



SAUR ENGINEERS & CONSULTANTS PVT. LTD.

Registered Energy Auditor, Licensed Electrical Contractor, IE&L, Registered Electrical Contractor (A-GRADE) Channel Partner-MEDA, Govt. of Maharashtra, ISO 9001:2008, Certified Solar Grid Engineers Channel Partner-MNRE, GOI.

Detailed Report
Energy-Green-Environment Audit

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Project Beneficiary
2022-2023

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Nirmala Memorial Foundation
College of Commerce and Science

=====

90Ft Road, Thakur Complex,
Kandivali (East), Mumbai..

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Consultants & Auditor

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SAUR
Engineers & Consultants
Pvt. Ltd.

REGISTRATION NO. : EA-28

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D-8, Plot No. 108, Akshay, Rsc-16,
Gorai-1, Borivali (west), Mumbai-400092
MAHARASHTRA
+919867499812/+919168402909

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Abstract & Summary

This is to certify that Energy, Green and Environment Audits have been successfully completed by M/s. Saur Engineers & Consultants Pvt. Ltd. Empanelled Energy Auditor(CLASS-A) MEDA, Government of Maharashtra and suggestions for improvements have been given. The Audit activity has been executed for beneficiary with following Details:-

Name of Beneficiary: Nirmala Memorial Foundation College of Commerce & Science

Registration Number: NA

Address: 90Ft Road, Thakur Complex, Kandivali, Mumbai.

Contact Person: Ms. Swiddle

Contact Number: 9004693948

Date of Audit: 20/05/2022

The report is generated from data, information, answer to asked questions, standards and procedures defined by different and concerned authorities time to time, available site condition, weather condition, operational and availability conditions provided by beneficiary on the day of survey. If any changes on above said measures on any other parameters affecting these measures may lead to change, alter, in-corrections even falsifying calculations, results, recommendations and suggestions. The values, figures, amounts mentioned are indicative to the site situation and condition; it may not reflect each and every aspect of it. The report is generated restricted to given scope and available conditions and measures.

Summary:

SL No	ENCON Suggestion	Investment Rs	Saving Rs/Year	Payback Months
1	Replace TL with 20W LED Tubes	3,00,000	1,80,000	20
2	Replace Conventional Fans with BLDC Fans	10,80,000	3,10,000	42
3	Install SPV GCRT- 20Kwp	12,50,000	3,00,000	50



ENERGY AUDITOR "CLASS-A" No. EA-28
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Mumbai - 400 091.

Sign & Seal

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Registration No: EA-28

Solar rooftop and power plants | Solar and Electric Consultation | New Electric Connections
Load Management and extension | Change of Name on Bills | Meters (New, Shifting, additional)
Substation Management | Permissions, approvals, liasoning | Electrical & Safety Audits & Assessment

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**Empanelled Energy Auditor-CLASS A,
MEDA, Government of Maharashtra**

1. Introduction

1.1. Energy Audit

Energy Audit is a Basic essential activity to be done for saving in electrical billing and also allied with any energy saving projects like renewable energy project and solar projects. Energy Audit is an assessment of usage, consumption and pattern of energy used in the premises based on all above parameters along with conditions and benchmarks as resource and Building Envelope Analysis, working, operational and Maintenance Procedure Analysis, Utility Data Analysis, Load Data Analysis, Analysis of Energy Consumption, Load Evaluation, consumption pattern and billing history, back-up systems and also the administrative requirements, assessment of safety concerns, assessment of operating and occupancy schedules for Equipment, Power Quality and Environmental Parameters Analysis, Efficiency and Wastage Analysis and assessment of potential risk factors.

Energy Audit is a process of systematic identification, quantification, recording, reporting and analysis of energy usage properties of institute. It aims to analyze within and surrounding the place concerned, which will see interrelation with eco-friendly atmosphere. Energy audit is a valuable means for an Institution related to educational area to determine how and where they are connected with Energy conservation drive of nation. Understanding these conditions the institution can make plans for day to day working, future expansions as well as an eco-friendly view of life while making changes and planning for savings. It provides better understanding of impact of energy consumption on working conditions to staff and visitors. As the Energy availability is becoming an increasingly important issue for the nation, the role of higher education institute is more vital and prevalent in relation with the issue.

The rapid urbanization and economic development at local, regional and global level has led to Energy availability and quality crisis. On this background it becomes essential to adopt the system of Energy efficient and safe Campus for the institution which leads for sustainable development and at the same time persisting the quality of the same while travelling on the growth path. Moreover, it is social responsibility of a High energy consuming institution to ensure that they contribute towards the saving of Energy and thus making it available who are destitute in term of energy availability.



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1.2. Green Audit

Green Audit is a process of systematic identification, quantification, recording, reporting and analysis of components of natural diversity properties of institute. It aims to analyse within and surrounding the place concerned, in purview of relationship with natural diversity around. Green audit is a valuable means for an Institution related to educational area to determine how and what natural resources or diversity of nature they are surrounded with or they are living with. Green Audit report includes assessment of premises which refers to nature friendly environment with lesser carbon emission in terms of initiatives, implementation, best practices, working environment, capacity utilization based on all above parameters observed during green audit along with conditions and benchmarks as Air Quality, Water Quality, Noise Data, Weather Data, Tree Diversity, Faunal Diversity as well as biodiversity conditions. Understanding these conditions the institution can make plans for day to day working, future expansions as well as a nature-friendly view of life while making changes and planning for savings.

It can create consciousness and awareness about natural diversities around and helps to standardize practices for working with observation of nature friendly work style. It provides better understanding of green diversity available surrounding conditions to staff and students. As the vanishing diversity of nature is becoming an increasingly important issue for the nation as well as the world, the role of higher education institute is more vital and prevalent in relation with the issue.

The rapid urbanization and economic development at local, regional and global level has led to several greenery and ecological crisis. On this background it becomes essential to adopt the system of Green Campus for the institution which leads for sustainable development and at the same time persisting the quality of the same while travelling on the growth path. The National Assessment & Accreditation Council, New Delhi (NAAC) has made it mandatory to all Higher educational institutions should submit a Green Audit Report. Moreover, it is social responsibility of a Higher educational institution to ensure that they contribute towards the saving of Green areas and maintaining good levels of qualities for natural resources available such as Air, water, atmosphere, flora, faunal, Etc.



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1.3. Environment Audit

Environmental Audit is a process of systematic identification, quantification, recording, reporting and analysis of impact on components of environmental diversity properties of institute. It aims to analyse within and surrounding the place concerned, which will see interrelation with eco-friendly atmosphere. Environmental audit is a valuable means for an Institution related to educational area to determine how and where they are impacting on natural resources or diversity of nature. Environmental audit report includes assessment of premises which refers to impact on environment with carbon emission, wastages in terms of initiatives, implementation, best practices, working environment, capacity utilization based on all above parameters observed during Environmental audit along with conditions and benchmarks as Wastage types, recycling, Greenery, effect of impact, Carbon footprints as well as biodiversity conditions. Understanding these conditions the institution can make plans for day to day working, future expansions as well as an environment-friendly view of life while making changes and planning for savings.

It can create health consciousness, environmental awareness, practice green values and ethics. It provides better understanding of impact on surrounding conditions to staff and students. If self-enquiry is natural and necessary outgrowth of a quality education, it could also be stated that institutional self-enquiry is natural and necessary outgrowth of a quality educational institution. Thus it is imperative that the institution evaluates its own contributions towards a sustainable future. As the pollution and CO₂ is becoming an increasingly important issue for the nation, the role of higher education institute is more vital and prevalent in relation with the issue.

The rapid urbanization and economic development at local, regional and global level has led to several greenery and ecological crisis. On this background it becomes essential to adopt the system of Green Campus for the institution which leads for sustainable development and at the same time persisting the quality of the same while travelling on the growth path. The National Assessment & Accreditation Council, New Delhi (NAAC) has made it mandatory to all Higher educational institutions should submit a Environmental audit Report. Moreover, it is social responsibility of a Higher educational institution to ensure that they contribute towards the saving of environment and reduce level of quantity for impact on natural resources available.



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1.4. Objective

The Energy audit of an institution has becoming the paramount important for self-assessment of the Institution which reflects in the role of the institution in mitigation to current problem of reducing Energy availability and quality. The institution has been putting efforts to keep reducing and standardizing energy usage since its inception. Therefore the purpose of present Energy audit is to identification, quantification, recording, reporting and analysis of components of Energy utilization and electrical safety properties of institute framework of energy conservation in compliance with the applicable regulations, policies and standards. The main objectives to carrying out the energy audit are:-

- To have overview of premises
- To record and document Utility data
- To record and document Load profile data
- To record and document basic Electrical Safety observations data
- To record and document Energy Conservations (if any)

The green audit of an institution has becoming the paramount important for self-assessment of the Institution which reflects in the role of the institution in mitigation to current problem of reducing greenery and natural resources depletion. The institution has been putting efforts to keep clean and green atmosphere since its inception. Therefore the purpose of present green audit is to identification, quantification, recording, reporting and analysis of components of natural diversity properties of institute framework of Green atmosphere sustainability. The main objectives to carrying out the green audit are:-

- To record and document Air quality data
- To record and document Water quality data
- To record and document Weather/Meteorology data
- To record and document Noise Level data
- To record and document Tree Diversity data
- To record and document Faunal diversity data

The Environmental audit of an institution has becoming the paramount important for self-assessment of the Institution which reflects in the role of the institution in mitigation to current problem of reducing greenery and natural resources depletion. The institution has been putting efforts to keep clean and green atmosphere since its inception. Therefore the purpose of present Environmental audit is to identification, quantification, recording, reporting and analysis of components of surrounding environmental properties of institute framework as a part of global environment sustainability. The main objectives to carrying out the Environmental audit are:-

- To record and document Wastage type and management
- To record and document Recycling Procedures



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- To record and document Impact on environment
- To record and document Carbon footprints

1.5. Methodology

The purpose of Energy Audit of is to ensure that the practices followed in the campus are in accordance with the Energy Conservation Policy of the Country. The methodology includes: collection of data, physical inspection of the campus, observation and review of the documentation and data analysis.

The report is based on the documents obtained while on site, visual inspection and data collection carried out during the assessment period. All the measurements recorded on site are indicative loads and duties. All readings are collected for analysis and improvement planning. Cost estimates are indicative only as more detailed design and acceptance of suggestions will be required to improve the accuracy of these estimates.

The units are selected from SI (international standards) with meters, Celsius degrees, Etc.

1.6. Audit Statement

The building is adopting the “Energy Efficient Campus” system for Energy conservation and sustainability. There are main three pillars i.e. Energy saving by technology and Operation & Maintenance procedures, safe working on occupational health and performance and 100% inmates demonstrating energy efficiency literacy. The goal is to maintain safe working environment, reduce energy consumption, while creating an atmosphere where inmates can work and live healthy.



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2. Topography

2.1. Overview

SL No	Head	Details
1	Name of Applicant Institution	Nirmala Memorial Foundation College of commerce & Science
2	Address	90Ft Road, Thakur Complex, Kandivali (East) 400101
3	Contact Number	8097387080
4	Registration Certificate Number	NA
5	Sector Type	College
6	Senior Management Contact	Ms. Swiddle
7	Contact Number	9004693948
8	Status of Institution (Pvt./Public)	Private
9	Company Turnover (Rs. In Lakhs)	Not Applicable
10	Number of Employees	45-60
11	Year of Establishment	2003
12	Plot Area (ft ²)	As per given Map (Approximate 30000 ft ²)
13	No of Buildings	1
14	Building Type	RCC
15	Age of Building	20 Years
16	Leakages/Cracks on wall/roof	Minor
17	No. of workers (Footfall)	60 - 65
18	No. of Customers (Footfall)	2000
19	Day Vs Night activity in %	Only Daytime
20	Shifts per day	1
21	Hours per shift	8
22	DG Set installed	No
23	Inverter Installed	No
24	Renewable Energy System installed	No
25	(Solar/Wind/Biomass/Biofuel/Etc.)	No



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2.2. Location

SL No	Head	Details	Remark
1	Name of Institute	Nirmala Memorial Foundation College of commerce & Science	Mumbai city Limit
2	Category	College	Educational Institute
3	Address	90Ft Road, Thakur Complex, Kandivali (East) 400101	
4	State	Maharashtra	
5	Nearest Railway Station	Kandivali	Western Railway
		Kandivali (proposed)	Central Railway
6	Nearest Bus Station	Borivali	Interstate/Intrastate
7	Nearest Airport	CSIA, Mumbai	
8	Longitude	19.212716	
9	Latitude	72.865394	

2.3. Layouts

Sitemap

– Attached

Floor Map

– Attached

Google Map

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2.4. About Premises

Nirmala Memorial Foundation College of Commerce and Science, a flourishing institution affiliated to the University of Mumbai made its humble genesis in 2003, through the enlightened vision and guidance of Mr. Thakurbhai Desai.

As an institution its purpose is to impart quality education to students of all creeds in general and the Gujarati Linguistic Minority in particular. The college strives to develop the intellectual powers of students and all concerned, continuously and consistently through methods that are participative, interactive and facilitative in a measurable manner; also to train them to be responsible and worthy citizens by adopting change in its path.

The college offers a number of traditional and self-financing under graduate and post graduate courses that are affiliated to University Of Mumbai, imparting education to about 7,000 students who reside in and around this fast growing suburb. A perfect blend of dedicated and forward looking Management and committed Teaching and Non-Teaching Staff have ensured that the college is on the right trend and have steered it in the right direction.

The greatest strength of the college is that it is managed by academicians, who not only understand and respect the value of education and educationists but also believe that knowledge is power and the value of knowledge lies not in its accumulation but in its utilization.

Nirmala provides excellent infrastructure to facilitate the education process and enhance the learning ability of the students through availing amenities like:

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The eight storied building includes modern air-conditioned office blocks, well equipped classrooms, well planned corridors and 2 elevators.

Fully furnished library with large collection of books, periodicals and journals (both Indian & Foreign) and spacious reading rooms.

Air-conditioned computer labs with 150 advanced machines and licensed software.

Well organized and spacious gymkhana.

Air-conditioned auditorium hall.

The students' comfort common rooms for girls and boys.

State-of-art technology, in its teaching process making use of mike systems, LCD projectors.

Hygienic and nutritious canteen.

3. Floral Diversity

Nirmala Memorial Foundation College of commerce & Science, which was established in the year 2003, has eco-friendly environment since then. It has long legacy of healthy environmental practices periodic awareness, preservation and maintenance. As very much common in Mumbai City the college campus is limited to its plot premises hence having no scope for plantation within. College practices awareness camps, seminars and trails to fulfil the backlog.

4. Faunal Diversity

The college campus as very much common in Mumbai City the college is limited to its plot premises hence having no scope for plantation within. Since there is negligible plantation within and surrounding of College campus there are very less animal species were observed in including invertebrates and vertebrates (different groups like Beetle, Moth, Bug, Bird, Ant, Spider, Wasp, Millipede, Slug, Louse, Earthworm, Snail, Butterfly, Dragonfly, Grasshopper etc.).

SL No	Scientific Name	Common Name	Family	Category
1	Copelatus haemorrhoidalis	Diving beetle	Dytiscidae	BEETLE
2	Spodoptera exigua	Beet armyworm	Noctuidae	MOTH
3	Dysdercus cingulatus	Red cotton bug	Pyrrhocoridae	BUG
4	Columba livia	Rock pigeon	Columidae	BIRD

5	Streptopelia senegalensis	Laughing Dove	Columidae	BIRD
6	Pycnonotus cafer	Red vented bulbul	Pycnonotidae	BIRD
7	Passer domesticus	House sparrow	Passeridae	BIRD
8	Corvus splendens	Crow	Corvidae	BIRD
9	Phaethontidae psittaciformes	Parrot	Sturnidae	BIRD
10	Camponotus consobrinus	Banded sugar ant	Formicidae	ANTS
11	Eratigena atrica	Giant house spider	Theridiidae	SPIDER
12	Hasarius adansoni	Jumping Spider	Salticidae	SPIDER
13	Acheta domesticus	House cricket	Gryllidae	INSECT
14	Planorbarius corneus	Great ramshorn	Planorbidae	SNAIL
15	Acrida conica	Giant green slantface	Acrididae	GRASSHOPPER
16	Calotes versicolor	Indian garden lizard	Agamidae	REPTILE
17	Ratus ratus	Rat	Muridae	MAMMAL
18	Funambulus palmarum	Indian palm squirrel	Sciuridae	MAMMAL

Plantation Drive by the Institute:





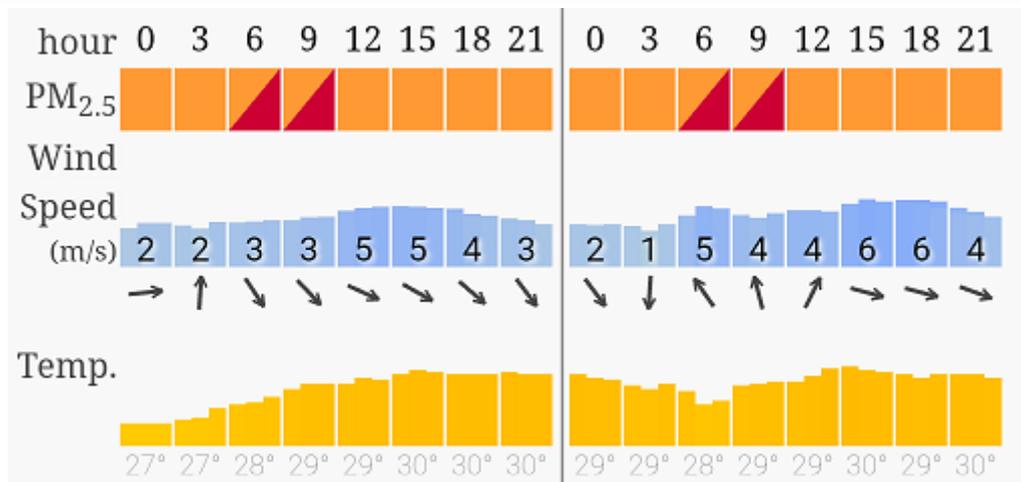
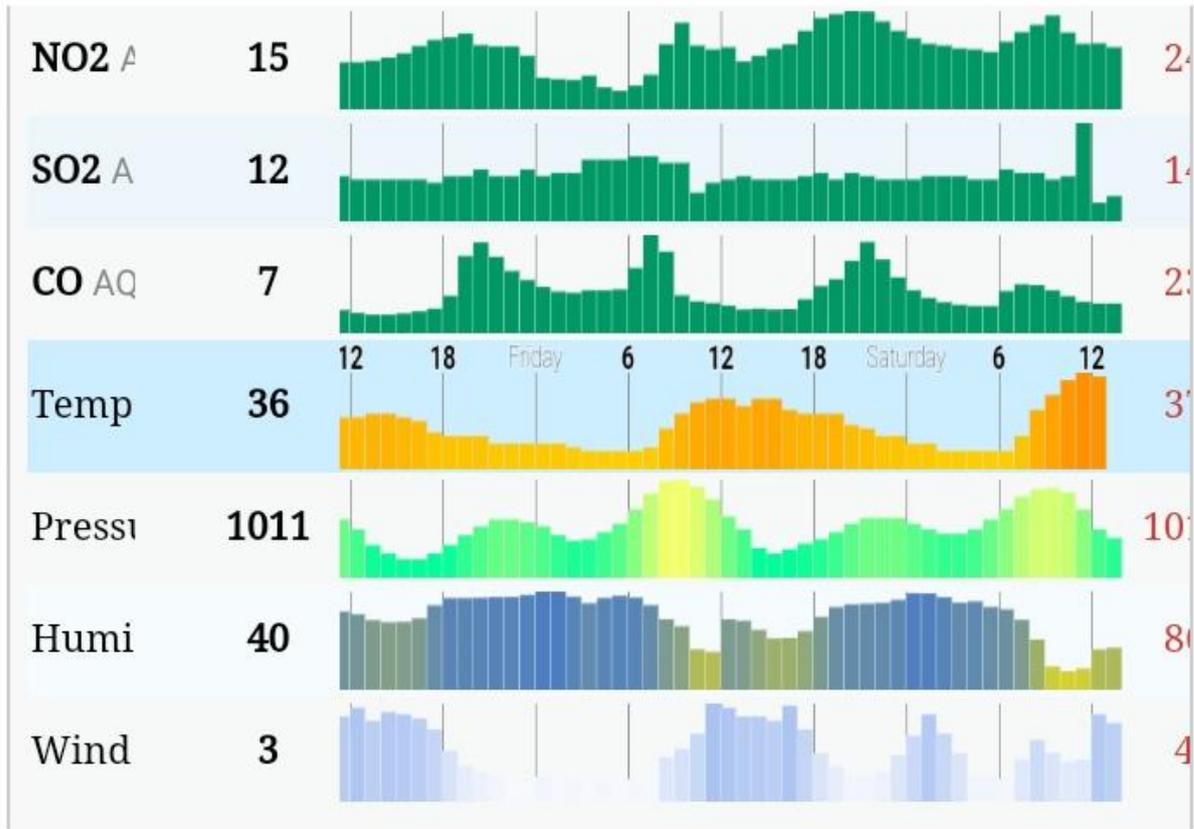
5. Air Quality

5.1. Air Quality Index



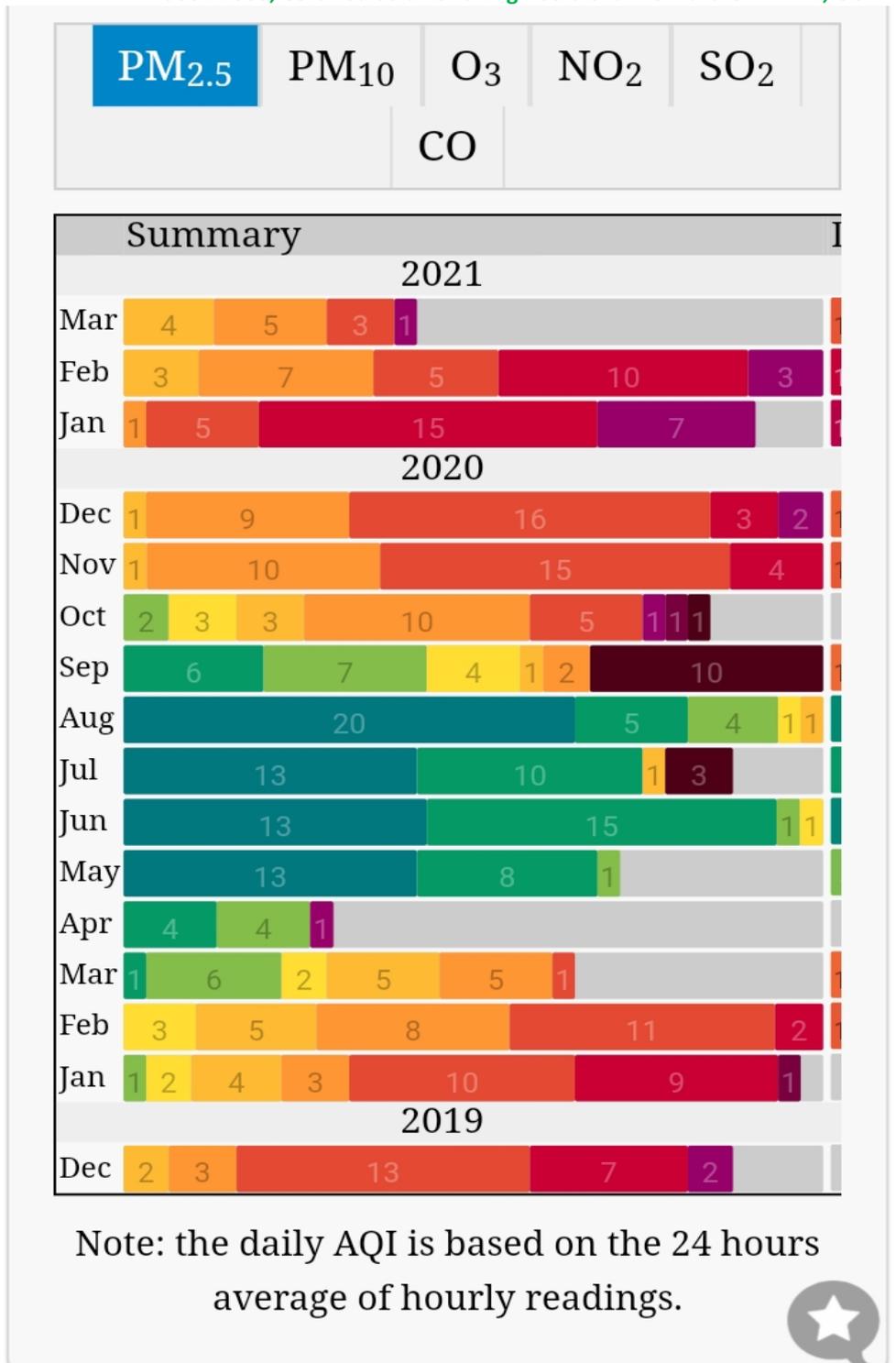
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This table indicates quality of Air available for city where site is located, Area where the site is located and at actual site.

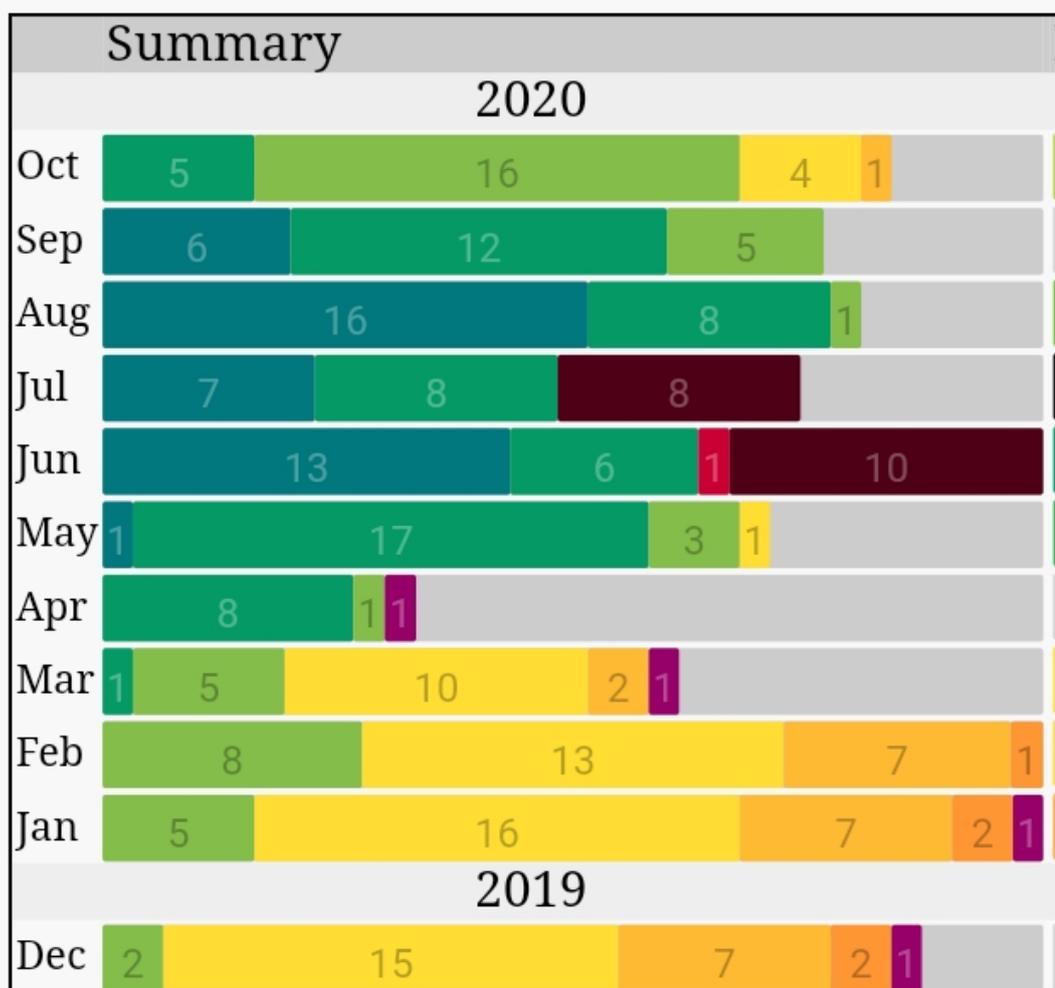
5.2. Table-2: Air Quality Annual PM 2.5



This table shows annual air quality level at PM2.5mcr. Different levels shown in different colors where numbers on colors show number of days with the same situation.

5.3. Table-3: Air Quality Annual PM 10

PM _{2.5}	PM ₁₀	O ₃	NO ₂	SO ₂
		CO		



Note: the daily AQI is based on the 24 hours average of hourly readings.

This table shows annual air quality level at PM10mcr. Different levels shown in different colors where numbers on colors show number of days with the same situation.

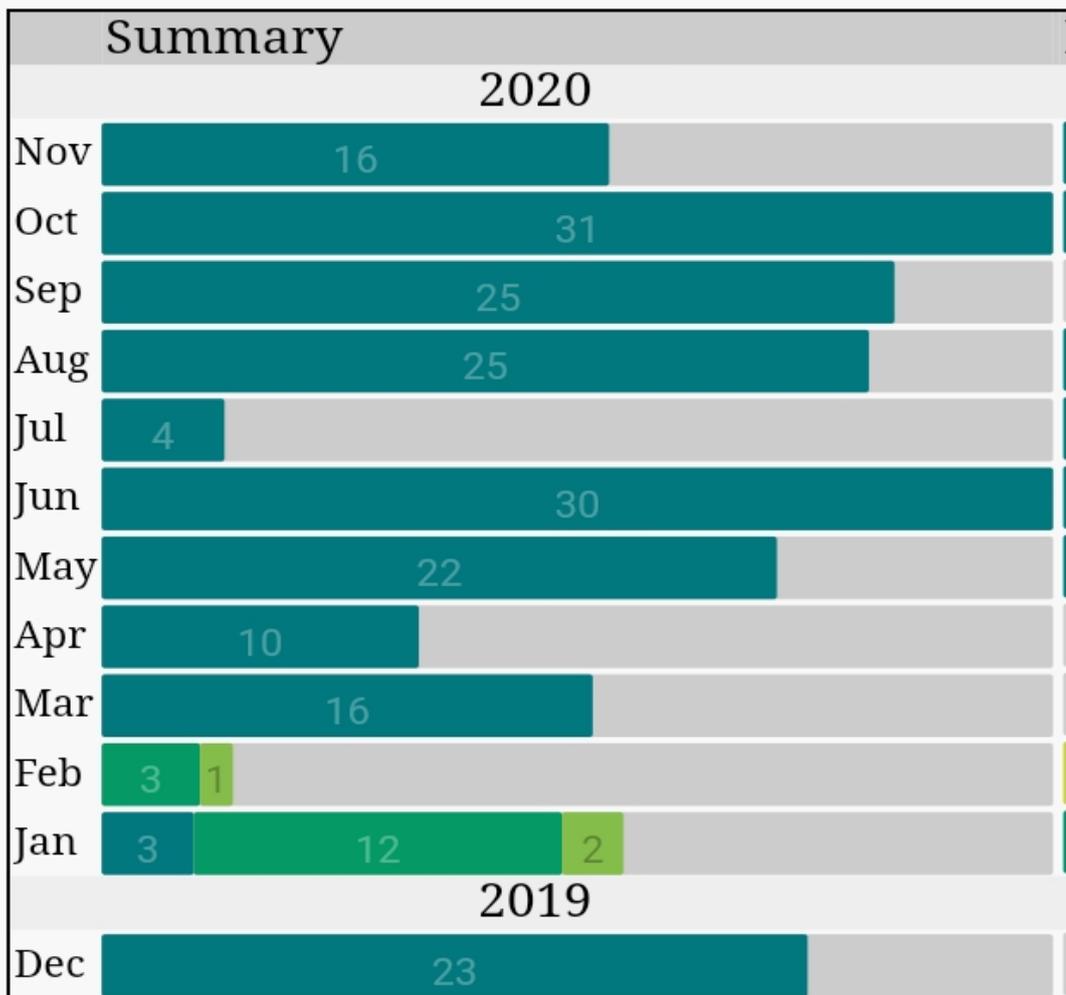
5.4 Table-4: Air Quality Annual O₃

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PM _{2.5}	PM ₁₀	O ₃	NO ₂	SO ₂
		CO		



Note: the Ozone data is based on the 24 hours average of hourly readings. This is not correct - Daily Ozone concentration should be

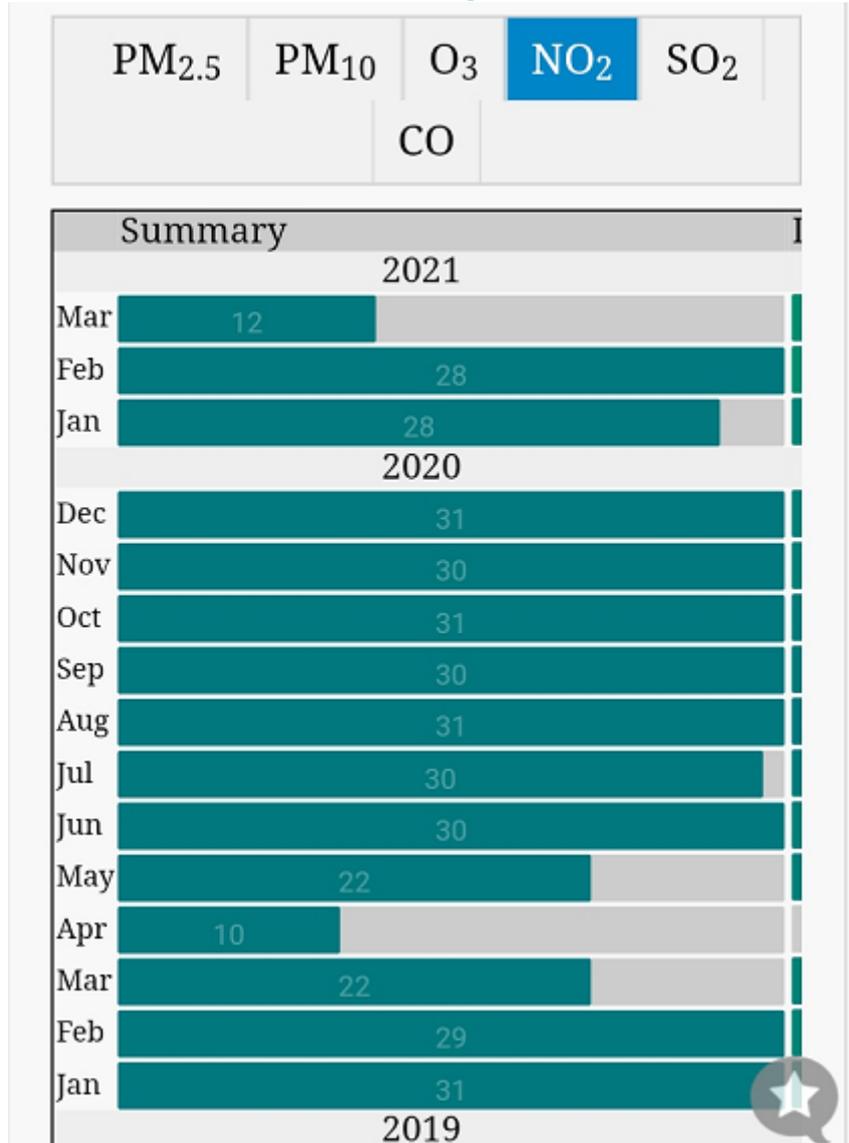
This table shows annual air quality level at O₃ (Ozone). Different levels shown in different colors where numbers on colors show number of days with the same situation.

5.5 Table-5: Air Quality Annual NO₂



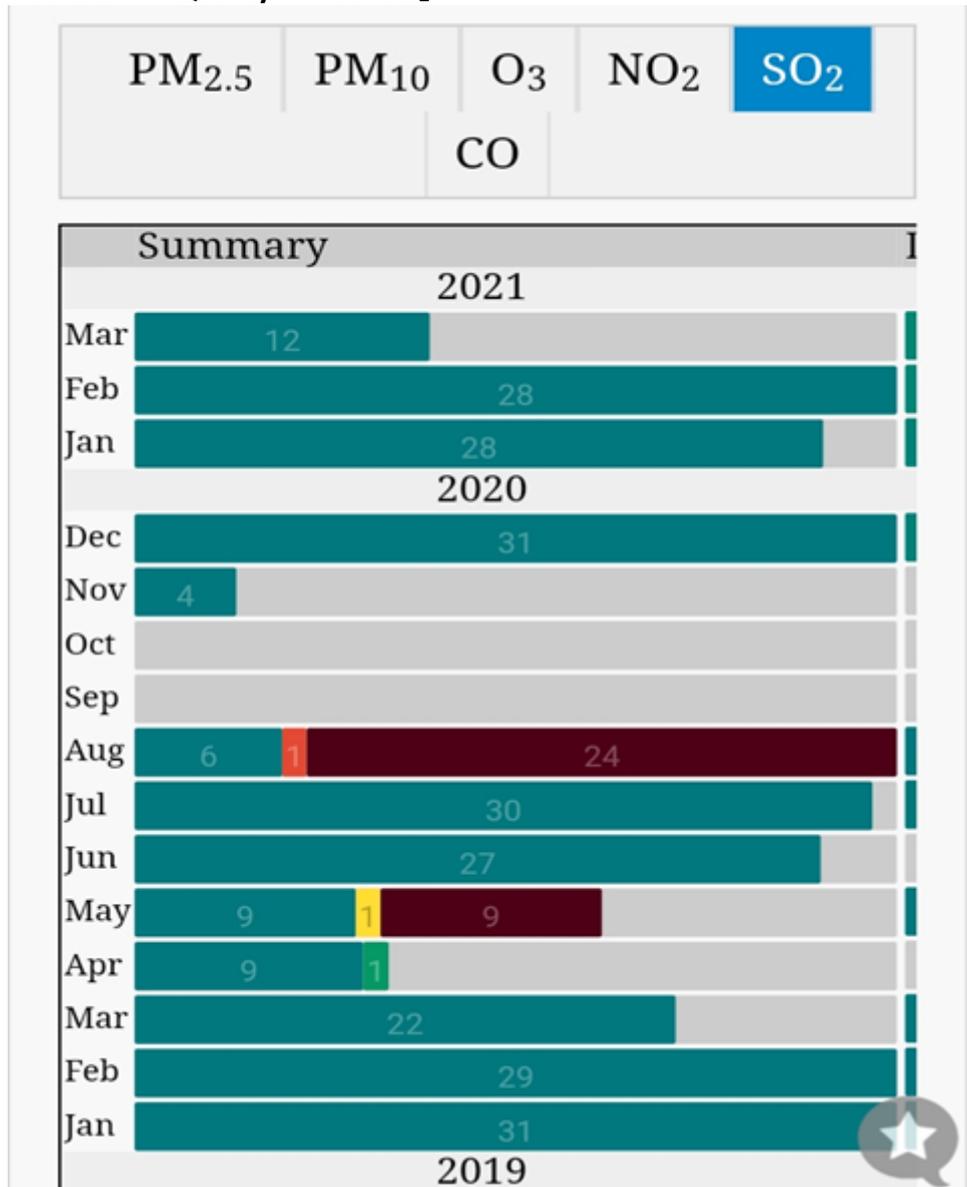
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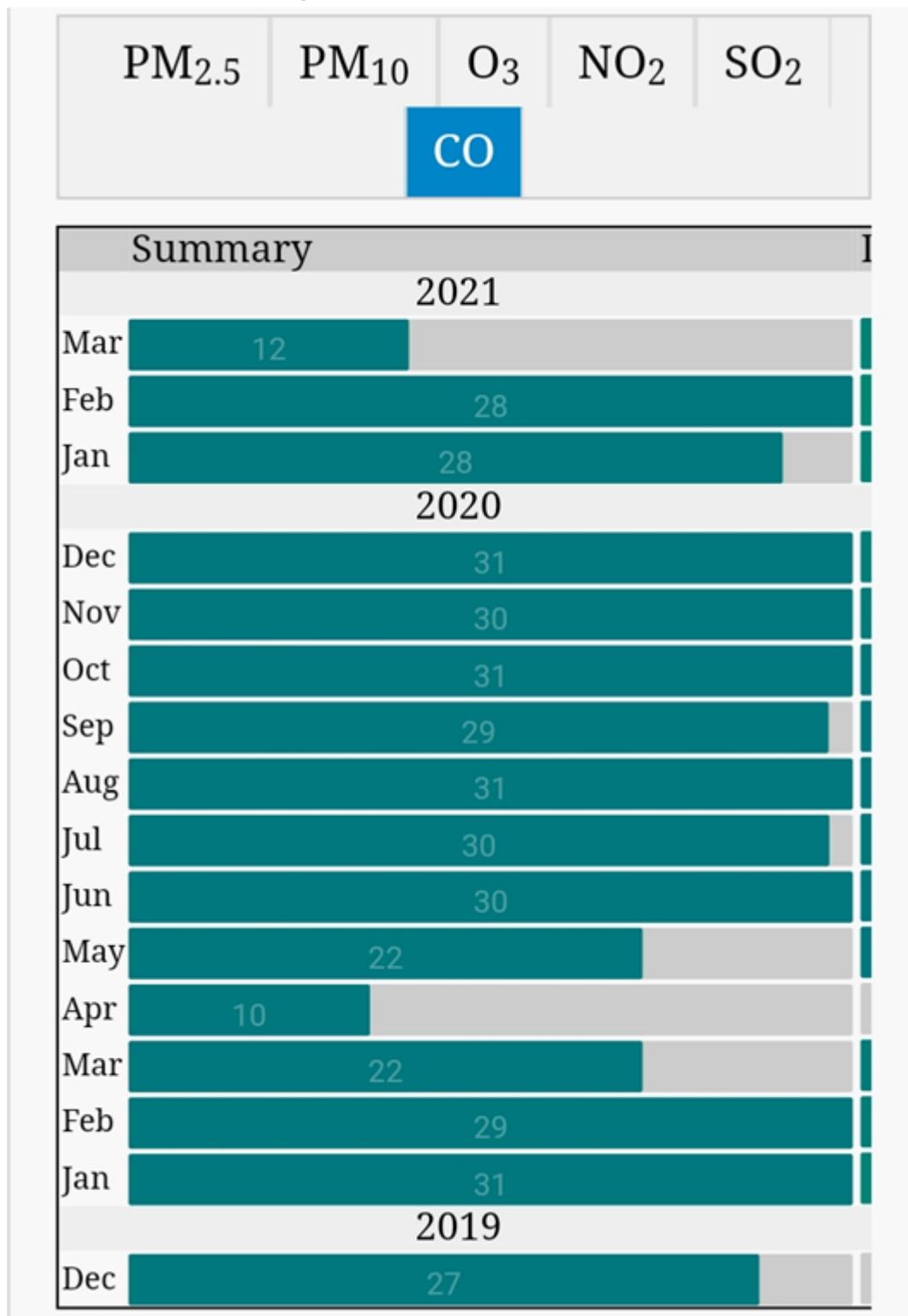
This table shows annual air quality level at NO₂ Nitrogen Di-Oxide. Different levels shown in different colors where numbers on colors show number of days with the same situation.

5.6 Table-6: Air Quality Annual SO₂



This table shows annual air quality level at SO₂ Sulphur Di-Oxide. Different levels shown in different colors where numbers on colors show number of days with the same situation.

5.7 Table-7: Air Quality Annual CO₂



This table shows annual air quality level at CO₂ Carbon Di-Oxide. Different levels shown in different colors where numbers on colors show number of days with the same situation.

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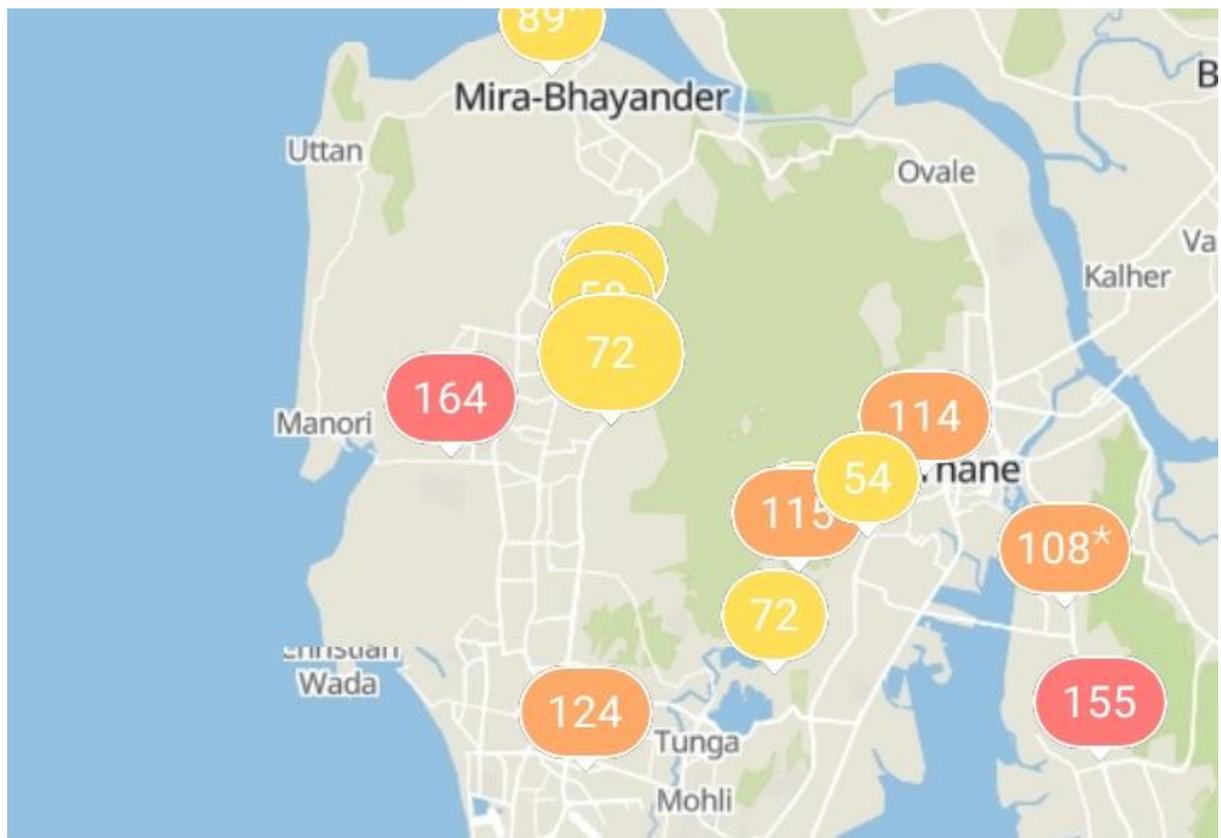
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Colour Codes of different levels of pollution are as follows

AQI Air Pollution Level

Health Implications
Cautionary Statement (for PM2.5)

0 - 50 Good Air quality is considered satisfactory, and air pollution poses little or no risk None	101-150 Unhealthy for Sensitive Groups Members of sensitive groups may experience health effects. The general public is not likely to be affected. Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.	201-300 Very Unhealthy Health warnings of emergency conditions. The entire population is more likely to be affected. Active children and adults, and people with respiratory disease, such as asthma, should avoid all outdoor exertion; everyone else, especially children, should limit outdoor exertion.
51 -100 Moderate Air quality is acceptable; however, for some pollutants there may be a moderate health concern for a very small number of people who are unusually sensitive to air pollution. Active children and adults, and people with respiratory disease, such as asthma, should limit prolonged outdoor exertion.	151-200 Unhealthy Everyone may begin to experience health effects; members of sensitive groups may experience more serious health effects Active children and adults, and people with respiratory disease, such as asthma, should avoid prolonged outdoor exertion; everyone else, especially children, should limit prolonged outdoor exertion	300+ Hazardous Health alert: everyone may experience more serious health effects Everyone should avoid all outdoor exertion



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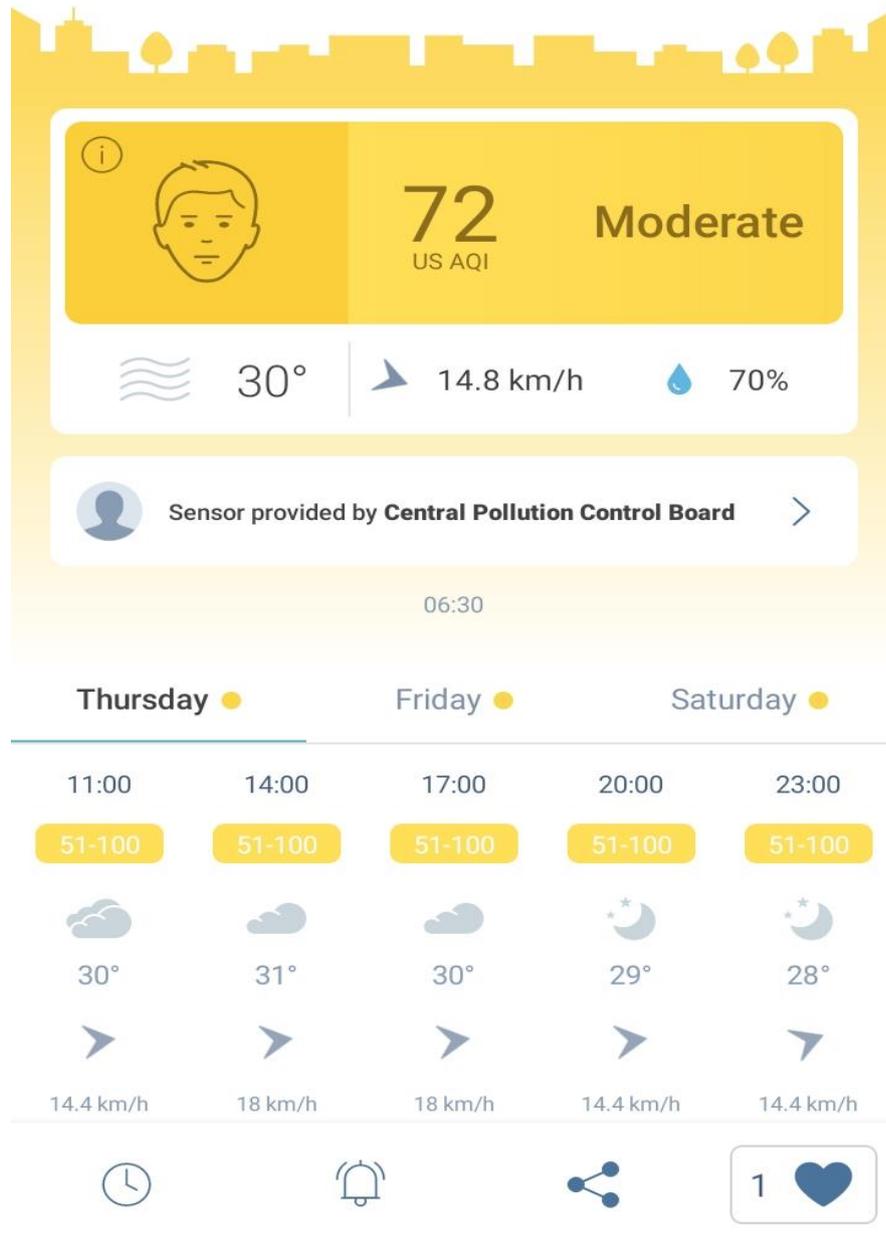
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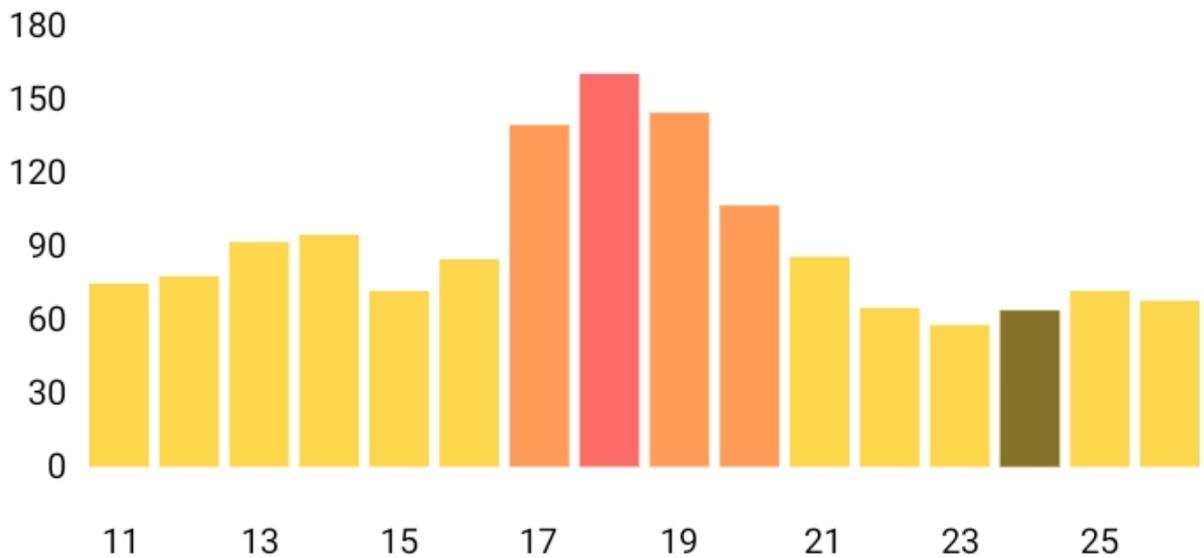
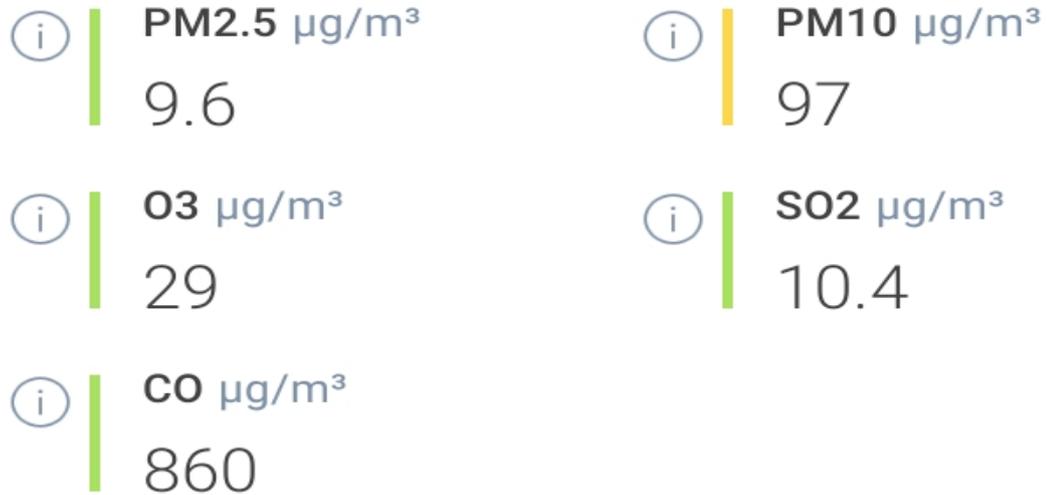


Kandivali East, Mumbai - MPCB

Borivli, India



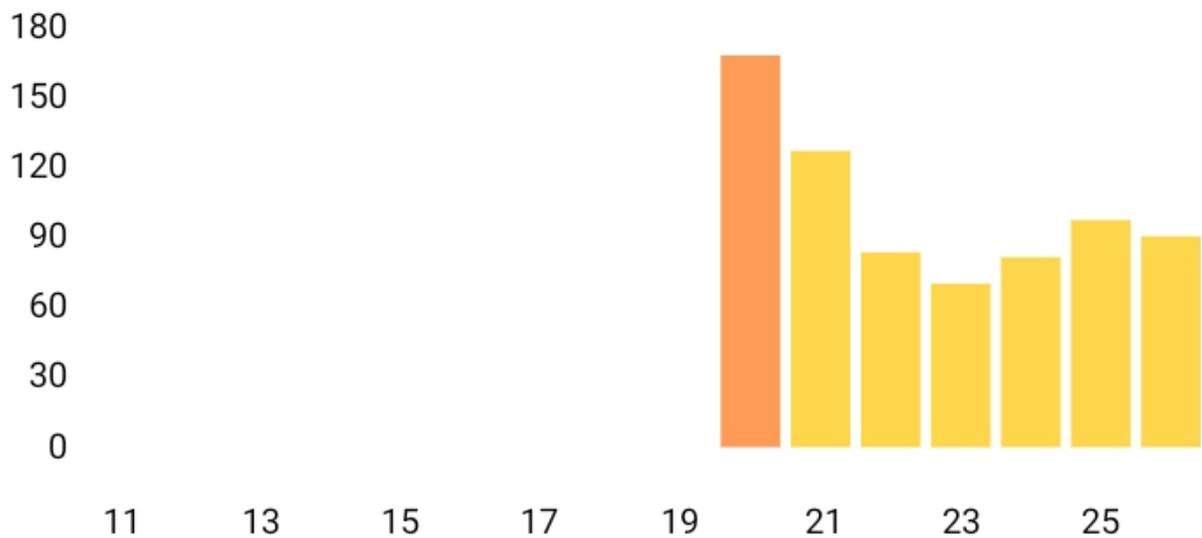
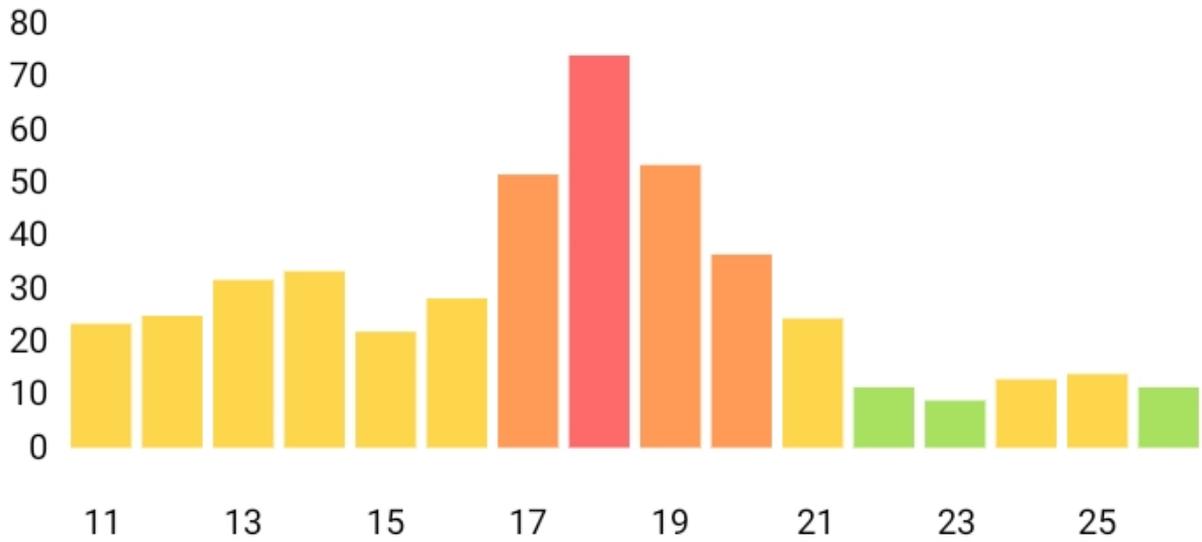
Pollutants





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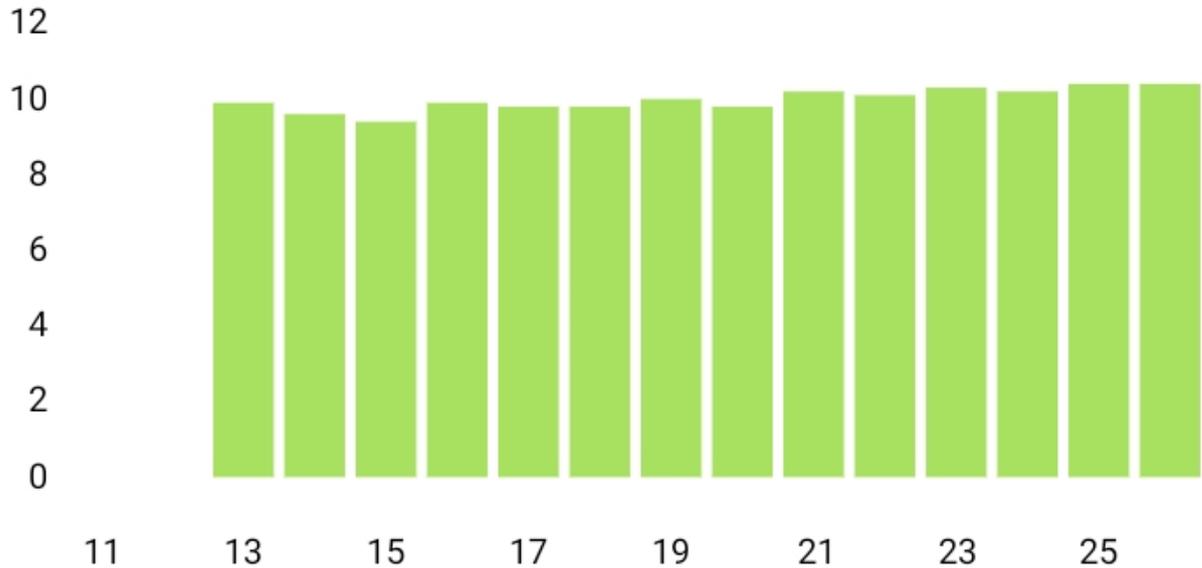
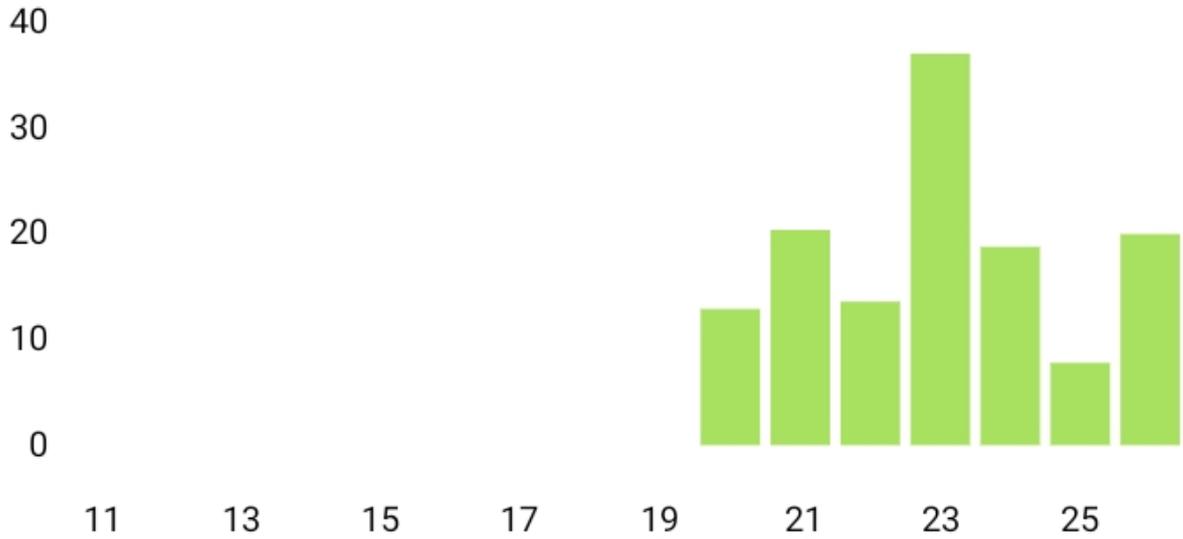
Plot No. 108 / D - 8, Akshay Co. op. Society, Gorai- 1, Borivali (W), Mumbai-400092.

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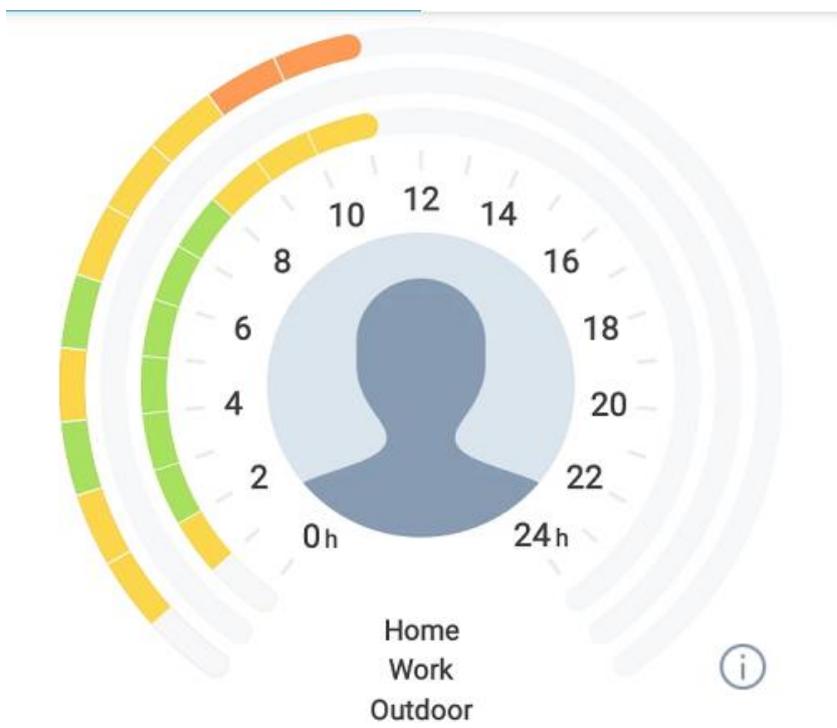
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6 Meteorology

1. Weather/Meteorology Data:-

Vasai 401201

The following are the site co-ordinates.

Latitude: 19. 212716

Longitude: 72.865394

Average Altitude: 50 m

Annual Solar radiation: 369.2 kWh/ Sq.m/year

Sunshine & Daylight Hours

- Hours of sunshine in range from 2:11 for every day in July to 9:48 per day in December
- The longest day of the year is 13:08 long and the shortest day is 10:51 long.
- The longest day is 2:16 longer than the shortest day.
- There is an average of 2680 hours of sunlight per year (of a possible 4383) with an average of 7:20 of sunlight per day.
- It is sunny 61.1% of daylight hours. The remaining 38.9% of daylight hours are likely cloudy or with shade, haze or low sun intensity.
- At midday the sun is on average 70.1° above the horizon at Mumbai/ Bombay.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
 Average Sunlight Hours/Day	09:00	09:24	09:05	09:18	09:17	05:24	02:11	02:36	04:54	08:00	09:12	09:48	07:20
 Average Daylight Hours & Minutes / Day	11:06	11:29	12:00	12:33	13:00	13:14	13:07	12:44	12:12	11:40	11:12	10:59	12:00
 Sunny & (Cloudy) Daylight Hours (%)	82 (18)	83 (17)	77 (23)	75 (25)	72 (28)	41 (59)	17 (83)	21 (79)	40 (60)	69 (31)	83 (17)	90 (10)	61 (39)
 Sun altitude at solar noon on the 21st day (°).	51.1	60.4	71.3	83	88.5	85.4	87.8	83.2	71.7	60.2	51	47.7	70.1

Rainfall/ Precipitation

- It receives on balance 2168 mm (85.4 in) of rainfall per year, or 180.7 mm (7.1 in) per month.
- On average there are 107 days per year with more than 0.1 mm (0.004 in) of rainfall (precipitation) or 8.9 days with a quantity of rain, sleet, snow etc. per month.
- The driest weather is in [January](#), [February](#) & [March](#) when an average of 0 mm (0 in) of rainfall (precipitation) occurs.
- The wettest weather is in [July](#) when an average of 682 mm (26.9 in) of rainfall (precipitation) occurs.

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annua
 Average Mm	0	0	0	2	12	592	682	487	307	61	23	2	2168
 Liters/m ²	0	0	0	2	12	592	682	487	307	61	23	2	2168
 Number of Wet Days	0	0	0	1	2	20	29	27	21	5	2	0	107
 Percentage of Sunny (Cloudy) Daylight Hours	82 (18)	75 (25)	77 (23)	72 (28)	72 (28)	40 (60)	17 (83)	21 (79)	39 (61)	69 (31)	80 (20)	90 (10)	61 (39)

Average Temperatures

- The average temperature is hot at 27.5 Degree Celsius.
- Mean monthly temperatures have a variation of 5.7 Degree Celsius.
- Mean daily temperatures have a variation of 7.6 Degree Celsius.
- The hottest month (May) having mean temperature of 30.2 Degree Celsius.
- The coolest month (January) having mean temperature of 24.5 Degree Celsius.

	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	Annual
 Average Max Temp °C	29.6	29.6	31.1	32.3	33.4	32	30.1	29.6	30.5	32.5	32.9	31.6	31.3
 Average Temp °C	24.5	24.8	26.9	28.7	30.2	29.2	27.7	27.3	27.7	28.7	28	26.3	27.5
 Average Min Temp °C	19.3	20	22.6	25	27	26.3	25.3	24.9	24.9	24.8	23	20.9	23.7

Relative Humidity

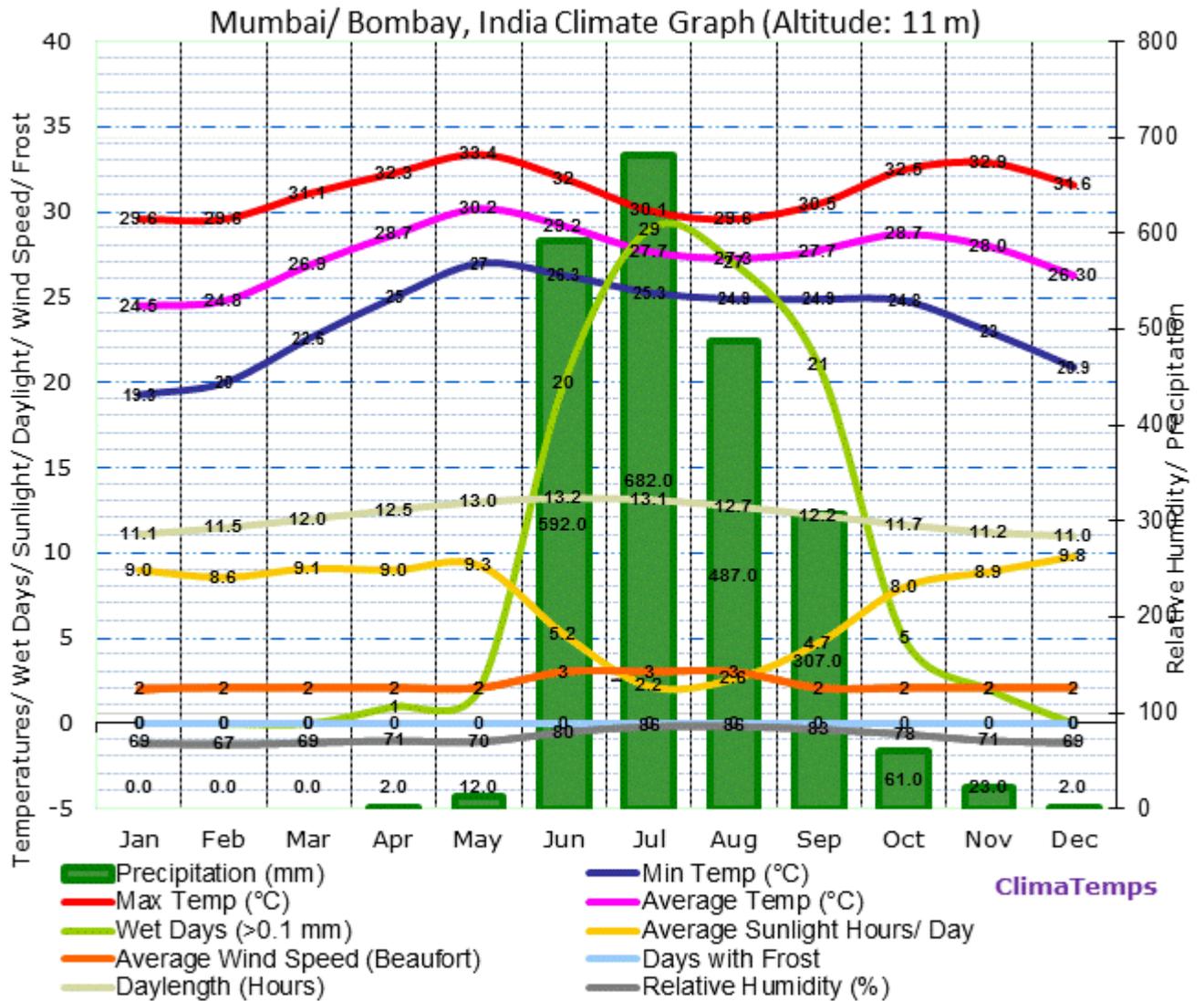
- The average annual relative humidity is 74.9% and average monthly relative humidity ranges from 67% in February to 86% in July.

	<u>Jan</u>	<u>Feb</u>	<u>Mar</u>	<u>Apr</u>	<u>May</u>	<u>Jun</u>	<u>Jul</u>	<u>Aug</u>	<u>Sep</u>	<u>Oct</u>	<u>Nov</u>	<u>Dec</u>	Avg
 Relative Humidity (%)	69	67	69	71	70	80	86	86	83	78	71	69	74.9
 Average Dew Point Temp °C	18.4	18.3	20.7	22.9	24.1	25.4	25.1	24.7	24.5	24.5	22.2	20.2	22.6



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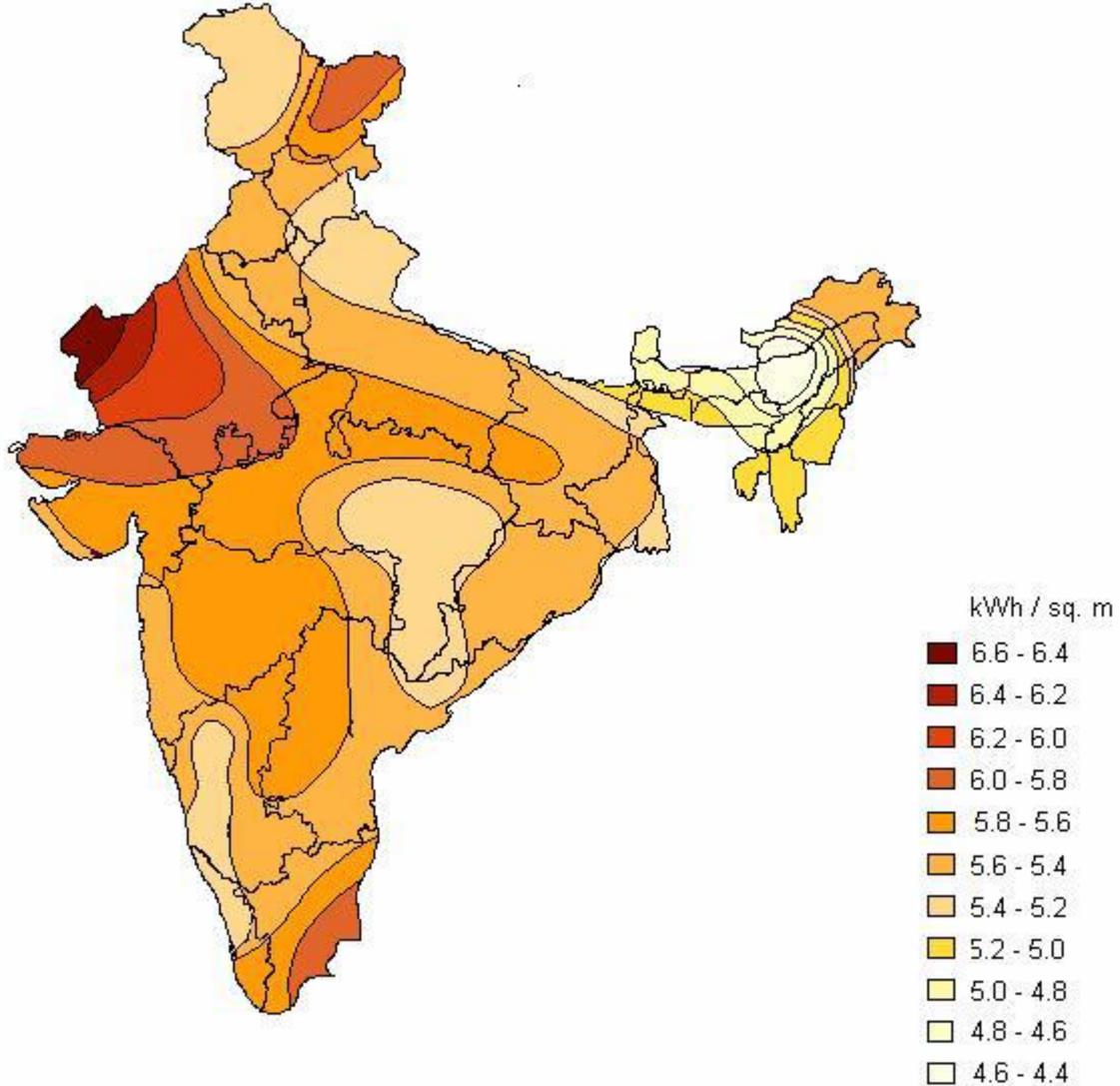




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Radiation Data



Month	Irradiation(KWh)
Jan	5.32
Feb	6.25
Mar	7.05
Apr	7.38
May	7.33
Jun	5.64
Jul	5
Aug	5.12
Sep	5.65
Oct	5.72
Nov	5.38
Dec	5

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Sun Position Report

Values obtained as:

Sun Position

Latitude:	19 5' N	Time zone:	UTC +5.5
Longitude:	72 51' E		No DST
Magnetic declination:	0 37' W		

Magnetic North was used for this calculation.
Do not correct compasses for Magnetic declination, this has been accounted for in the calculations.

Daily Summary	C Dawn	Az'	Sunrise	Day Length	Sunset	Az'	C Dusk
Thu 21/12/2020	06:42	114.6°	07:06	10:60	18:05	245.6°	18:29
Fri 22/12/2020	06:43	114.6°	07:06	10:60	18:05	245.6°	18:29
Sat 23/12/2020	06:43	114.6°	07:07	10:59	18:06	245.6°	18:30
Sun 24/12/2020	06:44	114.6°	07:07	10:60	18:06	245.6°	18:30
Mon 25/12/2020	06:44	114.6°	07:08	10:60	18:07	245.6°	18:31
Tue 26/12/2020	06:45	114.6°	07:08	10:60	18:08	245.6°	18:31
Wed 27/12/2020	06:45	114.6°	07:09	10:60	18:08	245.6°	18:32

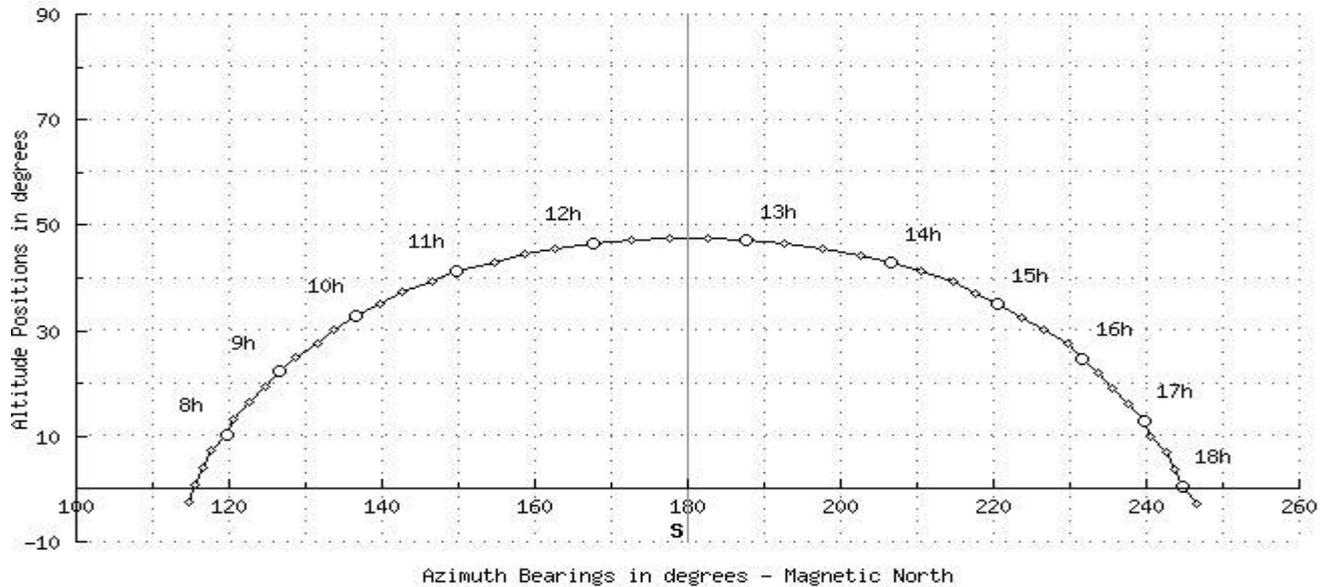
Thursday, 21st December 2020

	Az'	Alt'	*Shadow												
07:00	115°	-2°	-	10:00	137°	33°	1.54	13:00	188°	47°	0.93	16:00	232°	25°	2.14
	116°	1°	57.29		140°	35°	1.43		193°	46°	0.97		234°	22°	2.48
	117°	4°	14.3		143°	37°	1.33		198°	46°	0.97		236°	19°	2.9
	118°	7°	8.14		147°	40°	1.19		203°	44°	1.04		238°	16°	3.49
08:00	120°	10°	5.67	11:00	150°	41°	1.15	14:00	207°	43°	1.07	17:00	240°	13°	4.33
	121°	13°	4.33		155°	43°	1.07		211°	41°	1.15		241°	10°	5.67
	123°	16°	3.49		159°	44°	1.04		215°	39°	1.23		243°	7°	8.14
	125°	19°	2.9		163°	46°	0.97		218°	37°	1.33		244°	4°	14.3
09:00	127°	22°	2.48	12:00	168°	47°	0.93	15:00	221°	35°	1.43	18:00	245°	0°	-
	129°	25°	2.14		173°	47°	0.93		224°	33°	1.54		247°	-3°	-
	132°	28°	1.88		178°	47°	0.93		227°	30°	1.73				
	134°	30°	1.73		183°	47°	0.93		230°	27°	1.96				

Calculation intervals: Every 15 minutes :: Shadow length = (*Shadow x Object height)

Sunrise: 07:06 - Az' 114.6°

Sunset: 18:05 - Az' 245.6°



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9:53

Solar Calculator

Latitude: Altitude:

Longitude: Accuracy:

Summary Table Charts Maps Forecast

Longitude / Latitude :	72.865395 / 19.212715
Location:	Late Datta Ji Salvi Marg, Asha Nagar, Thakur Complex, Kandivali East, Mumbai, Maharashtra. Pin-400101 (India)
DayLength (Min / Max):	10.84 / 13.16 hours
Avg Temp. (Min / Max):	23.0 °C / 31.0 °C
Tilt Angle for Solar PV:	17°
Annual Global Insolation:	1859 (kWh/m ² /year)
Power Production of PV:	371.8 kWh/m ² /year considering <input type="text" value="20"/> % efficiency and energy loss.
	<input type="text" value="10"/> m ² of PV will generate 3718.0 units per year.
	or
	10.2 units per day.



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9:53

Solar Calculator

Latitude: 19.212716 Altitude: 0

Longitude: 72.865394 Accuracy: 500

Get Location **Calculate**

Summary Table Charts Maps Forecast

Long Term Monthly Temperature (°C)

Months	Average	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min	23	19	20	22	25	27	26	25	25	25	24	22	20
Max	31	29	29	31	32	33	32	30	29	30	32	32	31

Long Term Monthly Solar Insolation (2009-2021)(kWh/m²)

Months	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Min	1514	110	135	151	180	165	92	77	132	112	122	119	119
Max	2180	137	153	186	196	214	207	225	223	198	165	142	134
Avg	1859	131	144	179	190	204	147	136	168	153	150	130	127

Monthly Solar Insolation (2009 -2022)(kWh/m²)

Years	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
2022	641	133	145	174	189								
2021	1707	130	139	182	184	165	130	119	133	120	160	122	123



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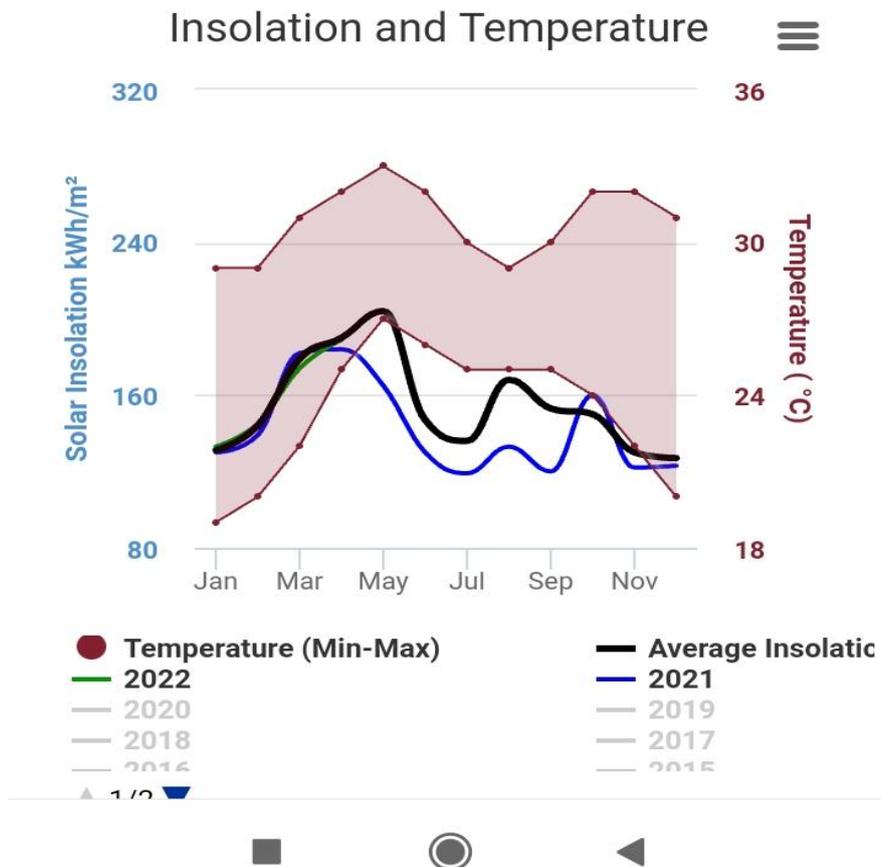
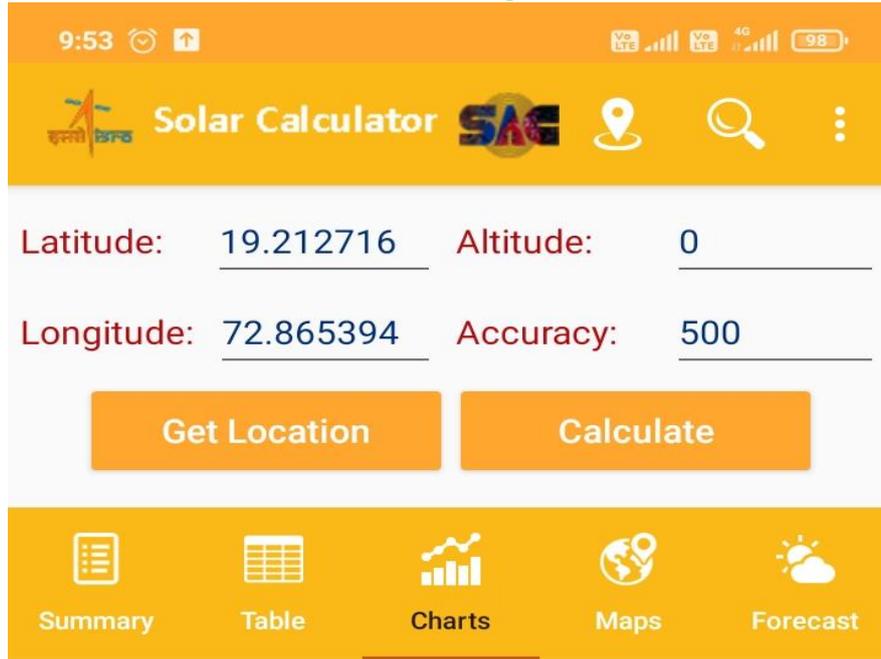
The screenshot shows the 'Solar Calculator' app interface. At the top, the status bar displays the time 9:53, signal strength, 4G LTE, and battery level at 98%. The app header includes the title 'Solar Calculator', the SAC logo, and navigation icons for location, search, and a menu. Below the header, the current location is displayed as Latitude: 19.212716, Altitude: 0, Longitude: 72.865394, and Accuracy: 500. Two orange buttons, 'Get Location' and 'Calculate', are positioned below the location data. A navigation bar at the bottom of the app features five icons: Summary, Table, Charts, Maps, and Forecast. The 'Table' view is active, showing a grid of data for each year from 2009 to 2021. The table has 14 columns of numerical data.

2021	1707	130	139	182	184	165	130	119	133	120	160	122	123
2020	1787	129	142	174	180	201	137	140	137	156	149	121	121
2019	1689	110	139	151	180	205	154	107	160	112	122	130	119
2018	1860	133	135	170	193	199	133	116	198	175	152	134	122
2017	1890	133	144	181	193	204	142	148	169	168	153	132	123
2016	1865	133	149	182	190	205	149	121	186	141	149	132	128
2015	1837	135	142	177	194	210	129	144	145	152	151	128	130
2014	1805	131	139	186	195	199	170	100	132	147	146	129	131
2013	1723	136	147	183	192	211	92	77	141	126	142	142	134
2012	2033	133	153	186	190	214	166	135	223	194	164	142	133
2011	2050	137	144	184	196	212	207	217	171	155	156	139	132
2010	2071	136	148	183	194	214	132	225	221	198	165	125	130
2009	1850	132	147	184	189	208	165	121	166	145	145	119	129



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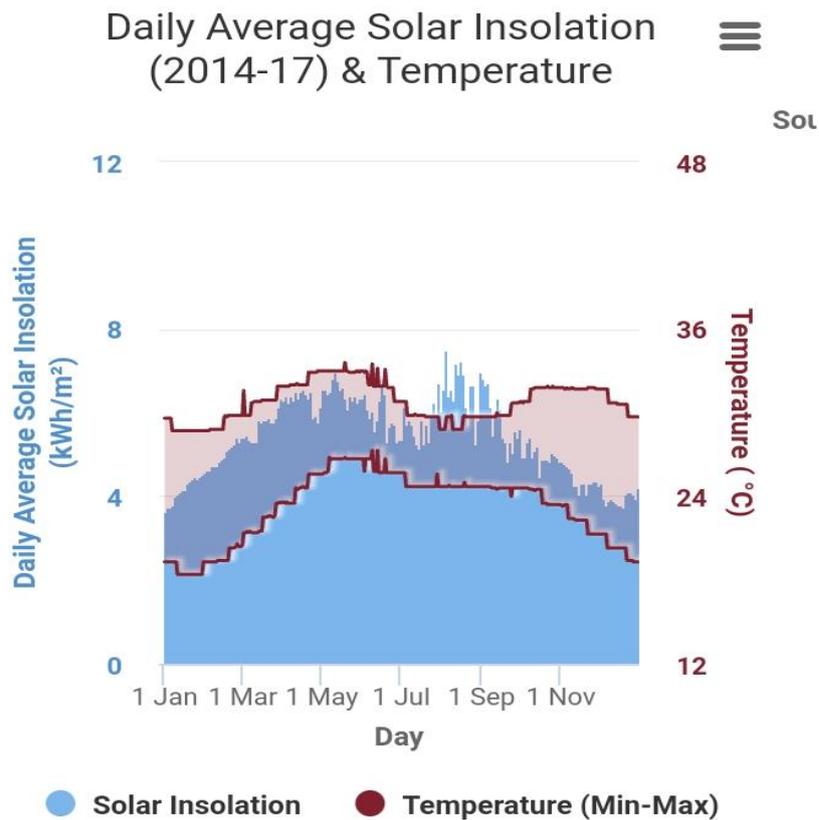
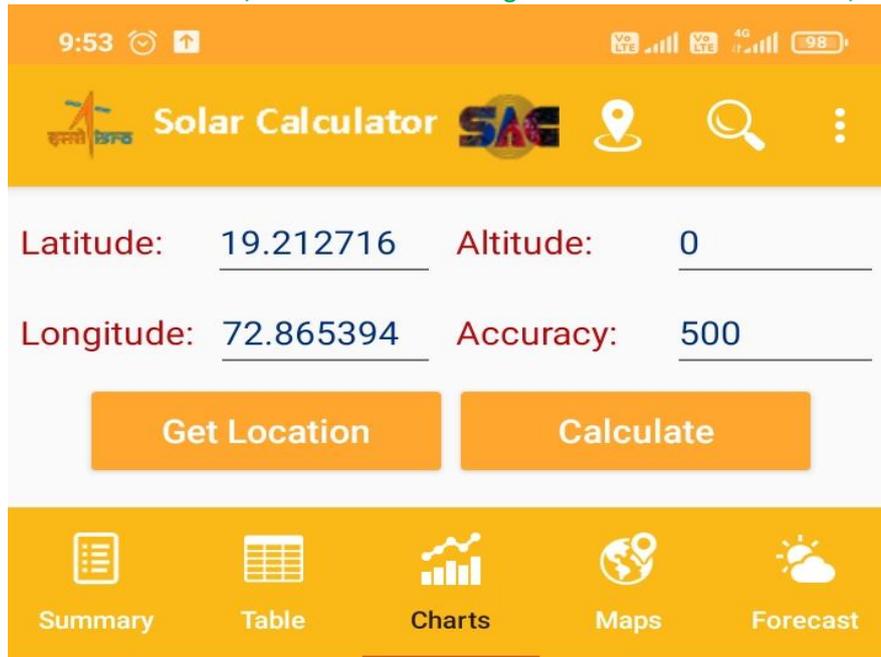
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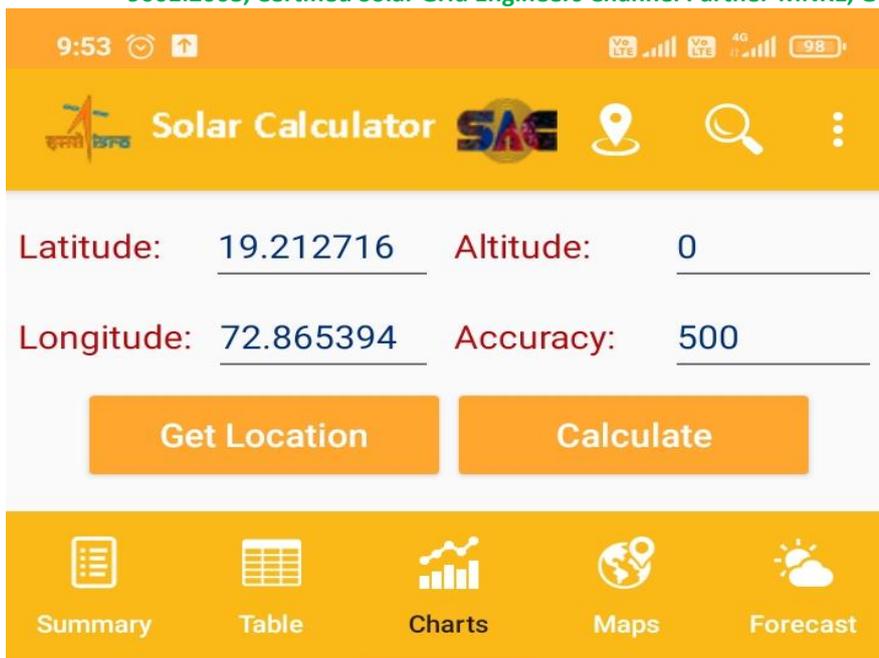
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9:53 [Icons] [Signal] [4G] [98]

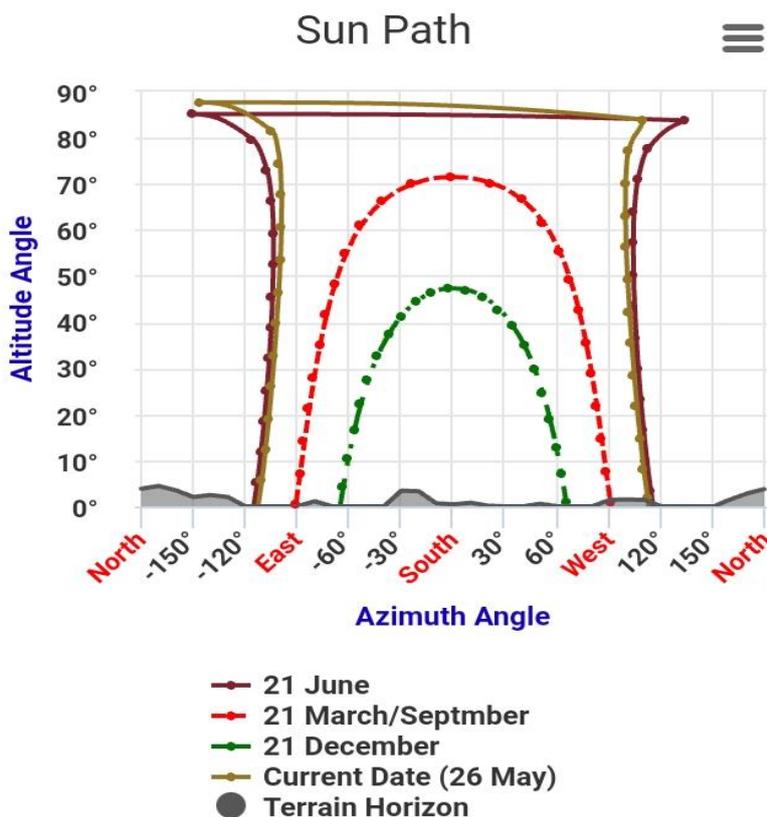
Solar Calculator [SAC] [Location] [Search] [Menu]

Latitude: 19.212716 Altitude: 0

Longitude: 72.865394 Accuracy: 500

[Get Location] [Calculate]

Summary Table Charts Maps Forecast





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9:54

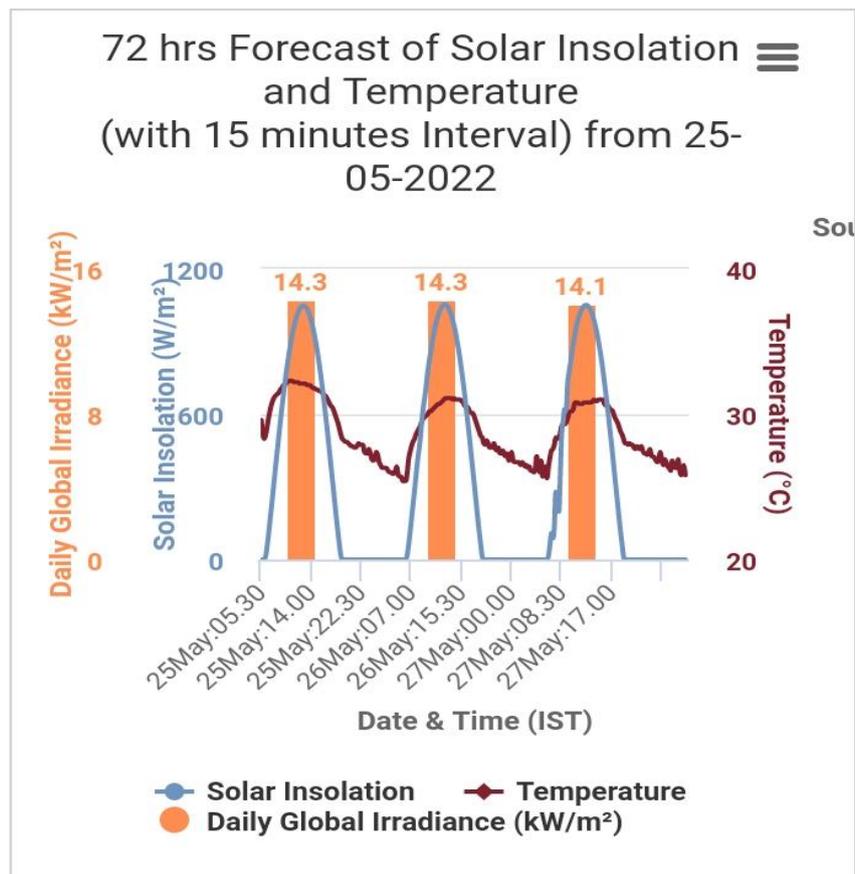
Solar Calculator

Latitude: 19.212716 Altitude: 0

Longitude: 72.865394 Accuracy: 500

Get Location **Calculate**

Summary Table Charts Maps Forecast



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9:56 [Icons] [Signal] [4G] [98]

Wind Calculator [SAC] [Location Icon] [Menu Icon]

Latitude: 19.2136368 [Get Location]

Longitude: 72.8654452 [Calculate]

Table | Chart | Forecast

Latitude : 19.2136368
Longitude : 72.8654452

Month	Wind Speed (m/s)	Wind Direction(°)
January	2.4	221 ↙
February	1.9	212 ↙
March	1.8	208 ↙
April	1.3	254 ←
May	1.2	70 →
June	2.7	28 ↗
July	3.7	56 ↗
August	2.8	70 →
September	1.9	297 ↙
October	1.8	241 ↙
November	2.0	241 ↙
December	2.2	237 ↙



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9:56

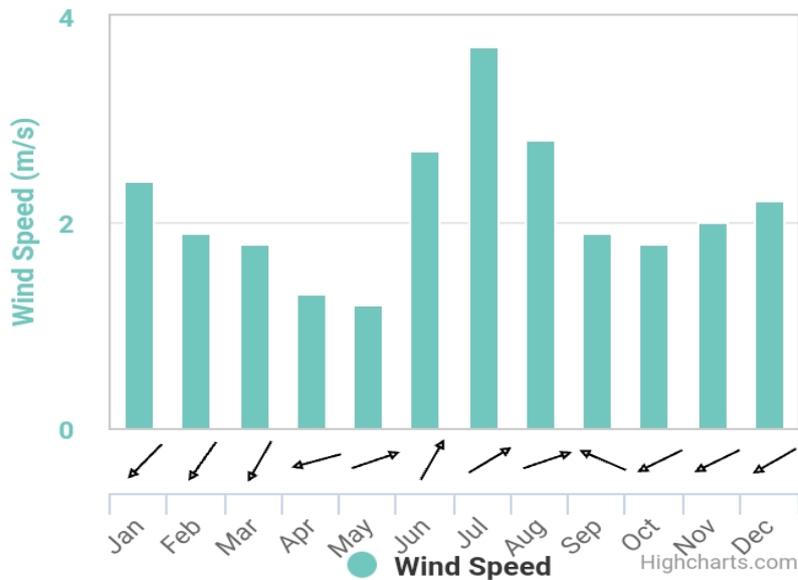
Wind Calculator

Latitude: 19.2136368

Longitude: 72.8654452

Table Chart Forecast

Wind Chart





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9:56 [status icons]

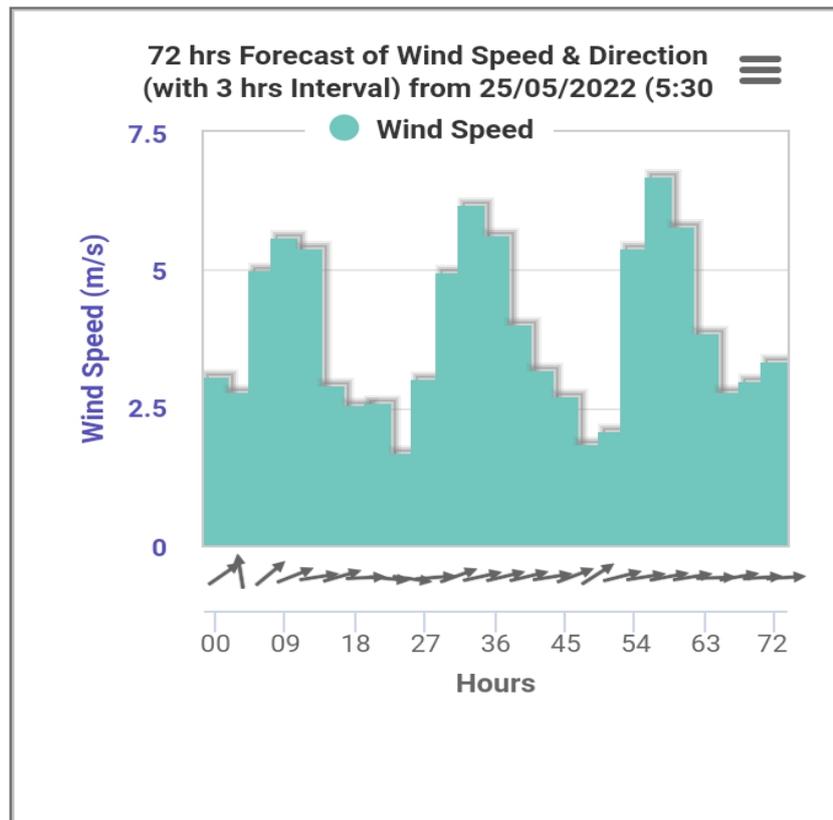
Wind Calculator [SAC logo] [location icon] [menu icon]

Latitude: 19.2136368 **Get Location**

Longitude: 72.8654452 **Calculate**

Table | Chart | **Forecast**

Height (hPa): Surface ▾



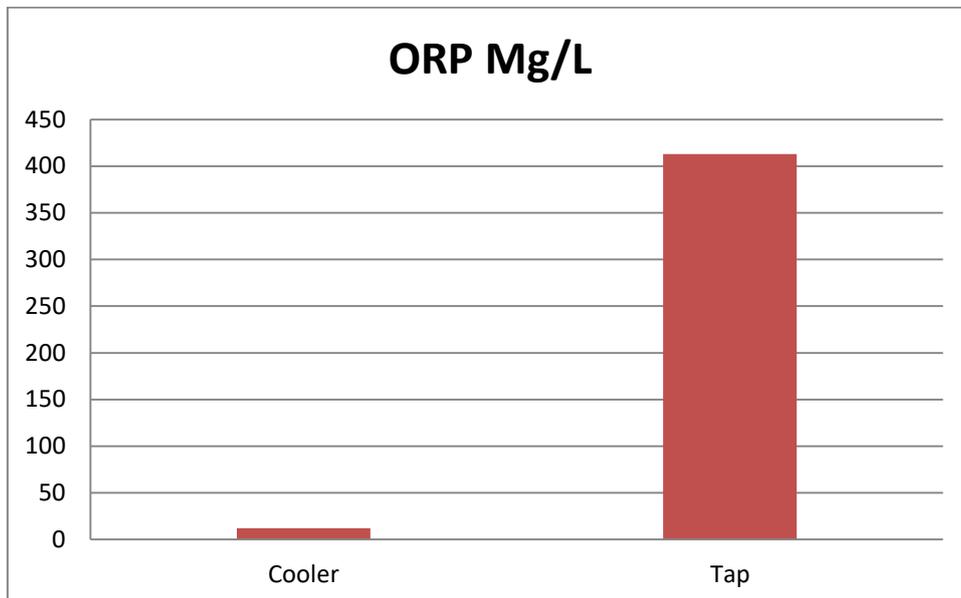
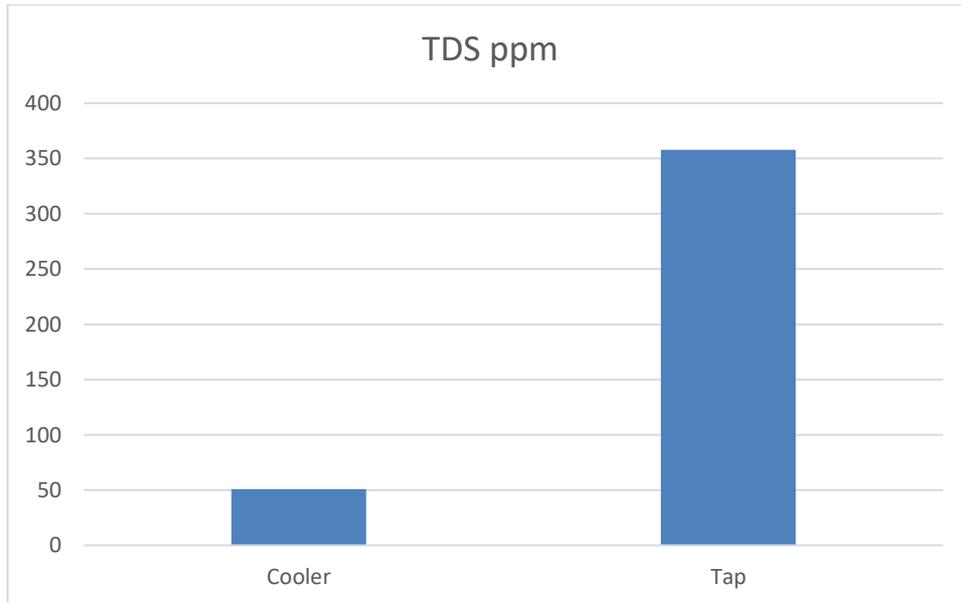


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7 Water

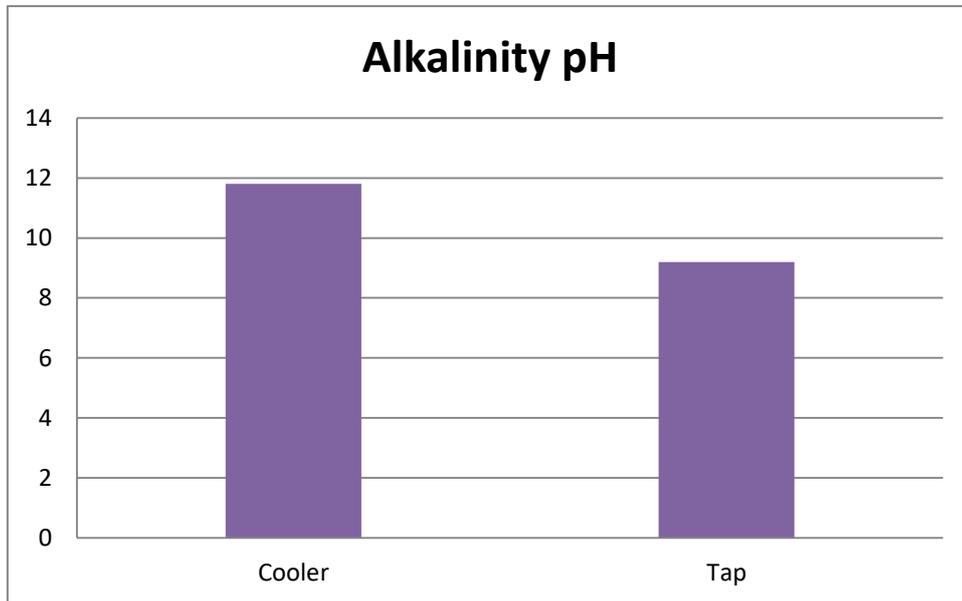
SL No	Use	TDS	ORP	Alkalinity
No	Activity	ppm	Mg/L	pH
1	Cooler	51	12	11.8
2	Tap	358	413	9.2





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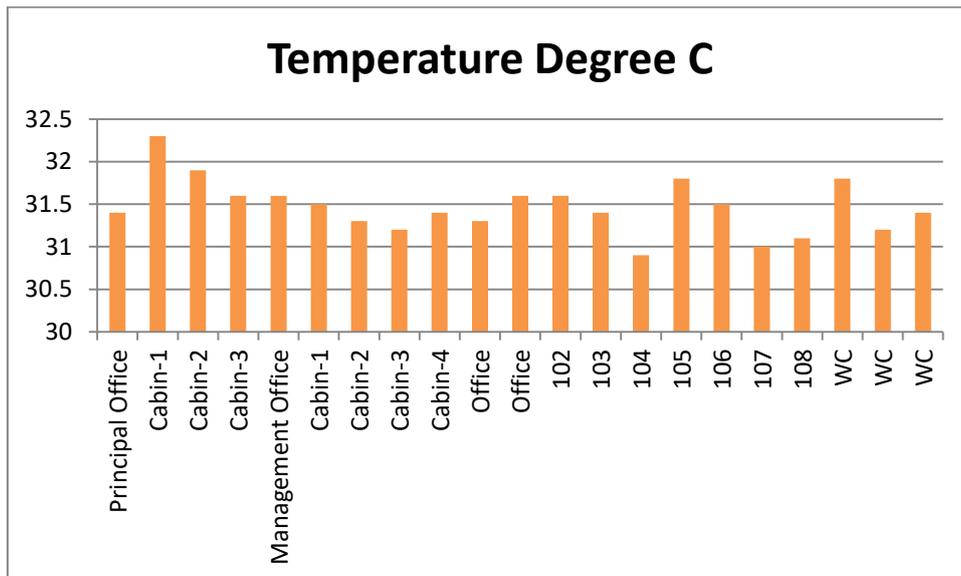


8 Atmosphere (Temperature, Humidity and Noise)

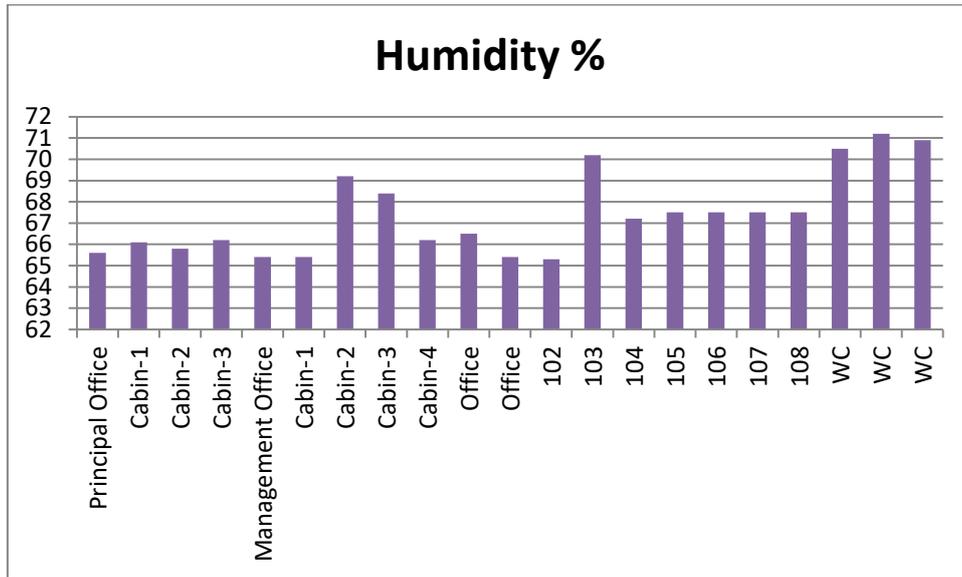
First Floor

Floor	Room	Temperature Degree C	Humidity %	Noise dB
First	Principal Office	31.4	65.6	49
First	Cabin-1	32.3	66.1	48
First	Cabin-2	31.9	65.8	48
First	Cabin-3	31.6	66.2	48
First	Management Office	31.6	65.4	48
First	Cabin-1	31.5	65.4	48
First	Cabin-2	31.3	69.2	49
First	Cabin-3	31.2	68.4	49
First	Cabin-4	31.4	66.2	48
First	Office	31.3	66.5	50
First	Office	31.6	65.4	46
First	102	31.6	65.3	46
First	103	31.4	70.2	48
First	104	30.9	67.2	45
First	105	31.8	67.5	45
First	106	31.5	67.5	45
First	107	31	67.5	45
First	108	31.1	67.5	45
First	WC	31.8	70.5	45
First	WC	31.2	71.2	48
First	WC	31.4	70.9	48

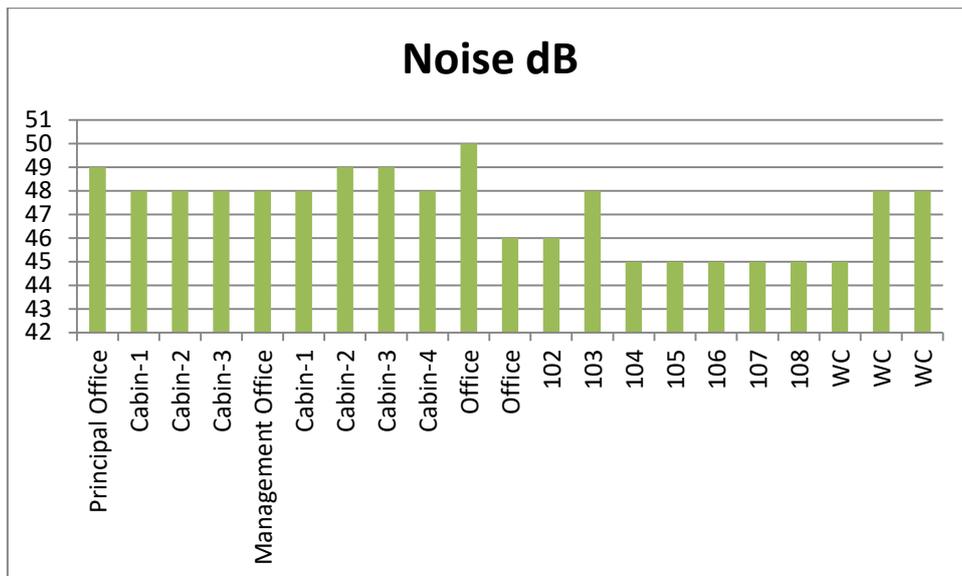
Temperature



Humidity



Noise





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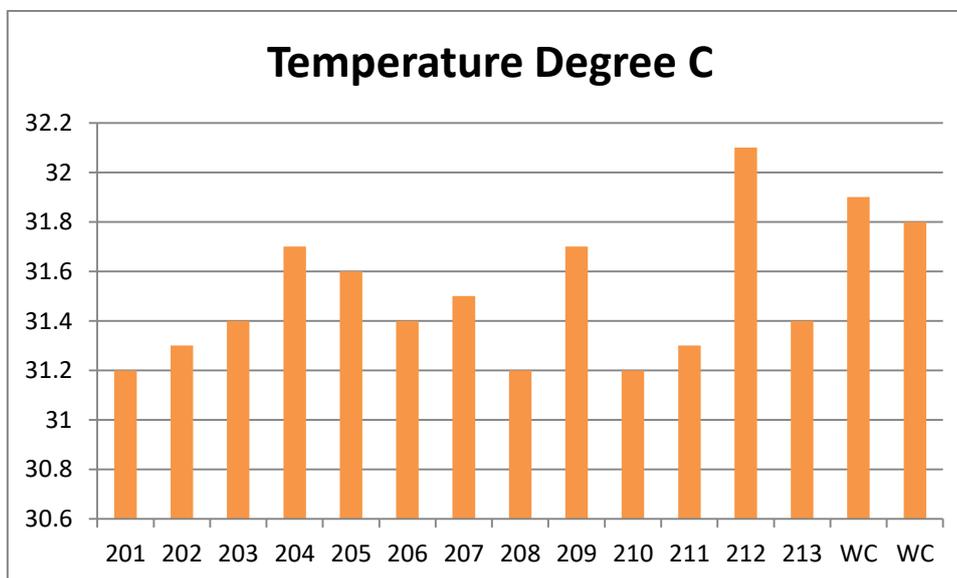
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Second Floor

Floor	Room	Temperature Degree C	Humidity %	Noise dB
Two	201	31.2	67.3	48
Two	202	31.3	66.6	49
Two	203	31.4	68.5	49
Two	204	31.7	69.6	47
Two	205	31.6	65.2	48
Two	206	31.4	66.6	47
Two	207	31.5	66.2	48
Two	208	31.2	65.1	49
Two	209	31.7	68.1	47
Two	210	31.2	67.3	48
Two	211	31.3	65.9	47
Two	212	32.1	66.7	48
Two	213	31.4	66.5	49
Two	WC	31.9	72.2	47
Two	WC	31.8	73.6	48

Charts

Temperature



Solar rooftop and power plants | Solar and Electric Consultation | New Electric Connections
Load Management and extension | Change of Name on Bills | Meters (New, Shifting, additional)
Substation Management | Permissions, approvals, liasoning | Electrical & Safety Audits & Assessment

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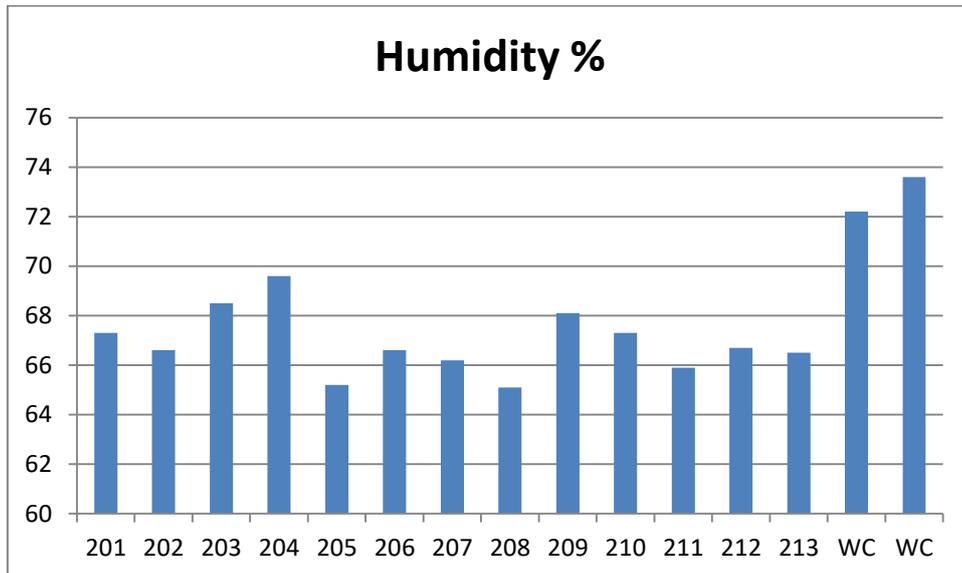
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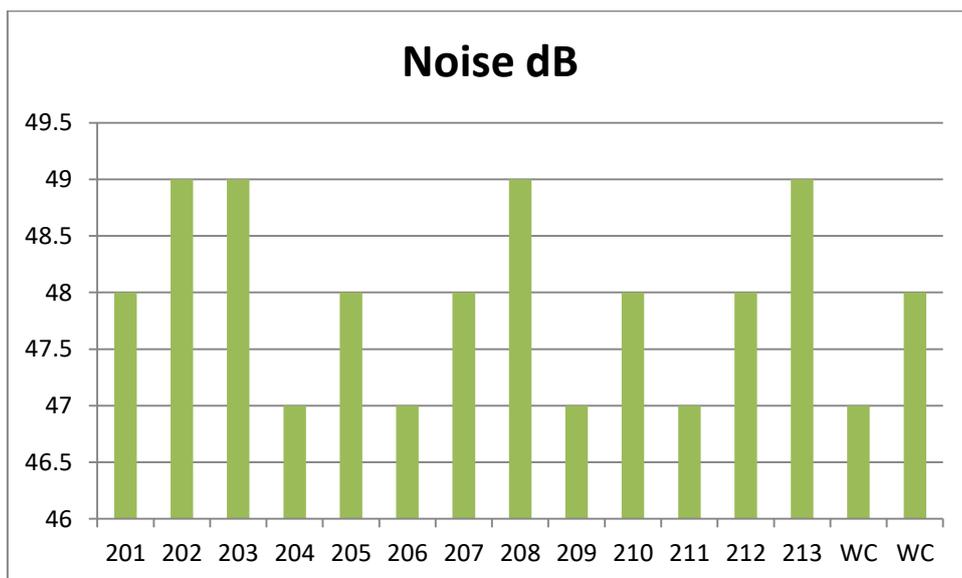
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Humidity



Noise





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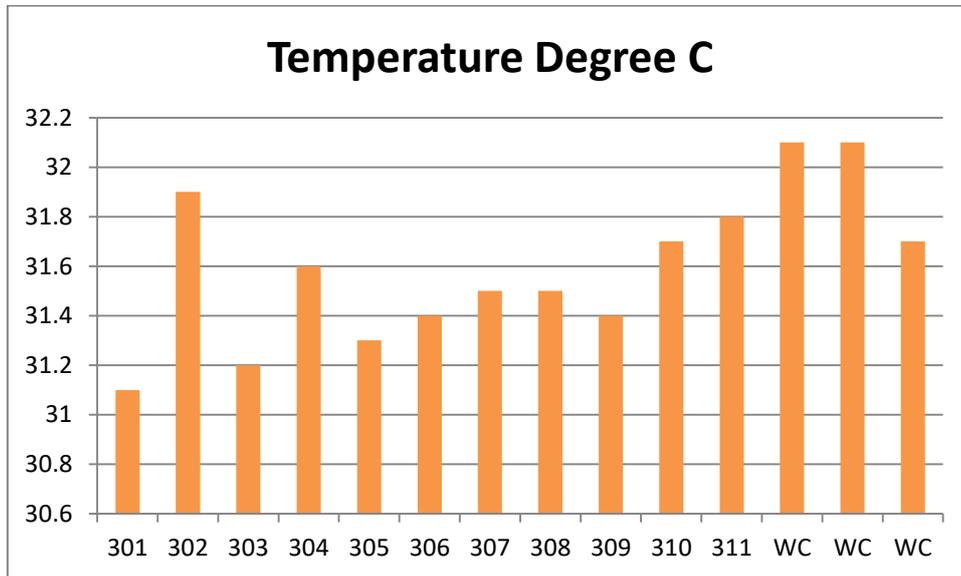
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Third Floor

Floor	Room	Temperature Degree C	Humidity %	Noise dB
Three	301	31.1	67.5	45
Three	302	31.9	67.5	45
Three	303	31.2	67.5	48
Three	304	31.6	68.2	48
Three	305	31.3	69.1	46
Three	306	31.4	68.1	48
Three	307	31.5	67.2	49
Three	308	31.5	67.2	48
Three	309	31.4	67.4	49
Three	310	31.7	67.2	46
Three	311	31.8	67.5	47
Three	WC	32.1	67.4	47
Three	WC	32.1	72.3	47
Three	WC	31.7	73.1	46

Charts

Temperature



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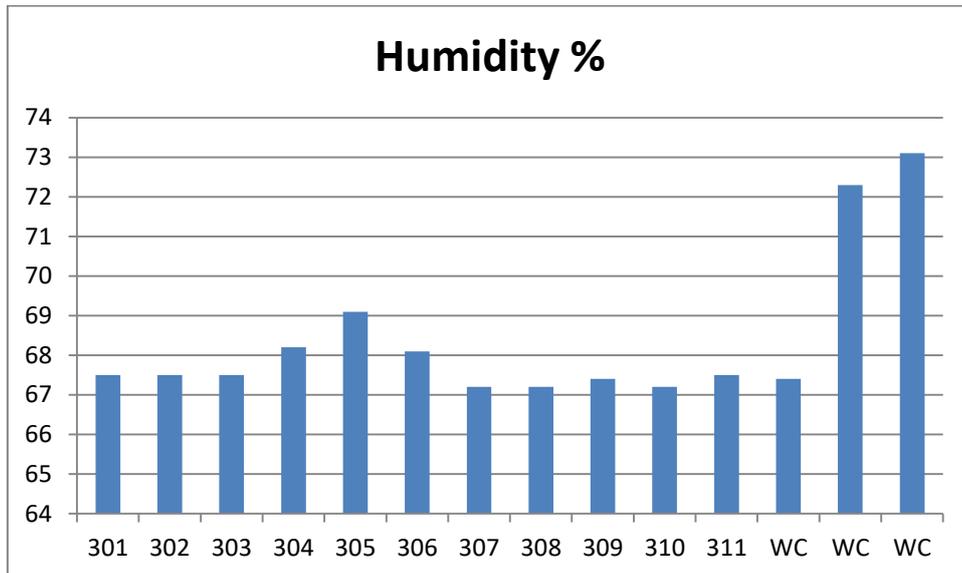
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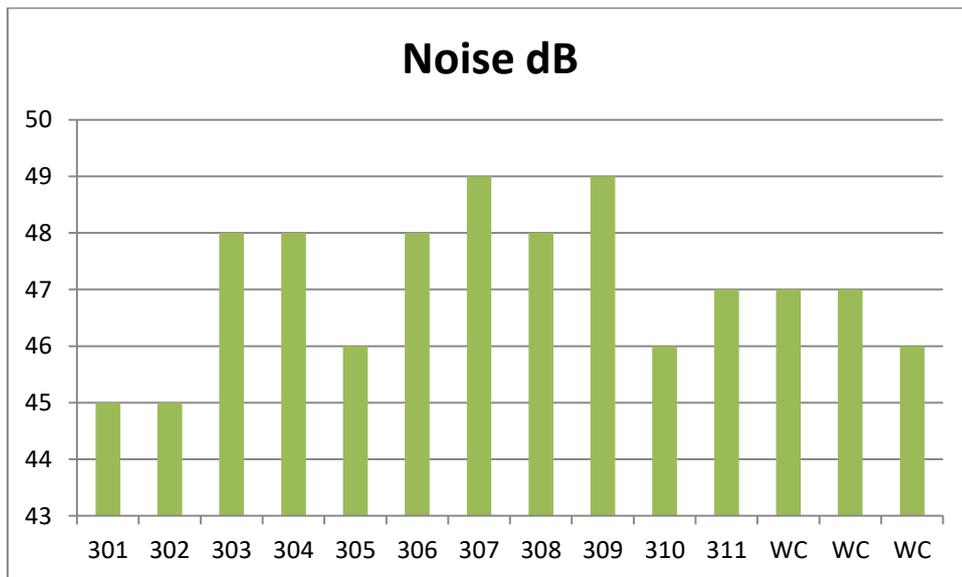
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Humidity



Noise

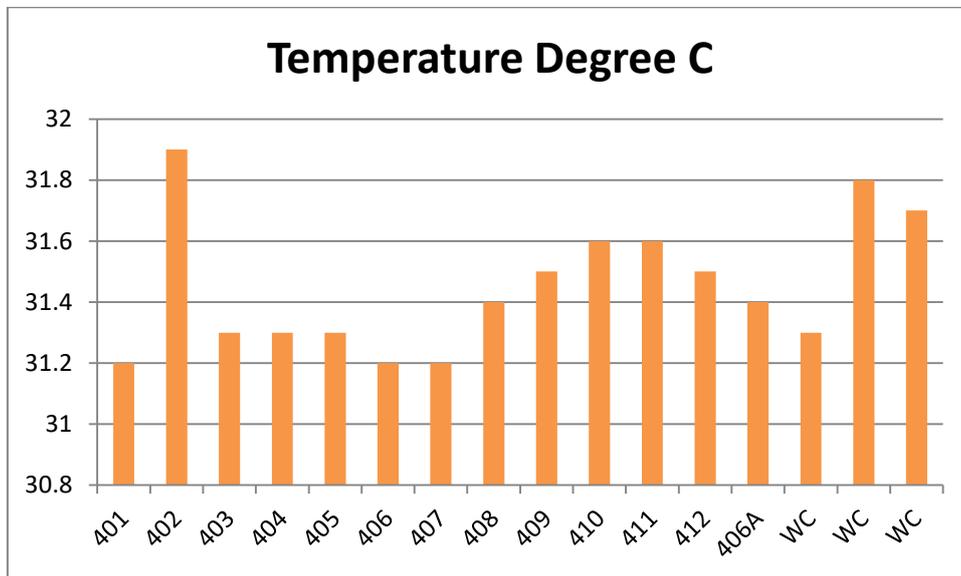


Fourth Floor

Floor	Room	Temperature Degree C	Humidity %	Noise dB
Four	401	31.2	66.1	48
Four	402	31.9	65.8	48
Four	403	31.3	66.2	48
Four	404	31.3	65.4	48
Four	405	31.3	65.4	48
Four	406	31.2	69.2	49
Four	407	31.2	68.4	49
Four	408	31.4	66.2	48
Four	409	31.5	66.5	49
Four	410	31.6	65.4	46
Four	411	31.6	65.3	46
Four	412	31.5	65.9	47
Four	406A	31.4	67.2	45
Four	WC	31.3	67.5	45
Four	WC	31.8	72.5	45
Four	WC	31.7	71.5	45

Charts

Temperature

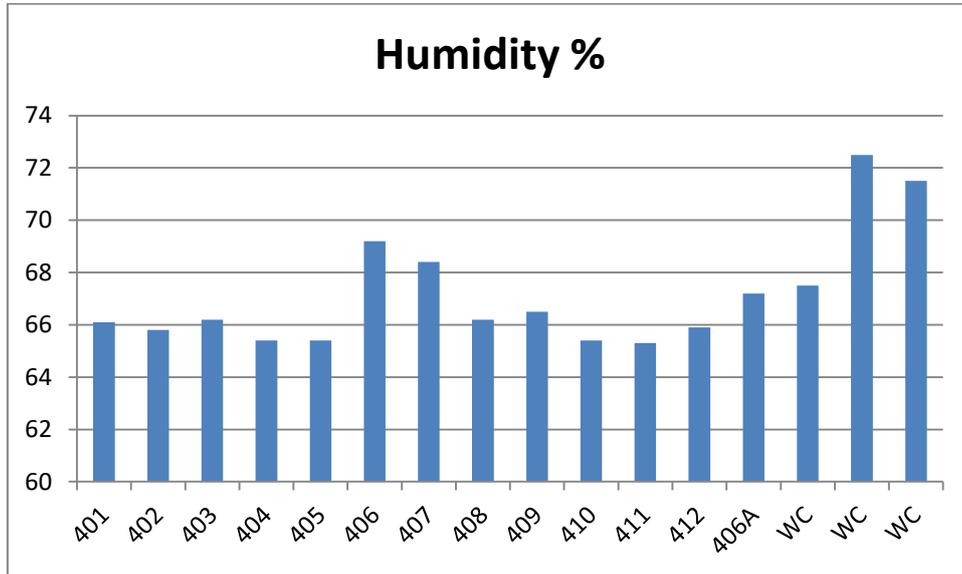




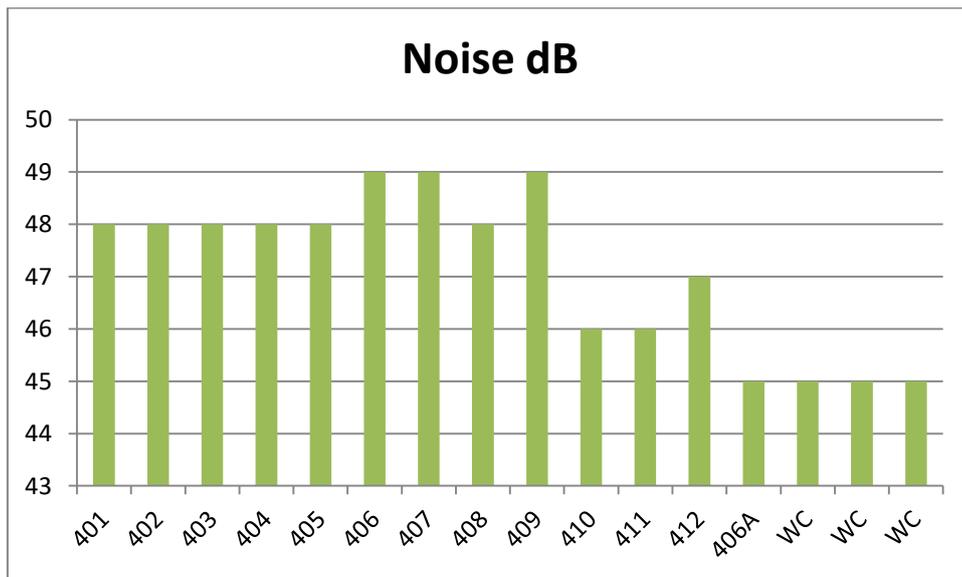
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Humidity



Noise





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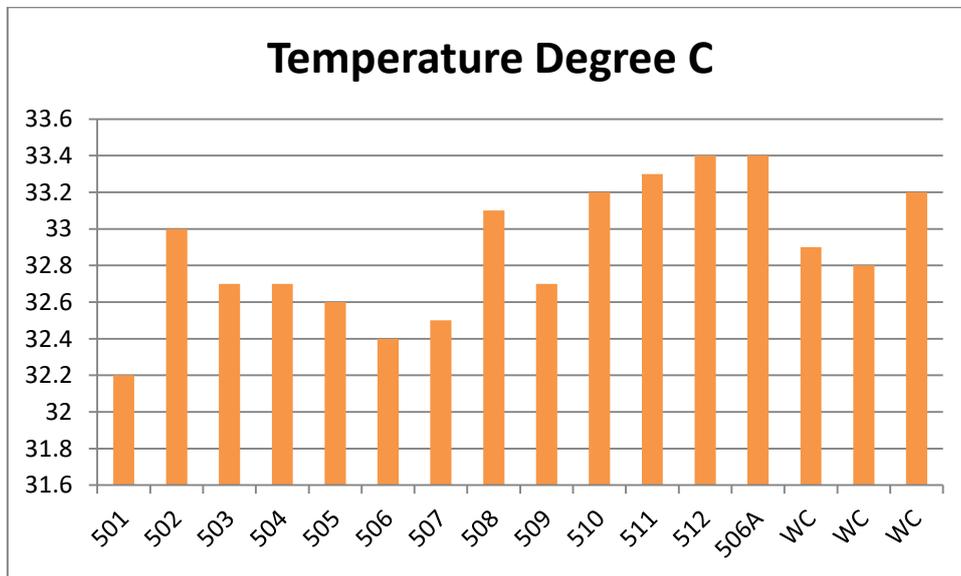
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Fifth Floor

Floor	Room	Temperature Degree C	Humidity %	Noise dB
Five	501	32.2	68.3	48
Five	502	33	68.6	49
Five	503	32.7	68.5	49
Five	504	32.7	67.6	47
Five	505	32.6	68.2	48
Five	506	32.4	69.6	47
Five	507	32.5	66.2	45
Five	508	33.1	68.1	49
Five	509	32.7	69.2	47
Five	510	33.2	69.3	48
Five	511	33.3	69.4	47
Five	512	33.4	68.4	48
Five	506A	33.4	66.5	49
Five	WC	32.9	69.2	47
Five	WC	32.8	73.6	48
Five	WC	33.2	73.7	49

Charts

Temperature



Solar rooftop and power plants | Solar and Electric Consultation | New Electric Connections
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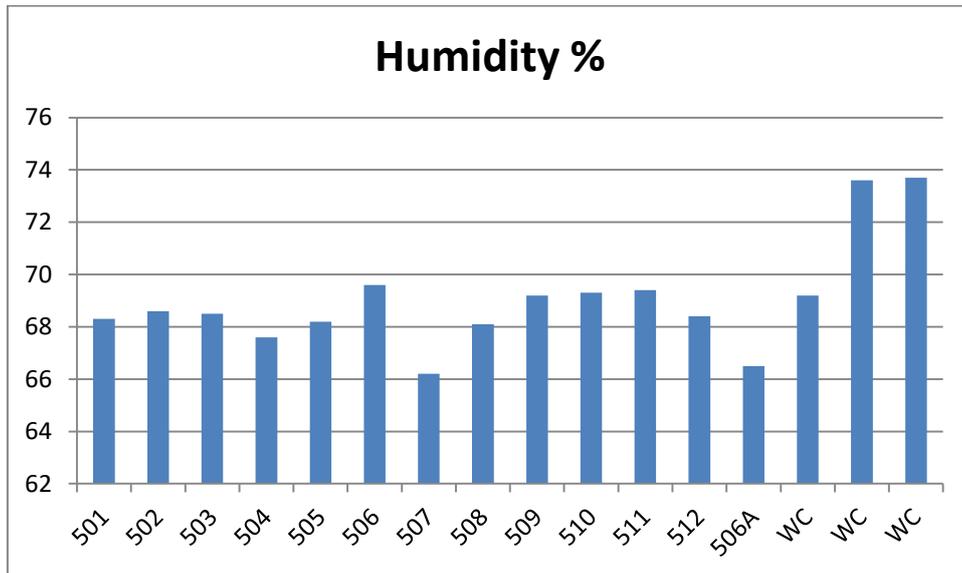
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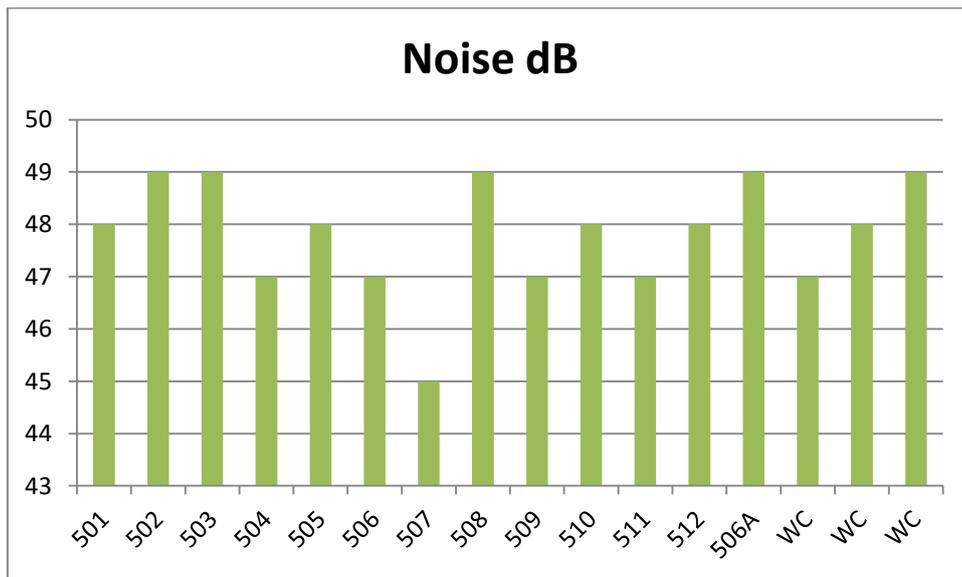
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Humidity



Noise





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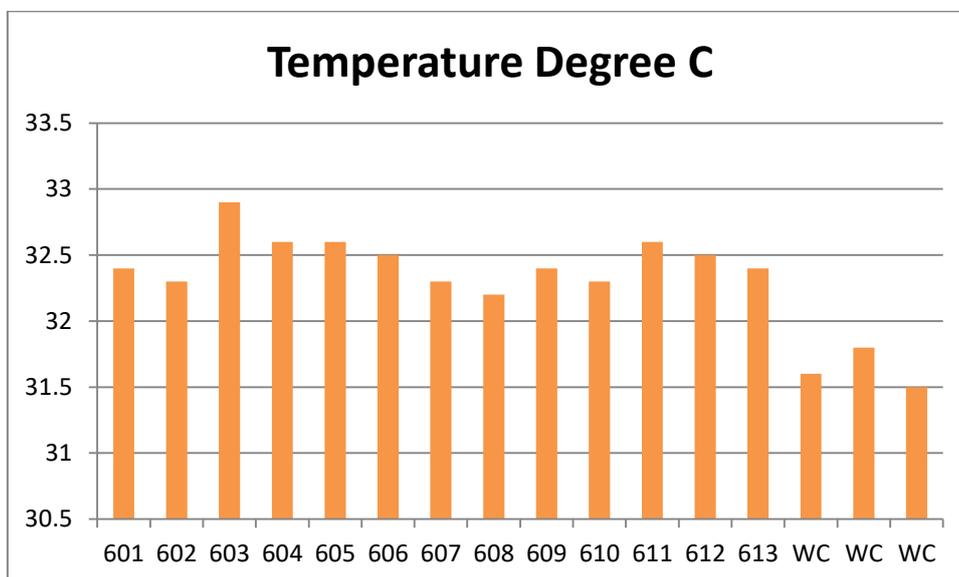
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Sixth Floor

Floor	Room	Temperature Degree C	Humidity %	Noise dB
Six	601	32.4	65.6	49
Six	602	32.3	66.1	48
Six	603	32.9	65.8	48
Six	604	32.6	66.2	48
Six	605	32.6	65.4	48
Six	606	32.5	65.4	48
Six	607	32.3	69.2	49
Six	608	32.2	68.4	49
Six	609	32.4	66.2	48
Six	610	32.3	66.5	50
Six	611	32.6	65.4	46
Six	612	32.5	65.3	46
Six	613	32.4	70.2	48
Six	WC	31.6	67.2	45
Six	WC	31.8	67.5	45
Six	WC	31.5	67.5	45

Charts

Temperature

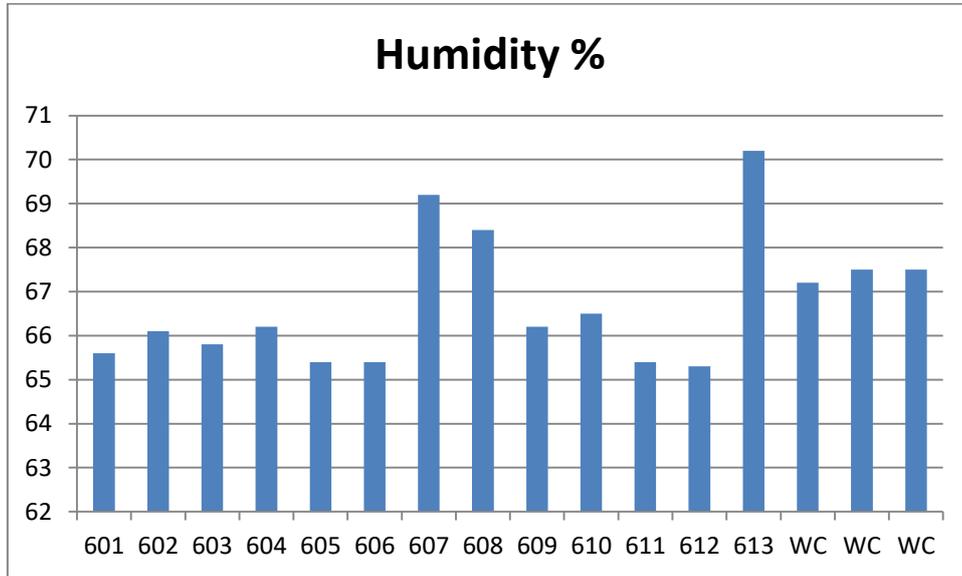




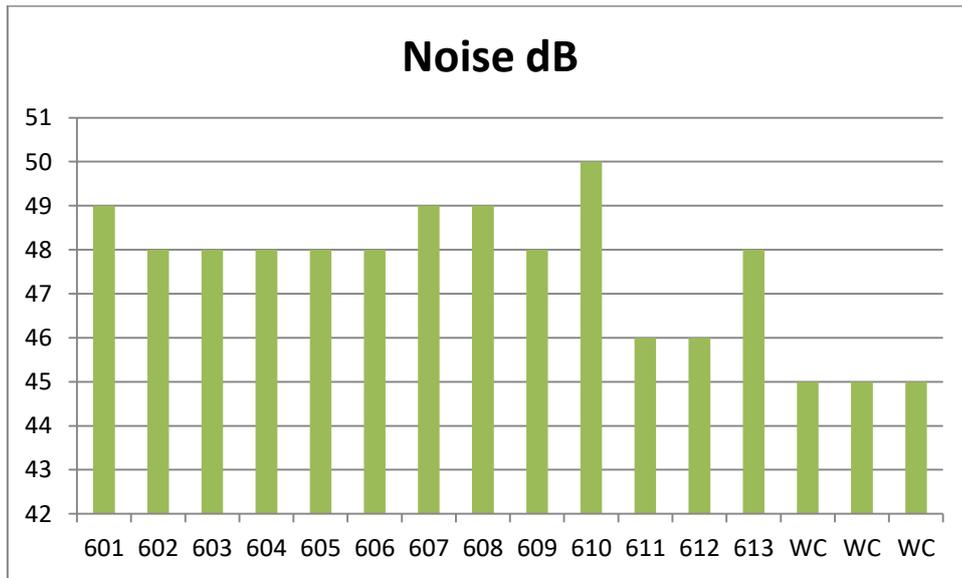
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Humidity



Noise





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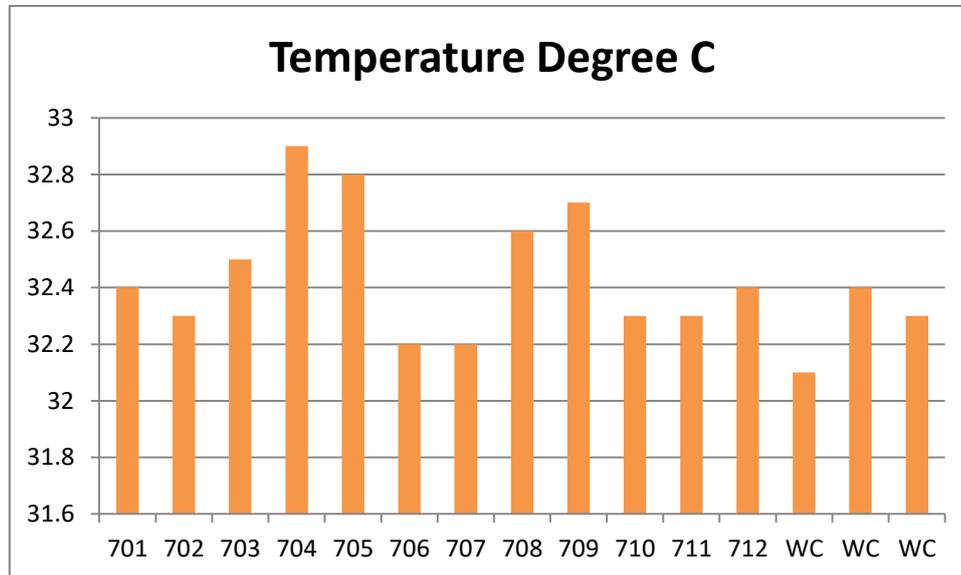
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Seventh Floor

Floor	Room	Temperature Degree C	Humidity %	Noise dB
Seven	701	32.4	69.4	47
Seven	702	32.3	68.4	48
Seven	703	32.5	66.5	49
Seven	704	32.9	69.2	47
Seven	705	32.8	73.6	48
Seven	706	32.2	65.6	49
Seven	707	32.2	66.1	48
Seven	708	32.6	65.8	48
Seven	709	32.7	66.2	48
Seven	710	32.3	65.4	48
Seven	711	32.3	65.4	48
Seven	712	32.4	69.2	49
Seven	WC	32.1	71.4	49
Seven	WC	32.4	70.2	48
Seven	WC	32.3	71.3	45

Charts

Temperature



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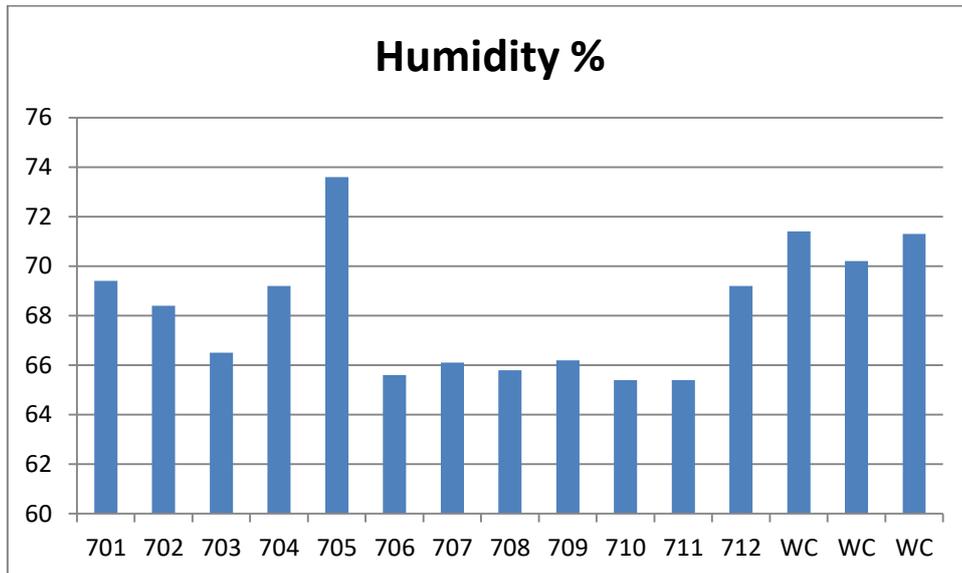
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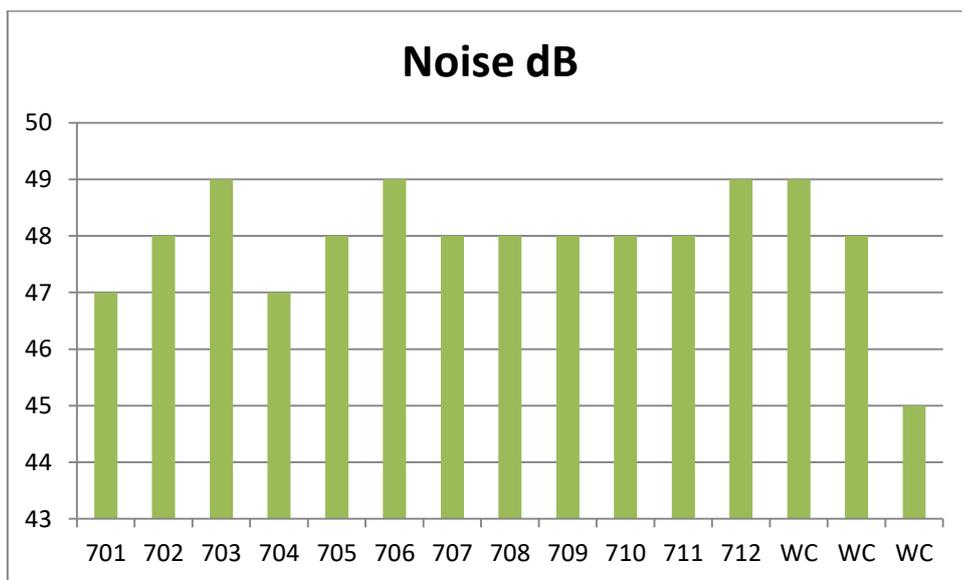
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Humidity



Noise





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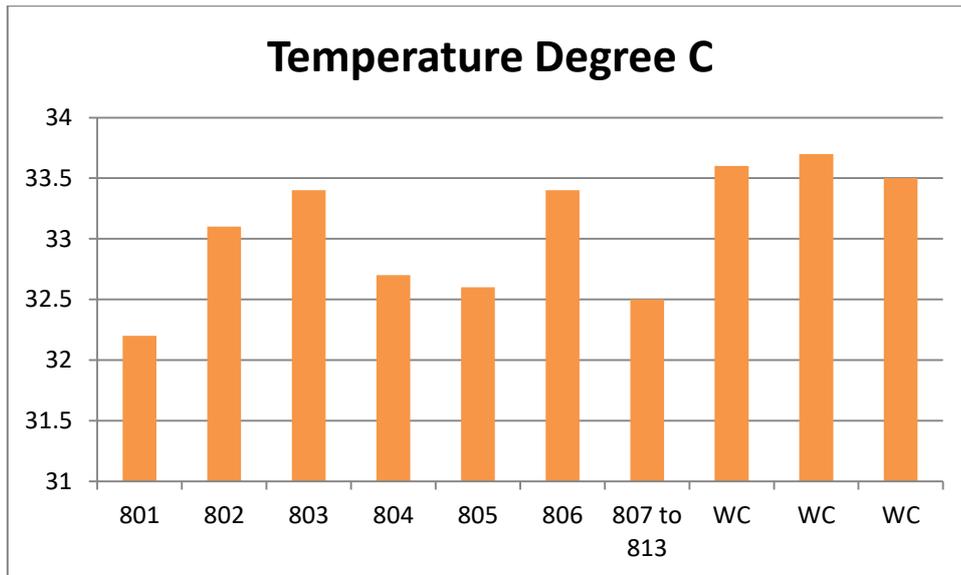
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Eighth Floor

Floor	Room	Temperature Degree C	Humidity %	Noise dB
Eight	801	32.2	66.3	48
Eight	802	33.1	66.5	49
Eight	803	33.4	67.5	49
Eight	804	32.7	67.2	48
Eight	805	32.6	68.3	47
Eight	806	33.4	69.6	47
Eight	807 to 813	32.5	66.2	45
Eight	WC	33.6	72.3	49
Eight	WC	33.7	71.8	47
Eight	WC	33.5	73.3	48

Charts

Temperature



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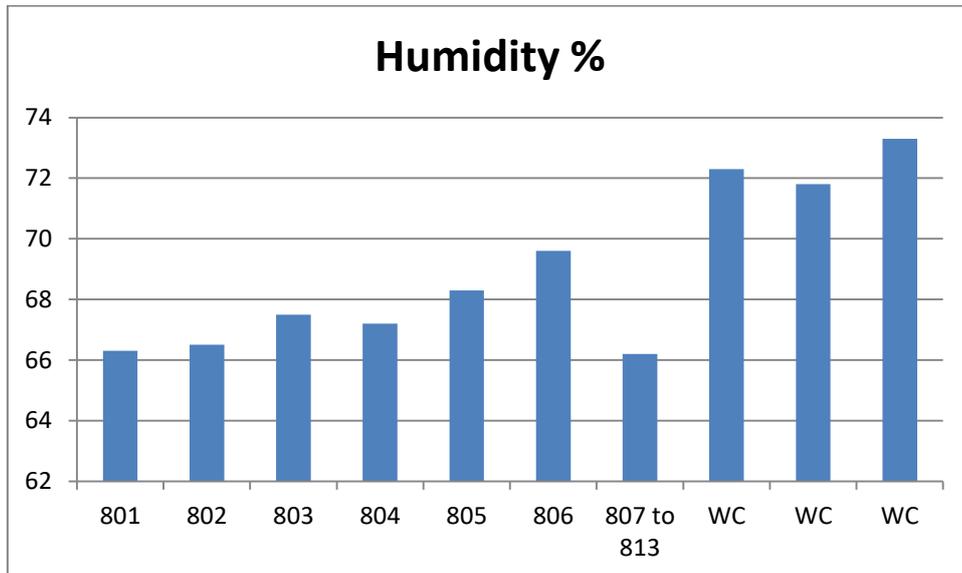
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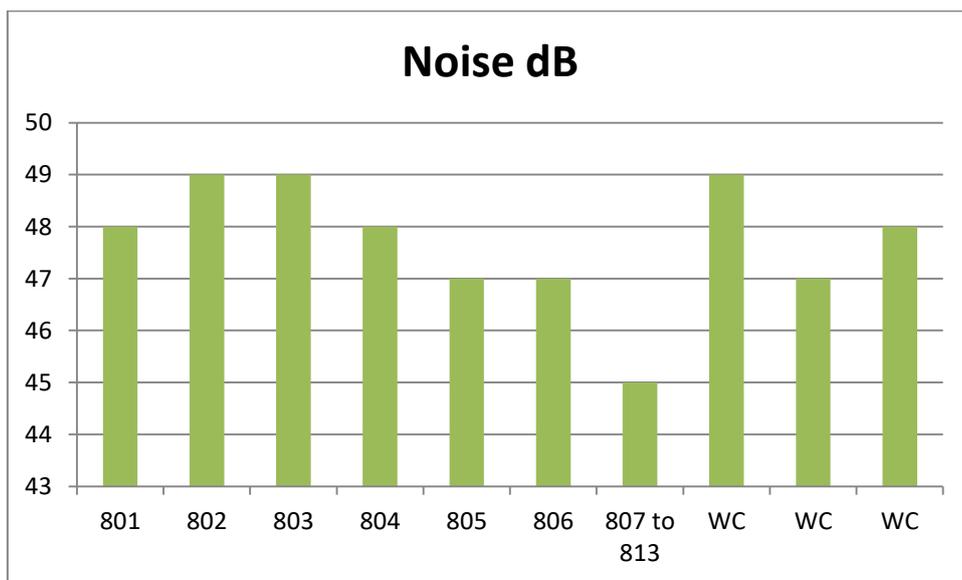
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Humidity



Noise





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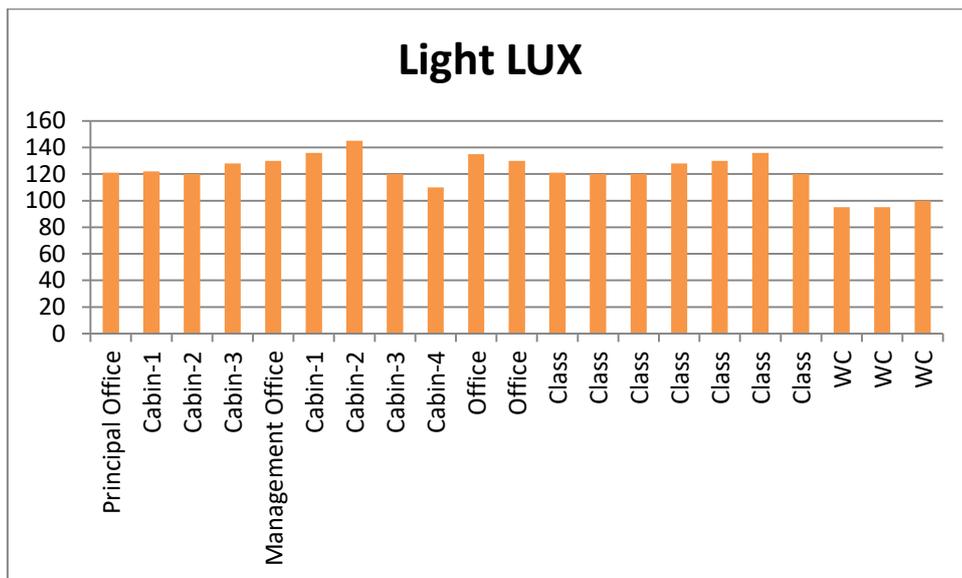
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9 Illumination

First Floor

Floor	Room	Light
First	Principal Office	121
First	Cabin-1	122
First	Cabin-2	120
First	Cabin-3	128
First	Management Office	130
First	Cabin-1	136
First	Cabin-2	145
First	Cabin-3	120
First	Cabin-4	110
First	Office	135
First	Office	130
First	Class	121
First	Class	120
First	Class	120
First	Class	128
First	Class	130
First	Class	136
First	Class	120
First	WC	95
First	WC	95
First	WC	100

Chart



Solar rooftop and power plants | Solar and Electric Consultation | New Electric Connections
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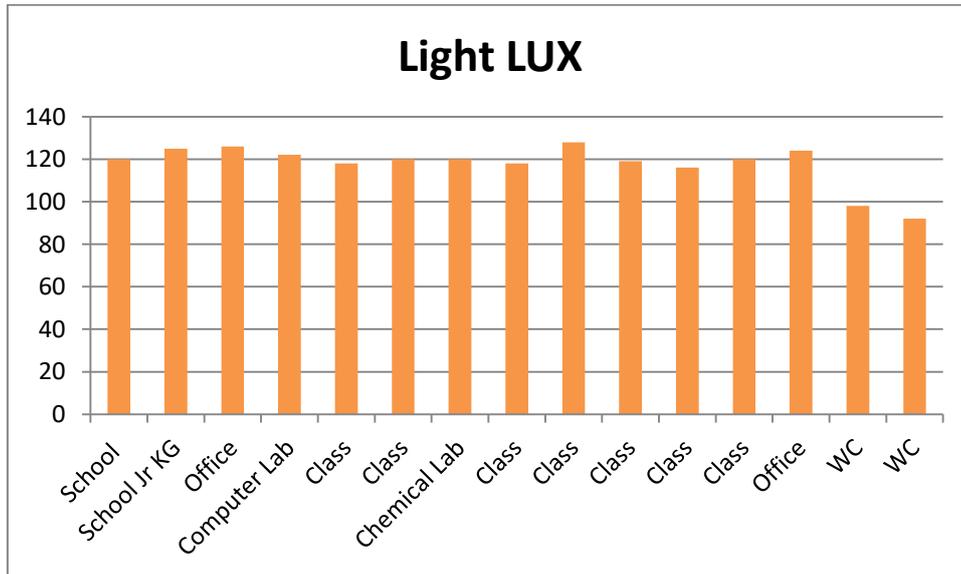


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Second Floor

Floor	Room	Light LUX
Two	School	120
Two	School Jr KG	125
Two	Office	126
Two	Computer Lab	122
Two	Class	118
Two	Class	120
Two	Chemical Lab	120
Two	Class	118
Two	Class	128
Two	Class	119
Two	Class	116
Two	Class	120
Two	Office	124
Two	WC	98
Two	WC	92



Solar rooftop and power plants | Solar and Electric Consultation | New Electric Connections
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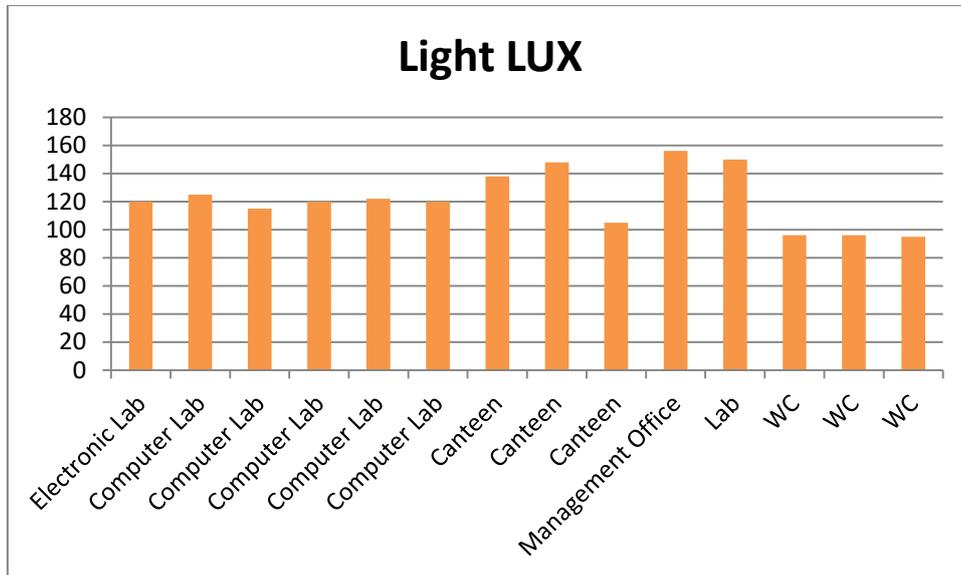


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Third Floor

Floor	Room	Light LUX
Three	Electronic Lab	120
Three	Computer Lab	125
Three	Computer Lab	115
Three	Computer Lab	120
Three	Computer Lab	122
Three	Computer Lab	120
Three	Canteen	138
Three	Canteen	148
Three	Canteen	105
Three	Management Office	156
Three	Lab	150
Three	WC	96
Three	WC	96
Three	WC	95



Solar rooftop and power plants | Solar and Electric Consultation | New Electric Connections
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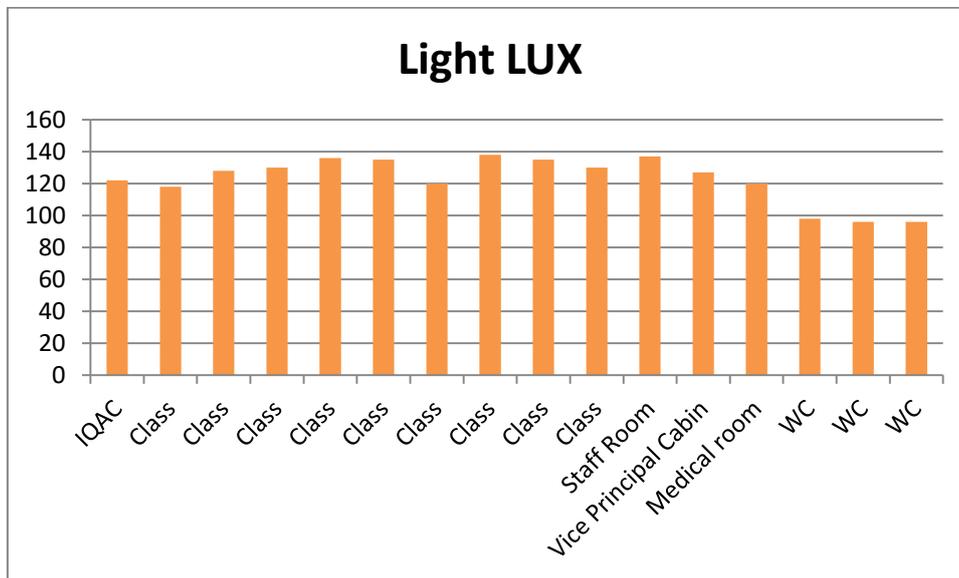


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Fourth Floor

Floor	Room	Light LUX
Four	IQAC	122
Four	Class	118
Four	Class	128
Four	Class	130
Four	Class	136
Four	Class	135
Four	Class	120
Four	Class	138
Four	Class	135
Four	Class	130
Four	Staff Room	137
Four	Vice Principal Cabin	127
Four	Medical room	120
Four	WC	98
Four	WC	96
Four	WC	96



Solar rooftop and power plants | Solar and Electric Consultation | New Electric Connections
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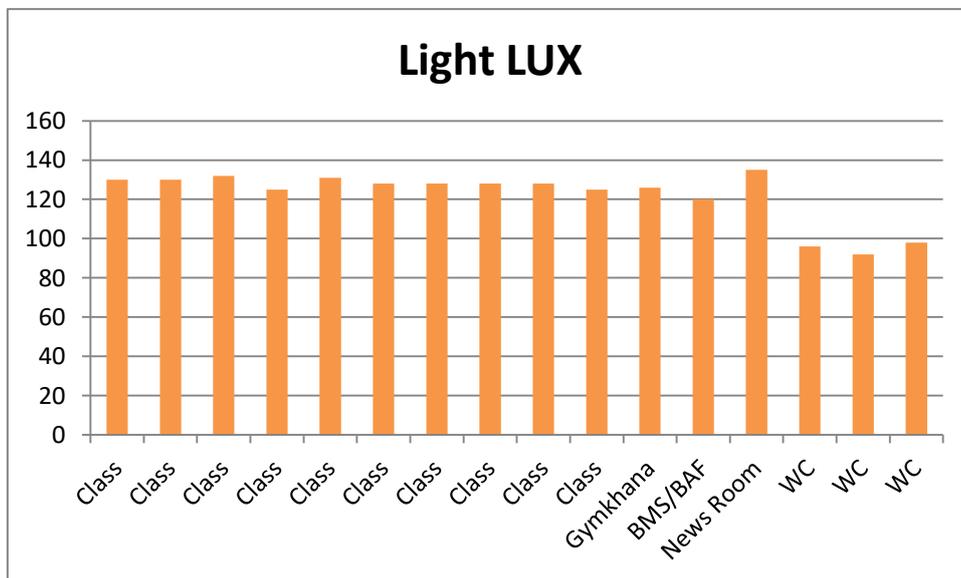


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Fifth Floor

Floor	Room	Light
		LUX
Five	Class	130
Five	Class	130
Five	Class	132
Five	Class	125
Five	Class	131
Five	Class	128
Five	Class	128
Five	Class	128
Five	Class	125
Five	Gymkhana	126
Five	BMS/BAF	120
Five	News Room	135
Five	WC	96
Five	WC	92
Five	WC	98



Solar rooftop and power plants | Solar and Electric Consultation | New Electric Connections
Load Management and extension | Change of Name on Bills | Meters (New, Shifting, additional)
Substation Management | Permissions, approvals, liasoning | Electrical & Safety Audits & Assessment

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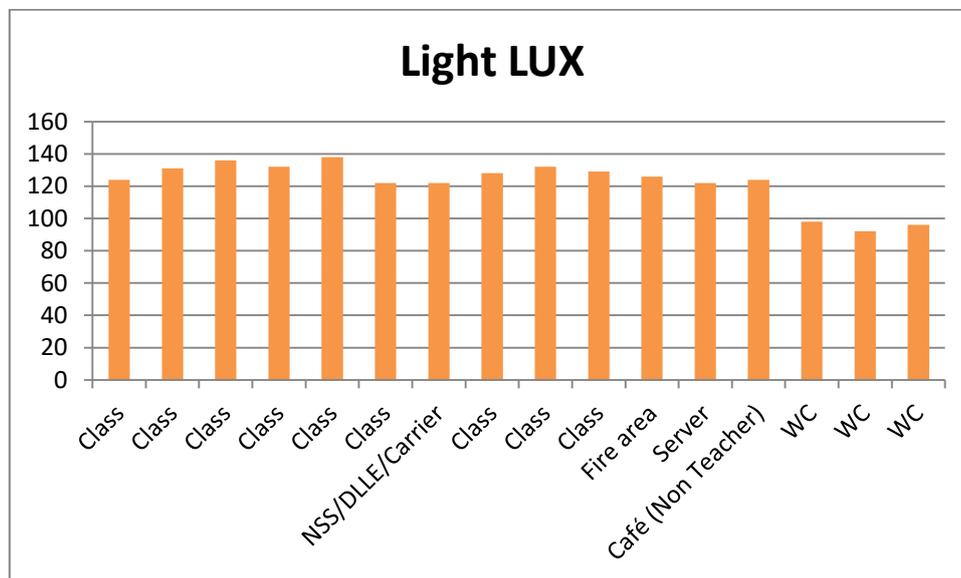


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Sixth Floor

Floor	Room	Light
		LUX
Six	Class	124
Six	Class	131
Six	Class	136
Six	Class	132
Six	Class	138
Six	Class	122
Six	NSS/DLLE/Carrier	122
Six	Class	128
Six	Class	132
Six	Class	129
Six	Fire area	126
Six	Server	122
Six	Café (Non Teacher)	124
Six	WC	98
Six	WC	92
Six	WC	96



Solar rooftop and power plants | Solar and Electric Consultation | New Electric Connections
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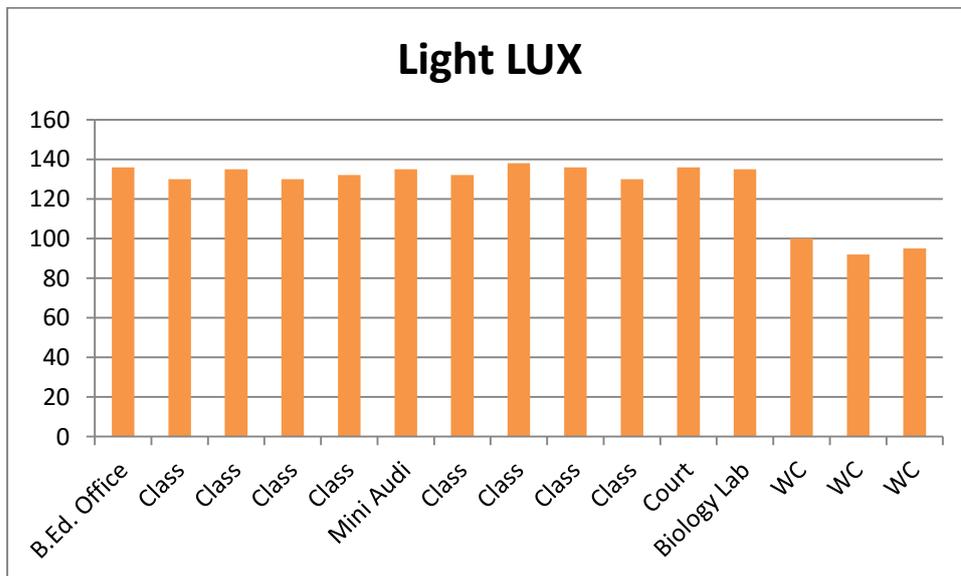


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Seventh Floor

Floor	Room	Light LUX
Seven	B.Ed. Office	136
Seven	Class	130
Seven	Class	135
Seven	Class	130
Seven	Class	132
Seven	Mini Audi	135
Seven	Class	132
Seven	Class	138
Seven	Class	136
Seven	Class	130
Seven	Court	136
Seven	Biology Lab	135
Seven	WC	100
Seven	WC	92
Seven	WC	95



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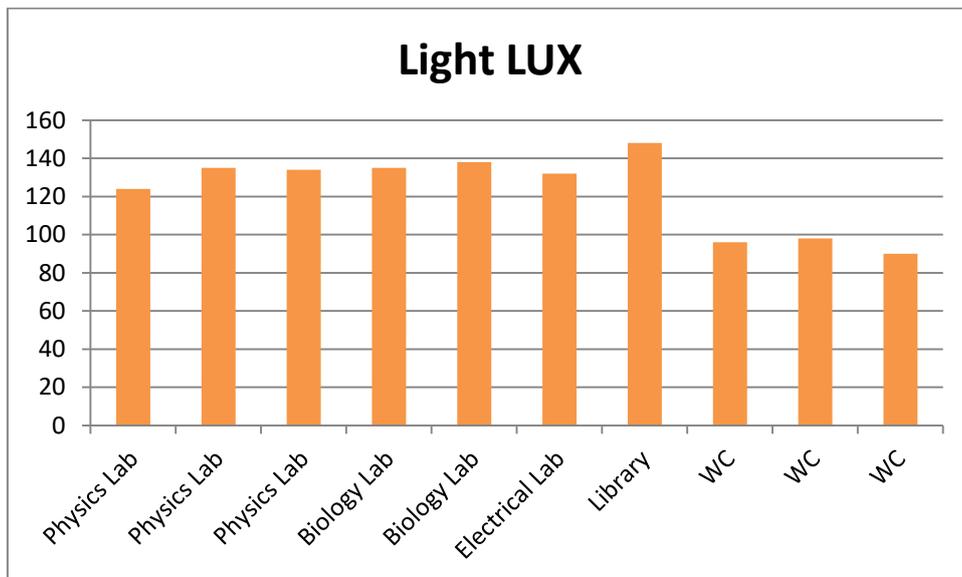


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Eighth Floor

Floor	Room	Light
		LUX
Eight	Physics Lab	124
Eight	Physics Lab	135
Eight	Physics Lab	134
Eight	Biology Lab	135
Eight	Biology Lab	138
Eight	Electrical Lab	132
Eight	Library	148
Eight	WC	96
Eight	WC	98
Eight	WC	90



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10 Energy Audit

10.1 Electrical Energy System

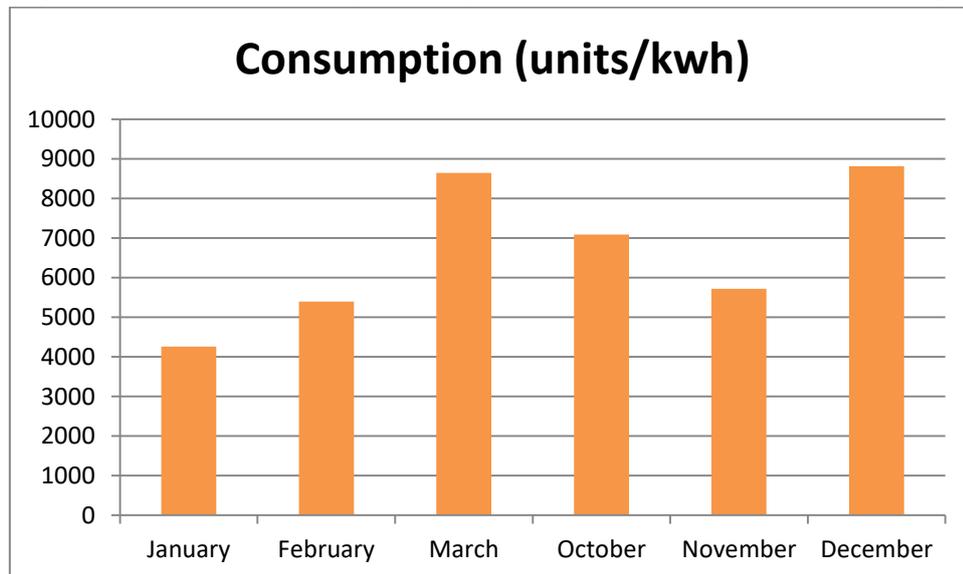
SL No	CA No	Meter No	Sanctioned Load	DISCOM	Phase
1	150011040	9029543	20	AECL	Three
2	150011043	9029544	20	AECL	Three
3	150199211	9029545	20	AECL	Three
4	150287272	9029541	20	AECL	Three
5	151030479	7915169	11	AECL	Three
6	102714632	9029542	8	AECL	Three
7	900000023103	SC001640	149	TPCL	Three

10.2 Electrical Bill Analysis

Bill SL No. 1 to 6

Billing Summary			
Month	Consumption	Expenses	Rate
(name)	(units/kwh)	(Rs)	(Rs/Kwh)
January	4255	42799	10.05852
February	5392	53446	9.912092
March	8645	83919	9.70723
October	7085	69306	9.782075
November	5713	56454	9.881673
December	8811	85473	9.700715

(Note: Data for Months April to September is not available for above bills)



Solar rooftop and power plants | Solar and Electric Consultation | New Electric Connections
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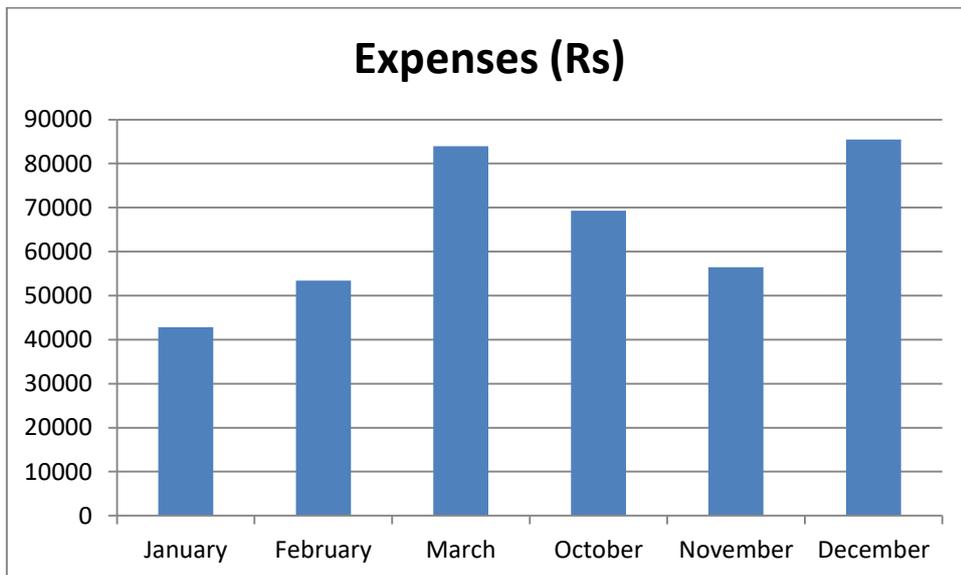
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Bill SL No. 7

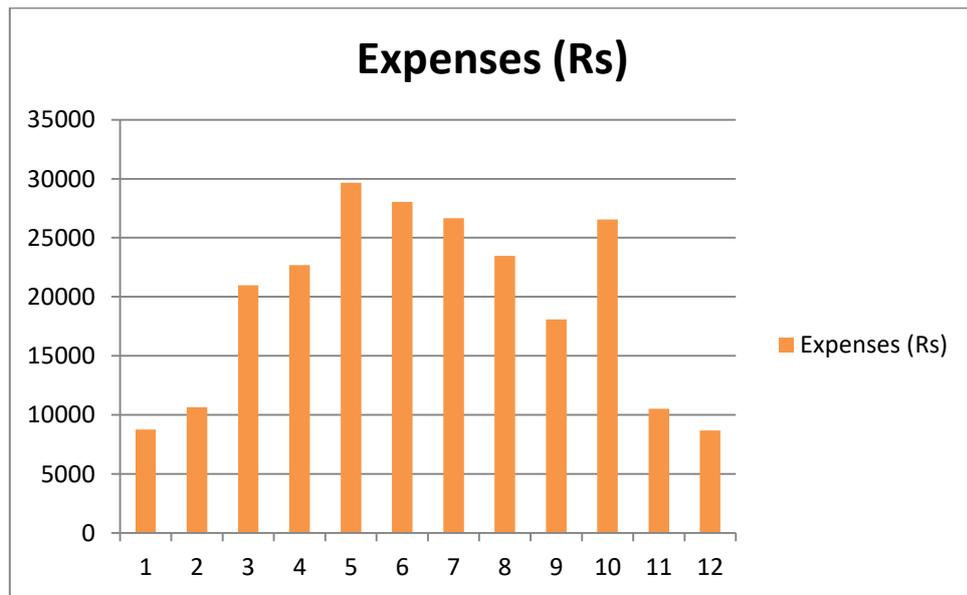
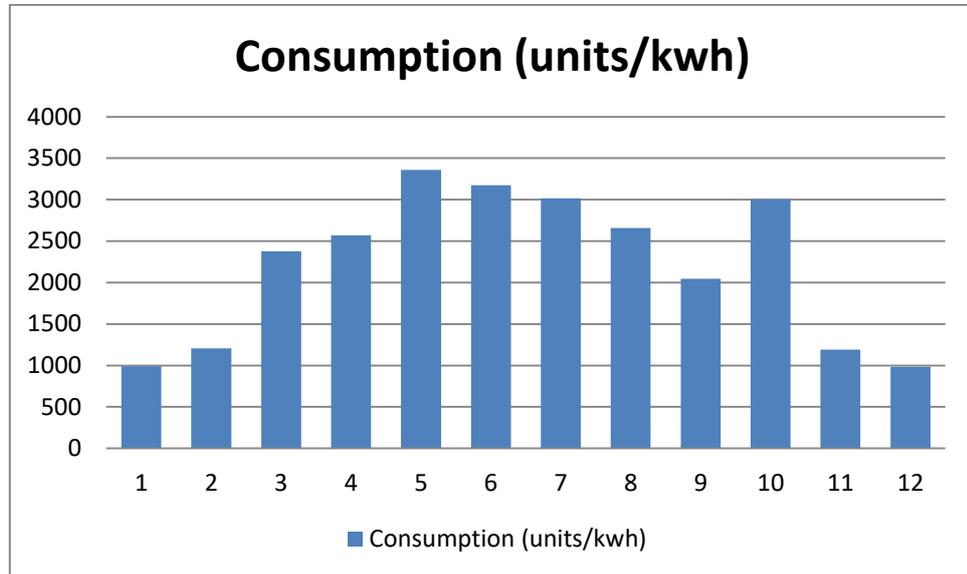
Billing Summary			
Month	Consumption	Expenses	Rate
(name)	(units/kwh)	(Rs)	(Rs/Kwh)
January	3358	29181.02	8.69
February	7215	62698.35	8.69
March	10892	94666.00	8.69
April	4339	37705.91	8.69
May	1549	13460.81	8.69
June	1926	16736.94	8.69
July	3860	33543.40	8.69
August	2682	23306.58	8.69
September	3326	28902.94	8.69
October	7379	64123.51	8.69
November	6401	55624.69	8.69
December	7700	66913.00	8.69

(Note: Data for Expense is not available for above bill hence unit rate of available bill is considered)



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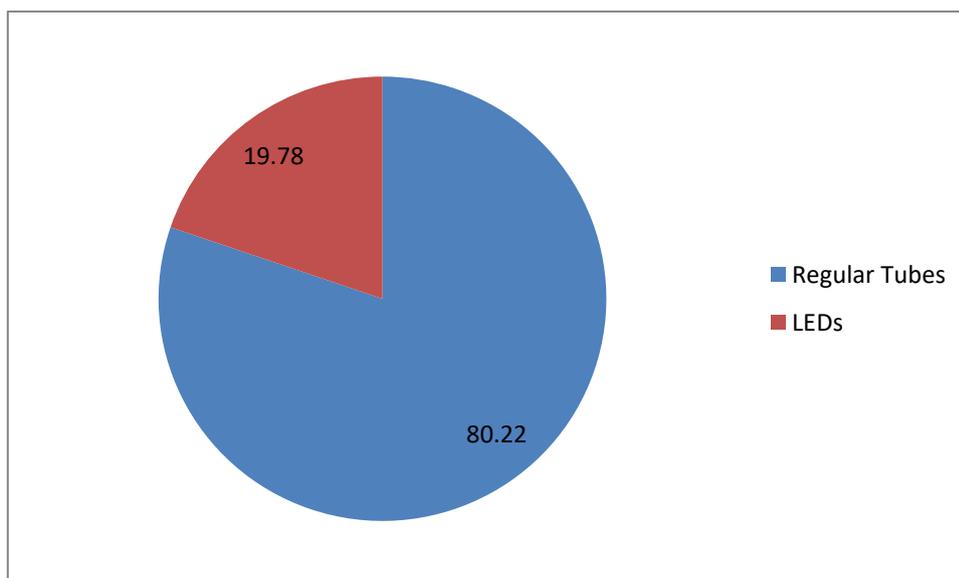
10.3 Consumption Scenario

Meter-1 to 6	Usage (Kwh)	Payment (Rs)	Duration
Total	39901	391397	Annual
Min	5713	56454	October
Max	8645	83919	March
Average	6650	65438.55	Annual

Meter-7	Usage (Kwh)	Payment (Rs)	Duration
Total	60627	526863.15	Annual
Min	1549	13460.81	May
Max	10892	94666	March
Average	5052.3	43905.3	Annual

10.4 Assessment of Lighting System

Lights	Regular Tubes	LEDs
Nos	594	293
Load(Kw)	23.76	5.86
Percentage	80.22	19.78



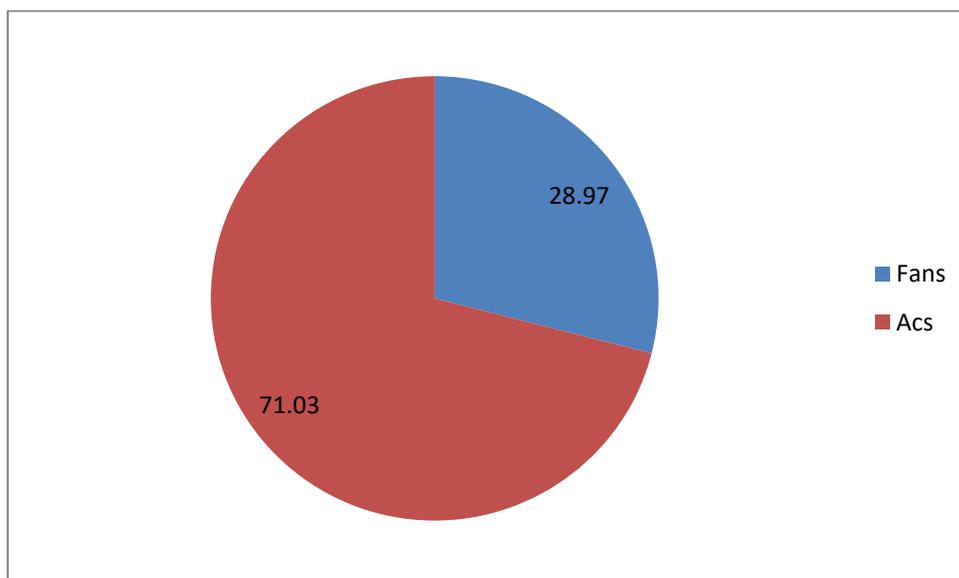


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10.5 Assessment of Cooling System

Cooling	Fans	Acs
Numbers	572	65
Load(Kw)	40.04	98.15
Percentage	28.97	71.03



10.6 Use of Renewable Energy System

Not Available



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11 Safety Assessment

11.1 Status of presence of electrical safety hazards:

SL No	Safety Hazard Yes/No Remarks	Yes/No	Remarks
1)	Existence of non ISI/standardized appliances	No	
2)	Whether the existing wiring is more than 20 years old.(Wiring more than 20 years old must be recommended for replacement)	No	
3)	Whether Fire detection and Alarm system is installed?	Yes	
4)	Whether sufficient number of fire extinguishers is installed?	Yes	
5)	Segregated UPS room with proper ventilation/exhaust is provided?	NA	
6)	Is their display of emergency telephone number of nearest fire station, hospital and key person?	No	
7)	Whether frequent sparking at certain place(s) reported	No	
8)	Whether switches found with burnt marks	No	
9)	Existence of non standardized tube lights/CFLs/Bulbs and TL starters and chokes	No	
10)	Dampness in walls and ceiling	No	
11)	Loose switches/plugs	No	
12)	Naked wiring or connections	No	
13)	All Electrical cables/wiring are in conduits and are protected by a fire proof insulation	Yes	
14)	Seepage /Leakage of water in walls or on and around electrical installations	No	
15)	Whether connection to each AC is provided through an individual MCB of appropriate rating & of standard make and ISI approved.	Yes	
16)	Whether there are frequent tripping due to overloads ?	No	



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11.2 Safety Survey:

- 11.2.1 Actual Cable Size (at meter): 185 Sqmm
- 11.2.2 Year of Installation: 2004
- 11.2.3 Actual Available Cut-out Size: 100A
- 11.2.4 Year of Installation: 2004
- 11.2.5 Actual Required ELCB Size: **Present at Branches but bypassed or failed in test**
- 11.2.6 Meter Cabin Condition: **Bad**
- 11.2.7 Availability of Fire extinguisher/ Sand Buckets: **No (In Meter cabin)**
- 11.2.8 Water proofing/Seepage: No
- 11.2.9 Damages/Tampering: No
- 11.2.10 Adequacy in connections/Termination/Joints: Good
- 11.2.11 Ease of accessibility: Good
- 11.2.12 Danger Signs: **NO**
- 11.2.13 Smoke detectors : Good
- 11.2.14 Alarm system: Yes
- 11.2.15 Emergency Entry/Exit door: Yes
- 11.2.16 Emergency evacuation plan: **NO**
- 11.2.17 Fire extinguishers: Yes
- 11.2.18 Public Address system : YES
- 11.2.19 Rodent arrester: **NO**
- 11.2.20 CCTV: Yes
- 11.2.21 Meter cabin: Average Condition
 - 11.2.21.1 Leakage: **NO**
 - 11.2.21.2 Damaged/tempered/cracks: **YES**
 - 11.2.21.3 Name plate: **No**
 - 11.2.21.4 Water logging possibility: **No**
- 11.2.22 Physical Inspection of Power source : Average Condition
 - 11.2.22.1 Adequacy as per standards **OK**
 - 11.2.22.2 Rusting of panel **Minor**
 - 11.2.22.3 Visible scaling **Minor**
 - 11.2.22.4 Scaled/ Unclean wires breakers **YES**
 - 11.2.22.5 Wet / Dampness **NO**



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11.3 Following Regulations have been breached by electric connections present

1. Regulation 3: Registers of designated persons

No registers maintained

2. Regulation 16: Separate Earthing

Not provided

3. Regulation 18: Danger Notice

Not provided

4. Regulation 19: Insulation Floor Mat in Meter cabin and Server room

Not provided

5. Regulation 27: Generation station Fire Bucket with clean Dry sand

No

Additional Fire Extinguisher nearby

No

First Aid Box

No

Training of staff

No

6. Regulation 28: Precautions and response to electric Shock

No

7. Regulation 34: Insulation Resistance

No

8. Regulation 41: Earth Resistance

No

Record of Registered value

No

9. Regulation 42: Provision of ELCB/RCB

No (Bypassed or Failed in sample test)



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12 Wastage Types and Management

SL No	Wastage Type	Quantity	Action
1	Biomass	NA	NA
2	Paper	10-20Kg approx. per month	Cleaned by housekeeping and sent to municipal wastage
3	Water	100-500Ltrs approx. per year due to leakage	Not considered
4	E-Waste	Un-quantified	Cleaned by housekeeping and sent to municipal wastage
5	Bio-Hazardous	NIL	NIL
6	Fuel	Electricity Wastage by running fans and lights for uncounted time after room cleaning	NIL
7	Production	NIL	NIL
8	Process	Occasional electricity wastage by room user/s accidentally keeping equipments switched On while leaving the room.	NIL
9	Food	Occasionally wastage in very low quantity	Cleaned by housekeeping and sent to municipal wastage
10	Man-Hours	NIL	NIL

Best Practices

1. Install a vermin-compost plant for Biomass and food wastage (point no.1 and 9).
2. Install a Bin in reception area to collect paper wastage (point no.2).
3. Fix all taps, replace old pipelines, use Teflon tapes on ties, and use sealants for joints to avoid leakage (point no.3).
4. Install a Bin in reception area to collect E- wastage like damaged or dead luminaries, mobiles, computer or spare-parts, Etc. hand over it to proper scrap vendor once bin is full (point no.4).
5. Update SOP of cleaning with statement "Switch OFF Fans after 5 Minutes once room is cleaned". (point no.6)
6. Fix a Notice on Back-side of Exit Door of Room-"SWITCH OFF all electrical equipments and Taps". (point no.8 and 6)
7. In present scenario observed there is no any recycling procedure is thought, documented or observed in premises.
8. Recycling of one side used papers to be observed.
9. Prepare and observed a Generalized SOP having attributes specialize on each type of wastage and it's re-usage and/or recycling.



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13 Environment Impact on Natural resources

13.1 Table-1: Overall

Environmental Impact Analysis Report		
Annual Consumption	100528	KWh
Annual Green- Impact		
Co2 Generated	65124	Kg
Coal Burned	59194.8	Kg
Diesel Burned	31371.3	Ltr
Natural Gas Burned	1196937	Cub Ft
Trees Cut	2964.6	Nos
Water Consumed	213532	Ltr
Life Time Green- Impact		
Co2 Generated	1185759	Kg
Coal Burned	3403904	Kg
Diesel Burned	571269	Ltr
Natural Gas Burned	2.2E+07	Cub Ft
Trees Cut	53986.5	Nos
Water Consumed	3888421	Ltr

13.2 Table-2: Occupational Area Based

Environmental Impact Analysis Report		
Annual Consumption	100528	KWh
Annual Green- Impact		
Co2 Generated	2.17	Kg
Coal Burned	1.97	Kg
Diesel Burned	1.05	Ltr
Natural Gas Burned	39.90	Cub Ft
Trees Cut	0.10	Nos
Water Consumed	7.12	Ltr
Life Time Green- Impact		
Co2 Generated	39.53	Kg
Coal Burned	113.46	Kg
Diesel Burned	19.04	Ltr
Natural Gas Burned	726.54	Cub Ft
Trees Cut	1.80	Nos
Water Consumed	129.61	Ltr

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13.3 Table-3: Footfall Based

Environmental Impact Analysis Report		
Annual Consumption	100528	KWh
Annual Green- Impact		
Co2 Generated	9.30	Kg
Coal Burned	8.46	Kg
Diesel Burned	4.48	Ltr
Natural Gas Burned	170.99	Cub Ft
Trees Cut	0.42	Nos
Water Consumed	30.50	Ltr
Life Time Green- Impact		
Co2 Generated	169.39	Kg
Coal Burned	486.27	Kg
Diesel Burned	81.61	Ltr
Natural Gas Burned	3113.75	Cub Ft
Trees Cut	7.71	Nos
Water Consumed	555.49	Ltr

13.4 Table-4: Carbon Footprints

Head	General	Per Square Foot	Per Person
Per Year	65124	2.17	9.30
Lifetime (20Years)	1185759	39.53	169.39

Ranges:

Best: (Below 1800/Per Person per year)

Average: (Below 3000 and Above 1800/Per Person per year)

Bad: (Above 3000/Per Person per year)

Carbon Footprint found best category.

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14 Suggestions

1. Air quality is found moderate. There is scope to increase in Tree diversity; Plants like Tulsi, Camphora, Etc. can be planted for getting more pollution-free atmosphere. Also to increase the quality more greenery can be implemented. This can be done through gardening in empty places, terrace gardening and Green walls.
2. Water quality is found average. Quality is observed from RO output. To maintain the quality, water testing has to be done in every season (after every four months). A standard operating process has to be defined, documented and observed for tank and pipeline cleaning and maintenance.
3. Noise level is appropriate.
4. Illumination level found good. To maintain accurate level, windows to be cleaned regularly, obstacles on windows to be moved, Proper capacity and efficiency of luminaries to be used and luminaries also to be cleaned once in a week. For details refer illumination section.
5. The climatic conditions are hot and humid. This increases fan consumption.
6. The site has excellent solar irradiation which can be utilized for electricity generation.
7. Arrange Exhibitions and identification programs for students and locals to understand medicinal plants.
8. Start a planting drive with students outside campus.
9. Gift small plants or seeds/seed-balls to students leaving or going to native place and encourage them to plant at their own premises.
10. There should be display of emergency telephone number of nearest fire station, hospital and key person.
11. ELCBs found faulty or bypassed, those need to be replaced immediately.
12. Fire extinguisher/ Sand Buckets to be installed in meter cabin.
13. Danger Signs to be installed in meter cabin and near electrical boards.
14. Emergency evacuation plan to be prepared and displayed at centre place.
15. Earthing pits and lightning arrestor to be installed.
16. Generate awareness among user about environment conservation.
17. Prepare and observe SOPs for the same.
18. Put "SWITCH OFF" boards on back side of Doors.
19. Use energy efficient Lighting.
20. Use Energy efficient fans.
21. Keep AC temperature to 26⁰ C.
22. Clean Luminaries, Fans, ACs regularly to increase efficiency.
23. Prepare and observe SOPs for maintenance of equipments.
24. Avoid Draft printing, use email/Whatsapp maximum.



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25. Following tests are to be conducted at-least annually

- Earthing
- Lightning Arrestor
- Grounding Continuity
- Voltage
- Polarity
- Neutral Current
- Load Unbalance
- Earth Resistance
- Insulation Resistance
- Illumination
- Power Quality
- Thermography

26. Saving Opportunities (considering current average rate and six hours daily usage)

- A. Replacing Regular Tube lights with LED will save approximately Rs. 15,000 per month.
- B. Replacing Regular Fans with BLDC Energy saving Fans will save approximately Rs. 25,000 per month.
- C. Installation of SPVGCRT (Solar Photovoltaic Grid Connected Roof Top) System with Net Metering facility can save 80% of Electricity bill. (Solar Resource Analysis is required).

15 Disclaimer

The report is generated from data, information, answer to asked questions, standards and procedures defined by different and concerned authorities time to time, available site condition, weather condition, operational and availability conditions provided by beneficiary on the day of survey. If any changes on above said measures on any other parameters affecting these measures may lead to change, alter, in-corrections even falsifying calculations, results, recommendations and suggestions. The values, figures, amounts mentioned are indicative to the site situation and condition; it may not reflect each and every aspect of it. The report is generated restricted to given scope and available conditions and measures.

16 Conclusion

We hereby conclude report for “Energy Audit, Green Audit and Environment Audit” of the Work done under scope of work for “Nirmala Memorial Foundation College of commerce & Science, 90Ft Road, Thakur Complex, Kandivali (East) Mumbai 400101”. Please study it thoroughly and implement recommendations and suggestions at earliest.

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