

## Press Release

### The buildings sector can make or break India's net-zero transition

*Without increased climate action, the emissions caused by the buildings sector are projected to surpass India's total remaining carbon budget, leaving no room for other sectors.*

**New Delhi, 18 March 2024:** 'By 2030, India is expected to be home to 6 megacities with populations above 10 million. Currently, 17% of India's urban population lives in slums. Ensuring access to adequate, safe, and affordable housing for all and the reduction of adverse environmental impact are key indicators of SDG 11,' said Ms Sanyukta Samaddar, IAS – Commissioner NCR & SDGs, Government of Uttar Pradesh, India, during the launch of the report *Pathways to Steer India's Buildings Sector Towards a Net-Zero Future*.

The report by the Center for Study of Science, Technology and Policy (CSTEP), a science- and technology-based think tank, highlights the importance of curbing emissions from the building sector, particularly the indirect emissions. Ms Samaddar added that 'Buildings not only shape India's energy and emissions trajectory but also its development trajectory. Addressing the challenges in this sector, therefore, assumes immense significance for steering it on a more sustainable trajectory.'

The buildings sector currently accounts for 25% of India's greenhouse gas (GHG) emissions and is expected to exceed India's total remaining carbon budget by 2070. However, consumption cannot be curbed because this sector directly impacts well-being (shelter, thermal comfort, access to healthcare, etc.). It is, therefore, critical to understand the synergies between development goals and climate action in this sector to sustainably transition towards a net-zero economy.

Speaking at the event, Dr Ritu Mathur, Senior Energy Economist, NITI Aayog, said, 'NITI Aayog is working on a state support mission to enhance action on the ground. For this, key challenges involve scaling up data and enabling green skilling. There is a lot of technology-based innovation, nature-based solutions, and a number of success stories—but these are scattered. By collating them under one platform and making people aware of these solutions as well as using systems thinking to find a way forward can help us tap into benefits and advantages that are possible.'

Ms Shriti Pandey, Founder and CEO of Strawstructure Eco, noted, 'There is a myth that using nature-based materials for building can be expensive. However, not only are they affordable but also locally sourced. The unique USP of using natural materials for construction are that they reduce carbon footprint while also providing thermal comfort within buildings.'

CSTEP's study developed net-zero pathways for India's buildings sector using its system dynamics model, Sustainable Alternatives Futures for India (SAFARI).

The modelling framework highlights the challenges for balancing development objectives with climate action imperatives. It charts a strategic pathway for navigating India's sustainable development journey in the buildings sector up to 2070. CSTEP

explored the business-as-usual (BAU) scenario (maintaining the status quo), decent living standards (DLS) scenario (meeting certain development goals), buildings-led decarbonisation scenario (BLS), industry-led decarbonisation scenario (ILS), and buildings- and industry-led decarbonisation scenario (BLS + ILS).

In the BAU scenario, the cumulative emissions from buildings between 2020 and 2070 are projected to reach 90.85 GtCO<sub>2</sub>-e, exceeding the carbon budget allocated for India (according to the Climate Equity Monitor) by 2%. In the DLS scenario, accounting for efforts towards developmental goals such as achieving housing and clean cooking for all by 2030 and providing thermal comfort through cooling appliances results in cumulative emissions of 97.11 GtCO<sub>2</sub>-e, which overshoots the carbon budget by 8%.

BLS envisions the impacts of interventions driven by behavioural changes, such as opting for cleaner cooking fuels, using energy-efficient appliances and solar rooftop systems, and incorporating passive design elements (better construction materials, cool roofs, etc.) in construction. This scenario also assumes the achievement of decent living standards. In such a scenario, 72% of the remaining carbon budget is used by 2070. The ILS scenario, with power sector decarbonisation and a reasonable amount of industrial decarbonisation, has a similar impact on cumulative emissions as BLS.

The scenario that combines BLS + ILS demonstrates the collective impact of a 72% reduction in emissions and a 47% reduction in energy demand in 2070, resulting in a substantial saving of 1.83 GtCO<sub>2</sub>-e. This scenario utilises 54% of the allocated carbon budget, but even with such aggressive decarbonisation, emissions from the buildings sector do not reach net-zero levels because of the hard-to-abate industrial emissions.

The study also dives deeper into the thermal comfort aspects in the residential sector, which is crucial for achieving Sustainable Development Goal 3 (good health and well-being) and, at the same time, hugely energy/emissions intensive. The authors argue that most modelling studies analyse cooling demand based on appliance ownership, but the SAFARI model allows the determination of thermal comfort requirements as a function of building envelope and construction choices.

They find that only 22% of the total thermal comfort requirements were fulfilled for the overall population in 2023, attributable to a low appliance penetration rate of 7–10%. Assuming an increase in the ownership of air-conditioners with income growth, the cooling electricity demand from appliances will surpass the thermal comfort needs by 2050. This presents a substantial opportunity for energy savings, potentially achievable through regulatory shifts that incorporate thermal comfort considerations and the adoption of passive design aspects.

Given the multi-stakeholder nature of the buildings sector, action across sectors and coordinated efforts between different stakeholders are needed to sustainably decarbonise the buildings sector without compromising on development goals and quality of life.

Dr Indu Murthy, Sector Head of the Climate, Environment and Sustainability at CSTEP, observed that this is an opportune time to integrate strategies to decarbonise India's buildings sector since most of the buildings that will exist in India in 2050 are yet to be

built. 'Influencing behaviour change is essential to decarbonising the sector so that strategies are picked up and seamlessly integrated into lifestyles,' she said.

The report is published on the CSTEP website: <https://cstep.in/publications-details.php?id=2740>

### **Media contact**

**For more details and interviews, please write to us at [cpe@cstep.in](mailto:cpe@cstep.in).**

**About CSTEP:** The Center for Study of Science, Technology and Policy (CSTEP) is one of India's leading think tanks involved in solving the grand challenges that the country faces. These include Sustainable and Secure Future, India's Green Energy Transition, Clean Air for All, and Digital Transformation.