Indian Institute of Technology Roorkee

Action for Climate Change Mitigation

2024

April 2025

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GREEN COMMITTEE OFFICE

1.0 BACKGROUND

Ministry of Education vide its letter No. 1-11/2013TS-1(Sectt.) dated 05-06-2013 communicated the IIT Council's Green/Sustainable Agenda for Educational Institutions with the following background

- IITs being the premier institutions, have to play a lead role in implementing the Green / Sustainability Agenda in the country by adopting and implementing programmes to reduce their Carbon footprint, recycle the resources, adopt energy efficient measures and include sustainability issues in the teaching programme.
- The Council of IITs decided that each IIT would establish a Green Office, which would carry out a Green Audit of its curriculum and its institutional management practices, such as energy, water, waste, construction projects, natural resource (forest, water etc.) and conservation of bio-diversity.
- It was suggested to implement the greening agenda in a phased manner, but to be initiated at the earliest. The Green office could be located in the Institute's existing department/Centre concerned with sustainable development/climate engineering so that technical resource support is available.
- It could set up a working-group drawn from active faculty/students interested and working on this agenda to create a participatory, transparent process with ownership. It should also involve different department representatives to reflect it's inter-disciplinary and inter dependent concerns. It should also involve external experts from different agencies/ offices/ other organisations engaged meaningfully and constructively with concerns for a green environment.

Developing green policy (vision document) and framework for the institute and facilitating and undertake Greening initiatives are the key responsibilities of the green office. It shall work for the following:

a) To develop a baseline scenario for the institute (data and info on CO_2 emissions, water use, waste generation, carbon footprint, paper use, etc.)
b) To develop of green technology packages (installation of SPV, wind mill, waste to energy, rain water harvesting, paper recycling, etc).
c) To implement of Green Action Plan in phased manner.
d) To monitor, Reporting, Verification and Evaluation.
e) Mainstreaming Green Agenda in Education and Teaching.

IIT Roorkee setup first green office and notified the green committee in Feb. 2014. The green committee is chaired by Director and have representatives of state of work, students and faculty with a coordinator (Annexure). Minutes of meeting are uploaded on the website for wider awareness https://www.iitr.ac.in/GP/green_committee.html

2.0 INTRODUCTION

IIT Roorkee is committed to fostering a culture of sustainable development across its campus, aiming to enrich the experience of both students and staff while building a lasting global legacy. To minimize the adverse impacts of climate change on the nation's resources and to achieve sustainable development goals, it is essential to devise rational adaptation strategies and strengthen the capacity to implement them effectively. IIT Roorkee strives to address not only environmental concerns but also social and economic challenges, thereby embracing all three pillars of sustainability and contributing to climate change mitigation.

IIT Roorkee is dedicated towards enabling a culture of Sustainable development across the campus and enhance the student and staff experience, thus, creating a global legacy. In order to minimize the adverse impacts of climate change on country's resources and attaining its sustainable development and management, there are needs for developing the rational adaptation strategies and enhancing the capacity to adapt those strategies. IITR aims at doing important work not only on environmental issues but also on social and economic matters, thereby, covering the three dimensions of sustainability and mitigate climatic effects.

3.0 SETTINGS AND INFRASTRUCTURE

- Indian Institute of Technology, Roorkee (IITR) is a 'Specialized higher education institution' situated in India. Located in a Tropical wet and dry climate, it has 3 campus sites in total. This urban campus has a total area of 15, 92,438 Sq. m. The ratio of open space area to total area is 81.83%. Total area on campus covered in forest vegetation is about 0.08% while that covered in planted vegetation is about 45.03%. Besides this, the total area on campus for water absorption is about 23.58%.
- The chart below shows the total number of regular students in the campus:
- Institute Population - The chart below shows the total number of regular students in the campus of 2024:

UG/PG/Ph.D.	Female	Male	Total
UG	1102	4382	5484
PG	380	1444	1824
Ph.D.	1002	2067	3069
Total	2484	7893	10377

Total number of regular students is 10377
The academic and administrative staffs are as below:
No of faculty as on date: 552
Visiting/Adjunct Faculty, Emeritus Fellow, Professor of Practice- **77**

The details of Non-faculty are given below:
Non-Faculty (Group 'A') – 98
Group B (Technical & Admin) + Group C (Technical & Admin & C-MTS) – 533
Y Pool – 39, Project Staff – 681, Agency Manpower - 508

The families of the staff are also considered since they reside inside the campus area taking to a total of 5200 staff members.
Thus the total open space area divided by total campus population is about 72 sq. m/person.

4.0 ACTIONS TAKEN TO MITIGATE CLIMATIC CHANGE IMPACTS

4.1 Energy and Climate Change

- IIT Roorkee intends to realize further energy savings by paying close attention to energy management. All departments of the institute have assessed their own energy consumption and realized their own energy-saving potential by means of, for example, insulation, LED lighting, motion and photo sensors for efficient operation of the lighting fixtures and the deployment of sustainable technology. IIT Roorkee aims towards saving energy by energy management and focussing on renewable energy sources.
- IIT Roorkee has been a pioneer in utilizing solar energy on an academic campus. https://www.iitr.ac.in/GP/solarification.html. It is one of the academic institutions which have the comprehensive rooftop solar energy installation and is an excellent showcase of solar technology for all the students, faculty and visitors. The institute has utilized the rooftop area of every building on campus for solar photovoltaic (PV) and solar thermal applications for hostels and residences. The energy generated by the solar PV system is connected to the campus distribution grid, which supplements electricity requirements of various departments. The solar thermal systems are being used for water heating and cooking. IIT Roorkee is planning to install rooftop Solar Photovoltaic (PV) systems on all parking area sheds across the campus. The faculty and students have led successful initiatives for energy conservation and reducing carbon footprint using solar energy. The summary of solar installations at IIT Roorkee campus is as follows:

4.1.1 Solar PV system

- Installed in the year 2014, it consists of 27 units of Solar PV systems of various sizes on rooftops of buildings with the total generation capacity of 1.81 MWp.
- A 47 kW solar PV system commissioned at Noida Campus of IIT Roorkee in November 2016 on OPEX.
- 1.0 MW was commissioned in Sept 2021 with a 25-year power purchase agreement with a RESCO company at a tariff of Rs 1.899 per unit.

Thus a total capacity of SPV system in IIT Roorkee in 2.867 MW installed in different years.

Solar Energy Generation with following SPV Systems

1	**1.812 MWp SPV System installed on CAPEX**						
Year	April 2018 to March 2019	April 2019 to March 2020	April 2020 to March 2021	April 2021 to March 2022	April 2022 to March 2023	April 2023 to March 2024	April 2024 to March 2025
kWh	21,33,050	20,89,061	20,34,752	17,69,079	17,83,500	15,09,420	17,12,542
2	**1.0 MWp SPV System installed under RESCO Model**						
Year				July 2021 to March 2022	April 2022 to March 2023	April 2023 to March 2024	April 2024 to March 2025
kWh				8,01,032	13,20,384	12,86,572.4	12,70,691.1
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Year	April 2018 to March 2019	April 2019 to March 2020	April 2020 to March 2021	April 2021 to March 2022	April 2022 to March 2023	April 2023 to March 2024	April 2024 to March 2025
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kWh				8,01,032	13,20,384	12,86,572.4	12,70,691.1

4.1.2 Solar water heating system

It consists of a water heating system covering the entire campus at the students' hostels (Bhawans), guest houses, residences, and departments. It generates hot water of about 4,61,900 liters per day.

4.1.3 Solar system for steam cooking

It consists of the solar system for steam cooking at nine hostels. It is equivalent to 5000 cylinders of 14.2 kg each LPG annually.

4.1.4 Supervisory Control and Data Acquisition System for Solar Systems

All the solar PV systems have SCADA for monitoring and data generation, and research on PV systems and they have been connected to IIT Roorkee internal distribution-grid.

Thus the campus has more than 3 types of solar energy production. The carbon dioxide deduction is summarized as:

Energy Efficient Interventions	Reduction of Electricity and Carbon
Energy efficient appliances: Air Conditioners, Fans, Lighting and Street Lighting	An overall reduction of 10 % of annual saving of electricity
Use of Alternate Sources	

Energy Efficient Interventions	Reduction of Electricity and Carbon
Solar PV systems (a) 1.81 MW installed during 2013-14 on CAPEX (b) 1.00 MW installed during 2021-22 on RESCO Total: 2.81 MW= 2.79 Million units	[1]Annual reduction of 2,541 Ton/CO_2
47 kW systems at IIT Roorkee Noida campus	Annual reduction of 44 Ton/CO_2
Solar water heating system: 4,61,900 Litres of hot water per day equivalent of saving of 5.2 Million units annually	Annual reduction of 4,312 Ton/CO_2
Steam Cooking 61 solar Sheffler dishes of 16 sq m equivalent to 4000 cylinders of 14.2 kg each LPG annually eq 0.768 million units of electricity	Annual reduction of 606 Ton/CO_2
	Total reduction of 7503 Ton/CO_2

4.2 Measures for Energy Efficiency

All departments of the institute have access to their energy consumption and realize their energy-saving potential by means of, insulation, LED lighting and the deployment of sustainable technologies etc., achieving a total energy efficiency of 55.66%. There has been an increase of almost 20% in Energy Efficient appliances as a percentage of total appliances https://www.iitr.ac.in/GP/green_initiatives.html

- Replacement of fluorescent based light fittings by LED Lights in the departments / hostels / lecture halls/ residences.

- In common areas of buildings, a new initiative has been taken to install LED lights having auto-dimming capability. Normally, this LED tube light will glow at 3.5 W, but whenever there is a movement of any person, it will glow to 18 W, thus, saving energy.

- All the electronic appliances being procured and installed such as, fans, air conditioners etc. are 5-star rated with electronic speed regulator.

- There are motion sensors controlled exhaust fans in many washrooms.

- IIT Roorkee is implementing SCADA based smart and sustainable campus. This will entail the creation of a smart energy management system and micro grid with battery energy storage. The project will establish an Integrated Monitoring, Analytics and Control Center (I-MAC) for systems ranging from energy assets to transport, water, and waste. includes the setting up of an integrated energy and digital platform, embodying intelligent and futuristic energy systems to increase energy efficiency, renewable energy use and sustainable transport, minimizing harm to the planet. This also integrates smart power and energy systems, environment, safety, security and disaster management, among other things.

[1] Central Electricity Authority, Govt of India, CO2 Baseline Database for the Indian Power Sector User Guide Version 20.0, Dec 2024

- Along with the energy efficiency, smart building measures related to automation, safety, water, indoor environment, lighting etc. have also been implemented in IITR. These features are established to generate a beneficial environmental impact over the building lifecycle. The total floor area of smart building to the total all floors building area is about 8.02 %.

- Installation of Air sourced based Heat Pump for water heating in a hostel has been done recently. This system can provide a total of 8000 Litre/hr hot water throughout the year utilizing 75% less electricity than an electric geyser.

- IITR implemented the elements of 'green building' such as natural ventilation and daylighting, introduction of courtyards in different areas, louvers and small widows on south façade, large glazed widows on north façade, solar panels installed on rooftops, use of energy and water efficient appliances and use of green materials for construction; to name a few "Mehta Family- School of Data Science and Artificial Intelligence". IIT Roorkee is practising incorporating Smart Building concepts across almost all of its campus infrastructure. In alignment with the principles of Green Building, one of the buildings currently under construction is in the process of securing a **Platinum rating** under the **IGBC Green Building Certification**. Additionally, two other buildings—the **Chemistry Building** and the **572-Seater Student Hostel**—are under review for the **'GHAR' rating** as part of the **CPWD Green Certification**. Notably, all newly constructed buildings on campus are being followed the concept of both **Smart Building** and **Green Building** principles.
- IITR has implemented programs which aims to reduce all three scopes emissions, namely, Direct GHG emissions, Fugitive emissions and Indirect GHG emissions resulting from the generation of the electricity, incineration or landfill of institution's solid waste, regular commuting from and to institutions by students and employees.

- The faculty and students have led successful initiatives for energy conservation and reducing carbon footprint using solar energy. The total carbon footprint[2] (scope1 and 2) of the institute is about 29591 metric tons (about 1.63 metric ton per person).

- A poster and brochure on solar initiative taken by institute be prepared and circulated among the institute community for creating awareness and utilisation of solar energy in the campus.

4.3 Measures for Waste Handling for Reduction in Carbon Emission

As the waste treatment and recycling activities are major factors in creating a sustainable environment, some programs have been implemented in IITR to manage he waste in an efficient manner.

- IITR has implemented a Door-to-Door garbage collection program in the campus.

- For Manual segregation of solid waste in various location in the IITR campus, Separate dustbins for wet/ organic and dry waste have been installed at various

[2] Central Electricity Authority, Govt of India ,CO2 Baseline Database for the Indian Power Sector User Guide Version 20.0, March 2024

locations in the campus. The residents have been provided separate dustbins for wet and dry waste.

- Sanitary waste management: Sanitary waste is collected from the IIT hostel naming Sarojini Bhawan, Vigyan Kunj, Kastoorba and Himalaya. Yellow sanitary bins are installed at appropriate places in and out of the girl's hostel buildings for the proper separate collection of sanitary waste. The collected sanitary waste is disposed properly through a Biomedical Waste Management firm.

- The facility for management of solid waste of IIT Roorkee is developed by Fabetto Ecotech Pvt Ltd. at the site provided by Cantonment Board Roorkee. The solid waste (including horticultural waste, departmental waste, mess waste etc.) produced from IIT Roorkee campus is processed at the facility.

- The IITR community intends to use plastic bottles to create self-watering plants and storehouses for plants.

- Collection and segregation of hazardous e-waste to avoid its incorrect disposal and helping school children to create some innovative craft using e-waste.

- During Zero Waste Week (September 25 – October 1, 2024), a series of impactful activities were organized to promote sustainability and responsible waste management. A Case Study Competition encouraged participants to analyse real-world sustainability challenges and propose innovative solutions. The Medicine Collection Drive gathered 10 kg of unused medicines, helping approximately 100 individuals in need. In the E-Waste Collection Drive, 5 kg of electronic waste was collected for proper recycling. Additionally, the Best out of Waste Competition inspired creativity by motivating participants to repurpose waste materials into useful or decorative items.
- The institute has established a formal policy to reduce the use of paper and plastic.

- To reduce the use of papers, emphasis is given on using digital technologies, reducing paperwork by using electronic communications for administrative and project works. Online submission of project proposals and online database management.

- Creation of web repository of documents to avoid using papers. All the academic processes (eg: procedure for transcripts or mark sheets; notifications regarding courses; important notices, etc.) are uploaded online to reduce the use of paper.

- NSS IIT Roorkee launched the "Swachhta Hi Sewa" initiative which is focused on the theme "Plastic Waste Awareness and Segregation".

- Free Water Distribution system has been implemented in the campus to reduce the use of plastic water bottles and the use of Tumblers.

- Apart from this, in terms of waste management, the organic waste is treated at the source itself.

- For the collection of inorganic waste, mild steel dustbins and PVC moveable dustbins have been ordered and started being placed in the hostels of IITR campus

- The new bins are placed adjacent to the current bins in the campus, thus making a pair of organic and inorganic bins. The bins are colour-coded (Organic-Green; Inorganic-Blue) to avoid confusion.

- For the Inorganic waste, 100 numbers of 30 litres mild steel dustbins have been ordered for the East zone of IITR campus (1st year hostel, Rajendra Bhawan) while 6 numbers of 1100 litres PVC moveable dustbins have also been ordered for Sarojini Bhawan and 1st year hostel in the East zone. The placement for the same has already been started. These new bins are placed adjacent to the current bins in the campus, thus making a pair of organic and inorganic bins. The bins are colour-coded (Organic-Green; Inorganic-Blue) to avoid confusion. For the Inorganic waste, IITR has contacted a local reseller who is a link between recycling companies and incineration plants. This waste can be handed over to him; he will further segregate it & will send to respective places for recycling or incineration.

- All hazardous waste generated at IIT Roorkee is now being safely and responsibly disposed of by sending it to the Treatment, Storage and Disposal Facility (TSDF) located in Laksar.

- Wet/organic waste management: Processing of Wet/organic waste is done with composting. Horticulture waste is shredded and converted into compost using aerobic composting technique. Food and vegetable waste is mixed with horticulture waste for composting. Some cow dung and culture are being used for better composting process.

Figure 3. Composting of solid waste of IITR campus

- Future plans for segregation of solid waste and Bio-methanation of organic part is considered as the option to reduce the waste contribution to the society and retrieving the energy from the waste.

- Feasibility assessment of usage of recycled plastic and other waste as cutlery substitutes.

- Use of recycled paper for administrative work, wherever possible, inside the campus.

Waste Management Interventions	
Recycling of Electronic waste	20 bins
Inorganic waste	100 numbers of 30 litres mild steel dustbins 6 numbers of 1100 litres PVC moveable dustbins
Organic waste	Treated at source itself Bio-methanation and Vermi-composting

4.4 Water and Wastewater

The aim of the IITR is to decrease ground water usage, increase conservation programs, manage generated wastewater and protect the habitation.

- For management of wastewater, sewage treatment plant of capacity 3 Million litre per day (MLD) has been constructed at Roorkee campus and 0.5 MLD capacity STP at Saharanpur campus of IIT Roorkee. The STPs are based on the Sequencing Batch Reactor (SBR) process. The system provides high-quality effluent for safe discharge or non-potable reuse with minimum space and power requirements. Around 39,552 m^3 of treated water from STPs outlet is used every month for the sports fields, lawns and kitchen garden, sprinkler systems for which required infrastructure has been laid.

- Rain water is recharged directly to the ground through open unpaved areas. IITR has 3,37,696 m^2 of open area which is used to recharge rain water to the ground.

- The pilot project for Rain Water Harvesting has been taken up at Roorkee campus for which two sites have been identified and the development of rain water harvesting structures has started.

- Water efficient appliance usages are replacing conventional appliances. IITR houses about 31.66% water-efficient appliances. Future plans include water efficient fixtures (taps, shower heads, cisterns, toilets, urinals, lawn sprinklers etc.), be used, whenever/wherever changed are required.

- A water meter is installed to measure the amount of rainwater that has been used. The recycled water is also used for the garden sprinkler system, toilet flushing with a current water consumption of 1MLD.

- Reduction of freshwater consumption and steps being taken to reduce: the metering, appliances, monitoring, reusing 1MLD of treated waste water instead of freshwater.

- Create awareness among the campus fraternity regarding sensible use of water including sweepers, gardeners and cleaners through scheduling of monthly informational emails to serve as visual reminders for water conservation, display banners and pamphlets at various locations inside the campus etc.

- Planning and mitigation of the storm water drainage issues in the campus. Also, the development of drainage arrangement including development of retention in the sports fields, recharging structure, remodelling the outlet drain is being carried out.

Water and Wastewater Management Interventions			
Appliance	**Total Number**	**Total number of water efficient appliances**	**Percentage water efficiency (%)**
WCs	2940	1385	47.10
Wash Basins	3060	540	17.6
Urinals	1090	320	29.35
3,37,696 m^2 of open area	Recharge of rain water to ground		

Built rain water harvesting structures	
25,000 m^3 per day of treated wastewater at Roorkee campus	sports fields, lawns and kitchen garden, sprinkler systems purposes
zone/area to be selected for making 100% metering for monitoring the water consumption and a suitable telescopic tariff	

5 Transportation

Transportation systems play an important role in carbon emission and pollutant levels in IITR.

- Transportation policies to limit the number of motor vehicles on campus uses of campus buses and bicycles have been implemented to encourage a healthier environment.

- The pedestrian policy has encouraged students and staff to walk around campus and avoid using private vehicles. The use of environmentally friendly public transportation has decreased the carbon footprint around campus.

- Regular shuttle service is provided (by institute or other parties). The future goal is to minimize on campus transportation which would help to reduce carbon footprint through better planning.

- Solar charged battery operated rickshaws are used as shuttle service in IITR.

- Apart from this, Zero Emission Vehicles are available, and provided by the institute at a subsidized rate. The total number of Zero Emission Vehicles (ZEV) divided by total campus population is about 0.71.

- The initiatives have resulted in more than 30% decrease in parking area or parking area reduction reaching its limit.

- A Number of Transportation Initiatives is designed to decrease Private Vehicles on Campus such as E-Rickshaws inside campus. uses of bicycles on campus since, students are not allowed to use motorized vehicles, pedestrian friendly paths, and use of electric cars inside the campus etc.

- The campus is designed in such a way that the faculty houses and student residences are within 1 mile from the educational departments and offices. Hence, no cars are required due to the close proximity between different areas.

- Total Number of Vehicles actively used and managed by the Institute - 14
- Electric Cars -02
- Diesel Cars - 04
- Electric Buggies - 02
- Traveller (Diesel) - 03
- Buses (Diesel) – 03

- Reduction in Diesel and petrol by usage of 2 e-vehicles.

No Carbon emitting vehicle in the campus

- Institute has adopted a policy of observing 1st day of each month during 8 am to 6 pm as No Carbon Emitting Vehicle Day in all campuses of IIT Roorkee with exemptions made to Government (GA numbered), milk, food, grocery, postal material delivery

vehicles (Army), campus security, fire services, ambulance, and local administration vehicles, Vehicles carrying differently-abled persons/people with health concerns, Institute and Department guests from outside Roorkee and Taxis.

E-vehicle charging point intallations:

- Charging points for e-scooters have been installed at Canal View Apartments, Shivalik Apartments, Hill View Apartments and River View Apartments. More are being installed.

- In the institute garage there are two cars and two buggy carts and for them the charging station is installed in the institute vehicle section.

4.6 Biodiversity

- Implemented a mini-forest (Miyawaki forest) having 1100 trees of about 70 species in an area of 300 m^2 near Saraswati Mandir with cooperation of SayTrees organisation during Sept 2021. Miyawaki, also called the Potted Seedling Method, is an afforestation technique pioneered by Japanese botanist Akira Miyawaki that helps build dense, multi-layered native forests. The approach is supposed to ensure that plant growth is 10 times faster and the resulting plantation is 30 times denser than usual. It requires a very little space (a minimum of 2 sq m). It involves planting dozens of native (indigenous) species in the same area, and becomes maintenance-free after the first three years. The overall density of the forest is beneficial in lowering temperature, making soil nutritious, supporting local wildlife and sequestration of carbon for a climate challenge since this method is more suited to building sustainable long-standing forests which kind of set up an equilibrium.


- Biodiversity census - a unique step/decision for any campus in urban setting**.** The biodiversity census has been carried out by Wildlife Institute of India located in Dehradun. The report records and details all the species of flora and fauna present on IITR Campus. This will help IITR in appreciating the natural assets and also to motivate students in keeping healthier environments around them. https://www.iitr.ac.in/GP/pdf/Biodiversity_of_an_Urban_Greenspace_IIT_Roorkee_Report.pdf

- Under the "MeriLiFE" Mission of the Department of Higher Education, Ministry of Education, IIT Roorkee planted 1,100 saplings in 2023–24 and 1,500 plants during the year 2022–23 and. Currently, approximately 90% of these plants have survived, reflecting the institute's sustained commitment to environmental sustainability and ecological conservation.
- On September 24, 2024, NSS IIT Roorkee organized a tree plantation drive on campus to celebrate NSS Day. This initiative aimed to enhance green cover, promote environmental sustainability, and encourage students to actively participate in community service. In collaboration with Arsh Yog Jankalyan Trust, a local NGO dedicated to environmental conservation, a total of 100 saplings were planted. Of these, 86 were placed near Himalaya Bhawan, while 14 were planted in Rajiv Bhawan. The saplings were carefully chosen native species, ensuring they would thrive in the local climate and ecosystem

4.7 Education and Research

About 4.8% courses in IITR are related to sustainability including climate change; so much so that the institute uses 2.5% of the total funds for sustainability related activities in the institute. A significant number of faculty and students work on different aspects of climate change in different departments.

- Many faculty members of IIT Roorkee are working on the life cycle assessment of the current research practices.

- Tree plantation program on Independence day and World Environment Day

- Health of air should be monitored, So, air pollution monitoring system can be installed as a green initiative in the inside of campus of Roorkee and Saharanpur

- There are about several student organisations related to sustainability, viz., National Service Scheme (NSS), Indian Green Building Council (IGBC) Student Chapter, ECO Group, Unnat Bharat Abhiyan (UBA), AWWA IITR student Chapter aimed at inculcating sustainability and mitigating/reducing ,climate change impacts and the importance of the environment in the campus community, finding solutions pertaining to the fields including proposing sustainable solutions for socio-economic problems by employing entrepreneurial skills.

- IIT Roorkee also have initiated preparing and publishing the annual sustainability report. The recent report is available at https://www.iitr.ac.in/GP/

- IITR has implemented programs which aims to reduce all three scopes emissions as per GHG protocol and also adopted by IPCC (https://ghgprotocol.org/about-us; https://www.ipcc.ch/site/assets/uploads/2018/02/ipcc_wg3_ar5_annex-i.pdf):
  Scope 1:
  Process emissions: Direct greenhouse gas (GHG) emissions from physical or chemical processes rather than from fuel combustion.
  Scope 2:
  Purchased electricity: Indirect GHG emissions resulting from the generation of the electricity* purchased and used by the institution.
  Scope 3:
  Waste: Indirect GHG emissions resulting from the incineration or landfill of institution's solid waste.
  Commuting: Indirect GHG emissions resulting from regular commuting from and to institutions by students and employees.

The total carbon footprint of the institute is about 29591 metric tons (about 1.63 metric ton per person) only taking in to components where institute has role to play in carrying out its normal activity.

* https://cea.nic.in/wp-content/uploads/2021/03/User_Guide_Version_20.0.pdf

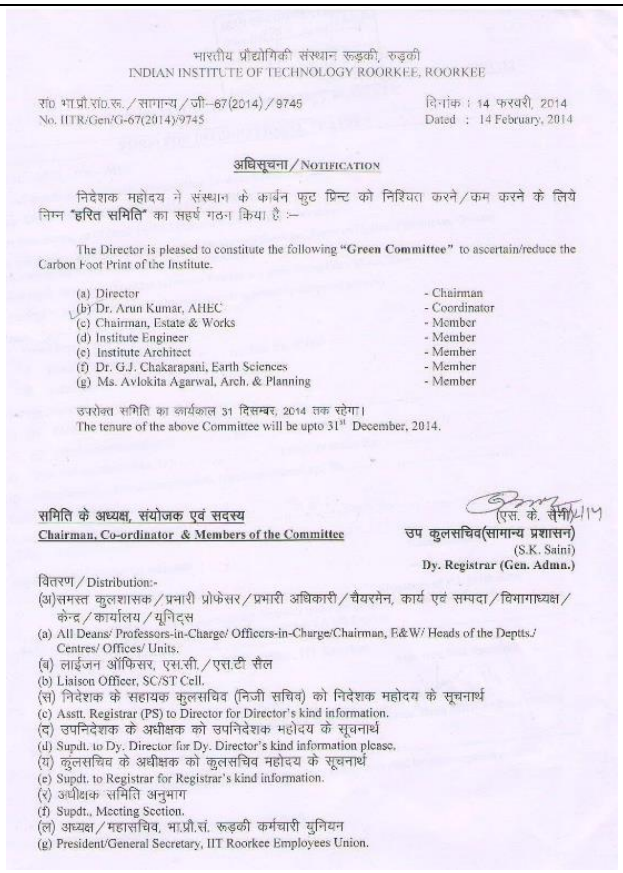
- The institute has also decided to reduce carbon emissions by 50% by 2047 and achieve net zero targets by 2060.

5.0 CONCLUSION

IIT Roorkee has implemented strategies under the heads of land, water, energy, waste, environment and education in order to mitigate climate change. IITR has taken significant steps in all these fields to reduce carbon emissions. Not just this, a proportionally significant effort is being put towards educating and training the younger generation of students which will enable us in taking the agenda of environmental sustainability and mitigation of climate change, a long way ahead.

Annexure: Office Memo issued for setting up green committee

The first one in 2014 and the most recent in 2024 for the year 2024 are shown below



भारतीय प्रौद्योगिकी संस्थान रूड़की, रुड़की
INDIAN INSTITUTE OF TECHNOLOGY ROORKEE, ROORKEE

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No. IITR/Gen/G-67(2014)/9745 — Dated : 14 February, 2014

अधिसूचना / NOTIFICATION

निदेशक महोदय ने संस्थान के कार्बन फुट प्रिन्ट को निश्चित करने / कम करने के लिये निम्न "हरित समिति" का सहर्ष गठन किया है :–

The Director is pleased to constitute the following "Green Committee" to ascertain/reduce the Carbon Foot Print of the Institute.

(a) Director	- Chairman
(b) Dr. Arun Kumar, AHEC	- Coordinator
(c) Chairman, Estate & Works	- Member
(d) Institute Engineer	- Member
(e) Institute Architect	- Member
(f) Dr. G.J. Chakarapani, Earth Sciences	- Member
(g) Ms. Avlokita Agarwal, Arch. & Planning	- Member

उपरोक्त समिति का कार्यकाल 31 दिसम्बर, 2014 तक रहेगा।
The tenure of the above Committee will be upto 31st December, 2014.

समिति के अध्यक्ष, संयोजक एवं सदस्य
Chairman, Co-ordinator & Members of the Committee

(एस. के. सैनी)
उप कुलसचिव(सामान्य प्रशासन)
(S.K. Saini)
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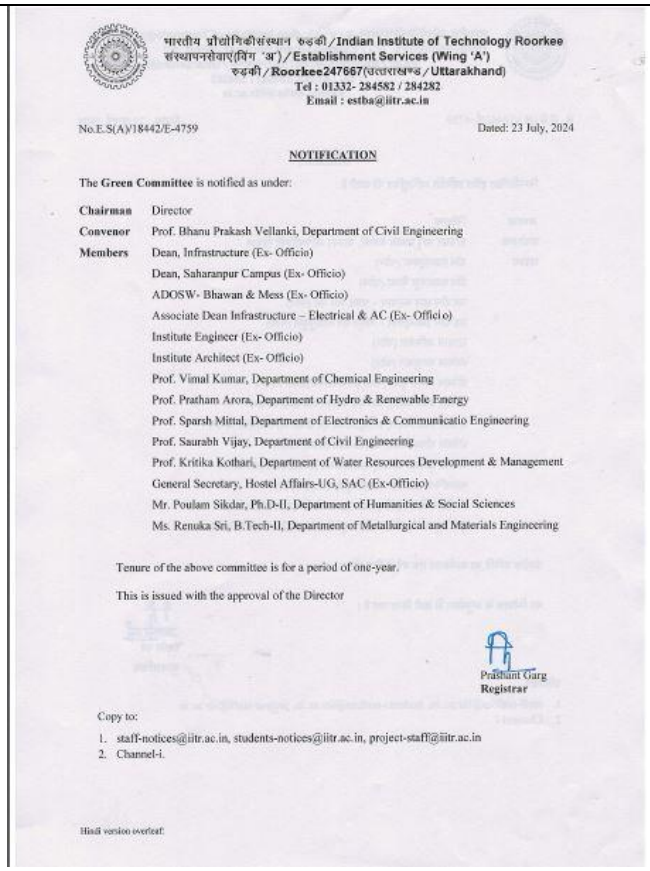

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No.E.S(A)/18442/E-4759 — Dated: 23 July, 2024

NOTIFICATION

The Green Committee is notified as under:

Chairman	Director
Convenor	Prof. Bhanu Prakash Vellanki, Department of Civil Engineering
Members	Dean, Infrastructure (Ex- Officio)
	Dean, Saharanpur Campus (Ex- Officio)
	ADOSW- Bhawan & Mess (Ex- Officio)
	Associate Dean Infrastructure – Electrical & AC (Ex- Officio)
	Institute Engineer (Ex- Officio)
	Institute Architect (Ex- Officio)
	Prof. Vimal Kumar, Department of Chemical Engineering
	Prof. Pratham Arora, Department of Hydro & Renewable Energy
	Prof. Sparsh Mittal, Department of Electronics & Communicatio Engineering
	Prof. Saurabh Vijay, Department of Civil Engineering
	Prof. Kritika Kothari, Department of Water Resources Development & Management
	General Secretary, Hostel Affairs-UG, SAC (Ex-Officio)
	Mr. Poulam Sikdar, Ph.D-II, Department of Humanities & Social Sciences
	Ms. Renuka Sri, B.Tech-II, Department of Metallurgical and Materials Engineering

Tenure of the above committee is for a period of one-year.

This is issued with the approval of the Director

Prashant Garg
Registrar

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