Materials Advances to Achieve One World Climate

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Climate change has made the human ecosystem uncertain. The eco-adaptation is contributing significantly to a progressive shift in the entire geographical region until and unless it reaches an equilibrium stage. It is critical to support innovative, cleaner public transportation and decarbonization in the carbon industries to create a sustainable world. Global organizations are developing strategies and agendas to contribute to the Sustainable Development Goals in various ways [**1**]. The economic growth and well-being of the people require an understanding of the one world-one climate concept, and this in turn necessitates basic information for climate rejuvenation strategies in contemporary society. Urban ecosystems can be managed through the provision of a wide range of social, ecological, and technological services that all contribute to better environmental conditions, including cleaner air and water, control of flooding, better mental health, and more vibrant social and cultural life [**2**]. The shift in the environment and the degradation are a primary source of concern, and immediate treatment through the development of new materials is helpful to achieve climate neutrality by the year 2050 [**3**]. The production, size, and landscape of the advanced materials market were the primary factors that went into determining the key drivers for the future [**4**]. The global materials market is expected to increase by many folds soon, according to market trends for types including new buildings, electronics, and energy materials as well as high-end applications in medical devices, automotive, aerospace, electrical and electronics, power, and others [**4**]. Information in a database that can be understood by the top 100 researchers in materials, a field in which a global selection of research and development is reflected [**5**]. The transformations for improved characteristics are taking place in the materials industries because of recent innovations. These innovations are driving results for sustainability, light-weighting, 3D printing, and surface engineering as a result of the development of intelligent materials, nano-formulations, and advanced composites [**6, 7**].

The conceptual motive of a perspective that is climate neutral should push toward "One World, One Climate" (also known as "One World, One Ecosystem") by fostering eco-friendly working communities that have access to pollution-free environments (**Fig. 1**). The only way to modify the environmentally friendly policies is to do so in a manner that is coordinated on the regional and national levels. If the world were to adopt the concept of climate neutrality with human beneficial assessment, it might provide a once-in-a-generation opportunity to expand and colonize new areas with a greater sense of assurance.

Fig. 1. The demonstration of One World Climate ensures that humans live in an eco-neutral atmosphere. The International Association of Advanced Materials has pledged to work under the motto "Advancement of Materials to a Sustainable and Green World."

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A rich chronicle of organic innovation

Important drivers in the fields of biomedical, engineering, chemistry, structural engineering, physics, mechanical, space, food, and manufacturing engineering are the innovation and technological direction established by green materials. Recent advancements have inspired the materials community to utilize and innovate their processes and methods to investigate the future of ecological materials and engineering and examine how these cutting-edge green tools can aid in gaining a deeper understanding of health and energy functionality within the context of climate resilience. Two major objectives of climate research are to utilize multidisciplinary expertise and the local environment to generate new materials for the production and storage of clean energy and the management of sustainable healthcare. Consequently, the use of advanced materials for energy and health, as well as technological green transition, is necessary for the future of developed societies.

Green transition and energy utilization

Possibilities for a sustainable energy system with cost-effective production, storage, conversion, transport, and distribution are created by advanced materials. The global energy crisis caused by the depletion of fossil fuels prompted the use of electrical energy from renewable sources such as wind, solar, water, etc. The rapid transition of industries to reduce emissions and improve eco-friendly, promising energy alternatives to halt environmental deterioration is a formidable obstacle. The most prudent course of action is to follow the evolving trends in hydrogen energy research for climate [**8**]. The trends in digitization, energy-efficient integrations, and renewable energy production have spawned new research areas in green hydrogen and water energy forms such as tidal, wave, and ocean currents [**9**]. Utilizing biomass for climate-neutral energy production is also the best practice for waste management [**10**].

Smart materials for medical use

For disease diagnosis and in cases where physiological parameters and tracking metabolic status are monitored via wearable medical devices, an appreciation of health and materials innovation is crucial [**11**]. These high-tech gadgets stand for a more robust medical industry and a more wholesome way of life.

The current healthcare model in a sustainable framework calls for a materials-science approach to biosensors nanotechnology and device development [**12-15**]. Biosensing systems integrated into digital health care have the potential to improve disease diagnosis and treatment [**16,17**]. Various applications of advanced materials and nanomaterials have positive effects on human health, and innovations in these areas have allowed for the creation of new commercial products [**18,19**]. The release of biomedical nanomaterials, drugs, and vaccines from medical applications into the environment requires consideration of green chemistry and sustainable practices [**20-22**].

Materials innovation through environmental action

Cooperation on a national, regional, and global scale among nations is essential to the provision of financial and technical assistance for green transition and the realization of an environmentally friendly environment. The field of advanced materials needs to determine its goals to complete the Sustainable Development Goals [**23**]. The change that has the potential to bring benefits needs to be implemented. According to a study, a plethora of materials such as metal-organic frameworks, oxides/ hydroxides, carbonaceous materials, zeolites, and clays are required for the implementation of climate remediation [**24**].

The entire planet is currently dealing with a wide range of environmental problems, including those affecting the ocean and forests, two ecosystems in which humans are largely absent [**25,26**]. Because climate change raises the global risk to human life, it is essential to have a solid understanding of the role that nanomaterials play in terms of toxicological concerns, regulatory requirements, and innovation priorities to achieve climate neutrality by 2050 [**3,21,23**]. A number of materials have the potential to enhance a variety of processes, including the adsorption and catalysis of pollutants, the generation and/or storage of clean energy, and the management of waste. In addition, the widespread implementation of advanced technologies and management significantly accelerates the expansion of the business of advanced materials to maintain a sustainable environment.

Materials at the cutting edge of their resolution

Since its inception, the International Association for Advanced Materials (IAAM) has been a staunch supporter of the implementation of environmentally friendly procedures [**27**]. IAAM will hear from leading research professionals on how innovative technologies resolved climate issues and regularly influenced our understanding of human demand as part of this exciting new development. Dive into the most recent resources and information made available by the IAAM platform, which has its key features highlighted for-

- Featuring innovative subjects
- Worldwide expert's R&D links
- Set continental activities
- Frontiers resolution
- Global networking
- Training and education

Frontiers experts, regional experts, and subject matter present and eager to discuss how to best address global concerns by examining frontiers. The world's foremost authorities on developing and implementing sustainable energy technologies have gathered to debate the state of the art in advanced functional materials and the obstacles standing in their way. To put new forms of clean energy into use, material innovation has proven crucial. Therefore, IAAM is at the forefront of such an initiative among the world's leading materials research professionals by providing a comprehensive advanced materials forum to discuss the latest trends and in-depth intuition for academia and industry across a variety of fields (**Fig. 2**).

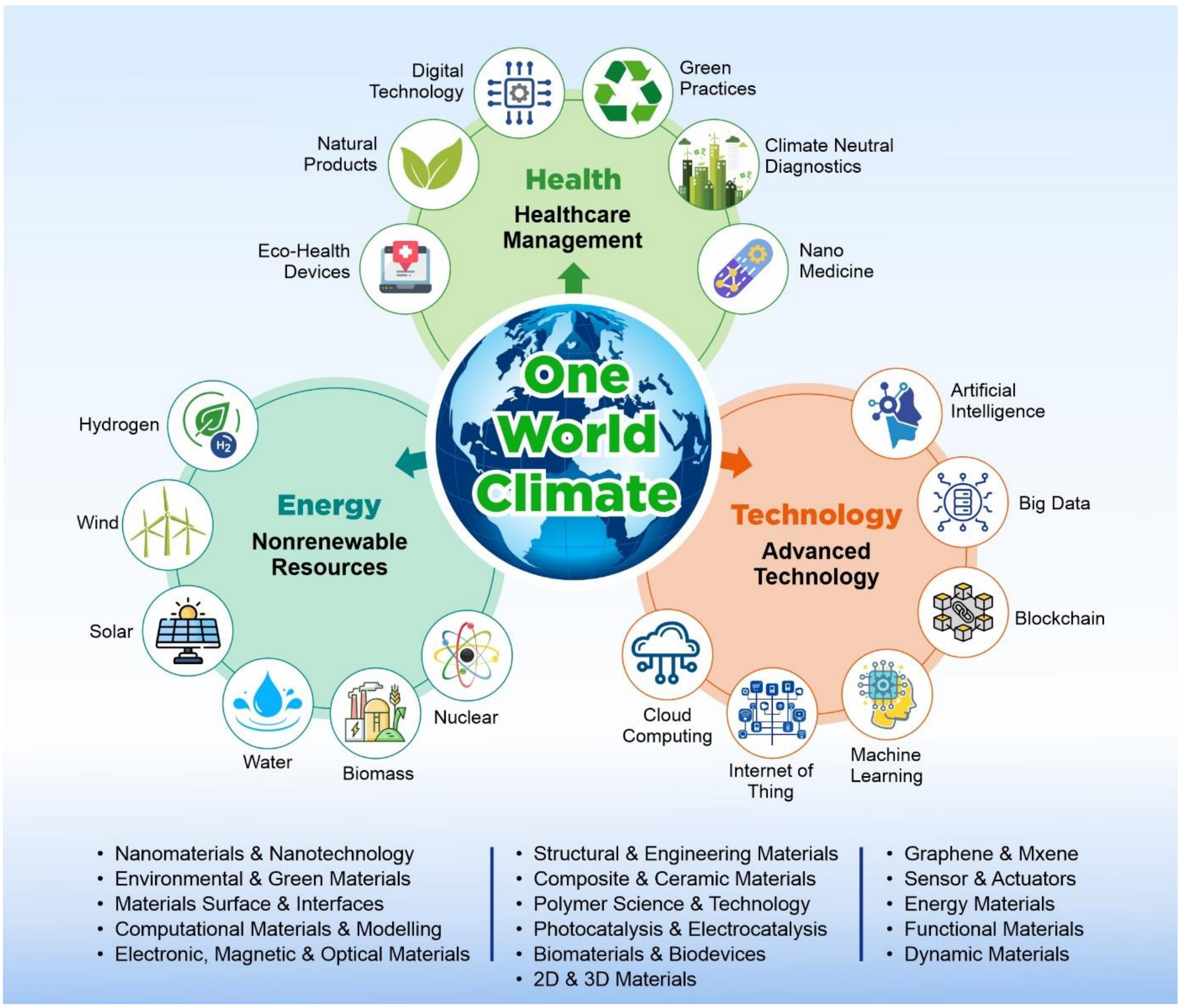

Fig. 2. Illustration of International Association of Advanced Materials activities involving emerging materials and sustainable technologies, as well as participation in a value-added role with global materials professionals through networking and training.

IAAM's idea of one world climate

Throughout this decade, the International Association of Advanced Materials (IAAM) is focusing on the 'Advancement of Materials to a Sustainable and Green World'. The global climate situation is depleted and underfunded. Even though too many pollution centers focus solely on specific issues, they are unable to integrate all stakeholders at the same time. However, there are insufficient products, processes, materials, and prescriptions. As a result, IAAM keeps pace with evolving materials technologies and is actively involved in advancing clean technologies that play a value-added role in materials innovation toward sustainability [**26**]. The Institute of Advanced Materials is involved in long-term alliances for health, energy, and the environment [**27**]. IAAM's Climate Neutrality Congress, Advanced Materials Congress, and International Conclave on the Materials, Energy, and Climate attests to the proficiency of parallel events through topical scientific sessions for materials knowledge and understanding of next-generation technologies, where innovation supports the new process and development for a climate neutral society.

The collaboration of diverse technology and innovation experts from around the world on materials science provides opportunities for prestigious research organizations and educational institutes to share their R&D efforts on a global platform and gain valuable feedback and cooperation. Furthermore, sustainable ecosystems, ecological materials, skilled education, industrial training, and net-zero R&D consortiums bring high-end conversion to the process, as well as methods for reducing pollution and ensuring a single global climate.

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