Recommendations for a National Cap-and-Trade System Based on the Successes and Failures of the Three Largest Existing Carbon Markets

Michael Murza

I. Introduction

Anthropogenic climate change is a serious threat to the natural world upon which our economy relies; a low scenario of greenhouse gas (GHG) emissions[1] will continue to contribute to increased health costs,[2] greater need for government aid in response to more extreme weather events,[3] rising agriculture prices,[4] and a significant deterioration of essential foundations of the food chain,[5] among many other problems. In 2007, the Intergovernmental Panel on Climate Change (IPCC) released its Fourth Assessment (AR4), which sets out the most comprehensive scientific basis for climate change and presents predictions for future consequences, qualified by conservative statistical analyses.[6] The IPCC is in the final stages of preparing its Fifth Assessment (AR5), due to be released in four parts between September 2013 and October 2014, which will further enhance our knowledge and understanding of the causes and consequences of climate change.[7]

In 1992, the United Nations developed the Rio Declaration on Environment and Development (Rio Declaration), stating 27 principles meant to provide guidance on sustainable development around the world.[8] At the conclusion of the Rio Declaration, the United Nations Framework Convention on Climate Change (UNFCCC) was developed "to cooperatively consider what they could do to limit average

[1] At the IPCC's low scenario levels, there will likely be an average 1.8 degree Celsius rise in global temperatures which could correspond to a sea level rise of 0.18-0.38 meters by the end of the 21st century. IPCC Fourth Assessment [IPCC 4th], Summary for Policymakers at 13.
[2] According to the World Health Organization, [by 2002] anthropogenic climate change already causes 5.5 million cases of illness and 150,000 deaths each year; this could double by 2030 with continuing trends. The World Health Organization, *The World Health Report*, 2002- Reducing Risks, Promoting Healthy Life 72 (2002)
[3] IPCC 4th, Summary for Policymakers at 15.
[4] Research in Science magazine has found that anthropogenic climate change has driven up food prices by as much as 20%. http://www.guardian.co.uk/environment/2011/may/05/food-prices-global-warming
[5] http://www.pbs.org/newshour/updates/climate-change/july-dec12/acidification_12-05.html
[6] IPCC 4th, Summary for Policymakers at 2, fn. 5.
[7] http://www.ipcc.ch/index.htm
[8] http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm

global temperature increases and the resulting climate change, and to cope with whatever impacts were. . .inevitable."[9] In the United States, the Clinton Administration signed the Rio Declaration, which went into effect in 1994.[10] Three years later, in Kyoto, Japan, the UNFCCC developed the first major attempt at addressing global climate change by setting international emissions limits for those countries willing to adopt the treaty.[11] The United States signed, but never ratified, the Kyoto Protocol, refusing to bind itself to the emissions targets set by the treaty.[12] Instead, since then, the United States has insisted that it would not bind itself to emissions reductions targets unless other countries that are deemed 'developing' also agree to meet similar emissions reduction targets.[13]

Over the years, the United States has largely stayed isolated from the global push to reduce carbon emissions. However, it is clear that the United States population overwhelmingly supports federal legislation to combat the increasing threat and current consequences of climate change.[14] President Barack Obama has often said that he recognizes the threat of climate change and believes it is in the best interest for the United States to take action, whether through legislation or executive action.[15] Early into his second term, he has begun to make changes in his administration to support

---

[9] http://unfccc.int/essential_background/items/6031.php
[10] http://maindb.unfccc.int/public/country.pl?country=US
[11] The Kyoto Protocol. http://unfccc.int/kyoto_protocol/items/2830.php
[12] http://maindb.unfccc.int/public/country.pl?country=US
[13] However, the United States may no longer be able to use this as an excuse for inaction. The lead climate negotiator of the Group of Least Developed Countries (49 countries; 12% of the world's population), Quamrul Chowdury, recently indicated these countries are willing to commit to binding emissions cuts even though "they are the ones least responsible for increasing those emissions."
http://www.guardian.co.uk/environment/2013/apr/03/climate-change-greenhouse-gas-emissions
[14] According to two recent polls, 65% of Americans believe climate change is a serious problem and want Obama to take "significant steps" to prevent it. However, it should be noted the two studies were commissioned by the League of Conservation Voters and the Natural Resources Defense Council, both environmental organizations. http://www.guardian.co.uk/environment/2013/feb/13/barack-obama-act-climate-change-poll.
[15] In President Obama's State of the Union on February 12, 2013 he said that if Congress doesn't take action to reduce greenhouse gas emissions, "[he] will direct [his] Cabinet to come up with executive actions we can take, now and in the future, to reduce pollution, prepare our communities for the consequences of climate change, and speed the transition to more sustainable sources of energy." http://www.reuters.com/article/2013/02/13/us-obama-speech-climate-idUSBRE91C09T20130213. President Obama has already instructed multiple Executive Agencies to go forward with climate change adaptation plans as a means of dealing with the consequences the United States is facing and will continue to experience due to climate change.

these assertions.[16] For the past few decades, the United States has attempted to enact different types of domestic legislation as a means of curbing these emissions. There are three major avenues by which legislators have tried to address the issue: direct regulation, a carbon tax, and a cap-and-trade program. Direct regulations have taken the form of coal plant emission limits,[17] federal gas mileage standards for new vehicle fleets,[18] and many other environmental laws. Other countries have tried varying forms of the carbon tax, like Australia;[19] China[20] and Alberta, Canada[21] are also considering a carbon tax. In early 2013, two separate bills have been introduced in Congress attempting to implement a market-based carbon price, which would ultimately amount to a carbon tax.[22] Recently, in addition to emission regulations and carbon taxing, cap-and-trade has become one of the most widely used means of reducing global carbon emissions.

This paper will address the three largest carbon cap-and-trade markets around the world.[23] However, many other countries have begun to implement their own forms of cap-and-trade within their borders. This is a promising trend, indicating that most of the industrialized world is recognizing the importance of and opportunities inherent in putting a price on carbon. New Zealand has had an

---

http://www.scientificamerican.com/article.cfm?id=obama-administration-releases-first-ever-climate-adaptation-plans.

[16] Obama's Energy Secretary, Ernesto Munoz, believes it is important to find a way to put a price on carbon to increase the cost of and reduce emissions, which would bring about "a push toward efficiency,…clean technology,…[and] security." http://www.washingtonpost.com/business/economy/ernest-moniz-mit-physicist-is-to-be-nominated-as-energy-secretary/2013/03/04/e3fe68aa-808c-11e2-a350-49866afab584_story_2.html

[17] http://www.nytimes.com/2012/03/28/science/earth/epa-sets-greenhouse-emission-limits-on-new-power-plants.html

[18] http://www.nytimes.com/2011/07/30/business/energy-environment/obama-reveals-details-of-gas-mileage-rules.html

[19] http://www.bbc.co.uk/news/world-asia-18662560

[20] http://www.washingtonpost.com/blogs/wonkblog/wp/2013/02/21/china-may-soon-get-a-carbon-tax-but-will-it-make-any-difference/

[21] http://www.theglobeandmail.com/report-on-business/industry-news/energy-and-resources/albertas-bold-plan-to-cut-emissions-stuns-ottawa-and-oil-industry/article10762621/

[22] The first bill, introduced by Senators Barbara Boxer and Bernie Sanders, targets upstream carbon emitters, such as coal mines and oil refineries. The second bill, introduced by Representative Henry Waxman, Senator Sheldon Whitehouse, Senator Brian Schatz, and Representative Earl Blumenauer, targets downstream carbon emitters, such as power plants. http://climatedesk.org/2013/03/could-waxmans-new-bill-offer-new-hope-for-a-carbon-tax/

[23] The European Union's Emissions Trading System, the Regional Greenhouse Gas Initiative, and California's cap-and-trade program under landmark climate legislation, AB 32.

operating cap-and-trade system in place since 2010.[24] Australia's fixed-price carbon market is planned to convert to a complete cap-and-trade system in 2015, at which point the market is supposed to be linked with the European Union's Emissions Trading System.[25] South Korea's parliament passed legislation in 2012 that supports the development of a cap-and-trade system.[26] China has developed seven regional cap-and-trade systems that could turn into a national program.[27] There is a cap-and-trade system in Rio de Janeiro that will likely be a blueprint for a Brazilian national program.[28] Japan,[29] the United Arab Emirates,[30] Kazakhstan,[31] and Vietnam[32] have all indicated that a carbon cap-and-trade market is a serious possibility. Given Mexico's recent climate change law requiring a 30% GHG emission reduction from business-as-usual by 2020, it is likely Mexico too will have to consider a carbon cap-and-trade scheme to reduce emissions.[33] Each of these indications of additional carbon markets is promising for the continued strength of a large portion of the international economy; in 2011 alone, the value of trading carbon around the world reached $176 billion, an 11% increase from 2010.[34]

In this paper, I will analyze the successes and failures of the three largest cap-and-trade systems in the world and distill them into recommendations for a cap-and-trade system at the national level in the United States.

Part I will discuss the European Union's Emissions Trading System (EUETS), a program that launched in 2005 and is still operating today. The EUETS operates in 27 countries and 3 European

[24] Carbon Trading Magazine, June 2012, page 16.
[25] Carbon Trading Magazine, Dec 2012/Jan 2013, page 7.
[26] Carbon Trading Magazine, June 2012, page 16.
[27] http://www.newscientist.com/article/dn21361-china-set-to-launch-first-caps-on-co2-emissions.html
[28] Carbon Trading Magazine, June 2012, page 18.
[29] Id. at 16.
[30] Id. at 19.
[31] Id.
[32] Id. at 5.
[33] Id. at 18.
[34] Carbon Trading Magazine, July/August 2012, page 04.

Economic Area States.[35] This section will focus on the highly publicized failures in the beginning of the cap-and-trade program and the steps the EU has taken, or is contemplating taking, to address these issues. This paper will also identify some successes that the EU system had, which were quite impressive given it was the first major multi-national carbon market in the world.

Part II will discuss the Regional Greenhouse Gas Initiative (RGGI), an agreement between nine States in the US Northeast, with four other States and Canadian Provinces acting as observers, to participate in a regional cap-and-trade system.[36] The program's first auction was in 2008, and compliance requirements began in 2009.[37] This section will include a short political history of the program and a discussion of some real and perceived strengths and weaknesses.

Part III will introduce California's recently launched cap-and-trade program, for which the first auction occurred in November 2012 and compliance obligations began on January 1, 2013.[38] While the program is relatively new, this paper will discuss the development of the program under the Western Climate Initiative and California's landmark environmental law, AB 32, the outcome of the first two auctions, and a description of the program's successful cost-containment mechanisms.

Part IV will briefly outline the Waxman-Markey bill, also known as the American Clean Energy and Security Act of 2009 (ACES), which passed the House in 2009 but failed to pass the Senate in 2010.[39] This bill, had it passed, would have set up a federal cap-and-trade system very similar to the EUETS. Part IV will provide a general outline of the comprehensive bill as a blueprint for the recommendations presented in Section V.

---

[35] The three EEA States are: Iceland, Liechtenstein, and Norway. http://ec.europa.eu/clima/policies/ets/index_en.htm

[36] The nine currently participating States are: Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. The four observers are: Pennsylvania, Quebec, New Brunswick, and Ontario. http://www.rggi.org/

[37] Id.

[38] http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm

[39] http://www.c2es.org/federal/congress/111/acesa

Section V will synthesize the successes and attempt to avoid, or address, the failures of the three existing major cap-and-trade systems using ACES as a starting point. After 4 more years of experience with multiple cap-and-trade systems around the world and a more supportive public and Executive Administration, ACES could be updated to be a bi-partisan, globally harmonized emissions trading system supporting a robust international carbon market as well as reducing greenhouse gas emissions, fostering the development and deployment of clean technology, and mitigating climate change's continued destruction of our environment and economy.

I. European Union Emissions Trading System (EUETS)

The European Union Emissions Trading System, a product of the European Commission, began in January of 2005. The goal of the EUETS was to "limit [the EU's] greenhouse gas emissions to 8% below 1990 levels for the years 2008 through 2012 and drive its emissions down to 20% below 1990 levels by 2020."[40] In order to do this, the EUETS caps carbon emissions from more than 11,000 power generating facilities in 30 countries; furthermore, the program covers about 45% of total greenhouse gas emissions throughout the EU.[41] The program was introduced in three phases. The first phase, Phase I, began in January 2005 and continued to December 2007.[42] The program's second phase, Phase II, began January 2008 and continued until December 2012, roughly coinciding with the Kyoto Protocol's first commitment period. The third phase, Phase III, began in January 2013 and will run until December 2020, when the EU hopes to have reached the original goal of 20% below 1990 emission levels.

The three-phased structure of the EUETS has both positive and negative consequences. One of the strengths of a phased system is that the organization running the system can reevaluate how the system is functioning over time and react accordingly.[43] On the other hand, a major flaw in the phased system is that one of the most important aspects of a market-based system, such as a cap-and-trade program, is regulatory certainty. By splitting the program into three phases, points at which the governing body can change some of the rules, the program is not certain throughout its lifespan. Many critics claim that this type of regulatory uncertainty prevents firms from making long term efficiency investments, though there is evidence to the contrary.[44] Regardless, implementing the EUETS in phases

---

[40] Brown, L.M.; Hanafi, A.; Petsonk, A. *The EU Emissions Trading System: Results and Lessons Learned*. [EUETS Report] Environmental Defense Fund. Page 1. 2012. Available online at: http://www.edf.org/sites/default/files/EU_ETS_Lessons_Learned_Report_EDF.pdf

[41] http://ec.europa.eu/clima/policies/ets/index_en.htm

[42] The January 2005 date is important because the EUETS went into effect before the Kyoto Protocol, which went into effect on February 16, 2005. See, http://unfccc.int/kyoto_protocol/status_of_ratification/items/2613.php.

[43] This will be discussed in detail, *infra*.

[44] "The expectation of a carbon price five, ten and twenty years from now is far more important in influencing the long-term investment that is essential for low-carbon development." See, EUETS Report, *supra*, note 39, at 15.

is a balance between the pros and cons of a system that can be changed at any time and a program that remains static for its entirety. The European Commission has used the phased system positively to tweak some of the major issues that arose during Phase I, which the European Commission refers to as a "learning by doing" approach.[45]

The first and most publicized misstep in Phase I of the EUETS was an over-allocation of emission allowances. Because the EU lacked historical average emissions data from the covered entities, emissions allocations were based on regulated entities own estimations of expected emissions.[46] This led to the ETS authorities issuing more emissions allowances than were actually necessary. As a result, with too many allowances, the price of each allowance dropped significantly. The European Commission responded to this over-allocation in Phases II and III, once verified emissions data were available. With this data, the European Commission was able to determine the appropriate amount of emissions allowances to allocate to covered entities.

At the beginning of Phase III, a surplus of emissions allowances remains and the European Parliament's Environment Committee has recently "backed a plan to prop up the price of a ton of carbon by withdrawing an oversupply of credits from the market."[47] However, in April 2013, the European Parliament vetoed this plan, known as "backloading," because they did not want to increase compliance costs and introduce such uncertainty into the program.[48] The real results on the market due to the rejection of this plan remain to be seen, though prices fell sharply after the veto.[49] Another recommendation to increase the value of emissions allowances is increasing the emissions reduction

[45] "How long has the EU ETS been operating?" http://ec.europa.eu/clima/policies/ets/faq_en.htm
[46] "What are the main lessons learned from experience so far?" Id.
[47] "It devised a system to withdraw credits from the market, reducing the surplus, and then to reintroduce them gradually at a later date, maintaining the pressure on industry to become more energy-efficient." http://wwwp.dailyclimate.org/tdc-newsroom/2013/02/carbon-market-rescue
[48] http://science.time.com/2013/04/17/if-carbon-markets-cant-work-in-europe-can-they-work-anywhere/
[49] Id.

target, particularly increasing the goal from 20% emissions reductions below 1990 levels by 2020 to 30%, though this, too, would require the cancellation of some existing emissions allowances.[50]

The over-allocation of emissions allowances has created what many claim is another problem with the EUETS: price volatility. Between 2006 and 2013, the price for one metric ton of carbon has gone from a high of €32 in April 2006 to a low of €2.16 in January 2013.[51] However, the Environmental Defense Fund analyzed price volatility as is relates to other commodities and found that "price volatility is part of the regular functioning market."[52] In fact, between July 2008 and March 2012, EUETS emissions allowances were less volatile than fossil fuel prices: coal prices fluctuated 3% more than EUETS emissions allowance prices, West Texas oil prices 11% more, and due to the recent boom in natural gas, natural gas prices have fluctuated 24% more than EUETS emissions allowance prices.[53]

However, whether the price is too volatile to prevent long term investments does not speak to another perceived problem of an allowance price of €2.16: many experts claim that the price of an allowance must be closer to €25-€30 to "provide an adequate incentive for companies to cut emissions and invest in cleaner technologies."[54] On the other hand, some argue that "lower allowance prices can be a sign of an ETS's success: Unexpected innovations often lower allowance prices as emissions reductions are achieved at a lower cost, and fewer allowances are needed."[55] Either way, the EUETS has successfully reduced carbon emissions throughout the EU regardless of the price of the credits; the extent to which it could be doing better is up for debate.

---

[50] Carbon Trading Magazine. December 2012/January 2013. Page 14. Available at: http://www.carbon-tradingmagazine.com/articles/dec-2012jan-2013-online/

[51] http://www.spiegel.de/international/europe/drop-in-carbon-price-underscores-disastrous-week-for-carbon-trading-a-879769.html

[52] EUETS Report at 16, see fn. 40.

[53] Furthermore, "the price of an ETS allowance has displayed less volatility than coffee, cocoa, oranges, rice, and many other commodities." Id.

[54] http://www.bbc.co.uk/news/business-21133917. Gareth Griffiths, chief commercial officer of Germany's biggest utility has claimed that "Emission permits would have to be almost 15 times more expensive to incentivize companies to move away from coal burn to gas." http://www.bloomberg.com/news/2013-04-25/no-end-to-power-rout-as-carbon-market-vote-fails-energy-markets.html

[55] EUETS Report at 15.

The data suggests that the EUETS has been extremely successful in decoupling carbon emissions from GDP, something that indicates that even with an over allocation of credits, price volatility, and a relatively low price for carbon, the EUETS is succeeding in reducing carbon emissions throughout the EU. In 2009, the EU member states' greenhouse gas emissions were 17% lower than 1990 levels, which is almost the goal for the entire program.[56] At the same time, GDP grew by more than 40% and the manufacturing sector grew by 12%.[57] Critics may try to argue that the emissions reductions were due more to a poor economy than the result of a successful cap-and-trade program; however, a study from New Energy Finance found that the EUETS was responsible for 40% of emissions reductions while the recession accounted for only 30% of the reductions.[58] Therefore, it seems that while the problems associated with the over-allocation of allowances in Phase I may have affected the price of allowances on the market, the program is still a success and future programs could compound those successes in the absence of a similar misallocation in the initial stages.

The EUETS had a few other problems associated with the running of the program, such as some regulated entities receiving windfall profits from freely allocated allowances. Windfall profits occur "when a firm reaps a profit from an event it did not control or from revenue it did not earn."[59] Essentially, many utilities were given allowances for free that could then be traded on the market for €15. The utilities then included the price of the allowance in the total cost of electricity generation. In countries where the electricity sector is deregulated, the utilities could pass this extra cost on to the customer and collect the extra money charged to the customer based on the market price of an allowance.[60] The easiest way to avoid this problem is to auction off all allowances, rather than give

[56] EUETS Report at 5.
[57] Id.
[58] Id. at 8.
[59] Id. at 19.
[60] Id. at 19-20.

them away.[61] Unfortunately, it is nearly impossible to obtain the political will to implement a cap-and-trade program with a full auction in the first phase. Therefore, it is important to identify sectors, such as deregulated electricity generating utilities, that would receive windfall profits and design regulations[62] to prevent these unearned profits from going to the utilities. The European Commission developed the three Phases to fix this problem over time; while all the allowances were given away for free in Phase I, 3% were auctioned off in Phase II, and about 50% will be auctioned off in Phase III.[63] Importantly, however, most countries in the EU will auction off 100% of allowances in their power generation sectors.[64] This will minimize further windfall profits in the EU.

Like most modern markets, the EUETS was subject to a few instances of cyber-attacks, tax fraud, and theft. The cyber-attacks were handled by reassessing the security of the systems of particular countries that had inadequate cyber-security.[65] The main type of tax fraud is known as a "Value-Added Tax (VAT) carousel."[66] This occurs when market participants purchase allowances in countries where there is no VAT and then sell them in countries that include the VAT in the price of allowances.[67] This problem was exacerbated by the fact that the tax systems of the EU are not harmonized, giving criminals the opportunity to take advantage of the different systems.[68] Finally, the largest allowance theft in the EUETS's history was in the Czech Republic in early 2011, where thieves phoned in a bomb threat and then took advantage of the resulting chaos.[69] The thieves stole about $40 million in allowances, which

[61] Id. at 20.
[62] Such as regulated electricity prices and capital gains tax schemes. Id. at 21.
[63] Id. at 20.
[64] "Industrial sectors that pose less risk of windfall profits will receive free allowances based on a CO_2 efficiency benchmark." Id.
[65] Id. at 26.
[66] Id.
[67] Id.
[68] "In carbon markets that have harmonized tax regimes or do not trade between conflicting tax jurisdictions, this type of tax fraud is impossible." Id.
[69] http://www.cbsnews.com/8301-501465_162-20029253-501465.html

represented about 0.02% of the allowances in circulation at the time.[70] However, the market flaws that allowed these thieves to succeed were easily corrected with new security measures.[71]

The final aspect of the EUETS that critics have attacked is the Clean Development Mechanism (CDM), an offset program created by the Kyoto Protocol and adopted by the European Commission. The CDM authorizes different types of carbon emission mitigation programs that "deliver real, permanent, additional, and verified" emissions reductions.[72] The first major issue with the CDM program is determining what projects are truly "additional," as this is a counterfactual assessment and cannot be determined with absolute certainty.[73] The program generally determines additionality based on project-by-project analyses, though it is difficult to ascertain a true determination of project-specific business-as-usual scenarios considering buyers, sellers, project developers, and verifiers "all have the incentive to inflate the measure of 'what would have otherwise occurred' in order to ensure that the project generates more credits."[74] However, in Phases II and III, the European Commission has used ever-increasing real, verified data to make realistic assessments of what a business-as-usual scenario is.

Another major issue with the CDM was one of the projects approved by the Kyoto Protocol: the destruction of HFC-23. This is a potent greenhouse gas by-product of the production of certain types of refrigerants, with a global warming potential more than 10,000 times that of carbon.[75] China has taken advantage of this protocol, having figured out that if they increased production of certain kinds of refrigerants, they would create more HFC-23. This HFC-23 can then be destroyed as part of the whole process for as little as €0.17 per CO_2e ton.[76] If emission allowances were selling for their average price

[70] Id.
[71] EUETS Report at 26.
[72] EUETS Report at 23.
[73] The debate over "additionality" was the subject of a lawsuit attacking California's cap-and-trade program, which will be discussed in greater detail in Part III of this paper.
[74] EUETS Report at 24.
[75] Newell, Richard G., William A. Pizer, Daniel Raimi. *Carbon Markets 15 Years After Kyoto: Lessons Learned, New Challenges*. [Carbon Markets Paper] Journal of Economic Perspectives, 27:1, Winter 2013, at 137. Available here: http://pubs.aeaweb.org/doi/pdfplus/10.1257/jep.27.1.123
[76] http://www.eia-international.org/china-threat-to-vent-super-greenhouse-gases-in-bid-to-extort-billions

of €12, this means the value of the emission allowance is roughly 70 times greater than the actual cost to destroy the greenhouse gas.[77] While the creation of a greenhouse just to destroy it is enough justification to question the offset protocol, China also releases about half the HFC-23 it creates in this process because half of its refrigerant production is ineligible for the CDM;[78] this practice adds significantly more greenhouse gasses to the air than would exist without this protocol. Despite protests from China, the CDM Executive Board has recognized these flaws in the CDM and, as of May 2013, the EUETS will no longer recognize offset credits from the destruction of HFC-23.[79]

While the EUETS ran into a few problems resulting from Phase I, it is clear that it is reducing greenhouse gas emissions and is not significantly affecting the overall economy of the EU. The EU's emissions dropped an additional 2.4% in 2011, meaning the EU is on track to meet their emissions reduction goal of 20% below 1990 levels by 2020.[80] The continuing emissions reductions, coupled with an expanding economy, indicate that greenhouse gas emissions can successfully be decoupled from economic growth through a cap-and-trade program, even one with as many problems as the EUETS saw in Phase I. These experiences are a positive indicator that a phased system by which the program can ensure success from a "learning-by-doing" approach is an appropriate design for a large, multi-jurisdictional cap-and-trade program.

[77] Id.
[78] Id.
[79] EUETS Report at 25.
[80] http://www.reuters.com/article/2012/05/15/us-eu-carbon-idUSBRE84E0SA20120515

II. Regional Greenhouse Gas Initiative (RGGI)

In 2005, seven states in the United States Northeast entered into a multijurisdictional agreement to reduce greenhouse gas emissions known as the Regional Greenhouse Gas Initiative, or RGGI. These states were: Connecticut, Delaware, Maine, New Hampshire, New Jersey, New York, and Vermont.[81] Despite economic and environmental success, some states decided to withdraw from the agreement, which will be discussed *infra*; still others recognized the benefits of such a system and signed on to the agreement after the initial development.[82] RGGI's current make-up is: Connecticut, Delaware, Maine, Maryland (joined in 2006), Massachusetts (joined in 2007), New Hampshire, New York, Rhode Island (joined in 2007), and Vermont.[83] This is a large portion of the United States, as the 10 States comprise one-fifth of the US's GDP and one-sixth of its population.[84] Initially, the States agreed to limit emissions to 188 million metric tons of carbon dioxide (or equivalent) across the region.[85] The States have auctioned nearly 70% of their allowances, with about 10% being "set-aside" allowances for States to distribute according to their respective statutes and the remaining permits going unsold.[86] The revenue raised from these auctions has gone to renewable energy efforts,[87] infrastructure upgrades,[88] helping low-income families pay utility bills,[89] or going into the State's general fund to help

[81] Carbon Markets Paper at 129.
[82] Id.
[83] http://www.rggi.org/
[84] EUETS Report at 38.
[85] http://insideclimatenews.org/news/20111213/cap-and-trade-massachusetts-clean-economy-rggi-energy-efficiency-green-buildings-new-jersey-christie?page=2
[86] http://www.rggi.org/market/co2_auctions/allowance_allocation
[87] http://www.businessweek.com/news/2013-02-06/u-dot-s-dot-northeast-cap-and-trade-program-said-to-lower-carbon-limit
[88] http://saratogian.com/articles/2013/02/09/news/doc511709ab2afa0870442591.txt
[89] http://insideclimatenews.org/news/20111213/cap-and-trade-massachusetts-clean-economy-rggi-energy-efficiency-green-buildings-new-jersey-christie

with deficits.[90] From the start of the program in 2005, RGGI has generally seen great successes, likely based on avoiding the problems seen in the early stages of the EUETS.

The States' revenue generated from auctions since the program's launch has been about $912 million; however, the economic benefits of the program reach much further than putting money into States' coffers.[91] While some of this auction revenue has been spent on shoring up certain States' general funds, the vast majority has been spent on energy efficiency related matters.[92] After completing a study that highlighted the successes of RGGI, Paul Hibbard, Vice President of the Boston-based Analysis Group, said, "Energy efficiency investments have a much bigger multiplier effect than any other category of spending."[93] This is because "[when] homeowners and businesses used RGGI dollars to retrofit and weatherize buildings, they not only ended up saving on energy costs and spending money elsewhere in the economy—they also put contractors and installers to work."[94] In fact, the RGGI participating States experienced 16,000 additional jobs due to RGGI, with an overall job loss due to the recession of 74,300.[95] This regional decline in jobs would have been greater without RGGI.

Due to energy efficiency projects, the associated increase in jobs, and other residual economic activity due to RGGI, the program has spurred $1.6 billion in economic activity in the region.[96] Furthermore, these energy efficiency programs have significantly reduced the utility bills of RGGI States' residents. Since 2009, consumer's bills have seen a 10% reduction.[97] This reduction translates into a net

---

[90] However, not all regulated entities approve of revenue being used for the general fund. "[A] diversion of $90 million in proceeds by [New York's] former Gov. David Paterson to balance the state budget in 2009 also angered plant owners." http://www.timesunion.com/business/article/New-York-voiding-gas-credits-2681450.php

[91] EUETS Report at 39.

[92] About 63% of auction revenue has gone to energy efficiency projects. http://www.rggi.org/docs/RGGI_Auctions_in_Brief.pdf

[93] http://insideclimatenews.org/news/20111213/cap-and-trade-massachusetts-clean-economy-rggi-energy-efficiency-green-buildings-new-jersey-christie

[94] Id.

[95] EUETS Report at 39.

[96] http://insideclimatenews.org/news/20111213/cap-and-trade-massachusetts-clean-economy-rggi-energy-efficiency-green-buildings-new-jersey-christie

[97] http://www.washingtonpost.com/blogs/wonkblog/wp/2013/02/09/cap-and-trade-is-still-alive-in-new-england-is-it-working/

gain of about $1.1 billion for energy consumers across the region.[98] One study has found that when power plant revenue reductions, reductions in consumer electricity bills, and the increase in program funding from RGGI auction revenue are combined, the value added from RGGI is $33 per person throughout the RGGI participating States.[99]

Aside from the economic benefits of the program, RGGI successfully implemented cost containment mechanisms to prevent the price issues in the EUETS and has avoided any indication of theft or fraud that would weaken the program's integrity. The first major cost containment mechanism that RGGI utilized, and that the EUETS did not, was auctioning the initial permits rather than freely allocating them to regulated entities. Furthermore, the emissions cap was based on verified historical emissions data, rather than self-reported data.[100] A different type of regulation that RGGI implemented to keep the cost of permits reasonable was a price floor;[101] although many of the permits were trading at or just above the price floor, the floor was designed to continue to provide incentives to regulated entities to implement more efficient technological improvements.[102] Prices have not been affected by theft or fraud because RGGI has adequate cyber security and tax protections to avoid the problems experienced in the EUETS resulting from these shortcomings.[103]

RGGI's economic and environmental successes were not completely blemish-free. RGGI over-estimated the initial cap; this led to an oversupply of permits and, ultimately, depressed some permit

[98] "This reflects average savings of $25 for residential consumers, $181 for commercial consumers and $2,493 for industrial consumers over the study period." <http://green.blogs.nytimes.com/2012/01/27/reaping-a-bonus-from-cap-and-trade/

[99] This reflects a $1.6 billion net economic benefit for participating states spread across the region's population. EUETS Report at 40.

[100] However, due to many factors the emissions calculations were not accurate for the years following the initial predictions, an issue that will be discussed *infra*.

[101] Carbon Markets Paper at 130.

[102] Id. at 135.

[103] RGGI's "independent market monitor has found no major irregularities since trading began in 2008." Id. at 139.

prices.[104] Also, as a result of political pressure, one State decided to withdraw from the program, creating political uncertainty regarding the strength and stability of the market.[105]

RGGI's estimate for the initial cap was based on estimated 2009 emissions data and assumed carbon emission levels would increase over time, as they had in the past.[106] However, due to numerous unforeseen changes in the market, such as the global recession and the recent natural gas boom, the actual rate that emissions declined was significantly more than the cap required.[107] Some of the energy efficiency programs supported by the auction revenue also successfully reduced emissions.[108] By 2013, the program's cap had been lowered to 165 million tons, yet the actual emissions were only 91 million tons.[109] To remedy this disparity, in February 2013, the RGGI States agreed to lower the cap to 91 million tons for 2014, which will decline by 2.5% every subsequent year.[110]

Because of the excess cap, many States have begun to retire unneeded credits. This will take the unnecessary permits off the market; however, it can have an effect on future permit prices, as firms will need more permits as the cap declines.[111] The Department of Environmental Conservation in New York recently decided to retire 38.8 million unused credits, and Connecticut, Delaware, Massachusetts, Rhode Island and Vermont are also retiring another 35.5 million.[112] While this is good for reducing the cap, it will likely increase permit prices, raise electricity bills, and create more uncertainty in a delicate market that thrives its best with political and regulatory certainty. The excessive cap and resulting lower

---

[104] http://www.washingtonpost.com/blogs/wonkblog/wp/2013/02/09/cap-and-trade-is-still-alive-in-new-england-is-it-working/

[105] http://insideclimatenews.org/news/20111213/cap-and-trade-massachusetts-clean-economy-rggi-energy-efficiency-green-buildings-new-jersey-christie?page=2

[106] http://www.businessweek.com/news/2013-02-06/u-dot-s-dot-northeast-cap-and-trade-program-said-to-lower-carbon-limit

[107] http://usnews.nbcnews.com/_news/2013/03/29/17518351-epa-proposes-tighter-fuel-emissions-standards-could-push-price-of-gas-higher?lite

[108] http://www.businessweek.com/news/2013-02-06/u-dot-s-dot-northeast-cap-and-trade-program-said-to-lower-carbon-limit

[109] Id.

[110] http://www.washingtonpost.com/blogs/wonkblog/wp/2013/02/09/cap-and-trade-is-still-alive-in-new-england-is-it-working/

[111] http://www.timesunion.com/business/article/New-York-voiding-gas-credits-2681450.php

[112] Id.

permit prices and market uncertainty gave one State the political fuel necessary to pull out of the program.

In 2011, in response to political pressure from the conservative lobbying group Americans For Prosperity, New Jersey's Governor Chris Christie pulled the State from the program.[113] Despite generating $150 million in economic activity and creating 1,800 new jobs in New Jersey, Governor Christie claimed that RGGI "'does nothing more than tax electricity, tax our citizens, tax our businesses.'"[114] Other States' legislatures, such as Delaware, Maine, and New Hampshire, have attempted to withdraw from the program; however, the proposals were defeated given the promising economic numbers coming from RGGI.[115] Although New Jersey left the program, which created a bit of uncertainty as to the strength of the program, other States have joined since its inception and the market has continued to grow and provide economic activity and new jobs in participating States.

Overall, RGGI has been a great success in terms of creating economic activity, bolstering new markets and additional jobs, and reducing greenhouse gas emissions. Some critics have pointed out that by 2020, RGGI will have only reduced emissions by about 13 million tons, which represents only 0.06% of United States emissions.[116] However, others have argued that any emissions reductions are essential, and that the success of a program like RGGI is important as a blueprint for a national scheme.[117]

[113] http://insideclimatenews.org/news/20111213/cap-and-trade-massachusetts-clean-economy-rggi-energy-efficiency-green-buildings-new-jersey-christie?page=2
[114] Id.
[115] Id.
[116] http://www.washingtonpost.com/blogs/wonkblog/wp/2013/02/09/cap-and-trade-is-still-alive-in-new-england-is-it-working/
[117] Id.

III. California's Cap-and-Trade Program

In November 2012, California completed its first cap-and-trade allowance auction. This auction was the beginning of California's long awaited cap-and-trade system, which began in 2003 as part of the West Coast Global Warming Initiative, later evolving into of the Western Climate Initiative (WCI) in 2007.[118] Five States started the WCI by agreeing to form a market-based solution to reducing greenhouse gas emissions.[119] By 2008, the WCI included 7 States and 5 Canadian provinces. However, due to the recession and political factors, as of 2013 only California and Quebec have implemented regulations to administer these programs. The development of California's cap-and-trade program is particularly important for a national cap-and-trade scheme because California is often at the forefront of environmental and other programs that are eventually adopted by the rest of the country.[120] Furthermore, the linkage with Quebec, which will be discussed *infra*, is an important step to establishing a North American cap-and-trade scheme that could hopefully bring together emissions trading markets in Canada, the United States, and Mexico.

Cap-and-trade was implemented in California under the umbrella of its landmark Global Warming Solutions Act of 2006, otherwise known as AB 32. Under this Act, the California Air Resources Board (ARB) was directed to develop policies to reduce greenhouse gas emissions throughout the state. So far, the three major policies have been the Renewable Portfolio Standard of 33%, the Low Carbon Fuel Standard, and cap-and-trade. While AB 32 does not specifically direct ARB to develop a cap-and-trade program, it authorizes ARB to use "market-based compliance mechanisms" as a means of achieving AB 32's goals of reducing emissions below 1990 levels by 2020.[121] Because ARB decided to develop a cap-and-trade system in which emissions allowances are auctioned, the California Chamber of

[118] http://www.westernclimateinitiative.org/history
[119] Id.
[120] http://www.nationaljournal.com/magazine/california-s-new-cap-and-trade-law-a-model-for-the-country-20121213
[121] Health & Safety Code §38570

Commerce filed a lawsuit the day before the first auction, arguing that ARB did not have the legislative authority to administer an auction as a means of raising revenue for the State.[122]

California's system will have quarterly auctions and will eventually cover 85% of California's emissions.[123] The program is generally based on the very successful Federal SO_2/Acid Rain cap-and-trade program that was developed out of the 1990 Clean Air Act.[124] California was also very careful to avoid some of the problems that the EU experienced in the early stages of the EUETS; in fact, Dave Clegern, the spokesman of the ARB, the state agency charged with developing and overseeing the program, stated, "We learned what not to do from the E.U. We looked at their program, consulted with them, and made adjustments based on their experiences."[125] Based on the results of the first auction, at which the State sold all 23.1 million of the 2013 vintage for $10.09 per allowance and raised over $288 million dollars, and the second auction in February 2013, which sold all 12.9 million allowances at $13.62 and raised an additional $223 million,[126] the program is off to an early success. Many of these successes can be contributed to the careful planning of the staff at the ARB, including sophisticated cost-containment mechanisms and effective protections against market manipulation and fraud.[127]

As explained earlier, certainty is one of the main factors in a successful market for carbon emissions. When the price of allowances is reasonably predictable, regulated entities have an easier time making long term investments in emission reductions. While regulatory certainty is a major component of overall program confidence, developing cost-containment mechanisms to prevent wild

---

[122] http://www.calchamber.com/PressReleases/Pages/11132012-CalChamberSuestoInvalidateCARBsCapandTradeAuction.aspx

[123] Page 1. http://www.arb.ca.gov/newsrel/2011/cap_trade_overview.pdf

[124] http://www.forbes.com/sites/kensilverstein/2012/07/31/californias-carbon-caps-are-contentous-but-coming/2/

[125] http://www.nationaljournal.com/magazine/california-s-new-cap-and-trade-law-a-model-for-the-country-20121213

[126] http://www.sacbee.com/2013/02/23/5210552/californias-second-carbon-auction.html

[127] For a paper concluding that it is "unlikely that CARB will experience market manipulation that can significantly affect the efficiency or fairness of the market" please see "Examining Market Manipulation, Gaming and Enforcement in California's Cap-and-Trade Program," which can be found at: http://law.ucla.edu/centers-programs/environmental-law/Pages/Publication.aspx?PubID=12

price volatility is also crucial to an effective market. California has implemented five main cost-containment mechanisms, including three-year compliance periods, allowance banking, allowance reserve accounts, free allocation of allowances to certain regulated entities, and offset provisions.

The first cost-containment mechanism is three-year compliance periods.[128] This provision allows entities greater flexibility in complying with their emissions obligations. Overall emissions and allowance prices can be affected by year-to-year variations in business cycles, weather events, fuel prices, etc. For example, in California's low water years natural gas and other forms of electricity generation replace hydropower as a significant additional source of electricity;[129] as a result, some regulated entities' overall annual emissions increase based on the availability of water. The regulations allow regulated entities to surrender allowances for three years' worth of emissions to account for these variations, rather than every year. By giving entities a three-year compliance period, the regulations take into account these year-by-year variations to provide greater flexibility and keep costs low.

California's cap-and-trade program also allows for allowance banking.[130] Nearly every cap-and-trade system in the world allows for allowance banking, as it is seen as an essential aspect of a properly functioning market. If at the end of a compliance period a regulated entity has more allowances than necessary to satisfy its compliance obligations, that entity may either "bank" these excess allowances and use them for a future compliance period or sell them on the open market to other regulated entities that do not have a sufficient number of allowances to cover their emissions for that compliance period. Allowance banking typically encourages early reductions because the program's declining cap will likely cause allowance prices to increase over time. However, the flexibility of allowance banking gives covered entities the freedom to use or retain allowances consistent with effective business practices.

[128] 17 CCR § 95840
[129] http://www.eia.gov/todayinenergy/detail.cfm?id=10091
[130] 17 CCR § 95922

The regulations include a provision creating an "Allowance Price Containment Reserve Account," which provides a "soft-ceiling" on allowance prices during compliance periods.[131] If prices become too volatile and spike, the Air Resources Board has set a price ceiling, above which the allowances cannot go. In 2013, this maximum is set at $40-$50, depending on the allowance vintage.[132] The price of the Reserve Auction Allowances will increase by 5% plus inflation annually.[133] This provision compliments the price floor that has been set by the ARB, which is $10 and will also increase by 5% plus inflation each year.[134] By creating a defined range of possible allowance prices, e.g. $10-$50, the ARB has minimized the potential for wild price volatility such had been seen in the EUETS that weakened investors' confidence in the market.

While the regulations contain certain provisions that are intended to keep costs low, other factors may also keep costs low. In the first auction, only 10% of emissions allowances were auctioned off; the other 90% were freely allocated to regulated entities. Auctioning all allowances avoids any possibility of windfall profits; however, ARB has required that the electricity companies receiving allowances for free must sell them and use the revenue to offset increased electricity prices to their customers.[135] The California Public Utilities Commission has issued regulations indicating that 85% of their auction revenue will go to customers in the form of a bi-annual rebate on their electricity bill that amounts to $60 each year per household.[136] Furthermore, by giving away most of the allowances in the early stages of the cap-and-trade program, ARB is giving covered entities the flexibility to ease into their compliance obligations. As the cap is lowered and covered entities are required to purchase more allowances, businesses will have a better idea how to pass along increased costs to customers or invest in more efficient technologies if they want to keep the price of their products the same. By giving

[131] 17 CCR § 95870(a)
[132] http://legalplanet.wordpress.com/2012/04/04/auction-prices-in-californias-cap-and-trade-program/
[133] Id.
[134] Id.
[135] http://www.sacbee.com/2012/12/20/5066550/utilities-benefit-in-state-carbon.html
[136] Id.

regulated entities this flexibility, ARB is able to keep allowance prices lower than without these freely allocated allowances, while also ensuring that entities with a likelihood of windfall profits are required to return those profits to their customers.

Finally, the last major cost containment mechanism implemented by ARB is the option for regulated entities to satisfy up to 8% of their compliance obligations with approved offset credits.[137] ARB has approved four offset protocols that can offer credits to regulated entities. These four protocols are: urban forestry projects, US forest projects, livestock programs, and ozone depleting substance programs.[138] While these offset options offer regulated entities flexibility in meeting their compliance obligations, offsets do not come without problems. Similar to many of the complaints about the clean development mechanism projects in the EUETS, critics argue that offset projects cannot guarantee additional greenhouse gas emission reductions and thus should not be included in the cap-and-trade system. Recently, a California Superior Court rejected these claims in a lawsuit filed by Citizens Climate Lobby and Our Children's Earth Foundation.[139] These two environmental groups asserted that the offset protocols could not ensure additionality because the regulations measure additionality with a standards-based approach, rather than a project-by-project approach. The Court summarized the decision as such:

> Determining additionality is difficult, and it is impossible to precisely delineate between additional and non-additional projects. All additionality determinations suffer from this limitation, not just standards-based approaches. Petitioners ignore this reality and insist Respondent must use a perfect additionality mechanism or none at all. This argument is inconsistent with the science behind additionality. . .[140]

[137] 17 CCR § 95970, § 95854
[138] http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm
[139] The Court's decision can be found at: http://cdn.law.ucla.edu/SiteCollectionDocuments/Centers%20and%20Programs/Emmett%20Center%20on%20Climate%20Change%20and%20the%20Environment/CCL%20v%20ARB.pdf
[140] Id. at pp. 23-24.

While the court denied the environmental groups' petition for a writ of mandate, the lawsuit and another filed by the California Chamber of Commerce may have created enough uncertainty in the program to keep allowance prices low in the first auction.[141]

Though still in its relative infancy, California's cap-and-trade system has been a great success so far. As the world's eighth largest economy, the continued success of California's cap-and-trade program is crucial for cap-and-trade markets around the world. Furthermore, it serves as a test program if Congress decides to pursue a market-based solution to climate change at the national level. For these reasons, it was incredibly important for California to learn from the problems in the EUETS and RGGI; hopefully, if California's program has any problems, they can either be fixed quickly or Congress can develop a national scheme to avoid these issues and subsume the California program.

[141] Carbon Trading Magazine, Dec 12/Jan 13 at 10.

IV. American Clean Energy and Security Act (ACES)

On June 26, 2009 the House of Representatives passed H.R. 2454, otherwise known as the American Clean Energy and Security Act, ACES, or the Waxman-Markey Bill.[142] Unfortunately, the bill never passed the Senate, and has since been abandoned. In its final form, ACES set out a comprehensive blueprint for many programs that supported clean energy development and greenhouse gas emission reductions at a national level, including a renewable energy standard,[143] a cap-and-trade system, plans for investments in clean technology,[144] carbon capture and sequestration (CCS) mandates for coal-fired power plants,[145] support for worker re-training, clean car incentives, and support for "smart grid" research and implementation.[146] While this paper will focus mainly on the design of the cap-and-trade system, many of the other programs would have been funded with the revenue generated by the auction of allowances under cap-and-trade.

The cap-and-trade system under ACES, which would begin in 2012 and be fully in place by 2016, set 2005 as the baseline measure for emissions reduction goals.[147] This proposed emissions trading system, like California's system, is generally based off the Clean Air Act's Acid Rain cap-and-trade program.[148] It requires that capped sectors reduce emissions by 3% below 2005 levels by 2012, 17% by 2020, 42% by 2030, and 83% by 2050.[149] Capped sectors include 85% of the United States economy,

---

[142] http://democrats.energycommerce.house.gov/sites/default/files/documents/ACES-2454-Summary-July-2009.pdf

[143] There would have been a requirement that all electric utilities get at least 20% of their electricity from renewable sources and energy efficiency by 2020. Id.

[144] The Bill directs about $190 million to clean technology and energy efficiency by 2025. http://grist.org/article/2009-06-03-waxman-markey-bill-breakdown/

[145] "By 2025, all coal plants built after 2009 would have to capture 50 percent of their CO2 emissions." Id.

[146] Id.

[147] HR 2454, Title VII, Part A, Section 703. Bill text can be found here: http://www.govtrack.us/congress/bills/111/hr2454/text

[148] At page 3. http://democrats.energycommerce.house.gov/sites/default/files/documents/ACES-2454-Summary-July-2009.pdf

[149] Id.

including "electricity producers, oil refineries, natural gas suppliers, and energy-intensive industries such as paper, iron, steel, and cement manufacturers."[150]

These capped sectors would need to buy allowances in auctions similar to the EUETS, RGGI, and California programs. In the early stages of the program, 80% of these allowances would be freely given to regulated entities while the other 20% would be auctioned off.[151] By 2031, about 70% of the allowances would be auctioned off.[152] Between 2012-2025, the Bill directs 55% of auction revenue to protect electricity consumers from increased electricity bills,[153] 19% to "trade-vulnerable" sectors to "help transition to a clean energy economy," 13% to clean energy technology and efficiency, 10% to various programs such as worker re-training and international efforts, and the remaining 3% would have ensured ACES remained budget neutral for the federal government.[154]

ACES also includes provisions that would allow for regulated entities to meet their compliance obligations through offset projects.[155] Half of these credits must come from domestic sources; however, if there are not enough domestic projects to meet this requirement, up to 75% of offset credits may come from foreign sources.[156] These foreign projects, though, are not eligible under ACES "until the United States has entered into an agreement with the originating nation establishing the terms of the offset program."[157] Furthermore, the integrity of the offset program will be ensured by an independent scientific panel to ensure additionality and other crucial factors.[158] The text of the Bill itself does not

[150] http://grist.org/article/2009-06-03-waxman-markey-bill-breakdown/
[151] Page 4. http://democrats.energycommerce.house.gov/sites/default/files/documents/ACES-2454-Summary-July-2009.pdf
[152] Id.
[153] The EPA estimated ACES would cost the average household $80-111 per year, while the CBO estimated the Bill would cost the average household about $175 per year. Id at 5.
[154] Id. at 4.
[155] Id. at 3.
[156] Id.
[157] Id.
[158] Id.

specify which offset projects are eligible, but rather delegates this task to certain Executive Agencies.[159] These offset provisions will be discussed in greater detail in the following section.

While ACES and the California model are similar, a new federal bill, modeled on ACES and informed by the successes of California's system and some of the failures of the EUETS and RGGI, can be presented to Congress to create a more successful national cap-and-trade system. The next section will discuss some of ACES' more specific provisions and introduce some changes that can be made to hopefully make the bill more likely to pass both Houses of Congress, rather than die in the Senate as ACES did.

[159] Id.

V. Recommendations for a Federal Cap-and-Trade Program

Perhaps the most challenging aspect of passing a comprehensive bill addressing climate change is the recent polarized politicization of the issue. Many politicians continue to deny the severity, and some even the existence, of climate change in the face of overwhelming scientific consensus.[160] Therefore, if a new bill is to pass both houses of Congress, there will need to be a significant change in the public's understanding and perception of climate change, which must be reflected by elected officials.[161] While it is clear that a majority of Americans believe in climate change and want the Federal Government to act,[162] many elected officials are bankrolled by the fossil fuel industry and are thus unwilling to support many of the attempts to transition to a cleaner economy.[163]

Another political barrier to a Federal cap-and-trade system is the split amongst those who do support pricing carbon. While some support a market-based approach such as ACES, others have recently introduced legislation to impose a carbon tax.[164] It is imperative that those who wish to see a price on carbon come together to develop the most politically feasible mechanism for doing so; approaching the issue in factions will surely fail. While a carbon tax has lower transaction costs and creates relative certainty for taxed entities, "tax" is a poisonous word in Washington D.C. and is not the most economically efficient means of determining an appropriate carbon price. A cap-and-trade system, particularly one with a price floor, which will be discussed *infra*, could be considered a hybrid "cap-and-tax" system by guaranteeing a minimum price on carbon. By creating a market in which to trade emissions allowances, a cap-and-trade system will allow the market to price carbon, rather than politicians. Furthermore, considering the vast majority of international jurisdictions are adopting cap-

---

[160] http://wwwp.dailyclimate.org/tdc-newsroom/2012/03/kerry-vents-on-climate
[161] http://legalplanet.wordpress.com/2012/05/16/the-climate-misinformation-nation/
[162] See, *supra*, note 14.
[163] http://priceofoil.org/fossil-fuel-industry-influence-in-the-u-s/
[164] Interestingly, Henry Waxman is one of the named authors of ACES and this recent legislative carbon tax proposal. http://democrats.energycommerce.house.gov/index.php?q=news/waxman-whitehouse-blumenauer-and-schatz-release-carbon-price-discussion-draft

and-trade rather than a carbon tax, it seems prudent to pursue a comprehensive and properly developed cap-at-trade system at the United Stated Federal level.

a. Adaptive Regulatory Structure

Before the specifics of such a large program are developed, it is important to step back and look at the overarching skeleton for such a program. As has been clear from other cap-and-trade systems throughout the world, regulatory certainty is essential for a properly functioning program. On the other hand, flexibility to tweak the program as time goes on and circumstances change is necessary for the program to avoid being ineffective and outdated. Therefore, the program must find a balance between the two extremes. In their paper, "The EU Emissions Trading System: Results and Lessons Learned," the Environmental Defense Fund recommends that a "predictable cap guided by the evidence of climate science provides a flexible, automatic stabilizer that helps to smooth unexpected downturns in the macroeconomy by reducing the costs of emission reductions."[165] However, flexibility based on evolving scientific knowledge must also be paired with a predictable timeframe for review and a transparent revision process.[166]

A three-phase process, like that in the EUETS and California system, is an effective way of identifying periods during which regulations will remain unchanged while providing the opportunity for regulators to update those regulations as scientific knowledge changes. Like the EUETS system, the first phase could be used as an opportunity to develop "a proper trading infrastructure, including emissions data and registries."[167] Furthermore, to make this work, the Legislature would need to determine an official scientific body to provide analyses of the current scientific understanding of climate change to be presented at the end of each compliance period to inform any necessary changes to the program from a scientific perspective. Furthermore, there would need to be an identified body that performs an

[165] EUETS Report at 14.
[166] Carbon Market Paper at 141.
[167] EUETS Report at 7.

economic analysis to assess the actual effect the program has on the economy and make recommendations based on what is actually happening. Both of these bodies would need to provide transparent access to their methodologies and conclusions. While this increases transaction costs, it will give interested parties the opportunity to remain informed as to the basis for potential tweaks at predetermined phased intervals. The costs would be covered by the revenue generated from the auction.

Another option that could help ease regulated entities into a cap-and-trade system and provide revenue to pay for the system is a system similar to Australia's program. There, the government placed a fixed price on carbon that will eventually turn into a cap-and-trade system. In this option, regulated entities would have a fixed compliance cost and be able to make efficiency investments accordingly; eventually, these fixed costs would become based on market forces and any early emission reductions could be rewarded in that market. Furthermore, while this wouldn't guarantee emission reductions in the early stages, it would guarantee a revenue stream for the Government; this money could go toward funding the development of an effective and comprehensive cap-and-trade program in later stages.

b. Scope of Program

Once the number, length, and nature of each phase are determined for the lifetime of the program, legislators and/or regulators must identify what entities will be covered by the cap. One of the downfalls of the EUETS is the fact that it only covers about 45% of the overall economy's emissions.[168] California's program, when fully implemented, will account for about 85% of California's economy.[169] The more aspects of the economy that a cap-and-trade program covers, the better for the overall functioning of the system; this follows from the notion that a larger market is more economically efficient than a smaller one, which is an important justification for encouraging linkage among jurisdictions. While it is not feasible to cover every single entity, due to technical, logistical, and leakage

[168] See, fn. 41.
[169] See, fn. 121.

concerns, covering 80-85% of the economy will foster a more efficient national carbon market than a program that only targets 50% of the economy, as the EUETS did. With approximately 85% of the economy covered by the cap-and-trade program, allocation of allowances will be incredibly important. Unlike the EUETS, RGGI and California had real and verified emissions data on which they could base initial allowance allocation. Therefore, it is essential for ACES to have real and verified emissions data from regulated entities in each state, which is easy based on US EPA's GHG reporting requirements.[170]

c. Allowance Allocation

As discussed *supra*, a cap-and-trade auction in which 100% of the emissions credits are auctioned off in the first phase is unlikely to pass in the current political climate. While this would eliminate the opportunity for any windfall profits, it increases costs for industry. It is important to keep the interests of industry in mind as this program comes together because the program will work its best if all parties are satisfied with the design. Furthermore, other jurisdictions have found it helpful to give industry the opportunity to ease into their compliance obligations to keep costs low and help all parties involved transition into a relatively new market.

California only auctioned 10% of the required credits in its first auction; the EUETS gave away nearly all allowances in Phase I and only auctioned 3% in Phase II; ACES recommends auctioning 20% of allowances in the early stages of the program. California was able to auction 10% without seeing the effects of windfall profits because California's electricity market is regulated. California's system was requires utilities to auction off all of the credits they received for free and return the profits to the consumer.[171] In an unregulated market, such as many of the jurisdictions in the EU, a utility can pass the cost of compliance on to the consumer while keeping the revenue raised from the freely allocated allowance auction sales. Therefore, it is very difficult to prevent this from happening at a national level in the United States because each jurisdiction treats electricity regulation differently.

[170] http://www.epa.gov/ghgreporting/
[171] http://www.sacbee.com/2012/12/20/5066550/utilities-benefit-in-state-carbon.html

To avoid windfall profits based on the free allocation of allowances to electric utilities, Congress would have to make the legislative intent clear that FERC may assert jurisdiction over utilities. The legislative finding that preventing windfall profits by regulating utilities affects interstate commerce must have a rational basis.[172] If this is the case, the bill would carry the presumption of constitutionality.[173] The United States Supreme Court has found that where the legislative intent is clear, "federal regulation of intrastate power transmission may be proper because of the interstate nature of the generation and supply of electric power."[174] If FERC can develop regulations to prevent windfall profits from freely allocated allowances to electric utilities, then the California model of auctioning 10% of allowances in the first phase would make the transition to a cap-and-trade system more industry friendly. Otherwise, the Legislature could develop a specific capital gains tax scheme to tax these windfall profits at a higher rate, with a provision to return this additional tax revenue to utility customers.[175] In addition, to minimize windfall profits, the program should consider auctioning a higher percentage of allowances in the first phase, such as 20%, the amount identified in ACES.

ACES also has its own provision to minimize windfall profits. ACES indicates that regulated utilities delivering electricity to customers would receive only 32% of their allowances for free through 2025.[176] The utilities are then directed to use these profits to keep rates low.[177] The EUETS will auction off nearly 100% of allowances to the power generation sector.[178] The authors of a national cap-and-trade bill could consider this approach, though the proposal will likely meet political resistance. ACES

[172] Hodel v. Indiana, 452 U.S. 314, 323 (1981)
[173] Usery v. Turner Elkhorn Mining Co., 428 U.S. 1, 15 (1976)
[174] F.E.R.C. v. Mississippi, 456 U.S. 742, 755 (1982) (finding that in regards to PURPA, Congress "determined that 'the protection of the public health, safety, and welfare, the preservation of national security, and the proper exercise of congressional authority under the Constitution to regulate interstate commerce require,' among other things, a program for increased conservation of electric energy, increased efficiency in the use of facilities and resources by electricity utilities, and equitable retail rates for electricity consumers, as well as a program to improve the wholesale distribution of electric energy, and a program for the conservation of natural gas while ensuring that rates to gas consumers are equitable.")
[175] EUETS Report at 21.
[176] ACES Summary at 5.
[177] Id.
[178] See, fn. 63.

also contains a ratepayer fairness provision, which makes sure that local distribution companies are not allocated any more allowances than are needed to cover its direct and indirect costs related to the program.[179] Minimizing windfall profits through careful allowance allocation is an important step to ensuring a properly functioning program.

d. Price Floor and Ceiling

Allowance allocation is one of the main cost containment mechanisms that ensures a reasonable price on carbon. However, the Legislature can include other cost-containment mechanisms, as California and other jurisdictions have done, to further protect the price from getting too high. Important cost containment mechanisms, discussed *supra*, are a set price floor and price ceiling. By developing a reserve at which allowances can be purchased at a set price if the auction prices get too high, the Legislature can signal to industry the very maximum that firm could potentially have to pay to satisfy its compliance obligations. Furthermore, a price floor ensures the lowest price for allowances, giving both the Federal Government an indication of the least amount of money the program can raise and regulated entities the very minimum they can be required to pay for their compliance obligations given their current level of emissions.

ACES has a provision for a $10 price floor, similar to the California model. While the price floor can be set at any price, the $10 floor guarantees a reasonable price for carbon in early stages and has worked well in the California program thus far. The price floor in RGGI of $1.89[180] is far too low for a national cap-and-trade program. As indicated in ACES, the price floor should increase accordingly with inflation, but should remain the same throughout phases. If after the first phase the independent economic analysis determines a $10 price floor is inefficient, it can be updated accordingly.

On the other end of the spectrum is the "soft-ceiling" provision of the California cap-and-trade system. California's system has a set price for the "Allowance Price Containment Reserve Account,"

[179] ACES Summary at 5.
[180] http://www.platts.com/RSSFeedDetailedNews/RSSFeed/ElectricPower/6734973

which is $40-50 based on allowance vintage. This price will increase by 5% plus inflation each year. ACES, on the other hand, has a price ceiling of 160% of the three-year allowance trading average.[181] Of course, each approach has its advantages. California's fixed price ceiling gives regulated entities a guaranteed maximum compliance obligation cost; this allows for long term financial planning for entities that wish to invest in emission reduction technologies and those who contemplate continue to pay-to-pollute. The ACES approach, however, makes the price maximum relative to the trading average over the long term; this guarantees more long-term stability in the price and ensures that a predetermined ceiling is not too low compared to three-year market pricing, though it doesn't identify any fixed long-term price maximum so it may be difficult for firms to make long-term investments based on precise numbers.

Therefore, it seems a fixed price ceiling, subject to revision based on the independent economic analysis accompanying each phase transition,[182] is the best option when pursuing a national cap-and-trade system geared toward providing regulated entities with more long-term certainty where feasible. In determining this price ceiling, however, Congress should evaluate the economic analyses out there that have looked at the price that is most likely to trigger energy efficiency improvements; one study, mentioned *supra*, found that the price of an allowance must be €25-€30, or $32-$39, to be effective.[183] California's soft-ceiling of $40-$50 exceeds these estimates and can thus inform a price ceiling in new legislation, but the authors of a new cap-and-trade bill must be cognizant of the importance of making sure the price ceiling is high enough to ensure proper incentives for emissions reductions.

e. Multi-Year Compliance Periods

[181] ACES Summary at 4. http://democrats.energycommerce.house.gov/sites/default/files/documents/ACES-2454-Summary-July-2009.pdf

[182] This analysis could include an ACES-like metric, analyzing the three-year average of the market and ensuring the market ceiling is at least 160% of the average.

[183] See, fn. 53.

The EUETS, RGGI, and California programs offer three-year compliance periods as a means of allowing annual natural and business variations to average out over a period of time greater than a single year. ACES, on the other hand, includes two year compliance periods. In proposing national legislation, it is important to keep in mind the structure of other programs to make potential linkage easier in the future.[184] Furthermore, three-year compliance periods have worked extremely well for each of the other programs. Therefore, new federal legislation should include three-year compliance periods. However, it may be necessary to set up three year compliance periods with a scientific reevaluation of the necessary length of compliance periods as the climate changes over time. For instance, every three compliance periods there could be a reevaluation of yearly emissions compared to the three-year emission averages. These data could then be used to calculate emissions averages based on two- or four-year compliance periods to maximize efficiency.

RGGI has an option to extend the compliance periods from three years to four years.[185] This is triggered if the twelve month rolling average price of allowances is greater than $10. If this occurs, then a "stage two trigger event" occurs, and the compliance period is extended from three years to four. This price trigger situation is another option for the Legislature to consider. However, the uncertainty of compliance periods can cause prices to fluctuate and adds an additional variable. If the length of compliance periods were updated at time periods specified ahead of time in the legislation, the program would efficiently balance the needs of industry with the evolving nature of climate change science and the developing market.

f. Allowance Banking

Allowance banking is part of nearly every cap-and-trade system in the world. It provides the flexibility regulated entities need to balance its present need for allowances with the prospect of future allowance prices rising. Therefore, if an entity decides it is the proper business move to buy unneeded

[184] Linkage will be discussed in greater detail *infra*.
[185] "Overview of RGGI CO_2 Budget Trading Program" at 7. http://www.rggi.org/docs/program_summary_10_07.pdf

allowances now in order to save them and use them in the future, it is able to do this with allowance banking. Of course, there are shortcomings with allowance banking because it is a provision based on long-term certainty; for instance, there is the possibility that the program may fail before the regulated entity has a chance to use its banked allowances, thus causing a financial loss. However, because this is unlikely and the banking provisions provide a great deal of flexibility to regulated entities, it is important to have as part of any cap-and-trade program.

ACES[186] and RGGI[187] include unlimited allowance banking provisions, but ACES counts banked allowances at an 8% discount rate.[188] Furthermore, under ACES, these banked allowances can only make up 15% of an entity's compliance obligation for a given year.[189] California's system limits the amount of allowances an entity may "hold" in a given year, based on a specified formula.[190] The EUETS did not allow for Phase I allowance banking, but inter-phase banking was allowed between Phases II and III.[191] By not allowing banking between phases, "cost shocks have to be absorbed immediately."[192] Therefore, inter-phase banking is essential for flexibility and price stability. Based on the existing systems, the ACES proposal is a hybrid approach of unlimited banking and value limitations. By allowing regulated entities to hold unlimited allowances from different vintage years, but limiting the amount the entity can surrender in a given compliance year, the ACES system finds a good balance by giving entities flexibility while maintaining rigorous regulatory requirements.

g. Penalties

In regards to the surrender of allowances at the end of a compliance period, each system has its own form of penalties if a regulated entity does not meet its compliance obligations. If a regulated

[186] ACES Summary at 4.
[187] "Overview of RGGI CO_2 Budget Trading Program" at 6. http://www.rggi.org/docs/program_summary_10_07.pdf
[188] Carbon Markets Paper at 136. See ACES §725(c)(2)(C)(i).
[189] See ACES §725(c)(2)(A).
[190] The formula is: Holding Limit = 0.1*Base + 0.025*(Annual Allowance Budget – Base); where "Base" equals 25 million metric tons of CO_2e and the "Annual Allowance Budget" is the number of allowances issued for that budget year. http://www.c2es.org/us-states-regions/action/california/cap-trade-regulation#sub11
[191] Carbon Markets Paper at 136.
[192] Id.

entity does not surrender a required allowance, the EUETS has a fixed penalty of €100 per ton.[193] In RGGI, compliance and enforcement is left to the individual states.[194] This gives states the freedom to deal with their businesses as they see fit; however, RGGI does encourage states to implement monetary penalties similar to those imposed by the EUETS.[195] California's system, on the other hand, indicates that for every ton of CO_2e an entity is required to surrender, but does not, that entity must purchase four additional credits and surrender them, plus additional fines if additional credits are not purchased in a specified amount of time.[196] ACES requires entities that do not comply with their allowance obligations to pay twice the price of the missing allowance.[197]

The fixed price approach of the EUETS and RGGI do not seem to depend on the market enough; while they do offer certain costs for an entity's failure to surrender the appropriate number of allowances, these fixed costs do not reflect a changing market. The penalties under the California and ACES systems are directly related to the market, and are thus a better representation of the regulated entity's violation. However, the EUETS program's fine of €100 per ton is significantly more than the California system, which is double the ACES proposal. In the California program, if an entity were to violate its compliance obligation and allowances were priced as they were after the second auction ($13.62), it would be penalized $54.48. This is roughly €41.71 in April 2013 exchange rates. The EUETS penalty of €100 is roughly $130.62, more than twice California's penalty and more than four times ACES proposed penalty (though the actual price of allowances under ACES cannot be known). Therefore, for a federal cap-and-trade proposal, ACES should be updated to have a penalty of significantly more than its current 2x multiplier, and can even go further than California's system to penalize violators as harshly as

[193] https://www.gov.uk/participating-in-the-eu-ets
[194] http://www.rggi.org/docs/neghg_compliance.pdf
[195] Id.
[196] http://www.acc.com/legalresources/quickcounsel/UCCTR.cfm
[197] ACES 723(b)(2)

the EUETS. This will provide proper incentives to not only comply with the cap-and-trade program, but also invest in more efficient technologies to avoid an unintentional violation.

h. Offsets

The final main cost-compliance mechanisms that exist in nearly every cap-and-trade system, and are included in ACES, are provisions for meeting compliance obligations by participating in an offset credit market. As discussed supra, the EUETS allows for offsets under the Clean Development Mechanism of the Kyoto Protocol, modified as necessary by the CDM Executive Board.[198] RGGI limits offset compliance to 3.3% for a given compliance period, unless specified trigger events occur in which entities will be able to satisfy 5-10% of their compliance obligations with offset credits.[199]

The EUETS began its program by approving the CDM as the method by which entities could satisfy compliance obligations through offsets. The CDM has come under great scrutiny, as discussed *supra*, because of questionable projects (typically in India and China) and the fact that additionality is generally determined by a case-by-case financial analysis.[200] Because of the many publicized problems in the CDM program, it should not be approved at the national level. Although it can provide some insight into what has worked and what hasn't, the program as a whole would likely be ineffective for a properly functioning federal system in the United States.

RGGI has approved five different offset protocols: (1) capturing and destroying methane from landfills; (2) reduction in sulfur hexafluoride emissions; (3) forest carbon sequestration projects; (4) avoidance of CO2 emissions through energy efficiency; and (5) emissions reductions through manure management.[201] These projects can exist in RGGI participating jurisdictions or in any jurisdiction that has entered into a Memorandum of Understanding recognizing the strict requirements ensuring the emissions reductions from the programs are "real, additional, verifiable, enforceable, and

[198] See, fn. 79.
[199] Program Summary at 9. http://www.rggi.org/docs/program_summary_10_07.pdf
[200] Id. at 11.
[201] Id. at 9.

permanent."[202] Additionality, the most controversial aspect of offset verification, is determined by benchmark and performance standards.[203] Because the cap under RGGI is significantly higher than actual emissions and the allowance prices are so low, there are very few offset projects that exist for compliance purposes.

The California Air Resources Board has approved four offset protocols as part of California's cap-and-trade program. These protocols are: (1) urban forestry; (2) U.S. Forests; (3) Livestock Digester projects; and (4) projects that destroy certain ozone depleting substances.[204] ARB has limited a regulated entity's ability to use offset credits to 8% of their compliance obligations.[205] California's offset protocols were challenged by two environmentalist organizations, who claimed the offset protocols could not guarantee additionality and were, thus, illegal aspects of the regulation.[206] The court dismissed the claims, highlighting that California's standards-based approach using a conservative business-as-usual benchmark was the most scientifically feasible means of assessing additionality.[207] As far as offset projects go, according to the court, additionality is based on counterfactual scenarios and thus cannot be determined with absolute certainty; as such, as long as the best methods are employed, the additionality tests for offset projects fit within the legislative directive. Considering these offset provisions withstood judicial scrutiny, they should be the blueprint for any offset programs developed for a national cap-and-trade scheme.

ACES provisions provide that regulated entities may meet up to 2 billion tons of emission credits with offset credits.[208] One billion of these credits must come from offset projects that are located in the United States, unless there are not enough at which point only 25% must be domestic. Furthermore, for

---

[202] Id.
[203] Id. at 11.
[204] http://www.arb.ca.gov/cc/capandtrade/offsets/offsets.htm
[205] Id.
[206] See, fn. 139.
[207] Id.
[208] ACES Summary at 3. http://democrats.energycommerce.house.gov/sites/default/files/documents/ACES-2454-Summary-July-2009.pdf

offset credits from a foreign jurisdiction to count, that foreign jurisdiction must enter into an agreement in which the foreign country agrees to the United States' offset requirements. This is similar to RGGI and California's programs. ACES directs the Secretary of Agriculture to develop offset protocols related to livestock and forestry; however, because ACES never passed these protocols were never developed.

ACES, written before California's offset protocols were finalized, challenged in court, and upheld, should be updated to include many of the provisions that ensure additionality in California's program. It is important, however, to consider the types of offset protocols offered in RGGI as well. Because Federal legislation will cover the entire country, a broader option of available offset projects will give regulated entities greater freedom to find emissions reductions from approved projects. While the CDM should not be used as a model for offset projects under Federal legislation, it is very important to consider offset programs in relation to other foreign jurisdictions; linkage among markets should always be a driving factor that is not foreclosed by poor planning. If the US doesn't consider the ease of linkage while developing offset policies, it will inefficiently isolate the US cap-and-trade program from the global market. While the ACES provision that any foreign offset project must come from a jurisdiction that enters into an agreement with the US regarding offset requirements should remain, the actual requirements should incorporate foreign concerns at the earliest stage feasible.

i. Revenue Expenditure

Once the auctions have been completed and the Federal Government has revenue to spend, there are ways for the government to spend that money that is better than others. For instance, the tremendous success of investing revenue in energy efficiency projects throughout RGGI indicates it is one of the smartest ways for the government to spend this money. So far 63% of RGGI auction revenue has gone to energy efficiency, renewable energy, and related projects in participating states.[209] Part of

[209] http://www.rggi.org/docs/RGGI_Auctions_in_Brief.pdf

this revenue also goes to keeping consumers' electric utility bills lower, a policy that has been discussed *supra*.

While these two goals are important, it is also important politically to ensure this program remains budget neutral. Therefore, a sufficient percentage of the auction revenue should be reserved to cover the costs of the program. Until 2025, ACES sets aside 3% of auction revenue for budget neutrality, while between 2025-2050 it sets aside 7% of auction revenue.[210] Once new legislation is drafted, an operating cost analysis must be done in order to determine the appropriate percentage of anticipated auction revenue that should be designated to ensure budget neutrality. It is important to make sure that the polluters, and not the taxpayers, are paying for this program.

j. Linkage

Linkage, as discussed *supra*, is essential for a cohesive global carbon market. There are many factors that make two or more cap-and-trade programs able to connect once they have come on-line individually. The first, in order to avoid some of the fraud experienced in the EUETS, is to have similar tax structures in linked jurisdictions. Of course, it is nearly impossible to have exactly the same tax structures between foreign jurisdictions; however, the EUETS and the US have tax schemes that can prevent this kind of fraud from happening if future linkage were to occur. These protections must be identified in the legislation prior to the start of the program, which the EUETS did not do causing the fraud problems experienced in Phase I.

Another major aspect that needs to be the same for programs to link are minimum regulatory requirements. On April 8, 2013, California's Governor approved the linkage between California and Quebec's cap-and-trade systems.[211] The Governor was required to make four findings before linkage could be finalized; these findings are: (1) Quebec's program requirements are at least as strict as

[210] ACES Summary at 4.
[211] http://legalplanet.wordpress.com/2013/04/08/breaking-news-brown-approves-california-cap-and-trade-linkage-to-quebecs-system/

California's; (2) linkage must not affect either jurisdiction's ability to enforce the provisions of the program; (3) Quebec's enforcement provisions are at least as strict as California's; and (4) linkage will not impose extra liability on California.[212] The Governor made these findings and thus approved linkage; CARB will promulgate final regulations and the two jurisdictions are expected to be linked by January 1, 2014.[213] These four findings are important for the Legislature to pay attention to when developing a national cap-and-trade that contemplates, as it should, linkage with foreign jurisdictions. However, California's third finding highlights the importance of remaining the baseline that other jurisdictions must meet or exceed in terms of the stringency of their regulations and enforcement capabilities. As the world's single largest GDP, which is only slightly behind the entire EU,[214] a United States carbon market could possibly be the largest in the world. Furthermore, with the problems the EUETS has experienced, a United States market would have significant influence in the global carbon market. Therefore, the US should ensure that any linkage with foreign jurisdiction does not compromise the rigorous and science-based policies that come together under the Federal cap-and-trade legislation. The United States has the opportunity to reinvigorate the world cap-and-trade market with a well-planned and comprehensive legislative proposal that factors in the missteps taken by earlier carbon markets while also implementing the successes of those markets.

[212] http://legalplanet.wordpress.com/2013/04/08/breaking-news-brown-approves-california-cap-and-trade-linkage-to-quebecs-system/
[213] Id.
[214] http://useconomy.about.com/od/grossdomesticproduct/p/largest_economy.htm

VI. Conclusion

Over time we have seen each successive cap-and-trade program get stronger because it was developed with the missteps and failures of earlier systems in mind. Congress has the opportunity to make a cap-and-trade program that capitalizes on the successes of previous cap-and-trade systems, particularly building on the successful framework implemented by California in 2012. ACES should be updated taking into account some improvements California was able to make given the timing of the two legislative proposals, which would develop a comprehensive cap-and-trade program that could be the blueprint for reinvigorating the global carbon market. Some confidence in the global market has dwindled due to the highly-publicized problems in the EUETS; however, these errors shouldn't serve to dismantle a global push to reduce carbon emissions through a market-based system. Instead, these early programs should be used as guides for what to avoid and what policies have been tested and succeed in certain circumstances. California, the world's 8th largest economy, has made incredible strides in putting a price on carbon and allowing the market to reduce emissions rather than direct regulations. The United States government should learn from California's lead and craft a similar policy that can not only be applied to the US economy, but can be successfully linked to other jurisdictions to create a robust and efficient carbon market that will reduce emissions and hopefully avoid some of the consequences of global warming that would happen with current business-as-usual emissions levels.