



# Green Fiscal Policy: A Catalyst for Sustainable Economic and Environmental Development

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**Abstract :** Green fiscal policy, an innovative approach to economic management, has gained prominence as a means to address pressing environmental challenges while fostering sustainable economic growth. This research paper explores the concept of green fiscal policy, its underlying principles, and its multifaceted impacts on economic, social, and environmental domains. By analyzing case studies of renewable energy sources particularly solar energy, the paper delves into the effectiveness, challenges, and potential of green fiscal policy in achieving a harmonious balance between economic development and environmental preservation. The findings emphasize the importance of well-designed green fiscal measures in steering nations toward a greener and more resilient future.

## I. INTRODUCTION

The 21st century has brought about unprecedented challenges at the intersection of economic growth, environmental sustainability, and societal well-being. As concerns about climate change, resource depletion, pollution, and ecological degradation have gained prominence, the need for innovative policy solutions that harmonize economic and environmental goals has become increasingly evident. Green fiscal policy, a concept that marries fiscal instruments with environmental objectives, has emerged as a promising approach to address these complex challenges and pave the way for a more sustainable future.

Green fiscal policy is a collection of fiscal policy instruments that are used to achieve environmental goals. It can include a variety of measures, such as taxes, subsidies, and public investments, that are designed to encourage the development and use of clean technologies and renewable energy sources, and to discourage the use of fossil fuels and other polluting activities.

Among this solar energy is a renewable energy source that has the potential to play a major role in meeting the world's growing energy needs in a sustainable way. It is clean, abundant, and widely available. However, solar energy technologies can be relatively expensive to install, and they may not be suitable for all applications.

This paper aims to provide a comprehensive exploration of green fiscal policy, Green fiscal policy can be used to promote the development and deployment of solar energy in a number of ways. For example, governments can provide subsidies to help consumers and businesses purchase solar panels and other solar energy equipment. They can also offer tax breaks to companies that invest in solar energy projects. In addition, governments can make public investments in solar energy research and development, and in the deployment of solar energy infrastructure, such as solar farms and transmission lines.

India is a strong promoter of solar energy. The government has set ambitious targets for solar energy deployment, and it has implemented a number of policies and programs to support the solar energy industry.

Some of the keyways in which India is promoting solar energy include:

- **Setting ambitious targets:** The Indian government has set a target of installing 500 GW of solar power capacity by 2030. This is equivalent to about 30% of India's total electricity generation capacity.
- **Implementing supportive policies:** The Indian government has implemented a number of policies and programs to support the solar energy industry. These include:
  - **Feed-in tariffs:** The government has set feed-in tariffs for solar power, which are guaranteed prices that solar power generators are paid for their electricity. This helps to make solar power more financially attractive for investors.

- **Net metering:** Net metering allows solar power generators to offset their electricity consumption with the electricity they generate from their solar panels. This helps to reduce their electricity bills.
- **Incentives for rooftop solar:** The government offers a number of incentives for rooftop solar installations, such as subsidies and tax breaks.
- Investing in solar energy research and development: The Indian government is investing in solar energy research and development to help reduce the cost of solar energy technologies and to improve the efficiency of solar panels.
- Promoting the domestic solar manufacturing industry: The Indian government is promoting the domestic solar manufacturing industry by offering tax breaks and other incentives to solar panel manufacturers.

As a result of these efforts, India has become a major player in the global solar energy market. The country is now the fourth largest solar power producer in the world, and it is expected to become a global leader in solar energy in the coming years.

Here are some specific examples of how India is promoting solar energy:

1. The government has launched a number of solar energy parks across the country. These parks provide land and other infrastructure for solar power projects.
2. The government is offering subsidies to solar power developers who build solar energy projects in rural areas. This is helping to bring solar power to underserved communities.
3. The government is promoting the use of solar power in government buildings and other public institutions. This is helping to set an example for the private sector.
4. The government is supporting the development of solar energy storage technologies. This will help to make solar power more reliable and to reduce its reliance on the grid.

India's efforts to promote solar energy are having a positive impact on the country's economy and environment. The solar energy industry is creating jobs and generating revenue. Solar power is also helping to reduce India's reliance on fossil fuels and to improve air quality.

Overall, India is a strong promoter of solar energy. The government has set ambitious targets, implemented supportive policies, and invested in solar energy research and development. As a result, India is becoming a major player in the global solar energy market.

**Here are some examples of how other countries has been used to promote solar energy:**

- **Germany:** Germany has one of the most ambitious solar energy programs in the world. The country has used a combination of subsidies and tax breaks to support the deployment of solar panels on homes and businesses. As a result, Germany has become a world leader in solar energy production.
- **China:** China is another major investor in solar energy. The country has set aggressive targets for solar energy deployment, and it has used a variety of fiscal policy instruments to support these targets. For example, China provides subsidies to solar energy companies, and it offers tax breaks to consumers and businesses that purchase solar panels.
- **United States:** The United States has also used fiscal policy to promote solar energy. The federal government offers a tax credit for the purchase of solar panels, and many states offer their own solar energy incentives. As a result, the United States has become one of the leading markets for solar energy in the world.

Green fiscal policy has played a significant role in the growth of the solar energy industry. By providing subsidies and tax breaks, governments have made solar energy more affordable for consumers and businesses. In addition, public investments in solar energy research and development have helped to reduce the cost of solar energy technologies.

However, it is important to note that green fiscal policy is not a silver bullet. It is important to have a comprehensive approach to promoting solar energy, including supportive regulatory policies and market-based mechanisms. In addition, governments need to ensure that green fiscal policy instruments are targeted effectively and that they are used efficiently.

Overall, green fiscal policy is a valuable tool that governments can use to promote the development and deployment of solar energy. By providing subsidies, tax breaks, and public investments, governments can help to make solar energy more affordable and accessible, and they can accelerate the transition to a clean energy future.

## II. NEED OF THE STUDY

Green fiscal policy is the use of fiscal instruments, such as taxes, subsidies, and public spending, to promote environmental protection and sustainable development. It is a critical part of efforts to address global challenges such as climate change, air and water pollution, and biodiversity loss.

There is a need to study green fiscal policy for several reasons:

- To better understand the potential of fiscal policy to address environmental challenges. Fiscal policy is a powerful tool that can be used to influence economic behavior and shape the investment landscape. By studying green fiscal policy, we can learn how to use this tool most effectively to achieve environmental goals.

- To identify the best mix of fiscal instruments for different contexts. There is no one-size-fits-all approach to green fiscal policy. The best mix of instruments will vary depending on the specific environmental challenges facing a country or region, as well as its economic and political context. By studying green fiscal policy, we can learn from the experiences of other countries and identify the most effective approaches for different settings.
- To assess the impact of green fiscal policy. It is important to understand the economic, environmental, and social impacts of green fiscal policy. This information can be used to design and implement policies that are effective and efficient, and to avoid unintended consequences.

The study of green fiscal policy is a relatively new field, but it is rapidly growing in importance. As the world faces increasingly pressing environmental challenges, policymakers are increasingly looking to fiscal policy as a tool to address them. By studying green fiscal policy, we can help to ensure that this tool is used effectively to achieve a sustainable future.

Here are some specific examples of the need to study green fiscal policy:

- To design policies that can help countries achieve their net zero emissions targets.
- To develop policies that can support the transition to a green economy, while also protecting vulnerable communities.
- To assess the costs and benefits of different green fiscal policy instruments, such as carbon taxes and subsidies for renewable energy.
- To understand how green fiscal policy can be used to promote environmental justice and equity.

The study of green fiscal policy is essential for developing and implementing effective policies to address the world's environmental challenges.

### III. IMPLEMENTATION CHALLENGES OF GREEN FISCAL POLICY

Green fiscal policy is the use of fiscal instruments, such as taxes, subsidies, and public spending, to promote environmental protection and sustainable development. It is a critical part of efforts to address global challenges such as climate change, air and water pollution, and biodiversity loss.

However, there are a number of challenges to implementing green fiscal policy. Some of the most common challenges include:

- **Political opposition:** Green fiscal policy can often face opposition from powerful vested interests, such as the fossil fuel industry. These groups may lobby against green fiscal policies or try to undermine their implementation.
- **Economic costs:** Some green fiscal policies, such as carbon taxes, can impose costs on businesses and consumers. This can lead to opposition from these groups and can also make it difficult to build political support for green fiscal policy.
- **Lack of capacity:** Many countries lack the capacity to implement green fiscal policy effectively. This may be due to a lack of expertise, data, or institutional infrastructure.
- **Equity concerns:** It is important to ensure that green fiscal policy is implemented in a way that is equitable and fair. This means that the costs and benefits of green fiscal policy should be distributed in a just manner.

Here are some specific examples of implementation challenges for green fiscal policy:

- **Subsidizing renewable energy in a way that is efficient and targeted.** Renewable energy subsidies can help to reduce greenhouse gas emissions and promote the development of renewable energy technologies. However, subsidies can also be expensive and can lead to market distortions. It is important to design renewable energy subsidies in a way that is efficient and targeted, so that they support the development of renewable energy in a cost-effective manner.
- **Reforming public procurement to favor green products and services.** Public procurement is a major source of demand for goods and services. Governments can use public procurement to promote the demand for green products and services. However, this can be challenging, as it often requires changes to existing procurement procedures.

Despite the challenges, there is a growing recognition of the importance of green fiscal policy. More and more countries are implementing green fiscal policies to address environmental challenges and promote sustainable development.

There are a number of things that can be done to overcome the challenges to implementing green fiscal policy. These include:

- **Building public support for green fiscal policy.** This can be done by educating the public about the benefits of green fiscal policy and by addressing the concerns of those who may be negatively affected by green fiscal policy.
- **Designing green fiscal policies that are efficient, effective, and equitable.** This requires careful planning and analysis.
- **Developing the capacity to implement green fiscal policy effectively.** This includes investing in training and research and building the necessary institutional infrastructure.

By addressing the challenges to implementing green fiscal policy, we can create a more sustainable future for all.



#### IV. BENEFITS AND SYNERGIES

Green fiscal policies offer a number of benefits, including:

- Environmental benefits: Green fiscal policies can help to reduce greenhouse gas emissions, improve air and water quality, and protect biodiversity.
- Economic benefits: Green fiscal policies can boost economic growth, create jobs, and attract investment.
- Social benefits: Green fiscal policies can improve public health, reduce poverty, and promote social justice.

In addition to these benefits, green fiscal policies can also create synergies with other policy goals. For example, green fiscal policies can help to:

- Promote innovation and technological development: Green fiscal policies can create incentives for businesses to invest in new, clean technologies.
- Improve energy security: Green fiscal policies can help to reduce reliance on imported fossil fuels and increase the use of renewable energy sources.
- Reduce inequality: Green fiscal policies can be designed to benefit low-income households and communities that are disproportionately affected by environmental pollution.

Here are some specific examples of the benefits and synergies of green fiscal policies:

- A carbon tax can reduce greenhouse gas emissions and promote the transition to a green economy. It can also generate revenue that can be used to fund public services or to reduce other taxes.
- Subsidies for renewable energy can help to reduce greenhouse gas emissions and promote the development of renewable energy technologies. They can also create jobs and boost economic growth.
- Investing in public transportation can reduce air pollution and traffic congestion. It can also make it easier for people to get around without a car, which can save them money and reduce their carbon footprint.

Green fiscal policies are an important tool for addressing environmental challenges and promoting sustainable development. By offering a range of benefits and synergies, green fiscal policies can help to create a better future for all.

#### V. FUTURE OUTLOOK AND RECOMMENDATIONS

The future for green fiscal policy is very promising. As the world becomes increasingly aware of the need to address climate change and other environmental challenges, there is a growing demand for effective policy solutions. Green fiscal policy is a powerful tool that can be used to achieve these goals.

In the coming years, we can expect to see more and more countries implement green fiscal policies. These policies will be designed to promote the transition to a green economy, reduce greenhouse gas emissions, and improve air and water quality.

Here are some specific recommendations for the future of green fiscal policy research:

- More research is needed on the design and implementation of effective green fiscal policies. This includes research on how to design policies that are efficient, effective, and equitable. It is also important to study the best practices for implementing green fiscal policies in different contexts.
- More research is needed on the impacts of green fiscal policies on economic, social, and environmental outcomes. This includes research on the impact of green fiscal policies on economic growth, employment, poverty, and inequality. It is also important to study the environmental impacts of green fiscal policies, such as their impact on greenhouse gas emissions and air and water quality.
- More research is needed on the interactions between green fiscal policy and other policy areas. This includes research on how green fiscal policy interacts with other environmental policies, as well as with economic and social policies. It is important to understand how these interactions can affect the effectiveness of green fiscal policy.

By addressing these research needs, we can help to ensure that green fiscal policy is used effectively to create a more sustainable future for all.

In addition to the above recommendations, I would also suggest that researchers focus on the following areas:

- The role of green fiscal policy in promoting innovation and technological development. Green fiscal policy can be used to create incentives for businesses to invest in new, clean technologies. This is essential for the development and deployment of the technologies that we need to address climate change and other environmental challenges.
- The role of green fiscal policy in promoting social justice and equity. Green fiscal policy can be designed to benefit low-income households and communities that are disproportionately affected by environmental pollution. This is important for ensuring that everyone benefits from the transition to a green economy.
- The role of green fiscal policy in promoting economic resilience. Green fiscal policy can be used to invest in infrastructure and other measures that make economies more resilient to climate change and other environmental shocks. This is important for ensuring that economies can continue to grow and prosper in the face of these challenges.

I believe that these are all important areas of research that can help to make green fiscal policy even more effective in achieving its goals.

## VI. RESULTS AND DISCUSSIONS

According to the Central Electricity authority report: 57% of power generated will be via renewable energy sources by 2027. In Paris agreement, India committed that by 2030, the 50% of the total energy mix is comprised of renewable energy. India committed to achieve 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030.

The central aim of the Paris agreement is to strengthen the global response to the threat of climate change by keeping the global temperature rise of this century well below 2 degrees Celsius above pre-industrial levels.

The Paris agreement requires all parties to put forward their “nationally determined contributions” (NDCs)

India’s 2022 NDC has three main elements-

- An emissions-intensity target of 45% below 2005 levels by 2030.
- A target of achieving 50% cumulative electric power installed capacity from non-fossil fuel-based energy resources by 2030.
- Creation of a carbon sink of 2-5 to 3 GtCo<sub>2e</sub> through additional forest and tree cover by 2030.

The below table shows that out of total installed capacity of 399496.61 MW, 204079.50 that is 51 % is met by coal only which itself shows the need to move towards renewable sources of energy on which we are progressing, 39% is met by Renewable energy resources.

Table 1: All India Installed capacity as on 31.03.2022 (MW)

Resource	Capacity (mw)
Coal	204079.50 (51%)
Gas	24899.51 (6%)
Renewable energy resources	156607.90 (39%)
Diesel	509.71
Nuclear	6780 (2%)
Lignite	6620.00(2%)

Table 2: All India Renewable Energy installed capacity (MW) on 31.03.22

Resource	Capacity (in mw)
Solar	53996.54 (34%)
Wind	40357.58 (26%)
Biomass	10682.36 (7%)
Small hydro	4839.39 (3%)
Large hydro	46722.52 (30%)
Total- 156607.90 MW	Total- 156607.90 MW

The table 2 shows that the majority of the RE installed capacity is met by the Solar Energy that is 34%.but if we look at the tariffs in solar energy, they were very costly and hence there is a question that why people will shift to costlier energy? For this government took initiative and from 2013-14 to 2020-21, as we can see in table 3, the tariffs are continuously declining from 6.47 to 1.99. and this shows that we are progressing towards achieving the dual objective of affordable electricity and environment friendly electricity.

Table 3: Trend in solar tariff, Year tariffs (in Rs.)

Year	Tariff (in Rs.)
2013-14	6.47
2014-15	6.17
2015-16	4.34
2016-17	3.3
2017-18	2.44
2018-19	2.44
2019-20	2.36
2020-21	1.99

According to the estimates of renewable energy installed capacity, the majority of it will be from solar energy that is 55% .

Table 5: Estimated renewable energy installed capacity by 2026-27

Renewable Energy	Capacity (in mw)
Solar	185566 (55%)
Wind	72895 (22%)
Biomass	13000 (4%)
Small hydro	5200 (1%)
Large hydro	59892 (18%)

Major ongoing schemes and policies related to renewable energy sources:

- **National solar mission:**  
national solar mission was launched in 2010 and aims to establish India as a global leader in solar energy by creating favourable policy conditions for solar technology diffusion.
- **International solar alliance:**  
ISA is an inter-governmental organization working to create an international power transmission grid for solar power. It aims to mobilize over USD 1000 billion by 2030 to promote solar generation and technologies.
- **Pradhan Mantri Kisan Urja Suraksha evam Utthan Mahabhiyan (PMKUSUM):**  
It aims to provide clean energy to more than 3.5 million farmers by solarizing their agriculture pumps.
- **Green energy corridors:**  
The GEC scheme facilitates the evacuation of electricity from renewable energy projects. It involves setting up transmission and evacuation infrastructure.
- National wind-solar Hybrid policy
- National offshore wind energy policy
- Hydro policy notification, 2019

Government of India and States are promoting usage and installation of solar panels in rooftops of individuals and commercials holding. People are motivated by providing good amount of subsidy to consumers and forcing less tax on manufacturers and raw materials.

According to a new Plan report, in order to keep its global commitments to source half its energy from non-fossil fuel sources by 2030, India must install 500GW of capacity at a cost of Rs. 2.44 lakh crore. In late 2000s, China emerged as the largest solar energy producer globally while; India entered late but is ahead of China in big project race.

According to US based Institute for Energy Economics and Financial Analysis (IEEFA) out of 10 largest solar parks, 5 are being constructed in India. World's largest solar park, Bhadla solar park is situated in India. It is the reflection of future with capacity of 2245MW in 1400 acre land.

## VII. CONCLUSION

Green fiscal policy is the use of fiscal instruments, such as taxes, subsidies, and public spending, to promote environmental protection and sustainable development. It is a critical part of efforts to address global challenges such as climate change, air and water pollution, and biodiversity loss.

The research on green fiscal policy is still in its early stages, but it is growing rapidly. Researchers are using a variety of methodologies to study the impacts of green fiscal policy on economic, social, and environmental outcomes.

The research on green fiscal policy has shown that it can be a very effective tool for addressing environmental challenges. For example, carbon taxes have been shown to be effective at reducing greenhouse gas emissions. Renewable energy subsidies have been shown to be effective at promoting the development and deployment of renewable energy technologies. And investments in public transportation have been shown to be effective at reducing air pollution and traffic congestion.

However, the research on green fiscal policy has also shown that there are a number of challenges to implementing it effectively. These challenges include political opposition, economic costs, lack of capacity, and equity concerns.

Despite the challenges, there is a growing recognition of the importance of green fiscal policy. More and more countries are implementing green fiscal policies to address environmental challenges and promote sustainable development.

Here are some conclusions that can be drawn from the research on green fiscal policy:

- Green fiscal policy is an effective tool for addressing environmental challenges.
- There are a number of challenges to implementing green fiscal policy effectively, but these challenges can be overcome.
- Green fiscal policy can be designed to promote economic growth, create jobs, and reduce inequality.
- Green fiscal policy is an essential part of efforts to create a sustainable future for all.

Governments should consider implementing a mix of green fiscal policies, tailored to their specific needs and circumstances. Green fiscal policies can be used to create a more sustainable future for all, while also boosting economic growth and creating jobs.

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