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5

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Abstract

Economists and policy analysts recognize a well-designed cap-and-trade scheme as the premier approach to effectively reduce carbon emissions. However, politics is bound to play a major role in the policymaking process—more so with carbon dioxide emissions than other pollutants like sulfur dioxide. This paper examines the political climate in which the major trading scheme in the European Union was proposed in order to explore how politics affects the programs' environmental integrity and ultimate policy outcome. Based on an analysis of the EU's program, many pieces need to align within the political landscape for a cap-and-trade system to pass the policymaking body, let alone an ambitious one.

Keywords

Cap-And-Trade, Emissions Trading System, Climate Change, Carbon Dioxide

Introduction

"Climate change is the greatest challenge of our time… it threatens our planet, our only home," announced Thomas F. Stocker, the co-chairman of the Intergovernmental Panel on Climate Change (IPCC) (Gillis, 2013). In September 2013, IPCC, a United Nations-sponsored committee of scientists, reported that it is 95 % certain that climate change is largely caused by anthropogenic activities (IPCC, 2013). The Environmental Protection Agency (EPA) has identified human causes of climate change to include activities such as burning fossil fuels, raising livestock, storing waste in landfills, and a host of other activities, all of which result in carbon dioxide (CO_2) or other greenhouse gas (GHG) emissions that block heat from exiting the Earth's atmosphere ("Climate Change Science," n.d.). As climate change occurs, rising sea levels threaten coastal communities, extreme weather disrupts crop cycles, and increased chances of heat waves and air pollution creates major public health issues.

In the early 20th century, British economist Cecil Pigou first recognized that market prices may not include effects that are external to the buyer and seller and emphasized the importance of internalizing those externalities (Conniff, 2009). Pressing questions in the climate policy arena revolve around how to best reduce carbon and other GHG emissions, principally by placing a price on emissions to account for their external effects. Environmental economists and policymakers have generally agreed that cap-and-trade can reduce CO_2 emissions at relatively low compliance costs while retaining the program's environmental integrity, making it the best climate policy to reduce carbon emissions compared to a carbon tax or command-and-control legislation. While a well-designed cap-and-trade mechanism may be the best theoretical solution to decrease carbon emissions, politics and divisive interests intrinsic to the policymaking process often get in the way of implementing the original policy proposal. Despite the political challenges facing cap-and-trade policy, policymakers must recognize the urgency of taking national action for the sake of environmental and business interests. By analyzing the emissions trading program in the European Union (EU), policymakers can better understand how the political landscape, shaped by the political system, public opinion, interest groups, and political leadership, can lead to certain design and implementation challenges. In fact, many pieces in the game of political Tetris must fit together before the policymaking body can enact a sustainable cap-and-trade policy.

The Basics of Cap-and-Trade

A carbon cap-and-trade program places a cap, or maximum limit, on CO_2 emissions on a target group of sources and lowers the cap over time. The cap may apply to the entire economy or to a selection of fossil fuel intensive sectors. The government agency administering the program distributes emissions allowances—usually worth a ton of CO_2 emissions each—through an auction, free allocations, or a combination of the two. Programs can also cover other GHGs in the cap in a 'CO_2 plus.' In this 'CO_2 plus' model, allowances are measured in "carbon dioxide equivalent" (CO_2e). The available allowances during each compliance period constitute the cap, which ensures that covered entities reach the target quantity of emission reductions. The governing agency usually retains some allowances to provide a buffer for smooth market prices and to protect new entrants. For each compliance period, participating sources must surrender an allowance for each unit of CO_2—or CO_2e—emitted during that period. Free allowance allocations help ease the cost burden for particularly emissions-intensive industries, while auctioning allowances raises revenue for administering agencies that can be used to offset the social costs of the cap-and-trade program for companies and consumers or to fund other climate programs.

Covered entities must acquire a sufficient amount of allowances to emit CO_2 or reduce emissions in each compliance period. Participants can trade allowances to reach abatement goals. Those who can reduce emissions more cost-effectively can sell their excess allowances to participants unable to reduce emissions as cheaply. This market mechanism incentivizes participants to invest in cost-efficient emission reduction technologies. If the technology costs more than allowances, participants would opt to purchase more allowances. Allowance prices are likely to increase over time and continue to incentivize investments, since the caps decline and companies reduce emissions through more expensive methods.

Most cap-and-trade schemes allow for the banking and borrowing of allowances. Participants can deposit extra allowances for later use (banking) or hedge allowances at a specific price to mitigate volatile allowance prices in later periods (borrowing). Policymakers can design a scheme to avoid allowance price spikes and moderate the severity of the cap by setting price ceilings for allowances or selling some allowances at fixed prices. Participants can also earn additional credits—offsets that help satisfy required abatement goals—through different carbon reduction techniques, such as carbon capture and sequestration. If participants do not obtain sufficient allowances to cover their emissions, they are subject to fines, calculated as a flat fee or a rate per ton of CO_2e. Different cap-and-trade programs around the world can link to one another by permitting allowance creation and trading among schemes. International linkage decreases the chances of leakage, which occurs when increased emissions outside the cap-and-trade program offset reductions that take place within the program.

Literature Review

Cap-and-Trade: The Best Way to Reduce Carbon Emissions

Stavins (2007) evaluates different types of carbon emissions reduction policy and concludes that a cap-and-trade mechanism can decrease CO_2 emissions more effectively—and at a lower compliance cost—than a carbon tax or setting industry standards. A carbon tax imposes a fixed price on carbon emissions for certain sources, which allows companies to project the marginal cost of compliance and eliminates fears of carbon price volatility. While a carbon tax provides more certainty for compliance costs, the policy's environmental goals can be easily compromised compared to that of cap-and-trade policy. The actual quantity of emissions reduced by a tax is unknown until the tax has been implemented for some time. Once legislated, tax levels are difficult to amend. This uncertainty and inflexibility can undermine the tax's environmental integrity—the ability to fulfill environmental goals of reducing emissions and mitigating climate change (Stavins, 2007). In contrast, a cap-and-trade program ensures a set reduction of carbon emissions by creating a cap and distributing allowances based on the cap. When negotiating a carbon tax, interest groups would lobby for exemptions, which are extremely difficult to repeal (Stavins, 2007). Under a tax regime filled with loopholes, exempt companies would not be as incentivized to reduce their carbon emissions, which can also compromise the tax policy's environmental integrity. While interest groups would similarly lobby policymakers on cap-and-trade provisions, the system provides intrinsic solutions for reducing the burden on carbon-intensive industries with free allowances, which could be phased out gradually while increasing allowance prices continue to incentivize investments in emissions reduction technology (Stavins, 2007).

Not only would a carbon tax struggle to meet its environmental goal, a carbon tax will encounter "stiff resistance… in the current political climate" in comparison to a cap-and-trade system, which hints toward the importance of the political landscape in environmental policymaking (Stavins, 2007). Stavins (2007) caveats his assertion and notes that "no policy proposal [including a carbon tax] should be ruled out," since political leadership and public opinion may change. Ultimately, the deciding factor between cap-and-trade and a carbon tax should be based on two factors: "which is more politically feasible and which is more likely to be well-designed" (Stavins, 2008b). According to Stavins, cap-and-trade enables policymakers to appease interest groups via free allowances and still maintain its environmental, making it the policy solution that is "optimal in Washington" (Stavins, 2008b).

Command-and-control mandates can also reduce carbon emissions, though this policy mechanism has far higher compliance costs which can deter investments in emissions reduction technology. In the U.S., the EPA has the authority under §202(a)(1) of the Clean Air Act (CAA) to regulate harmful air pollutants, including CO_2, by setting ambient air standards.[1] Congress does not need to amend or enact any law, avoiding months or years of Congressional debate and interest group lobbying.[2] However, standard-setting is limited by administrative capacity and resources, since it requires the administering agency to set different standards for different emission sources (Stavins, 2007). Establishing controversial standards inevitably involves protracted litigation, as shown in past U.S. Supreme Court cases, such as *Massachusetts v. EPA* (2007) and *Utility Air Regulatory Group v. EPA* (2013). Furthermore, setting industry standards can stifle innovation and the development of new technologies that may otherwise result in greater emission reductions at a lower cost (Stavins, 2001). Stringent command-and-control regulation often only applies to new capital stock, which discourages companies from retiring old plants and investing in new capital that must fulfill more stringent regulations (Stavins, 2007). Outdated equipment usually emits more heavily and can offset the reductions occurring elsewhere, further threatening the policy's environmental integrity (Stavins, 2007). In comparison, cap-and-trade ensures that emissions are reduced to a specific amount, encourages innovation, and does so cost-effectively through a trading mechanism. Under a cap-and-trade program, market forces incentivize investments in clean technology and give industries more flexibility on *how* and *when* they should cut emissions. Thus, when choosing among the three policy solutions, many economists favor cap-and-trade, since it can uphold its environmental goals, has the lowest compliance costs, and is more politically feasible.

Past Successes Depended on Political Context and Program Design

Not only does cap-and-trade seem to be the best policy in theory, cap-and-trade programs brought many environmental successes in the past and have become a popular response to reduce certain emissions. However, these outcomes largely depend on the program's design and political context. For instance, the Clean Air Act Amendments of 1990 authorized a highly successful cap-and-trade program to reduce sulfur dioxide (SO_2) and nitrous oxide (NO_x) emissions to decrease acid rain (Stavins, 2007). The SO_2 cap-and-trade

1 In *Massachusetts v. EPA* (2007)*,* the U.S. Supreme Court ruled in favor of the EPA, stating that the agency has the authority to regulate all air pollutants, including carbon dioxide, under §202(a)(1) of the Clean Air Act, 42 U.S.C. §7521(a)(1).

2 The 2007 ruling has received a lot of push back from interest groups, such as the coal industry. For instance, the U.S. Supreme Court will hear a case regarding EPA's authority to regulate GHGs from stationary sources, which includes coal-fired power plants. See Liptak (2013) for a further discussion of this U.S. Supreme Court case.

program met statutory reduction goals and cut SO_2 emissions by 5.5 million tons between 1990 and 2005, while generating $1 billion in annual cost-savings (Conniff, 2009). The program generated about $122 billion a year in benefits from cleaner lakes, healthier forests, and avoided health problems (Conniff, 2009). A 2003 Office of Management and Budget study found that the Acid Rain Program "accounted for the largest quantified human health benefits of any major federal regulatory program implemented" between 1993 and 2003, with benefits exceeding costs by more than a forty-to-one ratio (EPA, "Cap-and-Trade," n.d.). To this day, the SO_2 cap-and-trade program is considered one of the most successful regulatory programs ever.

Granted, SO_2 is very different from CO_2, which is considered a more ubiquitous pollutant and therefore more politically difficult to regulate. SO_2 is a regional pollutant and was generally accepted as a prominent contributor to acid rain, causing clear, visible damage in people's daily lives. In addition, the Railroad Revitalization and Regulatory Reform Act of 1976 and the Staggers Rail Act of 1980 deregulated the railroad industry and decreased the price of transporting low-sulfur content coal to power plants (Schmalensee & Stavins, 2012). These pieces of legislation created positive externalities and helped the Acid Rain Program achieve its environmental goals without necessarily spurring investments in emissions abatement technology. In other words, the SO_2 cap-and-trade's success was unique to its circumstances.

Due to previous successes such as the U.S. SO_2 cap-and-trade program, more policymakers view cap-and-trade as a feasible and preferred solution to mitigate climate change. Betsill and Hoffman (2011) examine an array of cap-and-trade programs in operation between 1996 and 2011 and found that policymakers around the world have used or seriously discussed using the mechanism in 32 different instances between 1997 and 2011, indicating the legitimacy of the cap-and-trade mechanism as a way to reduce CO_2 emissions (Betsill & Hoffman, 2011).

Despite past successes and the perceived legitimacy of cap-and-trade policy among policymakers, Stavins (2008a) notes that not all previous programs have been as effective and emphasizes the critical influence of policy design and related forces on a program's "ability to achieve its environmental goals [and] costs." In 1994, California launched a cap-and-trade program in the Los Angeles Basin called the Regional Clean Air Incentives Market (RECLAIM) to reduce regional SO_2 and NO_x emissions. Though the program reduced NO_x emissions by 60 % and SO_2 emissions by 50 %, too many allowances were distributed in the early years and businesses were not incentivized to reduce emissions at the expected rate (EPA, 2002). In 2000, an unexpected shortage of allowances due to the deregulation of California's electricity market and a surge of energy production resulted in a price spike; allowances cost $45,609 per ton of NO_x—twenty times their historic price (EPA, 2002). RECLAIM exemplifies the importance of program design and surrounding events to its overall success. Stavins (2007) clearly showcases why a program must be robustly designed and can be the most cost-effective and environmentally impactful solution to reducing GHG emissions.

Politics in Design

While Stavins (2007) maintains the merits of a well-designed cap-and-trade program and points out that politics plays a role in policy decisions, he does not delve further into how politics and policy are intertwined throughout the cap-and-trade design and implementation process, which can change the original policy proposal and affect the program's environmental goals. No matter what program design economists propose to policymakers, the bill that comes out of the legislative body is bound to be different. Heinmiller (2007) analyzes the intrinsically political nature of the cap-and-trade mechanism and explains why politics sways or alters the implementation of policies grounded in economic theory. In the cap-setting and allowance allocation processes, different political forces fight for provisions to benefit their own interests, often resulting in a program—assuming discussions even come to a consensus—that looks drastically different from the original policy proposed by experts and economists.

Heinmiller (2007) points out that "cap-and-trade policies are most needed and most likely to be introduced in situations of resource scarcity and overexploitation where vested interests are already well established and cannot be ignored." Creating a carbon market is especially sensitive to politics, because all human activity releases CO_2. Placing a price on carbon would inevitably affect electricity costs, increase the cost of living, and raise business production costs in the short-run, especially when fossil fuel comprises a majority of the world's current energy mix.[3] Caps must be set to balance environmental integrity and economic livelihood, interests that Heinmiller (2007) calls the "green" and "brown" opposition. "Green" interests hope to protect clean air and a safe climate, while "brown" interests hope for minimal regulation and wish to sustain existing business and labor practices. As a result, Heinmiller believes that the cap level will likely be higher than the original cap proposed by climate scientists.

The process of allowance allocations is also politicized, since cap-and-trade, by nature, is a zero-sum game, and stakeholder behavior does not always fall in line with economic theory. The Coase Theorem suggests that "any initial allocation of rights will eventually result in an economically efficient distribution of [allowances]," if the allowances to pollute are specified and fully tradable (Heinmiller, 2007). Entities will trade allowances until they have the most efficient amount to meet the cap. However, covered entities view allowance allocation as a zero-sum game; when more players—or polluters—enter the game, each player gets a smaller slice of the pie (Heinmiller, 2007). Thus, shareholders have vested interests in acquiring the most allowances, which they can either sell or use as pollution permits. The amount of allowances the participant acquires may indicate winners and losers in the economy under a cap-and-trade program, so the stakes of not having enough allowances are very high. Unlike the opposing forces of "green" and "brown" interests, there "are typically multiple, highly fragmented" interests in the allowance allocation process (Heinmiller, 2007). This second layer of political interests adds more complexity to implementing a successful cap-and-trade system. If the government allocates too many allowances, low allowance prices can undermine the program's environmental integrity—a danger some economists do not foresee if they ignore the political implications throughout the cap-and-trade policy design process.

Applying Heinmiller's (2007) theory, Betsill and Hoffman (2011) recognize that political negotiations throughout the design and implementation process often lead to a less

3 In 2011, coal made up 42 % of the world's electricity generation, natural gas contributed to 21 % of electricity generation, and nuclear generated about 12 %. In the U.S., coal makes up 44 % of the nation's electricity generation fuel mix. Natural gas makes up 22 % and nuclear makes up 19 %. The latter two sources emit far less GHGs, but the base load of electricity still comes from coal. See "Breakdown of Electricity Generation by Energy Source" for more details.

ambitious cap-and-trade program. According to Betsill and Hoffman (2011), "ambitious proposals often have been scaled back when [governments] implement trading… There is often a gap between the optimal policy design suggested by economists and political feasibility." When a scheme is nonoperational and still in the design phase, policymakers often prefer the "CO_2 plus" model, considered a more effective and ambitious model since it covers more pollutants and provides more opportunities for emission reductions. Once the program is authorized by the policymaking body, it will more likely only cover CO_2 since less coverage is more politically expedient and cater to regulation-wary "brown" interests (Betsill & Hoffman, 2011). In another instance, most program proposals include auctioning allowances, yet most operational programs before 2003 started with free allocations, which help to minimize adding incremental costs for covered entities (Betsill & Hoffman, 2011). Betsill and Hoffman's (2011) analysis apply Heinmiller's (2007) theory and demonstrate how political tensions throughout the design of a cap-and-trade program result in policies that alter what economists envisioned. Economic models are a good starting point, but these conflicting interests must be considered in order to design an effective and politically acceptable program.

While most policymakers and economists agree that cap-and-trade is the best option for mitigating climate change, they must recognize that the legislated policy may look drastically different from the original proposal due to the weight of interest groups throughout a democracy's policymaking process. The case study of the European Union's cap-and-trade program will apply the assertions of Stavins and Heinmiller in order to make sense of why certain policy outcomes occurred in this particular political landscape.

Challenges Ahead for Cap-and-Trade & Why Policymakers Should Pay Attention

Due to the complex layers of politics involved, cap-and-trade climate policy still faces many challenges, which will be analyzed in the context of the European Union Emissions Trading Scheme. Policymakers and interest groups must understand these political challenges in future climate policy negotiations for the sake of environmental and business interests. If cap-and-trade remains the premiere policy solution, nations will eventually need to link schemes together to reduce leakage. Betsill and Hoffman's (2011) survey of cap-and-trade show that regional and subnational programs have been on the rise in recent years, which will make it increasingly difficult for corporations to comply with a patchwork of environmental policy and more challenging for policymakers to link programs.

The rise of regional programs can be attributed to weak multilateral trading programs set up by the Kyoto Protocol. Once stakeholders realized that these trading systems lack legitimacy due to poor design and the failure of key nations, including the U.S., to ratify Kyoto, subnational bodies started to set up programs to meet Kyoto commitments and local policy objectives (Betsill & Hoffman, 2011). At the 2009 Copenhagen Summit, parties largely agreed to not pursue a multilateral trading system and to rely on linking regional schemes in the future (Betsill & Hoffman, 2011). Even though larger programs offer more abatement flexibility and reduce leakages, different regions began to create separate cap-and-trade programs, including the Western Climate Initiative (WCI) in California and Canada and the Regional Greenhouse Gas Initiative (RGGI) in Northeastern states of the U.S. Since new regional cap-and-trade programs can operate under many different governments and rules, their rise presents a global business challenge of ensuring compliance to a patchwork of climate policy. Such inconsistency hinders the efficiency of national and multinational corporations.

Assuming cap-and-trade will be the premier mechanism that states will use to reduce GHG emissions, governments must overcome the impending policy hurdle of collaborating across nations (Betsill & Hoffman, 2011). Stakeholders will likely reassert their interests in future linkage negotiations, exacerbating the already complex balance between policy objectives and appeasing stakeholders (Betsill & Hoffman, 2011). Betsill and Hoffman's (2011) projection emphasizes the importance of understanding the politics that surround the negotiation process and the urgency to create comprehensive, national (if not multinational) programs to provide certainty and predictability for businesses. Businesses and governments around the world should have a vested interest in designing and implementing effective national programs *now* and avoid having to link together a complex patchwork of regional programs in the future. However, before legislating cap-and-trade programs, policymakers must be cognizant of the most important indicators of policy success. This paper argues that while stakeholders can drastically alter the original policy proposal, the most important indicator of policy outcomes and the highest barrier to entry depends on the current political environment.

Examining the European Union Emissions Trading Scheme

Introduction to Case Study

Though many environmental economists share Stavins' (2007, 2008b) view that cap-and-trade is the best policy mechanism to reduce carbon emissions from a political, economic, and environmental perspective, the most influential element within the policymaking process may be anything but the validity of the policy proposal. Besides politics throughout the negotiation process, certain political conditions, such as supportive public opinion and political leadership, must exist for the policymaking body to even *begin* negotiations and create a sustainable cap-and-trade program. Whether or not a successful cap-and-trade bill can be introduced, passed, and implemented to successfully reduce carbon emissions depends on the political system in place, the state of the economy, public opinion, and political leadership. Many pieces must align in the dynamic game of political Tetris before Heinmiller's (2007) theory of politicking ensues throughout specific provision negotiations.

The EU ETS is the largest, most developed cap-and-trade program in the world. The program covers 11,500 sources, which accounts for over 2 billion metric tons of CO_2, 14 % of the world's GHG emissions, and 45 % of GHG emissions from 27 member states (Ellerman & Buchner, 2007; K. Lewis, 2013). In comparison, the U.S. Acid Rain Program only covered 3,000 sources and 16 million tons of SO_2 (Ellerman & Buchner, 2007). The EU ETS is groundbreaking in both scale and environmental intent, prized by the EU as the "flagship of its climate policies" (Fujiwara & Georgiev, 2012). Some scholars even believe that the EU ETS "is by far the most significant accomplishment in climate policy to date" (Ellerman & Buchner, 2007). In the case of the European Union Emissions Trading Scheme (EU ETS), public support set up a political landscape open to a cap-and-trade program, though the decentralized political system lends itself to relatively a less ambitious EU-wide cap.

Given the size of the scheme and the leadership exhibited by the EU, analyzing the factors that contributed to certain policy outcomes will help enlighten future cap-and-trade programs. The EU ETS provides an insightful case for how politics has influenced each step of the policymaking process, from its birth to present day implementation. Firstly, public acceptance of climate policy and a cap-and-trade program in EU member states created a stable environment for policy negotiations to occur. However, the political context of a supranational organization allowed "brown" interests to effectively lobby for a less stringent cap. Politics between "green" and "brown" interests continue to play a part throughout the implementation process as the European Parliament tries to 'backload' allowances. Despite low allowance prices, the EU ETS has upheld its environmental integrity thus far by meeting Kyoto targets and sets a nuanced example for other nations. This analysis can better inform future climate policy proposals, which will be particularly important since governments and interest groups prefer consistent, predictable programs over a patchwork of regional cap-and-trade schemes.

An Accepting Political Climate

The EU is known for being a global leader in climate action and is expected by the public and foreigners to act on climate change, which fostered an environment conducive to initiating cap-and-trade negotiations (Ellerman & Buchner, 2007). Since the Climate Change Convention in 1991, the EU has been on the forefront of developing and promoting ambitious climate change policy (Oberthur & Kelly, 2008). For example, the EU was instrumental in developing the United Nations Framework Convention on Climate Change (UNFCCC) in 1992, which led to the adoption of the Kyoto Protocol in 1997 (Oberthur & Kelly, 2008). The EU consistently proposed and accepted the most stringent emission reduction targets throughout the Kyoto Protocol negotiations (Oberthur & Kelly, 2008). In 1997, some convening countries in Japan adopted and ratified the Kyoto Protocol, which set internationally-binding commitments for developed and developing nations to decrease carbon emissions with "common but differentiated responsibilities" (United Nations, n.d.). The EU-15, countries that were EU members before 2004, committed to reducing emissions to 8 % below 1990 levels by 2012 and 20 % by 2020 (European Commission, 2013). Furthermore, 72.5 % of member states worried about future changes in climate, and it was seen as the EU's obligation to reflect those sentiments in policymaking (Lorezoni & Pidgeon, 2006). The European Commission (EC), the governing body of the EU, strived to provide directional leadership and show other nations its commitment to reducing carbon emissions. The desire to lead by example combined with public support for climate policy set up a friendly environment for introducing a cap-and-trade program to meet Kyoto targets.

Once the EU ratified the Kyoto Protocol, member states were collectively bound by the international treaty to hit their emissions reduction targets, creating the external momentum for finding an effective mechanism to reduce CO_2 pollution. In order to meet its Kyoto commitments, the EU was actively in search of the best policy solution to reduce emissions. While preparing to ratify Kyoto, the EC produced the "Green Paper on GHG Emissions within the European Union," which advocated for a cap-and-trade scheme to help EU countries meet their collective Kyoto commitments (Commission of the European Communities, 2000). EC studies showed that a cap-and-trade program would cost €2.9 to €3.7 billion annually to meet Kyoto targets, while other programs could cost up to €6.8 billion each year to obtain Kyoto goals (European Commission, 2006). Prior to ratifying the Kyoto Protocol, several smaller cap-and-trade programs were already operating within Europe, which also increased public acceptance of such policy solution. The United Kingdom established a cap-and-trade program, Denmark set up a carbon offset program, and even British Petroleum (now BP) created an internal emissions trading scheme (Ellerman & Buchner, 2007). These programs generated remarkable political momentum and public acceptance of cap-and-trade as an effective policy to address climate change (EC, 2013). In the EU's search for policy solutions to cut CO_2 emissions, cap-and-trade stood as the optimal method.

Politics in Design

Once the EC recognized a general consensus in the need to legislate a comprehensive cap-and-trade program to address climate change, the EC, member states, and affected firms entered a series of negotiations and designed an accommodating policy with less stringent caps and mostly free allowance allocations. Since the EU is essentially a monetary union, member states retain power over almost all other policy areas, including environmental policies. For large-scale reform to occur, all 27 member states must unanimously agree to the changes. The decentralized nature of the EU implied that specific policy provisions, including cap levels and allowance allocations, would be devolved to member states. Accordingly, the 2003 Emission Trading Directive, the authorizing legislation for the EU ETS, gave each state the responsibility to propose its own National Allocation Plan (NAP), which set out the total number of European Union Allowances (EUAs) the state wanted and how it will allocate those allowances to companies (Global CCS Institute, 2010). Under the Directive, member states had freedom to decide how many allowances to allocate to each sector as they saw fit, as long as NAPs met Kyoto commitments. Industries played a role in reporting emissions data and hashing out their desired provisions with member states, though the exact extent of their influence is difficult to extrapolate. Since abatement costs were hard to predict, "brown" interests advocated for less stringent caps by overestimating baseline emissions and lobbied for free allocation of EUAs (Ellerman & Buchner, 2007).

Characteristic of the decentralized process, the EC simply made sure the NAPs meet the criteria set out by the Directive so each state can reach Kyoto commitments and the European Burden Sharing Agreement (BSA)—an agreement between the EU-15 to collectively reduce emissions by 8 % below 1990 levels by 2012 and to share such burden depending on each state's GDP (Ellerman & Buchner, 2007). If the Commission rejected the state's initial NAP, it would get sent back to the state for renegotiation. Member states even brought legal challenges to contest disagreements with Commission decisions, which significantly lagged the launch of some states' programs by three to four years (Ellerman & Joskow, 2008). The resulting EU-wide cap is modest and only slightly lower than what emissions would be under Business As Usual (BAU) conditions (Ellerman & Buchner, 2007). The political structure of the EU allowed for "brown" interests to negotiate at the state level, which created a cap-and-trade scheme with less stringent caps.

Allowance allocations were also decentralized and help explain the EU's less than ambitious policy. The Directive recommended states to auction up to 5 % of their allowances during the first phase and up to 10 % in the second (Ellerman & Buchner, 2007). However, business interests opposed allowance auctions, since they feared increased production costs and preferred free allocations. Ultimately, the business lobbies won over "green" interests: only four member states proposed auctioning up to 5 % of their allowances in their plans. The EU ETS auctioned about 0.13 % of its allowances across all the member states and distributed the rest for free (Ellerman & Buchner, 2007). The less ambitious guidelines mark a discrepancy between Directive guidance and the actual scheme, which can be attributed to the political negotiations among the member states and market actors (Ellerman & Buchner, 2007).

Despite the lax cap and allowance provisions, the EU ETS is still designed to reduce emissions, and there is reason to believe the program has not lost all of its environmental ambitions. Many member states opted to allocate fewer allowances to their electricity sector in order to hold this industry to more stringent reduction goals, which greatly appealed to "green" interests. Buchner, Carraro, and Ellerman (2006) point out that the UK was the first to publish a NAP, which allocated relatively fewer allowances to the electricity sector than non-power sectors. The electricity sector emitted 60 % of the carbon emissions, yet did not face foreign competition and had the cheapest potential abatement costs (switching from coal to natural gas) (Ellerman & Buchner, 2007). Thus, the UK designated fewer allowances to this sector. Many following NAPs created by the EU-15 adopted similar logic to meet their reduction targets. The power sector agreed to receive fewer allocations, knowing increased production costs can be passed on to electricity consumers, despite consumer opposition to windfall profits. Even though market actors and member states played a large role in decreasing the stringency of the program by proposing high caps and free allowance allocation, many NAPs from the EU-15 were designed to fulfill the BSA, and the EC did its best to make sure that the proposed NAPs would meet Kyoto targets. The resulting policy design reflects the push and pull from "green" and "brown" interests throughout cap-and-trade design negotiations.

An Assessment of Implementation Issues: The Over Allocation of Allowances

Due to the devolved politics intrinsic to a supranational organization, negotiations favored member states, which favored the business interests within those states, and led to a modest cap and more free allocation of allowances than originally recommended. While the EC did not intend to drastically over allocate allowances, policymakers did not anticipate other contingencies that could—and did—result in a significant surplus of allowances. In 2006, the EU ETS had 80 million tons of surplus allowances, accounting for about 4 % of the EU-wide cap (Ellerman & Buchner, 2007). After realizing they could meet the cap, non-power sector actors sold their surplus of allowances near the end of the first compliance period and flooded the market with allowances (Ellerman & Joskow, 2008). The EU's renewable energy and efficiency mandates also contributed to undermining the cap-and-trade program, since companies were already on-track to independently reduce emissions (Plumer, 2013). Lastly, participating firms and government regulators relied on historical emissions data to create projection models that defined allowance levels. Original expectations about allocations and prices were incorrect since the models could not consider the risk of a recession (Ellerman & Joskow, 2008). The global recession reduced market activity and carbon emissions. All of these external factors placed a downward pressure on allowance prices.

The second compliance period caps were more stringent than the previous period by 25 to 35 % (Ellerman & Joskow, 2008). However, a surplus of allowances still accumulated. In February 2013, the EU ETS accumulated 1.5 to 2 billion tons of extra allowances—equivalent to about a year's worth of allowances—driving allowance prices from €20 in 2011 down to €5 (Economist, 2013). Past experiences with over allocation, like in RECLAIM, provide fair warning of the risks and long-term repercussions of endemically low prices. Low allowance prices do not incentivize investments in emissions reduction technology, since reaching compliance with allowance purchases is the cheaper option. The International Energy Agency (IEA) has found that the EU needs to raise allowance prices to $65 per ton before power plants seriously consider switching from coal to natural gas-generated electricity (Plumer, 2013). Once the economy recovers, prices can spike and overburden covered entities. Some observers often view the EU ETS as an ineffective program. For example, Jeff Swartz of the International Emissions Trading Association, a nonprofit business organization whose goal is to establish an international framework for emissions trading, said that the EU scheme "may well become an example of what *not* to do" (Economist, 2013). To pessimists, the policy design, shaped by an intrinsically decentralized and politicized process, rendered the EU ETS a failed endeavor.

Attempts to Amend the EU ETS in a Recovering Economy

Attempts to amend the EU ETS continue to showcase the role of politics in climate policy, which is often exacerbated in a recovering economy. In response to the allowance surplus and low carbon prices, the European Parliament (EP), the legislative body of the EU, has discussed 'backloading' 900 million allowances from the market and reintroducing them when demand increases in 5 years. Backloading allowances would shrink supply and raise allowance prices in the short-run to incentivize advancement in emissions reduction technology and shift the EU's energy supply to become less carbon intensive.

Since the economy is still recovering, policymakers and businesses are wary about creating policies that would increase the price of carbon and raise energy costs. Furthermore, backloading opponents argued that the EU needs "longer term predictability in the legislation" and backloading would not give businesses certainty (K. Lewis, 2013). The backloading proposal failed on a 334 to 315 vote in April 2013, which ironically drove carbon prices down further to €2.75 per ton (Economist, 2013). "Brown" and "green" continue to influence program implementation—and "brown" interests usually have the upper hand in a recovering economy. Roger Pielke Jr., an environmental studies professor at the University of Colorado Boulder, coined the term the "iron law of climate policy," which means that when climate policy threatens the economy, even the greenest states back away (Walsh, 2013). This "iron law" definitely holds true in the EU throughout the design and implementation process, despite the EU's leadership in climate policy.

Is the EU ETS a Success or Failure?

Despite challenges of over allocation in the EU ETS, the EU is still on track to meet climate mitigation goals under the Kyoto Protocol. MIT environmental scholars, Ellerman and Buchner (2007), argue that over allocation in certain sectors was intended by design. The EC allocated the shortage of allowances to the electricity sector within the EU-15 to allow for more flexibility in other sectors and member states (Ellerman & Buchner, 2007). Over allocation has occurred in the non-power sectors because business interests asserted themselves to create a relatively lenient program. On the other hand, the power and heat sector experienced a net under allocation of allowances, as intended by the EU-15 to meet the BSA (Ellerman & Buchner, 2007). Negotiations between "brown" interests and governments were framed by commitments made in the Kyoto Protocol and the BSA. Thus, the trading scheme has retained some environmental integrity in a few sectors at the cost of environmental accomplishments in others.

In the first trial period, the EU successfully met Kyoto commitments by cutting emissions by 18 % below 1990 levels in 2012 and set up cap-and-trade infrastructure in a multinational arena (B. Lewis, 2013). More specifically, the EU-15 over achieved their first Kyoto target, averaging reductions of 12.2 % below 1990 levels in 2012 (EC, n.d.). A recent European Environment Agency study showed that the EU is also on its way to fulfilling the second compliance phase reduction target of 20 % below baseline levels before 2020 (Stringer, 2013). Though many concessions were made to "brown" interests during the design phase, the EU is still reaching its commitment goals. However, these reductions may principally result from the economic downturn, not actual investments in emissions reduction; low allowance prices will delay emissions reduction throughout the EU. If firms do not make emissions reductions before the economy fully recovers, they may find themselves facing far higher abatement costs as the demand for emission allowances increase rapidly, in which case the EU may not meet its 2020 target. Thus, there is only reason for conditional optimism.

Nonetheless, the EU ETS faces a reality that will be hard to ignore in future climate negotiations: the political structure and interest groups are significant elements that shape cap-and-trade policy and can largely affect the policy's success (Ellerman & Buchner, 2007). Arguably, negotiations and consensus-building around policy change is intrinsic to a liberal democracy and these challenges are bound to occur in the policymaking process. The challenges resulting from the design and implementation of the EU ETS showcase the dynamic, ongoing influence of industry stakeholders and member states in creating and amending the cap-and-trade program, a quality that will not escape climate policy in any democratic institution.

Conclusion

The EU had a political landscape ripe for tackling climate legislation, though it experienced design and implementation issues as a result of its own political structure. The events explored emphasize the importance of fostering a political climate that is receptive to climate policy and the difficulty of aligning many moving parts: 1) the public needs to agree that climate change is a priority that needs policy action, 2) policymakers must balance the concessions made to interest groups while maintaining the environmental integrity of the program, and 3) the economy must be stable before people can focus on environmental and climate change issues. As exhibited through the issues facing the EU ETS, passing cap-and-trade policy that's well-designed and well-implemented is a lot harder than it sounds—especially in a recovering economy—even if cap-and-trade is logically the most cost-effective method to reduce carbon emissions.

Many economists agree that cap-and-trade is the most efficient, cost-effective policy solution to reducing climate change; it has proven itself to be a popular policy in more than 32 instances. In order to design a cap-and-trade policy, stakeholders and policymakers engage in negotiations that will alter the policy to balance "brown" and "green" interests. The political vetting process can 'water down' the bill and make it less ambitious by setting lenient caps and distributing too many allowances for free, as in the case of the EU ETS. However, political negotiations are inevitable in a democratic policymaking process, especially in the EU's decentralized system. However, the immense challenge of passing a cap-and-trade bill and keeping it in place proves that cap-and-trade policy must be introduced in an accepting environment in order to have a chance to withstand powerful industry interests that oppose increased production costs. Moving forward, policymakers and stakeholders must recognize the difficulty of implementing a successful cap-and-trade policy when advocating for this policy solution and keep in mind the political context, public opinion, and the economic landscape.

Despite the difficulties in passing a cap-and-trade program, there is a need and urgency to take national action in order to provide business certainty, avoid future political challenges, and address the causes of climate change. For instance, when a key nation like the U.S. delays national cap-and-trade policy, more regional and subnational programs are created to reduce carbon emissions. A lack of national and international agreements on cap-and-trade design leads to a patchwork of regional programs—as Betsill and Hoffman (2011) predict—entangling companies in the bureaucratic red tape that many corporations want to avoid.

In the long-run, the patchwork of decentralized programs will eventually need to be standardized and linked together to minimize leakage and ensure a level playing field for businesses in an increasingly globalized world. Linking more systems together will present even more logistical—let alone political—challenges, when more stakeholders and business interests join the negotiation table. Ideally, current global negotiations will lead to long-term international commitments to using cap-and-trade the climate policy of choice and provide predictability for businesses. However, multilateral negotiations will likely move slowly and the resulting bottom-up process may undermine the cost-effectiveness of the market mechanism (Horstink & Bode, 2012).

Without a comprehensive climate policy, businesses will likely face higher mitigation costs when governments install less efficient command-and-control standards. Furthermore, politicians and their constituents will face even more challenges when they do not address climate change now, since extreme weather events will continue to occur more frequently, sea levels will continue to rise, and public health will continue to deteriorate. Understanding the implications of legislative inaction, policymakers around the world must pursue climate mitigation strategies that acknowledge the many contextual elements involved in successful environmental policy design and implementation.

Author's Notes

If you are interested in learning more about carbon cap-and-trade in other countries, feel free to read "The Politics and Future of Carbon Cap-and-Trade: Lessons from the European Union, Australia, and the United States." In this extended article, I compare and contrast the political landscape of two additional cases studies and explore how each unique political context has affected policy outcomes. Correspondence concerning this article should be addressed to Alice H. Chang, Claremont McKenna College, 24613 SE 9th Place, Sammamish, WA 98074. Contact: alice.chang.15@cmc.edu

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