NettZero

Symbiosis College of Arts and Commerce, Pune, is Asia's first Verified CARBON NEUTRAL College

NettZero Certificate of Carbon Neutrality

UNFCCC Certificate

United Nations
Framework Convention on
Climate Change

Date: 13 JANUARY 2024
REFERENCE: VC31625/2024

VOLUNTARY CANCELLATION CERTIFICATE

Presented to
Symbiosis College of Arts and Commerce, Pune (as advised by NettZero)

Project
24 MW Bhilangana - III Hydro Power Project

Reason for cancellation
Towards the comprehensive offsetting of Scope 1, 2 & 3 emissions of Symbiosis College of Arts and Commerce, Pune for April 2022 to March 2023 (As advised by NettZero)

Number of units cancelled
100 CERs

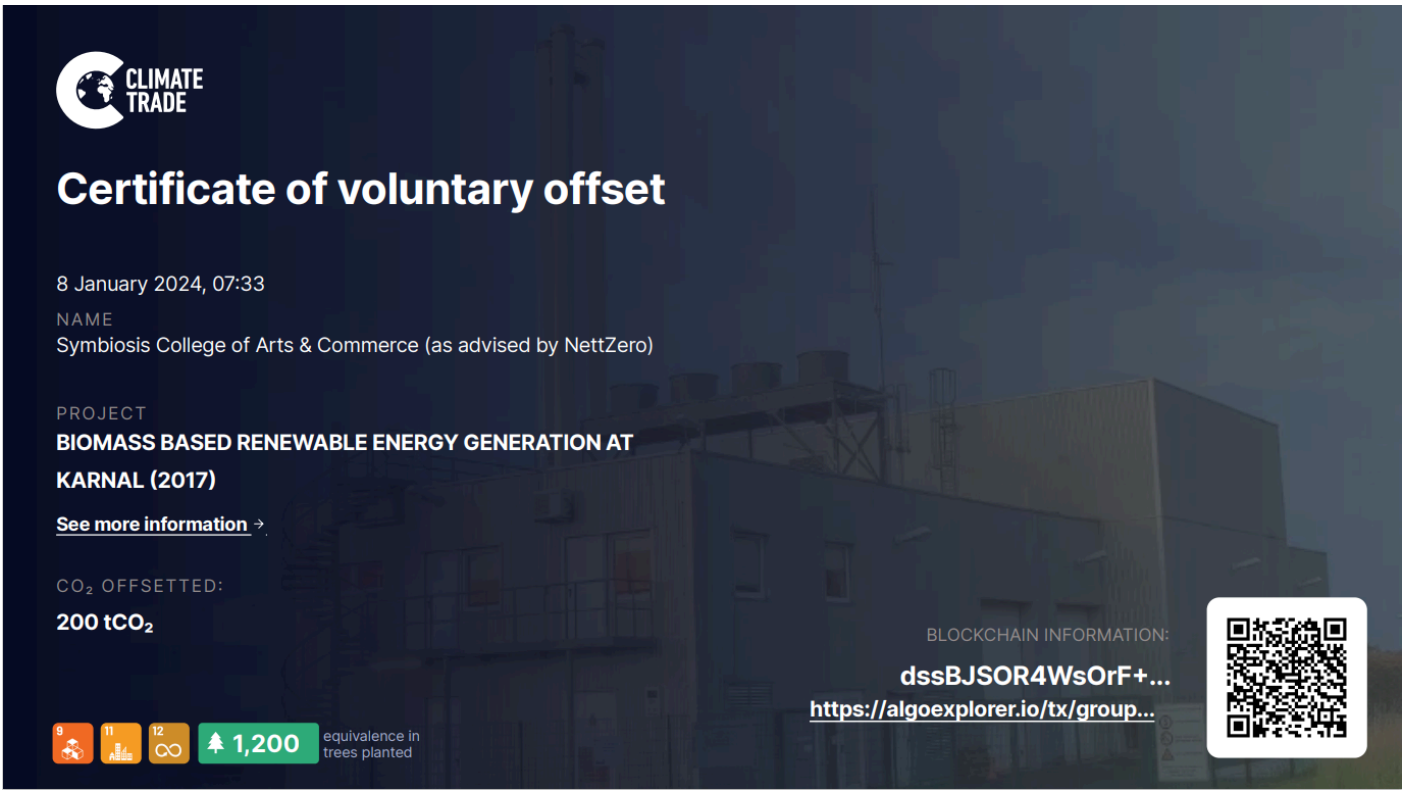
Equivalent to 100 tonne(s) of CO_2

Start serial number: IN-5-202773306-2-2-0-2936
End serial number: IN-5-202773405-2-2-0-2936

Monitoring period: 20-12-2011 - 28-02-2014

The certificate is issued in accordance with the procedure for voluntary cancellation in the CDM Registry. The reason included in this certificate is provided by the cancellor.

Verra Certificate



NettZero

SYMBIOSIS COLLEGE OF ARTS AND COMMERCE, SCAC, PUNE

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SYMBIOSIS COLLEGE OF ARTS & COMMERCE

CARBON NEUTRALITY REPORT

(2022-2023)

Prepared by NettZero Environmental Advisory Technologies Private Limited

1. Contributions

1.1 This report, created by **NettZero Environmental Advisory Technologies Private Limited**, is exclusively prepared for **Symbiosis College of Arts & Commerce (SCAC)** as the sole recipient. It is imperative that the report remains confidential and should not be distributed to any other party without prior written consent from NettZero Environmental Advisory Technologies Private Limited.

1.2 The data and information presented in this report are derived from documents and materials made available to NettZero Environmental Advisory Technologies Private Limited by SCAC. It is assumed that the individuals providing this information are duly authorized, and the provided documents are complete and accurate representations of the originals.

1.3 It is important to emphasize that this report focuses on the specific scope of work outlined in the agreement between SCAC and NettZero. As such, it does not encompass aspects related to legal matters, commercial considerations, taxation, corporate governance, accounting practices, or the overall financial position of the college.

1.4 The report does not offer any commentary on the creditworthiness of any parties involved, except where explicitly stated. Furthermore, this document should not be interpreted as an endorsement or recommendation for any financial institutions or organizations.

1.5 NettZero has relied on the information provided directly by SCAC for the preparation of this report. While efforts have been made to ensure the accuracy of this information, verification of the data and documents has been conducted, except in cases where it is explicitly mentioned.

1.6 NettZero Environmental Advisory Technologies Private Limited assumes no obligation to update the report unless expressly requested by SCAC and agreed upon under mutually acceptable terms.

1.7 This report aims to provide an objective assessment of the specific scope of work assigned to NettZero Environmental Advisory Technologies Private Limited by SCAC.

It should be interpreted solely within the context of this engagement and not as a comprehensive evaluation of all aspects of SCAC's operations or financial standing.

1.8 NettZero Environmental Advisory Technologies Private Limited appreciates the cooperation and support of SCAC throughout the preparation of this report. We remain committed to maintaining the confidentiality and integrity of the information provided.

Date: January 10, 2024

2. Abbreviations

SCAC	Symbiosis College of Arts & Commerce
GHG	Green House Gas
CO2eq.	Carbon dioxide equivalent
LPG	Liquefied Petroleum Gas
Avg.	Average
CEAI	Central Electricity Authority of India
MWh	Megawatts Hours
kWh	Kilo Watt Hours
HSD	High Speed Diesel
MT	Metric Tons
GWP	Global Warming Potential
IPCC	Intergovernmental Panel for Climate Change
lps	Liters Per Second
KLPD	Kilo Liters Per Day
kg	Kilo gram
km	Kilo meter
kV	Kilo Volt
kWp	Kilowatts peak
MU	Million Units
MW	Megawatts

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3. Acknowledgments

We extend our heartfelt appreciation to the entire Symbiosis College of Arts & Commerce College for their invaluable contribution and unwavering support throughout the process of preparing the Carbon Assessment Report.

We wish to express our gratitude to the dedicated faculty, administrative staff, and management team at Symbiosis College of Arts & Commerce, whose commitment to sustainability and environmental stewardship has been instrumental in driving this initiative forward. Your vision and dedication to promoting a culture of sustainability within the college have set a commendable example for the entire educational community.

We would like to express our sincere thanks to Dr. Hrishikesh Soman, Principal of Symbiosis College of Arts and Commerce, Pune, for granting us the opportunity to conduct a comprehensive carbon audit of the institute. Furthermore, we would also like to express our acknowledgments to each participant for their prompt and insightful responses to the traveling survey. Your willingness to participate and provide essential data demonstrates your commitment and responsiveness to addressing the challenges behind climate change and environment deterioration.

We recognize the importance of your contributions and look forward to continuing our collaborative efforts to promote a greener, more sustainable future for Symbiosis College of Arts & Commerce and the broader community.

4. Executive Summary

Table 1: Inventory of Scope 1, Scope 2 and Scope 3 emissions

1	**Category 1: Direct Emissions in tonnes CO2eq**	**Emissions (tco2eq)**	
1.1	Direct Emissions from Fuel Consumption	4.1	**Scope 1**
1.2	Direct Emissions from LPG Consumption	47.2	
	Sub total	**51.3**	
2	**Category 2: Indirect GHG Emissions from imported electricity**		
	Indirect Emissions from purchased electricity	102	**Scope 2**
	Sub total	**102**	
3	**Category 3: Indirect Emissions in tCO2e from transportation and purchasing activity**		
3.1	Emissions from Commuting	19	**Scope 3**
3.2	Emission from purchased goods	15	
	Sub total	**34**	
4	**Category 4: Carbon Sink/ Green Initiatives**		
4.1	Carbon Removal from the installed solar plant	-9.3	
4.2	Carbon Removal by planted trees	-3.87	
	Sub total	**-12.9**	
	Total Emissions from Scope 1, Scope 2 & Scope 3 (tCO2e)	**175**	

In this comprehensive carbon footprint assessment, emissions from Symbiosis College of Arts & Commerce (SCAC) have been meticulously categorized into four key categories.

- Under Scope 1, direct emissions from fuel consumption and LPG usage amount to **51.3tCO2e** equivalent emissions.
- In Scope 2, which encompasses indirect emissions from imported electricity, SCAC accounts for **102 tCO2e** emissions due to purchased electricity.
- Scope 3 addresses additional indirect emissions associated with transportation and purchasing activities. Commuting contributes **19 tCO2e** emissions, while purchased goods add **15 tCO2e** resulting in a subtotal of **34 tCO2e.**
- Additionally, the institution has made commendable efforts to mitigate its carbon footprint. The installed solar plant has led to a carbon removal of **9.3 tCO2e**, and the trees planted on the campus contribute to a carbon removal of **3.87tCO2e**.

In total, when combining emissions from Scope 1, Scope 2, and Scope 3, SCAC's carbon footprint stands at **175tCO2e** emissions. This assessment provides a comprehensive overview of the institution's emissions profile, emphasizing its dedication to tracking, reducing, and offsetting greenhouse gas emissions as part of its commitment to sustainability.

5. Introduction

This section provides an overview of the background and context of Symbiosis College of Arts & Commerce (SCAC), outlining the scope and objectives of this report.

5.1 Symbiosis College of Arts & Commerce: A Distinctive Educational Legacy

Symbiosis stands as one of India's prominent educational institutions, delivering quality education across diverse disciplines for over four decades. It embodies the philosophy of *"Vasudhaiva Kutumbakam"*, where the world is considered one large family.

Recognized for its pioneering contributions to education, the Symbiosis College of Arts and Commerce attained 'Autonomy' status from the University Grants Commission, New Delhi, starting from the academic year 2012-13. It remains affiliated with Savitribai Phule Pune University, Pune, which confers degrees to its students. Notably, the college was honored with the 'College with Potential for Excellence (CPE)' designation by the UGC in 2016. Over the past decade, it has consistently ranked among the top 10 colleges in India and has been hailed as the best in Pune City in surveys conducted by India Today and Neilson-Org Marg. Furthermore, Symbiosis College of Arts and Commerce achieved a 'Reaccreditation A+' status with a 3.51 CGPA for the third cycle by NAAC, reflecting its commitment to excellence in education.

5.2 Importance of Carbon Neutrality

The importance of achieving carbon neutrality in colleges and institutes cannot be overstated. It represents a profound commitment to environmental responsibility and sustainability. These institutions play a pivotal role in shaping the future, as they not only educate the leaders of tomorrow but also set influential examples today. By achieving carbon neutrality, colleges and institutes demonstrate a resolute commitment to mitigating climate change, showcasing responsible environmental practices, and leading by example.

Beyond mere symbolism, carbon neutrality entails concrete actions—reducing direct emissions, procuring renewable energy, optimizing transportation systems, and fostering sustainable procurement. These initiatives not only lower the institution's environmental impact but also offer invaluable real-world lessons to students and the community at large.

Moreover, carbon neutrality in colleges and institutes is a testament to their role as responsible global citizens. It contributes to the global effort to limit global warming to 1.5 degrees Celsius, a critical threshold to avoid catastrophic climate consequences. By embracing carbon neutrality, these institutions stand as beacons of sustainability, inspiring students, staff, and the wider community to adopt eco-conscious practices and contribute collectively to a more sustainable, equitable, and resilient future for our planet.

5.3 Scope & Objectives of report

The scope of this report encompasses a comprehensive assessment of SCAC's journey towards carbon neutrality. It delves into the meticulous identification of emissions sources across all three scopes, the quantification of greenhouse gas emissions, and the institution's commitment to offsetting and reducing its carbon footprint. The primary objective is to document and communicate the college's environmental efforts and achievements, shedding light on its dedication to sustainability.

Furthermore, this report serves as a tool for transparency, accountability, and a source of inspiration for other educational institutions and organizations aiming to take meaningful steps in addressing climate change. By contributing to the Race to Zero, SCAC not only sets a remarkable example within the educational sector but also demonstrates its dedication to being a responsible global citizen actively engaged in the fight against climate change.

5.4 Carbon Accounting Standards (GHG Protocol, ISO 14064 and NEXT Protocol)

The GHG Protocol and ISO 14064-1 are two indispensable tools in the global effort to combat climate change and promote sustainable environmental practices. The GHG Protocol, developed by the World Resources Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), serves as a comprehensive framework for quantifying and managing greenhouse gas emissions. It provides organizations with a standardized methodology for measuring and reporting emissions, enabling them to better understand their environmental impact and identify areas for improvement. This transparency is vital in fostering accountability and encouraging companies to reduce their carbon footprint.

ISO 14064-1, on the other hand, is an internationally recognized standard that specifically addresses greenhouse gas accounting and verification. It establishes a consistent and credible approach to measuring and verifying emissions data, enhancing the reliability of reported information. This standard not only bolsters the credibility of emission reduction

claims but also facilitates international cooperation by ensuring that emissions data can be trusted across borders.

Together, the GHG Protocol and ISO 14064-1 play pivotal roles in helping organizations worldwide transition to more sustainable practices. They provide a common language for businesses, governments, and NGOs to communicate about emissions, set reduction targets, and track progress toward a low-carbon future. By adhering to these standards, we are not only fostering environmental responsibility but also working collectively to address the urgent challenge of climate change and safeguard the well-being of our planet for future generations.

The NEXT Protocol, or NettZero Environmental Xcellence & Transformation Protocol, stands as a pioneering framework, distinctively focusing on carbon accounting and Scope 3 emissions. Inspired by ISO 14064, GHG Protocol and PAS 2060 but uniquely tailored to diverse organizational objectives, this protocol surpasses conventional standards. It meticulously accounts for not only direct (Scope 1) and energy-related indirect emissions (Scope 2) but also delves into the intricate landscape of Scope 3 emissions, comprehensively addressing the full spectrum of impacts across the value chain. What sets the NEXT Protocol apart is its dynamic and adaptive nature, integrating real-time data analytics to offer a nuanced understanding of the carbon footprint.

6. Carbon Accounting Methodology

Carbon accounting methodology refers to the systematic approach and set of procedures used to quantify, track, and report greenhouse gas emissions (GHGs) and carbon dioxide equivalents (CO2e) associated with an organization's activities. It involves the identification of emission sources, data collection, emissions factor selection, and the application of quantification methods. This structured approach enables organizations, including Symbiosis College of Arts & Commerce, to measure their carbon footprint accurately, supporting informed decision-making and sustainable practices. It also serves as a vital tool in the pursuit of carbon neutrality and the reduction of environmental impacts.

6.1 Methodology Used

In the pursuit of carbon emissions calculations and the journey towards sustainability, reliance is placed on established methodologies such as the Intergovernmental Panel on Climate Change (IPCC) and the Greenhouse Gas Protocol (GHG Protocol). These methodologies offer essential tools for precise carbon emissions measurement.

Consequently, this report adheres strictly to ISO 14064:2006 guidelines and specifications, following the GHG Protocol for emissions calculations.

The methodology can be summarized as follows:

- **Identification of Emission Sources:** Thoroughly identifying the sources of emissions specific to Symbiosis College of Arts & Commerce.
- **Collection of GHG Activity Data:** Comprehensive data on activities and processes contributing to greenhouse gas emissions within the institution is gathered.
- **Selection of Emissions Factors:** Carefully choosing emissions factors relevant to the operations to ensure accurate quantification.
- **Selection of Quantification Methodology:** Employing a well-defined quantification methodology tailored to the unique context, ensuring accuracy and consistency in calculations.
- **Calculation of Greenhouse Gas Emissions:** Precise calculations are performed to determine the institution's greenhouse gas emissions profile.

This robust methodology forms the foundation of the commitment to sustainability and provides a clear and accurate assessment of Symbiosis College of Arts & Commerce's carbon emissions.

6.2 Baseline year

The choice of a baseline year is a critical decision for studies of this nature, as accuracy is paramount when estimating greenhouse gas (GHG) emissions. In our diligent analysis of Symbiosis College of Arts & Commerce, we have selected the baseline period from April 2022 to March 2023. This timeframe has been carefully chosen to ensure a meticulous examination of the college's inventory, allowing us to establish a strong foundation for our GHG emissions assessment.

6.3 Greenhouse gas covered in the study

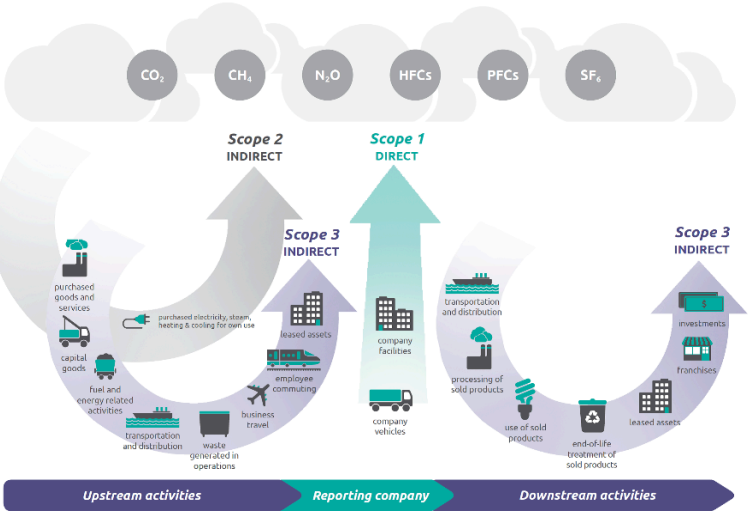
Internationally, standard inventories involve the assessment of emissions for all seven greenhouse gases recognized and regulated under the GHG Protocol. However, for the sake focus in determining the carbon footprint of Symbiosis College of Arts & Commerce, our assessment has exclusively considered carbon dioxide emissions. The emissions are reported in metric tons of carbon dioxide (CO_2) to provide a clear and streamlined representation of the college's environmental impact.

6.4 Boundary Setting

In our carbon assessment process, we have carefully delineated the boundaries, choosing both organizational and operational boundaries. The organizational boundary encompasses the **campus and hostel area of Symbiosis College of Arts & Commerce, situated at Senapati Bapat Rd, Shivajinagar, Pune, Maharashtra 411004**.

On the operational front, we have adopted a comprehensive approach. For SCAC, this includes a thorough examination of various aspects, such as energy and fuel consumption, staff travel, and purchased goods. These operational boundaries are further categorized into three distinct scopes:

Scope 1 emissions encompass all direct carbon dioxide (CO2) emissions originating from the college's operational activities. These emissions pertain to sources owned or controlled by the college, including energy and fuel consumption.



Scope 2 emissions account for energy indirect emissions resulting from the consumption of purchased electricity by SCAC.

Scope 3 emissions involve indirect emissions associated with transportation. This includes emissions from staff commuting and emissions linked to purchased goods, providing a comprehensive view of the college's carbon footprint.

By establishing these clear organizational and operational boundaries, we aim to conduct a thorough and accurate assessment of carbon emissions and their sources within the defined parameters.

6.5 Categorization of Emission Sources

In the commitment to advancing sustainability initiatives at Symbiosis College of Arts & Commerce, the identification of emissions sources across all three scopes—Scope 1, Scope 2, and Scope 3—is a foundational step towards achieving carbon neutrality. Meticulous cataloging of both direct and indirect sources of greenhouse gas emissions within the

institution's boundaries laid the groundwork for well-informed decision-making and the development of effective carbon reduction strategies.

In Scope 1, a rigorous analysis was conducted on LPG and fuel consumption, ensuring a precise assessment of direct emissions. Within Scope 2, a data-driven methodology was employed to comprehensively assess purchased electricity consumption, utilizing empirically validated data to quantify indirect emissions accurately. In Scope 3, the investigation extended to emissions arising from daily commuting and comprehensive data collection regarding purchased goods, enabling a comprehensive understanding of the entire carbon footprint of Symbiosis College of Arts & Commerce.

7. Estimating GHG Emissions with each scope

At Symbiosis College of Arts & Commerce (SCAC), calculating emissions across all three scopes involves a meticulous process. Emissions associated with Scope 1, Scope 2, and Scope 3 are determined through data collection, rigorous analysis, and the application of emissions factors. This comprehensive approach provides a holistic understanding of the institution's carbon footprint and guides sustainability efforts.

7.1 Scope 1

Scope 1 emissions at Symbiosis College of Arts & Commerce encompass direct greenhouse gas emissions originating from activities and sources within the institution's control. These emissions mainly include on-college power generation and the consumption of High-Speed Diesel (HSD) for essential operations. Scope 1 emissions are crucial in the pursuit of carbon neutrality. Addressing these direct emissions sources is essential for mitigating immediate environmental impacts and laying the foundation for sustainable practices and a substantial reduction in the institution's carbon footprint.

7.1.1 Emissions due to fuel consumption

Diesel is primarily utilized at Symbiosis College of Arts & Commerce for power generation in DG (diesel generator) sets. It's noteworthy that the college does not possess any vehicles for transportation purposes. Therefore, the data collection and GHG emissions calculations chiefly pertain to diesel consumption for electricity generation in DG sets, representing a significant aspect of college operations. This focused approach ensures accurate reporting and transparency in accounting for carbon emissions and the GHG footprint.

Table 2: Diesel Consumption for DG Sets

Date	HSD Consumption (DG Set 1)	HSD Consumption (DG Set 2)
12/8/2022	220	66
25/10/2022	220	-
1/12/2022	198	198
9/1/2023	286	44
8/2/2023	22	66
9/3/2023	198	-
Total	1144	374
HSD consumption [L] (DG set 1+2)	**1518**	

Source: Data collected from the DG set inventory

Total High-Speed Diesel (HSD) consumption is tracked in liters. For emissions calculations related to HSD, an emission factor of **2.7 kg CO2e/liter of HSD** is applied.

Consequently, the total emissions amount to **4.1 tCO2e**, calculated as the product of the total consumption (1518 liters) and the emission factor (2.7 kg CO2e per liter).

7.1.2 Emissions due to LPG consumption

The S.B. Road Canteen and S.B. Road Mess facilities play a significant role in the campus's daily operations, including cooking processes that rely on LPG (liquefied petroleum gas). To determine greenhouse gas (GHG) emissions accurately, the reporting period considered for LPG consumption is from April 2022 to March 2023. During this time frame, the LPG consumption data was diligently collected and analyzed.

Table 3: LPG Consumption by S.B. Road Canteen & S.B. Road Mess

Year	Month	Quantity (Canteen)	Quantity (Mess)
2022-2023	April	23	40
2022-2023	May	16	45
2022-2023	June	19	35
2022-2023	July	29	45
2022-2023	August	33	45

2022-2023	September	32	51
2022-2023	October	27	58
2022-2023	November	33	80
2022-2023	December	42	75
2022-2023	January	37	79
2022-2023	February	34	75
2022-2023	March	28	80
Total		**353**	**708**
Total (Canteen + Mess)		**1061**	

Source: Data collected from the canteen and mess registry

Total LPG Consumption = 1061 cylinders * 19.5 kg/cylinder = **20,689 kg or 20.69 metric tons (MT)**

The emission factor utilized for calculating emissions attributed to LPG combustion stands at **2.940 (t CO2e/ MT of LPG)*.**

For total carbon emissions due to LPG consumption: 20.69 MT * 2.940 t CO2 eq. / MT of LPG **= 61 t CO2e**

The LPG (liquefied petroleum gas) used in both the campus canteen and mess is collectively owned by four institutional entities. The emissions associated with the SCAC's usage contribute to **77.4%** of the overall emissions generated from LPG consumption.

The total carbon dioxide equivalent (tCO2e) emissions from LPG consumption amount to 47.2 tons.

**Emission factor for the LPG combustion calculations is considered from IPCC database*

7.2 Scope 2

Scope 2 emissions at Symbiosis College of Arts & Commerce pertain to the indirect greenhouse gas emissions associated with purchased electricity consumption. These emissions are a result of the college's reliance on external sources for its electricity needs. In essence, Scope 2 emissions reflect the environmental impact associated with the electricity procured from external providers, highlighting the importance of efficient energy management and sustainable energy sourcing practices to reduce these indirect emissions.

7.2.1 Emissions due to electricity consumption

The nature of CO2 emissions stemming from electricity consumption is intricately linked to the method of electricity generation. India's electricity generation mix comprises various sources, including Coal, Natural Gas, Nuclear, Hydro, and other renewable energy sources.

The Central Electricity Authority of India (CEAI) has computed CO2 emission factors for different electricity grids within the country. In our emissions calculation process, we employ a grid emission factor of **0.91 tCO2/MWh** *. This factor is integral to accurately determining the total emissions associated with electricity consumption.

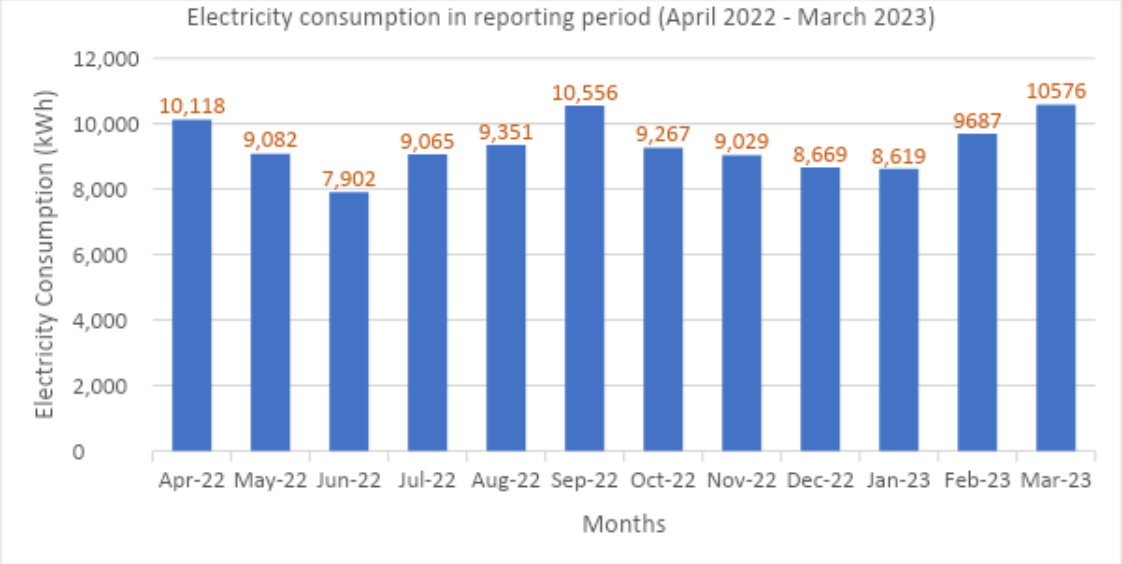


Figure 2 Electricity consumption for the reporting period (Apr 22- Mar 23)

During the reporting period from April 2022 to March 2023, Symbiosis College of Arts & Commerce (SCAC) meticulously monitored its electricity consumption. The total electricity consumption for this period amounted to **112 megawatt-hours (MWh)**, equivalent to **111,921 kilowatt-hours (kWh)**.

As a result, the emissions attributed to electricity consumption by SCAC during this period total **102 t CO2e**. (Total Electricity Consumption (in MWh) × Emission Factor (tCO2/MWh).

It's noteworthy that electricity consumption stands as the single largest contributor to greenhouse gas (GHG) emissions within the institute's region.

7.3 Scope 3

Scope 3 emissions at Symbiosis College of Arts & Commerce expand beyond direct and indirect sources, encompassing a broader spectrum of greenhouse gas emissions. These emissions stem from activities associated with commuting and the procurement of goods and services.

Commuting emissions arise from the daily transportation of students, faculty, and staff to and from the college. Additionally, emissions linked to purchased goods and services account for the environmental impact of products procured by the institution. Scope 3 emissions highlight the interconnectedness of the institution with external activities and suppliers, emphasizing the importance of sustainable transportation practices, supply chain management, and environmentally responsible purchasing decisions in reducing the overall carbon footprint.

7.3.1 Emissions due to commuting

Commuting holds a significant role in the context of Scope 3 emissions calculations, as it sheds light on the environmental impact associated with the daily transportation habits of individuals. The choice of transportation mode and the distances covered contribute substantially to the institution's carbon footprint. Thus, understanding and addressing commuting emissions are pivotal point in assessing the scope 3 emissions associated with an institute.

Table 4: Daily Commuting data associated with SCAC

Type of Vehicle	Total kms*	Emission factor (kg/CO2e)	Total emissions (kms/ kgCO2e)
Bus (Public)	48290	0.15161	7321
Auto (Public)	14370	0.10768	1547
Car Petrol (Private)	26340	0.2	5268
Car Diesel (Private)	22000	0.16	3520
Two-Wheeler (Private)	35910	0.0356	1278
Emissions from all commuting for April 2022 to March 2023 (km/kg CO2e)			**18935**

Source: Travel survey conducted by NettZero within the institutional sphere

The daily commuting patterns of individuals at Symbiosis College of Arts & Commerce (SCAC) primarily involve two-wheelers and usage of public transport like bus, with some individuals living nearby opting for alternative modes of transportation, including four-wheelers.

To compile comprehensive data on commuting, a **thorough travel survey was conducted**, categorizing the information according to the respective modes of transport. Emission factors for each mode of transport, were applied. The overall distance covered by different modes of transport was aggregated by combining individual data based on their chosen mode of commute.

The total emissions stemming from commuting activities amount to **19 tCO2e**. This figure underscores the significance of sustainable transportation practices and their role in the commitment to environmental responsibility.

7.3.2 Emissions associated with purchased goods

Emissions resulting from the procurement of goods and services hold significance in the Scope 3 emissions profile. The environmental impact associated with the products and services acquired is a substantial contributor to the overall carbon footprint. These emissions underscore the interconnectedness of the institution with external suppliers and their production processes. As part of the commitment to carbon neutrality, responsible purchasing decisions and sustainable supply chain management become essential in reducing emissions linked to purchased goods and services.

Table 5: Data pertaining to the procurement of goods at (SCAC)

Ser No	Nomenclature	A/U	Qty	Carbon Footprint (TCO2e)
1	Interactive Intelligent Panel 86” Boards	Nos	3	0.3
2	PTZ Camera	Nos	2	0.06
3	Work Station Desktop	Nos	3	1.5
4	HP Pavilion Laptop	Nos	2	0.6
5	CCTV Camera			0.03
	Dome Camera	Nos	47	1.41
	Mile Sight Dome Camera	Nos	1	0.03
	Bullet Camera	Nos	19	0.57
	NVR 16 CH	Nos	1	0.04
	NVR 32 CH	Nos	2	0.08
	Network Switch 24 Port	Nos	2	0.04
6	Dell Power Edge R-450 VMware Server	Nos	2	0.032
7	Storage Dell EMC-4024	Nos	1	0.025
8	Dell Power Edge R550 Backup Server	Nos	1	0.48
9	Network Switch Cisco SX-350X 24 port	Nos	1	0.03

10	vCloudPoint V1 Zero Client	Nos	9	0.48
11	Dual Side PVC ID Card Printer Zebra Technology USA ZC-300	Nos	2	0.15
12	UPS Battery 6 KVA Exide 12V 26V SMF	Nos	20	4
13	Steel Racks	Nos	10	0.0825
14	Steel Cupboard	Nos	5	0.1375
15	High Back Chair	Nos	1	0.072
16	Air Conditions	Nos	4	5.2
17	Tube Light	Nos	50	0.0085
18	Square Light	Nos	4	0.00068
Total emissions by purchased goods (April 2022-March 2023), t CO2e				**15**

Source: Data collected from account office

During the reporting period from April 2022 to March 2023, Symbiosis College of Arts & Commerce (SCAC) acquired a diverse range of goods, including interactive intelligent panels, cameras, workstations, laptops, and various networking equipment. These purchases, while essential for the institution's functionality, are associated with emissions totaling **15 tCO2e**.

To arrive at this figure, a comprehensive study of the entire product lifecycle was conducted, analyzing data from diverse sources, including emissions factors obtained from extensive research across various online references.

It's crucial to recognize that each product, from PTZ cameras to air conditioners and beyond, contributes to the carbon footprint. As the journey towards sustainability and carbon neutrality progresses, these findings underscore the importance of responsible procurement practices and a commitment to reducing the environmental impact associated with the goods acquired.

7.4 Other additional scopes

In addition to the primary scopes, Symbiosis College of Arts & Commerce (SCAC) has identified various green initiatives implemented on the college campus to foster a more environmentally conscious community. These initiatives include the strategic planting of trees, which serves as a significant greenhouse gas (GHG) sink, and the utilization of solar panels for sustainable energy generation. These actions contribute to carbon sequestration and renewable energy use,

further aligning the institution with sustainable practices and a commitment to a greener future.

7.4.1 Green initiatives

A solar rooftop power plant with a 15 kWp capacity has been installed on the hostel building at the Dr. Babasaheb Ambedkar Museum within the campus in Pune. This installation effectively fulfills the electricity demands of the hostel building. The solar rooftop plant is now operational, serving as the primary source of electricity for the institute building. Below, you will find technical specifications and details pertaining to the existing solar rooftop installation at Symbiosis College of Arts and Commerce in Pune.

Table 6: Technical Specifications of the Solar PV Plant

Output	5.5 kWh/Sq.m/day (All output is under STC, 25°C)
System Capacity	15kW
PV Module	Model-ALP-250Wp X 60 nos
Inverter	Micro Inverters

Source: Data collected from physical visit to the campus

Table 7: Emissions Reduction to the installment of Solar PV

Total Daily Energy Output (kWh/day)	330
Annual Energy Generation (kWh/year)	99000
Emission factor for grid electricity	0.91
Project Emissions (kg CO2e)	90090
Emissions Reduction (Baseline Emissions- Project Emissions) (t CO2e)	12

Source: Evaluated from the above table

The solar power plant installed at the campus has not only contributed significantly to clean energy generation but has also resulted in a notable reduction in greenhouse gas emissions.

By harnessing the sun's energy, the plant produces a daily output of **330 kWh** (Output* No. of PV modules) and an annual energy generation of **99,000 kWh** (Daily Energy Output * No. of operational days). Project emissions (90090 kg CO2e) have been calculated by determining the Annual Energy Generation (kWh/year) and multiplying it by the emission factor.

To quantify the emissions reduction achieved, the project's emissions were compared to the baseline emissions, which are determined by the previous Scope 2 grid electricity.

The installation of the solar plant has led to a reduction of **12 tCO2e**, marking a substantial step towards sustainability goals and a greener future.

The hostel building, accommodating students from three institutional entities, is equipped with solar panels. The emissions savings attributed to the SCAC's contribution represent 77.4% of the total emissions savings resulting from the solar panel installation. The overall emissions savings from this solar installation total **9.3 tCO2e**.

7.4.2 GHG Sink due to Land Use and Land Use Change

Table 8: Emissions reduction by green area coverage

No. of trees	Absorption/ month (kg)	Absorption/ year (kg)	Carbon Sequestration (tCO2e)
144	416	4992	5.0

Source: Collected from on campus visit (Check Annexure for more details)

The campus boasts an impressive green area coverage, encompassing 11,214 sq. meters (2.77 acres) out of a total campus area of 18,983 sq. meters, constituting 59.07% of the campus.

The calculation of carbon dioxide sequestration in various plant species involves a multi-step process, including determining the total weight of the tree, its dry weight, and ultimately the weight of carbon contained within it. Across our campus, a total of eighteen different tree species have been cataloged, with a collective count of 165 trees.

These trees collectively absorb approximately **416.34 kg** of carbon dioxide each month, equivalent to **4,992 kg per year**. This substantial carbon absorption translates to a reduction of **5 tons (tCO2e)** in carbon emissions annually.

SCAC is responsible for the maintenance of 77.4% of the trees planted on the campus, while the remaining three institutes also contribute to this effort. The collective emissions savings resulting from tree plantation initiatives amount to **3.87 tCO2e**.

8. Offset Procurement Considerations & Process

In the pursuit of sustainability and carbon neutrality, diligent consideration of offset procurement becomes paramount. This process entails a comprehensive evaluation of the

carbon footprint, wherein the greenhouse gas emissions linked to operational activities are rigorously assessed.

To counterbalance these emissions and contribute to a net-zero carbon impact, engagement in the acquisition of carbon offset credits is essential. These credits facilitate investments in initiatives aimed at mitigating carbon emissions in other contexts, effectively neutralizing environmental footprints. Through this conscientious approach to offset procurement, alignment with responsible environmental practices is achieved, further contributing to the global endeavor to combat climate change.

In this context, it is noteworthy that carbon emissions equivalent to **200tCO2e have been successfully offset**, underlining SCAC's commitment to reducing its carbon impact. This achievement reflects their dedication to sustainable practices and responsibility in mitigating the effects of climate change.

9. Project Description

9.1 UN CDM's Project

24 MW Bhilangana - III Hydro Power Project

Promoting hydro energy in India

The 24 MW Bhilangana - III Hydro Power Project, situated in Village Ghuttu, Tehsil Ghansali, District Tehri, Uttarakhand State, India, is a run-of-the-river initiative comprising three units of 8 MW each. Implemented by Bhilangana Hydro Power Limited (BHPL), the project aims to harness the waters of Bhilangana River, a Bhagirathi tributary, for environmentally friendly electricity generation. With a focus on responsible environmental practices, the project contributes to India's sustainable development by ensuring efficient use of natural resources. By generating electricity that displaces grid electricity, sourced from various fuel types, the project mitigates anthropogenic greenhouse gas emissions linked to fossil fuel-based thermal power stations in the grid. The sustainable development goals that project contributes to are:

Affordable and Clean Energy (SDG 7): The project directly aligns with SDG 7 by generating clean and sustainable electricity, contributing to the goal of ensuring access to affordable, reliable, sustainable, and modern energy for all.

Climate Action (SDG 13): By mitigating anthropogenic greenhouse gas emissions associated with fossil fuel-based thermal power stations, the project supports SDG 13, which focuses on urgent action to combat climate change and its impacts.

Industry, Innovation, and Infrastructure (SDG 9): The hydro power project showcases innovative infrastructure development in the energy sector, emphasizing the importance of sustainable practices within the industry.

Decent Work and Economic Growth (SDG 8): The indirect employment opportunities created during the construction and operation phases contribute to SDG 8, promoting sustained, inclusive, and sustainable economic growth.

9.2 Verra's Project

Promoting biomass green energy in India

Biomass Based Renewable Energy Generation at Karnal

The project involves the utilization of biomass, specifically rice husk, for steam generation to meet captive consumption needs. Located in Karnal district, Haryana, India, the initiative encompasses the retrofitting of three steam generation boilers with capacities of 12 TPH, 12 TPH, and 3 TPH, previously fueled by pet coke. The conversion allows these boilers to efficiently utilize rice husk as a sustainable alternative for steam generation, aligning with the project's objective of promoting eco-friendly practices and reducing environmental impact. By repurposing biomass and adopting cleaner energy sources, this initiative contributes to the achievement of Sustainable Development Goals:

Industry, Innovation, and Infrastructure (SDG 9): The project aligns with this goal by promoting sustainable industrialization through the adoption of biomass-based steam generation, fostering innovation in cleaner energy solutions, and enhancing infrastructure resilience.

Sustainable Cities & Communities (SDG 11): The project supports the development of sustainable cities and communities by addressing energy needs through environmentally friendly practices, contributing to safety, resilience, and inclusivity in urban areas.

Responsible Consumption and Production (SDG 12): By transitioning from pet coke to rice husk as a fuel source, the project promotes responsible consumption and production, aligning with sustainable patterns that reduce environmental impact and support a more circular and eco-friendly economy.

10. Future for SCAC's Sustainability Roadmap

Expanding carbon neutrality efforts signifies an unwavering commitment to sustainability and environmental responsibility. At Symbiosis College of Arts & Commerce (SCAC), the pursuit of carbon neutrality is just the beginning of a transformative journey. This path can ultimately lead to a net-zero state in terms of greenhouse gas emissions, which involves not only minimizing emissions but also investing in innovative solutions that actively remove or offset carbon from the atmosphere.

Aligned with global initiatives like the United Nations Race to Zero, SCAC demonstrates its role as a responsible participant in the worldwide effort to combat climate change. Through dedication and ambitious sustainability practices, SCAC contributes to the collective pursuit of a net-zero carbon future, where environmental impact is minimized, and the health of the planet is safeguarded for future generations.

11. Conclusion

As SCAC continues to set an example and inspire positive change, its pursuit of carbon neutrality serves as a guiding light for other institutions and organizations. This report not only highlights its accomplishments but also underscores the urgent need for collective action in addressing the pressing challenges posed by climate change. SCAC's commitment to sustainability is not just commendable; it is a testament to its vision of a more sustainable, resilient, and equitable future for all.

12. Resources

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13. Annexure

Total no. if trees presented on campus

Type of trees	Qty.
Coconut Tree (*Cocos nucifera*)	10
Mango (*Mangifera indica*)	3
Jamun (*Syzygium cumini*)	3
Guava (*Psidium guajava*)	1
Jujube (*Ziziphus jujuba*)	3
Tamarind (*Tamarindus indica*)	5
Custard Apple (*Annona squamosa*)	6
Southern Blue Gum (*Eucalyptus globulus*)	3
Cook Pine (*Araucaria columnaris*)	2
Southern Silky Oak (*Grevillea robusta*)	2
Sandalwood (*Santalum album*)	1
Ashoka tree(*Saraca asoca*)	7
Cluster fig (*Ficus racemose*)	4
Royal poinciana (*Delonix regia*)	21
Pukul Lima (Samanea saman)	6
Frangipani (*Plumeria alba*)	4
Neem tree (*Azadirachta indica*)	7
African tulip tree (*Spathodea campanulate)*	4
Almond (*Prunus amygdalus*)	3
Jacaranda (*Jacaranda mimosifolia*)	11
Indian beech (*Millettia pinnata*)	3
River tamarind (*Leucaena leucocephala*)	26
Champak (*Magnolia champaca*)	1
Gliricidia (*Gliricidia sepium*)	4
Sorrowless tree(*Saraca asoca*)	2
Banyan tree (*Ficus benghalensis*)	1
Portia tree (*Thespesia populnea*)	1

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