Role of Data, Digital Tools, and Standards in Decarbonising Infrastructure

(Course Code: 2412125)

(May 12th – May 16th, 2025)

Department of Civil Engineering, Visvesvaraya National Institute of Technology (VNIT), Nagpur

Overview

India's infrastructure sector forms the backbone of its urban and rural landscapes, delivering essential services such as transportation, healthcare, water supply, energy distribution, and waste management. With over 50% of the infrastructure needed by 2030 yet to be constructed, the country stands at a critical juncture—facing both a remarkable opportunity to shape a sustainable future and the pressing challenge of mitigating environmental impacts. As a significant contributor to greenhouse gas (GHG) emissions, mainly through energy, transport, and buildings, decarbonising this sector is vital to addressing climate change and meeting global sustainability goals.

This workshop is designed to empower professionals with the knowledge and tools to integrate decarbonisation principles into the design, construction, and operation of infrastructure projects. It emphasizes a comprehensive life cycle approach to design, construction, operation, maintenance, and deconstruction, ensuring that sustainability is embedded at every stage. Participants will explore cutting-edge strategies to reduce emissions while driving economic and social progress.

Key themes include:

- The critical role of infrastructure in supporting India’s climate commitments and sustainability goals.
- Practical applications of whole-life carbon assessments to enhance infrastructure efficiency and reduce emissions.
- Innovations in low-carbon materials and their integration into modern infrastructure projects.
- The use of digital tools, international standards, and data-driven methodologies to advance low-carbon initiatives.
- Case studies demonstrating real-world challenges, actionable solutions, and best practices in decarbonisation.

Led by experienced faculty, this workshop offers actionable insights, practical skills, and a strategic framework to support a low-carbon transition. Join us to help shape a resilient, sustainable, and climate-friendly future for India’s infrastructure sector.

Modules	**Duration: 5 days (Dates: May 12th – May 16th, 2025)** **Module 1: Foundations of Decarbonisation** ● Explore the global climate agenda, the role of the infrastructure sector in emissions, and high-level priorities for decarbonisation. ● Learn about the Indian context, including government initiatives, industry perceptions, and emerging construction technologies. **Module 2: Whole-Life Carbon Assessment** ● Understand whole-life carbon concepts, including emissions types (Scope 1, 2, 3), embodied, and operational carbon. ● Gain insights into applying international standards for emissions reporting and life cycle assessments. **Module 3: Tools and Data for Decarbonisation** ● Research life cycle assessment (LCA) methodologies, best practices, and data standards for emissions reporting. ● Work with tools such as Gabi, online emissions databases, and EPD formats to enhance emissions calculations and data integration. **Module 4: Digital Workflows and Materials Innovation** ● Discover the integration of BIM, CDE, and design workflows for carbon footprint calculations. ● Explore low-carbon materials, their sustainability applications, and practical tools like the Embodied Carbon Calculator (EC3) for project-level assessments. **Module 5: Advanced Topics and Applications** ● Discuss circularity principles, financing decarbonisation initiatives, and managing new versus existing assets. ● Engage with real-life case studies through field visits and tackle advanced decarbonisation topics, including the role of procurement in achieving sustainability goals. **Number of participants for the course will be limited to fifty (50).**
Who can attend	● Infrastructure professionals, project managers, and engineers seeking to integrate decarbonisation strategies into projects. ● Sustainability officers, policymakers, and consultants focused on low-carbon infrastructure and whole-life carbon assessments. ● Researchers, academics, and students interested in exploring sustainable practices and innovations in infrastructure. ● Digital transformation specialists and data scientists working on tools and standards for sustainable infrastructure.

Fees

The participation fees and Bank Details for registration are as follows:

Participants from abroad: USD $ 500 Industry/Working Professionals: INR 4000 Academic/Research Institutions: INR 3000 PhD Scholars: INR 1000 Master's/Graduating Students: INR 1000	Registration fee payment procedure: Step 1: Visit the link: https://pay.vnit.ac.in/home Or scan Step 2: Under 'Select Payment Category', choose (Conference/Seminar/Workshop). **Step 3: Under 'Name of the Event (Conference/Seminar/Workshop), choose** 'Role of Data, Digital Tools, and Standards in Decarbonising Infrastructure' Step 4: Fill in the required details, select the registration category as applicable, and pay the fees.

- The above fees include working lunch, tea/snacks, instructional materials, tutorials, and laboratory sessions.
- The accommodation needs to be done separately with a request. The guest house charges are Rs. 1800/- per day.
- Hostel AC accommodation can also be made on the prior request.

Registration Form:
https://forms.gle/E8tf8ebZ9xC1b415A

Last date for course registration:
April 31st, 2025

The Faculty

Anil Sawhney, Ph.D. PMP FHEA FRICS

Dr. Anil Sawhney is an accomplished construction and infrastructure leader with a background in research, education, thought leadership, advising, and consulting. He has twenty-nine years of post-PhD experience and teaching expertise, with a rich mix of academic, research, industry, and consulting experience in the USA, India, Canada, the UK, and Australia. Dr Sawhney is the Head of sustainability for the Royal Institution of Chartered Surveyors (RICS). He also serves as the Visiting Professor of the Practice of Project Management at Boston University. He has previously served as the Professor of Project Management at Liverpool John Moores University, Associate Dean, Director, and Professor of the RICS School of Built Environment, Noida, Professor of Civil Engineering at Indian Institute of Technology, Delhi, and a tenured Associate Professor at Arizona State University. He is a Fellow of the RICS, a Fellow of the Higher Education Academy (HEA) in the United Kingdom, and a Project Management Professional (PMP) of the Project Management Institute. Anil is also an adjunct faculty member at Columbia University, Liverpool John Moores University, and the University of Southern California.

Dr. Sawhney has significant teaching, research, and consulting experience in sustainability, construction management, digital modelling and simulation, with over USD 1.7 million in external research funds. Professor Sawhney is well-published, with over 175 publications in refereed technical journals and conferences. He co-authored the Handbook of Construction Safety, Health, and Well-being in the Industry 4.0 Era in 2023 and the Construction 4.0-Innovation Platform for the Built Environment handbook in 2020. He served as a consultant to several entities, including the World Bank, from 2002 to 2006. In 2022, he was appointed chair of the ICMS Standard Setting Committee. Previously, he served on the Technology Sub-Mission of the Housing for All by the 2022 mission of the Ministry of Housing and Urban Affairs, Government of India.

Dr. Rahul V Ralegaonkar is a Professor in the Department of Civil Engineering, Visvesvaraya National Institute of Technology (VNIT), Nagpur, India. He has over two decades of professional experience in teaching, research, consultancy and administration. He was also a visiting researcher at UTA, USA (2016) and a honorary visiting professor at LJMU, UK (2019-2024). He has published more than 175 research papers in international/national refereed journals and refereed international/ national conferences. Dr Rahul has completed 07 sponsored research projects and currently working on 03 Research Projects sponsored broadly in the area of sustainable construction materials and technologies. He has been granted 8 patents and a few novels products are successfully demonstrated on field. He has been on editorial board for the Wiley's Advances in Civil Engineering Journals. He is also a part of BIS committee member.

Dr. Mangesh V Madurwar is an Associate Professor in the Department of Civil Engineering, VNIT, Nagpur, India. He has over 15 years of professional experience in teaching, research, consultancy and administration. He was also a visiting researcher at UTA, USA (2019). He has published more than 100 research papers in international/national refereed journals and refereed international/ national conferences. Dr Mangesh has completed 03 sponsored research projects and currently working on 02 Research Projects sponsored broadly in the area of sustainable construction engineering. He has been granted 1 patent and a few novels products are successfully transferred to the industries. He has been actively involved in reviewing several research articles. He is also technical advisor to a lot of premier institutions as a third-party certified auditor.

Dr. Vaidehi A Dakwale is an Assistant Professor in the Department of Civil Engineering, VNIT, Nagpur, India. She has over 15 years of professional experience in teaching, research, consultancy and administration. She has published more than 50 research papers in international/national refereed journals and refereed international/ national conferences. Dr Vaidehi has completed 02 sponsored research projects broadly in the area of Waste to Wealth. She has been granted 3 patents and a novel machine is successfully transferred to the industries. She has been actively involved in reviewing several research articles. She is also involved in various consultancy activities for quality compliance requirements.

Course Details:

Dates: May 12th – May 16th, 2025

Venue:

Department of Civil Engineering, Visvesvaraya National Institute of Technology (VNIT), Nagpur -440010, Maharashtra, India

Course Coordinator(s)

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