

# ENVIRONMENT AUDIT REPORT

2023-2024



## HOLY CROSS COLLEGE (AUTONOMOUS)

**Nagercoil  
Tamilnadu -629 004.  
INDIA**

**TJ Solutions  
4/101, Raja Sir  
Muthiah Nagar,  
Bye-pass road, Ellis  
Nagar,  
Madurai-625 016.**

## CERTIFICATE

### Environmental Audit 2023 -2024

This is to certify that **HOLY CROSS COLLEGE (AUTONOMOUS), NAGERCOIL**, has conducted a detailed **Environmental Audit** of their campus and has submitted the necessary data and credentials for scrutiny. The activities and measures carried out by the College have been verified based on the field visit and reports submitted and were found to be **EXCELLENT**. The efforts taken by the faculty and students towards environment and sustainability are highly appreciated and commendable.



**U.Chandra Kumar B.E -BEE Accredited auditor  
(AEA-0244)**

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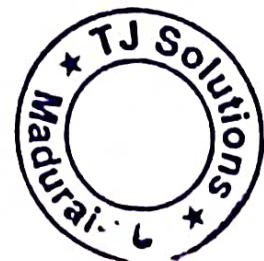
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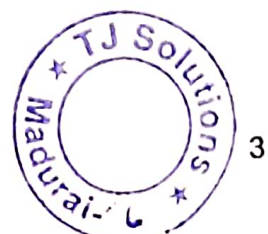


## ACKNOWLEDGEMENT

Environment Audit Assessment Team thanks to the Principal, Holy Cross College (Autonomous), Nagercoil for assigning the task of Environmental Audit of this college to us. We appreciate the cooperation that we got from all the faculties and students during the entire process.

The following officers from TJ Solutions under the guidance of Mr.U.Chandra Kumar B.E., have carried out the Green Audit.

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## Disclaimer

TJ Solutions Audit Team has prepared this report for Holy Cross College (Autonomous), Nagercoil based on input data submitted by the representatives of the college complemented with the best judgment capacity of the expert team.

While all sensible care has been taken in its preparation, details contained in this report have been compiled in good faith based on information gathered.

It is further informed that the conclusions are arrived at by best estimates and no representation, warranty or undertaking, express or implied, is made and no responsibility is accepted by the Audit Team in this report or for any direct or consequential loss arising from any use of the information, statements or forecasts in the report.


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TJ Solutions

Madurai



  
Accredited Energy Auditor

**CHANDRA KUMAR.U**  
BEE Accredited Energy Auditor  
(AEA 0244)

## 1. INTRODUCTION:

The environment audit aims to analyze environmental practices within and outside the college campus, which will have an impact on the eco-friendly atmosphere. Environment audit can be defined as systematic identification, quantification, recording, reporting and analysis of components of the college environment. It was initiated with the motive of inspecting the effort within the institutions whose exercises can cause threat to the health of inhabitants and the environment. Through the environment audit, the structure of the environment and several factors that enhanced the environment sustainability were determined.

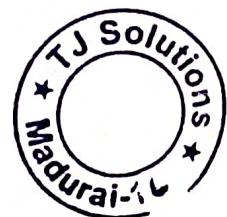
### 1.1. NEED FOR ENVIRONMENT AUDITING

Environment auditing is the process of identifying and determining whether institutions practices are eco friendly and sustainable. Traditionally, we are good and efficient users of natural resources. But over the period of time excess use of resources like water become habitual for everyone especially, in common areas. Now, it is necessary to check Whether we are handling resources carefully? Environment audit regulates all such practices and gives an efficient way of natural resource utilization. In the era of climate change and resource depletion it is necessary to verify the processes and convert it into a green and clean one. Environment audit provides an approach for it. It also increases overall consciousness among the people working in institutions towards an environment.

### 1.2. GOALS OF ENVIRONMENT AUDIT

College has conducted an environment audit with specific goals as:

1. Identification and documentation of environment practices followed by college.
2. Identify strength and weakness in environment practices.
3. Analyze and suggest solutions for problems identified.
4. Assess facility of different types of waste management.
5. Increase environmental awareness throughout the campus
6. Identify and assess environmental risk.
7. Motivates staff for optimized sustainable use of available resources.
8. The long-term goal of the environmental audit program is to collect baseline data of environmental parameters and resolve environmental issues before they become a problem.



### 1.3. OBJECTIVES OF ENVIRONMENT AUDIT

1. To examine the current practices, which can impact on the environment such as resource utilization, waste management etc.
2. To identify and analyze significant environmental issues.
3. Setup goal, vision, and mission for environment practices on campus.
4. Establish and implement Environment Management in various departments.
5. Continuous assessment for betterment of performance in environment

### 1.4. BENEFITS OF ENVIRONMENT AUDIT TO EDUCATIONAL INSTITUTIONS

There are many advantages of an environmental audit to an Educational Institute:

1. It would help to protect the environment in and around the campus.
2. Recognize the cost saving methods through waste minimization and energy conservation.
3. Empower the organization to frame a better environmental performance.
4. It portrays a good image of the institution through its clean and green campus.

## 2. OBJECTIVE AND SCOPE

The broad aims/benefits of the eco-auditing system would be

- Environmental education through systematic environmental management approach
- Improving environmental standards
- Benchmarking for environmental protection initiatives
- Sustainable use of natural resources in the campus.
- Financial savings through a reduction in resource use
- Curriculum enrichment through practical experience
- Development of ownership, personal and social responsibility for the College campus and its environment
- Enhancement of College profile
- Developing an environmental ethic and value systems in young people



### 3. EXECUTIVE SUMMARY

An environmental audit is a snapshot in time, in which one assesses campus performance in complying with applicable environmental laws and regulations. Though a helpful benchmark, the audit almost immediately becomes outdated unless there is some mechanism in place to continue the effort of monitoring environmental compliance. This audit report contains observations and recommendations for improvement of environmental consciousness.

The audit outputs and recommendations are summarized as follows:

- Total water consumption for Holy Cross College and Hostel - 67.2 KL/Day
- Electrical Energy consumption from TNEB GRID alone -156747 units
- Total Electrical Energy consumption-192417.5 units
- Renewable energy from Solar PV power plants-33915.5 units
- Total Renewable energy utilization-46311.5 units (equivalents)
- GreenHouse Gas Emission - 254 t CO<sub>2</sub>e
- GreenHouse Gas Reduction - 28.6tCO<sub>2</sub>e
- Net GHG Emission - 225.4t CO<sub>2</sub>e
- Air pollution impact on Ambient Air quality is negligible since the quantity of fuel used for combustion in the institution is very less
- Noise levels inside the campus are within the prescribed limit.
- Green Belt Development, outside the campus, by the Institution, in coordination with external agencies is highly appreciable.
- Excellent waste management system is followed by the Institution. Very good initiative is taken by the institution to reduce paper consumption, collection of waste paper and disposal for recycling.
- RO reject water is reused for garden purpose
- Drip irrigation and sprinklers are used for watering the garden.





- The rain water is drained to the rainwater desilting chamber, recharge cum percolation chamber and a pond.
- The ETP plant is constructed on the campus. Chemistry lab water is treated through ETP plant and used for garden purposes.
- Press type taps were used for water conservation purposes.
- Lot of initiatives are taken to conserve Water and Energy by the Institution.
- Flow meters are to be provided for better water management
- Waste water management has to be improved to reduce the water consumption.
- Steps to be taken for maximizing the solar power harvesting.
- Ramps and user friendly pathways are constructed.
- They have constructed Green buildings inside the campus.

We are happy to submit this detailed environment audit report to the Holy Cross College(Autonomous), Nagercoil.

  
TJ Solutions  
Madurai





Accredited Energy Auditor

**CHANDRA KUMAR.U**  
BEE Accredited Energy Auditor  
(AEA 0244)

## 4. WATER

### 4.1 Water usage at Holy Cross College(Autonomous), Nagercoil

Total number of students studied during the academic year 2023-2024: 2005

Teaching & non-Teaching staff in the institution during the academic year

2023-2024: 218

Total number of stakeholders: 2223

Number of college working days: 192

Sl. No	Place	Water usage Quantity Liters / Day
1	Laboratories	1,000
2	Drinking	2,000
3	Garden	30,000
4	Rest room	10,000
6	Construction	3,000
7	Canteen	4,000
	<b>Total</b>	<b>50,000</b>

Water usage in the Holy Cross - 50.0 KL / Day

Water usage per day per stakeholder in the college -22.4 liters

Waste water generation in the college - 15 KL/day



## 4.2 Water usage at Hostel

Number of students residing in the hostel during the academic year  
2023-2024: 173

Number of day's hostel was occupied with the students- 220

Sl. No	Place	Water usage Quantity Liters / Day
1	Cooking	750
2	Drinking	500
3	Garden	5,000
4	Toilet ,Bath room and clothes washing	10,000
5	Vessel Cleaning	1,000
	Total	17,250

Water usage at Hostel - 17.2 KL / Day

Water consumption per day per stakeholder in the hostel - 99.7 liters

Waste water generation in the Hostel - 11 KL /day



## 5. Electrical Energy

### 5.1 TNEB Grid Electrical Energy Consumption: 2023-2024

<b>TNEB ENERGY CONSUMPTION -COLLEGE</b>			
<b>Sl.No</b>	<b>Service No</b>	<b>Tariff</b>	<b>Units Consumed</b>
1	7123014167	LM2B1	64696
2	7123014181	LM2B1	51435
3	7123014166	LM51	2809
4	7123014335	LM51	94
5	7123014180	LM51	255
6	7123014321	LM51	4868
7	7123010534	LM51	2278
	<b>Total</b>		<b>126435</b>

<b>TNEB ENERGY CONSUMPTION -HOSTEL</b>			
<b>Sl.No</b>	<b>Service No</b>	<b>Tariff</b>	<b>Units Consumed</b>
1	7123014168	LM51	2480
2	7123014169	LM51	330
3	7123014170	LM51	12772
4	7123014171	LM51	14730
	<b>Total</b>		<b>30312</b>



### 5.2 Diesel Generator Electrical Energy Consumption: 2023-2024

Sl. No	Location	Unit Consumption	Diesel Consumption (L)	Units/Litre
1	College	1620	540	3.0
2	Hostel	135	45	3.0
	<b>TOTAL</b>	<b>1755</b>		<b>3.0</b>

### 5.3 Solar power Electric energy consumption: 2023-2024

Sl. No	Solar Capacity KW	Solar Power Generation Units
1	19	28433.5

#### Solar street light

50 W lights- 17 nos

Solar power generation and utilized from all the street lights- 2482 units/yr

#### Solar water heater

Grid electrical energy (equivalent) saved due to Solar heaters(200L) is 3000 units/year

Source	Energy consumption -unit
TNEB	15674.7
Diesel	1755
Solar	33915.5
Total	192417.5

**Total Electrical Energy consumption in the College & Hostel -192417.5 units**

**Electrical Energy consumption per stakeholder per year - 86.5 units**



## 6. FUEL CONSUMPTION

### 6.1 LPG

For cooking and LAB, LPG gas is used in the hostel ,College and canteen

LP GAS usage in the year 2023-2024

**Total  $140 \times 19 = 2660$  Kg (1 Commercial cylinder= 19Kg)**

### 6.2 BIOGAS

Biogas consumption during the year 2023-24- 660 m<sup>3</sup>/yr

## 7.Waste Generations and Management

### Liquid waste Management

- The treated filtered water is re-used for gardening purposes within the College campus.
- RO plants rejected are used for gardening purposes.
- The ETP plant is constructed.

### Solid waste Management

- Glass wastes are disposed of periodically through the municipal waste collection system.

### Biodegradable waste management

- Separate dustbins are kept to collect the waste food and used plates.
- BioDegradable and nonbiodegradable waste are collected in separate bins provided.
- Withered dry leaves are collected separately and dumped in the pits and converted into Biofertilizer by vermicomposting pits.



## Plastic Waste Management

- Use of polythene bags, plastic cups and laminated papers are prohibited.
- Students and staff are advised to bring cloth bags
- All the stakeholders are motivated to use stainless steel water bottles and lunch boxes.
- Plastic utensils in the stores, canteen and hostel kitchen are replaced with stainless steel plates, tumblers etc
- Use of plastic folders for assignments and projects are prohibited.
- Plastic waste that comes in through lab equipment's package, empty chemical containers etc. are collected separately and disposed periodically for recycling.

## E-Waste Management

- Most electronic machines are purchased under Buy-Back agreement and others were disposed off through authorized vendors.

## Hazardous Waste Management

- To get rid of toxic fumes in the Chemistry laboratory, a separate fume hood and industrial exhaust fans are installed.

## 8. Pollution abatement measures

### 8.1 Waste Reduction

- ❖ Students are instructed not to waste paper while writing examinations.
- ❖ In order to reduce the use of paper the following initiative were taken
- ❖ Student admission-Attendance - Electronic Method
- ❖ Payment of fees- Through Bank net banking system
- ❖ Selection of elective courses through online mode
- ❖ Online assignments
- ❖ Submission of e-assignment through email



- ❖ Profile of staff and students are made online
- ❖ Office circulars through SMS, WHATSAPP or Email
- ❖ Online Admission Process - Printing of applications reduced & submission of applications through admission portal.
- ❖ All inter department communications are through intranet
- ❖ Online exams are conducted to reduce paper usage.
- ❖ Library accessibility through library smart card.

### **8.2 Waste Reuse**

- ❖ Reuse one sided paper
- ❖ Reuse Envelopes

### **8.3 Waste to wealth**

#### **Inside the campus**

- ❖ Dry leaves are converted into bio fertilizer
- ❖ Waste papers are collected in an arranged manner and sent for recycling

### **8.4 Water Conservation initiatives**

- ❖ Water purifiers are provided in hostels and colleges for safe drinking water.
- ❖ Press type water taps are installed to reduce the wastage of water.
- ❖ No showers in the bathroom.
- ❖ Installed water efficient bathroom fittings.
- ❖ Water sprinklers are used in the garden.
- ❖ Sanitary incinerator is constructed on the campus.





## 8.5 Energy conservation

- ❖ The fans, lights, air-conditioners and other electronic and electrical equipment are switched off when not in use.
- ❖ Computers are switched to sleep mode or hibernate mode automatically when not in use
- ❖ Electrical equipment like CROs, Oscillators, Sodium lamps are switched off in the laboratory when the students complete their observations.
- ❖ At the end of every practical session, Computer monitors and UPS are switched off
- ❖ 5 Star rating Energy efficient electrical equipment has been installed.
- ❖ Automatic power(sensor based) switch off systems are installed and may be introduced in required areas.

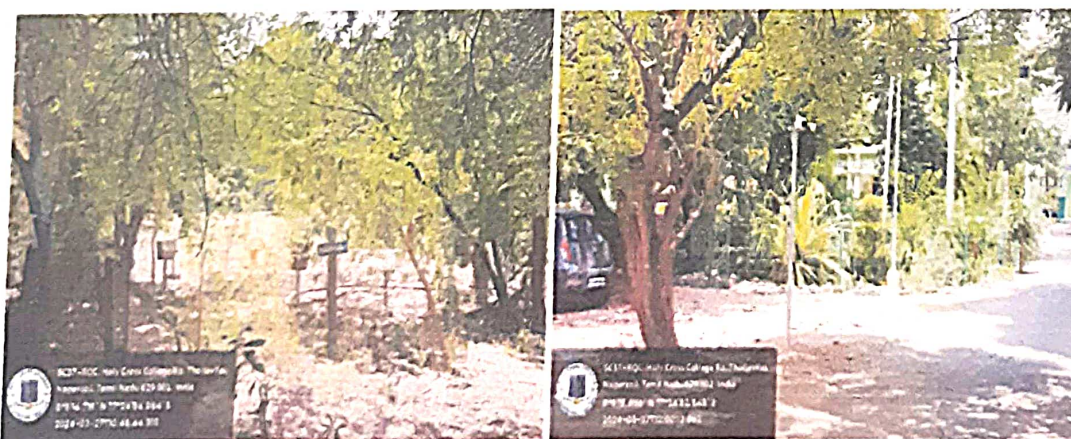


## 9. Greenbelt Development

- The campus is lush green with gardens, lawns and plants wherever there is open space.
- The eco-friendly ambience of the campus is a noteworthy feature of Holy Cross College(Autonomous), Nagercoil.
- The greenbelt area of the college is 19870 Lakh Sq ft.
- The list of trees and the arrival of new saplings are recorded every year.
- All the plant specimens are identified and documented.

### 9.1 Routine Green Practices

- Every year new tree saplings are planted inside the college campus.
- The Green campus drive is an initiative of the College to protect the environment.
- The campus protects age-old trees in addition to several new trees and plants planted.
- Tree plantation programmes are organized regularly in coordination with the external environmental organizations.
- Environmental awareness rallies are conducted regularly to spread the message of environment preservation.



## 10. Renewable Energy

### 10.1 Solar PV Power Plants

Solar Power Plant Details		
Holy Cross College		
Name	Solar Panel Capacity	Grid Type
College	19	ON Grid

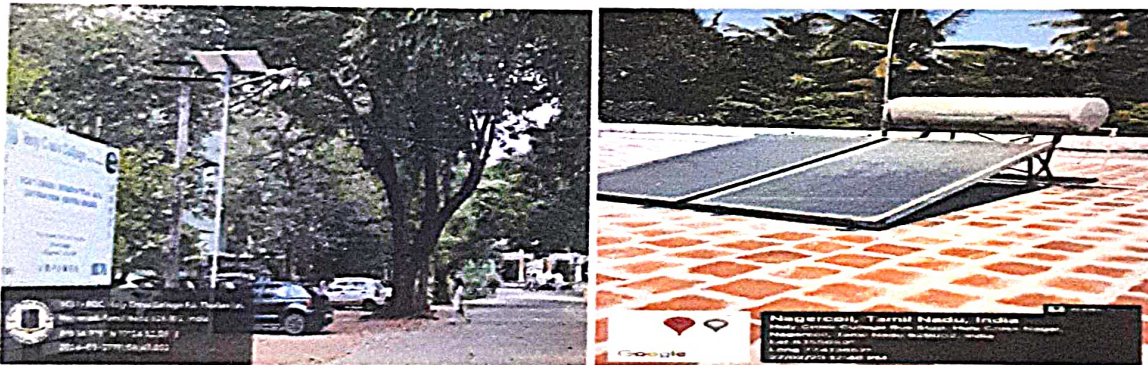
### 10.2 Solar street light

No of Solar Street lights- 50 W lights- 17 Nos

Solar power generation and utilized from all the street lights-2482 units/yr

### 10.3 Renewable energy- Biogas

Biogas consumption during the year 2023-2024 - 660 m<sup>3</sup>/yr



## 11. Rainwater Harvesting

At Holy Cross College(Autonomous), Nagercoil rainwater harvesting is done effectively to enhance the groundwater level. The institution has rainwater harvesting pits at various locations with Desilting chambers and recharge cum percolation chambers, and they are being maintained properly. The rooftop water is also drained during the rainy season and is allowed to flow into the pits constructed in various places inside the campus including the Hostel Premises. The total area of the college is around 20 acres, the rooftop area of the building comprising various departments is approximately 1922.72 lakh Sq.m.

Rainwater Harvesting pond with respect to nearest borewell and buildings



## 12. AMBIENT AIR

### 12.1 GreenHouse Gas Emission / Reduction

- GreenHouse Gas emission due to diesel
- GreenHouse Gas emission due to petrol
- GreenHouse Gas emission due to LPG

79392.45 Kg CO<sub>2</sub> e  
32398 Kg CO<sub>2</sub> e  
8059.8 Kg CO<sub>2</sub> e



- GreenHouse Gas emission due to Grid power 126965 Kg CO<sub>2</sub> e
- GreenHouse Gas emission due to Biomass 7200 Kg CO<sub>2</sub> e
- Total GHG emission 254015.25 Kg CO<sub>2</sub> e  
254 t CO<sub>2</sub>e

### GreenHouse Gas Reduction

- GreenHouse Gas reduction due to Solar power 28.6 t CO<sub>2</sub>e
- Net GHG Emission (254-28.6) 225.4t CO<sub>2</sub> e

## 12.2 Ambient Air Quality

### Flue gas emission sources

- LPG combustion at hostel, canteen and labs
- BIOMASS combustion at hostel
- Diesel generator at College and Hostel

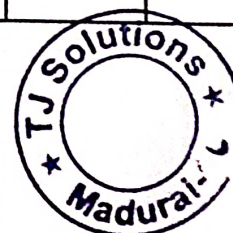
### Fuel consumption per year

- LPG - 2660 Kg
- BIOMASS- 6000 Kg
- Diesel at Hostel/college-585 liters

The quantity of flue gas emission and the impact on ambient air quality from the above combustion are negligible.

- To monitor the Ambient Air Quality, one Continuous Ambient Air Quality Monitoring Station (CAAQMS) is placed at TNPCB (Tamil Nadu Pollution Control Board) office Nagercoil
- The distance between Holy Cross college and TNPCB is 10 KM

Sl.no	District (location)	So2	No2	CO	PM2.5	PM10	AQI Index	Prominent pollutant
1	Holy Cross College(Autonomous)Nagercoil	30	15	1	26	30	GOOD	So2



### 13. Noise level

#### Noise level inside the campus

Sl. No	Location	Max value in dB	Average Value in dB
1	Near library	60.0	47.1
2	Administrative building	65.1	56.2
3	Hostel	79.0	74.0
4	Near Auditorium	65.8	52.8
5	Near Main Entrance	85.1	72.1
6	Near Generator Room	66.0	59.2

- Diesel Generators (DG) sets do not run on a continuous basis. Only during power failure, DG sets are operated during the working hours of the College.
- Generally Power failure occurs for a very short time period.
- During planned shutdown hours, DGs run continuously based on the load
- Noise disturbance due to DG set is negligible.
- All buildings are far away from the National Highway. Noise disturbance from the national highway is not appreciable.

### 14. Audit Findings & Recommendations Findings

- Total water consumption for Holy Cross College(Autonomous)Nagercoil and Hostel is 67.2 KL/Day.
- Water usage per day per stakeholder in the college-22.4 liters.
- Water consumption per day per stakeholder in the hostel -99.7 liters
- Electrical Energy consumption from TNEB GRID alone is 15674.7 units.



- Total Electrical Energy consumption is 192417.5 units.
- Renewable energy from Solar PV power plants- 28433.5 units.
- GreenHouse Gas reduction -254 t CO2 e.
- Air pollution impact on Ambient Air quality is negligible since the quantity of fuel used for combustion in the institution is very less
- Noise levels inside the campus are well within the limit.
- Excellent waste management system is followed by the Institution. Very good initiative is taken by the Institution to reduce paper consumption, collection of waste paper and disposal to recyclers.
- Bio- waste are converted into Bio compost and Bio fertilizer
- Rainwater collection system covers a large area and the harvested water is used to recharge the well and ground by pond.
- Lot of initiatives are taken to conserve water and Energy by the Institution.
- Flow meters are to be provided at source to know the water consumption and for better water management.
- E waste MOU has to be signed with an external agency.
- More green buildings can be constructed.
- More capacity of solar power plants may be installed to reduce energy drawn from the TNEB Grid.



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