Priority of Materials Research for Reaching Climate Neutrality Goals

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The scientific foot is directed towards a range of net-zero paths, which can predict the sustainable future of society. Climate neutral practices require ultimate plan of action for people, planet, and prosperity [**1**]. It is critical to set synergy among education, industry, and government policies for creating a clear vision to evolve various sectors addressing net-zero utilization and climate neutrality objectives on regional basis. The materials research drives in the direction of climate neutrality goal by advancing the field [**2**]. The net-zero emissions must be globally achieved by 2050 and important objectives should be decided [**3**]. The global trends of materials research are shifting towards important directions highlighting innovation and trends for promising materials industry [**4,5**]. Thus, advancement of materials could concur with health, energy, and environmental technologies, which are not harming to biodiversity and ecosystem. The recent advances increase the role of intelligent materials more in current scope [**6-8**]. Therefore, making smart building blocks and devices are getting very high attention [**9-11**]. The emerging global trends for net-zero technology require transforming research and innovations such as green energy, waste conversation and digitalization [**12,13**].

Moreover, sustainable ecosystem begins through high-end conversion procedures, reducing pollution, and ecological materials [**14,15**]. During the post pandemic years, Institute of Advanced Materials is offering professional education, industrial training, and net-zero R&D consortia for partnerships and joint activities. The technological focus on expanding the role of the materials and altering the level of socio-economic prospects should lie and evolves in the relevant direction to create new avenues for the health, energy, and environment under sustainable agenda [**16,17**]. Alternately, contemporary advances in graphene bioelectronics, biosensors and bio-mechatronics brings transformative solutions for various sectors [**16-19**]. The new dimensions in science and technology offer more flexibility to end users with the provision of net-zero materials, such as monitoring devices for health (dynamic biomaterials), energy (thermo-optical-electric materials) and environment (sensing materials). The pace of transformation in technology impacts the ecosystem of businesses and their investments. The "convergence of materials" demonstrates noteworthy impact on socioeconomics and human lives through affecting the manufacturing-business-industry for health, agriculture, and energy.

Allocation of relevant technologies and competences for developments of materials having potential to transform multiple field such as healthcare, drug discovery, renewable energy resources, sustainable environment and net-zero transport by selecting manufacturing process will be proper lead. Working on materials lattice configuration, conducting performance and efficient opto-electronics promises to revolutionize flexible electronics could offer better net-zero execution [**6-8,16-19**]. The distributed and shared technology infrastructure facilitates to achieve the UN sustainable development goals by 2030, where organization will be utilizing hybrid-cloud and IT structure for data processing to make faster device accessibility, usability, and cost-effectiveness.

Likewise, biological trends for creating new business raise important queries concerning to environment efficacy. Therefore, organizations should essentially measure their technological compatibility via net-zero relevance, and climate neutrality implications. The utilization of sustainable materials could assist climate neutrality goals for both industry and society. The education and research benefit in reducing disparities in the global context through defined structure [**20,21**]. The materials fabrication, formulations and their diverse behaviors in the specific environment sort out by developing resources using integrated R&D and start-ups. Propelled by artificial intelligence, micro-electronics, and bio-revolution ensures personalized and public-based eco-guidance for health and food sectors. Adopting digital technologies (AI and IoT) unlock economic activity, implementing quicker manufacturing and research development for innovative ideas in the upcoming decades [**22**].

The digitization of business and technology process pave the manufacturing and decentralized infrastructures for healthcare, transport, energy, and environmental services to remote regimes. For reaching sooner to the net-zero goals, correct network availability, capable technology drivers, expert researcher could contribute to major shifts in the materials landscape. Renewable energy for net-zero transports, sustainable technologies for clean environment trending towards cost efficient clean tech [**23**]. International Association of Advanced Materials, IAAM keeps pace with emerging materials technologies and prospects by scheming operational programmes relating to materials

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world development through manufacturing cost lessening. With the creation of net-zero and waste utility alliances, IAAM sustains exponential green-technology growth through connecting multidisciplinary experts of the world R&D links **(Fig. 1)**. IAAM is involved in advancing clean technologies having a value-added role for materials innovation towards correct decisions making regarding their utility [**24**].

Institute of Advanced Materials engages in sustainable collaborations with three important sectors: health, energy, and environment [**25**]. The Translational Research Innovation Cooperation (TRIC) Consortiums accelerate their global networks of cooperation to transform research from TRL 3 to 6. TRIC Consortiums have multidisciplinary experts' groups from several countries of all major continent. IAAM provides way to initiate building research project ideas further by pitch sessions. This leads to participation in the future grant proposals and new green tech initiatives. Overall, these collaborations will jointly benefit to each other through partnerships of consortia and international networking. Thus, net-zero consortia bring the best possible solutions for different problems of translational climate neutral R&D by mapping out the path for new net-zero technologies, sustainable materials, and green products.

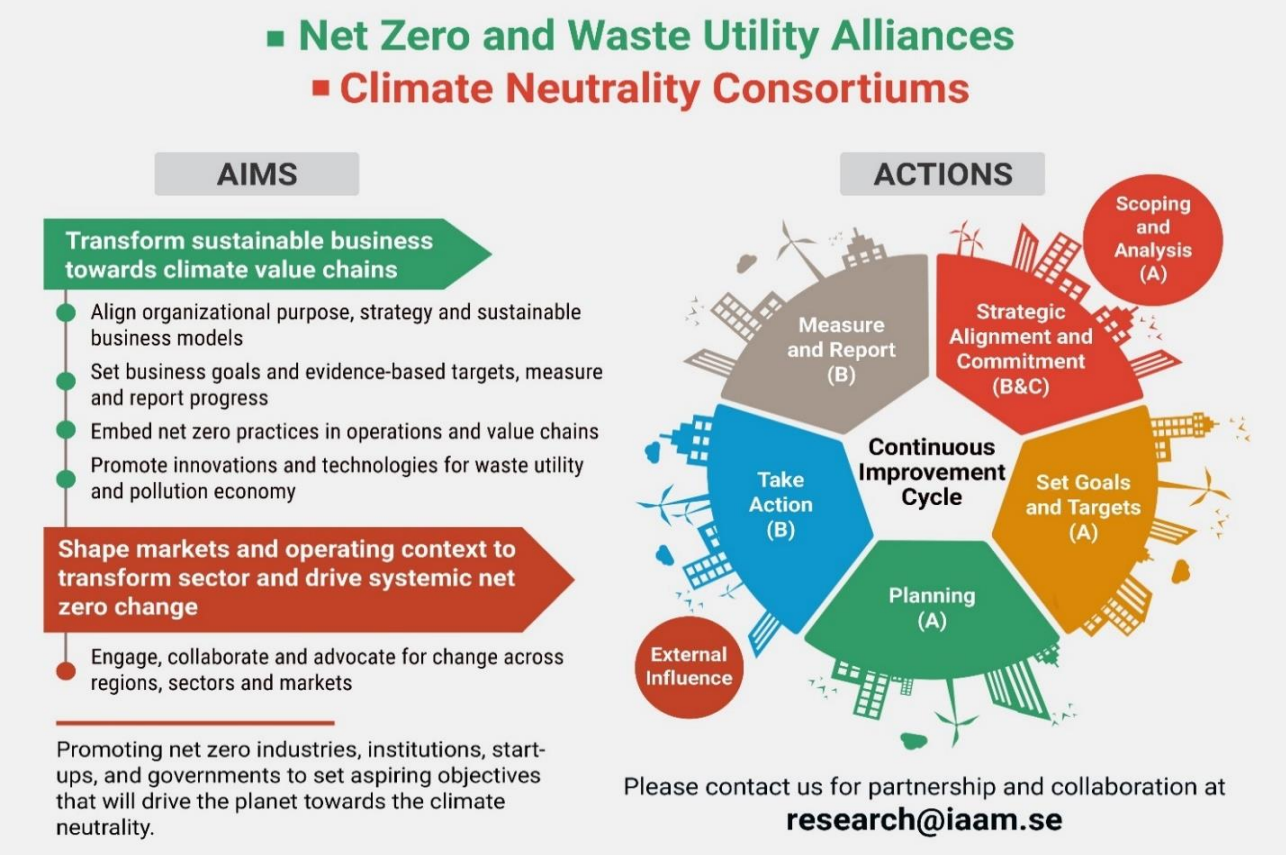

Fig. 1. The Climate value chain with net-zero and waste utility alliances connecting multidisciplinary experts through world R&D links.

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