ENERGY ASSESSMENT

REPORT

2019-2020

Prepared For

SRI AUROBINDO COLLEGE (Morning)
Shivalik, Malviya Nagar,
New Delhi-110017, India

Project No.: ITPL22-R-5029A

Issued By:

INDOHAAN TECHNOLOGIES PRIVATE LIMITED

ACKNOWLEDGEMENT

M/s Indohaan Technologies Pvt Ltd wishes to express our thanks to the Principal and all staff members of **Sri Aurobindo College (Morning)** for the support and courtesy extended to the visiting team during the data collection and study.

Report Reference : ITPL22-R-5029A R0

Report Title **: Energy assessment report (2019-2020)**

Project No. **:** ITPL22-P-5029

Status **:** Completed

Client Name **:** Sri Aurobindo College (Morning)

Client Contact **:** Principal, Sri Aurobindo College (Morning)

Issued By **:** Indohaan Technologies Private Ltd.

Document Production Record

Issue No	Name	Date	Position
Prepared	Deepika	18th March 2022	Safety Engineer
Checked by	AVM.	22nd March 2022	Consultant

Document Revision Summary

Issue No	Date	Details of Revision
First	23rd March 2022	First submission

Distribution List

Client	Client Contact	Number of copies
Sri Aurobindo College	Principal	Electronic Transmission only

INDEX

CHAPTER 1
EXECUTIVE SUMMARY

1.1 Introduction

Energy assessment study has been carried out on the request of Sri Aurobindo College to assess actual generation of Solar power (renewable energy source) from the 50kWp Solar power plant, analyse efficiency of utilization & evaluate savings on electricity bills for the academic year 2019-2020

It is also pertinent to mention that, based on recommendation in the previous study report; Sri Aurobindo College is continuing to carry out carried out replacement of previously installed T8/T12 tube lights with LED fittings with an aim to reduce energy costs and at the same time to achieve possible improvement in illuminance

The study & analysis presented in this report is based on field observations, Lux level measurements, review of BSES Energy & Solar supply bills & technical analysis/ calculations of consumption & corresponding savings for the academic year 2019-20

Some of the key results are intended to be reproduced by the College in the next AQAR report, to be submitted to NAAC team as evidence for continued efforts in upholding energy conservation initiatives.

Following are the highlights of the study, which are presented as part of this Executive summary.

1.2 Lighting-Energy saving by replacement with LED

It is noteworthy to mention that the College is continuing to implement Energy saving measure by replacing the previously installed T8/T12 tube lights with energy efficient LED lights (22Kw /2100 Lumens – Syska /Surya make).

The analysis presented in Annexure-1 of this report indicate that this continual effort has resulted & a net overall energy saving of 5.7% compared to previous year

1.3 Contribution of Renewable energy (Solar)

A 50kWp Solar power generating photo voltaic system supplied by M/s Hero Solar Energy Pvt Ltd has been in operation since August 2018 in the College premises.

We have analysed the Solar supply bills & observed that the Solar generation is almost meeting the commitment made in the Power purchase agreement (PPA) on an yearly basis though on closer analysis a small shortfall is noted during summer months; probably due to accumulation of ambient dust which is likely to be present in the atmosphere during this period

Notwithstanding this negligible shortfall, our calculation show that the actual contribution of Renewable energy (Solar in this case) on an yearly basis is 18.9 % of the total energy consumption considering Morning & evening colleges as ONE Entity), which is a good achievement.

The contribution in the Winter months is expectedly higher (=24 %) due to lower heat load of Air conditioning /fans & slightly better generation of solar power

The continued usage of LED lights has contributed to about 5.7% saving in the overall energy consumption (BSES + Solar)

An apple to apple comparison of all the above noted parameters with respect to corresponding results of previous years is provided under part C of Annexure-1.

The College should suitably highlight the enhanced performance metrics in their Annual report & the next AQAR report.

CHAPTER 2

INPUT DATA & BASIS OF STUDY

2.1 Preamble:

Sri Aurobindo College was established in 1972, the birth centenary of the philosopher, patriot-poet, Sri Aurobindo, as a constituent college of the University of Delhi. The College inculcates the ideals of Sri Aurobindo and believes that an active commitment towards excellence is fundamental to the process of education.

The College, popularly referred to as "Aurobindo", offers liberal education in humanities, commerce and science to more than 2500 students. It offers B. A. Honours in English, Hindi and Political Science, B.A. Programme, B.Com. (H) and B.Com., B.Sc. Honours Electronics, B.Sc. Programme Life Sciences and Physical Sciences.

Besides catering to students from Delhi, particularly South Delhi, a large number of students come from diverse parts of the country including Bihar, UP and North Eastern India.

The College has seen remarkable growth over the years. The quality of the incoming students and the University results has shown a progressive upward movement. Continual addition and updation of essential amenities and facilities has made the College a prestigious institution for academic and co-curricular pursuits. Student engagements in extracurricular activities like Sports, NCC, and Cultural Societies are encouraged under the able guidance of skilled faculty. The college is committed to a student-centred environment and the college is dedicated to education covering a broad spectrum.

Indohaan Technologies offers a comprehensive Health, Safety, Environmental and Risk management consultancy services for commercial buildings, manufacturing units, large industrial plants and office premises. Our key services include consulting and training in:

- Process /Personal and Fire Safety
- Risk Analysis
- Process Hazard Analysis
- Occupational Health
- Energy and Environment

- Power Quality Improvements
- Sustainability

2.2 Assessment Study Team

Following were the members of assessment team, who visited the site on 9th and 21st March 2022 for data collection and lux measurement:

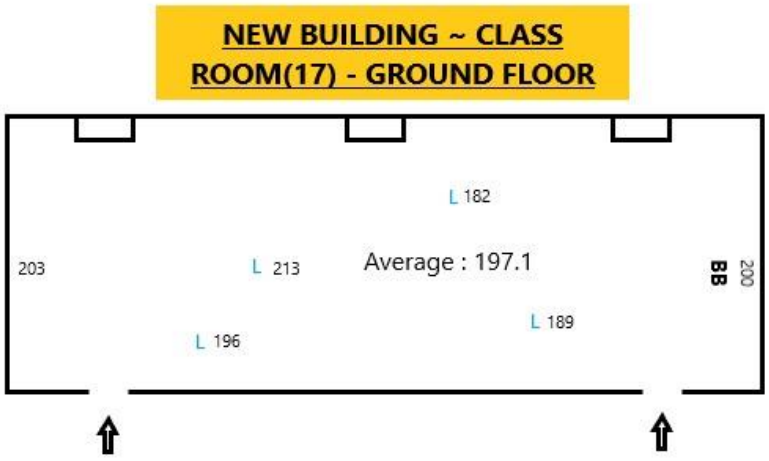
- Mr. Ashok Grover
- Ms. Deepika Soorma

2.3 Lux measurement

Indohaan study team measured the illuminance at random locations in the New & Old building and noted that Lux level is in the same range as reported in previous audit reports & therefore the detailed observations are not being not repeated here.

However for records, a typical measurment work sheet is presented below as example to show measurment pattern.

- All units are in Lux as measured by Lux Meter (AMPROBE make LM-100)
- The measurements are done at the working plane level



2.4 Data collection- Energy & Solar bills

Energy bills issued by BSES & Solar generation bills issued by M/s Hero Energy have been collected for the academic year 2019-20 & the consumption data therein is basis of our study for meeting the said objectives of this assignment

Chapter 3 provides more details on the performance evaluation

CHAPTER 3

PERFORMANCE EVALUATION OF

3.1 LED LIGHTING

3.2 SOLAR POWER PLANT (50 kWp)

3.1 LED Lighting:

The Lux level measurement was carried at random at various location of the old & new building & it was found to be in the same range as recorded in previous assessment reports. The resultant saving on account of continuing this effort for switching over to LED lights is reflected by way of reduced overall energy consumption as quantified in the subsequent section

3.2 Solar power generation & utilization

Solar power generation from 50kWp photo voltaic plant has been running since August 2018. The unit has been connected to the distribution panel going to the New building & the surplus is exported back to the grid via Net metering system

The actual solar generation was studied in consideration to the planned commitment provided by the Solar plant supplier in the Power plant agreement (PPA) for 2nd year running along with utilization, contribution & the resultant savings in Electricity bills for the academic year 2019-20

The detailed analysis & saving is tabulated in Annexure-1 & the noteworthy results are highlighted below for immediate attention

3.2.1 Performance analysis highlights:

1) The Solar plant is performing slightly above its rated capacity as per commitment indicated by the supplier for the 2nd year of running. This is a noteworthy effort for good upkeep of the plant & and adherence to regular maintenance schedule

2) The actual Solar power contribution is 18.9 % of the total energy requirement on an yearly basis considering Morning & evening college as One entity. The contribution goes up during winter months in view of lower heat load of Air conditioning & non usage of Fans

3) As a result of generation of slightly over capacity Solar power, efficient utilization and continual usage of LED bulbs, there has been a 5.7% reduction in the overall Energy consumption in comparison to previous year & the same is reflected well in the BSES Energy bills also, which is a consistent achievement for the college

4) It is suggested that all the enhanced performance parameters reported above should be prominently highlighted in the College Annual report & the forthcoming AQAR report submission to NAAC.

.

CHAPTER 4
ANNEXURE

Annexure No.1: Solar power generation, contribution & savings

Solar Power Generation, contribution to energy consumption & savings 2019-20													
Description	Nov	Dec	Jan	Feb	March	April	May	June	July	Aug	Sept	Oct	**Yearly total**
	WINTER Months				**SUMMER Months**								
A) Information collected from previous Audit report													
Solar Power output (Planned) as per Power purchase agreement PPA-1st year running	**68558**												
Accordingly Winter & Summer season break up will be	17140				51418								68558
Yearly consumption as per BSES Bill 2018-2019	**310868**												
Accordingly Winter & Summer season consumption was	77717				233151								310868
Actual generation of Solar power 2018-2019	**19000**				**53128**								72128
Total Energy consumption BSES + Solar 2018-219	96717				286279								382996
B) Information collected during this Audit													
Yearly consumption as per BSES Bill 2019-2020	**292854**												
Accordingly Winter & Summer season consumption is	56160				236694								292854
Solar Power output (Planned) as per Power purchase agreement PPA-2nd year running	**67557**												
Accordingly Winter & Summer season break up will be	17565				49992								67557

Actual generation of Solar power 2019-2020	**17860**	**50282**	68142
Total Energy consumption BSES + Solar 2019-2020	74020	286976	360996
c) Analysis for presentation in AQAC report for 2019-2020			
Actual Solar power generation			
Actual Solar power generation vs Planned output (for 2nd year running) on percentage basis	**101.7 %**	**100.6%**	**100.9%**
Actual contribution of generated Solar energy to total energy consumption			
Overall with Morning & Evening college as ONE Entity	**24%**	**17.5%**	**18.9%**

Actual savings in consumption /reduction in BSES bill wrt previous year			
Overall % Reduction on BSES bill wrt previous year	**28%**	(-)1.5%	**5.8%**
% Saving in overall consumption wrt to previous year	**23.5%**	(-) 0.24 %	**5.7%**