

Engineers are at the forefront of identifying, developing and implementing new technologies to combat the effects of climate change



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Climate change and the effect of global warming have become serious global challenges, gaining urgency with time. With Earth Day around the corner, we must revisit our strategies, ponder where we are and realign ourselves to the goal of achieving net zero carbon emissions by 2070. Engineers and engineering solutions are critical in identifying and implementing possible solutions and spearheading innovations across multiple fronts, from renewable energy to green infrastructure, ensuring a sustainable future. A few technological interventions that can make a tangible impact are:

Renewable energy technologies

Energy is the biggest change-maker in the path to net-zero carbon emissions. Seventy-five per cent of our current carbon emissions are from this sector alone. Fossil fuel or coal for power generation is still a significant contributor, even after 50 years of extensive research and government policies. For developing nations like India, which are still heavily dependent on coal, achieving net-zero in energy is a challenge. However, small steps in electrifying the complete energy sector, reducing our dependency on fossil fuels and increasing the contribution of renewable sources in our energy mix are the key to finding a balance. Engineers are at the forefront of this effort, driving the adoption of solar, wind, hydropower, and hydrogen energy by developing more efficient technologies. Advancements like floating solar plants to utilise underutilised water bodies and taller wind turbines to harness stronger winds at higher altitudes are pushing the boundaries of innovation. Simultaneously, developments in smart-grid systems, energy storage and improved grid integration allow better energy supply and use.

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Sustainable infrastructure

Climate resilience is slowly gaining prominence in infrastructure projects, with engineers developing solutions that use more sustainable materials, are more energy efficient and can be sustained even in changing environments. This includes designing roads and bridges that can endure severe weather, creating flood-resistant urban systems through elevated structures and natural barriers, and incorporating nature-inspired architecture. Green infrastructure also focuses on plant-based designs that absorb storm water, cool urban areas and improve air quality, thereby enhancing the liveability of cities.

Improved energy efficiency

The development of artificial intelligence and its integration with technology for intelligent design and applications and more efficient energy systems is crucial to mitigating climate change. Reducing energy consumption is as important as increasing renewable energy production. Efficient building materials with improved insulation, smart appliances, ultra-efficient electric vehicles and enhanced public transit infrastructure can improve cost efficiency and reduce the carbon footprint.

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Policy and systemic transformation

Engineers also play a vital role in defining policies and helping shape legislation that supports sustainable development and climate adaptation strategies. Strategies and policies on water conservation, clean energy, sustainable agriculture, sustainable infrastructure, EVs and the implementation of technical solutions integrated into national and international climate strategies will require engineering interventions on a larger scale.

Thus, this Earth Day, let us all pledge to support the advancements and encourage a collective commitment to embracing new technological interventions and practices towards a sustainable future.

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