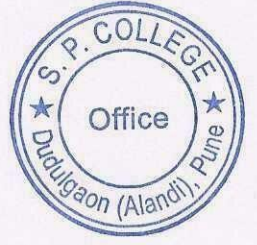


# ENERGY AUDIT REPORT

of

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



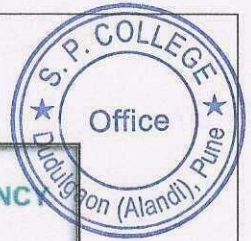
Year: 2017-18

Prepared by

## **Enrich Consultants**

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





MAHARASHTRA ENERGY DEVELOPMENT AGENCY



## Maharashtra Energy Development Agency

(A Government of Maharashtra undertaking)

2<sup>nd</sup> Floor, MHADA Commercial Complex, Opp. Tridal Nagar, Yerwada, Pune 411 006

Ph No: 020-26614393/266144403, Fax No: 020-26615031

Email: [econ@mahaurja.com](mailto:econ@mahaurja.com), Web: [www.mahaurja.com](http://www.mahaurja.com)

ECN/2017-18/CR-01/5726

30<sup>th</sup> November 2017

### CERTIFICATE OF REGISTRATION FOR CLASS 'A'

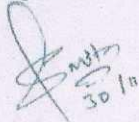
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Yashashree, Plot No. 26, Nirmal Baug  
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- This empanelment is valid upto **3 year** from the date of registration, to carry out energy audits under the Save Energy Programme of MEDA.
- The Director General, MEDA reserves the right to cancel the registration at any time without assigning any reasons thereof.

  
(Smita Kudarikar)  
Manager (EC)





# Enrich Consultants

Yashashree, 26, Nirmal Bag Society,  
Near Muktangan English School, Parvati, Pune 411 009  
Tel: 09890444795 Email: [enrichcons@gmail.com](mailto:enrichcons@gmail.com)

Ref: EC/SGMSPMSPACC/17-18/01

Date: 16/5/2018

## CERTIFICATE

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The College has adopted following Energy Efficient Practices:

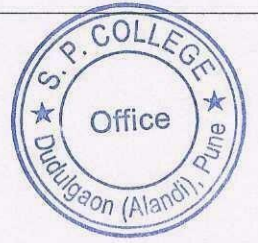
- Usage of Energy Efficient LED Fittings
- Maximum usage of Day Lighting

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

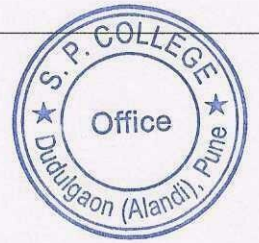




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5	Study of Usage of Alternate Energy	14
6	Study of Usage of LED Lights	15



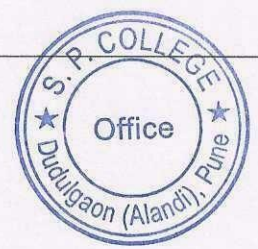


## **ACKNOWLEDGEMENT**

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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 & CO<sub>2</sub> Emission:

No	Parameter	Energy Consumed, kWh	CO <sub>2</sub> emissions, MT
1	Total	8643	6.91
2	Maximum	983	0.79
3	Minimum	517	0.41
4	Average	720.25	0.58

### 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 has yet to install 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 1.072 kW.
- The Total Lighting Load is 3.272 kW.
- The percentage of LED Lighting Total Lighting load works out to be 33 %

### 6. Assumption:

- 1 kWh (Unit) of Electrical Energy releases 0.8 Kg of CO<sub>2</sub> into atmosphere





## ABBREVIATIONS

AC	:	Air conditioner
SGMSPM	:	Shri Gajanan Maharaj Shikshan Prasarak Mandal
BEE	:	Bureau of Energy Efficiency
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





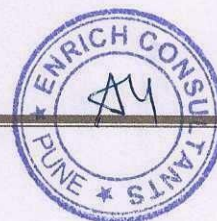
## CHAPTER-I INTRODUCTION

### 1.1 Objectives:

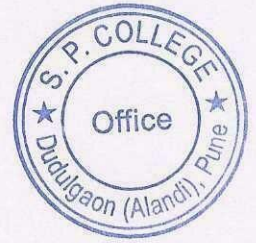
1. To study Connected Load and Present Energy Consumption
2. To Study CO<sub>2</sub> emissions
3. To study Scope for usage of Alternate / Renewable Energy
4. To study usage of LED Lighting

### 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







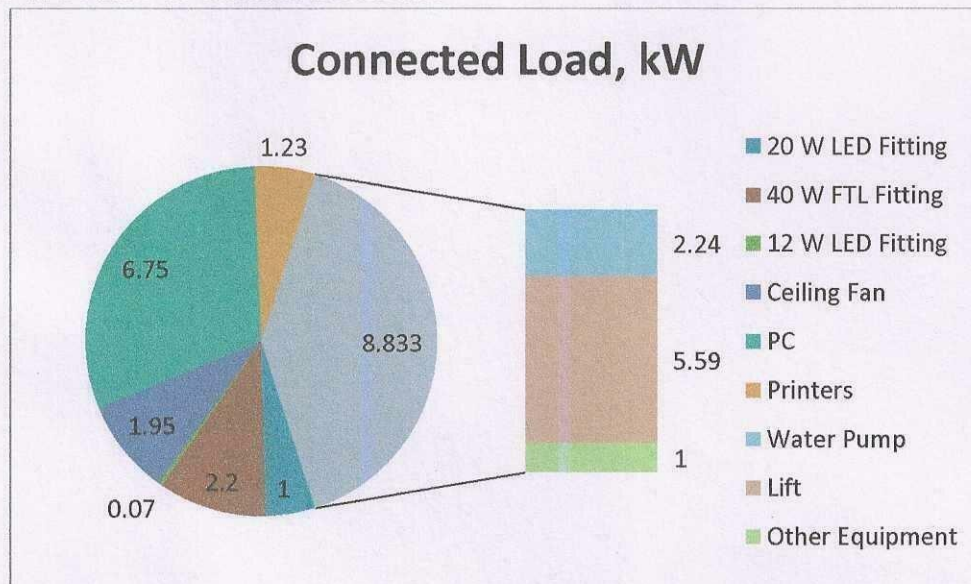
## CHAPTER-II STUDY OF CONNECTED LOAD

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	50	20	1
2	40 W FTL Fitting	55	40	2.2
3	12 W LED Fitting	6	12	0.07
4	Ceiling Fan	30	65	1.95
5	PC	45	150	6.75
6	Printers	7	175	1.23
7	Water Pump	1	2238	2.24
8	Lift	1	5595	5.60
9	Other Equipment	5	200	1
10	<b>Total</b>			<b>22</b>

**Chart No 1: Details of Connected Load:**



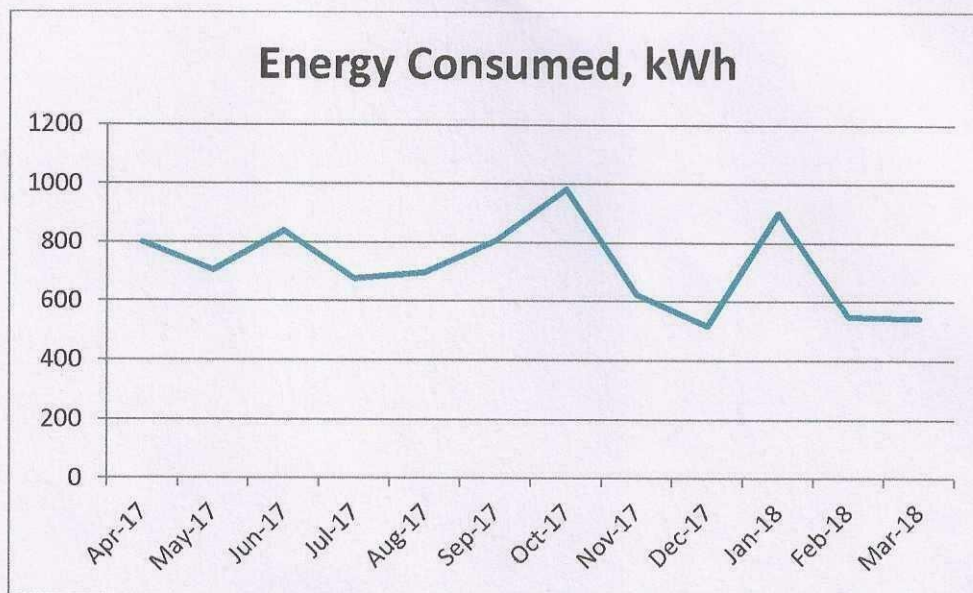


**CHAPTER-III**  
**STUDY OF PRESENT ENERGY CONSUMPTION**

In this chapter, we present the analysis of last year Electricity Energy Consumed  
**Table No 3: Electrical Energy Consumed: 17-18:**

No	Month	Energy Consumed, kWh
1	Apr-17	800
2	May-17	705
3	Jun-17	840
4	Jul-17	676
5	Aug-17	697
6	Sep-17	807
7	Oct-17	983
8	Nov-17	624
9	Dec-17	517
10	Jan-18	903
11	Feb-18	548
12	Mar-18	543
13	Total	8643
14	Maximum	983
15	Minimum	517
16	Average	720.25

**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	8643
2	Maximum	983
3	Minimum	517
4	Average	720.25





## 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 CO<sub>2</sub> Emissions:

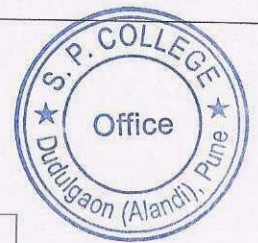
The basis of Calculation for CO<sub>2</sub> emissions due to Electrical Energy are: 1 Unit (kWh) of Electrical Energy releases 0.8 Kg of CO<sub>2</sub> into atmosphere

Based on the above Data we compute the CO<sub>2</sub> emissions which are being released in to the atmosphere by the College due to its Day to Day operations

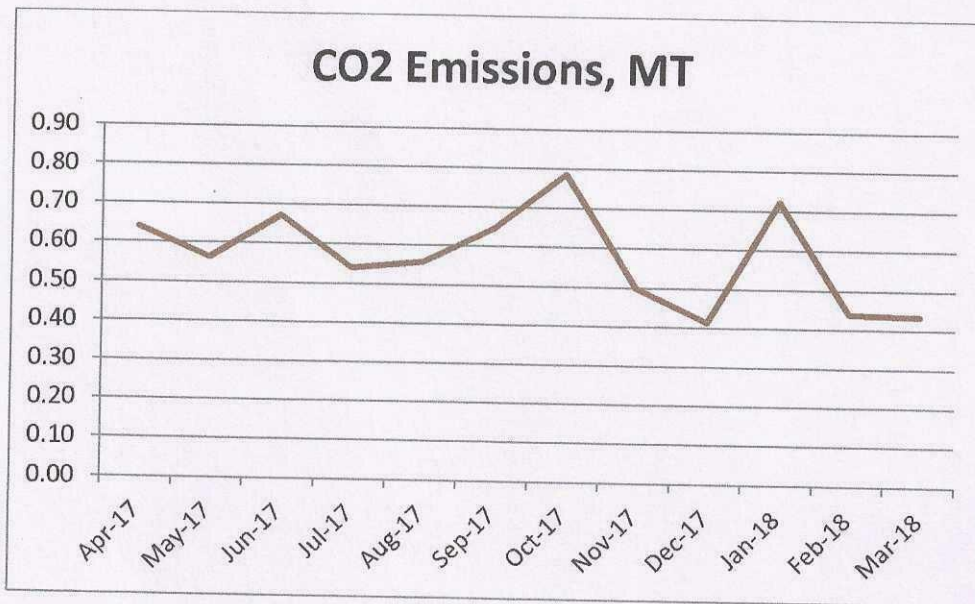
**Table No 5: Month wise CO<sub>2</sub> Emissions:**

No	Month	Energy Consumed, kWh	CO <sub>2</sub> Emissions, MT
1	Apr-17	800	0.64
2	May-17	705	0.56
3	Jun-17	840	0.67
4	Jul-17	676	0.54
5	Aug-17	697	0.56
6	Sep-17	807	0.65
7	Oct-17	983	0.79
8	Nov-17	624	0.50
9	Dec-17	517	0.41
10	Jan-18	903	0.72
11	Feb-18	548	0.44
12	Mar-18	543	0.43
13	Total	8643	6.91
14	Maximum	983	0.79
15	Minimum	517	0.41
16	Average	720.25	0.58





**Chart No 3: Representation of Month wise CO<sub>2</sub> Emissions:**



**Table No 6: Key observations:**

No	Parameter	Energy consumed, kWh	CO <sub>2</sub> Emissions, MT
1	Total	8643	6.91
2	Maximum	983	0.79
3	Minimum	517	0.41
4	Average	720.25	0.58





## **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	50	Nos
2	Load per Unit of 20 W LED Fitting	20	W/Unit
3	Total Load of 20 W LED Fittings	1	kW
4	Qty of 40 W FTL Fittings	55	Nos
5	Load per Unit of 40 W FTL Fitting	40	W/Unit
6	Total Load of 40 W FTL Fittings	2.2	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	1.072	kW
11	Total Lighting Load=3+6+9	3.272	kW
12	% of Total Lighting Load met by LEDs= $10 \times 100 / 11$	33	%



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





# GREEN AUDIT REPORT

of

Shri Gajanan Maharaj Shikshan Prasarak Mandal's,  
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Alandi Devachi (Dudulgaon), Tal. Khed, Dist.Pune 412105.

Year: 2017-18

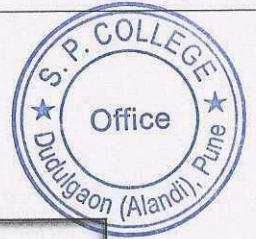
Prepared by

## ENRICH CONSULTANTS

Yashashree, 26, Nirmal Bag Society  
Near Muktangan English School, Parvati, Pune 411009  
Phone: 09890444795 Email: [enrichcons@gmail.com](mailto:enrichcons@gmail.com)







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(A Government of Maharashtra undertaking)

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ECN/2017-18/CR-01/5726

30<sup>th</sup> November 2017

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

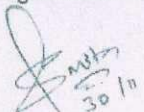
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Ref: EC/ SGMSPMSPACC/17-18/02

Date: 16/5/2018

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The College has adopted following Green Practices:

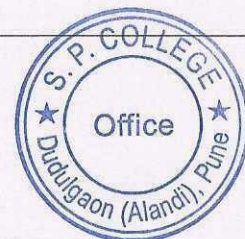
- Usage of Energy Efficient LED Fittings
- Segregation of Waste at source
- Installation of Rain Water Management Project
- Maintenance of Good Internal Road
- Tree Plantation in the campus

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





## INDEX

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

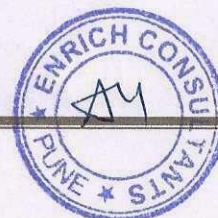




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1	Total	8643	6.91
2	Maximum	983	0.79
3	Minimum	517	0.41
4	Average	720.25	0.58

### 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 CO<sub>2</sub>** into atmosphere





## ABBREVIATIONS

SGMSPM : Shri Gajanan Maharaj Shikshan Prasarak Mandal  
LED : Light Emitting Diode  
kWh : kilo-Watt Hour  
MT : Metric Ton  
CO<sub>2</sub> : Carbon Di Oxide





## CHAPTER-I INTRODUCTION

### 1.1 Objectives:

1. To study present Energy Consumption
2. To Study the present CO<sub>2</sub> emissions
3. To study Usage of Renewable Energy
4. To study Waste Management practices
5. To study Green 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
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## CHAPTER-II

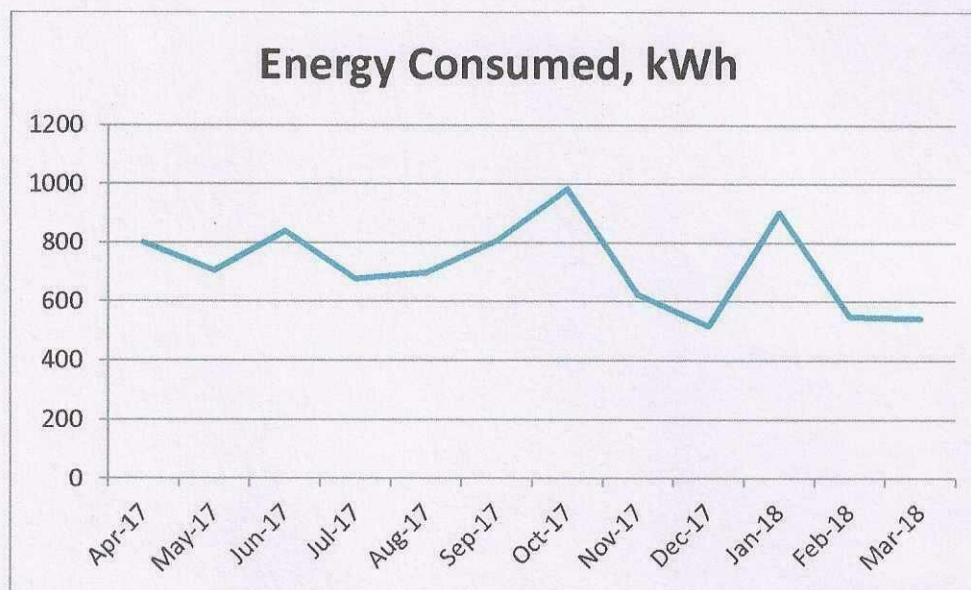
### STUDY OF PRESENT ENERGY CONSUMPTION

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

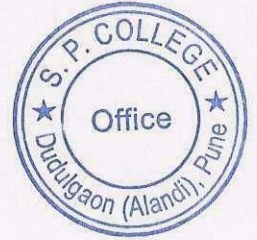
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**Chart No 1: To study the variation of Month wise Energy Consumed, kWh:**



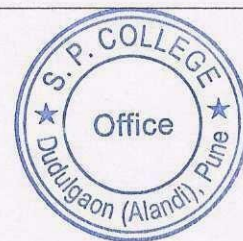




**Table No 3: Important parameters:**

No	Parameter	Energy consumed, kWh
1	Total	8643
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## CHAPTER-III CARBON FOOTPRINTING

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

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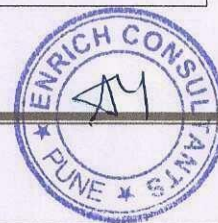
### Basis for computation of CO<sub>2</sub> Emissions:

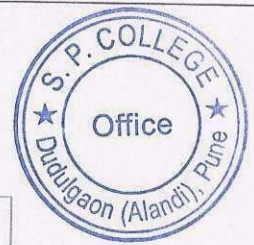
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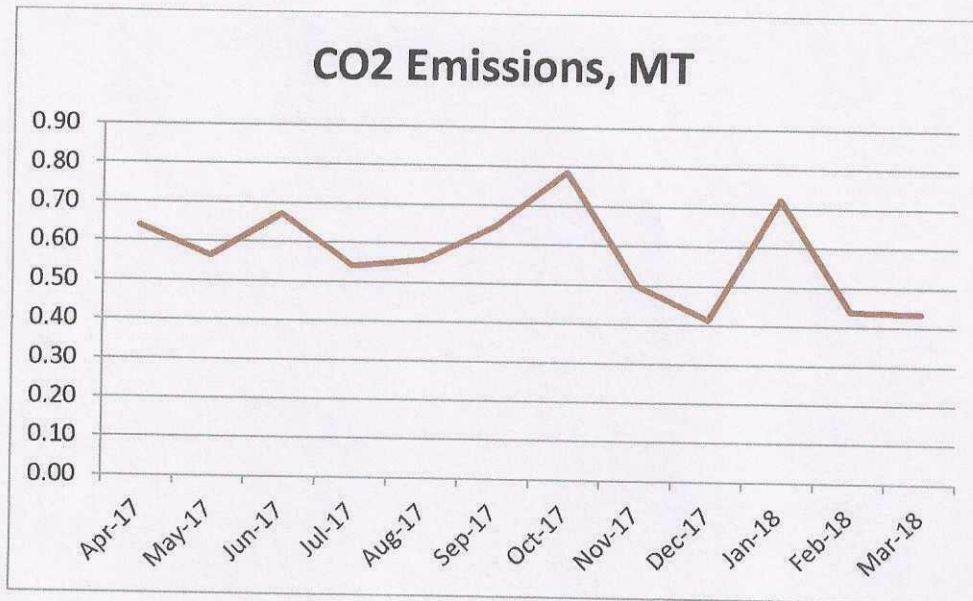
**Table No 4: Month wise CO<sub>2</sub> Emissions:**

No	Month	Energy Consumed, kWh	CO <sub>2</sub> Emissions, MT
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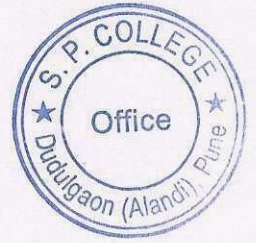
**Chart No 2: Representation of Month wise CO<sub>2</sub> emissions:**



**Table No 5: Key observations:**

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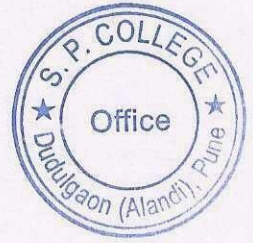


## **CHAPTER-IV**

### **STUDY OF USAGE OF RENEWABLE ENERGY**

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





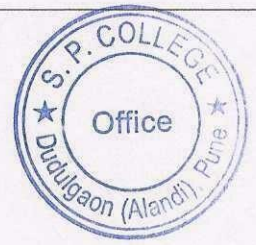
## **CHAPTER-V STUDY OF WASTE MANAGEMENT**

### **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:



*Princed*  
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