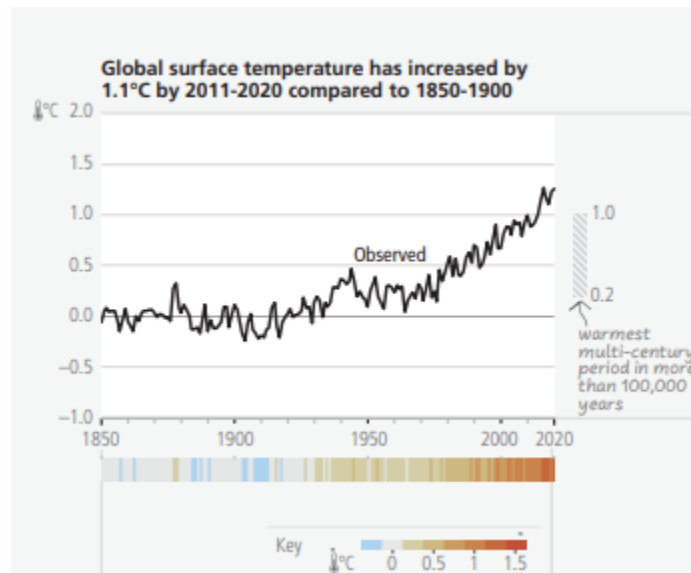


Individual Project Report (Assignment 2)

Are carbon markets the best way to reduce carbon emissions today?



EnSE205 - Principles of Env.Sustainability

**Majed Zamzami
(195560)**

Abstract

This paper on the carbon market debate project addresses whether carbon markets are the optimal way of reducing carbon emissions today. Carbon markets operate by capping the emissions and enabling companies to trade permits. This creates financial incentives for emission reductions. Proponents argue that such markets provide flexibility and economic efficiency. On the other hand, opponents of the utilization of carbon markets cite such issues as price volatility, administrative expenses, and market inefficiency. One of the central alternatives is carbon taxation, whereby a set tax per ton of carbon emitted is placed.

While carbon markets have succeeded in certain locations, their potential for price volatility and manipulation make them a cause of concern. Using a fixed carbon fee or carbon tax is an easier and more predictable way that is clear and more effective. By charging a fixed fee per ton of carbon dioxide emitted, we implement an open economic plan that is easily seen and directly discourages carbon-dependent activity. This ensures that emissions are minimized and precludes the risk of loopholes or corruption. This also allows companies to schedule their technology investments more effectively, allowing for a safe climate for innovation. The European Union Emissions Trading System (EU ETS) history shows both the advantages and disadvantages of this approach, with fluctuating permit prices leading to uncertainty for businesses.

This high price volatility makes it difficult for companies to make long term decisions and commitments to emerging technologies. Carbon taxation, on the other hand, exemplified by Sweden and Canada, provides a straightforward and sure economic signal to reduce emissions. Allowing businesses to commit to clean technologies without risking that prices change suddenly so their investments are worthless. This report presents a balanced argument but ultimately determines that carbon markets are not the best solution. Their volatility, susceptibility to manipulation, and cost of administration are more than their benefits. A carbon tax, however, presents a more stable and transparent method of lowering emissions, promoting stable long-term investment in clean technology.

Introduction: Background to the Problem

Effort to reduce global carbon emissions has resulted in various policy strategies, including carbon markets and carbon taxation. Carbon markets are founded upon a cap-and-trade system in which firms receive or buy permits for a set quantity of emissions, with the ability to sell excess permits. This policy influences companies to reduce emissions at minimum cost. Carbon markets are accused by critics of introducing excessive complexity, market volatility, and regulation problems. Climate change continues to be among the most pressing issues in the globe, with industrial carbon dioxide (CO₂) emissions from transport and power generation among the significant sources. The 2015 Paris Agreement set ambitious targets to restrict warming to below 2°C. Aggressive emission mitigation steps involving massive measures balancing economic and environmental interests must be undertaken in order to achieve the targets.

Two principal market-based methodologies have been formulated: carbon markets and carbon taxation. While carbon markets are conceived to let the price of CO₂ emissions be determined by supply and demand, critics argue that they fail to give a stable and predictable method to induce reductions. They reference instances such as volatile permit prices, regulatory loopholes, and the potential of large firms to game the system rather than lowering their carbon output. On the other hand, carbon taxes are a clear money penalty for emissions that encourage companies and consumers to adopt cleaner alternatives without the complexities of trading schemes. The taxes levied on carbon emissions at a fixed rate provides certainty for businesses and investors with long-term investments in mind. The argument is that simplicity provides greater transparency and efficiency in reducing emissions.

Both strategies aim to internalize the social costs of carbon emissions but do so in very different ways. Carbon markets create emission permits, as a new commodity, and rely on market forces to generate efficient outcomes. Carbon taxes use existing tax structures to place a direct price on emissions and may reduce administrative costs and risks of market loopholes. The choice among these alternatives involves subtle trade-offs between economic effectiveness, administrative feasibility, political acceptability, and environmental efficiency. Both have been piloted by nations and regions, yielding valuable experience about their real-world performance. The European Union Emissions Trading System is the most universal carbon market deployment, with Sweden and British Columbia providing successful carbon tax initiatives.

The Case for the Affirmative

Market Efficiency and Cost-Effectiveness

Carbon markets proponents argue that they provide businesses with choice with which to reduce emissions in the most cost-effective way. Businesses with low cost abatement do so and sell their excess allowances to businesses with higher cost abatement. This enables reductions in emissions to be done wherever it is most economical. Well designed carbon markets can provide abatement at 30-60% lower costs than traditional command-and-control policy instruments. It is because market-based instruments allow abatement to take place at the lowest cost where it takes place, rather than mandating symmetric abatement by all sectors and firms regardless of their respective marginal abatement costs.

Historical Success in Emission Reduction

The EU ETS has reportedly reduced emissions from power plants throughout the European continent by 47% since 2005. The cap-and-trade system of California also had the same effect with a reduction in power sector emissions by 35% between 2013 and 2020. Such statistics are indicative of the way in which market forces can lead to concrete reduction. ICAP (2023) asserts that the EU ETS has assisted significantly in breaking the link between carbon emissions and economic growth. During 2005-2022, emissions reduced by the installations covered under the EU ETS by some 37% collectively, whilst the economy within the EU increased by more than 10% over the corresponding period. It shows that emission reduction is feasible with the aid of carbon markets without hurting the growth of the economy.

Emissions trading systems that exist cover approximately 17% of worldwide greenhouse gas emissions, with the national ETS of China being the largest carbon market globally. Expansion of such systems is evidence of growing appreciation of their capacity to drive emissions reductions across various economic contexts.

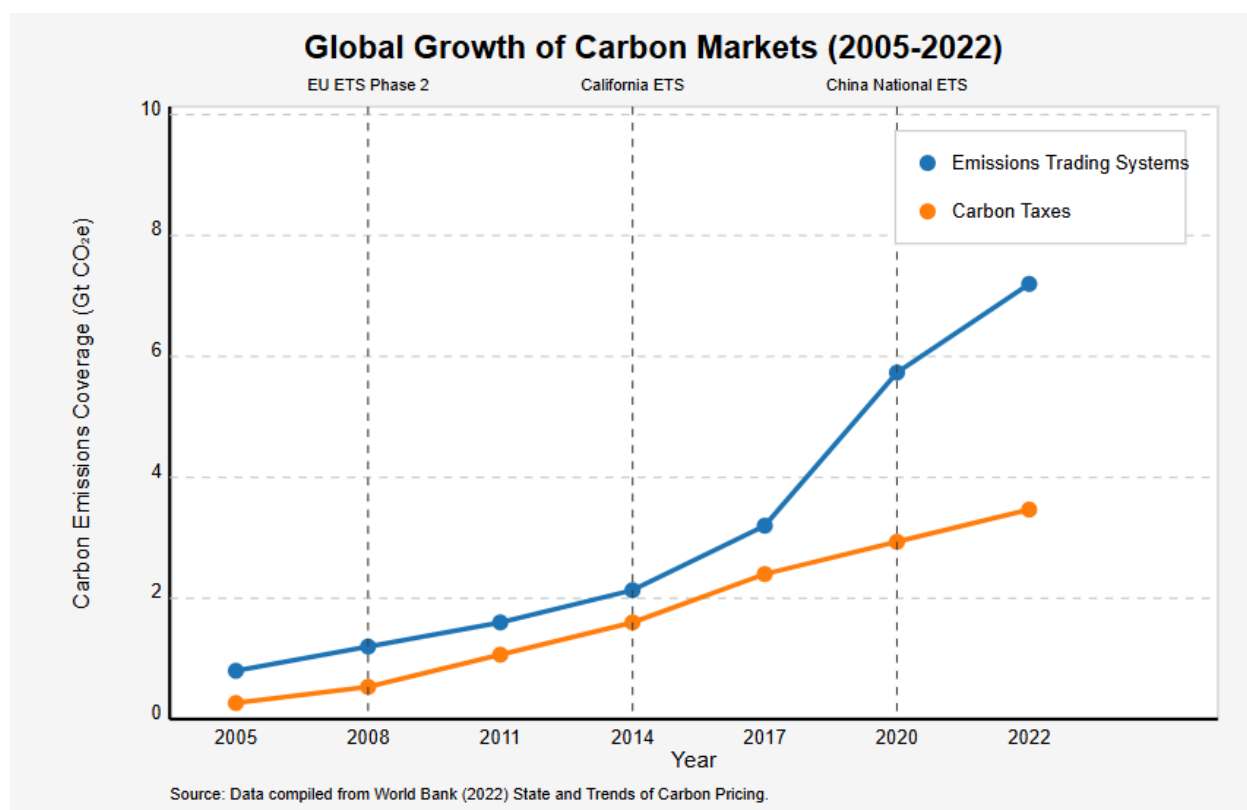


Figure 1. Global Growth of Carbon Markets (2005-2022)

Encouragement of Innovation

By turning the emissions of carbon into a cost, carbon markets compel firms to spend money on cleaner technologies. Firms have an incentive to become creative in carbon capture, energy efficiency, and renewable energy technologies to minimize their expenses over the long term. IPCC (2023) confirms that "carbon pricing instruments provide ongoing incentives for low-carbon technology innovation by internalizing the social cost of emissions." This is the most important innovation effect on long-term climate mitigation because technological transformation is essential for deep decarbonization scenarios.

Carbon markets have elicited unprecedented investment in low-carbon technology and emissions savings. By generating an open and clear financial signal to constrain emissions, carbon markets provide investor and business confidence for long-term decision-making regarding energy systems and industrial processes. Carbon pricing has stimulated deployment of renewable energy in carbon-priced areas at

faster rates. They have been implemented by large economies such as China, the EU, and Canada, showing their success as a prime emissions reducing measure. The overall trend towards carbon markets is that governments and businesses recognize them as a necessary tool in fighting emissions. 68 carbon pricing policies have existed or been in pipeline for enforcement globally, and they span 46 national jurisdictions. Both carbon taxes and emissions trading systems are among these policies, with the latter particularly gaining traction in major economies.

The interconnectivity potential of carbon markets offers further benefits through global cooperation. By linking different systems, carbon markets can improve liquidity, reduce price volatility, and reduce overall compliance costs. The development of global provisions for carbon markets under Article 6 of the Paris Agreement also shows the global recognition of market mechanisms as a key climate policy tool. International cooperation through linked carbon markets has the potential to reduce the cost of meeting the Paris Agreement goals globally substantially. By enabling mitigation to occur where it is most affordable, without consideration of country boundaries, carbon markets enable climate action to be more ambitious without increasing overall economic expense.

The Case for the Negative

Carbon Tax as a Better Alternative

Unlike carbon markets, a carbon fee or tax has the advantage of simplicity and certainty of a set charge. Charging a fixed fee for each ton of CO₂, businesses can invest in emissions reduction technology over the long term with assurance. The simplicity with which carbon taxes can be launched makes them particularly suitable for countries with low institutional capacity or those wanting to put in place carbon pricing at speed. Carbon taxes have proved to be more price-stable in the long term compared to emissions trading schemes. This makes it easier for investors and businesses that make long-term energy systems and process investment decisions to receive a clearer signal. Carbon markets have experienced abrupt price swings, whereas carbon taxes in regions such as British Columbia and Sweden have taken

expected directions, rising progressively over the years. Carbon taxes also give governments greater revenue predictability to plan more effectively for revenue recycling programs that can address distributional concerns as well as rally public support. The transparency of a carbon tax can render it more understandable for citizens to grasp the policy and evaluate its effects, which can increase its political sustainability.

Extreme Price Volatility

One of the most serious issues with carbon markets is their price volatility. Prices oscillate up and down with market forces, making long-term investment planning difficult for companies. For example, the EU carbon price plummeted to €3 in 2008 due to excessive free permit over-allocation but later rose to over €100 due to economic and geopolitical shifts. The volatility discourages investment in clean technology. The IPCC (2023) has identified price volatility as one of the key drawbacks of emissions trading systems, noting that "high price volatility in carbon markets can undermine their effectiveness by creating uncertainty for investors and reducing incentives for long-term low-carbon investments." The volatility is induced by a number of factors including economic cycles, policy changes, and external shocks such as the 2008 financial crisis or the COVID-19 pandemic.

The EU ETS has seen numerous cases of price crash, where the price has fallen more than 50% on a few occasions. The high price volatility renders it hard for firms to value carbon liabilities adequately in planning. Price controls such as price ceilings and floors have been put in place across most jurisdictions specifically to address this volatility problem. But such interventions need to be constantly tweaked and controlled in order to guarantee price stability, introducing even greater complexity to an already convoluted system.

Administrative Complexity and Inefficiency

Carbon markets require rigorous control and regulation, causing administrative inefficiencies and burdens. Rightful enforcement, fraud avoidance, and allowance management require sophisticated systems that are loop-holed and abused. Proper emission monitoring is a source of uncertainty as well. The implementation of an efficient emissions trading system requires high institutional capacity, including accurate emissions monitoring, reporting, and verification systems; registry infrastructure for

allowance tracking; and market oversight mechanisms. These requirements create high barriers to implementation, particularly for developing countries with limited administrative resources.

The administrative complexity is also extended to the initial allocation of permits, which becomes a politically sensitive exercise. The transaction costs of carbon markets can be significant, especially for small players. These include emissions monitoring and reporting, transaction costs, and verification of compliance. For small and medium enterprises, such administrative tasks can become a disproportionate expense, creating competitive disadvantages and unequal application across sectors.

Risk of Market Manipulation and Fraud

Carbon offsetting schemes have been condemned on the basis that they allow emitters to buy cheap credits instead of making reductions. Cases of fake credit transactions and ineffective offset schemes undermine the legitimacy of carbon markets. Carbon markets have been plagued by widespread cases of fraud, including value-added tax fraud, phishing scams on registry accounts, and recycling or double-counting of carbon credits. Not only do these frauds lead to economic losses but also undermine public trust in market-based measures for mitigating climate change. Many offset projects have been criticized as being unable to deliver expected emissions reductions or for claiming credit for actions that would have occurred in any case.

The World Bank (2022) reports instances where offset projects not only did not save emissions but actually harmed local communities or the environment. Indigenous people's rights have been abused in some forest carbon projects, and industrial gas destruction projects have given perverse incentives to release more toxic gases simply for the sake of earning offset credits.

Overview of Challenges and Issues

The carbon tax versus carbon market debate highlights deep differences in how we can address climate change through economic policy. Both seek to make polluters pay for carbon emissions, just in different ways and with different problems. Carbon markets sound great on paper, however the EU's experience shows how they can go wrong. Price crashes and volatility in carbon permit prices have made planning hard for companies. Such markets also need complex systems to track emissions and prevent cheating

that many countries don't have. Carbon taxes are simpler to put in place but tend to face even stronger political opposition because the costs are more visible. Once in place, they provide more predictable and stable prices, which help firms make long-term plans for reducing emissions. What is best depends on the conditions in each country and their government's effectiveness, political situation, and pre-existing policies are all factors.

Climate change is a global problem requiring global cooperation. Carbon markets might one day be linked across borders, allowing emissions to be reduced wherever it is cheapest. The Paris Agreement provides for such cooperation. However, global carbon offset mechanisms have been unable to ensure that so-called emissions reductions are real and would not otherwise have happened. Such doubts have created skepticism about market-based approaches. Carbon taxes are perhaps simpler domestically but coordinating tax levels internationally has proved difficult. A global minimum carbon price would provide an easy way of cooperation, but political hurdles remain high. New technologies can potentially solve some of the problems with carbon pricing.

Advanced satellites and electronic tracking systems could improve the monitoring of emissions and carbon offsets. Most policymakers now realize we don't have to choose just one approach. Hybrid systems that borrow components of both carbon taxes and markets are more common. For example, carbon markets can have price floors and ceilings to prevent extreme price volatility, but still allow the flexibility of trade. Neither carbon markets nor taxes alone will stop climate change. We also need regulations, public investments in clean tech, and other policies in tandem. Summary and Conclusion

After a review of the evidence, it's clear that both carbon markets and taxes have weaknesses and strengths.

Carbon markets are flexible but subject to price volatility and complexity. Carbon taxes are straightforward and offer certainty but may be more politically difficult at the outset. Practical experience suggests that well-designed carbon taxes deliver more predictable results with less administrative effort. The Swedish and British Columbian experiences show that carbon taxes can be an effective means of reducing emissions without dampening economic growth. Even so, the best approach is country-specific. In practice, blending aspects of the two systems is likely to work best. What is difficult is ramping up carbon pricing to climate objectives. Existing carbon prices in most locations are too low,

and a lot of emissions are not covered at all. Coverage and intensity of carbon pricing have to be raised in the future while making sure of equitable results. Going forward involves learning by doing and modifying our strategies. Neither carbon taxes nor markets are perfect, yet both are likely to play important roles in the combat against climate change.

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