AMALTHEA '25

AN AMALTHEA '25 EVENT

NETZERO

OFFICIAL RULEBOOK

VENUE: AB11/102

DATE: 8th November

TIME: 10 AM onwards

FEEL FREE TO CONTACT: Ankit Saha (6301907498)

NETZERO

ABOUT EVENT

NetZero is a case study event based on solving core environmental challenges facing the world today. In this event, participants will be asked to choose any one of the 4 problem statements. Problem statements will be based on one specific topic, such as photovoltaics, energy infrastructure, digitalization, etc.

Number of rounds: 2

Participant Guidelines: A team can consist of max 4 people. Any sort of unethical practices will lead to disqualification. Round 1 to be submitted in PDF format in 1 slider format. Round 2 to be a presentation of 8–10 slides in the PPT format.

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PROBLEM STATEMENTS

Problem Statement 1: While sodium-ion batteries promise lower costs, abundant raw materials, and superior safety, making them ideal for India's push oward domestic, scalable energy storage, they still lag behind lithium-ion in energy density, cycle life, and charging speed. Their larger, heavier form factor and slower ion diffusion limit adoption, even as India u rgently needs affordable, safe, and locally sourced alternatives to lithium-ion for its 500 GW renewable grid.

The Challenge: Can innovation in materials, cell design, or system integration bridge these gaps and unlock sodium-ion's potential for grid-scale storage in India?

Problem Statement 2: India's solar energy ambitions are constrained by a fundamental limitation: conventional silicon photovoltaic (PV) cells convert only 15-22% of sunlight into electricity, leaving the majority of solar radiation, especially infrared and ultraviolet wavelengths, unused. Worse, high operating temperatures degrade performance and dissipate energy as waste heat, further reducing output and increasing costs.

This inefficiency is a major barrier as India races toward 500 GW of renewable capacity by 2030. While solar remains one of the most abundant and scalable clean energy sources, its underperformance in real world conditions forces reliance on additional land, storage, or backup power, driving up system costs and complicating grid integration. India needs to find a more sustainable alternative to the current materials being used.

Problem Statement 3: India's National Green Hydrogen Mission (NGHM) targets 5 MMT of green hydrogen by 2030, but at $3.50–$4.00/kg, it's far from the $1.00–$2.00/kg viability threshold. The high cost of production, driven by expensive electrolyzers, rare-earth material dependencies, and energy inefficiencies, threatens to derail India's ambitions, even as global competitors race ahead.

The Challenge: How can India dramatically reduce the cost of green hydrogen production?

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Problem Statement 4: We're all racing to use digital technology and AI to fight climate change, optimizing energy grids, making logistics smarter, and enabling remote work. But there's a catch: all this progress runs on a massive, growing appetite for electricity. Data centers, cloud services, and AI models never sleep, and their energy use is often invisible to the companies relying on them.

Most businesses track emissions from things they own, ike vehicles or boilers, but struggle to measure the real environmental cost of their digital tools. The emissions from cloud providers and the digital supply chain are complex, hidden, and rarely accounted for. If we don't find a way to measure and reduce this hidden footprint, our digital solutions could end up doing more harm than good.

Find practical, scalable ways for companies to measure, report, and reduce the true environmental impact of their digital operations, so that the solutions meant to help the planet don't end up hurting it.

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NUMBER OF ROUNDS

Round 1

- Online event
- Submissions from participants: One one-page slider containing necessary information about the topic. Dense, concise format of information needed
- Dates: Submission begins: 31st October 2025
  Submission ends: 6th November 2025

Round 2

- Offline event
- Submissions from participants: PPT presentation (8 slides)
- Date, Time and Venue: 8th November, from 10am to 2pm, AB11/101, IITGN
- Duration: 10 minute Presentation
- 5 minute Q&A
- Total Duration: 120 minutes

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