR FANS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Fans	26.112	63	1645
2	H-Block	Fans	32.192	63	2028
3	U-Block	Fans	32.56	63	2051
4	Pharmacy Block	Fans	21.04	63	1325
5	Library	Fans	4.352	70	304
6	Guest House	Fans	1.76	77	135
7	Boys Hostel	Fans	32.64	77	2513
8	Girls Hostel	Fans	4.608	77	354
9	Canteen	Fans	0.384	70	26


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EQUIPMENT WISE ENERGY CONSUMPTION FOR LAB & OTHER EQUIPMENT

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Lab Equipments & Others	20	63	1260
2	H-Block	Lab Equipments & Others	28.72	63	1809
3	U-Block	Lab Equipments & Others	130.88	63	8245
4	Library	Lab Equipments & Others	1.28	70	89
5	Boys Hostel	Lab Equipments & Others	4	77	308
6	Girls Hostel	Lab Equipments & Others	2.88	77	221
7	Canteen	Lab Equipments & Others	3.68	70	257


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EQUIPMENT WISE ENERGY CONSUMPTION FOR PRINTER

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	printer	7.56	63	476
2	H-Block	printer	4.032	63	254
3	U-Block	printer	6.048	63	381
4	Pharmacy Block	printer	0.63	63	39
5	Library	printer	0.63	70	44
6	Guest House	printer	0.63	77	48
7	Boys Hostel	printer	0.63	77	48
8	Girls Hostel	printer	0.63	77	48


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EQUIPMENT WISE ENERGY CONSUMPTION FOR REFRIGERATOR&PUMPS

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW/hr)
1	A-Block	Refrigerators & Water Pumps	13.2	168	2217
2	H-Block	Refrigerators & Water Pumps	18.32	168	3077
3	U-Block	Refrigerators & Water Pumps	2.88	168	483
5	Library	Refrigerators & Water Pumps	1.28	168	215
6	Guest House	Refrigerators & Water Pumps	4.16	168	698
7	Boys Hostel	Refrigerators & Water Pumps	28.64	168	4811
8	Girls Hostel	Refrigerators & Water Pumps	8.8	168	1478
9	Canteen	Refrigerators & Water Pumps	2.6	168	436


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EQUIPMENT WISE ENERGY CONSUMPTION LCD PROJECTOR

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kWhr)
1	A-Block	LCD projectors	6.3392	42	266
2	H-Block	LCD projectors	5.8864	42	247
3	U-Block	LCD projectors	6.792	42	285
4	Pharmacy Block	LCD projectors	2.4904	42	104
5	Library	LCD projectors	0.4528	42	19


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EQUIPMENT WISE ENERGY CONSUMPTION FOR XEROX MACHINE

S.No	Block	Equipment	Total load(kW)	Running hours per week	Unit consumption per week(kW hr)
1	A-Block	Xerox Machines	1.26	70	88
2	H-Block	Xerox Machines	0.63	70	44
3	U-Block	Xerox Machines	0.63	70	44
4	Pharmacy Block	Xerox Machines	0.63	70	44
7	Boys Hostel	Xerox Machines	0.63	70	44
8	Girls Hostel	Xerox Machines	0.63	70	44


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