ENVIRONMENTAL TAX REFORM: ECONOMIC & SUSTAINABILITY IMPACTS

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Abstract

This dissertation is designed to compare recent environmental tax reform policies enacted by different countries. The purpose is to provide a theoretical analysis of the results of the tax policies and credits implemented. Many nations have recently enacted environmental taxes. These either give credit to positive actions or charge negative actions. It will discuss how past and present policies have affected various issues, evaluate their design, the governments of the countries putting them into practice, and compare them to other methods of addressing climate change. Crude oil is the source of most of the related tax revenues. Changing the tax rates on competing sources may help to distribute renewable energy more evenly in the future. Avoiding social and legal repercussions is important. Theoretically, these taxes should be distributed fairly, with mitigation measures in place for those who fall into lower income brackets and exemptions granted to specific industries. Proper fiscal reform measures have the potential to reduce pollution, strengthen the economy, and improve infrastructure.
1. Introduction

The objective of the thesis is to analyze the effects of recent tax reform in the United States and internationally. It will include an analysis of European countries, which have started fiscal change at an earlier date and are further developed in the process, and some analysis of developing countries that have seen laws enacted recently.

The opening section will consist of a literature review detailing the most important problems and concepts of environmental tax reform, and the potential benefits and consequences. Next, the scope of national and international tax policy will be assessed based on the methods used to take actionable measures.

2. Literature Review

It is necessary to give a broad definition of an environmental tax. According to the OECD (2017), these measures are important to determine comparative pricing between various goods and services. Categories that this may encompass include revenue, tax rates and bases, and exemptions. Applications of these characteristics can be towards fossil fuels, automobiles, and public transportation, chemicals that affect the ozone supply, determinable quantities of water or air pollutants, noise and waste management, and the oversight of biodiversity, wildlife, soil, forestry, fish, land, and water quantity. They conclude that environmental taxes provide the means to raise public revenue and can increase both economic efficiency and environmental effectiveness.
Factors that should be taken into careful account upon the design of an environmental tax are safeguards to reduce the economic cost and minimize the risk of environmental effects. First, the tax base, defined as the entire economic activity such as income, assets, purchases, and transactions subject to taxation by a tax authority, should be applied directly toward specific actions or pollutants that cause damage. A limited tax base is ineffective and non-neutral. A wide tax base lowers the cost of tax administration and makes it possible to raise more money at lower rates. (Tax Foundation 2023) Taxes that increase the initial market cost of a good are more effective to abate early production processes and development before the pollutant is emitted into the environment. The scope of a tax application should appropriately reflect the environmental damage. There should be consistency and few to no exceptions for those impacted. It should be predictable and credible to incentivize making improvements. Transparency and information are of note for the policy to be accepted publicly and effectively. Lastly, these taxes should overlap with different instruments in environmental policy to cover the broad scope. (OECD 2017)

An environmental tax should cover the same ground as the damage it is intended to repair. The tax rate considered and applied, defined as the amount of tax that a person or organization must pay determined by their tax rate, is to be proportionate to the harm done to the environment. To encourage actions that contribute to environmental protection, the tax must be reliable, and its rate must be known in advance. Revenues from environmental tax reform can be utilized as extra money or to lower other taxes. Depending on the income level, tax type, and value, the tax rate may be a fixed amount
or a percentage. Tax laws are enacted by both the federal and state governments that have the power to change rates. They pay for government services and programs using tax money. Other policy tools should be used to address distributional implications. (OECD 2017) It is important to carefully consider competitiveness issues, not to impede taxes but rather to offer the chance to coordinate policies and create temporary relief periods. Public approval of environmental taxation depends on clear information.

Unfortunately, fiscal factors can negatively change the effectiveness of a policy framework. For example, an absence of connection to the harmful externalities that led to the tax. The tax was not predicated on potential environmental harm if there was a lack of environmental consistency in the design. Attention to the spatial extent of taxable events is necessary as well, as the issue is that it brings technologies and premises at risk rather than damage and consumption. Rates that are relatively too low to deter the agents from harming the environment. According to the OECD’s 2018 Energy Tax report, carbon taxes are frequently negligible or barely present. The energy sector, which is the most negatively impacted of all sectors, is subject to a variety and complexity of taxation. Regional or international variation in environmental taxation causes disparities in revenue collection.

There are definitions for environmental instruments that cover critical topics. The concept of the double dividend hypothesis refers to the idea that environmental taxes can—for the first dividend—both lower pollution and—for the second dividend—lower overall economic costs associated with the tax system by using the money generated to replace other more distorting taxes that also slow economic growth. (Law Insider) A
second topic is revenue recycling, which describes the process of channeling all or a portion of the proceeds from an environmental tax back to the businesses that are being impacted. Reinvesting income can take the shape of specific expenditure plans, such as direct subsidies for investments that reduce pollution or energy consumption or for pollution control technologies. Countries may decide to grant tax credits to specific industries or subsectors of the economy. (Law Insider)

Like other excise taxes, taxes on consumption, and income taxes, a carbon price imposes economic consequences. The tax that is eliminated together with the carbon tax must be more economically detrimental than the carbon tax for the double dividend to occur. For example, a meta-analysis of carbon tax simulation studies discovered that 55% of the studies demonstrated a double dividend effect: most models that combined a carbon tax with a reduction in capital taxation found a double dividend, but the evidence was weaker in studies that combined a carbon tax with a reduction in labor taxes. (Tax Foundation 2022)

The United Nations Committee of Experts on International Cooperation in Tax Matters (2021) and the respective Subcommittee on Environmental Taxation Issues formed a framework for developing countries. They determine that environmental taxes are an economic instrument for a country that is useful and necessary to impact pollution and degradation. For example, the Paris Agreement from 2015 adds that every participant makes progress to reduce fossil fuel emissions.

At the Conference of the Parties meeting in Paris on December 12, 2015, nations ratified the Paris Agreement to combat climate change. Less than one year later, the
Agreement became enforceable. According to the agreement, each country must set its own goals for cutting carbon dioxide and other greenhouse gas emissions to keep global warming below 2°C relative to preindustrial times. Although the goals are not enforceable by law, nations are required to revise them every five years. (Climate Change Economics 2020)

One of the policy tools included in the National Determined Contributions (NDCs), which describe a country’s objectives for its overall national effort to control emissions, is carbon pricing. To control GHG emissions, over 40 national jurisdictions and 25 subnational jurisdictions use some type of carbon pricing, such as an emissions trading scheme or a carbon tax. Together, these countries and regions are responsible for around 25% of the world’s GHG emissions. (Climate Change Economics 2020) Mexico introduced a carbon tax in North America on January 1, 2014, and it is currently preparing to introduce an emissions trading system (ETS) in 2018. Canada declared in October 2016 that by 2018, every province and territory must establish a price on carbon. and that a set of minimum standards must be followed by each provincial strategy. Many subnational regions in North America already have a variety of carbon tax and emissions trading systems in place. (Climate Change Economics 2020)
3. Categories and Methodologies

Authorities are adopting more ambitious and complex policy tools to promote climate mitigation due to the significant costs involved with climate change, particularly market-based tools like carbon pricing. Carbon pricing has benefits that can promote development goals, like resource mobilization and is more cost-effective than other policy tools. As the name suggests, carbon pricing involves charging for carbon emissions to reduce the negative externalities brought on by greenhouse gas emissions. For carbon pricing schemes, there are two typical structures.

Imposing a carbon tax is the first and easiest method. According to this strategy, governments impose a set cost that businesses must pay for each ton of carbon they produce. Although the number of emissions may change, officials base the tax rate on the anticipated volume of carbon emissions at that cost. (United Nations 2021) The main advantage of carbon pricing is that it forces businesses to internalize the cost of carbon emitted during production, requiring them to factor in the cost of environmental damage when making production decisions, even though there are significant differences between the two systems.

The imposition of a tax forces emitters to consider the environmental cost of their actions and regulate their carbon emissions. While offering disincentives for new investments in carbon-intensive technology as well as incentives for innovation, carbon pricing creates incentives that permeate up and down supply chains, delivering emissions reductions where they make sense. Additionally, there are side effects of emissions
reductions to consider, such as pollution reduction and a consequent decrease in health-related expenses. (United Nations 2021)

Implementing an emissions trading scheme for carbon emissions is the second strategy. This sets a limit on carbon emissions for a collection of businesses or industrial facilities and grants emissions permits following that limit. For each ton of carbon, they desire to emit, businesses must get an allowance, either directly from the government or through trade. Although the overall number of emissions is known, the price of carbon varies under an ETS per market demand for emissions. Only industrialized nations have successfully done this since it is difficult and expensive. The Western Climate Initiative between California and Quebec, the European Union emissions trading system, and the Regional Greenhouse Gas Initiative (RGGI), which governs states in the Northeast of the United States, are the most well-known examples. (U.N. 2021) Other less common strategies that can be implemented include offsets and command-and-control systems.
Despite these variations, there are many similarities between the two strategies. Both works on the "polluter pays" tenet, which effectively promotes transitioning to more environmentally friendly energy sources and curtailing emissions-producing activities. It’s crucial to make sure that the increase in carbon prices required to combat climate change is politically acceptable under both strategies. (IMF 2022) Reforms to carbon pricing can help the poor while also promoting economic growth, for instance by compensating disadvantaged households with a portion of the revenues and allocating the remaining funds to lower labor taxes or beneficial investments. (IMF 2022)

**Implementation in the European Union**

The European Union is known as a leading group of nations for their early implementation of fiscal reform in tax policy. Data from the OECD (2017) can break down the targeted pollutant by category. Taxes designated for the environment account for 2% of GDP in member countries. Energy is the sector of the economy that is most impacted by environmental taxes. Outpacing taxes on transportation (19.1%) and pollution and resources (3.7%), energy taxes in the EU in 2020 accounted for more than all other environmental tax revenues (77.2% of the total). The EU collected €299.9 billion in taxes in 2020, which amounted to 2.2% of the European GDP and 5.4% of all tax receipts.
Still, the relative proportion that Carbon Taxes make up in any member country is generally under 3%. In general, consumption taxes (32.1%), social insurance taxes (25.7%), and individual income taxes (23.9%) are more prevalent in OECD countries than corporate income taxes (9.8%) and property taxes (5.6%). (Tax Foundation 2023) The amount fluctuates in proportion significantly by each member county, and some categories have seen changes in reliance over time, including carbon taxes. The dependence of OECD nations on business income tax revenue increased despite a global drop in corporation tax rates. A change in the composition of the OECD’s member nations is one reason for this development. 14 nations have joined the OECD since 1994. Colombia and Mexico are the only two of this group that derive more than 20% of their income from corporate income taxes. The other 35 OECD nations generate 9.8 percent of the global corporate tax income on average. OECD countries’ average reliance on social insurance taxes has increased (2.4%) and their average reliance on individual income taxes has decreased (6.0%) since
While personal income taxes frequently have higher rates and can be more skewed toward worker decisions, social insurance taxes typically have wider bases and lower rates.

The report by the European Commission, "Green Taxation and Other Economic Instruments," (2021) details multiple existing policies and provides useful models of scenarios. Some more specific examples of levies implemented in the E.U. include those on NOx, biomass and coal, pesticides, wastewater, external water supply, landfills, household garbage, drink containers, livestock, and peat.

A model based upon the E3ME, a global macro-econometric model created by Cambridge Econometrics, has been utilized to determine the effects of the listed specific instruments. (European Commission 2021) Three scenarios were used to run the models in each instance: the use of revenues to pay down government debt, the use of revenues to
reduce labor taxes, and the use of revenues to recycle funds in a manner specific to the Member State and the instrument such as improvements in renewable energy or social security reduction. Results were provided in terms of the impact on GDP, employment, real household income, and trade when these scenarios were compared to a normal business baseline assuming no additional environmental levies.

The introduction of a single polluter pays instrument typically has a negligible net macroeconomic impact; for most of the analyzed measures, the change from the baseline in all indicators is less than 0.1%. The percentage change with the baseline is greater than 0.1% only for the PAYT and the fertilizer levy, for Greece in the case of a landfill tax, and for Bulgaria in the case of the water use charge. (EC 2021)

Different scenarios and Member States have different effects on real incomes. If income is utilized to pay down debt, polluter pays economic instruments that hurt real incomes for all households, but if revenues are recycled, income grows for all households. Every income quintile experiences an impact similarly, and there are typically little distinctions between them. (E.C. 2021)

Macroeconomic consequences are influenced by how additional tax funds are employed. The scenario with tailored revenue recycling or lower income taxes typically produces better results in terms of GDP than the one with debt reduction. Regarding the forestry felling charge and the NOx tax, the magnitude of the baseline difference grows, whilst the effects in the scenario with debt reduction remain minimal. (E.C. 2021)
Another study, titled “The Study on U.S. Carbon Tax Strategies,” utilizes eleven different modeling comparisons to determine the results that potential trajectories and revenues a United States carbon tax could produce. The project is the Stanford Energy Modeling Forum Model Inter-comparison Project number 32 (EMF 32). (Climate Change Economics 2018) The trajectory of the carbon price and the use of the money are two crucial criteria that are varied to explore the potential effects of an economy-wide carbon pricing policy. All the scenarios impose a carbon price on all CO2 emissions from fossil fuels, which account for about 77% of all gross GHG emissions in the United States. (C.C.E. 2018) The findings in this research concentrate on four "core" pricing trajectories where the tax starts at either $25 or $50 in 2020 and increases by either 1% or 5% annually. This study offers results for revenue-neutral revenue recycling along with these fixed price trajectories. All options include maintaining baseline levels of government spending and returning net revenues to consumers either as a single sum or by lowering the marginal tax rates on either labor or capital income. (C.C.E. 2018)
The goal of pricing carbon emissions is to decrease the demand for energy derived from fossil fuels and promote the use of low- or non-emitting energy sources, such as nuclear, natural gas, and renewable energy sources, e.g., hydro, wind, and solar. An increase in the price of fossil fuels with higher carbon emissions encourages people and businesses to move to other, frequently cleaner fuels. Despite the likelihood these fuels may initially cost more, the increased cost encourages consumers to switch to lower-carbon energy sources, use less energy, or use energy more effectively. The results of the cross-model comparison and EMF 32 modeling agree with this idea. Implementing a carbon tax reduces demand for emissions-intensive energy sources like coal and oil, according to modeling data, while it raises demand for energy sources with lower emissions levels, such as renewables and natural gas. (C.C.E. 2018)

Another study (Tax Foundation 2023) simulated three methods to allocate the proceeds of a carbon tax. One was a mechanism to boost transfer payments. The carbon dividend is where each person receives a check equal to the amount of money raised divided by the population of the United States. The Child Tax Credit could also be increased with the carbon fee. The carbon tax’s adverse effects on income earners in the bottom quintile of the earnings distribution would be eliminated if just 11 percent of the tax’s revenue were allocated to greater social safety net spending. (Tax Foundation 2023) The benefit of using proceeds from the carbon tax for social investment is that it fully addresses or resolves the tax’s regressive effects, a carbon tax and dividend proposal would result in a net tax reduction for the poorest 70% of families. The drawback of allocating money to transfers is that it eliminates the chance for pro-growth policies. The biggest pro-growth
tax reform option open to policymakers is the full expensing of capital expenditure. Another choice is to use the carbon fee to fund public infrastructure and R&D. (Tax Foundation 2023)

Unsurprisingly, many evaluations reveal that a carbon fee could considerably lower emissions. While a 2009 study by Sumner estimate that the European countries’ carbon taxes have had a significant impact on emissions reductions, attributing reductions of up to 15% to the carbon tax, a 2008 Metcalf study estimates that a $15 per ton tax on CO2 emissions that rises over time would reduce greenhouse gas emissions by 14.0 percent. (Routledge 2018) In addition, the carbon price introduced in British Columbia resulted in a 9.9 percent reduction in greenhouse gas emissions in the province, as opposed to just 4.6 percent for the rest of Canada, where comprehensive carbon taxes were not enacted, according to 2012 research by the University of Ottawa. (Routledge 2018)

A concept that is a potential implementation in almost all OECD member countries is a Value-Added Tax (VAT). A VAT would require companies to pay taxes on the difference between their total sales to consumers and other businesses and their purchases of inputs from other companies. The difference therein reflects the value the company has brought to the relevant item or service. (Routledge 2018) The retail sales price is the total value added at each step of production. It incorporates the cost of extracting the raw materials, therefore the VAT mimics the tax patterns produced by a retail sales tax and is like other taxes on aggregate consumption. However, retail sales taxes are only collected at the time of final sale while VATs are collected at every stage of manufacturing. (Routledge 2018) A VAT typically has a better administrative setup than a retail sales tax and is simpler to
implement. Although it would be new to the United States, the VAT is already in existence in every other member of the OECD and roughly 150 other nations globally. A 5 percent VAT with a broad base could produce revenue equal to 1 percent of GDP in the United States. (Routledge 2018) This indicates that the VAT is manageable, can generate a sizable income, and poses no risk to economic expansion.

A carbon tax might enhance other economic incentives in addition to lowering emissions by lowering other tax rates or paying down the deficit according to a 2011 study. (Routledge 2018) A carbon tax would lessen the U.S. economy's reliance on foreign energy supplies and improve market incentives for energy efficiency, the utilization of renewable energy sources, and the manufacture of items with low energy consumption. It would encourage fresh private sector research and innovation in the creation of novel approaches to using renewable energy and energy-saving technology. Shifts in price signals would be permanent. Other climate-related regulations impacting the transportation industry may be reformed and made simpler with the establishment of a carbon fee. (Routledge 2018)

When a policy is put into place, the public's perceptions of the tax are crucial. An effective implementation may depend on maintaining public approval and attitudes over time. Research on the adoption of other comparable policy instruments, such as taxes and congestion charges in major European cities like Stockholm and London, demonstrates that the degree of acceptability was comparatively low before implementation but steadily rose once the policy was put in place. (U.N. 2021) It has been a problem in failed attempts to enact carbon taxes. For instance, in Washington, where a ballot initiative for a carbon price was rejected in both 2016 and 2018, and in France in 2018, the yellow vests protests
compelled the government to postpone its plan to increase the current carbon price. (U.N. 2021) People’s experiences with a policy and its intended outcome influence how accepting they are. Governments should understand the significance of policy acceptability and develop carbon levies that will see the least amount of popular opposition and resultant political and economic consequences.

Reform in Developed Countries

Since 2008, the Canadian province of British Columbia has been hailed as a shining example of carbon taxes in a sub-state actor since it accounts for around 70% of the province’s greenhouse gas emissions. The province’s impartial treatment of the purchase and use of fossil fuels by both individuals and businesses has been considered as a divergence from other nations’ carbon levies, which exempted politically significant industries. (U.N. 2021) In general, the British Columbia carbon tax policy has been successful in lowering GHG emissions in the province significantly without limiting economic development and growth.
In Canada, provinces and territories must have a carbon pricing mechanism that satisfies a degree of strictness set by the federal government; otherwise, a federal carbon pricing system is in effect; this is referred to as the federal backstop. The federal system consists of a fuel charge on fossil fuels and an output-based pricing mechanism for big industrial facilities that can be applied wholly or partially depending on the conditions in each province or territory. (U.N. 2021)

The carbon tax in South Africa, which went into effect in June 2019, targets carbon emissions from processes in the industrial, power, building, and transportation sectors. The South African carbon tax, which accounts for 80% of the nation's GHG emissions, targets carbon emissions that exceed a particular threshold from industrial activities, the production of energy, and the combustion of fuels. (U.N. 2021) The perceived improvement in South Africa's carbon tax strategy has prompted calls for Kenya, Uganda, Nigeria, Rwanda, and other African nations to change their current tax laws and implement a carbon tax system to lessen environmental pollution in the extractive industry.

Sweden serves as a good illustration of how to implement a carbon tax effectively. In 1991, the nation enacted a tax on fuels for heating and transportation, gradually raising the amount from $28 to $120 per ton of CO2. (Economist 2022) A tax rate that was initially advantageous to the industry was gradually reduced. The tax was a component of a larger fiscal reform that also included lower energy, family, and company taxes as well as improved social transfers. From the beginning, important stakeholders were involved in the decision-making process.
Scope and Background for Carbon Emissions

Among the most common discussions for a tax instrument to be utilized is against fossil fuels. The tax base, rate, and scope are debated widely. According to a report by Carbon Majors Database (2017), the top 100 companies that produce fossil fuels are linked to 71% of all greenhouse gas emissions by companies, 25 of which make up 51% of these emissions from 1988 to 2015. Research shows that 32% of these legacy emissions originate from publicly traded corporations, underscoring the influence of investors in the shift to a sustainable economy.

Since 1988, the following businesses have produced the most emissions. ExxonMobil, Shell, BP, Chevron, Peabody, Total, and BHP Billiton are examples of publicly traded corporations. State-owned enterprises include Saudi Aramco, Gazprom, National Iranian Oil, Coal India, Pemex, CNPC, and Chinese Coal, of which Shenhua Group & China National Coal Group are important players. (CMD 2017) It is important to consider that environmental taxes should be levied directly at the source of the pollutant. Production is at a significantly larger scale than for smaller parties, thus greater amounts of revenue can be generated, and the activities will be more likely deterred.
In the United States, federal excise taxes on gasoline in 2010 were 18.4 cents per gallon, with municipal tax rates often adding another 20 to 30 cents per gallon. The average gasoline excise tax in the OECD is around $3.39 per gallon, which is over seven times the amount in the United States. (Routledge 2018) According to the OECD in 2011, gasoline taxes in OECD nations varied from $0.34 per gallon in Mexico to $5.14 per gallon in Turkey. (Routledge 2018) The United States has the second-lowest gasoline tax rate. Additionally, the United States per-mile gasoline taxes are low by historical standards, having decreased by 40% in real terms since 1960 (Routledge 2018) Additionally, the negative side effects of motor vehicles, such as pollution and congestion, justify gasoline taxes at least three times higher than present levels.

Although increasing gasoline taxes could have some influence on cutting carbon emissions, they are significantly less effective than a carbon tax since the former only applies to a much smaller variety of items that produce externalities. A 10-cent per gallon increase in the fuel excise tax would lower overall carbon emissions by 0.5 percent and automobile emissions by 1.5 percent. Fuel taxes will disproportionately affect low-income families in the short run as households struggle to change their behavior to avoid the cost. (Routledge 2018) Increased motor fuel excise taxes have the potential to generate large sums of money. A 50-cent increase in the gasoline excise tax would collect around 0.3 percent of GDP in additional revenue if gasoline and diesel fuel taxes were raised to their corrected levels. (Routledge 2018) Even if the gas tax were increased by 25 cents a year for ten years, the United States would still have gas taxes that are much lower than those of European industrialized nations.
It is also important to contrast carbon pricing with the current state of environmental policy. Today, four main regulatory frameworks deal with carbon emissions. To meet Corporate Average Fuel Economy (CAFE) criteria, a manufacturer's fleet of automobiles for a certain model year must achieve a specific level of fuel economy. The Clean Power Plan (CPP), which mandates that states select among several emissions-restricting regulations, focuses on emissions from the production of electricity. (Tax Foundation 2022) Appliance and equipment efficiency regulations aim to reduce emissions from both the household and commercial sectors, while the Renewable Fuel regulations (RFS) mandate that fuel distributors have a set amount of renewables in their fuel. (Tax Foundation 2022)

**Renewable Energy Incentivization**

There have been some fiscal reforms that target individual taxpayers through negative incentives such as tax credits. Federal tax credits and deductions enable Americans to upgrade homes and businesses to be energy efficient, thus lowering demand and costs by switching to renewable sources. Through 2032, new federal income tax credits are accessible, offering up to $3,200 per year to reduce the price of energy-efficient home modifications by up to 30%. The tax credits can help households cut their monthly energy costs by financing improvements including installing heat pumps, heat pump water heaters, insulation, doors, and windows, as well as upgrading electrical panels and conducting home energy audits. (IRS 2023) The Residential Clean Energy credit offers a 30 percent income tax credit for clean energy equipment like rooftop solar, wind energy, geothermal heat pumps, and battery storage through 2032, reducing to 22 percent for 2033 and 2034. (IRS 2023)
The Section 45L Tax Credit for Energy-Efficient New Homes was extended through 2032. The base-level tax credit for house builders is linked to satisfying ENERGY STAR program requirements for single-family, prefabricated, and multifamily dwellings for homes and units purchased on or after 2023. The deduction for energy-efficient commercial buildings, which was made permanent under Section 179D in 2021, was expanded and extended. This will be available to buildings that improve their energy efficiency by at least 25%, with bonuses for further efficiency gains. (IRS 2023)

The United Kingdom has been a leading nation for renewable energy subsidies. According to a KPMG Report (2015), there are numerous incentives and collection instruments applied in the past decade. Subsidies for operation include a renewables obligation scheme, which adds that generators must include a specific portion of electricity from renewables, Feed-in-Tariff for small and large scales or Contract for Difference (CFDs), and long-term renewable heat incentives. All help to support renewable electricity formation. Strike prices, or breakeven return on investment, are detailed annually.
**State and Federal Level Reform**

The United States should require a carbon price to meet its climate goals. It can achieve its emissions reduction targets and promote American businesses in a future low-carbon economy and demonstrate the country’s commitment to effective climate mitigation policies. The U.S. regulatory agencies’ existing command-and-control techniques for regulating greenhouse gas emissions are probably insufficient to achieve President Biden’s target of halving emissions by 2030. (Routledge 2015) It has been predicted that implementing a sufficiently high carbon price will significantly affect carbon emissions. Potentially, a $50 per ton carbon tax that increases by five percent each year can result in emissions reductions of between 26 and 47 percent compared to 2005 levels. (Routledge 2015)

For jurisdictions with subnational levels, a nation’s constitution or public law structures will probably contain provisions defining which levels of the state have taxation authority. (U.N. 2021) Depending on the different forms of taxes, these levels may change. Furthermore, constitutional provisions that govern taxation and the environment may both apply in the case of carbon taxes.

Some U.S. states have implemented carbon pricing schemes: Washington state voted to implement its carbon pricing scheme in April 2021, while California inaugurated its cap-and-trade scheme in 2013. (Kennedy 2022) The Regional Greenhouse Gas Initiative is a regionalized cap-and-trade system that covers 18% of emissions in member states. It is
made up of eleven states in the northeastern United States. While Oregon lawmakers attempted unsuccessfully to establish a cap-and-trade system in 2019, the Hawaii state senate has declared its intention to pursue one in 2022. (Kennedy 2022)

The most effective and direct way to accomplish the emission reductions required to combat climate change is through carbon prices. If the U.S. is to achieve its climate goals, dramatic action will be required. While U.S. carbon emissions have decreased over the past 20 years since their peak in 2005, the rate of decrease has not been sufficient. The United States will only lower emissions from 2005 levels by 20-22 percent by 2025 and by 20-26 percent by 2030 if current policies are followed. (Kennedy 2022)
These taxes encourage switching to lower-carbon fuels in power generation, reducing energy use, and converting to cleaner vehicles because they raise the prices of fossil fuels, electricity, and other consumer products while lowering prices for fuel producers. Coal, electricity, and gasoline costs would normally rise by around 100, 25, and 10%, respectively, if a tax of $35 per ton on CO2 emissions were implemented in 2030. (IMF 2019) Carbon taxes offer an incentive for shifting energy spending to technology like renewable energy sources. In all nations, using a portion of the proceeds to pay for clean energy infrastructure upfront could increase the legitimacy and efficacy of carbon pricing. Carbon taxes might generate a sizeable amount of revenue—typically 1-2 percent of GDP for a $35 per ton levy in 2030. (IMF 2019) This is another key justification for them. The detrimental macroeconomic effects of higher energy prices, e.g., reduced employment and investment, might be mitigated if this revenue is used wisely to advance a nation’s economy. For developed economies, the revenue may be mostly used to reduce taxes on labor and capital gains, reflecting a restructuring of the tax code rather than an increase in the overall tax burden. The proceeds from carbon taxes might be primarily utilized to finance investments for accomplishing the goals of developing countries that are unable to raise enough money from broader taxes since a sizable amount of economic activity takes place in the informal sector.

The Social Cost of Carbon (SCC), according to climate economist William Nordhaus, was $31 per ton in 2015, but it will rise to $44 per ton by 2025 and $52 per ton by 2030. Similar predictions were made by the EPA under the Obama administration: $36 per ton in 2015, rising to $46 per ton by 2025 and $50 per ton by 2030. (Kennedy 2022) Instead, the UN
Framework Convention on Climate Change’s High-Level Commission on Carbon Prices estimated that to achieve the Paris Agreement’s target of limiting global warming to two degrees, a universal carbon price of $40–80 per ton by 2020 and $50–100 by 2030 would be necessary. Currently, a price range of $40 to $80 only covers 3.76% of world emissions. (Kennedy 2022)

Conclusions

Countries need to scale up their efforts to lower the level of GHG emissions if the world is to address the negative effects of rising sea levels, changing weather patterns, and extreme events. Nations that have not yet implemented a carbon tax policy should learn from previous issues to create plans that will aid in reducing global warming and climate change. The budget deficits in the United States are unsustainable. Imposing a carbon tax is one somewhat appealing alternative for increasing revenue on the tax side. A tax would promote economic efficiency, improve environmental results, and allow for the removal of specific additional tax subsidies and expenditure programs in addition to its effect on revenues. Negative distributional impacts might be mitigated by other policy adjustments. Carbon taxes can be a useful tool for policymakers as they look for methods to solve both the budgetary deficit and ways to enhance the tax system. While economic theory implies that carbon taxes are an obvious solution, there are practical implementation issues. Concerns can be addressed on two levels, specifically the disproportionate effect on low-income households and the drag on growth. The first is by contrasting a carbon price with the current policy framework, which is less efficient and less distributionally friendly than a carbon tax. The second is by considering revenue recycling alternatives. If employed
wisely, the money that a carbon tax would generate might more than offset both
distribution and growth issues. Effective design is key. There are unknowns associated
with the implementation of a carbon tax, not limited to the tax's structure and its intended
application. Instead of focusing on only one type of pollution, a carbon price needs to apply
to all emissions. In addition, the tax should be used as a substitute for current laws,
especially if the tax rate is high. The advantages of revenue recycling will differ depending
on the taxes utilized as offsets. Carbon taxes are feasible and thoughtful design is
important.

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