

Global Summit on Advanced Materials Challenges and Standardisation Needs for Net Zero Technologies

VAMAS Technical Workshop 2023
9th - 10th October 2023

Venue: CSIR National Physical Laboratory,
New Delhi, India, 110012

Background

Advanced materials are critical to support the transition to net zero technologies and reduce human impact on our climate. Standards, based on best practices identified through pre-normative research, accelerate the introduction of new materials in key application areas.

This workshop will bring together global experts to identify the critical gaps in materials standards needed to transition net zero technologies. It will also identify the pre-normative research needed to address the gaps to hasten the development of international standards.

Outcomes

Based on the discussions and input from the global experts participating at the workshop, a VAMAS Insights Report on materials challenges and standardisation needs for net zero technologies will be published. The report will influence the future direction of global pre-normative research upon which international standards are developed.

Technical Themes

- Materials for energy generation
- Materials for energy storage and carbon capture
- Materials for energy efficiency technologies
- Materials for a circular economy



Achieving net-zero emissions requires a significant shift in the way we generate and use energy. This transition presents several materials challenges. The 2-day workshop will focus on critical areas within the themes below:

Materials for energy generation

The energy sector is one of the largest sources of greenhouse gas emissions, accounting for approximately two-thirds of global emissions. A transition to low-carbon energy sources, such as renewable and clean energy (e.g. solar, wind, hydro power, geothermal, nuclear power) can significantly reduce emissions. Advanced materials are important to enable this transition by improving efficiency and reliability, and reducing dependence on critical materials.

Materials for energy storage and carbon capture

Advances in energy capture and storage can help achieve net zero by enabling the integration of more renewable energy into the grid, supporting the decarbonization of other sectors, such as transport, and reducing greenhouse gas emissions from industrial processes and fossil fuel-based power generation. Hydrogen and battery technologies are critical to enable integration of intermittent renewable energy into the grid, and to increase range and efficiency of electrical transport. Additionally, carbon capture, utilisation and storage (CCUS) technologies can reduce greenhouse gas emissions, and provide negative emissions through bioenergy.

Expected topics include

- Identification of areas with lack of standardisation and best practice
- Evaluation of performance and assessment methods to understand reliability of materials and devices
- Best practice development for materials/device testing
- Identification of technical barriers affecting efficiency
- Improvements needed for existing technologies
- Durability of materials at cryogenic temperatures
- Evaluation of recyclability, biodegradability to support a circular economy

Materials for energy efficiency technologies

Energy efficiency plays a crucial role in achieving net zero by reducing energy demand and thus the need for energy generation, capture and storage. It leads to less energy waste, and the energy that is used is more effectively and sustainably generated and stored. Advanced materials are critical in enabling more efficient buildings (e.g. insulation, heating and cooling), computing (e.g. low loss electronics), and power management (e.g. power electronics).

Materials for a circular economy

A circular economy reduces waste, minimises resource use, and promotes the reuse and recycling of materials and products, supporting a sustainable economy with reduced environmental impact and contributing to achieving net zero emissions. Critical areas include biodegradable and recycled materials, and recovery of valuable materials from waste streams, such as rare earth metals from electronic waste.

Who should attend?

The event will be of particular interest to researchers, industry, policy makers and standardisation experts working in the area of climate change and net zero technologies.

Participation at the meeting is by invitation only and registration is essential.

Organising Committee:

India: Prof Venugopal Achanta / Dr Sanjay Dhakate

UK: Prof Fernando Castro / Sam Gnaniah

USA: Dr Michael Fasolka / Dr Nicholas Barbosa

VAMAS is a global inter-governmental organisation established in 1982 following a G7 Economic Summit to facilitate innovation and global trade. Through international collaborative projects, VAMAS provides the technical evidence for harmonisation of measurement methods, reference materials, testing and specifications, leading to agreed and widespread adoption of best practices and standards. The work of VAMAS has led to the publication of international standards, the creation of new products and services, and the dissemination of best practice to global organisations.

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For more details https://www.nplindia.org/index.php/amcsnzt_2023/

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