



# To What Extent Can Investments In Green Energy Infrastructure Mitigate India's Projected Economic Losses From Climate Change, And How Can Economic And Philosophical Approaches To Sustainability Influence The Adoption Of Long-Term Growth-Oriented Green Technologies?

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## **Abstract**

The already large and growing green/renewable energy sector in India is a vital component for its future. This paper will show why this is such and how investments in green energy infrastructure can mitigate India's projected economic losses from climate change. The widespread belief is that India is in need of serious investment in its renewable energy sector if it looks to achieve its targets. Previous research has shown this through a qualitative, second hand research based approach which will also be adopted in this research paper. However, [this report](#) lacks engagement in local communities or consumer perspectives which results in more difficult implementations of the reports recommendations because it does not account for local needs as much as it could. Our findings have shown that India is in need of an investment surge as previously found, but also how air pollution massively contributes to future and current economic losses. This paper will explore the high potential that India has with solar power and how it can mitigate India's projected economic losses through PLI schemes and its electric vehicles fleet (EVs) which will directly tackle the economic consequences that air pollution poses.

*Keywords: India, renewable energy, green energy sector, solar power, climate change, air pollution, infrastructure, electric vehicles (EVs), PLI schemes (Production-Linked Incentive), sustainable development, consumer perspectives, local communities*

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## **I. Introduction**

India has pledged to achieve a net-zero on emissions by 2070, they are also striving for 500 GigaWatts (GW) of stored capacity for renewable sources of energy by 2030. (IEEFA, 2025). Additionally the global economy could face up to 50% loss in Gross Domestic Product (GDP) between 2070 and 2090 from the detrimental shocks of climate change if current policies and current usages of fossil fuels remain the same. (The Guardian, 2025). This economic loss is expected to take place unless immediate action by political leaders is taken to reduce carbon emissions and to restore nature in our world.

This paper looks to address the potential impacts investments in green energy infrastructure in India can have on reducing the highlighted economic losses caused by climate change and how political, economic and philosophical factors influence the needed shift in our markets and systems towards a more sustainable and long-term-goal driven society. These issues that societies face globally and within India signify the importance of green energy in our future and current systems as well as embodies the concept of sustainable economic growth. Sustainable economic growth is a way in which we can grow an economy in such a way that it satisfies the needs of present societies and markets whilst also avoiding compromising the ability of future generations to meet their own needs.

A big aspect of sustainable economic growth is using resources efficiently which involves transforming markets towards implementing green and more sustainable solutions. This is crucial as a shift towards investing in renewable sources will stimulate research and development in renewable technologies. Due to the labour intensive nature of the renewable sector particularly in the installation and maintenance processes for solar panels, windmills etc can grow and create industries and jobs for entrepreneurs and individuals. Now the question remains, to what extent will these benefits prove to be effective in reducing economic loss from climate change specifically in India.

First we must notice that India is a developing country, a developing country is one in which it is in the process of improving its economic, social and political structures but is still posed with large challenges compared to developed countries. Particularly in developing countries, households face lower average income levels compared to developed nations as well as the national economy is often less industrialised and rely more on agriculture and raw materials for their economic activity. Thus, this paper asks: **To what extent can investments in green energy infrastructure mitigate India's projected economic losses from climate change, and how can economic and philosophical approaches to sustainability influence the adoption of long-term growth-oriented green technologies?**

## II. Literature Review

This section will evaluate a previous report by the IEEFA (Institute for Energy Economics and Financial Analysis). This section will also cover the key talking points that the paper addresses such as DISCOM financial stress, India's 100% reliance on imports for essential minerals for renewable energy technologies, and its inadequate policy support for hybrid and storage projects. Finally, this section will evaluate the strengths of the report such as its clear and structured analysis, its credibility and relevance, and its direct nature towards policy makers and investors, as well as its weaknesses of the report such as its lack of use of localized data and macroeconomics dominant nature, and its support based view of innovation.

This IEEFA provides a report on the barriers preventing India in its renewable energy transition. Despite India's significant increase in their installed capacity for renewable energy from 180.79 GW in December 2023 to 209.44 GW as of December 2024, the IEEFA found that due to the systemic and structural issues within markets and regulations in India, the country may face hindered growth in its renewable energy expansion plans.

The IEEFA argues that these barriers can specifically be expressed through the DISCOM financial stress, India's 100% reliance on imports for essential minerals for renewable energy technologies, and its inadequate policy support for hybrid and storage projects. In this report ([IEEFA report](#), 2024) it mentions how many DISCOMs face financial adversity due to mounting losses, inefficient bill collection and inadequate tariffs. All these challenges prevent these companies from acquiring Power Purchase Agreements (PPA) and as a consequence, this stalls and delays renewable energy projects. Additionally, the inability of DISCOMs to sell the electricity because they don't have the PPAs to do so restricts their

access to guaranteed income, therefore they cannot show revenue certainty to banks and investors preventing these companies from accessing financing.

The IEEFA report also highlights the fact that India's renewable sector is highly dependent on imports for crucial materials that are essential for renewable technologies like lithium, cobalt and nickel. Consequently, this dependence on foreign sources for these minerals exposes the renewable sector to supply disruptions, price volatility and geopolitical risks. The final key takeaway claims that the inadequate policy support for hybrid and storage projects poses a threat to India's renewable sector. While the ISTS waivers benefit solar and wind projects, they pose a threat to the economic viability of storage and hybrid projects, this is because when the waivers expire, the projects that were designed to assume free transmission, face new costs. This targets wind and hybrid projects harder than solar and wind projects because hybrid and storage systems face higher capital costs therefore by adding the transmission costs this can tip the scale and deem their power more expensive than coal or different renewable sources to hybrid and storage systems. More specifically, storage projects in particular face issues with cost recovery, although the system adds grid resilience and flexibility, storage projects do not generate revenue like generation projects therefore to implement more costs through an expiration of ISTS waivers without revenue streams for flexibility services makes storage unappealing financially.

The IEEFA report provides an in-depth analysis of the state of India's renewable energy sector by expanding on the financial issues that DISCOMS face, the geopolitical dependencies that the country has on imports from mostly China and the regulatory and inadequate policy support that certain projects face. The report uses data as of late 2024 ensuring its credibility and relevance. On top of this the report directly addresses and speaks to investors, policy makers and utility companies, the report specifically does this by addressing investor confidence and market conditions that can be looked over in reports that lean more towards discussing policies. Additionally the report has a clear and concise structure to it with a clear and logical movement from discussing and locating problems to providing policy adjustments that can help tackle these issues holding back India's renewable energy sector from fully blossoming and achieving their target of 500 GW of non fossil fuel based energy by 2030. Finally, the report successfully identifies and highlights storage and hybrid systems as key features for the future of energy transition.

Whilst the report has its strengths with its in depth analysis, it only looks at the macro side of things, the report could use more localized data. For example, areas like regional disparities in grid infrastructure or DISCOM performance is not analysed as much as they could. This links well with another issue that the report has, that it could benefit with more engagement in local communities or consumer perspectives. This limits the reports effectiveness as a roadmap for an inclusive energy transition. As a consequence, this can make it more difficult to implement the recommendations the report makes as they don't account for local needs. The final issue that can be pointed out is how innovation is seen more as a supporting cast rather than its own driving frontier; the report does not fully envision how India can lead in the global clean energy sector, perhaps through AI-enabled grid balancing and climate resilient infrastructure.

### III. Methodology

To answer the question: **To what extent can investments in green energy infrastructure mitigate India's projected economic losses from climate change, and how can economic and philosophical approaches to sustainability influence the adoption of long-term growth-oriented green technologies?** This research paper will provide a qualitative research approach from credible sources such as the Financial Times, The Economic Times, The Government of India Press Information Bureau and more. The data collection is entirely secondary research and does not involve any data collected through interviews, surveys. This secondary qualitative approach works particularly well when addressing this question as the question blends economics, environmental science and public policy. Therefore by allowing for a

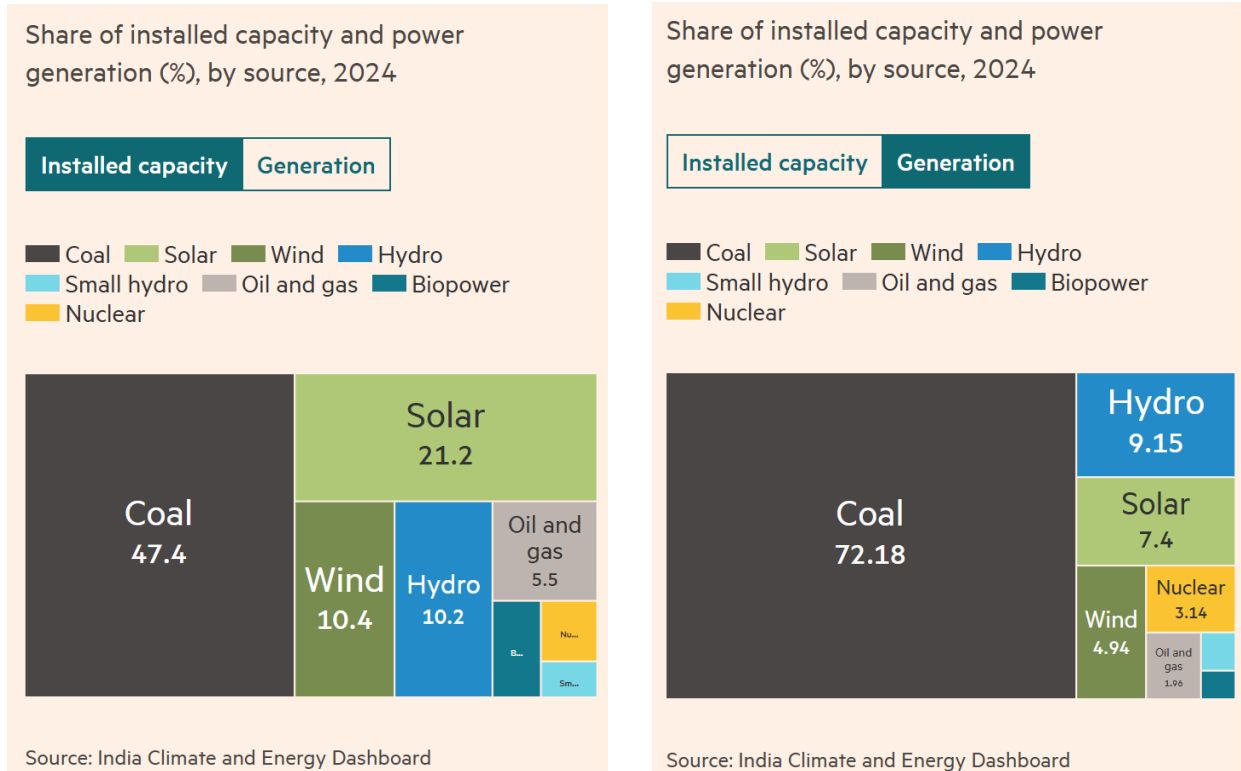
qualitative approach we can understand the links between these specific areas. Additionally in the paper we will see that India's development model and their public and private economy affect how green technologies are adopted, therefore by looking at qualitative reports from credible sources as previously mentioned will provide an in-depth analysis of the topics addressed by the research question. Finally, while economic losses can be quantified, it is difficult to quantify how policies are influenced or any behavioural shifts that can affect the course of action, thus qualitative research can pinpoint these factors that are influencing the adoption of green technologies in India.

#### **IV. Limitations**

Whilst these remain true, it is also important to note that there are several limitations of this qualitative secondary research approach as this approach relies entirely on other researchers' findings. This is aligned with another issue this approach faces, which is the fact that qualitative sources can present biases whether that be political or ideological. This makes it difficult for researchers to correct these biases. Finally, qualitative approaches lack the ability to quantify the numbers accurately, it is true that qualitative data can present certain themes or correlations however it lacks numerical proof to address the question of how much solar power can mitigate the projected economic losses from climate change.

#### **V. Results/Findings**

India has set an ambitious goal for itself of achieving 500 GW of non fossil fuel sources of energy by 2030. Currently as things are it seems as if they will be unable to achieve this. One of the reasons for this is the lack of investment that the renewable sector in India faces. Last year, India received just over \$13 billion in green energy investment according to the International Energy Agency (IEA). This number falls substantially short from the \$68 billion needed in order to achieve the 500 GW of power from renewable sources by 2030. (Financial Times, 2025) This represents the stimulus in investment and financing that India requires in its renewable sector. This sort of financial shortfall can really put a stop to India's green energy ambitions. We have previously seen from the IEEFA report that DISCOMs face financial adversity due to mounting losses, inefficient bill collection and inadequate tariffs preventing them from acquiring Purchasing Power Agreements (PPA) and as a consequence, stalling and delaying renewable energy projects. A report estimated that a total capital flow of \$300bn is needed by 2032 to keep India on track to meet its renewable energy targets. Aside from this however, India also faces a renewable energy capacity to power generation problem.



**Figure 1:** Share of installed capacity to power generation. Source: Schipani, A. and Kaushik, K. (2025). India’s Renewables Sector Falling Far Short of Needed Investment Surge. [online] @FinancialTimes. Available at: <https://www.ft.com/content/dabfeb72-f3ed-4207-b498-1c1d5c103ef2>.

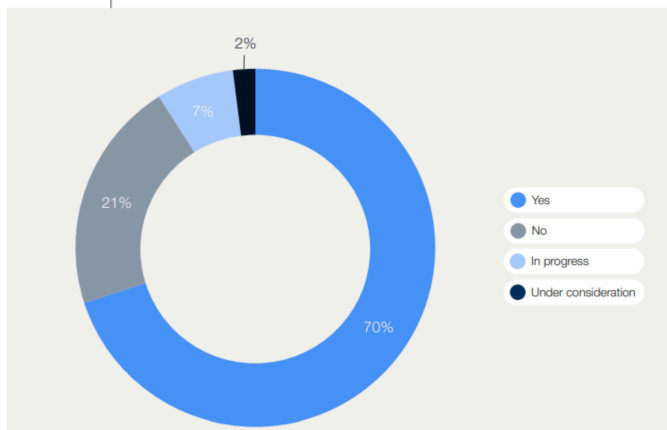
If we look at the percentage share of installed capacity across all sources of energy (renewable and non renewable) to the power generation created from said sources we can see that coal is a significant factor in both. More importantly, it contributes to 72% of the country's power generation. When we look at the renewable sources, the country has around 209 gw of installed renewable energy capacity which contributes to under a quarter of the country's total power generation. What this entails is that coal is not just a major source of energy for India but is a dominant one, this shows that India’s grid is still dependent on fossil fuels. Additionally it signifies that India is suffering from under generation from renewable energy sources despite having 209 GW of capacity and growing. This highlights the possibilities that India is facing struggles with grid integration, storage and policy support which we have previously looked at in the literature review. On the other hand, China (the world's largest polluter) generates close to 35% of its power from renewable sources excluding nuclear energy. Along with this, the US has raised questions with regards to Gautam Adani, the founder of Adani green energy which is India’s largest solar energy company. They have raised questions on the company's approach to securing contracts within the country. Adani green energy being put under the spotlight of controversy stimulates uncertainty amongst investors looking to invest in India’s renewable energy sector. This poses a large threat for India particularly because India has a huge demand for renewable energy however these kinds of controversies increase the risk perception associated with investing in India’s renewable projects therefore it can slow down new investments into said projects. This kind of news can really spook investors who are already weighing the risks which can particularly further deteriorate the needed investment in India’s renewable energy sector in order for them to achieve their 2030 goal. Finally to finish the report on the current state of India’s renewable energy sector S&P Global’s India subsidiary Crisil estimated in a report last month that India’s green investments totalled nearly \$70bn between 2019 and 2024. This will need to go up to \$350bn in the next five years if it is to meet its green energy targets. This is a rather difficult task due to perceptions of low-carbon

projects as being high risk and the changing regulatory policies that are resulting in an unpredictable business environment. Now if we look at the economic losses due to climate change for India we can see that India is projected to face 24.7% GDP loss due to climate change specifically by 2070, (The Economic Times, 2024). Key factors that contribute to this projected economic decline are presumed to be the rising sea levels and decreased labour productivity.

To simply put it, India’s extensive coastline is vulnerable to rising sea levels and therefore infrastructure built upon this coastline and agriculture can take a large hit and contribute to the projected economic loss for the future, all the buildings, shops and simply anything that contributes to economic activity within India can be subject to destruction. On top of this, the decreased labour productivity can be seen as an implication of more frequent heat waves, people cannot be as productive in high heat due to rapid dehydration and tiredness, it’s inhumane to think otherwise. The sectors that will likely face the most economic losses from the decreased labour productivity are agriculture and construction due to its labour intensive nature and openness to the sun and the heat.

Additionally, a third of India’s GDP comes from sectors reliant on nature like agriculture, fisheries and aquaculture. (World Economic Forum (WRF), 2024) This holds significance because it was previously mentioned how this affects labour productivity. However, according to a survey made by the WRF, it shows that India’s largest companies have made commitments to sustainability and natural climate solutions (NCS) which will look to protect and restore sustainably managed terrestrial, freshwater, coastal and marine ecosystems. This is a good sign because it shows that companies are starting to realize the threat that climate change poses to the economy and are showing their commitment to helping reduce the projected economic losses because of it. However as of December 2023 Climate Action Tracker has rated India’s efforts towards reaching their targets for 2030 as ‘highly insufficient’.

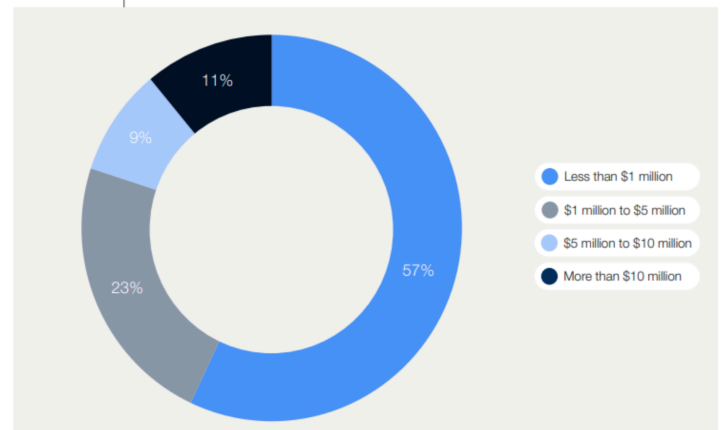
FIGURE 2 | Respondent companies that have integrated NCS into corporate sustainability commitments (%)



India's largest corporations are highly committed to NCS as part of their sustainability commitments.

Image: World Economic Forum

FIGURE 3 | Scale of investment in NCS



Most Indian corporates surveyed invest less than \$1 million into natural climate solutions.

Image: World Economic Forum

**Figure 2:** share of respondent companies that are integrating NCS to sustainability commitments and the scale of these investments. Source: Willige, A. (2024). India’s at-risk Economy Needs More Natural Climate Solutions. [online] World Economic Forum. Available at: <https://www.weforum.org/stories/2024/08/india-economy-natural-climate-solutions/>.

When we look at the percentage of companies that have either integrated or are in progress of integrating NCS into corporate sustainability commitments we can see that totals to 77% of respondent companies. But then when we look at the scale of investment that these companies have placed into NCS 57% of them commit to less than \$1 million. This represents the ‘highly insufficient’ effort into reaching their targets for 2030 and shows once again that India is in need of

investment into their renewable energy sector.

Another key issue that India faces is how air pollution negatively affects the country economically. We can see that air pollution is a significant negative externality of consumption, but this has further consequences such as increased healthcare costs. This is due to the long term exposure to pollutants such as Nitrogen Oxide (NOx) and particulate matter (PM2.5). (World Bank, 2024) These pollutants increase the risk of asthma, bronchitis, lung cancer and can cause cardiovascular problems. As a result this increases hospital admissions and increases the demand for medication. This has a larger spillover effect that hits obviously the environment but also productivity as those who are affected by air pollution related diseases can miss work and can be less productive.

This can be addressed however by striving for improvement in their Electric Vehicles (EV) sector. This can range from increasing production of EVs or by improving the charging infrastructure for EVs. The point is that EVs reduce air pollution in the streets and across the country. Why is this significant? Because in 2019 air pollution killed approximately 1.67 million people in India, 17.8% of the total deaths within India that year were related to air pollution, on top of this, India also faced lost output from premature deaths and morbidity related to air pollution of roughly US \$28.8 billion and \$8 billion respectively. In total this was a loss of \$36.8 billion which represents 1.36% of India's GDP at the time. This is not only a massive economic loss, but also represents how we morally ought to address these issues as air pollution is a significant cause of death within India. Additionally, air pollution is a significant negative externality of consumption in this instance because it increases the burden on healthcare systems and it decreases the workforce productivity. When we look at it from a wider lens, we can suggest that key issues that are prominent in India currently in terms of their renewable energy sector and how they face economic losses due to climate change are primarily the serious lack of investment into their renewable energy sector, India's grid dependency on coal and their inefficient transformation from stored capacity to generated power, its rising sea levels and decreased labour productivity and finally how air pollution significantly constrains the country economically through its health related costs.

## VI. Analysis & Findings

Now to answer part of the question being 'To what extent can investments in green energy infrastructure mitigate India's projected economic losses from climate change' we must first define the term 'green energy infrastructure'. Green energy infrastructure refers to physical and organisational systems that are needed in order to store, generate, transmit and use renewable and environmentally sustainable energy sources. India has a lot of potential for renewable energy in all sorts of forms but we are going to focus on one key source being solar energy and its potential to mitigate economic losses. In India, solar power can be a large renewable source of energy. Most parts of India have over 300 sunny days a year. (TOI+, 2025). Not only this, but India's capacity for solar power extends to its geographical diversity, solar infrastructure, and policy support. We've already seen how India has abundance in solar days but particularly is abundant in said solar days in some Indian states like Rajasthan, Gujarat, Madhya Pradesh, and Maharashtra.

However, Solar power will not mitigate all the economic losses due to climate change because of its intermittency of solar powered energy. Essentially, solar power is not available at all times like during the night, it can only generate electricity during the day when the sun is out. This represents the necessity of energy storage systems and other forms of electricity generation such as wind power and hydro power. The storage systems can preserve excess solar power that has been generated during sunny days and can then be used when there is a lack of sun perhaps during the night or during cloudy weather. It can also be said that the ability for solar energy to perform is dependent on grid adaption.

Then when we look at the potential infrastructure that can bridge the gap between the desired stored capacity and the

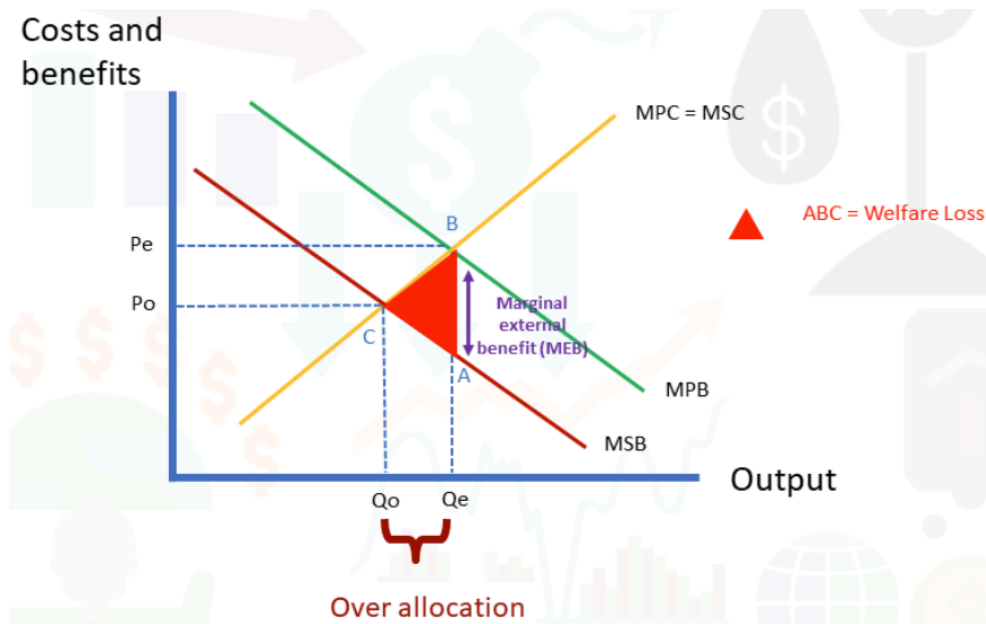
existing stored capacity and also mitigate the projected economic losses from climate change for India, we can see that currently India imports a large proportion of their solar panels, cells, and wafers primarily from China. However, India can tackle this by boosting domestic manufacturing capacity. How would they do this? through the Production Linked Incentive (PLI) scheme . This is a government initiative that offers financial incentives to produce domestically rather than import from abroad. This can limit the projected economic loss from climate change as it reduces the import vulnerability for India for solar panels, cells and wafers and other types of renewable energy sources which can be crucial during perhaps any supply disruption or more specifically a climate based one for solar panels, cells and wafers. Additionally, incentivising domestic production will stimulate job growth, and will increase overall production of infrastructure that contributes to stored capacity of renewable energy.

As a consequence, this will not only stimulate economic activity through the multiplier effect, but will also constrain economic losses due to climate influenced unemployment. The multiplier effect describes how an initial increase in spending through for example government spending or Investment, will lead to greater economic activity within an economy that is larger than the initial investment sum. In the case of PLI schemes, this suggests that when we add the value that financial incentives through the PLI schemes generate, and the value of investment that is generated through increasing domestic production of solar panels etc. this value is greater than the actual value of the financial incentives offered and the value of the investment. This is due to the fact that the stimulated investments create job opportunities in the renewable energy production sector, therefore these individuals will take with them an income that they can then use to further stimulate economic activity by consuming goods and services which then provides businesses with greater profits therefore increasing their reinvested profits and as a result, further creating economic activity. This PLI scheme has generated over 1.46 lakh crore (US \$17.5 billion) of actual investments as of August 2024, these investments have also boosted production and sales amounting to 12.50 lakh (US \$148 billion) crore and has also directly and indirectly generated 9.5 lakh jobs (950 thousand). (Government of India Press Information Bureau, 2024). It has also been said that in the future, the PLI schemes could generate incremental revenue of around US \$459 billion over the next 5-6 years for over 720 companies. (The Economic Times, 2025). The point is that in the case of these PLI schemes financial incentives that are provided, and actual investments created as result of these financial incentives contribute to greater economic activity than what their face value suggests through the multiplier effect. This represents the growing potential of India's central governments PLI schemes that have had and are expected to have a positive impact on the intended beneficiaries of India's exports, its reduction in imports and its generation of jobs in green sectors. Over all, all of this contributes to increasing production in infrastructure that can store renewable energy, therefore bringing India closer to its target of 500 GW of stored capacity by 2030.

However, it is important to point out that the PLI schemes alone will not successfully bridge the gap fully between desired stored capacity as India faces significant delays in project approvals for green energy infrastructure. The IEEFA report highlights how DISCOMs in India struggle to get access to PPA and therefore prevent them from selling electricity. As a consequence many of these companies face significant delays in their project approval. Additionally several PLI awardees for solar energy have faced delays in project approval and in financing preventing them as well as the country as a whole from working towards the desired stored capacity levels. This will consequently force companies to rely more on coal powered sources of energy therefore undermining their sustainability and finally limiting emission reductions therefore creating health and environment costs as previously seen in the discussion

Another thing that limits the effectiveness of the Production Linked Incentives schemes (PLI) is how it lacks an R and D or innovation focus. This is because the schemes reward high-volume production rather than firms innovating and making the ability to store energy capacity more efficient. This could potentially see India falling behind in global innovation

leaders in green energy technology. As a result, this stagnant technology results in lower efficiency as firms, instead of looking to develop better tech will instead look to scale up production of existing tech therefore preventing searches for cheaper and more efficient alternatives. As a consequence energy storage remains expensive and inefficient which slows down the shift from coal and fossil fuels to more sustainable alternatives therefore generating long term economic losses as previously mentioned from them.



**Figure 3:** Negative Externalities of consumption from petrol cars.

Source: *The Curious Economist* (2024). *Externality Diagrams*. [online] *The Curious Economist*. Available at: <https://thecurioseconomist.com/externality-diagrams/>.

Moving on to another way forward in which India can reduce their projected economic loss due to climate change is through improvements in its EV sector. Figure 3 represents the negative externalities of consumption of petrol cars. The issue here is that to the individual consumer, it is rational to consume and use petrol vehicles, as consumers will not consider the environmental social costs generated to society from them and will only consider the private costs like the price or necessity of petrol. This consumption, however, will generate external costs, briefly we touched upon how air pollution is a significant driver for economic losses in India. This is an example of an external cost generated from consumption of petrol vehicles. Therefore, the social cost is greater than the private cost in the case of petrol vehicles. Because the consumers don't pay for the external costs this leads to overconsumption as represented by the difference between  $Q_o$  and  $Q_e$ . As a result the market has failed to allocate resources efficiently which results in a deadweight loss and this is a type of market failure.

## VII. Analysis & Findings

However, if we were to look to increase production of EVs in India and potentially implement policies that prevent/limit the consumption and usage of petrol cars, these negative externalities would see themselves significantly decrease as the market for petrol cars shifts from MPB to closer to the MSB in figure 3. This is because there is an over-consumption of petrol vehicles and an under consumption of EVs therefore creating a deadweight loss in the process. However a big issue we have seen that limits the consumption and usage of EVs is the lack of/unreliable charging stations. This is being addressed through the PLI schemes for Advanced Chemistry Cells (ACC) which are a key component of these solar

powered charging stations. By 2030 India is expected to have 102 million EVs which will need 2.9 million public charging stations. (Clean Mobility Shift, 2023). Implementing more of these stations will directly reduce the negative externalities of consumption generated by petrol vehicles such as air pollution, healthcare costs and loss of productivity as EVs reduce emissions of PM2.5 and NOx. Therefore, by increasing the supply of charging stations, the capacity for EVs to be on roads increases. Consequently, this alongside policies that increase the demand for EVs or reduce the demand for petrol cars will allow for a shift from MPB to MSB therefore reducing the deadweight loss and reducing the negative externalities generated from the consumption of petrol cars like the previously mentioned air pollution, healthcare costs and a loss of productivity. This directly reduces costs to businesses and to health care systems which mitigates economic losses that are caused by climate change.

The issue with these EV stations however is how they can limit coverage in more rural areas. This ultimately boils down to how there is low demand for EVs themselves in these rural areas, especially with four-wheelers therefore this low demand creates a cycle, the less EVs there are in these rural areas, the less incentive for private operators and firms to invest in these EV charging stations due to the lack of a serious profit motive. Therefore as a consequence, not only are there less EV charging stations, but this promotes the regressive cycle, now people have less of an incentive to purchase and use EVs because of the lack of charging stations and so the cycle repeats constantly. This, as a result, seriously limits EV coverage in rural areas. In order to fix this issue the government could potentially look to provide financial incentives in the form of tax incentives through lowered GST rates and income tax rebates on EV purchases, Additionally the government could provide awareness campaigns and promote EVs through advertising and media. This will consequently incentivize individuals to consume EVs on a larger scale therefore capitalizing on the increased supply and thus allowing for a greater switch over from petrol vehicles to EVs finally reducing the negative externalities of consumption generated from petrol vehicles.

This represents how there needs to be a stimulus in demand for EV vehicles, not only to allow for more even coverage in rural areas, but also in order for these vehicles to be useful when it comes to mitigating projected economic losses and reducing negative externalities. Ultimately without the high demand for EVs, the economic burden of those negative externalities and the limited coverage in rural areas are felt by the economy as we've seen throughout the discussion and the results/findings. Therefore, it is absolutely crucial that there be a stimulus in demand for EV vehicles in India if they intend to prevent these negative economic consequences from coming to fruition and we can also say that success in one sector like solar power generation through PLI schemes can directly support powering EV charging stations with renewable energy which represents a synergy between the two, this shows the importance of not only increases in EV charging station production and EV consumption but also solar power production through PLI schemes.

## VIII. Conclusion

Finally, a conclusion on the question **“To what extent can investments in green energy infrastructure mitigate India’s projected economic losses from climate change, and how can economic and philosophical approaches to sustainability influence the adoption of long-term growth-oriented green technologies?”** This question has been addressed through several key arguments such as how solar energy will play a key role in India’s future of sustainable economic development, how India’s PLI schemes can further reduce import reliabilities and how it can stimulate domestic investment and finally how EV charging stations, paired with stimulated demand for EVs themselves can reduce economic losses through a reduction in negative externalities. These three points work together to tackle the issues that we saw in the findings, particularly how India faces a lack of investment into its renewable energy sector and how air pollution and health related costs arise from driving petrol cars rather than opting for a cleaner alternative through EVs. As a final statement, I believe that the extent to which these investments in green energy infrastructure can mitigate

India's projected economic losses from climate change is dependent on several factors such as the diversity India's renewable sector has, hopefully the country is not purely reliant on solar energy and will diversify their sector by creating a strong hydro and wind sector to compliment their solar one. But as a whole, green energy infrastructure has lots of potential in mitigating projected economic losses and should be the way forward for India.

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