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Low Carbon Transition in India

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India is on the verge of two major transformations. The first is the transformation of its economy. India will soon overtake China as the world's most populated country and will be home to one of the country's youngest populations in the world. The second is its green transformation. India is the fourth-largest emitter of greenhouse gases and the tenth-largest emitter of carbon dioxide in the world (CO₂). The transportation sector is the second-largest source of CO₂ emissions and has had a substantial impact on rising CO₂ levels.¹ However, India's GHG footprint is still small since it is growing. The Indian government is well aware of this serious predicament. As a result, it has developed strategies to reduce emissions. A variety of environmental laws have been enacted to establish a viable framework. After the Stockholm conference in 1976, constitutional validity was established. Further, this framework has been incorporated into directive principles, state policy, and fundamental rights and obligations as a result of the 42nd amendment. ²Furthermore, India has made a considerable effort to ensure that its economic transformation is not dependent on fossil fuels. The capacity of India's renewable energy sector has increased from 27 GW in 2000 to almost 93 GW in December 2016. . By 2022, Capacity is planned to increase to 175 GW. If this project succeeds India's renewable energy capacity can be expanded by 600 percent in just a matter of two decades. ³Despite these accomplishments, India's low-carbon

¹ Chelsea Harvey, 'Trump may not be able to halt the world's climate progress – thanks to China and India' (*The Washington Post*, 15 May 2017) <<https://www.washingtonpost.com/news/energy-environment/wp/2017/05/15/trump-may-not-be-able-to-halt-the-worlds-climate-progress-thanks-to-china-and-india/>> accessed 15 January 2023

² 'India First Biennial Update Report to the United Nations Framework Convention on Climate Change' (*Ministry of Environment, Forest and Climate Change*, December 2015) <<https://unfccc.int/resource/docs/natc/indbur1.pdf>> accessed 15 January 2023

³ Arsalan Ali Farooquee & Gireesh Shrimali, 'Reaching India's Renewable Energy Targets Cost-Effectively: A Foreign Exchange Hedging Facility' (*Climate Policy Initiative*, 17 June 2015)

transition is still a complicated process with many missing pieces. Through this research, paper authors want to convey the challenge that to effectively complete a low-carbon transition, India must address the finance of renewable energy projects,⁴ inefficiencies in the coal sector, and the absorption of other fuel sources, among other issues that the country has as a developing country. Limiting India's urban sprawl, resolving the country's chaotic transportation system, and dealing with the country's inadequate waste management methods are all concerns that must be addressed.

Keywords: *law, carbon, transmission, greenhouse gas.*

INTRODUCTION

Low carbon development has gained policy significance in the scientific community and is a concern of both environmental and development policy in an era when climate change has been accepted as an impending threat by the world. The United Nations Framework Convention on Climate Change was adopted by world leaders in 1997. The United Nations Framework Convention on Climate Change (UNFCCC) was a successful attempt that focused global attention on the subject of climate change and recommended that greenhouse gas emissions must be urgently reduced⁵. Furthermore, the context surrounding the worldwide effort to tackle climate change has changed dramatically since the Paris Agreement on climate change was signed in 2015.

The Countries have begun to address climate change by enacting "green new deals," which are policy packages that combine decarbonisation and adaptation measures with efforts to enhance livelihoods and generate income. India's promise in Paris was a substantial departure from the country's previous attitude to global climate talks, and it reflected a new sense of optimism about the country's growth trajectory and standing in the world. Even though a developing country like India has a well-known need for vast amounts of energy, India has chosen to focus

<<https://www.climatepolicyinitiative.org/publication/reaching-indias-renewable-energy-targets-cost-effectively-a-foreign-exchange-hedging-facility/>> accessed 15 January 2023

⁴ 'India 3rd Least efficient coal-fired power generating nation' (*DNA India*, 19 March 2018)

<<https://www.dnaindia.com/business/report-india-3rd-least-efficient-coalfired-power-Generating-nation-2068479>> accessed 15 January 2023

⁵ 'Second National Communication to the United Nations Framework Convention on Climate Change' (*Ministry of Environment & Forests*, 2012) <<https://unfccc.int/resource/docs/natc/indnc2.pdf>> accessed 15 January 2023

on developing renewable energy sources Instead. India is also working to reduce carbon emissions to meet its international commitment to alleviate the risks of climate change. Furthermore, India needs to address its renewable energy projects, as well as the financial means⁶ to handle them, to accomplish a low-carbon transition. India is also coming forward with specialized programs such as 'Make in India' and 'Skill India' to promote long-term sustainable development in the country.

REVIEW OF LITERATURE

- Cranston and Hammond (2010), explained a low-carbon economy in the twenty-first century entails controlling and coordinating population growth environmental policy and economic development.
- EREC (2008) Low-carbon energy will be utilized to reduce carbon emissions to ensure economic growth and enhance residential welfare at the same time.
- Mulugetta and Urban (2010), stated in their paper that the UK Department for International Development (DFID) observed that using less carbon to enhance future economic growth is a common component of low-carbon development in all nations.

METHODOLOGY

The research is based on both primary and secondary sources of data. Primary data was gathered by a questionnaire survey of roughly 50 people from all age groups around the country, while secondary data was gathered from case studies, articles, journals, and research papers. We gathered responses after conducting an in-depth investigation into India's low-carbon development target.

OBJECTIVE

- Examining the driving force behind India's low-carbon development ambition.

⁶ Sanjay Vijayakumar, 'Understanding Green Bonds and greener way of financing' (*The Hindu*, 05 April 2015) <<https://www.thehindu.com/business/what-are-green-bonds/article7070840.ece>> accessed 16 January 2023

- Determining the criteria for evaluating the difficulties caused due to carbon emission

LEGAL FRAMEWORK

A lot of environmental laws existed before India's independence in 1947, but the true impetus for establishing a well-developed framework came only after the 1992 United Nations Conference on the Human Environment.

IN THE COURSE OF BRITISH AUTHORITY FOLLOWING WERE THE ACTS IN EXISTENCE

- Bengal Smoke Nuisance Act, 1905.
- The factories Act, 1897.
- Bombay Smoke Nuisance Act, 1912

AFTER INDEPENDENCE

- Policy Statement for Abatement of Pollution and the National Conservation Strategy and Policy Statement on Environment and Development was brought out by the MoEF in 1992.
- Air (Prevention and Control of Pollution) Act, 1981;
- Atomic Energy Act of 1982.

The Constitution's three clauses are directly relevant to environmental issues. For starters, Article 21⁷ states that 'no one shall be deprived of his life or personal liberty except in compliance with the lawful procedure.' In *Subhash Kumar v State of Bihar*⁸ and *Virendra Gaur v State of Haryana*⁹, the Supreme Court recognized many Article 21 rights, including the right to a healthy environment. State high courts have followed the Supreme Court's lead, and nearly all now agree that Article 21 contains an environmental component.

⁷ Constitution of India 1950, art 21

⁸ *Subhash Kumar v State of Bihar* AIR (1991) SC 420

⁹ *Virendra Gaur v State of Haryana* (1995) 2 SCC 577

Second, according to Article 48A¹⁰, "the State shall endeavour to preserve and promote the environment, as well as to protect the country's forests and wildlife." Third, Article 51A states that "every Indian citizen shall have the duty to conserve and improve the natural environment, including forests, lakes, rivers, and wildlife, as well as to have compassion for living beings."

In **Pandey v India**,¹¹ The complainant filed a complaint with India's national green tribunal in 2017. Ridhima Pandey, a nine-year-old from Uttarakhand, argued on the public trust doctrine about India's commitments under the Paris Agreement. According to the Paris Agreement, India's policies necessitate stronger efforts to combat climate change. The term environment was used in the 1986 Environment Protection Act to refer to the surrounding climate. Section 2(m) of the Intergenerational Equity Act, as well as judicial judgments based on comparable legal principles, have been made in the Netherlands (*Urgenda Foundation v Kingdom of the Netherlands*), Pakistan (*Leghari v Pakistan*), and the United States (*Juliana v United States*). A few major cases that have changed and helped shape the policies of environmental laws and regulations include:

MC Mehta v Union of India¹², where it was decided that no motor vehicle conforming to the emission standard BS-IV shall be sold or registered throughout the entire country beginning in 2020. To reduce carbon emissions, BS-IV-certified automobiles would be utilized as a substitute. Instead of this judgment, other decrees were issued to prohibit the use of diesel automobiles to combat air pollution.

Union of India v MC Mehta,¹³ A complaint was filed against the excessive pollution of water by industrial wastes. It was brought to light that hazardous trash was being dumped into the Ganga in Kanpur. This was causing excessive pollution and hence the apex court ordered to close off of several tanneries in the vicinity.

¹⁰ Constitution of India 1950, art 48A

¹¹ *Ridhima Pandey v Union of India* (2017) SCC OnLine NGT 187

¹² *MC Mehta v Union of India* W P (C) 13029/1985

¹³ *Union of India v MC Mehta* (1988) SCR (2) 538

India Council for Enviro-Legal Action v UOI,¹⁴ A town whose environment had been damaged by the sludge operating of an industry that produced 'H' acid was to be restored by principle after the Supreme Court recapitulated multiple times.

State of Himachal Pradesh v Ganesh Wood Products,¹⁵ The Supreme Court argued in State of Himachal Pradesh v Ganesh Wood Products that forest-based industries must be protected for future resource requirements from the forest and sustainable development.

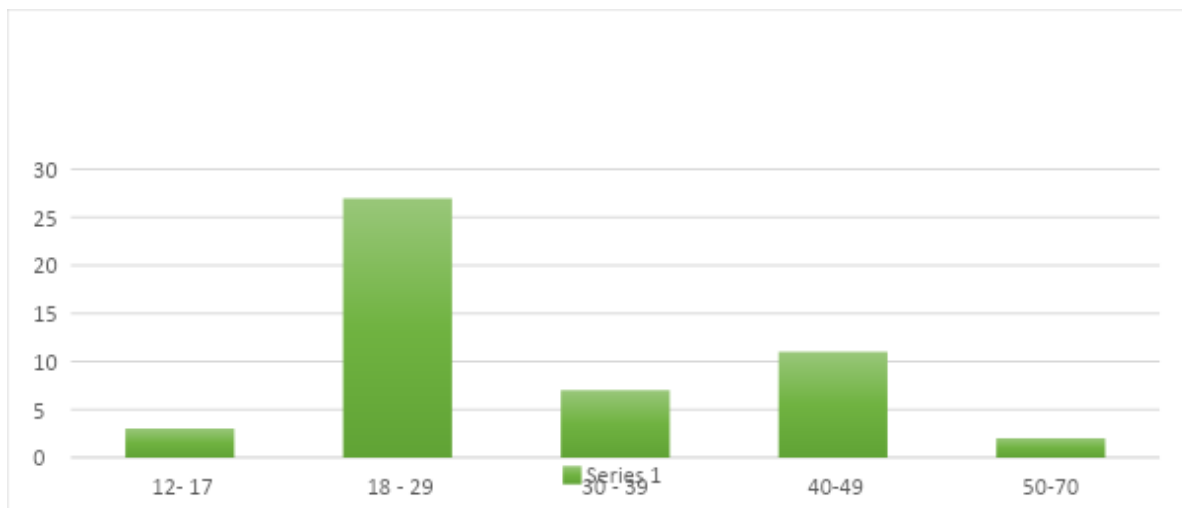
FINDINGS

The main conclusions are based on a questionnaire survey of approximately 50 persons from across India. They are further classified as follows:

Age group: The primary component that signifies demographic information is age, which demonstrates that the majority of people are younger, followed by older employed people.

What is your age?

50 responses



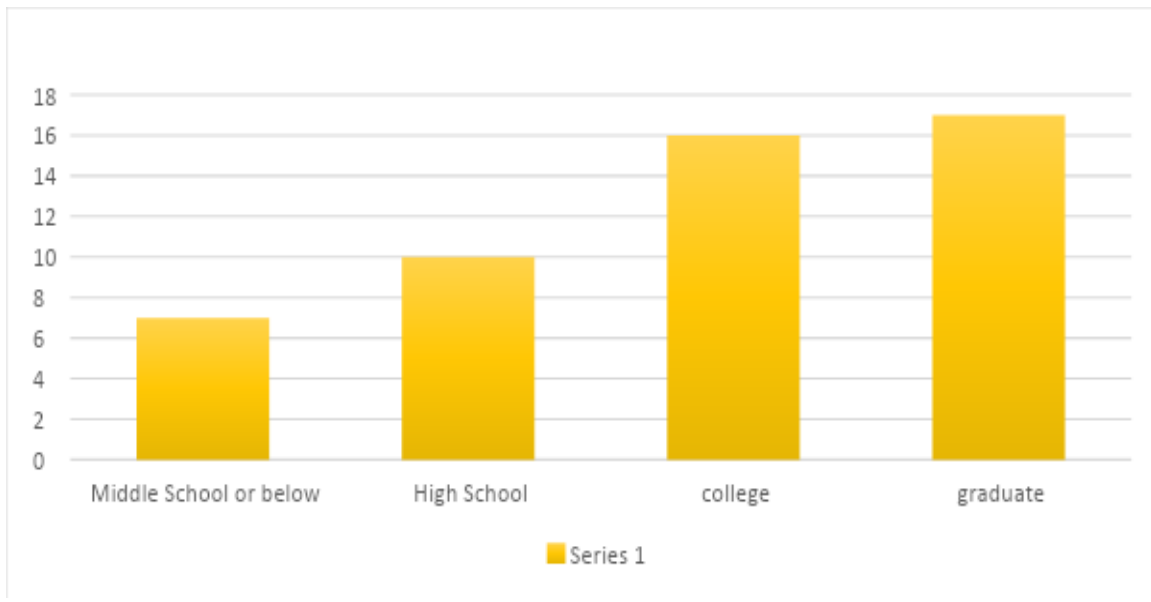
¹⁴ *India Council for Enviro-Legal Action v UOI* AIR (1996) SC 1446

¹⁵ *State of Himachal Pradesh v Ganesh Wood Products* AIR (1996) SC 149

Education: Education is the primary element that defines demographic information, indicating that the majority of individuals are younger and also relates factors like social status, image perception, and so on to the respondents' lifestyle.

What is your education level?

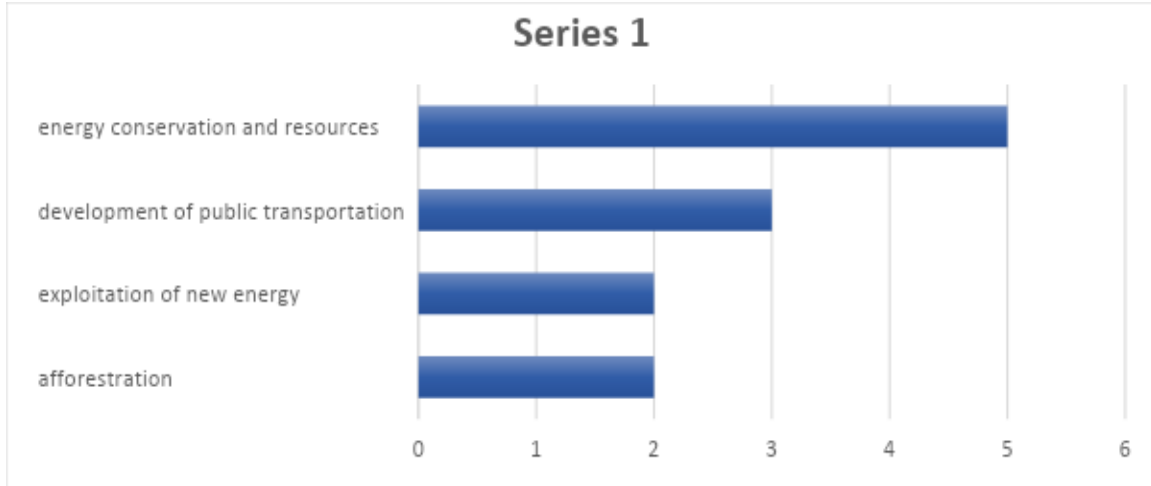
50 responses



Activities fundamental for low-carbon advancement within the society: A low-carbon economy (LCE) is one that employs low-carbon vitality sources and subsequently discharges the least greenhouse gases (GHGs), especially carbon dioxide, into the environment. An LCE's objective is to coordinate all viewpoints of its operations, such as manufacturing, farming, transportation, and control era, around innovations that deliver vitality and materials with low GHG outflows, and as a result, around individuals, buildings, machines, and gadgets that proficiently utilize those energies and materials, as well as arrange of or reuse squanders with negligible yield. Low-carbon economies advance environment versatility, commerce, business, well-being, vitality security, and mechanical competitiveness.

Which initiatives do you think are most important in the development of low-carbon societies?

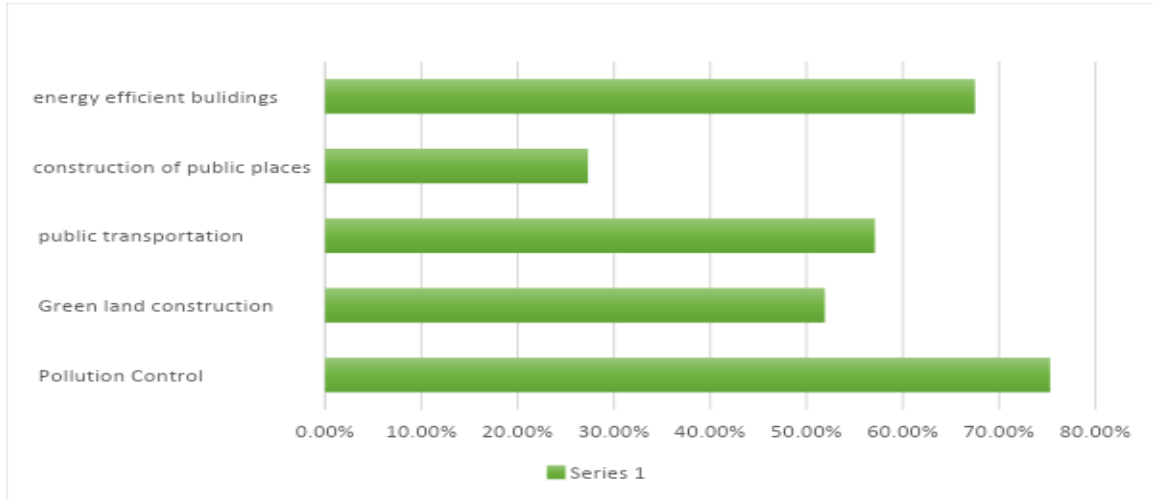
50 responses



Local government usage of low-carbon improvement measures: Since of the lower scale and the plausibility of circumventing national authoritative bureaucracy, neighbourhood administration in India can be received generally quickly. Local exercises might offer assistance to demonstrate the victory of modern arrangements or programs by illustrating their adequacy on a smaller scale. The model rules or practices can be duplicated in other areas or extended to an across-the-country program based on local victory. Despite the significance of local activity, local government organizations may discover it troublesome to begin and actualize unused approaches and programs due to a need for data, subsidizing, and skill.

What do you think the local government ought to prioritize when it comes to actualizing low-carbon neighbourhood improvement?

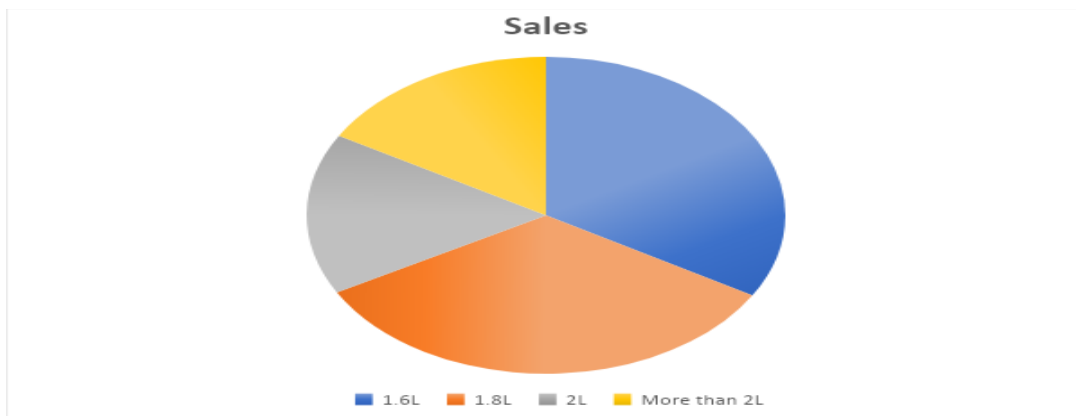
50 responses



Poor automobile maintenance and Vehicle engine displacement: Carbon dioxide is not a pollution since it is already present in the atmosphere. Even though carbon dioxide is a trace gas in the atmosphere, the excessive or high amounts created by automobiles considerably contribute to climate change. The more powerful an automobile's engine is, the larger it is. The more gasoline an engine consumes and the more CO₂ it releases every vehicle produces gas exhaust emissions, but when these emissions exceed the legal limit, the vehicle is considered illegal. When predefined limits are surpassed, problems arise. The primary source of these exhaust emission violations is Poor vehicle maintenance which causes incomplete combustion of gasoline thus producing more harmful gases in the climate.

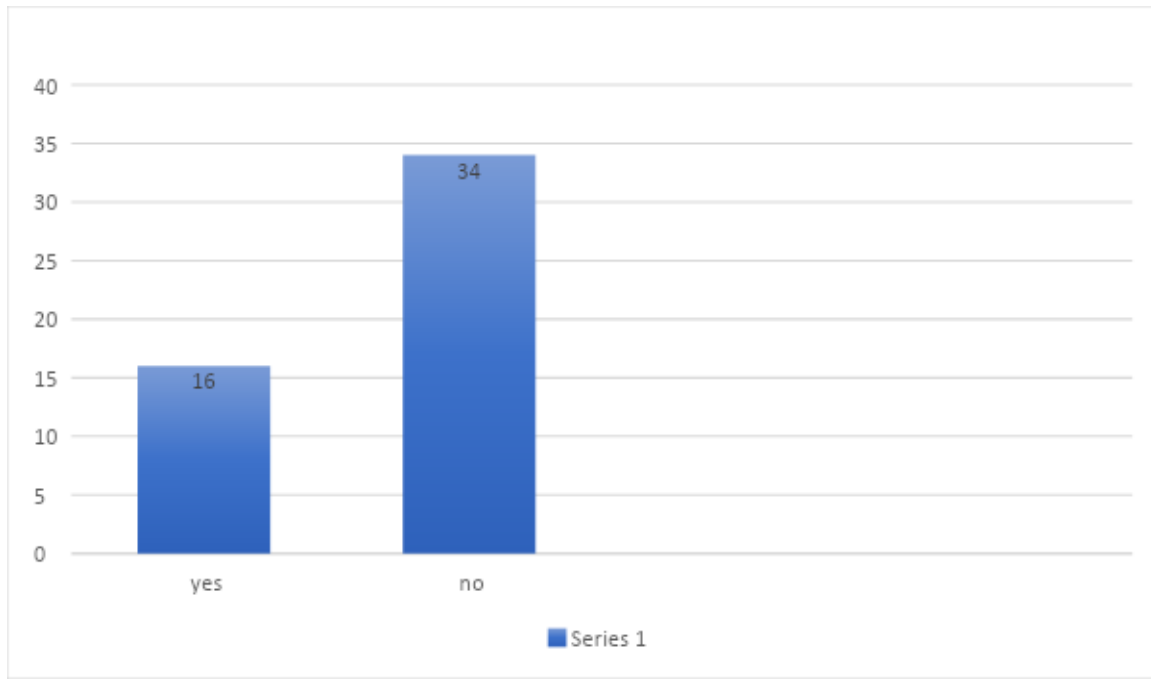
Which private car engine displacement would you prefer to use?

50 Responses



Do you / your family get your automobile service every 6 months (which is considered the appropriate time)?

50 responses



ANALYSIS

India's economic activity, in recent times, was hindered by one of the world's most severe lockdowns of all time. India's population currently is estimated to be 1.3 billion people. According to one prediction, India's carbon dioxide emissions in 2023 will be 30% lower than they were in the same month the previous year. Furthermore, India is expected to overtake China as the world's most populous country by 2027. It is also a country that intends to achieve tremendous progress during the next few decades. Such leaps will need a huge increase in energy consumption compared to what India already uses.¹⁶

¹⁶ Mahendra Sethi, 'Decoding urban India's carbon footprint: spatial-numerical mapping of thermal energy emissions' (2015) 108(9) Current Science
https://www.researchgate.net/publication/281653881_Decoding_urban_India's_carbon_footprint_Spatial-numerical_mapping_of_thermal_energy_emissions accessed 18 January 2023

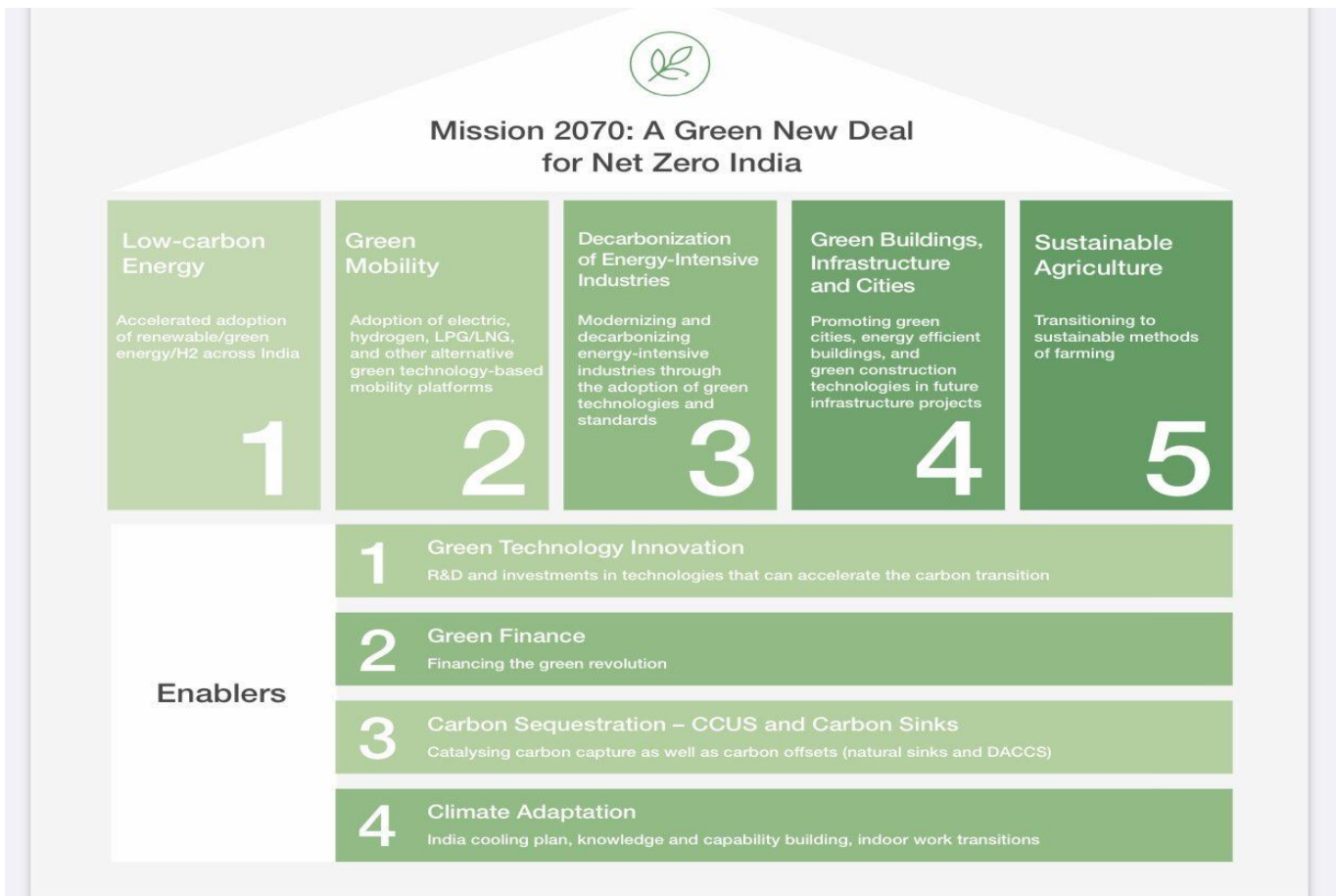
The transportation sector in India is quickly growing as the country's automotive ownership rises. As battery-powered vehicles account for such a small percentage of annual vehicle sales, the government's goal of having 30% of vehicles run on battery power by 2030 appears a long way off. Officials have stated that they will satisfy two significant climate change commitments ahead of schedule. India has pledged that non-fossil fuels will account for 40% of its electrical generating capacity by 2030. It will also reduce its concentrated outflows, or the proportion of total outflows to gross domestic product, by at least one-third from 2005 levels. Furthermore, India has increased its solar-energy capacity by more than a factor of twelve since 2014 and introduced energy-saving measures. After all, advanced economies created the climate problem, thus it is a much bigger responsibility for them. Following the ratification of the Paris Climate Agreement in 2015, India's environment minister stated several times that the industrialized world should vacate carbon space because countries like India are coming.



Further, to meet the targets of SDG 7 (affordable and clean energy) and SDG 13 (climate action), both of which call for finding alternatives to coal, petrol, and other fossil fuels to reduce carbon emissions and climate change, India has taken tremendous steps.



To achieve the goal of SDG 7 and SDG 13 India has already electrified practically all of its villages and residences (barring only 0.01 percent of households). Pradhan Mantri Sahaj Bijli Har Ghar Yojana (Saubhagya) is a focused effort that attempts to saturate electrical connections in the remaining households. The country's initial goal was to reach 175 GW of installed renewable energy capacity by 2022. (100 GW from solar, 60 GW from wind, 10 GW from biomass, and 5 GW from small hydropower). This goal was raised to 225 GW of renewable energy capacity by 2022 and 275 GW by 2027 in 2018. By 2022, India intends to achieve its NDC goal of a 40% renewable energy share in its overall energy basket. At last, India has also taken a significant step forward in declaring that the country will be a full-fledged green economy by 2070.¹⁷



¹⁷ Manish Kumar, 'India's Challenge of Disordered Urbanisation' (*The Hindu*, 26 February 2016) <<https://www.thehindu.com/feature/s/homes-and-gardens/indiaschallenge-of-disorderedurbanisation/article8285145.ece>> accessed 18 January 2023

CHALLENGES

One of the most frequently mentioned problems by leading Indian climate experts is the need to address poverty reduction and expand access to energy services while simultaneously moving India toward a low-carbon future. Higher prices and, in some cases, technical barriers to execution impede the adoption of low-carbon vitality arrangements.¹⁸ Interviewees expressed differing opinions on how difficult low-carbon development would be. Some say that India's economy already has low energy and carbon intensities, and that, regardless of climate mitigation goals, co-benefits such as energy security, job creation, and reduced air pollution will make low-carbon energy solutions the most desirable option.¹⁹

FUTURE SCOPE AND RECOMMENDATION

Many respondents stated that while considering the chances for low-carbon growth in foundation development, 70% of the framework that would exist in India in 2030 has not been developed. Almost every participant agrees that now is the most important time to focus on low-carbon initiatives so that inventive lock-in is energy efficient and practicable rather than energy-intensive and fossil-fuel based. As of present, some respondents have observed favourable signs of a green push in infrastructure construction. Government buildings must now fulfill energy requirements, while the private sector is leading the way in green building initiatives such as LEED certification. Despite the private sector's prominent role, some respondents indicated that government participation would be required to develop the requisite level of green infrastructure consumption. Government participation was suggested to include

¹⁸ Moulishree Srivastava, 'India is a high risk market due to regulatory issues: Colin Dyer' (*LiveMint*, 13 December 2013)

<<https://www.livemint.com/Companies/TKbZt3i1aWEvXnXSju9OIP/India-is-a-highrisk-market-due-to-regulatory-issues-Colin.html>> accessed 17 January 2023

¹⁹ Kala Seetharam Sridhar, 'Carbon Emissions, Climate Change, and Impacts in India's Cities' (*Irade*)

<<https://irade.org/Program%20Details%20&%20reading%20Materials/Reading%20Materials/Impact%20on%20Indian%20Cities.pdf>> accessed 17 January 2023

competitive public-private partnerships, motivational forces, evaluations, and industry benchmarks.²⁰

Further To make the transition to an LCE economically viable, we need to assign a cost (per unit production) to GHGs through emissions trading and carbon taxes. Ecosystem resilience, commerce, employment, health, energy security, and industrial competitiveness all benefit from low-carbon economies. In comparison to the 42 days allotted for this study, it would be better to spread it out over a longer length of time.

CONCLUSION

It's worth noting that India has a lot of potentials to aid with the low-carbon transition. Policy shifts aimed at increasing private capital funding for renewable vitality projects, technological shifts aimed at addressing inefficiencies in the coal sector, and updated methodologies for monitoring urban sprawl in India's developing cities could be the key to India becoming the world's first emerging economy to successfully manage a low-carbon financial transition. While it's important to comprehend the complexities of India's low-carbon initiative, it's also important to place it in the context of India's larger development goals.

India is still considered an underdeveloped country, with a per capita GDP of \$1,598 and 12.8 percent of the population living in extreme poverty. Despite the importance of achieving larger improvement aims, an impending demography shift, expanding urbanization, and a changing economic makeup, India has made a significant commitment to satisfying its worldwide ethical duties first.

²⁰ Joanna Slater, 'Can India chart a low-carbon future? The world might depend on it' (*The Washington Post*) <<https://www.washingtonpost.com/climatesolution/2020/06/12/.indiaemissions-climate/>> accessed 18 January 2023