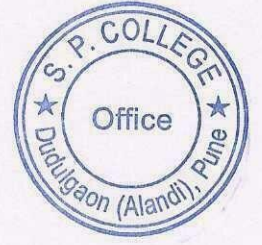


ENERGY AUDIT REPORT

of

Shri Gajanan Maharaj Shikshan Prasarak Mandal's,
SHARADCHANDRA PAWAR ARTS AND COMMERCE COLLEGE,
Alandi Devachi (Dudulgaon), Tal. Khed, Dist. Pune 412105.



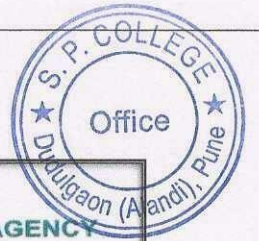
Year: 2018-19

Prepared by

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society,
Near Muktagan English School, Parvati, Pune 411009
Phone: 09890444795 Email: enrichcons@gmail.com





MAHARASHTRA ENERGY DEVELOPMENT AGENCY



Maharashtra Energy Development Agency

(A Government of Maharashtra undertaking)
2nd Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006,
Ph No: 020-26614393/266144403
Email: eee@mahaurja.com, Web: www.mahaurja.com

ECN/2018-19/CR-05/4174

19th September, 2018

**CERTIFICATE OF REGISTRATION
FOR CLASS 'A'**

We hereby certify that, the firm having following particulars is registered with **MAHARASHTRA ENERGY DEVELOPMENT AGENCY (MEDA)** under given category as "Energy Planner & Energy Auditor" in Maharashtra for Energy Conservation Programme of MEDA.

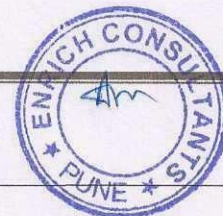
Name and Address of the firm : **Enrich Consultants**
Yashashree, Plot No. 26, Nirmal Bag Society,
Near Mukhtangan English School,
Parvati, Pune - 411009.

Registration Category : Empanelled *Consultant for Energy Conservation Programme*

Registration Number : **MEDA/ECN/CR-05/2018-19/EA-03**

- Energy Conservation Programme intends to identify areas where wasteful use of energy occurs and to evaluate the scope for Energy Conservation and take concrete steps to achieve the evaluated energy savings.
- MEDA reserves the right to visit the firm at any time without giving any prior information and canceling the registration, if the information is found incorrect.
- This empanelment is valid till **31st March 2021** from the date of registration, to carry out energy audits under the Energy Conservation Programme.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.


(Smita Kudarikar)
General Manager (EC)





Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Muktang English School, Parvati, Pune 411 009
Tel: 09890444795 Email: enrichcons@gmail.com

Ref: EC/SGMSPMSPACC /18-19/01

Date: 13/5/2019

CERTIFICATE

This is to certify that we have conducted Energy Audit at Shri Gajanan Maharaj Shikshan Prasarak Mandal's Sharadchandra Pawar Arts and Commerce College, Alandi Devachi (Dudulgaon), Tal. Khed, Dist. Pune-412105 in the year 2018-19.

The College has adopted following Energy Efficient Practices:

- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

For Enrich Consultants,

A Y Mehendale,
Certified Energy Auditor
EA-8192

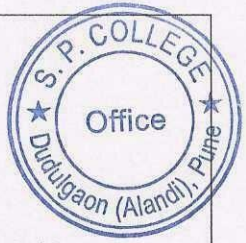




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3	Study of Electrical Energy Consumption	10
4	Carbon Foot printing	12
5	Study of Usage of Alternate Energy	14
6	Study of Usage of LED Lights	15



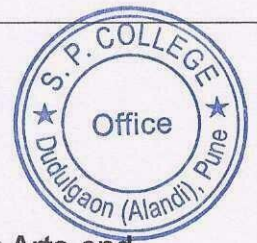


ACKNOWLEDGEMENT

We Enrich Consultants, Pune, express our sincere gratitude to the management of Shri Gajanan Maharaj Shikshan Prasarak Mandal's Sharadchandra Pawar Arts and Commerce College, Alandi Devachi (Dudulgaon), Tal. Khed, Dist. Pune-412105, for awarding us the assignment of Energy Audit of their Dudulgaon campus for the Year: 18-19.

We are thankful to all staff members for helping us during the field study.





EXECUTIVE SUMMARY

1. Shri Gajanan Maharaj Shikshan Prasarak Mandal's Sharadchandra Pawar Arts and Commerce College, Alandi Devachi (Dudulgaon), Tal. Khed, Dist. Pune 412105 consumes Energy in the form of **Electrical Energy**; used for various gadgets, Office & other facilities.

2. Energy Consumed & CO₂ Emission:

No	Parameter	Energy Consumed, kWh	CO ₂ emissions, MT
1	Total	9327	7.46
2	Maximum	1158	0.93
3	Minimum	512	0.41
4	Average	777.25	0.62

3. Various Measures Adopted for Energy Conservation:

- Usage of Energy Efficient LED fittings
- Maximum Usage of Day Lighting

4. Usage of Alternate Energy Source:

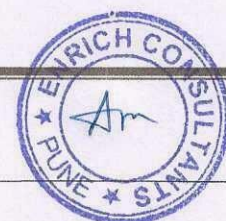
- The College is in process of installation of **2.5 kWp** Roof Top Solar PV Plant.
- The % of Annual Power requirement met by Alternate Energy is nil

5. Usage of LED Lighting to Total Lighting Load:

- The LED Lighting Load is **1.472 kW**.
- The Total Lighting Load is **2.472 kW**.
- The percentage of LED Lighting Total Lighting load works out to be **60 %**

6. Assumption:

- 1 kWh (Unit) of Electrical Energy releases **0.8 Kg** of CO₂ into atmosphere





ABBREVIATIONS

AC	:	Air conditioner
SGMSPM	:	Shri Gajanan Maharaj Shikshan Prasarak Mandal
FTL	:	Fluorescent Tube Light
LED	:	Light Emitting Diode
kWh	:	kilo-Watt Hour
Qty	:	Quantity
W	:	Watt
kW	:	Kilo Watt
PC	:	Personal Computer
MT	:	Metric Ton
MSEDCL	:	Maharashtra State Electricity Distribution Company Limited





CHAPTER-I INTRODUCTION

1.1 Objectives:

1. To study Connected Load and Present Energy Consumption
2. To Study CO₂ emissions
3. To study Scope for usage of Alternate / Renewable Energy
4. To study usage of LED Lighting

1.2 Table No-1: General Details of College:

No	Head	Particulars
1	Name	Shri Gajanan Maharaj Shikshan Prasarak Mandal's Sharadchandra Pawar Arts and Commerce College
2	Address	Alandi Devachi (Dudulgaon), Tal. Khed, Dist. Pune 412 105
3	Year of Establishment	2002
3	Affiliation	Savitribai Phule Pune University





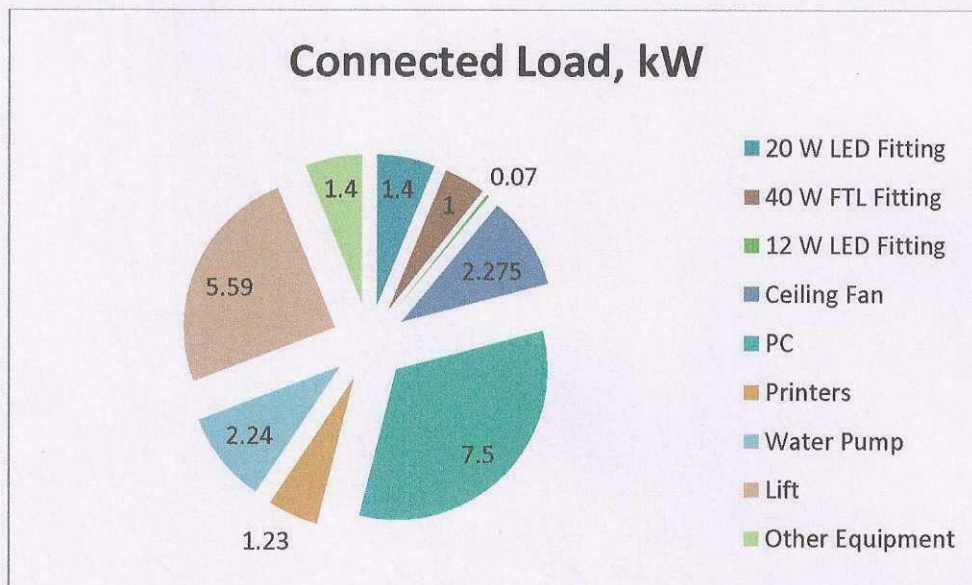
CHAPTER-II STUDY OF CONNECTED LOAD

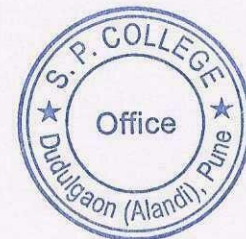
In this chapter, we present the details of various Electrical loads as under

Table No 2: Study of Equipment wise Connected Load:

No	Equipment	Qty	Load, W/unit	Load, kW
1	20 W LED Fitting	70	20	1.4
2	40 W FTL Fitting	25	40	1
3	12 W LED Fitting	6	12	0.07
4	Ceiling Fan	35	65	2.275
5	PC	50	150	7.5
6	Printers	7	175	1.23
7	Water Pump	1	2238	2.24
8	Lift	1	5595	5.60
9	Other Equipment	7	200	1.4
10	Total			23

Chart No 1: Details of Connected Load:





CHAPTER-III STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Energy Consumed

Table No 3: Electrical Energy Consumed: 18-19:

No	Month	Energy Consumed, kWh
1	Apr-18	602
2	May-18	750
3	Jun-18	512
4	Jul-18	831
5	Aug-18	620
6	Sep-18	833
7	Oct-18	1090
8	Nov-18	787
9	Dec-18	615
10	Jan-19	716
11	Feb-19	813
12	Mar-19	1158
13	Total	9327
14	Maximum	1158
15	Minimum	512
16	Average	777.25

Chart No 2: To study the variation of Month wise Energy Consumed, kWh:

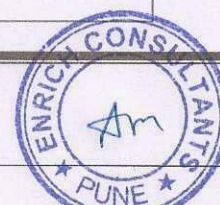
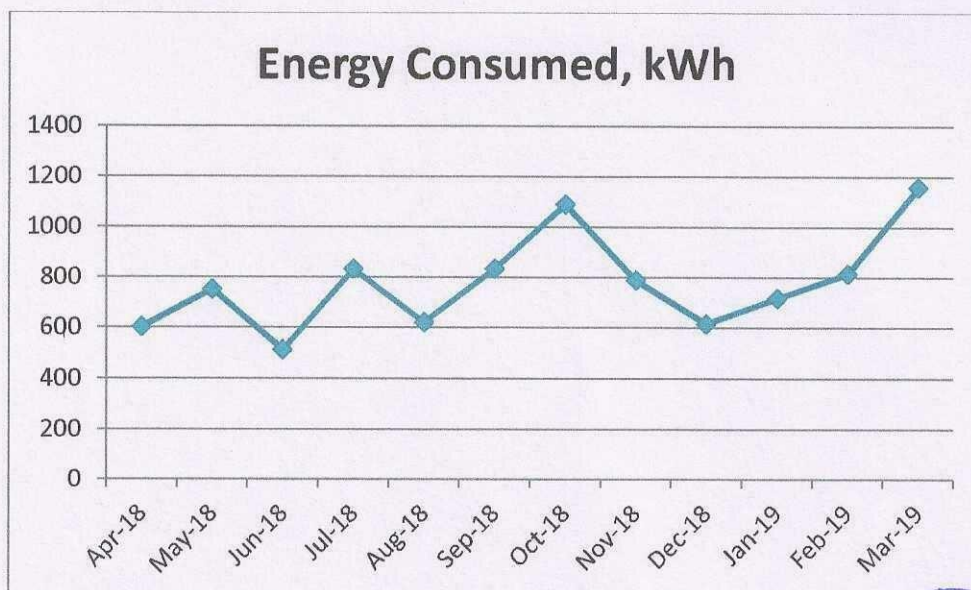
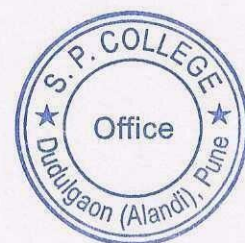




Table No 4: Important parameters:

No	Parameter	Energy Consumed, kWh
1	Total	9327
2	Maximum	1158
3	Minimum	512
4	Average	777.25





CHAPTER-IV

CARBON FOOT PRINTING

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the College for performing its day to day activities

The College uses Electrical Energy for various Electrical gadgets.

Basis for computation of CO₂ Emissions:

The basis of Calculation for CO₂ emissions due to Electrical Energy are: 1 Unit (kWh) of Electrical Energy releases **0.8 Kg of CO₂** into atmosphere

Based on the above Data we compute the CO₂ emissions which are being released in to the atmosphere by the College due to its Day to Day operations

Table No 5: Month wise CO₂ Emissions:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Apr-18	602	0.48
2	May-18	750	0.60
3	Jun-18	512	0.41
4	Jul-18	831	0.66
5	Aug-18	620	0.50
6	Sep-18	833	0.67
7	Oct-18	1090	0.87
8	Nov-18	787	0.63
9	Dec-18	615	0.49
10	Jan-19	716	0.57
11	Feb-19	813	0.65
12	Mar-19	1158	0.93
13	Total	9327	7.46
14	Maximum	1158	0.93
15	Minimum	512	0.41
16	Average	777.25	0.62



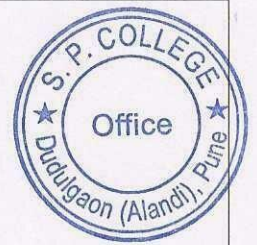


Chart No 3: Representation of Month wise CO₂ Emissions:

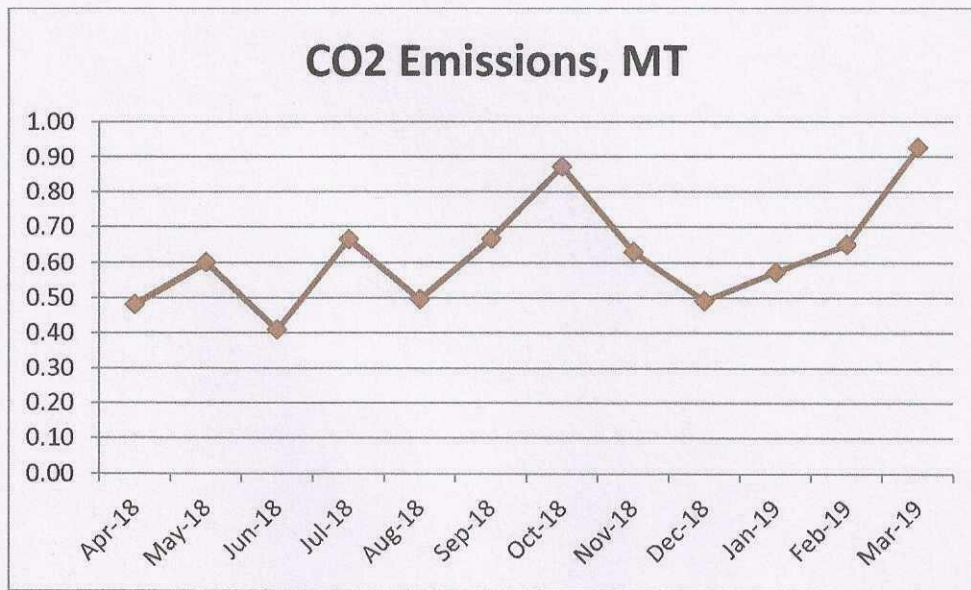


Table No 6: Key observations:

No	Parameter	Energy consumed, kWh	CO ₂ Emissions, MT
1	Total	9327	7.46
2	Maximum	1158	0.93
3	Minimum	512	0.41
4	Average	777.25	0.62





CHAPTER-V

STUDY OF USAGE OF ALTERNATE ENERGY

- The College has yet to install Roof top Solar PV Plant.
- As on Date the percentage of Annual Power requirement by Alternate Energy is nil.



CHAPTER-VI STUDY OF USAGE OF LED LIGHTS

In the following Table, we present the percentage of usage of LED lights to Total Lighting Load.

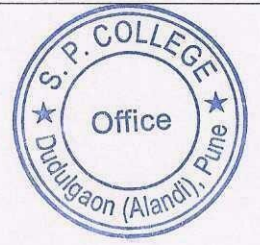
Table No 7: Study of % LED Lighting Load to Total Lighting Load:

No	Particulars	Value	Unit
1	Qty of 20 W LED Fittings	70	Nos
2	Load per Unit of 20 W LED Fitting	20	W/Unit
3	Total Load of 20 W LED Fittings	1.4	kW
4	Qty of 40 W FTL Fittings	25	Nos
5	Load per Unit of 40 W FTL Fitting	40	W/Unit
6	Total Load of 40 W FTL Fittings	1	kW
7	Qty of 12 W LED Fittings	6	Nos
8	Load per Unit of 12 W LED Fitting	12	W/Unit
9	Total Load of 12 W LED Fittings	0.072	kW
10	Total LED Lighting Load=3+6	1.472	kW
11	Total Lighting Load=3+6+9	2.472	kW
12	% of Total Lighting Load met by LEDs= $10 \times 100 / 11$	60	%



Principal
PRINCIPAL
Sharadchandra Pawar Arts & Commerce College
Dudulgaon (Alandi), Pune





GREEN AUDIT REPORT

of

Shri Gajanan Maharaj Shikshan Prasarak Mandal's,
SHARADCHANDRA PAWAR ARTS AND COMMERCE COLLEGE,
Alandi Devachi (Dudulgaon), Tal. Khed, Dist. Pune 412105.

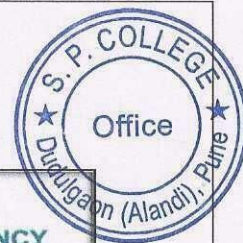
Year: 2018-19

Prepared by

ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society
Near Mukhtangan English School, Parvati, Pune 411009
Phone: 09890444795 Email: enrichcons@gmail.com





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Maharashtra Energy Development Agency

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Ph No: 020-26614393/266144403

Email: eee@mahaurja.com, Web: www.mahaurja.com

ECN/2018-19/CR-05/4174

19th September, 2018

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FOR CLASS 'A'**

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(Smita Kudarikar)
General Manager (EC)





Enrich Consultants

Yashashree, 26, Nirmal Bag Society,
Near Mukangan English School, Parvati, Pune 411 009
Tel: 020-24220747 Email: enrichcons@gmail.com

Ref: EC/ SGMSPMSPACC/18-19/02

Date: 13/5/2019

CERTIFICATE

This is to certify that we have conducted Green Audit at Shri Gajanan Maharaj Shikshan Prasarak Mandal's Sharadchandra Pawar Arts and Commerce College, Alandi Devachi (Dudulgaon), Tal. Khed, Dist.Pune -412105 in the year 2018-19.

The College has adopted following Green Practices:

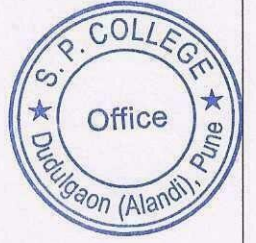
- Usage of Energy Efficient LED Fittings
- Segregation of Waste at source
- Installation of Rain Water Management Project
- Maintenance of Good Internal Road
- Tree Plantation in the campus

We appreciate the support of Management, involvement of faculty members and students in the process of Energy Conservation & making the campus Green.

For Enrich Consultants,

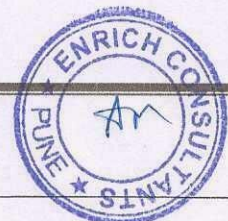
A Y Mehendale,
Certified Energy Auditor, EA-8192

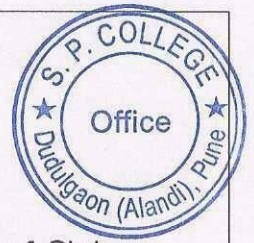




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4	Study of Usage of Renewable Energy	13
5	Study of Waste Management	14
6	Study of Rain Water Management	15
7	Study of Green Practices	16



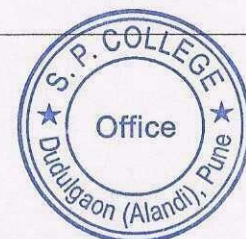


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We are thankful to all staff members for helping us during the field study.





EXECUTIVE SUMMARY

1. **Shri Gajanan Maharaj Shikshan Prasarak Mandal's Sharadchandra Pawar Arts and Commerce College, Alandi Devachi (Dudulgaon), Tal. Khed, Dist. Pune 412105** consumes Energy in the form of **Electrical Energy**; used for various gadgets, Office & other facilities.

2. Energy Consumed and CO₂ Emission:

No	Parameter	Energy Consumed, kWh	CO ₂ emissions, MT
1	Total	9327	7.46
2	Maximum	1158	0.93
3	Minimum	512	0.41
4	Average	777.25	0.62

3. Various Measures Adopted for Energy Conservation:

- Usage of Energy Efficient LED fittings
- Maximum Usage of Day Lighting

4. Usage of Renewable Energy Source:

- The College has yet to install Roof Top Solar PV Plant.

5. Waste Management:

5.1 Segregation of Waste at Source:

The Waste is segregated at source and the recyclable waste like Paper waste, Plastic Waste is handed over to authorized agency.

5.2 Organic Waste Management:

It is recommended to compost the organic waste like leafy and canteen waste.

6. Rain Water Management:

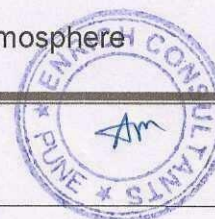
The College has installed Rainwater Management Project. The rain water falling on the terrace is collected through pipes and is used to increase the underground water table.

7. Green Practices:

- Good Internal Roads
- Internal Tree Plantation

8. Assumption:

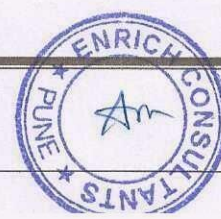
- 1 kWh (Unit) of Electrical Energy releases **0.8 Kg of CO₂** into atmosphere





ABBREVIATIONS

SGMSPM : Shri Gajanan Maharaj Shikshan Prasarak Mandal
LED : Light Emitting Diode
kWh : kilo-Watt Hour
MT : Metric Ton
CO₂ : Carbon Di Oxide





CHAPTER-I INTRODUCTION

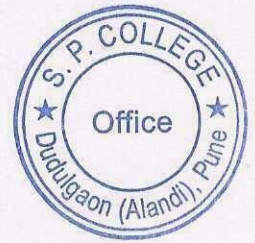
1.1 Objectives:

1. To study present Energy Consumption
2. To Study the present CO₂ emissions
3. To study Usage of Renewable Energy
4. To study Waste Management practices
5. To study Green & Sustainable Practices

1.2 Table No-1: General Details of College:

No	Head	Particulars
1	Name	Shri Gajanan Maharaj Shikshan Prasarak Mandal's Sharadchandra Pawar Arts and Commerce College
2	Address	Alandi Devachi (Dudulgaon), Tal. Khed, Dist. Pune 412 105
3	Year of Establishment	2002
3	Affiliation	Savitribai Phule Pune University





CHAPTER-II STUDY OF PRESENT ENERGY CONSUMPTION

In this chapter, we present the analysis of last year Electricity Energy Consumption
Table No 2: Electrical Energy Purchase Analysis- 18-19:

No	Month	Energy Consumed, kWh
1	Apr-18	602
2	May-18	750
3	Jun-18	512
4	Jul-18	831
5	Aug-18	620
6	Sep-18	833
7	Oct-18	1090
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10	Jan-19	716
11	Feb-19	813
12	Mar-19	1158
13	Total	9327
14	Maximum	1158
15	Minimum	512
16	Average	777.25

Chart No 1: To study the variation of Month wise Energy Consumed, kWh:

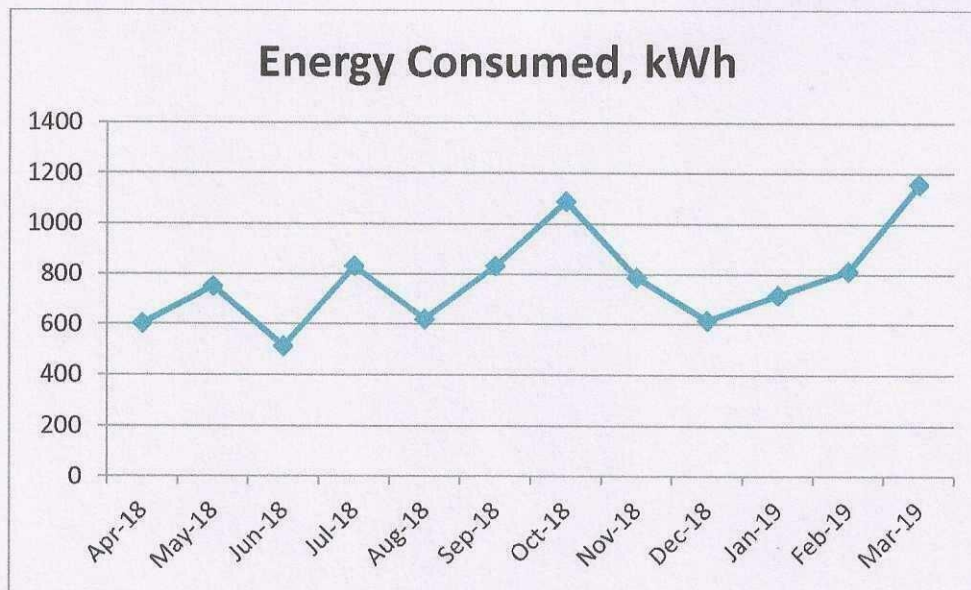
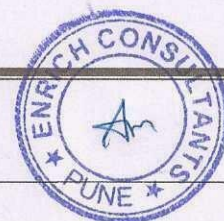
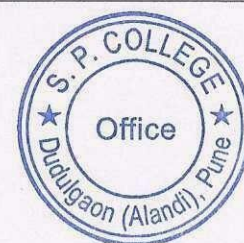




Table No 3: Important parameters:

No	Parameter	Energy consumed, kWh
1	Total	9327
2	Maximum	1158
3	Minimum	512
4	Average	777.25





CHAPTER-III

CARBON FOOT PRINTING

A Carbon Foot print is defined as the Total Greenhouse Gas emissions, emitted due to various activities.

In this we compute the emissions of Carbon-Di-Oxide, by usage of the various forms of Energy used by the College for performing its day to day activities

The College uses Electrical Energy for various Electrical gadgets.

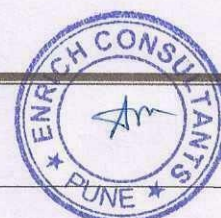
Basis for computation of CO₂ Emissions:

The basis of Calculation for CO₂ emissions due to Electrical Energy are: 1 Unit (kWh) of Electrical Energy releases 0.8 Kg of CO₂ into atmosphere.

Based on the above Data we compute the CO₂ emissions which are being released in to the atmosphere by the College due to its Day to Day operations

Table No 4: Month wise CO₂ Emissions:

No	Month	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Apr-18	602	0.48
2	May-18	750	0.60
3	Jun-18	512	0.41
4	Jul-18	831	0.66
5	Aug-18	620	0.50
6	Sep-18	833	0.67
7	Oct-18	1090	0.87
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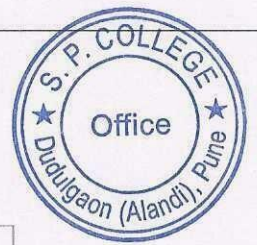


Chart No 2: Representation of Month wise CO₂ emissions:

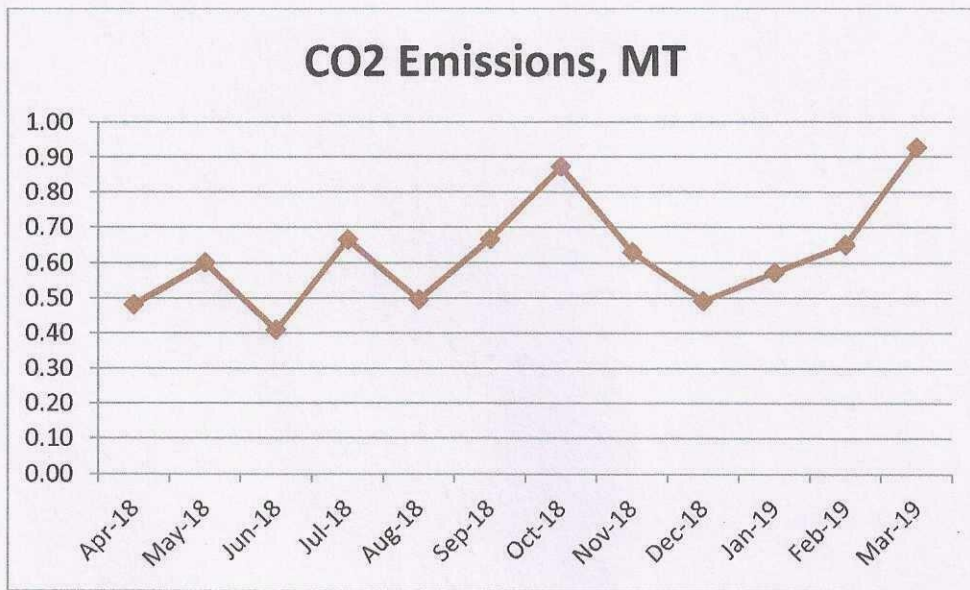


Table No 5: Key observations:

No	Parameter	Energy Consumed, kWh	CO ₂ Emissions, MT
1	Total	9327	7.46
2	Maximum	1158	0.93
3	Minimum	512	0.41
4	Average	777.25	0.62

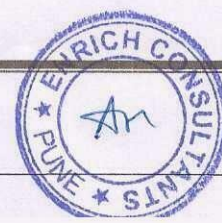




CHAPTER-IV

STUDY OF USAGE OF RENEWABLE ENERGY

The College has yet to install Roof top Solar PV Plant.





CHAPTER-V STUDY OF WASTE MANAGEMENT

5.1 Segregation of Waste at Source:

The Waste is segregated at source. Waste bins are located at various locations

Photograph of Waste Collection Bin:



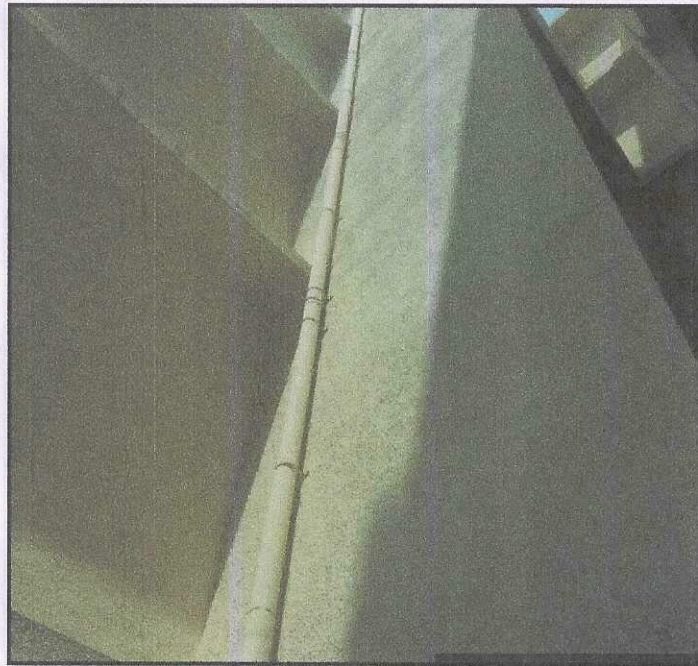


CHAPTER-VI

STUDY OF RAIN WATER MANAGEMENT

The College has implemented the Rain Water Management Project. The College has installed Pipes from the terrace and the Rain water falling on the terrace is gathered and is used to increase the underground water table.

Photograph of Rain Water Carrying Pipe:



CHAPTER-VII STUDY OF GREEN PRACTICES

7.1 Pedestrian Friendly Roads:

The College has well maintained pedestrian road as to facilitate the easy movement of the students within the campus.

Photograph of Road within campus:



7.2 Internal Tree Plantation:

The College has well maintained Tree Plantation.

Photograph of Tree Plantation:



Principal
PRINCIPAL
Sharadchandra Pawar Arts & Commerce College
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