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CARBON TAXATION AS A TOOL FOR EMISSION REDUCTION: A LEGAL ANALYSIS

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CARBON TAXATION AS A TOOL FOR EMISSION REDUCTION: A LEGAL ANALYSIS

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Abstract

The accelerating climate crisis has compelled the global community to adopt diverse policy measures to reduce greenhouse gas (GHG) emissions, with carbon taxation emerging as one of the most prominent market-based instruments. Rooted in the Polluter Pays Principle and Pigouvian taxation theory, carbon taxes seek to internalise the external costs of carbon-intensive activities by placing a price on emissions. In this context, the paper explores the conceptual foundations of carbon taxation. In the paper, the author will distinguish between carbon taxation and related instruments. The international framework for carbon taxation is traced through the Kyoto Protocol and the Paris Agreement. In the national scenario, the author observes that while India has yet to adopt a direct carbon tax, several fiscal and regulatory measures function as indirect carbon pricing instruments. Finally, the author in the conclusion emphasises that while carbon taxation holds promise as an economically efficient and equitable instrument, its effectiveness depends on transparent implementation, integration with broader climate and energy policies.]

Keywords: Carbon Tax, Climate Change, Carbon Emissions, Environmental Law, Market-based Instruments, Green Economy, Legal Framework

I

Introduction

The people advocating for a clean and green environment and sustainable development have recognised that the global community faces an unprecedented climate crisis, primarily fuelled by anthropogenic greenhouse gas (GHG) emissions. The United Nations Framework Convention on Climate Change (UNFCCC) has formulated the 'Kyoto Protocol' to address the issues relating to greenhouse gas (GHG) emissions. The member countries of the Kyoto Protocol realised the problem that the future generation would have to face and hence agreed to fight the issue collectively of global climate change by incorporating the objectives of the Kyoto Protocol, policies and measures in their respective domestic and international

policies and agreements to reduce their emission levels.¹ The World Bank, acting as a market facilitator and catalyst, has itself launched certain Carbon finance products like the Community Development Carbon Fund, the Bio Carbon Fund, etc.² The UNEP (United Nations Environment Programme) FI Climate Change Working Group (CCWG) is assisting the countries in promoting finance for various carbon solutions to this effect.³ In addition to the domestic policies and measures, industrialised countries have undertaken to reduce their GHG emission level voluntarily by taking certain market mechanisms like the Clean Development Mechanism (CDM).⁴ In spite of the fact that this approach was considered to be commendable in reducing greenhouse gas emissions, the UNFCCC and its Kyoto Protocol failed to achieve the expected results in combating climate change and reducing greenhouse gas emissions. So, the Conference of the Parties started looking for the substitution of a weak regime of the Kyoto Protocol, which was meant to be operated till 2020. The negotiation leading up to what became the Paris Agreement, which sets an ambitious direction for the climate regime, complements this direction with a set of common core obligations for all countries for the reduction of greenhouse gases.⁵ The Paris Agreement recognises that parties may engage in 'cooperative approaches' to achieve their NDCs, involving the use of 'internationally transferred mitigation outcomes' - the new jargon for emission trading and other mechanisms to link national climate policies.⁶ The Paris Agreement also establishes a new mechanism to 'promote the mitigation of GHG emissions while fostering sustainable development known as the "sustainable development mechanism (SDM)'. Like the CDM, the new mechanism will generate emission reduction offsets that another country can use to fulfil its NDC.⁷ Among these policy instruments designed to mitigate emissions, and to fulfil the objective of the climate change regime, i.e. reduction of greenhouse gases, the carbon market mechanism fails to fulfil the objectives set by UNFCCC and its Kyoto Protocol and the recent Paris agreement. In order to trim down the amount of carbon emissions, a price or tax, also known as a carbon tax, is becoming very popular among nations.⁸

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¹ L. Lakshmi, *Carbon Finance*, IV ICFAI J. ENVTL. L. 1 (2005).

² *Id.*, at 2.

³ *Ibid.*

⁴ *Ibid.*

⁵ Daniel Bodansky, Jutta Brunnée & Lavanya Rajamani, *INTERNATIONAL CLIMATE CHANGE LAW* 10 (1st edn., OUP 2017).

⁶ *Id.*, at 236.

⁷ But in contrast to the CDM, the SDM will not be limited to project-based reductions, and might involve emission reduction policies and programmes. In addition SDM will be able to generate offsets for emission reductions in developed as well as developing countries, thus merging the role of CDM and joint implementation under the Kyoto Protocol.

⁸ Saurabh Sood, *Role of Carbon Tax in Containing Carbon Emission – A Comprehensive Analysis*, II NAT'L J. ENVTL. L. 22 (2019).

Carbon Taxation as a Tool for Emission Reduction

The world is finding a solution to the problem of climate change in the form of carbon taxation.

Accordingly, the paper makes an attempt to focus on a specific aspect of the threat posed by GHG and assess the relative effectiveness of carbon taxation. For this, the paper aims to examine the theoretical and economic rationale for carbon taxation, the international and national legal frameworks governing carbon taxes, the effectiveness and limitations of carbon taxation in reducing emissions and finally recommendations for strengthening legal and policy frameworks.

II

Understanding Carbon Tax

There is no commonly agreed-upon definition of the concept of carbon tax. The process of definition is itself multifaceted; that is, there are different types of definitions.⁹ As per the "United Nations Handbook on Carbon Taxation for Developing Countries,"¹⁰ A carbon tax is defined as a compulsory, unrequited payment to the general government, levied on carbon emissions or their proxy, that can confer a reduction in corresponding carbon-based (equivalent) emissions in the atmosphere and is thus characterised as having both environmental purpose and effect.¹¹

Another meaning of carbon tax is "An instrument of environmental cost internalisation. It is an excise tax on the producers of raw fossil fuels based on the relative carbon content of those fuels".¹²

Further, "carbon taxes refer to taxes that are directly linked to the level of CO₂ emissions, often expressed as a value per tonne CO₂ equivalent (per tCO₂e)."¹³

⁹ Fanny Vanrykel, *The Illusive Simplicity and Straightforwardness of Carbon Taxes: A Legal Analysis*, 17–18 (2022)..

¹⁰ It provides tools and strategies to help countries manage distributional impacts, promote public acceptance, and effectively utilize tax revenues while addressing the challenges specific to developing economies

¹¹ UNITED NATIONS, *UNITED NATIONS HANDBOOK ON CARBON TAXATION FOR DEVELOPING COUNTRIES* 23 (2021).

¹² OECD, *GLOSSARY OF ENVIRONMENT STATISTICS, STUDIES IN METHODS, SERIES F, NO. 67* (United Nations, New York, 1997).

¹³ *Id.*, at 12.

The World Bank defines carbon tax as “that explicitly states a price on greenhouse gas emissions or that uses a metric directly based on carbon (that is, price per tCO₂e).¹⁴

It is to be noted that in all the above definitions, the tax base is the intent of the various definitions, but the first definition covers the GHGs; in the second definition, it is not specified which category of carbon tax it covers. The third and fourth definitions also cover GHGs within their ambit.¹⁵ Defining the concept of carbon tax poses several challenges that are central to this research. The process of definition is itself multifaceted; that is, there are different types of definitions.¹⁶

Economic Theory

Carbon tax occupies a central position due to its economic efficiency and potential for incentivising low-carbon alternatives. By assigning a cost to carbon emissions, the carbon tax compels industries, businesses, and consumers to reconsider their carbon-intensive activities. In order to slow down the amount of carbon emissions it is submitted that a price or tax be set on the carbon emissions. Such a price or a tax is known as a Pigouvian tax. A Pigovian (also spelt Pigouvian) tax is a tax on market transactions that create negative externalities, or adverse side effects, for those who are not directly involved in the transaction.¹⁷ A Pigovian tax is a type of tax on market transactions that create negative externalities. Economists argue that the costs of these “negative externalities,” such as environmental pollution, are otherwise borne by society, rather than the producer of the externality.¹⁸ Common examples of a Pigovian tax include carbon taxes to offset the environmental pollution from using gasoline or tobacco taxes to address the strain on public healthcare systems caused by consuming tobacco products.

Pigouvian tax named after British economist Arthur Pigou is a tax meant to discourage activities that impose a cost of production onto third parties and society as a whole. The tax is intended to correct an inefficient market outcome (a market

¹⁴ WORLD BANK, *PARTNERSHIP FOR MARKET READINESS: CARBON TAX GUIDE – A HANDBOOK FOR POLICY MAKERS* 27 (2017).

¹⁵ See Fanny Vanrykel, *The Illusive Simplicity and Straightforwardness of Carbon Taxes: A Legal Analysis*, 18 (2022).

¹⁶ Ibid.

¹⁷ Julia Kagan, *Pigovian Tax: Definition, Purpose, Calculation, and Examples*, INVESTOPEDIA, available at – <https://www.investopedia.com/terms/p/pigoviantax.asp> (last visited Sept. 1, 2025).

¹⁸ Pranim Chamling Rai, *Pigouvian Tax* (Unpublished)

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failure), and does so by being set equal to the social cost of the externalities.¹⁹ Pigou in his book *The Economics of Welfare* argues that industrialists seek their own marginal private interest. When the marginal social interest diverges from the marginal private interest, the industrialist has no incentive to internalise the cost incurred by the social.²⁰ Example of Pigouvian tax, is a tax on plastic bags, and sometimes even paper bags. This encourages consumers to bring their own reusable bags from home to deter the use of plastic and paper. Plastic is a by-product of burning fossil fuels and results in the damage of environment, while paper bags encourage deforestation. Tax on petrol, carbon emission tax, congestion charges etc. are other different pigouvian tax.²¹

The tax should be fixed at a level directly proportional to the consequent damages that a ton of carbon or carbon dioxide emissions will accrue. This means that the polluter will be charged for the marginal damage that has been caused in such a manner that it will not generate profit to the polluter to produce goods that cause carbon emissions beyond a certain point.²² The amount of carbon emissions will be lessened if the price or tax is set properly and this would result in subsequent reduction of environmental damages.²³ A carbon tax is a fiscal mechanism that places a charge on the carbon content of fossil fuels. Based on the Polluter Pays Principle, it incorporates the external costs of carbon emissions into market pricing, thereby aligning economic incentives with environmental sustainability. By doing so, it transfers the responsibility for the harm caused from society at large to the polluter. This approach harmonises the actual costs and benefits of business activities, encouraging firms to use resources more efficiently. From this perspective, the notion of a polluter extends beyond the direct emitter of carbon to include other parties linked to such emissions.²⁴

Distinction of Carbon Tax from Other Instruments

A carbon tax is not the same as “cap-and-trade,”²⁵ although the latter also falls under the carbon pricing umbrella. A cap-and-trade, or cap-and-permit, system sets a cap

¹⁹ Available at: [file:///C:/Users/HP/Desktop/114949Pigouvian%20Tax,%205th%20Semester,Paper%20DSE3%20by%20Pranim%20Chamling%20Rai%20\(1\).pdf](file:///C:/Users/HP/Desktop/114949Pigouvian%20Tax,%205th%20Semester,Paper%20DSE3%20by%20Pranim%20Chamling%20Rai%20(1).pdf) (last visited August 1, 2025).

²⁰ Ibid.

²¹ Ibid.

²² Supra note 8.

²³ Ibid.

²⁴ Id., at 23.

²⁵ Cap and trade refers to an emission trading system where an international or national regulator establishes an overall cap on emissions, issues emission units or rights, and allows the transfer and acquisition of such rights.

on the quantity of carbon emissions allowed each year in a given nation and issues permits up to that limit.²⁶ The quantity is fixed, but the permit price can vary. Economic booms may drive up carbon prices just as recessions may drive them down.²⁷ In contrast, a carbon tax is added to the price of carbon itself but allows the quantity of emissions to vary. During economic booms, the tax remains the same, but the quantity of emissions will be higher than in comparison to recessions.²⁸ Carbon tax provides price certainty, while cap-and-trade ensures emission quantity certainty. Some experts consider carbon taxes to be superior to cap-and-trade programs for several fundamental reasons:

- (a) Carbon taxes provide predictable energy prices, whereas cap-and-trade systems only exacerbate price volatility that discourages investments in carbon-reducing energy efficiency and carbon-replacing renewable energy.
- (b) Carbon taxes can be implemented faster than a complex permit-based cap-and-trade system.
- (c) Carbon taxes are not easily manipulable by special interests, whereas the complexity of cap-and-trade leaves it rife for exploitation by the financial industry.²⁹

Direct Regulation and Market-based Mechanisms

Taxes are often more flexible and cost-effective compared to rigid command-and-control measures.

IV

Legislative Aspects of Carbon-Taxation

Some 20 years after the Stockholm Conference, the UN convened a conference... known as the Earth Summit, held in Rio de Janeiro (Brazil) in 1992, attended by over 150 countries. International negotiations about how to respond to the threat of climate change only began in earnest in Rio de Janeiro in 1992.³⁰ One of the achievements of the Earth Summit includes the Framework of the Convention on Climate Change, signed by 154 countries. The 'ultimate objective' of the convention

²⁶CTR. FOR CLIMATE & ENERGY SOLS., *Cap and Trade Basics*, available at – <https://www.c2es.org/content/cap-and-trade-basics/> (last visited August. 30, 2025).

²⁷ James K. Boyce, *THE CASE FOR CARBON DIVIDENDS* 45 (2019).

²⁸ *Ibid.*

²⁹ *Ibid.*

³⁰ Robin Hahnel, *GREEN ECONOMICS – CONFRONTING THE ECOLOGICAL CRISIS* 159 (2011).

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is the stabilisation of greenhouse gas concentrations in the atmosphere at a level that would “prevent dangerous anthropogenic interference with the climate system” within a time frame that allows the ecosystems to adapt naturally, to ensure that food production is not threatened, and to permit sustainable development. It is maintained by recognising the need eventually to stabilise atmospheric concentrations of GHGs, the objective acknowledges climate change as a problem and helps to legitimise it as a matter of international concern.³¹ While the UNFCCC does not have a direct mandate to impose carbon taxes, through the Kyoto or flexible mechanisms, the Kyoto Protocol to the UNFCCC foresees the creation of markets for GHG emission reductions through project-based emission crediting or emission trading.³² The Kyoto mechanisms are also defined in Article 12, a clean development mechanism, which aims to enhance cooperation among industrialised and developing countries to achieve sustainable development and reduce emissions. The flexible mechanisms in general, and the CDM in particular, address the problem of global warming on an international level and through mechanisms based on the principle of trading emission reduction offsets.³³ However, Kyoto Protocol failed to yield expected results³⁴ and Paris agreement also substituted Kyoto Protocol. Even if it didn’t really lead to a significant reduction in emissions, the Kyoto Protocol was an important step towards a carbon neutral world.³⁵ The Paris Agreement, encourages countries to implement nationally determined contributions (NDCs) that can include carbon pricing as a means to achieve their climate goals, hence it outlines measures to strengthen international cooperation on climate change mitigation, including the use of market-based mechanisms like carbon pricing. These provisions are embedded within the Paris Agreement³⁶ which allows for the trading of carbon credits to support and finance climate action, often involving carbon taxes or ETS. The Paris Agreement does not (yet) directly call for nations to adopt carbon taxes. However, a wide range of public and private sector

³¹ Gordon MacDonald, *Scientific Basis for the Greenhouse Effect* in Dean Edwin Abrahamson (ed.), *THE CHALLENGES OF GLOBAL WARMING* 123, 126–28 (1989).

³² Charlotte Streck, *New Partnerships in Global Environmental Policy: The Clean Development Mechanism*, IV INT’L J. ENVTL. L. 16 (2005).

³³ Ibid.

³⁴ The ultimate criticism of the Kyoto protocol is that global emissions are still increasing relative to 1990 levels to this day and much of this increase is driven by the very countries that were excluded from reduction targets under the Protocol. Cited in Francesco Bassetti, *Success or failure? The Kyoto Protocol’s troubled legacy*, CLIMATE FORESIGHT (2022) available at – <https://www.climateforesight.eu/articles/success-or-failure-the-kyoto-protocols-troubled-legacy/> (last visited Sept. 15, 2025).

³⁵ Francesco Bassetti, *Success or failure? The Kyoto Protocol’s troubled legacy*, CLIMATE FORESIGHT (2022) available at – <https://www.climateforesight.eu/articles/success-or-failure-the-kyoto-protocols-troubled-legacy/> (last visited Sept. 15, 2025).

³⁶ See article 6.2, 6.3 and 6.4 of the Paris agreement

actors are pushing their decarbonisation strategies forward with at least some international cooperation, which could create synergistic benefits towards the ultimate decarbonisation goal.³⁷

Examples of Global Carbon Taxation Regimes

Currently, the World Trade Organisation (WTO) framework, along with the General Agreement on Tariffs and Trade (GATT) and other comparable trade and tax treaties, permits the imposition of carbon taxes on imports based on their carbon content, as well as the provision of rebates for exports containing carbon content.³⁸ Multiple nations,³⁹ and even some international programs, have already implemented a carbon tax. Singapore is the first Southeast Asian country to introduce a carbon tax in 2019.⁴⁰ Furthermore, there are 64 carbon pricing initiatives in force across the globe on various regional, national, and sub-national levels, with three more scheduled for implementation.⁴¹ The largest and most famous of the above systems is the EU ETS, a “cap-and-trade” system covering emissions from factories, power plants, and other installations in 30 countries (all EU countries plus Iceland, Liechtenstein, and Norway), covering around 40 per cent of the EU’s GHGs. Other national initiatives include ETSs in Kazakhstan, New Zealand, Mexico, and

³⁷ For example, [m]odeling has shown that cooperation through Article 6 of the Paris Agreement could reduce the cost of implementing NDCs by about half—equivalent to a savings of US\$250 billion in 2030—or reduce global GHG emissions by an additional 50 percent compared to countries acting alone. However, there is slow progress on finalizing the rules for such international cooperation under Article 6 as it covers a number of issues not easily resolved, including the transition of Kyoto Protocol credits, a levy on transfers of mitigation outcomes to fund adaptation effort in more vulnerable countries, and how to deliver on an overall mitigation of global emissions. Cited in: Myanna Dellinger, *Carbon Taxation for Climate Change Mitigation*, XI LSU J. ENERGY L. & RES. 156 (2022).

³⁸ M. Waggoner, *Why and How-to Tax Carbon*, 20 COLO. J. INT’L ENVTL. L. & POL’Y 1 (2008).

³⁹ For example, Argentina, Canada, Chile, China, Colombia, Denmark, the European Union (27 countries), Japan, Kazakhstan, Korea, Mexico, New Zealand, Norway, Singapore, South Africa, Sweden, the UK, and Ukraine.

⁴⁰ ACT GROUP, *Regulatory Update: Singapore Carbon Tax*, available at <https://www.actgroup.com/latest/news/regulatory-update-singapore-carbon-tax> (last visited Sept. 1, 2025).

⁴¹ Myanna Dellinger, *Carbon Taxation for Climate Change Mitigation*, XI LSU J. ENERGY L. & RES. 157 (2022).

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(recently) China, as well as carbon taxes in South Africa, Chile, Argentina, and Canada.⁴² Even some U.S. states have enacted carbon pricing systems.⁴³

Carbon Taxation in Domestic Law: The Indian Context

As the fastest-growing major economy in a rapidly heating world, India's electricity demand is growing fast. Since FY21, India's electricity consumption has risen at approximately 9% per annum, compared to an average of 5% annually in the preceding decade. The Central Electricity Authority (CEA) had projected electricity demand to grow at a 6% CAGR between 2022 and 2030.⁴⁴ Besides economic growth and urbanisation, climate change-induced heat stress, marked by increasingly hotter summers, is one of the key factors driving electricity demand.⁴⁵

India does not currently have a direct carbon tax, but several fiscal measures function as indirect carbon pricing, such as Clean Energy Cess (now GST Compensation Cess) on coal. India's Intended Nationally Determined Contribution (INDC) includes fiscal policies in its climate action, in particular "instruments like coal cess, cuts in subsidies, increase in taxes on petrol and diesel". India imposed a cess on domestically produced and imported coal and set up the National Clean Energy and Environment Fund (NCEEF) back in 2010. The policy design was to earmark part of the revenues from the coal cess for the NCEEF. The coal cess revenues were also used for other needs, such as the rejuvenation of the Ganga. The coal cess is levied on the dispatch of coal and lignite by coal producers and discourages coal consumption by increasing its cost. For this reason, India's INDC further specifies that "the coal cess translates into a carbon tax equivalent."⁴⁶ The Electricity Act, 2003⁴⁷ also provides renewable energy incentives.⁴⁸ The Electricity Act, 2003, includes several provisions that specifically promote renewable energy.

⁴² *Ibid.*

⁴³ California launched its cap-and-trade system in 2013, while the state of Washington voted to enact its own carbon pricing system in April 2021.

⁴⁴ THE HINDU (date not specified) available at – <https://www.thehindu.com/business/Industry/how-can-india-meet-its-rising-power-demand/article69325784.ece> (last visited Sept. 15, 2025).

⁴⁵ *Ibid.*

⁴⁶ INT'L INST. FOR SUSTAINABLE DEV., *The Evolution of the Clean Energy Cess on Coal Production in India*, available at <https://www.iisd.org/system/files/publications/stories-g20-india-en.pdf> (last visited August 16, 2025).

⁴⁷ The Act is enacted to promote a competitive, transparent, and efficient electricity market; this Act has undergone several amendments to align with India's evolving energy landscape, particularly the transition towards renewable energy.

⁴⁸ The Electricity Act indirectly supports mechanisms like Renewable Energy Certificates (RECs), allowing renewable energy projects to earn certificates for their green power, which can then be traded.

The Act empowers the central government to prepare and notify a National Electricity Policy and Tariff Policy in consultation with state governments and the Central Electricity Authority (CEA). The National Electricity Policy emphasises the development of renewable energy sources, aiming to diversify the energy mix and reduce dependence on fossil fuels. It outlines strategies to encourage investment in renewable energy, enhance grid integration capabilities, and promote research and development in clean technologies.⁴⁹ Section 66 directs the regulatory commissions to develop a market (including trading) in power. This provision facilitates the trading of Renewable Energy Certificates (RECs).⁵⁰ The REC mechanism encourages investment in renewable energy by providing a supplementary revenue stream for developers and adds liquidity to the market by enabling the trade of these certificates.⁵¹ The Energy Conservation Act, 2001,⁵² as amended in 2022, provides a mechanism for developing the Indian Carbon Market (ICM) by implementing the Carbon-credit-trading Scheme (CCTS).⁵³ The amended Act provides for the regulation of energy consumption by equipment, appliances, vehicles, vessels, industrial units, buildings or establishments that consume, generate, transmit or supply energy.⁵⁴ With special focus on promotion of new and renewable energy and the National Green Hydrogen Mission, the amendment seeks to (i) facilitate the achievement of *Panchamrit* — the five nectar elements presented by India in COP-26 (Conference of Parties -26) in Glasgow 2021.⁵⁵ The Amendment Act empowers the Central Government to enforce the efficient use of energy and its conservation,

⁴⁹ The Electricity Act, 2003, S. 3.

⁵⁰ Renewable Energy Certificates (RECs): RECs are market-based instruments that represent the environmental attributes of renewable energy generation. They allow entities to meet their RPOs by purchasing certificates equivalent to the amount of renewable energy required, providing flexibility and promoting market-based solutions.

⁵¹ Available at: <https://ecopurus.com/blogs/what-is-the-electricity-act-2003-key-provisions-for-renewable-energy-in-india/> (last visited August 16, 2025).

⁵² The Energy Conservation Act, 2001, was enacted in March 2002 to provide for the efficient use of energy and its Conservation and for the matters connected therewith and incidental thereto.

⁵³ The Energy Conservation Act, sec. 2 (db).

⁵⁴ Id., S. 14(a).

⁵⁵ Surabhi Khattar & Ashutosh Singh, *The Energy Conservation (Amendment) Act, 2022: Key Highlights*, CYRIL AMARCHAND BLOGS (Jan. 2023), available at – <https://corporate.cyrilamarchandblogs.com/2023/01/the-energy-conservation-amendment-act-2022-key-highlights/> (last visited Sept. 1, 2025).

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specifying a carbon credit⁵⁶ trading scheme.⁵⁷ The Carbon Credit Trading Scheme is aimed at reducing greenhouse gas emissions and, hence, addressing climate change. The Amendment Act empowers the central government, or any agency authorised by it, to issue a carbon credit certificate to the registered entity that complies with the requirements of the carbon trading scheme.⁵⁸ Not only this, the central government or any agency authorised by it may issue the energy savings certificate to the designated consumer whose energy consumption is less than the prescribed norms and standards in accordance with the prescribed procedure.⁵⁹

The Carbon Credit Trading Scheme is not India's first initiative of its kind under the Energy Conservation Act. Earlier, in 2012, the government introduced the Perform, Achieve, and Trade (PAT) Scheme under the National Mission on Enhanced Energy Efficiency as a market-driven compliance mechanism to promote energy efficiency in energy-intensive sectors. In this scheme, the verified energy savings of designated industries are converted into tradable Energy Saving Certificates (ESCs), which are issued by the Bureau of Energy Efficiency and traded on Power Exchanges. Likewise, the Renewable Energy Certificate (REC) mechanism established under the Electricity Act, 2003, also serves as a trading-based system in the Indian energy sector.⁶⁰

It is pertinent to note that the Carbon Credit Trading Scheme has not yet been notified and may be notified by the Central Government in future.

Challenges in India's Carbon Tax Implementation

The implementation of a carbon tax is a crucial step towards achieving the goal of limiting global warming. However, it is not without challenges, especially in developing countries like India. One of the main obstacles to implementing a carbon tax in India is the potential impact on its economy. India, as a developing nation, must approach any policy with caution, particularly those that impact its economy.

⁵⁶ While Carbon Credit has not been defined under the Principal Act or the Amendment Act, it generally refers to a tradable permit, allowing the holder to emit a specified amount of carbon dioxide or other greenhouse gases. The Central Government or any authorised agency may issue carbon credit certificates to registered entities compliant with the carbon credit trading scheme. Cited in: Surabhi Khattar & Ashutosh Singh, *The Energy Conservation (Amendment) Act, 2022: Key Highlights*, CYRIL AMARCHAND BLOGS (Jan. 2023), available at – <https://corporate.cyrilamarchandblogs.com/2023/01/the-energy-conservation-amendment-act-2022-key-highlights/> (last visited Sept. 1, 2025).

⁵⁷ Energy Conservation Amendment Act, 2001, S. 14(w).

⁵⁸ *Id.*, Sec. 14-AA.

⁵⁹ *Id.*, Sec. 14-A.

⁶⁰ *Supra* note 51.

A carbon tax would raise production costs for industries, which in turn could translate into higher consumer prices. Since the country relies heavily on coal⁶¹ for electricity generation, such a tax would directly affect its power sector. Moreover, India's economy is characterised by a vast presence of small and medium enterprises (SMEs), many of which lack the resources or technical capacity to accurately monitor their emissions. This makes the design of a carbon tax that is both effective and fair especially challenging. Another critical concern is how the generated revenue would be distributed. In a nation marked by significant income inequality, ensuring fair allocation is essential. The funds collected through a carbon tax could be directed toward climate change mitigation and adaptation initiatives or channelled into social welfare schemes to support vulnerable populations.⁶² A major obstacle in introducing a carbon tax in India lies in the country's intricate tax structure, which involves several layers of taxes and levies. This complexity may create administrative hurdles and raise compliance expenses. Nonetheless, many experts believe that simplifying the system could ease these difficulties. One possible approach for the government is to integrate the carbon tax within existing frameworks, such as the Goods and Services Tax (GST), thereby making the process more efficient and lowering compliance costs.⁶³

V

Conclusion

The escalating climate crisis has compelled the international community to adopt diverse policy measures to reduce greenhouse gas (GHG) emissions, with carbon taxation emerging as a vital tool among them. The Kyoto Protocol, Paris Agreement, and subsequent international instruments have provided frameworks for emission reductions, yet the anticipated results have remained modest due to weak enforcement and fragmented commitments. Against this backdrop, carbon taxation offers an economically efficient, market-based mechanism rooted in the Polluter

⁶¹ Currently, around 70% of India's electricity is generated from coal, making the power sector the single largest source of GHG emissions. Unlike developed nations, India cannot rely exclusively on reducing consumption; instead, it must balance decarbonization goals with the imperative of universal energy access and affordability. In such a scenario, a carbon tax could theoretically disincentivize fossil fuel use. However, the imposition of such a tax risks raising electricity costs, which could disproportionately affect lower-income households and slow industrial competitiveness.

⁶² Mohammed Khaja Qutubuddin, *How India's Carbon Tax Implementation Could Set a Precedent for G20 Countries*, EARTH (2023) available at – <https://earth.org/india-carbon-tax/> (last visited Sept. 15, 2025).

⁶³ *Ibid.*

Carbon Taxation as a Tool for Emission Reduction

Pays Principle and Pigouvian theory, incentivising industries to internalise environmental costs while simultaneously promoting sustainable development.

Globally, many countries have adopted carbon taxation regimes, often in parallel with carbon trading systems, to achieve their climate objectives. Although India has not introduced a direct carbon tax, its fiscal measures—such as the Clean Energy Cess on coal, renewable energy incentives under the Electricity Act, 2003, and market-based mechanisms like the Perform, Achieve, and Trade (PAT) and Renewable Energy Certificate (REC) schemes—function as indirect carbon pricing instruments. The recent Energy Conservation (Amendment) Act, 2022, with provisions for the Carbon Credit Trading Scheme, reflects India's growing commitment to align with global best practices and transition toward a low-carbon economy.

Nevertheless, carbon taxation alone cannot serve as a panacea. Its effectiveness is contingent upon the level of tax imposed, the robustness of administrative systems, and its integration with broader climate and energy policies. Challenges such as regressive impacts on vulnerable groups, risks of carbon leakage limit its potential. Therefore, while carbon taxation holds promise as an efficient and equitable instrument, its success depends on careful design, transparent implementation, and complementary legal and policy measures. From India's perspective, although introducing a carbon tax presents several challenges, there are strong arguments in its favour. The revenue collected could be invested in renewable energy development, energy efficiency measures, and sustainable transport projects. Moreover, such a tax would motivate industries to shift toward cleaner technologies and lower their emissions, ultimately generating both economic and environmental gains over time. In formulating and executing a carbon tax policy, the government needs to carefully weigh both challenges and opportunities, such as setting a suitable tax rate, promoting fairness, streamlining the tax structure, and maintaining transparency.