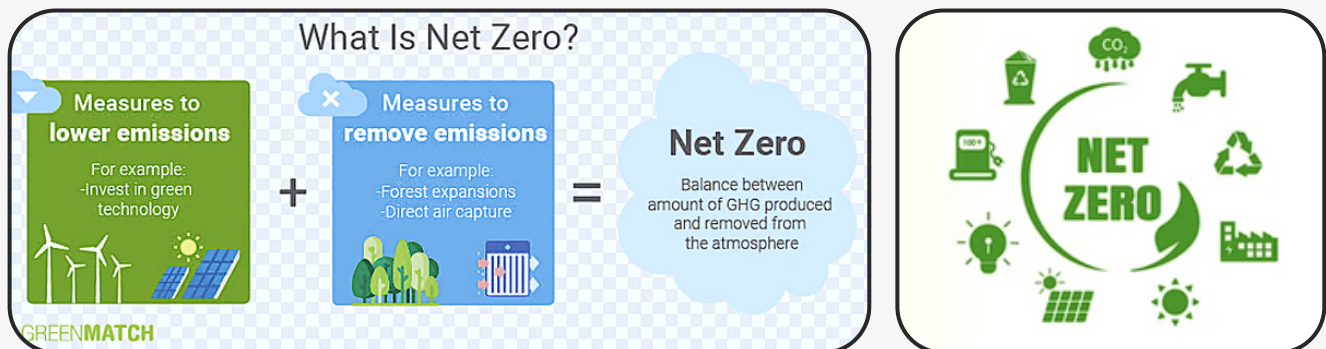


# Net zero carbon emissions: Is it really achievable in India?

## Introduction

India's commitment to becoming net-zero on carbon emissions by 2070 has initiated widespread debate regarding the realizability of this ambitious target. Being the third-largest emitter of greenhouse gases (GHGs) globally, India's journey towards net-zero is both critical and complex.

This article delves into India's emissions landscape today, the challenges it is facing, and the strategies that may enable it become net-zero by 2070.



## Understanding India's Emissions Landscape

India's GHG emissions have been rising, fueled by fast economic development and growing energy needs. In 2023, emissions increased by 2.6% to 3.96 billion metric tons of carbon dioxide equivalent (GtCO<sub>2</sub>e), with a forecast suggesting another 0.5% rise in 2024 to a new record high. Significantly, the power sector accounts for about one-third of these emissions.

In spite of these rises, India had a 7.93% decrease in overall GHG emissions in 2020 over 2019, according to its Fourth Biennial Update Report to the UNFCCC. If Land Use, Land-Use Change, and Forestry (LULUCF) is not included, the emissions were 2,959 million tonnes of CO<sub>2</sub>e; with LULUCF included, net emissions were 2,437 million tonnes of CO<sub>2</sub>e.

## Per Capita Emissions and Energy Use

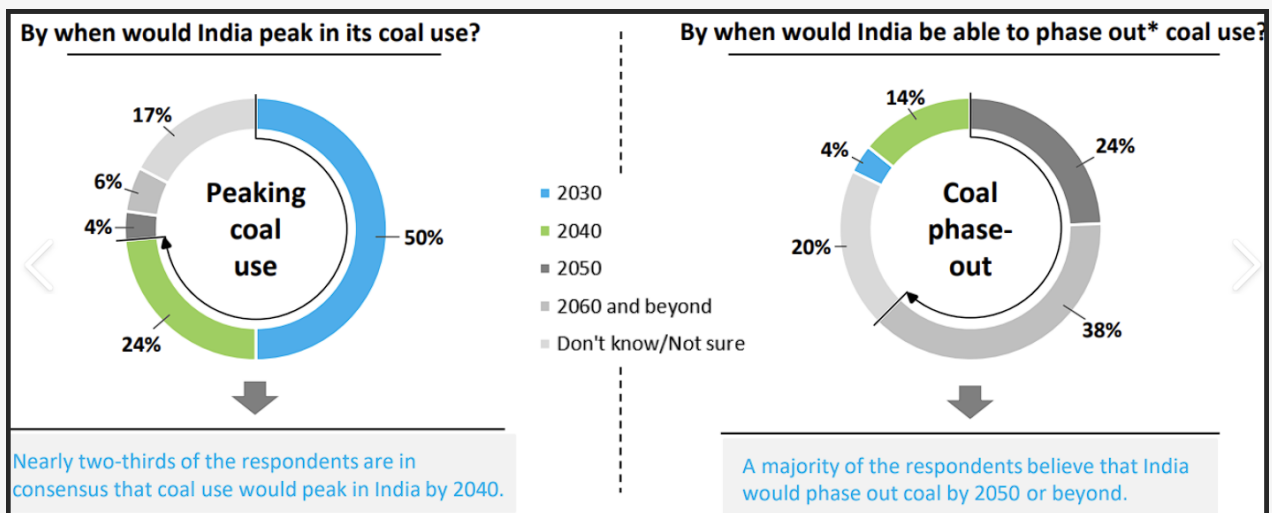
India's per capita energy-related CO<sub>2</sub> emissions remain lower than those of more economically developed countries. Factors influencing per capita emissions include the structure of the economy, energy system, and reliance on carbon-intensive transportation and industries.



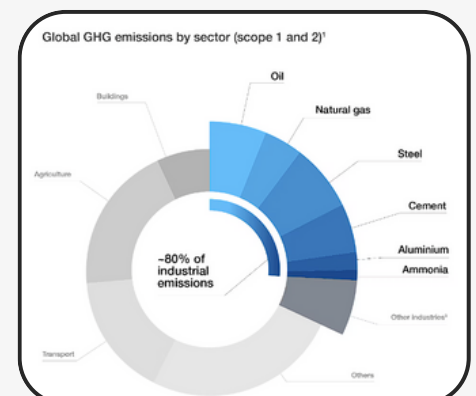
## Challenges on the Road to Net-Zero

Several significant challenges impede India's journey toward net-zero emissions:

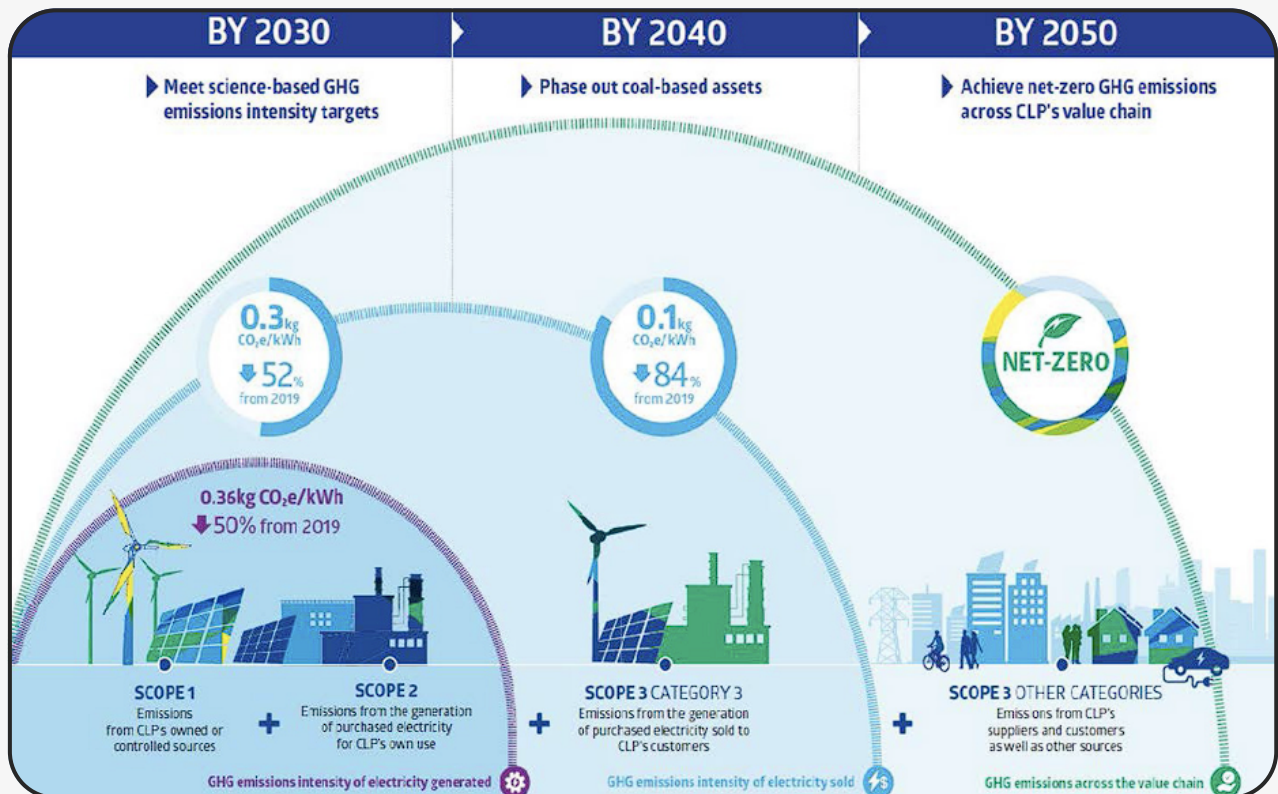
- **Dependence on Coal** : Coal still powers more than 70% of India's electricity generation. Even as investments in clean energy are being made, increasing electricity demand fueled by economic growth and the increased use of air conditioning during weather extremes has caused coal production and imports to increase. This dependence on coal holds back the development of green goals and climate goals. Further, the unavailability of large-scale substitutes for baseload generation makes phasing out coal even more challenging.



- **Financial Constraints** : Achieving net-zero by 2070 requires an estimated \$10 trillion USD. Current capital sources can only meet \$6.6 trillion of this need, highlighting a substantial financing gap. India currently collects approximately \$45 billion per year for climate initiatives, far short of the actual requirement. Further, insufficient access to affordable international finance and slow payment of climate funds create further barriers to scaling up green investments.



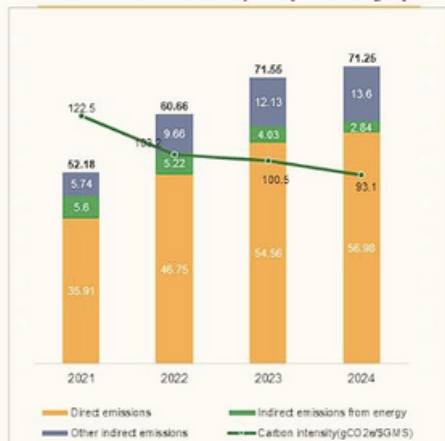
- **Renewable Energy Capacity** : In order to achieve net-zero, India's solar and wind capacity needs to grow from 100 GW to more than 7,400 GW by 2070. Although some states such as Gujarat and Tamil Nadu have been doing well, others are behind, which shows uneven development in renewable energy infrastructure. Further, land acquisition problems and regulatory issues delay large-scale renewable project development, and it is hard to meet ambitious capacity goals. In addition, poor energy storage technologies hinder the effective use of renewable power, highlighting the importance of battery technology and grid modernization.



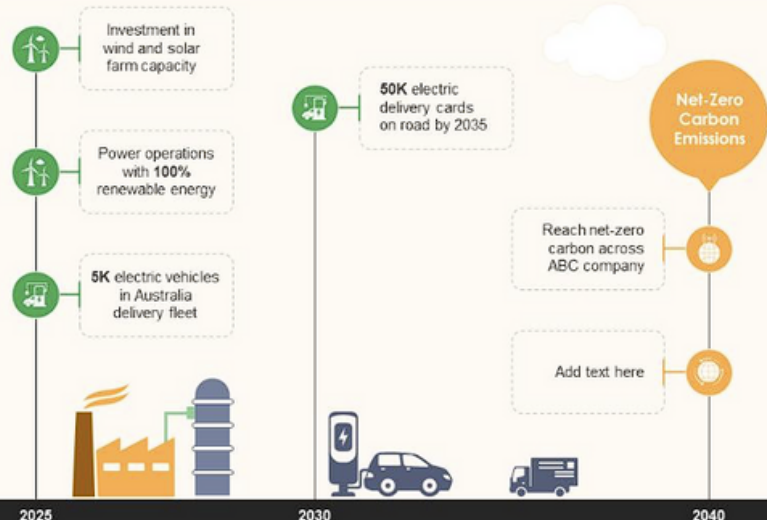
## Strategic roadmap for net zero carbon emissions

This slide covers roadmap to achieve organization's sustainable goal of reducing net zero carbon emissions by 2030. It includes initiatives such as investment in wind and solar farm capacity, power operations with renewable energy etc.

### Amazon's carbon footprint (MMT CO<sub>2</sub>e\*)

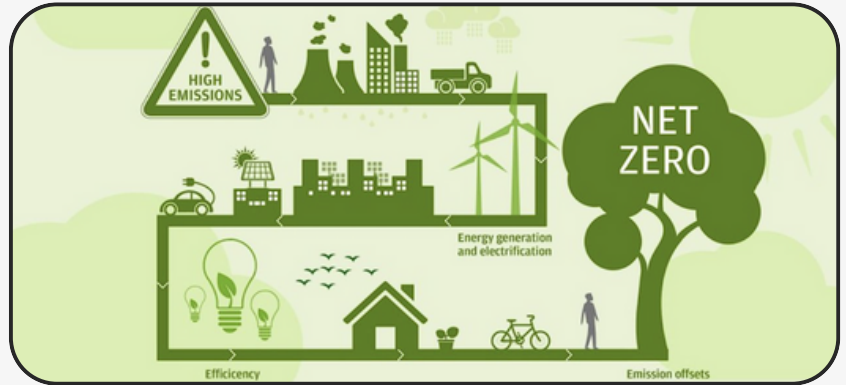


\*GCO<sub>2</sub>e/\$GMS: Grams of carbon dioxide equivalent per dollar of gross merchandise sales



- **Policy and Implementation** : India's net-zero goal has been rated as "Poor" by the Climate Action Tracker, citing a lack of stronger policies and implementation plans. The legal standing of the net-zero goal, made at COP26 and backed by a long-term plan submitted in 2022, needs more legislative support and detailed planning. Additionally, constant policy changes and regulatory delays generate uncertainty for green technology investors.

Institutionalization and policy consistency will be key to sustaining investor confidence and speeding up the transition. Furthermore, the absence of a sectoral roadmap with specific emission reduction goals constrains accountability and concerted action, and hence clear milestones and implementation mechanisms need to be defined.



## Strategies for Achieving Net-Zero

To overcome these challenges, India can follow various strategies:

- **Accelerating Renewable Energy Adoption:** Investing in renewable energy like solar, wind, and hydroelectric power can reduce reliance on coal. De-centralized renewable energy initiatives and strengthening the grid infrastructure will help promote this transition.
- **Enhancing Energy Efficiency:** Widespread implementation of energy-saving technologies in industry, transport, and residential spaces can make a big difference to emissions. Policy initiatives towards conservation and energy standards standards are essential.
- **Carbon Pricing and Markets:** Building strong carbon markets can reward emission cuts. Creating a carbon pricing system will encourage industries to adopt cleaner technologies.
- **Afforestation and Reforestation:** Increasing forest cover is a carbon sink. India plans to create an additional carbon sink of 2.5-3 billion tons of CO<sub>2</sub> equivalent through increased forest and tree cover by 2030.
- **International Collaboration and Financing:** Working with international financial institutions and industrialized countries to obtain funds and technology transfer is essential. Using global climate funds can fill the financing gap.
- **Policy Reforms and Governance:** Having transparent, binding policies with long-term commitments will ensure a secure investment climate for green technologies. Institutional capacity must be built to track and deliver climate actions.

## **Conclusion**

Reaching net-zero carbon emissions by 2070 is a challenging but possible target for India. It requires a multi-pronged strategy with heavy investments in renewable energy, policy changes, financial instruments, and global cooperation.

Although obstacles like coal reliance and funding issues are considerable, careful planning and collective action can make it possible for India to meet its commitment, making a significant contribution to international climate mitigation efforts. Moreover, achieving net-zero will not only assist in reducing climate change but also generate new economic opportunities, improve energy security, and enhance public health through reduced pollution levels.