SABS ENERGY ENVIRO PVT. LTD.

Ref No : SEEPL/EGEA/21/014

Date : 03/06.2021

Certificate

This is to certify that **GRY INSTITUTE OF PHARMACY, Khargone (M.P.)** has conducted Energy Audit, Environment Audit and Green Audit in the academic year 2020 - 2021 to assess the green initiative planning, efforts, activities, implemented in the college campus like Plantation, Waste Management, Rain Water Harvesting, Plastic ban, Conservation of Energy, Energy Management and various Environmental Awareness activities. Sabs Energy Enviro Pvt Ltd has verified campus data of **GRY INSTITUTE OF PHARMACY Khargone (M.P.)** This Energy Audit, Environment Audit and Green Audit are also aimed to assess impact of green initiatives for maintenance of the campus eco-friendly.

Mr. Sanjay Singh

EA-1462

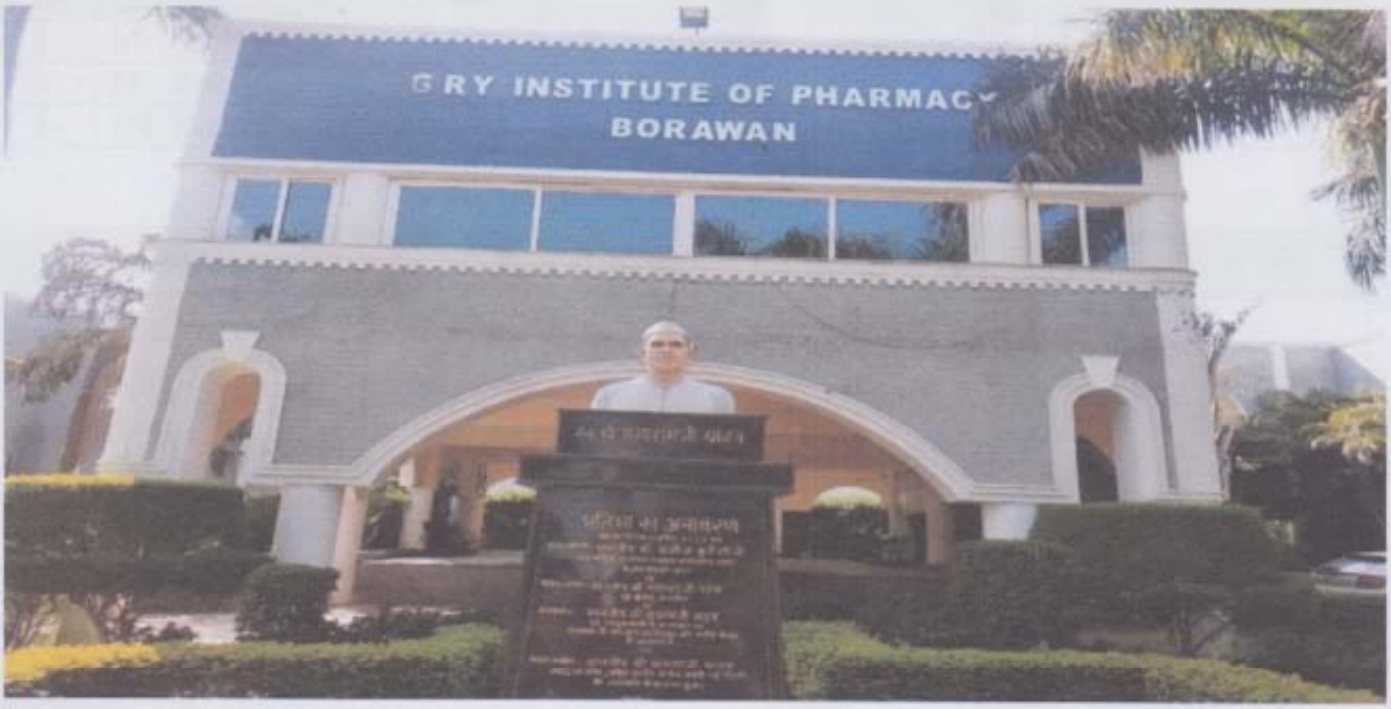
CERTIFIED ENERGY AUDITOR, BEE
Bureau of Energy efficiency
Ministry of Power Govt. of India

Save Energy save Nation

SABS ENERGY ENVIRO PVT. LTD.
WWW.SABSINDIA.COM
Works: 90/2 Abhinav Nagar Chitawad Ring Road,TinEmali, Indore
Mob. # 98260-12991, 8236088801 E-mail: sabsind@yahoo.co.in,sabsindia2018@gmail.com

ENERGY, ENVIRONMENT AND GREEN AUDIT REPORT

YEAR-2020-21



GRY Institute of Pharmacy
VindyaViharBorawan, Khargone (M.P.)

CONDUCTED BY:

ENERGY IS LIFE
BEE
CONSERVE IT

SABS ENERGY ENVIRO PVT.LTD

WE BUILDS A SOLID FOUNDATION FOR SAVING ENERGY

90/2 Abhinav Nagar, Teen Imli Square, Behind Vishesh Hospital
Indore, Madhya Pradesh -452001 India
Email Address : sabsind@yahoo.co.in , sabsindia2018@gmail.com
Contact number : 8236088801, 9826012991

Acknowledgement

SABS ENERGY ENVIRO PVT. LTD.is thankful to the **GRY INSTITUTE OF PHARMACY** for their positive support in undertaking this intricate task of Green Audit. The field studies would not have been completed on time without their interaction and timely support. We are grateful for their co-operation during field studies and provision of data for the study. The field study of this audit was carried out on May 2021.

The officials of **GRY INSTITUTE OF PHARMACY**coordinated and helped to the audit team during the field study and measurement.**SABS ENERGY ENVIRO PVT. LTD.**expresses special thanks to the following persons of GRY Institute of Pharmacy.

1	Principal	Dr. Sujit Pillai
2	Professor	Mr. Nikhlesh Birla
3	Asst. Professor	Mr. Narendra singhBhadore
4	Technician Advisor	Mr. Abhishek Yadav
5	Electrician	Mr. Rakesh Kumrawat

And all other officers, technicians and staffs for the keen interest shown in this study and the courtesy extended.
We are thankful to the management for giving us the opportunity to be involved in this very interesting and challenging project.

We would be happy to provide any further clarifications, if required, to facilitate implementation of the recommendations.

SABS ENERGY ENVIRO PVT. LTD.
Indore

SABS ENERGY ENVIRO PVT. LIMITED Date.....

MR. SANJAY SINGH
EA-1462
Certified Energy Auditor
M. Tech (Energy Management)

CHAPTER : 3
ENVIRONMENT AUDIT

AIR QUALITY AUDIT

Data/Observations

Air quality in the academic college is very significant for creating good educational atmosphere as well as for the health of the students, faculty, staff and other stake holder of the institute.College is exposed to various atmospheric pollutants from vehicles as well as by other external means of urban areas, but mainly turn proves us that vehicles may contribute to high carbon dioxide emission.

Table 2 : Air Quality Data of The Location of Past Three Months On Selected Date

Current Air Quality Index in Khargone, Madhya Pradesh 451001, India

Best Air Purifier & Mask 2021

O3	AQI 28 Good
PM2.5	AQI 86 Moderate
PM10	AQI 87 Satisfactory
Humidity	16.0 %
Barometric Pressure	1014.0 hPa
Wind Speed	8.34 m/s
Wind Direction	81.0 degrees

Source› SAFAR - India, Alandi Pune

Air Quality Alerts and Advices :

Satisfactory air quality index in **Khargone, Madhya Pradesh 451001, India**.

It may cause minor breathing discomfort to sensitive people. Healthy people may enjoy Air quality .

National ambient air quality standards

Pollutant	Satisfactory level*	Time weighted average
Sulphur dioxide (SO_2)	80 µg/m³	24 hrs
Nitrogen dioxide (NO_2)	80 µg/m³	24 hrs
Ozone (O_3)	100 µg/m³	8 hrs
Carbon Monoxide (CO)	2 mg/m³	8 hrs
Ammonia (NH_3)	400 µg/m³	24 hrs
Lead (Pb)	1 µg/m³	24 hrs
PM2.5	60 µg/m³	24 hrs
PM10	100 µg/m³	24 hrs
Benzene (C_6H_6)	5 µg/m³	Annual
Benzo Pyrene	1 ng/m³	Annual
Arsenic (As)	6 ng/m³	Annual
Nickel (Ni)	20 ng/m³	Annual

***Must comply at least 98% of the time**

2 21-09-2017 Air Pollution Monitoring in Cities, CDAC Bangalore

Finding

From the above study on air quality during these times air quality is Moderate most of the times, sometimes satisfactory and a few times good, which indicates medium pollution most of the times.

Study shows the changes in air quality due to regulatory parameters which includes Sulphur di oxide, nitrogen per oxide and particle matter.

PM10 & NH3 is **more than standard value on some of the days**. All other parameters were within permissible range air quality index inside and around the college campus was better than other parts of the city, mainly because of the greenery&also students prefer public

WATER AUDIT

Introduction

Water is a natural resource, all living matters depend on water. While freely available in many natural environments, in human settlements potable (drinkable) water is less readily available. We need to use water wisely to ensure that drinkable water is available for all,now and in the future. A small drip from a leaky tap can waste more than 180 liter of water in a day. It is therefore essential that any environmentally responsible institution should examine its water use practices. Water audit improves the knowledge and documentations of distribution system:

- It leads to reduce water losses.
- It improves financial performance.
- Efficient use of existing water.

The concerned auditor investigates the relevant method that can be adopted and improved to balance the demand and supply of water.

Observations:

Questioner for data collection

1) **What are the uses of water in college?**

Answer-Drinking, Washing,Toilet, Lab, Garden, Canteen, Hostel, Staff quarter.

2) **What are the sources of water in college?**

Answer-The main source of water isbore well and Municipality water.

3) **No. of motors used for pumping water?**

Answer- There are twopumps in college both are in working condition. One has the capacity 5 HP and other have 3 HP.

4) **Is there any water collection and recharge system?**

Answer- No, there is no water collection and recharge system for waste water coming from water cooler and taps.

5) **Is there any Wastage of water?**

Answer-No, there is no major wastage of water, 1. No leakage from Taps, 2. No wastage from over flowed tanks 3. Some wastage from water cooler.

6) **Is there any treatment plant for the lab water?**

3.C. WASTE AUDIT

Solid waste

- **Fact –**

Waste is produced by all types of routine activities carried out in the college that includes waste papers, parts of trees, leaf, poly bags plastics, glass, food products, etc.

- **Finding-**

Reduce-Reuse-Recycle is the root of sustainable development and qualitative human life with green environment, college strongly believes in this philosophy.

Reuse: Reuse of waste materials and recycling of those

Recycle: Organic waste material like parts of trees, leaf litters collected & dump in compost pits. This compost pit is in Botany Dept. This waste convert is to compost & reuse as a manure in garden for campus.

The waste papers from college centrally collected answer sheets and question papers from Autonomous Dept. Practical records collected from science laboratory.Newspapers and magazines from library, etc. The Institute has outsourced a Vendor to dispose of all the Answer Sheets, News Papers and other Paper Material. The Vendor recycle the paper as per the agreed the vendor. All paper waste given to vendors for recycling at regular intervals.

The waste is separated at each level and source. Throwing the waste anywhere is strictly prohibited. Usage of plastic bags is discouraged within the premises of the College. Dustbins are provided throughout the campus. The administrator in each building confirms that the waste in each floor is collected at selected time to time. The staff in each floor collects, clean, segregates and compiles the waste in the Green & Blue dustbins provided at each floor. The floor dustbins are covered and easily portable. Dry garbage from college campus collected by hour keeping staff from different collection point (from different lab, office, hostel.) Indore Municipal Corporation has system to collect the garbage daily from the Institute campus solid waste. The primary goal of solid waste management is reducing and eliminating adverse impacts of waste materials on human health and environment to support economic development and superior quality of life. The entire campus is duly cleaned regularly by sweepers and cleansing works.

Liquid Waste

Well-constructed drainage system leading to the IMC constructed chambers is there in place within the campus. Liquid waste is duly discharged by means of underground well laid pipe lines.

But the college does not have waste water treatment plant for waste water, generated from laboratories, canteen, hostel, Toilets.

- **Recommendations for Liquid Waste Management:** Water Treatment System should be Placed in college campus.

E-waste

E-waste: The E-waste is collected separately than the other type of waste generated in the campus. Separated E-waste is deposited in the separate box provided for the same purpose.

Fig5. Vermicomposting done in the campus for waste management

CHAPTER : 4

GREEN AUDIT

CHAPTER TREE DIVERSITY OF COLLEGECAMPUS

Objective–

The main objective of green audit is to enlist and enumerate the plant diversity of college campus. This is a continuous process and helps in maintenance and conservation of floraof campus.

This study was undertaken with following objectives –

(a) To identify the plantspecies growing in the area.

(b) To make a habit wise list along with their frequency.

(c) To generate basic data for further reference.

(d) To create awareness among students.

Methodology

Photo diversity of campus wasstudied by the investigative team.It was divided into parts. Different team visited these areas and noted name and number of plant species. This data was then cumulated and tabled.

Presentation of Data

The data was categorized on the basis of habits. There are various types of tress in the campus including neem,pipal,gulmohar,amla,aam,bargad. Grasses and sedges were innumerable so their names were mentioned.In addition to angiospermic plants, other groups were also represented for eg. algae (Diatoms, Oscillatoria, Spirogyra, Vaucheria), fungi, bryophytes (Riccia, Polytrichum, Cyathodium), Pteridophyta (Pteris), gymnosperms (Cycas, Juniperus, Araucaria,Thuja)

Result

This campusharbours a rich diversity of plants. It is an old institution \ and hence some members of natural vegetation are still present here. Some plants are introduced for avenue purpose and are combined to the road facing area.

Table 3: List of Trees

S.No	Plant Species	Specification
1	AzadirachtaindicaA. *Juss.*	
		Family-Meliaceae Hindi name-Neem English name- The Margosa Tree No. of trees - 90
2	PolyalthialongifoliaThw	
		Family-Moraceae Hindi name-Pipal English name- Ficusreligiosa No. of trees - 4

3	Delonixregia*(Boj.) Rafin*	
		**Family-Caesalpiniaceae** **Hindi name-Gulmohar** **English name-Flamboyant tree** **No. of trees - 124**
4	**Emblicaofficinalis *Gaertn.***	
		**Family-Euphorbiaceae** **Hindi name-Aola, Amla** **English name-Emblicmyrobolan** **No. of trees - 1**
5	**Magnolia Champaca**	
		**Family-Magnoliaceae** **Hindi name-Champa** **English Name- Dalbergiasissoo** **No. of trees - 1**

6	**Citrous lemon**	
		**Family- *Rutaceae*** **Hindi name-Nimbu** **English name- Lemon** **No. of trees - 7**
7	**Ficusbenghalensis*L.***	
		**Family-Moraceae** **Hindi name-Bargad, Barh** **English name- The Banyan** **No. of trees - 1**
8	**Santalum album**	
		**Family-Talaceae** **Hindi name-Chandan** **English Name- Sandalwood** **No. of trees - 38**

Table 4 : Various Types of Trees in College

S.No.	Scientitic Name	Vernacular Name	Family	Number
1	AzadirachtaIndica	Neem	Meliaceae	90
2	FicusReligiosa	Pipal	Moraceae	4
3	DelonixRegia	Gulmohar	Leguminosae	124
4	EmblicaOfficinalis	Amla	Euphobiaceae	1
5	Santalum album	Chandan	talaceae	38
6	Magnolia Champaca	Champa	Magnoliaceae	1
7	AeglaMarmelos	Belpatra	Rutaceae	1
8	PongamiaPinnata	Karanj	Fabaceae	1
9	Citrus limon	Nimbu	Rutaceae	7
10	PalmisteGargoulette	Bottle Palm	Arecaceae	8
11	AlstoniaScholaris	Saptraparni	Apocynaceae	2
12	FicusBenghalensis	Bargad	Moraceae	1
13	FicusRacemosa	Gular	Moraceae	4
14	Eucalyptus Globulus	Nilgiri	Myrtaceae	1
15	MurrayaPaniculata	Madhukamni	Rutaceae	2
16	MurrayaKoenigii	Meetha Neem	Meliaceae	1
17	ProsopisCineroria	Shami	Fabaceae	1
18	magniferaIndica	Aam	Anacardiaceae	2
19	Saracaasoca	Ashoka	Fabaceae	12
TOTAL				301

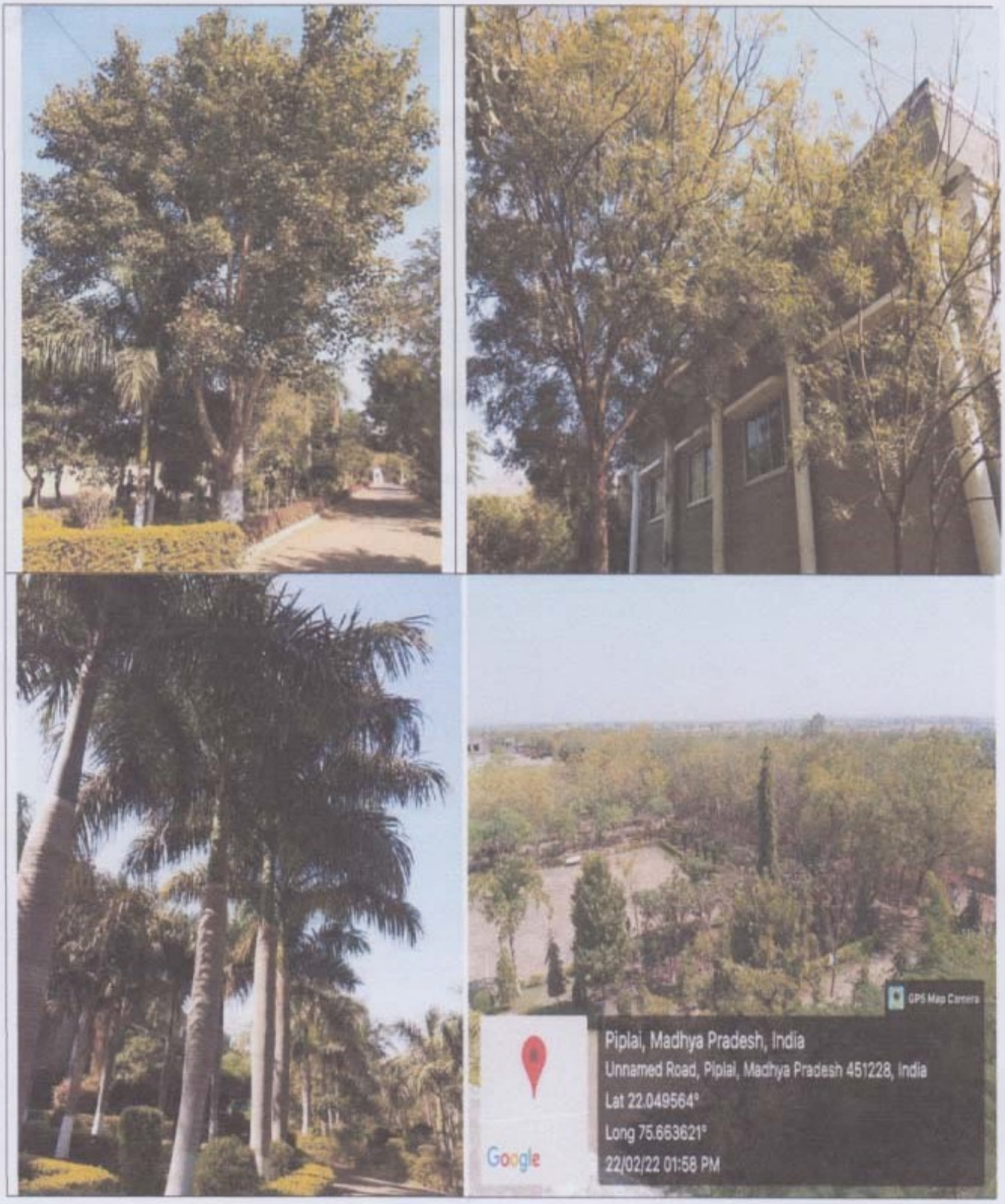


Fig: Tree diversity in the college campus

Fig 3: Tree diversity in the college campus

Other than these trees the campus hosts a long list of shrubs, Grasses. Details of which are given in following tables respectively.

CHAPTER :5
ENERGY AUDIT

Energy Audit is an effective means of establishment present efficiency levels and identifying Potential areas of improvement in energy consumption.

Energy audit of utility systems largely helps,which are given below:

- Reducing the energy consumption with resultant reduction in electricity bills.
- Audit involves data collection, data verification and detailed analysis of the data.
- The analysis leads to recommendations, which are short term (with minimum investment), medium term (with moderate investment) and long term (with capital expenditure).

The cost benefit analysis of various energy conservation proposals enables managements to take decisions regarding implementation schedules.
Here we are concerned about alternate energy as well as present use of energy.

Data/Fact

Alternate Energy initiatives such as: Solar Power Plant
Power requirement of the Institution met by the renewable energy

Table 9: Savings by Solar System installed in campus

Month	Total units consumed	Total units supplied	Units generated by 10 KW solar	Energy charges	Total bill	Per unit energy charges	Saving
	KWH	KWH	KWH	Rs	Rs	Rs	Rs
Jan 21	736.4	404.2	332.2	3443.8	14783	4.29	1426.016
Feb 21	689.0	408.8	280.2	3456	14841	4.29	1203.255
Mar 21	883.6	707.4	176.2	3456	15147	4.38	772.2516
Apr 21	1379.6	1213	166.6	7763.2	16233	2.09	348.3638
May 21	923.6	697.2	226.4	4462.08	12283	2.75	623.2231
June 21	1117.4	781.6	335.8	5002.24	12940	2.59	868.6612
July 21	1452.4	1342.6	109.8	8592.64	15812	1.84	202.0517
Aug 21	1327.2	1228.8	98.4	7864.32	13998	1.78	175.1459
Sept 21	1384.8	1268.4	116.4	8117.76	14241	1.75	204.2007
Oct 21	1913.2	1723.6	189.6	11031.04	19384	1.76	333.1695
Nov 21	898	569.2	328.8	3642.88	11388	3.13	1027.861
Dec 21	1140.2	1034	106.2	6617.6	14726	2.23	236.3245
Total Units (KWH) generated by solar			2466.6		175776	Total savings in Rs	7420.523

Fig 4: Solar panels of 10 kw