IISER Bhopal

INDIAN INSTITUTE OF SCIENCE EDUCATION AND RESEARCH BHOPAL

IISER Bhopal Climate Action Plan

2022-23

CONTENTS

PREAMBLE

The Indian Institute of Science Education and Research Bhopal (IISER Bhopal) was set up by the Government of India in 2008. The vision of the Institute is to provide high quality education to undergraduate, postgraduate, and doctoral students. The Institute also aspires to contribute to the society through teaching and research to help achieve global sustainability.

Further, the Institute aims to produce leaders in science and related disciplines. As an autonomous institution, it awards its own degrees. The campus, which covers around 200 acres of land, is at Bhauri Village, in the Bhopal district of Madhya Pradesh, India. It prides itself on its green campus and sustainable environmental initiatives, from the solar power plant with zero investment on the private partnership to the lake for rainwater harvesting and recharges wells for storm water recharging. There are ten academic departments which are: physics, mathematics, chemistry, biology, earth and environmental sciences, chemical engineering, electrical engineering and computer science, humanities and social sciences, economic sciences and the department of data science and engineering. All offer bachelor of sciences, combined bachelor and master of sciences, combined MS-PhDs and PhDs. There are around 2,079 students, including BS-MS, PhD and integrated PhD as on date. The student-run Students Activity Council (SAC), an extracurricular union of students, contains seven different activity councils: computing and networking council, cultural council, fine arts and literary council, science council, sports council, student development council, environmental and social initiative council.

On-Campus activities to manage and mitigate adverse climate change

There are several examples of local actions contributing to mitigating global issues. Several of these actions rely heavily on cyclization of material and energy resources and displacing fossil fuel derived energy with renewable sources of energy. At IISER Bhopal, although we are young Institution that is just emerging from a major infrastructure building phase, several initiatives are already in-place to ensure maximal utilization of material resources, responsible waste handling and disposal, and initiatives that reduce energy demand as well as projects to enhance renewable energy share to meet our power requirements. In fact, pro climate and environment initiatives were an integral part of infrastructure and services design. In addition to these tangible efforts, we are also a hub of generating knowledge and tools that will help tackle adverse climate impacts. IISER Bhopal engages in inter-and-transdisciplinary teaching and research aimed specifically at addressing the science, technology, and socio-cultural, policy aspects of climate change.

Following is a list of pro-environment and climate initiatives that IISER Bhopal is currently engaged. Details of several other activities and initiatives led by the climate change and environmental stewardship bodies on campus and IISER Bhopal short-term and long-term climate goals will soon be available.

1. Solar power projects

As a part of its 'Green Campus' initiative, IISER Bhopal has installed 346 kWP rooftop solar spread across the IISER Bhopal campus, on a roof area of 46,000 square feet. The solar plant was inaugurated by M Rajeevan, Secretary, Ministry of Earth Sciences, Government of India and Prof Siva Umapathy, Director, IISER, Bhopal. The expected generation for this project is 5.05 lakh units per annum and is estimated to save IISER around nine lakhs annually. This project will decrease 420 tons of carbon dioxide per annum, equivalent to planting more than 10,000 full-grown trees.

Roof top solar panels (345KWp)

Proposed; Solar necklace project. The proposed project is divided into five units and the brief details of the same are listed below.

Probable locations for the installation of solar power plant on campus

Unit-1

Overhead system over East West Pathway on North End

Unit-2

Overhead system over East West Pathway on South End

Unit-3

Overhead system near the Main gate area

All the 3 systems together will make a total installation capacity of 1194Kwp with a PR of 77.9%

Unit-4: Solar Trees

This consists of solar trees which are located along the pathway with which one will be able to produce power very close to the consumption point and feed at the consumption point itself thereby reducing the transmission losses. These trees will be located near the pathway possibly at the following locations (these locations are chosen since these are close to points of consumption). Each tree will consist of 18 nos. of modules with 350wp modules. Hence each tree will have a 6.3Kw load. 10 such trees will be connected to a string inverter of 50Kw and the output drawn to the consumption points to the nearest buildings in the campus.

Unit-5: Solar Carport

This consists of solar carport of 63kw capacity which is located near the admin building with which one will be able to produce power very close to the consumption point and feed at the consumption point at the admin building itself thereby reducing the transmission losses.

This carport will be an elevated structure will be located at the car parking lot near the admin building. This carport will provide additional benefit of shade to the cars parked below.

Solar water heating

Description of proposed connections

- The Output from all Units 1, 2 & 3 are grouped together and stepped up to 33 KV system with the help of a 33KV step up transformer and fed to the evacuation system at main substation through the net metering panel. This shall be done through a system of Distribution boards, circuit breakers etc.

- Output of solar trees are grouped together and fed to load points across nearby buildings in the campus, namely the administrative block, hostel block, security main gate office, academic blocks etc.

2.Rainwater harvesting

The harvested rainwater and utilised treated sewage water for gardening are being implemented at the Indian Institute of Science Education and Research, in view of the need to conserve water and achieve zero-water discharge at the institute. IISER Bhopal constructed 34 surface rainwater harvesting tanks at various locations and sewage water plants at different campus locations.

Locations of recharge wells in the campus

Ground water recharge wells

Sewage treatment plant

3. Tree plantation

The horticulture activity was started in 2009 to create the IISER Bhopal campus full of greenery and vibrant, including exotic and indigenous deciduous and coniferous trees and plants (long-life tall trees, flower, and medicinal trees, fruit trees, palm, and pine trees). Dr C.N. Rao inaugurated the first phase of the plantation at the new campus by planting the first Plant. In addition to this, several plantation drives have been organized to make the campus green.

Some more images of plant drive organised in the IISER Bhopal campus to the plantation of plants.

IISER Bhopal believes that nursing nature is the best way to promote creativity. Increasing the amount of landscaping and greenery on the campus can positively affect mental and physical health. The plants and trees will be chosen to create the health echo-systems for attracting exotic and migratory birds. IISER Bhopal has set up the nursery gardens and green parks on our campus and provided the tree name tags, including English and Hindi's botanical names.

4. Waste management

(i)Hazardous waste

The Hazardous waste material generates 3 tons approximately in a year. The generated waste material is disposed of through the M/s Green Gene Enviro Protection and Infrastructure Pvt. Ltd. located in Chittorgarh, Rajasthan. IISER Bhopal has an in-house storage facility in a separate shed with a capacity of 100 tons to store waste material. IISER Bhopal also has an authorization from Madhya Pradesh Pollution Control Board for generating, storage and disposal of Hazardous waste.

(ii)Bio-waste

The Bio-waste material generates from the Biological Science laboratory approx.10 kg per month, and the same disposal through the M/s Environment Protection Corporation (EPC) located in the Sehore, Madhya Pradesh. Approx. 58 kg Bio-waste material has been disposed as on date. IISER Bhopal also has authorization from Madhya Pradesh Pollution Control Board for generating, storage of disposal of Bio-waste.

(iii)Bio-medical waste

Bio-medical waste generates approximately 100 kg per year from the Institute Health Centre and Covid-19, testing centre. The waste material disposes through unit of M/s Environment Protection Corporation (EPC) located in the Sehore, Madhya Pradesh.
Apart from this, 2 nos of Green Dispo incinerators have been also installed in the girl's hostel for disposal of sanitary napkin. IISER Bhopal also has authorization from Madhya Pradesh Pollution Control Board for generating, storage of disposal of Bio-medical waste.

(iv)E-waste

The E-waste bin has been deployed in various campus locations to collect the E-waste material. The collected E-waste material has been discharged through the inviting tender process and auction as per the GFR-10 rule.

5. E-Rickshaws and Bi-Cycles

IISER Bhopal endeavors to be a motor vehicle free campus. As a start to this effort, E-Rickshwas and Bi-cycle use on campus are facilitated. The E-Rickshaw facility is available for movement of community member in the campus for a nominal charge. In collaboration with the Bhopal Municipal Corporation (BMC), bi-cycle facility has been introduced oncampus. The BMC has made two-cycle stations, one located at the campus's main entrance gate and another in the Hostels areas. The facility is available for a nominal charge, and booking can be made through an electronic application..

Thank you!