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Press Release

IIT (ISM) Dhanbad and sentra.world Partner to drive sustainability in Indian Steel Sector through Biochar Research

IIT (ISM) Dhanbad has recently signed a Memorandum of Understanding (MoU) with sentra.world, a Bangalore-based sustainability startup, to embark on a pioneering research initiative aimed at decarbonizing the iron and steel industry in India.

This collaboration focuses on the application of biochar—an environmentally friendly alternative to coal—within the steel manufacturing process. The research will involve characterizing biomass from over 10 Indian states and developing conversion processes to produce high-quality biochar suitable for all steel applications like coke making, sintering, sponge iron production etc.

The project leverages recycling of surplus biomass waste of around 720 million Ton like agricultural residues such as Parali (rice husk), forest residue like bamboo, agri-processing waste such as sugarcane bagasse, and invasive species like babool. By repurposing this biomass, the initiative aims to prevent stubble burning—a major contributor to air pollution—and create an additional revenue stream for farmers by monetizing agricultural waste.

With the Indian steel sector contributing 8-12% of the nation's total greenhouse gas emissions, the adoption of biochar could reduce emissions by up to 40%. This breakthrough would not only significantly mitigate climate impact but also generate rural livelihoods, enhance farmer incomes, and contribute to India's sustainable development goals.

"This innovative industry collaboration is pivotal for advancing towards *Amrit Kaal* as envisioned by our Hon'ble Prime Minister and achieving net-zero emissions by 2070," said Prof Shalini Gautam, Associate Professor, Department of Fuel Minerals & Metallurgical Engineering, IIT (ISM) Dhanbad.

"With over 50 customers actively seeking avenues for carbon footprint reduction, this partnership marks a significant milestone in decarbonizing hard to abate sectors in the country", said Vikas Upadhyay, Co-Founder of sentra.world.

The Department of Fuel Minerals and Metallurgical Engineering at IIT (ISM) Dhanbad, established in 1976, has been at the forefront of advancing research and technology in the processing of metallic, non-metallic, fuel, energy and mineral`

This collaboration with sentra.world aligns perfectly with the department's commitment to sustainable innovations, particularly in exploring biochar's potential to revolutionize the steel industry and promote decarbonization.

The outcomes of this research are expected to drive product standardization, improve sustainability, and set a global benchmark for innovation in the steel industry.

Prof Sagar Pal, Dean R& D; Prof Shalini Gautam, and Dr Amrit Anand from IIT(ISM) Dhanbad, and Sri Vikas Upadhyay and Sri Aayush Raj Sinha from sentra.world were present during the signing of MoU.

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