

Special Interest Group
on
Energy and Environmental Engineering

supported by
PES-IAS Chapter, IEEE Pune Section

Objective-

The objective of Special Interest Group in Energy and Environmental Engineering is to build a local ecosystem to address climate impact as well as build smart and sustainable campus by involving youth to develop engineering solutions

PES IAS chapter of IEEE Pune Section has established Special Interest Group on “ Energy and Environmental Engineering, inviting engineering colleges, city authority, NGOs, Industry to start acting at a local campus level making it a living laboratory to demonstrate the impact of small but sustainable steps towards energy conservation, energy efficiency, environmental sustainable, waste minimization, water optimization, build practices of circular economy.

The 9 engineering colleges, 20 plus faculty members, 200 plus students, 15 IEEE PES members over last 2 years contributed with diverse plans of creating awareness via seminars, trainings, panel discussions. There is an impressive survey conducted at each institution to measure, compute transportation related emission footprint and carve out a roadmap to become carbon neutral, smart and sustainable campus.

Partner Ecosystem-

- IEEE PES IAS Chapter, IEEE Pune Section
- JSPM's JSCOE
- Pune Institute of Computer Technology, Pune
- I2IT , Pune
- JSPM's RSCOE, Pune
- D. Y. Patil Institute of Technology
- G.H. Rasoni College of Engineering and Management
- MMCOE, Pune
- MKSSS's Cummins College of Engineering for Women, Pune
- TSSM,s BSCOER, Pune

Key Highlights towards creating a momentum

1. JSPM's Jaywantrao Sawant College of Engineering (JSCOE), Hadapsar, Pune

MoU signed on 14th September 2024



This report presents an overview of sustainability, energy, and environmental activities conducted at JSPM's Jaywantrao Sawant College of Engineering (JSCOE), Hadapsar, Pune, under the Electrical Engineering Department and Green Club initiatives.

JSCOE actively promotes sustainability, energy conservation, and environmental awareness through academic, co-curricular, and extracurricular activities. The Electrical Engineering Laboratory, Green Club, and IEEE student chapters play a major role in engaging students in sustainability-driven initiatives.

Inauguration of Energy and Environment Engineering (EEE) Laboratory

The EEE Laboratory at JSCOE was inaugurated on 10 February 2024. The laboratory supports practical learning, research, and innovation in the areas of electrical engineering, renewable energy, and sustainability.



Green Club Objectives

Youth engagement in water stewardship

- Energy conservation
- Carbon neutrality
- Climate change awareness aligned with the 1.5°C Climate Clock concept



Major Sustainability Activities

- Introduction of the “Why Waste” mobile application for monitoring water footprint.
- Energy Literacy online certification completed by more than 1000 students.
- Promotion of eco-friendly Ganesh festivals with focus on Nirmalya management.
- Tree plantation and rainwater harvesting initiatives.
- Promotion of electric vehicles and exposure to EV startups such as Elespa.
- E-waste and water-related online certifications in collaboration with industry platforms.



Startup Fest – Tech Manthan 2025

The Startup Fest 2025 (Tech Manthan) was successfully organized on 28–29 January 2025 at JSCOE. A total of 24 startups from AgriTech, IoT, AI & ML, FinTech, FoodTech, and HealthTech participated. The event included panel discussions and startup pitching sessions.



JAYAWANT SHIKSHAN PRASARAK MANDAL's Jayawantrao Sawant College of Engineering
Survey No. 98, Indrayani Nagar, Handewadi Road, Hadapsar, Pune-411028, Maharashtra
ACCREDITED BY NBA AND ACCREDITED WITH A+ GRADE BY NAAC

STARTUP FEST 2025

A National Level Event Organized by JSPM's JSCOE Mechanical and EnTC Department

FOCUS AREAS:

- AGRI-TECH
- FOOD-TECH
- CLEAN ENERGY
- HEALTH CARE
- IoT & AI/ML
- EV-SMART MOBILITY
- FINTECH
- SMART ENGINEERING

28th & 29th JANUARY 2025, 9.30 am

- Every registered Startups gets Networking access to market and investor
- Opportunity to meet 100+ Entrepreneurs and MNCs officials
- A facility of 10 X 10 booth area with chair, table and, electric point at the event

Registration Link: bit.ly/startupfest2025

ORGANIZER

Dr. P. A. Patil (HOD Mechanical), Dr. S. M. Hambarde (HOD E&TC), Prof. Priya Gokhale (Incubation Co-ordinator), Mr. Mihir Kedar (Cerebro@park), Mr. Ganesh Thorat (Cerebro@park), Prof. Siddhesh Bandekar (Mechanical Department), Prof. Neeta Pingole (E&TC Department)

CHIEF PATRON

Hon. Prof. (Dr.) T. J. Sawant (Founder Secretary JSPM, President TSSM), Mr. G. T. Sawant (Vice President JSPM, Secretary TSSM), Mr. R. T. Sawant (Trustee JSPM, TSSM)

PATRON

Dr. S. K. Sawant (Campus Director), Dr. V. A. Bugade (Campus Director), Dr. R. D. Kanphade (Principal JSCOE)



GPS Map Camera

Pune, Maharashtra, India
Fwfp+2mw, Satar Nagar, Hadapsar, Pune, Autadwadi Handewadi, Maharashtra 411028, India
Lat 18.472581° Long 73.936558°
28/01/25 12:44 PM GMT +05:30

Awareness and Outreach Programs

- Eco-friendly Ganesh Festival awareness programs in 2024 and 2025.

ECO FRIENDLY GANESH FESTIVAL 2024 and 2025

Awareness amongst students and society members for Nirmalya Management, Social responsibility towards Environmental sustainability, Water quality preservation and contribution towards Sustainable Development Goals



- Poster competitions aligned with Sustainable Development Goals:
 - SDG 6 – Clean Water and Sanitation
 - SDG 7 – Affordable and Clean Energy
- Expert session on Electrical Safety and Energy Audit by Dr. Santosh Patani.
- Pre-conference event for IEEE Returning Mothers Conference (Sustainability and Ethics Track), November 2025.



Creative Prize winning Posters by JSOE students on SDG 6 , Clean water and Sanitation SDG7 , Clean and affordable Energy

EcoCampus 2050 – Net Zero Energy Building Project

A group of two students, Aniket Lahudkar and Manasvi Kharat under the guidance of , Dr Amol Yadav, Dr. P.N. Gokhale presented their work on a field project titled “EcoCampus 2050: Paving the Path to Net Zero.” in the Ideathone contest for ‘Energy efficient and sustainable campus’

Problem areas identified:

- High energy consumption in Building A.
- Dependence on fossil-fuel-based grid electricity.

- Unsustainable waste management.
- Lack of water management infrastructure.

Proposed solutions: - Installation of 187 solar panels on Building A.

- Utilization of campus organic waste for biomass energy generation.
- Use of generated energy for a solar dryer project.
- Implementation of rainwater harvesting systems.

JSCOE's sustainability initiatives demonstrate a strong commitment to environmental responsibility, student engagement, and innovation. These activities contribute significantly towards achieving long-term goals of energy efficiency, carbon neutrality, and sustainable campus development.

Carbon Footprint Assessment

Objective - The evaluation of greenhouse gas emissions generated through transportation systems, diesel generator operations, LPG consumption, and electricity-based air conditioning systems.

Inspiration

The primary objective of the study is to quantify greenhouse gas emissions, identify major emission hotspots, evaluate operational inefficiencies, and propose targeted mitigation strategies aligned with the United Nations Sustainable Development Goals (SDGs), Ministry of Environment and Forest and Climate Change (MoEFCC), Government of India. T

Assessment

The assessment was conducted using IPCC Guidelines for Greenhouse Gas Emission Assessment and standard CO₂ emission factors for petrol, diesel, LPG, and electricity consumption. The study considered institutional activities and transportation data of 734 individuals, including students, faculty members, and staff, during the Academic Year 2025–2026.

Analysis

The analysis reveals that major Scope 1 emissions are generated from diesel generator sets, LPG combustion, and institute-controlled fuel-based systems. DG Set-1 alone contributes approximately 236.65 tons CO₂/year, while DG Set-2 and DG Set-3 each contribute approximately 73.95 tons CO₂/year.

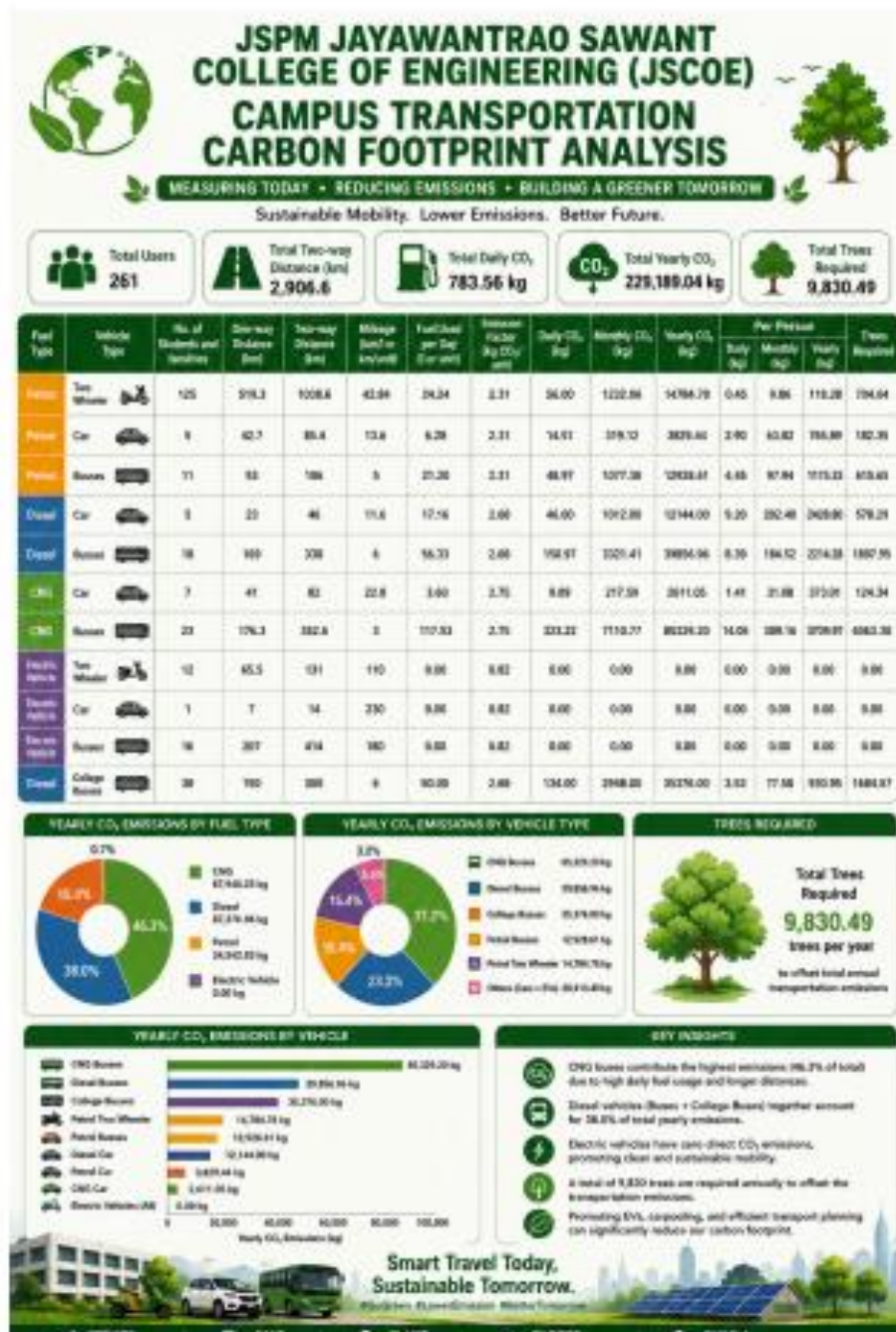
LPG consumption within campus facilities contributes approximately 423.16 kg CO₂ annually. These emissions collectively represent the dominant direct greenhouse gas emissions generated within institutional operational boundaries.

Transportation-related emissions under Scope 3 constitute another major environmental concern. Petrol Two-Wheelers were identified as the largest commuting source, generating approximately 14.78 tons CO₂/year, followed by Petrol Buses contributing approximately 12.93 tons CO₂/year and Diesel Cars contributing approximately 12.14 tons CO₂/year.

Insights and Outcomes

These findings indicate that student and faculty commuting activities contribute significantly toward the overall institutional carbon footprint. A major observation of the study is the dominance of diesel-based backup power systems in overall institutional emissions. Although transportation emissions are substantial, DG set operations contribute the highest carbon intensity due to continuous diesel combustion during power interruptions. The assessment also indicates that electricity-dependent systems such as air conditioning indirectly contribute toward greenhouse gas emissions depending on grid electricity generation sources.

JSPM's Jaywantrao Sawant College of Engineering, Hadapsar, Pune



2. Pune Institute of Computer Technology

MoU Signed on 26 April 2025

A Memorandum of Understanding (MoU) was signed on 26 April 2025 between Pune Institute of Computer Technology (PICT) and SIG on Energy and Environmental Engineering in association with PES IAS Chapter, Pune Section. The objective of this MoU is to promote academic–industry interaction, sustainability awareness, and technical engagement in the areas of energy efficiency, environmental engineering, and sustainable development practices.



Hosting of Ideathon student contest Finale 2025 on ‘Energy Efficient and Sustainable Campus’

PICT hosted the Finale of Ideathon 2025 focused on Energy Efficient and Sustainable Campus initiatives. The event was organized by SIG on Energy and Environmental Engineering in association with PES IAS Chapter and WIE Affinity Group, Pune Section, in collaboration with G. H. Raisoni College of Engineering, Wagholi, Pune on 25 August 2025.

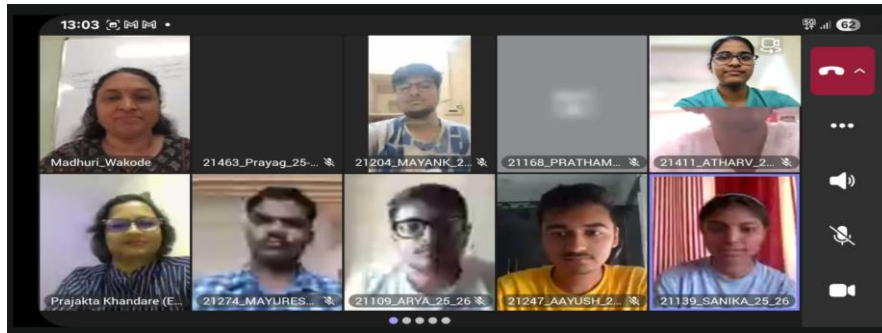
There was huge participation from 25 colleges, 100 groups, 300 students, finale showcased innovative ideas aligned with sustainability goals, emphasizing energy optimization, resource management, waste reduction, emission control, and environmental responsibility within a campus ecosystem.



Expert Session on Sustainable Development Practices

An expert lecture titled 'Sustainable Development Practices – An Industry Perspective' was conducted on 10 September 2025 at 12:00 PM by Prajakta Khandare, ISO 14064 Lead Auditor, Sustainability Consultant at Design2Occupancy (D2O), Expertise in ESG reporting, stakeholder consulting, GRESB, ECOVADIS

The session was attended by more than 100 students and focused on sustainability practices in industry, ESG reporting frameworks, environmental auditing, stakeholder engagement, and career opportunities in sustainability.



3. International Institute of Information Technology Pune, I2IT,Pune

The Special Interest Group (SiG) in Energy and Environmental Engineering was established to promote innovation and sustainability through research, education, and practical engineering solutions. The initiative provides a platform for students to address real-world challenges related to energy efficiency, environmental protection, and resource optimization.



Through interdisciplinary collaboration and industry-aligned projects, the SiG aims to bridge the gap between academic learning and practical implementation while nurturing future leaders in sustainable engineering.

IEEE PES IAS Ideathon Participation:

Students actively participated in the **IEEE PES IAS Ideathon**, presenting innovative solutions addressing sustainability challenges.

- Four student project proposals presented on focus areas:
 - Energy optimization
 - Water conservation intelligent monitoring systems

There was Interdisciplinary collaboration among engineering departments and Emphasis on practical and scalable solutions

Engineering Projects

Smart Water Monitoring System for Sustainable Hostel Water Management-

An IoT-based system designed to monitor water consumption in hostel facilities using real-time data analytics to minimize wastage and promote efficient water usage.

Smart Resource Optimization- A comprehensive system integrating resource monitoring and optimization techniques to improve campus sustainability.

ReFILTER – Closed-Loop RO Wastewater Minimization System- A system that captures and recycles reject water from reverse osmosis systems to significantly reduce water wastage.

Smart Energy Guardian – IoT-Based Short Circuit Prevention System- An intelligent monitoring system designed to prevent electrical faults while optimizing energy consumption through smart sensing and control.

Recognition and Achievements

Two projects from I²IT were selected among the **Top 16 Finalists** in the **IEEE PES IAS Ideathon**.

Smart India Hackathon 2025 Participation

A student team from BE E&TC has been selected for the **Smart India Hackathon 2025**

AgroSmart – Smart Irrigation System-

A sensor-based precision irrigation system.

Key Features- Soil moisture & temperature sensing, Smart irrigation scheduling using machine learning, Automated valve control using microcontrollers, Rainwater harvesting integration, Real-time monitoring dashboard for farmers,

Expected Impact- Up to **40% reduction in water wastage**, Improved crop yield, Sustainable irrigation practices

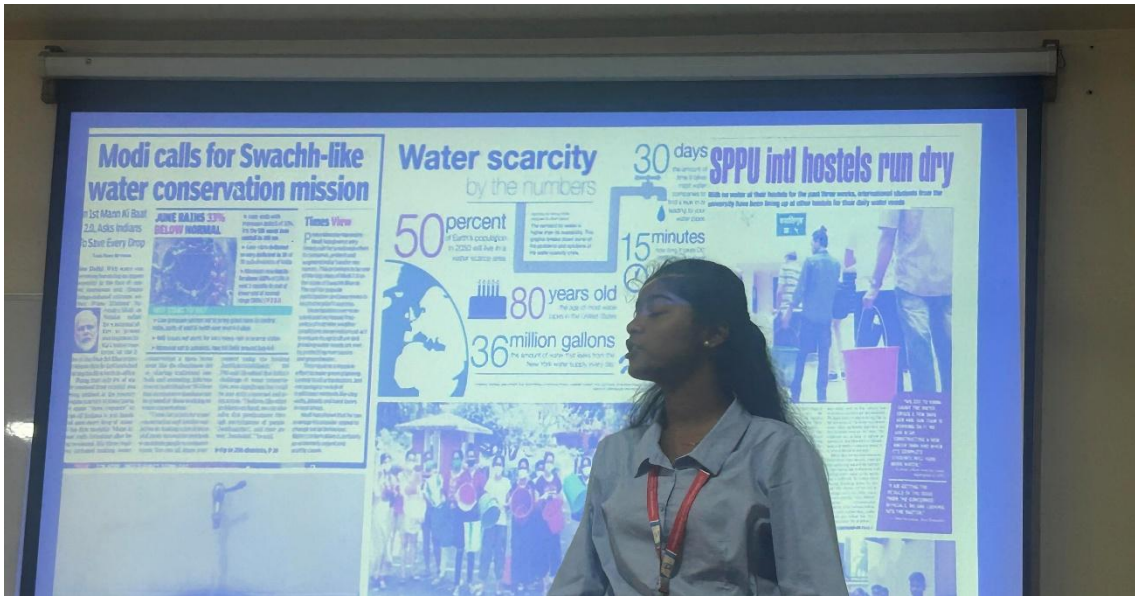
International Conference Initiative

The SiG is also contributing to the **I2ITCON 2026 – International Conference on Information, Implementation, and Innovation in Technology** during 30–31 July 2026

- **Special Track:** Sustainable Technological Innovations

This conference will provide a global platform for researchers and industry professionals to present cutting-edge work in sustainable technologies.

Through these initiatives, the group is actively developing solutions that address real-world sustainability challenges while preparing students to become future leaders in engineering and technology.



4. JSPM's Rajarshi College of Engineering Tathawade, Pune

MoU signed on 24 August 2024.

The signing of the MoU between SiG, EEE and the Electrical Department represents a milestone in fostering a strong partnership dedicated to sustainability, energy efficiency, energy conservation, etc.



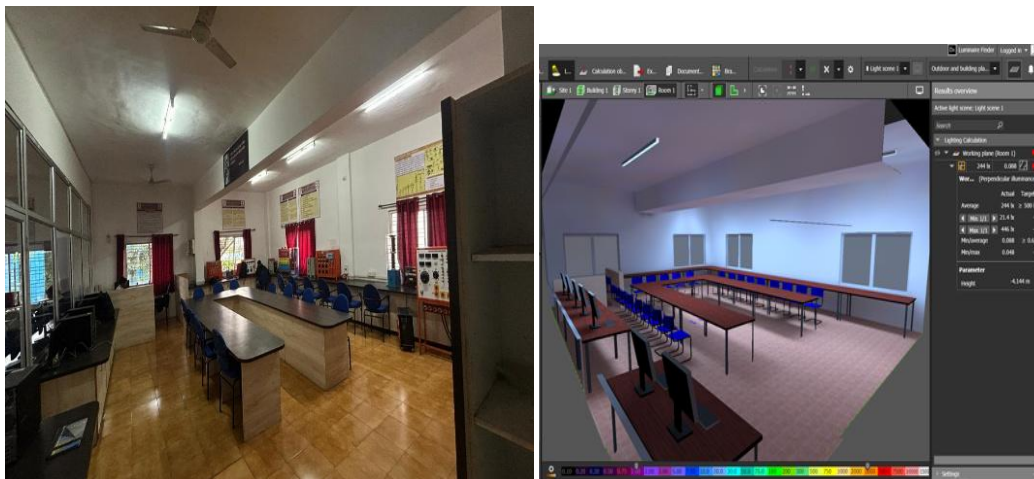
Guest lecture on the topic "The Importance of Clean Energy" On 24th Jan, 2025

Dr. Nitant Mate, an esteemed expert in clean energy and sustainable development, was invited as the resource person for this session. During the lecture, he provided valuable insights into the significance of renewable energy sources, their role in mitigating climate change, and the latest advancements in clean energy technologies.



Engineering Project

Energy-Efficient Indoor Lighting Design and Simulation for Educational Laboratories Using DIALux Evo in Accordance with Indian Standard 3646



Using DIALux Evo software, the current lighting conditions were digitally modelled and analysed to establish quantitative benchmarks. Subsequently, optimized lighting layouts employing high-efficiency LED luminaires were developed to meet the prescribed illumination levels for technical and educational environments

Carbon Footprint Assessment

Carbon emission activity report on comprehensive assessment of the **carbon emissions generated by RSCOE Campus operations**, with a focused evaluation of **vehicular emissions under Scope 1 and Scope 3 categories**.

Objective

The primary objective of the study is to quantify greenhouse gas emissions, identify major emission hotspots, evaluate operational inefficiencies, and propose targeted mitigation strategies aligned with the **United Nations Sustainable Development Goals (SDGs)** and **National Board of Accreditation (NBA)** sustainability expectations.

Analysis

The analysis reveals that **total Scope 1 emissions amount to 600.26 tCO₂e**, representing direct emissions from institute-owned vehicles, diesel generators, and refrigerant usage.

When employee and student commuting (Scope 3) is included, **total vehicular emissions rise to 635.23 tCO₂e**, highlighting the substantial environmental impact of campus transport activities. These figures establish a clear baseline for future emission reduction initiatives and long-term sustainability planning.

Findings

A critical finding of the study is the dominance of **fugitive emissions from refrigerants**, which account for **61.5% of total direct emissions**.

. The **MBA department exhibits an exceptionally high carbon intensity of approximately 2,915 kg CO₂ per student**, nearly **17 times higher than that of engineering departments**. This disproportionate impact is attributed to lower student strength combined with comparable energy and transport usage, underscoring the importance of intensity-based metrics alongside total emissions.

Insights and Outcomes

This concludes that although **stationary emissions are moderately managed, transport-related emissions—particularly those arising from student and employee commuting—represent the most critical area for intervention**. Addressing these emissions through behavioral change, shared mobility, electric vehicle adoption, and policy integration are essential for achieving meaningful reductions.

5. MKSSS's Cummins College of Engineering for Women

MoU signed on 13 January 2025



The IEEE Student Branch along with the Computational Intelligence Society (CIS) Chapter and IEEE Student Branch Special Interest Group (SiG) organized multiple innovative and sustainability-oriented events under **TECHNOSPHERA 2025**.

AI Solution Challenge

The AI Solution Challenge was a competitive innovation event designed to encourage participants to address real-world problems through the effective application of Artificial

Intelligence. The event focused on creativity, technical expertise, and practical feasibility. Participants developed working prototypes as part of their final submissions.



The competition was organized under two major themes: Healthcare, Smart Cities

VIBE-ATHON

The VIBE-ATHON was an AI-powered hackathon emphasizing rapid prototyping and “vibe coding,” an intuitive AI-assisted coding approach enabling participants to quickly design and build functional websites and prototypes. The event encouraged innovation, teamwork, and practical implementation of ideas.



Sustain-A-Meme (Poster Making Competition)

The Sustain-A-Meme competition was an on-the-spot poster design competition centered around sustainability and environmental awareness. Participants creatively expressed ideas through innovative formats such as memes and comic-style posters. To encourage imagination and independent thinking, the use of mobile phones was restricted during the event.

The theme for the competition was:

Circular Economy with emphasis on reuse, repair, recycling, and waste minimization

6. G.H. Raisoni College of Engineering and Management

MoU Signed on 25 September 2025.



The faculty members and students of GH Raisoni CoEM have shouldered the major responsibility of organizing IDEATHON 2025 and extended complete support for the successful execution of the context.

7. TSSM,s BSCOER, Pune

MoU signed on 22nd April 2026

On the occasion of *IEEE Power & Energy Society* (PES) Day and Earth Day, TSSM's BSCOER, Pune has signed an MoU with the Special Interest Group (SIG) on Energy & Environmental Engineering (EEE) supported by PES-IAS Chapter of IEEE Pune Section to promote collaborative activities in sustainable energy, green hydrogen, carbon emissions estimation, water conservation and management etc.



8. MMCoE, Pune



9. DYP DPU Pune

MoU signed on 27th July 2024



Journey continues in creating impact

The activities conducted under the MoU strengthened academic–industry collaboration, encouraged sustainable thinking among students, promoted innovation in energy and environmental engineering, and enhanced awareness regarding carbon footprints, ESG and sustainability reporting practices, energy efficiency etc.

The initiatives undertaken following the MoU signing have significantly contributed to sustainability awareness and professional development of students. The collaboration marks a strong foundation for continued engagement in the domains of energy efficiency, environmental engineering, and sustainable development.

Core Committee

Dr Dattatray Doke – Chair IEEE PES IAS Chapter, Pune Section

Dr Geetanjali Vaidya – Chair- SiG Energy and Environmental Engineering

Dr Surekha Deshmukh – Vice Chair IEEE PES IAS Chapter, Pune Section

Prof Manjusha Kanawade- Secretary IEEE PES IAS Chapter, Staff Advisor- Sig EEE RSCoE, Pune

Dr Mandar Bhawalkar- Member Execom -PES IAS Chapter

Dr Pravin Phutane- Staff Advisor , SiG EEE, RSCoE, pune

Dr Priya Gokhale- Staff Advisor – SiG EEE JSPM JSCOE, Pune

Prof Madhuri Wakode – Staff Advisor SIG EEE- PICT, Pune

Dr Mrudul Dixit – Staff Advisor- Cummins; CoE for Women, Pune

Prof Pallavi Ghatkamble - Staff Advisor- Cummins; CoE for Women, Pune

Dr Varsha Gegaonkar – Staff Advisor ,I2IT, Pune

Dr Deepti Chaudhari- Staff Advisor ,I2IT , Pune

Dr Rohini Devankar- Staff Advisor ,GH Risoni CoER, pune

Dr Tottappa Hasarmani- Staff Advisor, TSSM Bhiwarabai Sawant CoE, Pune

Dr Mrunal Deshpande – Staff Advisor MMCoE, Pune