

PRESS RELEASE

New report asks important questions as India develops net-zero strategy

For Immediate Release

Bengaluru: 31 October 2022

As we inch closer to another global climate summit, COP27, climate projection models will once again be thrust into the limelight as they play an important role in devising net-zero strategies. However, assumptions and estimates for India's 'net zero by 2070' target need to be reviewed carefully given the deep uncertainties involved. There is no correct pathway to net-zero emissions.

The latest report from the Bengaluru-based think tank the Center for Study of Science, Technology and Policy (CSTEP) titled *No Silver Bullet: Essays on India's Net-Zero Transition* aims to ignite conversations on complex and promising net-zero pathways and asks pertinent questions on India's net-zero goals. CSTEP has been analysing net-zero options for India using its Sustainable Alternative Futures for India (SAFARI) model, and the report is a result of the questions and discussions that came up while updating the model. Split into different sections, the report has essays on demand estimation and projection, industrial decarbonisation, the power sector, LIFE: Lifestyle for Environment, and carbon pricing.

Gross domestic product (GDP) is one of the key drivers of demand estimation in most models. However, the relationship between GDP and demand can be complex and dynamic. As countries develop, per capita demand for certain materials and services tends to saturate. For example, transport demand increases with income but is expected to plateau or saturate beyond a certain level. Similarly, per capita demand for cement and steel has saturated at different levels for different countries. India is expected to become a developed nation in the 2050s. Therefore, at what level will India's per capita demand saturate, if at all? The report tries to address questions such as this.

The industry sector—cement, steel, and fertiliser—currently contributes to around 32% of the country's total emissions. The role of the industry sector will, therefore, be critical in determining India's net-zero pathway. Electrification of industry is the common solution put forth by several models to reach net zero. But studies have shown that high-heat industrial processes cannot be easily electrified. Therefore, a blanket assumption on complete electrification prevents any discussion on alternatives to industry decarbonisation. Process emissions from the cement industry can be completely abated only with a technological breakthrough towards a new production process or through the use of carbon capture and utilisation/storage (CCUS) technologies. Therefore, achieving net zero without CCS/CCUS is questionable and worth pondering over.

Power is one of the most discussed sectors in the context of mitigation and net zero. It is considered a 'low-hanging fruit' because of the falling costs of renewable energy. However, there are unresolved issues relating to intermittency and cheap storage options, grid stability, import dependence for technology and critical minerals, and land acquisition and availability. Also, despite manifold increase in RE capacity, the power sector will be a significant emitter in 2070 because of the continued prevalence of gas and coal plants as per projections made by the SAFARI model in a business-as-usual scenario. Achieving net zero would require significant CCUS

installation, which increases consumption of electricity in coal and gas plants. How much carbon pricing will be required to justify that in a cost-optimised power system? The report explores nuclear power as an option to decarbonise the power sector at a reasonable rate. Nuclear power is often sidelined because of potential safety concerns and public perception.

Prime Minister Narendra Modi's call for Lifestyle for Environment (LiFE) at COP26 highlights the need for behavioural shifts for preserving the environment. The report emphasises that India must not aspire for Western standards of overconsumption as that may become too unsustainable for a populous country such as ours. There are some behavioural shifts that can help in our net-zero transition and overall sustainability to varying degrees. Examples include a partial dietary shift towards millet (from rice), the use of public transport for urban and intercity travel, electric cooking, and the use of energy-efficient appliances.

The success of carbon pricing is contingent on the availability of affordable low-carbon alternatives to shift to. This in turn depends on adequate investments flowing in towards developing low-carbon technologies. One source of finance could be the revenue generated from carbon pricing; however, that implies lower revenue recycling to address the inequality caused by the carbon price. Such trade-offs are discussed in the report with the aid of a systems map. A careful balance needs to be struck with complementary non-market policies to enable the success of carbon pricing in India at a transformative rather than incremental scale.

Given the complexity of these interdependencies and future uncertainties, long-term models have the power to do more than be mere calculators that attempt to provide a silver bullet solution.

The full report is available [here](#).

For more details and interviews, please write to us at 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 Grand Challenges that the country faces. These include Sustainable and Secure Future, India's Green Energy Transition, Clean Air for All, and Digital Transformation.