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ARTICLE

Carbon Tax with Reinvestment Trumps Cap-and-Trade

STEPHEN SEWALK*

I. INTRODUCTION

A. The Threat of Global Warming

There is a growing demand for domestic climate change legislation in the United States that will lead to significant reductions in greenhouse gas (GHG)¹ emissions. A recent publication by the Intergovernmental Panel on Climate Change (IPCC) stated that fossil fuel consumption accounts for the majority of anthropogenic GHGs.² If we fail to make significant reductions in GHG emissions, we are risking the future of our

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1. U.N. Framework Convention on Climate Change, 1949 U.N.T.S. I-30822 (defining “greenhouse gases” as “those gaseous constituents of the atmosphere, both natural and anthropogenic, that absorb and re-emit infrared radiation”); *see also* David G. Duff, *Tax Policy and Global Warming*, 51 CAN. TAX J. 2063, 2065 (2003) (explaining that different gases have different effects on global warming, so emissions are standardized to CO₂ equivalents when measuring their effects on global warming).

2. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC), SPECIAL REPORT ON RENEWABLE ENERGY SOURCES AND CLIMATE CHANGE MITIGATION (SRREN) SUMMARY FOR POLICY MAKERS (2011), *available at* http://www.ipcc.ch/news_and_events/docs/ipcc33/SRREN_FD_SPM_final.pdf (stating that the contributions of individual anthropogenic GHGs to total emissions in 2004, reported in AR4, expressed as CO₂-e were: CO₂ from fossil fuels at 56.6%, CO₂ from deforestation, decay of biomass etc. at 17.3%, CO₂ from other sources at 2.8%, CH₄ at 14.3%, N₂O at 7.9%, and F-gases at 1.1%).

environment. Global climate change threatens to bring on catastrophic devastation to our entire planet's resources.³ This threat has been a major push for climate change legislation in the United States.⁴ In order to reduce GHG emissions at the lowest possible cost, lawmakers need to adopt a climate change policy with economic incentives.⁵ To meet the challenge of reducing GHG emissions, innovation within the energy industry is necessary to promote development in cleaner production.⁶ The cost of such innovation plays a large role in managing this issue.

B. The Need for Change: The Push for Climate Change Legislation

Two distinct proposals have been made to reduce GHG emissions: a carbon tax and cap-and-trade. Cap-and-trade has focused on limiting emissions with the expectations that technology can actually do so without resulting in prices for carbon being so high that either economic growth is impacted or emissions are not reduced.⁷ The carbon tax proposals on the other hand claim that a tax on carbon would reduce demand for carbon intensive items thereby reducing total emissions while

3. See William Collins et al., *The Physical Science Behind Climate Change*, SCI. AM., Oct. 6, 2008, <http://www.scientificamerican.com/article.cfm?id=science-behind-climate-change> (providing a briefing of the science of climate change).

4. See OFFICE OF MGMT. & BUDGET, EXEC. OFFICE OF THE PRESIDENT, A NEW ERA OF RESPONSIBILITY: RENEWING AMERICA'S PROMISE 1, 21 (2009), available at <http://gpoaccess.gov/usbudget/fy10/pdf/fy10-newera.pdf> (stating that "[t]he Administration is developing a comprehensive energy and climate change plan to invest in clean energy, end our addiction to oil, address the global climate crisis, and create new American jobs that cannot be outsourced.").

5. Barry Anderson et al., *Technological Change and the EU ETS: The Case of Ireland 2* (Ctr. for Res. on Energy & Envtl. Econ. & Policy at Bocconi Univ., Working Paper No. 43, 2011), available at <http://ssrn.com/abstract=1855495>.

6. Suzanne Scotchmer, *Cap-and-Trade, Emissions Taxes, and Innovation*, 11 INNOVATION POL'Y & ECON. 1 (2011).

7. See generally Miles Young, *Beautifying the Ugly Step-Sister: Designing an Effective Cap-and-Trade Program to Reduce Greenhouse Gas Emissions*, 2009 BYU L. REV. 1379 (2009); Robert N. Stavins, *Addressing Climate Change with a Comprehensive U.S. Cap-and-Trade System*, 24 OXFORD REV. ECON. POL'Y 298 (2008); Robert N. Stavins, *A Meaningful U.S. Cap-and-Trade System to Address Climate Change*, 32 HARV. ENVTL. L. REV. 293 (2008).

refunding the tax to consumers.⁸ Neither of these proposals specifically addresses carbon emissions nor show how emissions are actually reduced. This paper introduces carbon tax with reinvestment, whereby all taxes raised by the carbon tax are reinvested into specific low-to-no carbon energy sources that result in a systematic reduction in total carbon emissions. The results are stunning and are shown in the models, resulting in a significant extended reduction in carbon emissions. More importantly, the proactive nature of the tax structure results in significant new construction, job creation, and eventually a reduction in total tax due to the rapidly declining emissions. The tax is structured so that there is no incentive to invest in production in non-compliant regions, resulting in a worldwide abatement effort for GHG emissions.

In Part I of this paper, I will review the current opinion surrounding carbon tax proposals as they appear in the literature. Part II will provide an overview of the current cap-and-trade proposals. Part III will introduce a carbon tax with reinvestment. In Part IV of this article, I will review the leading proposals arguing that a carbon tax is superior to cap-and-trade. And finally, for Part V, I will explain why a carbon tax with reinvestment trumps cap-and-trade.

II. CARBON TAX

A. What is a Carbon Tax?

A carbon tax is a tax that is levied per ton of emissions of carbon dioxide.⁹ This form of climate change regulation is recognized in the literature as being the simplest way to reduce carbon emissions.¹⁰ Carbon taxes act as a means of internalizing negative externalities.¹¹ Those who emit carbon through

8. See generally Michael J. Waggoner, *The House Erred: A Carbon Tax is Better than Cap and Trade* 1261 (U. of Colo. Law Sch., Working Paper No. 09-18, 2009), available at <http://ssrn.com/abstract=1489592>; Gilbert Metcalf & David Weisbach, *The Design of a Carbon Tax* (John M. Olin L. & Econ., Working Paper No. 447, 2009).

9. Young, *supra* note 7, at 1391.

10. *Id.*; Metcalf & Weisbach, *supra* note 8.

11. See Duff, *supra* note 1, at 2069.

consumption, production, and distribution create negative externalities in the form of pollution that affects all of society. Currently, those polluters are doing so with no repercussions. Through taxation, the polluters internalize those externalities. From an economic standpoint, this internalization through taxation is a justifiable reason to impose a carbon tax.¹² From an environmental standpoint, a carbon tax implements the “polluter pays principle,” as included in Principle 16 of the Rio Declaration.¹³ In short, this means that whoever causes the pollution should have to bear the costs of the harm caused, as well as the cost of minimizing future harm.¹⁴

B. Internalizing the Negative Externalities

Surprisingly, politicians are typically not supporters of a carbon tax. Carbon taxes force products to reflect their negative environmental impacts, they encourage technological innovation, they generate revenue, and they are easy to administer.¹⁵ Supporters of a carbon tax also cite the advantages of the tax for its lack of interference with other regulatory instruments, the clear message being sent by the government, and the price stability.¹⁶

12. *Id.*

13. United Nations Conference on Environment and Development, Rio de Janeiro, Braz., June 3-14, 1992, *Rio Declaration Principle 16*, U.N. Doc. A/CONF.151/26 (Vol. I), Annex I (Aug. 12, 1992) (The Rio Declaration is a declaration of 27 principles adopted by the UNCED and endorsed by the U.N. General Assembly. The principles of the Rio Declaration are the result of compromise between developed and developing nations.).

14. See ORG. FOR ECON. CO-OPERATION & DEV. (OECD), ECONOMIC INSTRUMENTS FOR ENVIRONMENTAL PROTECTION 27 (1989) (noting “the polluter should bear the cost of measures to reduce pollution decided upon by public authorities to ensure that the environment is in an acceptable state”).

15. Young, *supra* note 7 (citing Michael J. Zimmera, *Carbon Tax: Ready for Prime Time?*, 8 SUSTAINABLE DEV. L. POL’Y 67 (2008); Richard J. Pierce, Jr., *Energy Independence and Global Warming*, 37 ENVTL. L. 595 (2007)).

16. See, e.g., Roberta Mann, *To Tax or Not to Tax Carbon - Is That the Question?*, 24 NAT. RES. & ENV’T 44 (2009).

C. The Importance of a Revenue-Neutral Tax

Current carbon tax proposals call for a revenue-neutral tax with two favored approaches for revenue returns.¹⁷ The first approach is an equal dividends approach, where the revenues would be rebated directly to all U.S. residents in equal portions.¹⁸ The second approach is a “tax shift” approach. This method takes each dollar of the tax’s revenue and reduces existing taxes by that dollar amount. Taxes facing reduction could be federal payroll taxes or state sales taxes.¹⁹ These forms of revenue-neutrality help to encourage public acceptance of the tax and to prevent the tax from taking on a regressive form.²⁰ However, the approaches listed above do not assist in the overarching goal of emission reductions.

Prior to the creation of the European Union Emission Trading Scheme (EU-ETS), the European Commission proposed a region-wide carbon tax.²¹ The tax was poorly received by the EU members because they saw the proposal as a threat to their countries’ autonomy, as taxation had been firmly held to be a sovereign right for those countries.²² Nonetheless, all twenty-seven countries of the EU have some form of energy tax, and the European Commission has issued several directives recommending energy taxes in addressing climate change.²³ The United States does not have to overcome the issue of state sovereignty regarding excise taxes.²⁴ However, the United States is plagued by social disdain of paying taxes. This fact is obviated

17. *Pricing Carbon Efficiently and Equitably*, CARBON TAX CTR., <http://www.carbontax.org/introduction> (last visited Feb. 2, 2013).

18. *Id.* (providing a comparison to Alaska’s North Slope oil revenues).

19. *Id.*; see also Gilbert E. Metcalf, *Paying for Greenhouse Gas Reductions: What is the Role of Fairness?*, 15 LEWIS & CLARK L. REV. 393 (2011) (advocating the tax-shift approach for revenue neutrality).

20. Metcalf, *supra* note 19, at 400 (explaining the importance of avoiding a regressive tax).

21. F. J. Convery, *Origins and Development of the EU ETS*, 43 ENVTL. & RES. ECON. n. 3, 391 (2009).

22. *Id.* at 393.

23. *Id.* (stating that the United States, comprised of fifty states within one nation, does not have the same taxation issues with regards to a threat of state autonomy).

24. See generally I.R.C §§ 861, 4053(9) (2009).

in political elections. As historian Robin Einhorn wrote, “Americans hate everything about taxation with a passion. . . . No campaign promise works better than the promise to cut taxes.”²⁵ Nevertheless, taxation is considered a necessary burden by the public in order to obtain revenues to finance public necessities.²⁶ In this case, the public necessity takes the form of reducing harmful emissions in order to preserve the health of our nation and our environment. Additionally, the transparency of a carbon tax will assist in obtaining public support during implementation.²⁷ This is contrary to a similar cap-and-trade bill. A carbon tax meets the criteria of a climate change policy that can achieve ecological sustainability *and* political feasibility, despite the initial hesitation of the public.²⁸

In the existing literature, there are two recurring shortcomings regarding carbon taxes. The first is the regressive nature of the tax, and the second is the lack of guarantee as to the true reduction of carbon emissions. The first of these issues can be avoided by the methods of revenue-neutrality as discussed above. The second issue is more pressing. Current carbon tax proposals work off of the hope that taxation will discourage practices that emit carbon and push companies to invest in newer, cleaner technologies.²⁹ New legislation must rely on nothing but fact when it comes to the effectiveness of a policy’s emission reductions. For this reason, previous carbon tax proposals will not be sufficient.

25. Jonathan Mann, *Why Americans Hate Paying Taxes*, CNN, Dec. 17, 2010, http://articles.cnn.com/2010-12-17/us/jonathan.mann.us.taxes_1_tax-cuts-boston-tea-party-americans?_s=PM.

26. Duff, *supra* note 1, at 2068.

27. Mann, *supra* note 16.

28. Samantha McCann & Richard P. Young, *Path Dependence and Cap and Trade: Why We Need a Green Tax* (W. Political Sci. Ass’n, Annual Meeting Paper, 2011).

29. See generally Florian Habermacher & Gebhard Kirchgässner, *Climate Effects of Carbon Taxes, Taking into Account Possible Other Future Climate Measures* 27 (CESifo, Working Paper No. 340, Cat. 10: Energy and Climate Economics, 2011).

III. CAP-AND-TRADE

A. What is a Carbon Tax?

In a cap-and-trade program, a government agency establishes a limit, or cap, on regulated polluters' carbon emissions and then allocates set numbers of emission allowances among them. Trading of these allowances determines the value of allowances and creates a market between polluters.³⁰ If targeted polluters surpass this cap, they must purchase reduction credits from other regulated polluters who go below their assigned caps.³¹ A cap-and-trade program has been the leading proposal for climate change legislation in the United States.³² The most recent cap-and-trade proposal was the American Clean Energy and Security Act, also known as the Waxman-Markey bill.³³ This bill was designed to establish an emissions trading plan in the United States that would reduce carbon emissions and create clean energy jobs.³⁴ The Waxman-Markey bill was approved by the House of Representatives on June 26, 2009, but died in the Senate in that same year.³⁵ To date, the U.S. Congress has not passed any federal legislation on climate change.³⁶ However, political figures favor the idea of cap-and-trade because the cap-and-trade system is not called a "tax," and the government can decide where to allocate emission

30. Gilbert E. Metcalf et al., *Analysis of U.S. Greenhouse Gas Tax Proposals* (Nat'l Bureau of Econ. Res., Working Paper No. 13980, 2008).

31. David M. Driesen, *Capping Carbon* (Syracuse Univ. Coll. of Law, Working Paper, 2009), available at <http://ssrn.com/abstract=1463016>.

32. See Reuven S. Avi-Yonah & David M. Uhlmann, *Combating Global Climate Change: Why a Carbon Tax is a Better Response to Global Warming than Cap and Trade*, 28 STAN. ENVTL. L.J. 3, 5 (2009).

33. *H.R.2454 - The American Clean Energy and Security Act of 2009*, OPEN CONG., http://www.opencongress.org/bill/111-h2454/actions_votes (last visited Feb. 5, 2013).

34. See Robert Stavins, *The Wonderful Politics of Cap-and-Trade: A Closer Look at Waxman-Markey*, BELFER CTR. FOR SCI. & INT'L AFFAIRS (May 27, 2009), <http://www.robertstavinsblog.org/2009/05/27/the-wonderful-politics-of-cap-and-trade-a-closer-look-at-waxman-markey/>.

35. *H.R.2454*, *supra* note 33.

36. *Id.*

allowances.³⁷ Environmentalists favor this system for the absolute quantity restrictions on carbon emissions.³⁸ The money-making potential of a market-based program leads to support from many industry groups.³⁹ Groups supporting this type of program rely on the following assumptions of the cap-and-trade system: (1) carbon emissions below a certain level (that level which is set by the assigned cap) do not cause undue harm to the environment, and (2) a market in pollution allowances (the trade aspect) is “the most cost-effective means of reducing pollution to the predetermined level. . . .”⁴⁰

A cap-and-trade system gives the benefit of increasing the limits on carbon dioxide emissions, allowing for flexibility in the market.⁴¹ This flexibility allows for an ease of transition for affected facilities. This appeal of the cap-and-trade system obscures the fact that a cap-and-trade system is not the best option to combat climate change. First of all, even if Congress were to pass cap-and-trade legislation tomorrow, it will be years before a cap-and-trade system would be put into effect.⁴² The integral delays of our nation’s rulemaking process would stall the date at which the cap-and-trade could become operational. Second, deciding on an appropriate baseline for emission reduction targets, how allowances are distributed, and the all-important decision regarding the use of offsets would further challenge an early start date. Third, there is no certainty of the price required to achieve the promised reduction levels set forth by the reduction cap.⁴³ The carbon market is one of volatile price

37. See Roberta F. Mann, *The Case for the Carbon Tax: How to Overcome Politics and Find Our Green Destiny*, 39 ENVTL. L. REP. NEWS & ANALYSIS 10118, 101120 (2009).

38. *Id.*

39. Avi-Yonah & Uhlmann, *supra* note 32, at 5.

40. Mann, *supra* note 37, at 10120.

41. See generally Young, *supra* note 7.

42. See Zhong Xiang Zhang, *The U.S. Proposed Carbon Tariffs, WTO Scrutiny and China’s Response* 10 (Int’l Econ. & Econ. Policy, Working Paper, 2009), available at <http://ssrn.com/abstract=1517488> (describing the four years of preparation required before implementing the U.S. SO₂ Allowance Trading Program and the two years to establish the EU-ETS).

43. See Jon Strand, *Strategic Climate Policy with Offsets and Incomplete Abatement: Carbon Taxes Versus Cap-and-Trade* 2-3 (The World Bank, Dev. Research Grp., Env’t & Energy Team, Working Paper No. 5675, 2011).

shifts. If the price of carbon is too high, there will be pressure to relax the cap.⁴⁴ Too much relaxation in this cap abolishes the carbon market.

a. Why is Cap-and-Trade so Popular?

An upstream, economy-wide cap-and-trade system has been suggested as the best approach for short-to-medium term climate change regulation in the United States.⁴⁵ This proposal creates a system that includes a course of caps that begin modestly and gradually lower over time.⁴⁶ It is suggested that this type of cap-and-trade will create a long-run price signal that will encourage investment.⁴⁷ Included in this proposal are certain mechanisms to protect against cost uncertainty, as well as linkages with the climate policies of other countries.⁴⁸ It is argued that this proposed cap-and-trade system will provide the option to alleviate economic impacts through the distribution of emission allowances, and this will lead to public consent to reduce emissions.⁴⁹ This proposal of a cap-and-trade system that maximizes emission reductions and minimizes public cost is an effective approach. Cap-and-trade can do a very good job of reducing carbon emissions when we are *certain* of the demand for emissions, when we regulate those emissions *flawlessly*, and when *all* emission allowances are auctioned off.⁵⁰ However, if there exists uncertainty in the demand for producing emissions, and if there are difficulties in monitoring and regulating emission permits, the cap-and-trade proposal will lose its viability.⁵¹ If politics interferes in the dispersal of permits, this viability will be further weakened.⁵²

44. Avi-Yonah & Uhlmann, *supra* note 32, at 6.

45. Stavins, *supra* note 7, at 6.

46. *See id.* at 2.

47. *Id.*

48. *Id.*

49. *Id.*

50. Philip I. Levy, *The Carbon Tax/Cap-and-Trade Royal Rumble*, FOREIGN POLY, May 13, 2009, http://shadow.foreignpolicy.com/posts/2009/05/13/the_carbon_taxcap_and_trade_royal_rumble.

51. *Id.* at 1.

52. *Id.*

This described cap-and-trade system identifies the importance of low carbon technologies for cost management in emission reductions.⁵³ The price signals provided by caps extending decades into the future will incentivize the development and use of these technologies.⁵⁴ It is this assumed reaction that will lower future costs of achieving those reductions set by the decreasing cap. Due to the uncertainties surrounding this idea, additional policies are needed to provide further government funding and/or increased incentives for private funding in research and development.⁵⁵ These policies include multi-year compliance periods, banking and borrowing provisions, a cost containment mechanism to prevent extreme pricing, and the availability of offsets for carbon capture and sequestration.⁵⁶ In sum, this type of cap-and-trade system introduces significant complexity.

It is very important to consider cost when setting emission standards under a cap-and-trade system.⁵⁷ Traditional environmental law typically does not consider cost when setting environmental standards.⁵⁸ This is demonstrated by the national ambient air quality standards under the Clean Air Act. Like the goal of GHG emission reductions, the standards set by the Clean Air Act are established to protect human health.⁵⁹ For this reason, the Supreme Court has held that the United States' Environmental Protection Agency (EPA) cannot consider cost when setting these standards.⁶⁰ The clash of cost consideration and environmental standards does not fit in well with the aforementioned cap-and-trade proposals.⁶¹ For cap-and-trade to

53. Stavins, *supra* note 7, at 5.

54. *Id.*

55. *Id.*

56. *Id.* at 9.

57. See Driesen, *supra* note 31, at 19; see generally Richard S.J. Tol, *The Polluter Pays Principle and Cost-Benefit Analysis of Climate Change: An Application of Fund* (Fondazione Eni Enrico Mattei, Nota di Lavoro, Working Paper No. 88.2006, 2006), available at <http://ssrn.com/abstract=907456>.

58. Driesen, *supra* note 31, at 20.

59. *Id.*

60. See *Whitman v. Am. Trucking Ass'ns*, 531 U.S. 457, 471 (2001) (holding that section 109(b) bars consideration of cost in setting national ambient air quality standards).

61. Stavins, *supra* note 7, at 46.

work, both costs and environmental standards must maintain a stabilized state. Because of cap-and-trade's significant complexity, this is an unlikely feat.

Cap-and-trade supporters argue that cap-and-trade is the only proposal with a political chance.⁶² It is true that people do not want to have to pay to pollute, but how does cap-and-trade circumvent this issue? In truth, this factor is only temporarily overcome by the absence of the word "tax." The signal sent by a carbon tax is one that is very clear: pollution results in a negative externality imposed on others, so polluters should be forced to internalize the cost of their pollution by paying a tax.⁶³ Even if people are willing to pay the carbon tax, the intended message is clear.

Despite common belief, cap-and-trade may send a very ambiguous message in terms of emission reductions.⁶⁴ The goal is to reduce GHG emissions, but this goal is achieved either by requiring polluters to purchase the right to pollute or, in the case of free allowance distribution, use permits to pollute for free.⁶⁵ Cap-and-trade programs that auction off all emission allowances give the same message of internalizing the externalities.⁶⁶ However, where allowances are distributed for free, the message is more ambiguous. In a sense, the government is giving permission to pollute in the form of emission allowances. Finally, the wording surrounding both cap-and-trade and carbon tax emission requirements sends different signals. Arguably, the biggest barrier of implementing a carbon tax is the societal apprehension toward paying taxes.⁶⁷ In the case of sending a signal to polluters, the word "tax" sends a stronger, more severe

62. Levy, *supra* note 50, at 44.

63. Avi-Yonah & Uhlmann, *supra* note 32, at 44.

64. See Driesen, *supra* note 31 (addressing the problematic widespread acceptance of cap-and-trade programs resulting in an automatic reduction in carbon emissions).

65. Avi-Yonah & Uhlmann, *supra* note 32, at 44.

66. *See id.*

67. *Id.* at 44-45; see also Jonathan Remy Nash, *Framing Effects and Regulatory Choice*, 82 NOTRE DAME L. REV. 313 (2006); Janet E. Milne, *Environmental Taxation in the United States: The Long View*, 15 LEWIS & CLARK L. REV. 417, 419 (2011) (listing failed attempts at environmental taxes on environmentally damaging activities).

signal to polluters than phrases like “the purchase price for a right to pollute.”⁶⁸ Phrases like this are designed by legislators to remove the stigma surrounding pollution.⁶⁹ However, governmental condemnation of pollution sends the message that pollution is bad and that methods of development and production that reduce carbon emissions should be favored.⁷⁰ Alternatively, it can be argued that the lack of a stigma gives the opposite signal: the purchase price for a “right to pollute” puts less demand on society’s need to reduce emissions.⁷¹ Overall, the signal sent out to polluters is not nearly as important as the reductions in carbon emissions. If cap-and-trade is going to successfully reduce emissions, it will have to raise the cost of emissions.⁷² Support may be obtained by hiding this fact, but this deceptive approach is not ideal for a long-term environmental policy.⁷³

b. Cap-and-Trade and the Economy

Furthermore, in times of recession and slow economic growth, like our nation is currently experiencing, a cap-and-trade system will increase the burden on our economy. Cap-and-trade is designed to increase the cost of energy.⁷⁴ During this economic crisis, an energy policy that does not encourage a reduction in production costs is the wrong choice. A cap on emissions requires companies to increase costs to consumers in order to compensate for the costs of purchasing emissions allowances.⁷⁵ These additional costs will lead to a decrease in energy demand that occurs simultaneously with an increase in the cost of energy, so

68. Avi-Yonah & Uhlmann, *supra* note 32, at 44.

69. Nash, *supra* note 67, at 325-26.

70. *See id.* at 326.

71. *Id.*

72. Levy, *supra* note 50, at 2.

73. Nash, *supra* note 67 (providing a deeper look into the public tendencies resulting from “framing effects” of climate change legislation).

74. *See generally* William Yeatman, *Cap and Trade’s Economic Impact*, COUNCIL ON FOREIGN RELATIONS, Mar. 19, 2009, <http://www.cfr.org/united-states/cap-trades-economic-impact/p18738> (offering a take on cap-and-trade’s impact on the current economy from the point of view of an Energy Policy Analyst with Competitive Enterprise Institute).

75. *Id.*

companies will end up cutting jobs.⁷⁶ Whether directly affected by job losses or the increased prices on energy and energy intensive goods and services, everyone will feel the impact of cap-and-trade.

Even in a booming economy, cap-and-trade is not beneficial. An emissions cap will force companies to spend significant resources to adopt cleaner means of production. As mentioned, these adaptation costs will be placed onto consumers, increasing the price on all goods and services requiring energy as an input.⁷⁷ This price increase will make American goods less competitive in the world market.⁷⁸ This will incentivize companies to produce overseas in a country with no cap-and-trade.⁷⁹ As such, cap-and-trade has the capability to impair even a flourishing economy. In addition, there is no certainty that implementing cap-and-trade will result in real reductions of GHG emissions, particularly ones that the economy can afford.

B. European Union's Emission Trading Scheme

In its initial phase, the European Union's Emission Trading Scheme (EU-ETS) covered a very limited number of markets.⁸⁰ Steelmakers were part of the scheme, whereas aluminum smelters were not, so they faced no reductions.⁸¹ The Commission is working to eliminate these disparities, but while they may continue to make the carbon market more equal, companies will continue to put the pressure on politicians to be "more equal than others."⁸² Additionally, those companies that operate domestically, like power utilities, are able to pass on the cost of allowances to their consumers. Those companies that

76. *Id.*

77. *Id.*

78. See Sergey V. Mityakov, *Cap and Trade's Economic Impact*, COUNCIL ON FOREIGN RELATIONS, Mar. 19, 2009, <http://www.cfr.org/united-states/cap-trades-economic-impact/p18738> (explaining the hardships of cap-and-trade in a booming economy).

79. *Id.*

80. See generally Stephen Gardner, *The Winners and Losers of EU Carbon Trading*, CLIMATE CHANGE CORP., Sept. 22, 2008, <http://www.climatechangecorp.com/content.asp?ContentID=5654>.

81. *Id.*

82. *Id.*

work out of an international market do not have this convenience and experience greater difficulties in funding adaptation.⁸³ In fact, the International Energy Agency (IEA) has determined that the power industry has achieved oversight profits from their participation in the scheme.⁸⁴ Their allotted allowances paired with their ability to pass on their carbon cost have allowed the power sector to ride out the carbon market with little inconvenience while other sectors pay a heavy toll.

a. EU-ETS: Setting a Precedent?

The EU-ETS faced many problems during its first trading period. To begin, the Commission reviewed each nation's initial National Action Plan (NAP),⁸⁵ in which each country described its proposed reduction levels and the number of freely distributed allowances it required.⁸⁶ Unfortunately, the Commission had neither the time nor the technology to adequately assess the information provided in each NAP. Despite the fact that the Commission was forced to rely on the accuracy of each nation's assumptions leading to the proposed emission caps, the European Commission rejected more than half of those countries' NAPs in order to avoid allocations that exceeded overall need.⁸⁷ Though the task of the Commission was a formidable one, reduction targets were finally set. However, the EU-ETS soon learned that set emission targets did not mean a guaranteed market or guaranteed emissions.

83. *Id.*

84. *Id.*

85. See Claudia Kettner et al., *Stringency and Distribution in the EU Emissions Trading Scheme: The First Evidence*, 8 CLIMATE POL'Y 41 (2008) (explaining that the Commission guidelines for preparing the NAPs were created with the expectation that each EU member state had a similar interpretation of the EU guidelines. It was expected that each plan would place caps of similar rigidity, and therefore avoid any evident disparities between countries. As resulted in the data, variations of allowances and emissions were widespread.).

86. Joelle de Sepibus, *Scarcity and Allocation of Allowances in the EU Emissions Trading Scheme - A Legal Analysis* 3 (NCCR Trade, Working Paper No. 2007/32, 10, 2007).

87. *Id.* at 10.

The verified data for the EU-ETS was released in April of 2006.⁸⁸ According to this data, 2,029 million tons of CO₂ were allocated, but only 1,932 million tons were emitted, and only six of the twenty-four countries allocated less allowances than needed.⁸⁹ After this data was released, the price of allowances fell drastically from almost thirty euros at the time of the release down to twelve euros in May of that year, before continuing its decline to under one euro in 2007.⁹⁰ In all, this first trading period was marked as a failure and a carbon market collapse.

Overall, the allocation methods did not stray much from those of the first trading period, including the free allocation of emission allowances. Due to this, there had been little improvement. The Commission tried to be stricter in its examination of the second period NAPs, but with lacking resources to evaluate reduction methodologies, the assessments proved to be inconsistent and limited.⁹¹ However, in this current trading period, the Commission has continued its attempts to resolve those inconsistencies that plague the system. Recent revisions under the EU-ETS attempt to centralize the Directive to create a more harmonious system. This includes the setting of caps, the allocation of rules, and the monitoring, reporting, and verification of requirements.⁹² While it has risen from the monumental collapse of the first trading period, after six years, the EU-ETS continues to battle the complications of cap-and-trade's significant complexities.

b. Why the EU-ETS Will Not Work in the U.S. and What We Are Doing Instead

To date, the EU houses the largest cap-and-trade system aimed at reducing carbon emissions.⁹³ It is suggested that an

88. *Id.* at 14.

89. *Id.* (citing Kettner et al., *supra* note 85).

90. *Id.*

91. *Id.* at 14-15.

92. Sanja Bogojevic, *The EU ETS Directive Revised: Yet Another Stepping Stone*, 11 ENVTL. L. REV. 279, 280 (2009).

93. Gbenga Ibikunle & Andros Gregoriou, *International Emissions Trading: A Survey of Phases of the EU Emissions Trading Scheme* 5 (Soc. Sci. Res.

EU-style arrangement of cap-and-trade is not likely to be feasible for the United States.⁹⁴ The United States has much greater regional disparities in carbon emission intensities and income levels, creating extreme difficulties on the path of establishing cap-and-trade legislation.⁹⁵ The individual states of the United States and the countries of the EU are designated as either “green” states or “brown” states.⁹⁶ Green states have higher per capita income and lower emission intensities.⁹⁷ Brown states have lower income and higher emission intensities.⁹⁸ The EU-ETS was initially established by only fifteen West-European states—each of which were considered “green” states.⁹⁹ The EU-ETS was able to expand to twelve more states because EU membership required them to do so, offering these “brown” states valuable economic benefits to compensate any economic risks taken by joining the scheme.¹⁰⁰ Ten northeast states of the United States (all “green” states)¹⁰¹ have developed a cap-and-trade program under their Regional Greenhouse Gas Initiative (RGGI),¹⁰² and California’s Assembly Bill 32 proposes a similar

Network, Working Paper, 2011), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1952769.

94. David Wheeler, *Confronting the American Divide on Carbon Emissions Regulation* (Ctr. for Global Dev., Working Paper No. 232, 2010), *available at* <http://ssrn.com/abstract=1824509>.

95. *Id.*

96. *Id.* at 1.

97. *Id.* at 1-2.

98. *Id.* at 2.

99. *Id.* at 3-4 (comparing the initial EU-15 to the U.S. RGGI states, acknowledging the successes of small, regional cap-and-trade systems).

100. *Id.* at 4.

101. *Id.*

102. See *Fact Sheet: The Regional Greenhouse Gas Initiative (RGGI)*, REG’L GREENHOUSE GAS INITIATIVE, INC. (2010), *available at* http://www.rggi.org/docs/RGGI_Fact_Sheet.pdf (noting that RGGI is the first mandatory, market-based carbon emission reduction program in the United States. This cap-and-trade program has capped carbon emissions and intends to reduce CO₂ emissions from the power sector by 10% by the year 2018. The participating states include Connecticut, Delaware, Maine, Maryland, Massachusetts, New Hampshire, New York, Rhode Island, and Vermont. Because RGGI only limits emissions from the power sector, monitoring costs are low); see also Lawrence Fogel, *Serving a “Public Function”: Why Regional Cap-and-Trade Programs Should Survive a Dormant Commerce Clause Challenge*, 2010 WIS. L. REV. 1313, 1316 (2010) (noting problems of RGGI’s design include a potentially severe leakage problem

strategy for that state.¹⁰³ Unfortunately, the interstate disparities of the United States immensely surpass those of the EU.¹⁰⁴ As noted by Wheeler, the United States does not have the resources to incentivize the “brown” states to join these cap-and-trade programs, and without economic incentives, these states are not likely to accept limits on emissions.¹⁰⁵ In a direct comparison, the United States’ “green” states make up only 32% of U.S. carbon emissions, so without the full participation of the “brown” states, carbon emission limits would only account for one-third of the United States’ emissions.¹⁰⁶

As we have reached a time of “do or die” in the eyes of environmentalists, we cannot afford to play with a system that is largely untested and very likely ineffective. The United States used a cap-and-trade system for the reduction of acid rain in the 1990s, but we have never used this type of system to curb emissions that come from such a variety of sources.¹⁰⁷ The cap-and-trade market for sulfur dioxide (SO₂) emissions was not a

due to the regional nature of the program (as well as the interconnectedness of the electricity markets, and a very limited scope of coverage with its downstream monitoring)).

103. See Wheeler, *supra* note 94 (stating that California is also considered a “green” state). California Assembly Bill 32, the Global Warming Solutions Act, was passed and signed into law in 2006. The Bill sets the goal of carbon emission reductions into law, requiring that California adopt measures to reduce carbon emission levels down to the 1990 levels by the year 2020. The Scoping Plan was adopted in 2008 and provides an outline for actions to reduce GHG emissions in California. This Plan identifies cap-and-trade as one of the strategies for reducing GHG emissions. The California Air Resources Board (ARB) has been working to design a cap-and-trade program through the Western Climate Initiative (a collaboration of six western states and four Canadian provinces). According to Assembly Bill 32, the ARB must begin the adopted cap-and-trade program in 2012. See *Cap-and-Trade Program*, CA. ENVTL. PROT. AGENCY, AIR RES. BD., <http://www.arb.ca.gov/cc/capandtrade/capandtrade.htm> (last reviewed Jan. 31, 2013); see also Chris M. Amantea & Rafael Figuerido, *California’s Climate-Change Regulation and Related Regulations*, Cal. Bus. Law Deskbook §48:2 (2010); see generally Stavins, *supra* note 7.

104. *Id.* at 4.

105. Wheeler, *supra* note 94.

106. *Id.* at 6.

107. Avi-Yonah & Uhlmann, *supra* note 32, at 34.

true success, and in July of 2010, the sulfur market collapsed.¹⁰⁸ Sulfur dioxide emission allowances traded for as much as \$1,600 per ton before dropping to less than \$3 per ton.¹⁰⁹ In fact, many argue that the entire program had misleading environmental effects.¹¹⁰ The focus of the project was the reduction of acid rain through the reduction of SO₂ emissions. As a result, low-sulfur coal from the West was introduced to replace high-sulfur coal from the East and Midwest.¹¹¹ While this achieved the desired reduction of SO₂ emissions, this new coal introduced new forms of pollution from the need to transport this coal to the industrialized regions in the East and Midwest.¹¹² Increased amounts of this coal are required to achieve the same level of energy, and the pollution associated with cross-country transportation increased overall carbon emissions.¹¹³ In conclusion, the failed SO₂ market leads me to conclude that we have no experience with a successful cap-and-trade system.

C. Previous Cap-and-Trade Proposals

A deeper analysis of the cap-and-trade system finds that the literature has not paid sufficient attention to the feasibility of a carbon cap-and-trade program. During the 110th Congress, three climate change bills were considered in the U.S. Senate: the Low Carbon Economy Act of 2007 (the Bingaman-Specter bill), America's Climate Security Act of 2007 (the Lieberman-Warner bill), and the Manager's Amendment to the Lieberman-Warner bill (the Lieberman-Warner Climate Security Act of 2008).¹¹⁴ These bills were broad-based, cap-and-trade climate change bills that, due to political disagreements and the overhanging

108. Joseph Bast, *Cap-and-Trade's Market Failure*, AM. THINKER, July 28, 2010, http://www.americanthinker.com/archived-articles/./2010/07/capandtrade_market_failure.html.

109. *Id.*

110. *Id.*

111. *Id.*

112. *Id.*

113. *Id.*

114. Kenneth R. Richards & Stephanie Richards, *The Evolution and Anatomy of Recent Climate Change Bills in the U.S. Senate: Critique and Recommendations* (Soc. Sci. Res. Network, Working Paper, 2009), available at http://ssrn.com/sol3/papers.cfm?abstract_id=1368903.

economic crisis, the Senate did not pass.¹¹⁵ In order to determine the best form of climate change legislation, previous legislation must be analyzed. Identifying the key elements of climate change legislation and the policy principles for developing that legislation can give law and policymakers direction for the formation of new legislation, as well as insight into some of the pitfalls to be avoided.¹¹⁶ The Bingaman-Specter bill and both Lieberman-Warner bills identify major issues to be addressed by any form of climate change legislation. However, all three bills contain elements that require a great deal of additional refinement. The Manager's Amendment contains many sound climate change policy principles, but there is still a great deal of room for improvement.¹¹⁷ Unfortunately, the complexities involved with the implementation of a cap-and-trade program make it extremely difficult to draft an adequate bill.

The Waxman-Markey bill introduced titles outlining strategies concerning clean energy, energy efficiency, reducing global warming pollution, transitioning to a clean energy economy, and providing for agriculture and forestry related offsets.¹¹⁸ Some of the key provisions of the bill included the following: (1) creating a combined energy efficiency and renewable electricity standard that would require electricity suppliers to increase the use of renewable electricity to 20% of their demand by 2020; (2) setting up a strategic plan to improve overall U.S. energy productivity by at least 2.5% per year by 2012 and sustaining that improvement rate through the year 2030; and (3) establishing a cap-and-trade system for GHG emissions and setting goals for emission reductions from covered industries by 83% of the 2005 levels by 2050.¹¹⁹

115. *Id.* at 2.

116. *Id.*

117. *Id.* at 3 (listing some of the Manager's Amendment policy principles considered "sound").

118. Alejandro E. Camacho, *Transforming the Means and Ends of Natural Resources Management*, 89 N.C. L. REV. 1405 (2011).

119. *H.R. 2454: American Clean Energy and Security Act of 2009*, GOVTRACK.US, <http://www.govtrack.us/congress/bills/111/hr2454#overview> (last updated June 26, 2009).

a. Waxman-Markey

Waxman-Markey was the leading cap-and-trade proposal to date, but it failed to pass through the Senate primarily due to the complicated and bureaucratic nature of the bill. Prior to its failure, the bill was scrutinized for its potential effectiveness. The IPCC proposed that emissions should be reduced between 25% and 40% below the 1990 levels by 2020 for the purpose of stabilizing GHG concentrations and to prevent further environmental damage.¹²⁰ The enacted legislation would only achieve a maximum of a 23% reduction in emissions by 2020 and the cap-and-trade system would only achieve a 1% reduction from 1990 levels by 2020.¹²¹ Other estimates of the legislation's emissions reductions are significantly lower.¹²² The considerable uncertainty that surrounds possible climate change effects, and those information and technology gaps that have plagued past and present cap-and-trade systems are thought to be similarly present in the Waxman-Markey bill.¹²³ These unresolved issues will not suffice in adequate climate change legislation.

D. International Agreements on Climate Change

In response to the harmful effects of climate change, the United Nations adopted the United Nations Framework Convention on Climate Change (UNFCCC) in 1992.¹²⁴ During the meeting of the Conference of the Parties (COP) in Kyoto, Japan, delegates agreed to a protocol to the UNFCCC that established legal commitments for industrialized countries and

120. IPCC, *supra* note 2.

121. John Larsen & Robert Heilmayr, *Emission Reductions Under Cap-and-Trade Proposals in the 111th Congress*, WORLD RES. INST. (June 25, 2009), available at http://pdf.wri.org/usclimatetargets_2009-06-25.pdf.

122. See *Greenpeace Opposes Waxman-Markey: Climate Bill Not Science-Based; Benefits Polluters*, GREENPEACE USA, June 25, 2009, <http://www.greenpeace.org/usa/en/media-center/news-releases/greenpeace-opposes-waxman-mark/> (releasing a statement announcing its opposition to the Waxman-Markey bill on the basis that the bill would fail to achieve the effective reduction in GHG emissions as proposed).

123. Larsen & Heilmayr, *supra* note 121.

124. Soledad Aguilar et al., Int'l Inst. for Sustainable Dev., *COP 17 Final*, 12 EARTH NEGOTIATIONS BULL., no. 534, Dec. 13, 2011, at 1.

countries in transition to achieve emission reduction targets.¹²⁵ These countries agreed to reduce their GHG emissions by an average of 5.2% below their 1990 levels during the first commitment period (2008-2012).¹²⁶ The Kyoto Protocol was entered into force in 2005 and has 193 parties.¹²⁷ This Protocol establishes a very complex and ambitious regime, but the states that have been willing to assume emission targets under the Protocol represent only about a quarter of the world's GHG emissions.¹²⁸ On December 31, 2012, the Kyoto Protocol's first commitment period ended.¹²⁹ In preparation for the expiration of this commitment period, an ad hoc working group was established in 2005 to negotiate further commitments for a second commitment period.¹³⁰

a. Bali

In 2007, the COP 13 met in Bali, Indonesia and adopted the Bali Action Plan and the Bali Roadmap.¹³¹ The Action Plan focused on mitigation, adaptation, finance, technology, and long-term cooperative action.¹³² The Roadmap set a deadline for concluding the negotiation for December 2009 at the Copenhagen Climate Change Conference.¹³³

b. Copenhagen

During the Copenhagen Climate Change Conference in 2009, the Copenhagen Accord was presented for adoption by the delegates.¹³⁴ The Copenhagen Accord was a political agreement

125. *Id.* at 2.

126. *Id.*

127. *Id.*

128. Daniel Bodansky, *Whither the Kyoto Protocol? Durban and Beyond* 12 (Belfer Ctr. Sci. & Int'l Aff., Harv. Project on Climate Agreements, Policy Brief, 2011), available at http://belfercenter.ksg.harvard.edu/publication/21314/whither_the_kyoto_protocol_durban_and_beyond.html.

129. *Id.* at 1.

130. *Id.*

131. Aguilar et al., *supra* note 124, at 2.

132. *Id.*

133. *Id.*

134. *Id.*

that established a bottom-up approach to mitigation efforts in which countries define their own national climate change approach and pledge their commitment.¹³⁵ Delegates at Copenhagen disputed the transparency of the negotiating process, and the Copenhagen Accord was not formally adopted.¹³⁶ Instead, the parties agreed to extend the time for countries to gather their national emission reduction targets and mitigation actions and prepare for the COP 16 meeting.¹³⁷

c. Cancun

The U.N. Climate Change Conference in Cancun, Mexico, took place from November 29 to December 11, 2010.¹³⁸ During this meeting, the parties finalized the Cancun Agreements.¹³⁹ Cancun formally puts the pledges of the Copenhagen Conference into U.N. documentation, although they may increase or decrease in the future.¹⁴⁰ More importantly, developing countries agreed to look at ways they could reduce emissions in the future. However, those developing countries did not make specific pledges.¹⁴¹ The Cancun Agreements analyzed mitigation measuring, reporting, and verification, and addressed deforestation and forest degradation, the role of conservation, sustainable management of forests, and enhancement of forest carbon stocks.¹⁴² Finally, a new climate green fund was created to transfer money from developed countries to developing countries in order to reduce the impacts of climate change.¹⁴³ The Green Climate Fund was slated to begin in 2011; however, no specific amount of money was allocated to fund it.¹⁴⁴ While Cancun touched on many important issues, the big issue of the

135. Bodansky, *supra* note 128, at 4.

136. *Id.*

137. Aguilar et al., *supra* note 124, at 2.

138. *Id.*

139. *Id.*

140. Bodansky, *supra* note 128, at 4.

141. *Id.*

142. Aguilar et al., *supra* note 124, at 2.

143. *Id.*

144. *Id.*

future of the Kyoto Protocol was extended to the U.N. Climate Change Conference in Durban.¹⁴⁵

d. Durban

The outcomes of the U.N. Climate Change Conference in Durban yielded a decision by the parties to adopt a universal, legally-binding framework on climate change to be completed by 2015 and enacted in 2020.¹⁴⁶ This agreement, known as the Durban Platform, is noted for including the United States (which did not ratify the Kyoto Protocol) and the developing countries of China and India.¹⁴⁷ The Durban Conference also showed progress regarding the Green Climate Fund;¹⁴⁸ adopting a management framework with an objective to raise \$100 billion a year by 2020 to assist developing countries in adaptation and mitigation practices to counter global warming and climate change.¹⁴⁹

As seen through the scheme of International Climate Change agreements, the intention of the UNFCCC is pure, and the efforts are correctly aimed. The difficulties show up in the attempts to bring the world together and form binding agreements. A common trend in these international climate change conferences is to push back difficult decisions. While we may be headed down a worthy path, these current global climate change initiatives are working too slowly.

IV. CARBON TAX IS SUPERIOR TO CAP-AND-TRADE

The global climate change problem continues to apply pressure for the enactment of climate change legislation. In the following paragraphs, I will further expand on why a carbon tax trumps cap-and-trade in the following categories: (1) benefit certainty and cost certainty, (2) length of legislation, (3) implementation, (4) enforcement, (5) revenue and reinvestment,

145. *Id.*

146. *Id.* at 3.

147. Aguilar et al., *supra* note 124, at 4.

148. *Id.* at 5.

149. *Id.* at 2.

(6) coordination with existing laws, and (7) environmental effectiveness. This tax should be implemented as soon as possible in the form of a carbon tax with reinvestment.

A. Benefit Certainty and Cost Certainty

Cap-and-trade and carbon tax are both market-based mechanisms designed to reduce GHG emissions, but it is an ongoing debate as to which of these two mechanisms will prevail in climate change legislation. There are many differences between cap-and-trade and carbon tax, but at the heart of the issue is one fundamental difference: benefit certainty versus cost certainty.

A cap-and-trade system places a cap on the level of emissions permitted. This cap states that its implementation will provide environmental benefits from the achieved emission reductions. This is referred to as “benefit certainty.”¹⁵⁰ A carbon tax sets up an exact price on carbon emissions. This amount is set in advance so that emitters are always aware of the price of emissions. Thus, the carbon tax provides “cost certainty.”¹⁵¹ Cap-and-trade does not give cost certainty, as the market may fluctuate over time.¹⁵² In theory, the price stability of a carbon tax could prove as much as five times more cost-efficient than cap-and-trade.¹⁵³ Additionally, the “benefit certainty” of the caps is an unconvincing advantage if emissions are not actually capped at a sustainable level and if the regulations provide no incentive for over compliance, even when emission prices are very low.¹⁵⁴ Carbon taxes, on the other hand, provide no “benefit certainty,” though there is no question that they are able to maintain “cost certainty.”¹⁵⁵ The argument over which “certainty” is more important becomes irrelevant when cap-and-trade becomes

150. Avi-Yonah & Uhlmann, *supra* note 32.

151. *Id.*

152. *Id.*

153. Kenneth C. Johnson, *Beware of the Dogmatist: A Consensus Perspective on the Tax-Versus-Cap Debate* (Working Paper Series, 2008), available at <http://ssrn.com/abstract=1154638>.

154. *Id.*

155. Avi-Yonah & Uhlmann, *supra* note 32.

plagued by political intervention and safety valves and is unable to provide the “benefit certainty” of a fixed cap.¹⁵⁶

B. Length of the Legislation

Cap-and-trade bills are infamously long and complicated. The Lieberman-Warner Climate Security Act of 2008 is over three hundred pages in length,¹⁵⁷ and Waxman-Markey is almost 500.¹⁵⁸ This is appearing to be the norm among similar cap-and-trade proposals. While there are fewer carbon tax proposals, they are significantly shorter and simpler. The leading carbon tax proposal, sponsored by U.S. Representative John B. Larson, is seventeen pages in length.¹⁵⁹ Climate change laws must be specific enough to remedy the problems our country is facing. However, legislation that is too complicated with too much specificity will create additional problems. The longer the text of the law, the less likely it will be that the text is read and fully understood by the public.¹⁶⁰ Long, complicated laws tend to draw suspicion from citizens regarding hidden clauses, like the creation of benefits for favored parties, or disadvantages for those opposing the legislators.¹⁶¹ All in all, cap-and-trade bills leave wide gaps for modifications and loop holes.

C. Implementation

Aside from the write-up, cap-and-trade is extremely complicated to enact. The cap must be imposed “upstream,” which means that the majority of the population is only affected indirectly because the tax is applied on the producer rather than on the final product.¹⁶² Also, while the upstream approach

156. Joseph E. Aldy & Robert N. Stavins, *Economic Incentives in a New Climate Agreement* (Belfer Ctr. Sci. & Int'l Aff., Working Paper, 2008) (prepared for The Climate Dialogue, Copenhagen, Denmark).

157. Richards & Richards, *supra* note 114.

158. H.R. 2454, 111th Cong. (2009).

159. Richards & Richards, *supra* note 114.

160. Waggoner, *supra* note 8, at 1261.

161. *Id.*

162. See Aldy & Stavins, *supra* note 156, at 1 (defining the product cycle of fossil fuels. “Upstream” monitoring occurs at the sites of fossil fuel suppliers. “Upstream” monitoring requires fewer monitoring sites and results in lower

reduces the complexity brought by a large number of sources, the system remains complex.¹⁶³ First, the cap-and-trade system requires baselines to be set for the establishment of a cap. Next, regulators must decide how allowances will be created and distributed.¹⁶⁴ The options for this distribution include free dispersal or auctioned allowances. Free allowance distribution requires regulators to decide which industries receive allowances, but an auction requires complex monitoring to prevent fraud.¹⁶⁵ Third, further monitoring must be set up for the trading of allowances. Control must be stringent so that the same allowance cannot be used more than once.¹⁶⁶ Enforcement policies must be implemented to penalize those that exceed their allowances. Further, one must implement a transnational enforcement regime if allowances are traded internationally. Finally, provisions are typically set for the banking and borrowing of allowances.¹⁶⁷ Some of these provisions also allow for a safety valve to prevent extreme cost uncertainty.¹⁶⁸ If offsets are to be allowed for carbon sequestration and storage, or similar projects, this must also be included in a provision. The many requirements of a cap-and-trade system create extreme complexities that take time to work out. The more complex the program becomes, the more difficult it will be for the proposal to pass into law. In all aspects, a cap-and-trade system is much more complicated than a carbon tax. A successful cap-and-trade program requires intense monitoring and reporting mechanisms. Unfortunately, our current monitoring technologies are not sufficient to take on the task of such an expansive pollutant as carbon.¹⁶⁹

implementation costs but greater uncertainty. “Downstream” monitoring occurs at the point of final GHG emissions. This type of monitoring requires greater expenses, as the number of sites greatly increases through the product cycle).

163. *Id.*

164. *Id.* at 3.

165. Metcalf & Weisbach, *supra* note 8.

166. *Id.*

167. Aldy & Stavins, *supra* note 156.

168. *Id.*

169. Metcalf & Weisbach, *supra* note 8.

D. Enforcement

Adding to the extensive list of the complexities surrounding cap-and-trade is the extreme difficulty of enforcement. A carbon tax identifies every person as a polluter, whereas a cap-and-trade only identifies select industries as polluters.¹⁷⁰ Under cap-and-trade, monitoring creates many unseen costs and difficulties. Administrative costs are often overlooked, but remain crucial when looking at the costs of emission-reducing actions. The costs of establishing the cap-and-trade program include, but are not limited to, educating the targeted industries, monitoring emissions and compliance, and enforcing the policy.¹⁷¹ To reduce costs as much as possible, regulators must strive for minimal administrative efforts. This usually means that approaches that require monitoring fewer parties and use more readily available information are the most favored.¹⁷² This leads to a tradeoff between the extent of a program's coverage of emission sources and the administrative costs in order to achieve administratively simpler programs. New costs will continue to appear in the creation of a nation-wide cap-and-trade program, but an additional concern lies in our monitoring technologies. In cap-and-trade, an elaborate system would need to be created to distribute and collect allowances to prevent cheating. This is an extremely difficult and complicated task. Effective measures to penalize those that emit without allowances may be even more difficult. Cap-and-trade will require the creation of a completely new governmental body to take on these administrative and monitoring activities.¹⁷³ The carbon tax, on the other hand, can be enforced by the IRS and the EPA with their existing staff and extensive experience dealing with excise taxes and clean energy, respectively.

170. *Id.*

171. Richards & Richards, *supra* note 114, at 6.

172. *Id.* at 5.

173. Metcalf & Weisbach, *supra* note 8.

E. Revenue and Reinvestment

A carbon tax in any form will generate revenue. As an example, a tax of \$10 per ton of carbon (a very modest tax) is predicted to generate \$50 billion per year.¹⁷⁴ In theory, the higher the tax, the higher the revenue that will be generated. How this revenue is used plays a large role in the equity of the tax. While carbon taxes are criticized for potentially having regressive effects, cap-and-trade also faces this burden. In a performed study, U.S. households were broken down into income groups and regional groups. The study captured regional differences in heating and electricity costs, with the results demonstrating that the distribution of tax revenues has a huge role in the regressive nature of the carbon tax.¹⁷⁵

Sound policy must take into account the political constraints that burden all new legislation. Distributional issues, differences in values, or differences in beliefs of the programs' outcomes can cause political indecision.¹⁷⁶ Low-income households spend a greater percentage of their income on energy than do higher-income households.¹⁷⁷ This means that those lower-income groups will be hit harder by a rise in energy prices. In addition, states that are more reliant on coal, like those in the Midwest, will have a greater role in carbon dioxide emissions reductions.¹⁷⁸ The best policies must accommodate these political issues, while not compromising the cost-effectiveness principles.¹⁷⁹ Carbon taxes, with price stability, guarantee revenue that can be returned to the public in order to provide a payback for the taxation.¹⁸⁰

174. Avi-Yonah & Uhlmann, *supra* note 32, at 40.

175. DALLAS BURTRAW ET AL., RESOURCES FOR THE FUTURE, THE INCIDENCE OF U.S. CLIMATE POLICY: WHERE YOU STAND DEPENDS ON WHERE YOU SIT (2008), available at <http://www.mistra-research.se/download/18.87749a811cbd4c4fb480001008/Burtraw+et+al+2008+a.pdf>.

176. Richards & Richards, *supra* note 114, at 7.

177. See BURTRAW ET AL., *supra* note 175, at 1; see also Corbett A. Grainger & Charles D. Kolstad, *Who Pays for a Carbon Tax?* (Dec. 1, 2008) (on file with Univ. of Cal. at Santa Barbara, Dep't of Econ.).

178. Richards & Richards, *supra* note 114, at 8.

179. See *id.*

180. Mann, *supra* note 25.

F. Coordination with Existing Law

New legislation in the United States must be aware of existing legislations and regulations to avoid conflict. The Clean Air Act could prove to be problematic with new climate change regulation.¹⁸¹ In terms of international law, any new climate change legislation must be designed to accommodate existing international agreements to which the United States is a party. The legislation must also be sure to abide by those international trade laws set by the WTO.¹⁸² As it will be relying on existing tax laws and utilizing existing governmental bodies, a carbon tax will nestle comfortably within existing law. Cap-and-trade, on the other hand, may face further complications in order to avoid potential conflict, especially if we intend to coordinate with the regimes of other nations' programs, like the EU-ETS.¹⁸³ Exchanging allowances across borders will create immense enforcement difficulties as well as monitoring problems. Carbon taxes are easily collected on imports, and because the tax is also imposed on domestic production, it remains compliant with the WTO trade laws.¹⁸⁴

G. Environmental Effectiveness

In terms of climate change, all players are polluters, but not to the same level.¹⁸⁵ Overall, the scramble to create and enact a form of domestic climate change regulation has blinded some as to the true purpose of the regulation. Climate change regulation is meant to mandate carbon and GHG emission reductions with the state of the environment and the public's health as the main focus. Unfortunately, the race to pass a new piece of legislation has given way to political influence that is skewing the goals of

181. Chris Amantea, *Clean Air Act* [1], Cal. Bus. Law Deskbook §44.5 (2010).

182. Cinnamon Carlarne, *The Kyoto Protocol and the WTO: Reconciling Tensions Between Fair Trade and Environmental Objectives*, 17 COLO. J. INT'L ENVTL. L. & POL'Y 45, 71 (2006).

183. See Katie Miles, *International Investment Law and Climate Change: Issues in the Transition to a Low Carbon World* (Soc'y of Int'l Econ. Law, Working Paper No. 27/08, 2008), available at <http://ssrn.com/abstract=1154588>.

184. Carlarne, *supra* note 182, at 71.

185. Tol, *supra* note 57, at 1259.

proposed regulations. For example, both carbon tax and cap-and-trade bills have failed to give proof of any real emission reductions. Carbon taxes work off the assumption that a tax, by increasing the cost of carbon use throughout the chain of distribution, will discourage that use and cause the public to find alternate means of production.¹⁸⁶ Cap-and-trade assumes that market-based policies will provide strong incentives for the investment into new technologies, and thereby create an overall reduction in emissions.¹⁸⁷ The problem with these assumptions is just that: they are assumptions. There is no firm data to show that putting a price on carbon will reduce emissions. The EU-ETS has created a carbon market, but the successes are economical rather than environmental.¹⁸⁸ The existing systems are not up to par. What we need is something simple and feasible, but also something extremely effective at fixing the problem at hand.

V. CARBON TAX WITH REINVESTMENT

A. Everyone is an Emitter so Everyone Pays

Existing carbon tax proposals, and especially existing cap-and-trade proposals, are not capable of reducing carbon emissions with certainty. New regulation must be proactive in nature, include all emitters, and guarantee real reductions in carbon

186. Waggoner, *supra* note 8, at 1259.

187. See generally Stavins, *supra* note 7; see also Tess Schwartz et al., *Legal Issues for Carbon-Related Transactions: Regulations, Markets, Technology & Enhancing Value* (Practising Law Inst., Corporate Law & Practice Course Handbook Series, No. 18722, 2009).

188. Data regarding the emissions reductions resulting from the EU-ETS are inconsistent due to the lack of technologies capable of precise monitoring. See Peter Heindl, *The Impact of Informational Costs in Quantity Regulation of Pollutants: The Case of the European Emissions Trading Scheme 25* (Ctr. for European Econ. Res., Discussion Paper No. 11-040, 2011), available at <http://ftp.zew.de/pub/zew-docs/dp/dp11040.pdf> (acknowledging the high costs and complexity of the technologies required for emission monitoring, as well as the lack of informational distribution among the countries of the EU-ETS. Heindl proposes that the lack of predictability of informational and abatement costs could cause firms to delay investments into new technologies).

emissions. A better, more effective market-based approach for reducing carbon emissions is a carbon tax with reinvestment. This carbon tax with reinvestment would directly tax all carbon emitters through a downstream approach, as opposed to cap-and-trade's limited upstream proposals. This tax accounts for the societal costs of carbon emissions, and through this accountability promotes emission reductions just like cap-and-trade. However, the reinvestment part of the tax will offset any doubts regarding the social responsibility requirement of emission reduction proposals. The monetary payment of a carbon tax is a payoff of the environmental and societal costs imposed from emitting carbon, and sends the message about the harm of carbon emissions. If that is not clear enough, the carbon tax's reinvestment into the immediate construction of environmentally friendlier energy production facilities will further emphasize this message.

B. How Does the Tax Function?

A carbon tax with reinvestment is fundamentally simple. A tax starts at \$5 per ton of carbon contained within the product based on emissions intensity. The tax is measured at the source, but carried downstream and paid at the register. Based on emissions intensity, everyone is an emitter and therefore no one is exempt from the tax. Then every year the tax rate increases by \$5 per ton of carbon.¹⁸⁹ Despite an analysis remarking on the ability of increasing taxes to reduce future- and short-term emissions,¹⁹⁰ the carbon tax with reinvestment does not rely on public option to reduce GHG emissions. The assumption that taxation will encourage voluntary innovation in the power sector is not sufficient. To assure emission reductions, the revenue from the tax will be channeled to building new infrastructure for energy production. Current power plants will be replaced by

189. *See infra* Figure 1, for the revenues calculated from the carbon tax, beginning at \$5/ton in year 1 and increasing by \$5/ton each year until the tax reaches \$50/ton in year 10. The revenues are calculated as a percent of U.S. GDP.

190. Habermacher & Kirchgässner, *supra* note 29.

nuclear, geothermal, solar, and wind facilities, among others.¹⁹¹ There will be no added expense for the utilities, as they will not be the ones bearing the cost of construction, and neither jobs nor production will be lost.¹⁹² In fact, the construction of new infrastructure will create jobs, and the tax collected will pay to replace existing high emission power plant utilities. Replacing high emission power plants with low-to-no emission power plants will rapidly force emissions down. Over time, revenues will decrease even though the tax is increasing¹⁹³ because the newly built, non-emitting energy facilities will not carry a carbon tax, and energy prices will continue to drop. In twenty years, the United States could achieve a 38.67% to 74.91% reduction in carbon emissions across the building and utilities sector.¹⁹⁴ Carbon tax with reinvestment will bring about an extreme payout for all U.S. citizens. This payout will come in the form of clean and cheap energy as the tax progresses and clean energy infrastructure takes over. Also, regional disparities will be corrected by targeting those coal-reliant areas with the first bouts of infrastructure construction. The dirtiest coal plants will be the first to be replaced.

VI. CARBON TAX WITH REINVESTMENT TRUMPS CAP-AND-TRADE

A carbon tax with reinvestment maintains the ease of implementation and enforcement of previously discussed carbon taxes, and the progressive increase of the tax allows the market to adjust to the price change. This tax with reinvestment would produce revenue that would be used for the immediate construction of alternative energy production. Since the tax could

191. The logistics of this transfer of ownership go beyond the scope of this paper, but will be discussed in a separate article.

192. *See infra* Figure 2, for the Calculated Power Plants Orders in MWe, demonstrating the thousands of construction jobs that will be created in the creation of new energy infrastructure.

193. *See infra* Figure 1. Once the tax peaks at \$50/ton of carbon, the total tax collected declines rapidly as emissions decline.

194. *See infra* Figure 3 and Table 1. Figure 3 uses the base case and shows how emissions decline for utilities and buildings, as well as how total emissions decline. The table shows calculated emissions based on the time it takes to build power plants.

become effective almost immediately, the carbon tax with reinvestment would be the quickest way to reduce GHG emissions. With the instability of energy prices and the economic recession occurring across the nation, proposals for additional taxation weighs heavily on the American people. The cap-and-trade system will act just like a tax, and, as stated, the political advantages of the cap-and-trade system are deceptive. Both cap-and-trade and carbon tax approaches will initially affect energy prices. The difference, however, is that this carbon tax's reinvestment guarantees that the energy prices will fall significantly as alternative energy projects continue to be built at no cost to the utilities.

A. Cap-and-Trade with Reinvestment?

In theory, cap-and-trade can also be used to generate revenue that is equal to the amount generated by a carbon tax.¹⁹⁵ If all allowances are auctioned, the revenue created would likely be equivalent to that of a carbon tax. If this were the case, a reinvestment provision identical to that of my proposed carbon tax could be created for cap-and-trade. However, all cap-and-trade proposals introduced into Congress, those existing cap-and-trade programs in the U.S. and abroad, and most academic proposals call for some free distribution of allowances.¹⁹⁶ The EU-ETS distributed 95% of the allowances for free while most congressional proposals call for over half of the allowances to be free.¹⁹⁷ The reason for this free dispersal is the attraction of complete governmental control of providing allowances to the sectors that are considered most important for our nation. Nonetheless, free distribution of allowances means less revenue generated. This means that reinvestment would have little effect on creating clean energy. Moreover, the appeal of free allowances seems counterproductive for the ultimate goal of emission reduction. It is probable that some industries will receive too many allowances.¹⁹⁸ This will negatively affect the trading price

195. Driesen, *supra* note 31.

196. *Id.*

197. *Id.*

198. *Id.*

of allowances, leading to a repeat of the EU-ETS. Politicians in Europe created so many free allowances that the industries were not required to make any changes to their emissions. The price on allowances was next to nothing, and the EU failed to meet its goals under the Kyoto Protocol.¹⁹⁹ In terms of a carbon tax, the process of creating tax exemptions would be equivalent to the free distribution of allowances. To maintain fairness and simplicity, the carbon tax with reinvestment will offer no exemptions. The tax will be applied to all goods and services. Everyone is a polluter, so everyone will pay.

The objective of the carbon tax with reinvestment is what makes this tax so much more appealing and feasible in combating climate change. The carbon tax with reinvestment starts low (\$5/ton), increases annually until it reaches \$50/ton to allow the construction market to adjust, the revenues peak and then begin to decline rapidly as emissions decline.²⁰⁰ As stated, excise taxation is not a new concept for the United States. For this reason, no new organizations will be created for tax regulation purposes. The carbon tax with reinvestment will be implemented and regulated by the IRS and the EPA, using the existing, knowledgeable staff.

Our economy and lifestyle are dependent on infrastructure and energy. A properly structured tax on carbon with the goal of building a new energy economy would protect our economic and national interests, create many jobs,²⁰¹ and result in significant decreases in GHG emissions.²⁰² Previously proposed carbon taxes did have “benefit certainty” because the price of emissions could not guarantee that emissions would be reduced.²⁰³ A carbon tax with reinvestment does not rely on public accountability for carbon emission reductions. Instead, it relies on the construction and development of clean, alternative energy power plants for the reduction of GHG emissions.²⁰⁴ Until now,

199. Avi-Yonah & Uhlmann, *supra* note 32, at 42.

200. *See infra* Figure 1, for Estimated Revenues.

201. *See infra* Figure 2.

202. *See infra* Figure 3, for Emission Reductions.

203. Mann, *supra* note 16, at 45.

204. *See infra* Figure 3, showing emissions declining for utilities and buildings.

there was no obvious advantage to either system; one had to choose “cost certainty” or “benefit certainty.” A carbon tax with reinvestment has both. For this simple reason, we would be foolish not to immediately enact this tax.

B. An Example to Follow

Greenhouse gases are not stationery. They travel across the world, making climate change a global issue.²⁰⁵ Without the efforts of all industrialized and industrializing nations to reduce GHG emissions, the atmospheric concentrations of these gases will likely double the level of pre-industrialized emissions before the end of the century.²⁰⁶ There is a need for international coordination, and the Kyoto Protocol²⁰⁷ is not proving to be the answer. This is just one more reason the carbon tax with reinvestment is a necessary solution for climate change.

a. A Global Problem Requires a Global Solution

The carbon tax with reinvestment will be imposed on all domestic products as well as imports. The environmental cost of shipping products overseas is an area that is often overlooked. Agreements under the Kyoto Protocol have allowed fuel for international freight to avoid liability for emissions.²⁰⁸ The resulting issue is that goods exported across the world emit an overwhelming amount of GHGs without penalty. A 2009 report by the International Maritime Organization (IMO) estimated that 2.7% of the world’s total carbon emissions in 2007 were the result

205. Hans Gersbach & Noemi Hummel, *Climate Policy and Development* (CESifo, Working Paper No. 2807, 2009).

206. Jonathan H. Adler, *Eyes on a Climate Prize: Rewarding Energy Innovation to Achieve Climate Stabilization*, 35 HARV. ENVTL. L. REV. 1, 2 (2011) (citing IPCC, CLIMATE CHANGE 2007: SYNTHESIS REPORT (2007), available at www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf).

207. See David Wooley & Elizabeth Morss, *Global Climate Change*, in CLEAN AIR ACT HANDBOOK § 10:1 (2011) (discussing that the Kyoto Protocol expires in 2012, so negotiations are underway to reach a new agreement. As of yet, no new agreement has been implemented, including any additional reductions to be required by Annex 1 and Non-Annex 1 countries).

208. Oliver J. A. Howitt et al., *Carbon Emissions from International Cruise Ship Passengers’ Travel to and from New Zealand*, 38 ENERGY POLY 2552 (May 2010).

of international shipping.²⁰⁹ Burning oil in the form of heavy fuel oil, as well as marine diesel oil, releases large amounts of CO₂, SO₂, NO_x, and hydrocarbons, as well as smaller amounts of particulate matter, into the environment, contributing to global climate change.²¹⁰ The carbon tax with reinvestment will tax the amount of carbon emissions given off during shipping, along with the emission emitted during production.

b. Carbon Tax with Reinvestment will Comply with International Law

In his book, *Socially Responsible Investment Law: Regulating the Unseen Polluters*, Benjamin Richardson states that, “[t]he investment community continues to downplay inclusion of environmental and social criteria for consideration in corporate financing decisions.”²¹¹ Consistent with his thought is the argument that international investment law poses potential barriers to climate change regulation.²¹² Miles identifies several cases where investment laws have trumped environmental protection efforts,²¹³ noting that in any conflict between the

209. *Id.* (citing CORBETT O. BUHAUG ET AL., INT’L MAR. ORG. (IMO), SECOND IMO GHG STUDY 2009, 6 (2009), available at http://www.imo.org/blast/blastData.asp?doc_id=12612&filename=GHG%20StudyFINAL.pdf).

210. *Id.*

211. BENJAMIN J. RICHARDSON, *SOCIALLY RESPONSIBLE INVESTMENT LAW: REGULATING THE UNSEEN POLLUTERS* 6 (2008).

212. Miles, *supra* note 183, at 3.

213. *Id.* at 11-19 (discussing examples: (1) *Metalclad Corp. v. United States of Mexico* (citing *Metalclad v. United States of Mexico*, Award, 40 I.L.M. 35 (2000)), where an American investor brought a claim against Mexico, alleging expropriation of investment and a breach of fair and equitable treatment standards regarding the declaration of an ecological preserve surrounding the hazardous waste treatment site. The tribunal held that Mexico had not acted with the required levels of transparency consistent with NAFTA, and was therefore in breach of fair and equitable treatment standards. (2) *Azuris Corp. v. Republic of Arg.* (citing *Azurix Corp. v. Republic of Arg.*, ICSID Case No. ARB/01/12, Award (2006)), where Azurix contaminated the local water supply, causing the water to be undrinkable. Local authorities imposed a fine on Azurix for non-compliance with its obligations of water quality, and Azurix filed a request for arbitration with the International Centre for Settlement of Investment Disputes (ICSID) alleging that the action taken by the local authorities resulted in expropriation and breach of fair and equitable treatment standards. Azurix also claimed that the water problems were the result of poor infrastructure due to the failures of the local authorities. The tribunal, in short,

interests of investors and climate change regulation measures, very little weight is given to international environmental issues.²¹⁴ The potential for claims of indirect expropriation, discriminatory treatment, and breaches of fair and equitable treatment threaten climate change mitigation methods that include the allocation of permits or “rights to pollute.”²¹⁵ Under the General Agreement on Tariffs and Trade / World Trade Organization (GATT/WTO) regime, world trade must follow three fundamental obligations. The first is the most-favored-nation (MFN) principle, which requires any advantage that is provided to a product to be provided to all like products. The second principle, the national treatment principle, requires that foreign products be treated no less favorably than domestic products. The third principle is most relevant for cap-and-trade. The prohibition on quantitative restrictions prevents countries from using embargoes, quotas, or licensing schemes on imported and exported products.²¹⁶ With a cap-and-trade system, these international investment and trade laws are a true threat. If

held that the actions of the local authorities breached fair and equitable treatment. (3) *Methanex* (citing *Methanex Corp. v. United States*, 44 I.L.M. 1345 (2005)), where a Canadian investor challenged the health and environmental regulation in the United States after the Governor of California issued an order declaring that the Canadian ethanol manufacturer Methanex’s fuel additive would be phased out by 2002 for contamination reasons. Methanex filed a complaint under NAFTA. However, the tribunal rejected Methanex’s arguments. Although the ultimate decision found in favor of California’s position, Miles points to the flaw of the system, seeing as the claim proceeded to a hearing at all. (4) *Santa Elena* (citing *Compañía del Desarrollo de Santa Elena, S.A. v. The Republic of Costa Rica*, 39 I.L.M. 1317 (2000)), where a Costa Rican company that had been formed by American stockholders was expropriated by Costa Rica. The issue was not the expropriation, but rather the amount of compensation due to the Company. Costa Rica claimed the right to expropriate due to the ecological diversity of the surrounding land. The tribunal held that the environmental objectives made no difference to the application of international investment rules.)

214. Miles, *supra* note 183, at 19.

215. *Id.* at 27; see also Jacob Werksman et al., *Will International Investment Rules Obstruct Climate Protection Policies? An Examination of the Clean Development Mechanism*, 3 INT’L ENVTL. AGREEMENTS: POL. L. & ECON. 59 (2003).

216. Erik P. Bartenhagen, *The Intersection of Trade and the Environment: An Examination of the Impact of the TBT Agreement on Ecolabeling Programs*, 17 VA. ENVTL. L.J. 51, 61 (1997) (citing General Agreement on Tariffs and Trade, Oct. 30, 1947, 61 Stat. A-11, 55 U.N.T.S. 195, art. XI [hereinafter GATT]).

imports were to be included, and thereby limited, under a cap-and-trade system, an import quota would be implied. Setting quotas violates WTO law.²¹⁷ However, this will not be the case with the carbon tax with reinvestment. With an across-the-board tax on set quantities of carbon, there are no issues of discrimination or equity, nor is there an issue of violating WTO laws forbidding taxes on imports, “in excess of those applied, directly or indirectly, to like domestic products.”²¹⁸ As long as the taxes are paid, companies are under no obligation to change or experience indirect expropriation. A key challenge is to ensure that the objectives of these areas of law are able to align, rather than cross, in order to move forward to reduce the effects of climate change.²¹⁹ The simplicity of the system will allow the carbon tax with reinvestment to avoid clashing with the ever-favored international investment laws.

The effectiveness of a carbon tax with reinvestment on the international level could benefit the United States in several ways. First, effective emission reductions would mitigate the negative environmental and social health impacts of climate change.²²⁰ Second, the tax will encourage economic advancements through infrastructure development and new job creation. Finally, the international effects resulting from the carbon tax with reinvestment will assist the United States in maintaining its standing as a world leader.²²¹

VII. CONCLUSION

The need for a climate change policy that truly addresses the issue of climate change is increasingly evident. A carbon tax system is the best approach for the United States due to the simplicity of the design and ease of implementation, cost certainty, price stability, and the ability to generate revenue for the public good. However, a carbon tax must assure reductions in

217. GATT, at art. XI: b.

218. GATT, at art. III: 2.

219. *See generally* Miles, *supra* note 183.

220. Young, *supra* note 7.

221. *Id.*

GHG emissions, and must target *all* polluters. Until now, there has not been a carbon tax capable of these requirements.

Literature argues that the cap-and-trade system is the superior choice because of the historical successes of the system. As stated, the U.S. acid rain program is one of those cited examples,²²² but in reality, this is a poor example. We have never had an economy-wide cap-and-trade system. Currently, the EU-ETS is the only comparable wide-range cap-and-trade example. However, it would be unwise to enact a cap-and-trade system based on the flawed cap-and-trade system adopted by the EU.²²³ Conversely, our nation is very experienced with economy-wide excise taxes. In his tax bill, Congressman Larson simply added three new, relatively short sections to the existing excise tax section of the Internal Revenue Code.²²⁴ With regards to carbon cap-and-trade, there is no adequate piece of legislation. Previous proposals have shown just how difficult it is to draft a bill for cap-and-trade, and even if a bill were to be flawlessly designed, it is suggested that it would take at least two years to get the program through Congress and set up for implementation because of the delays in rulemaking.²²⁵ A carbon tax, utilizing the existing excise tax laws, could basically be enacted tomorrow. We have already delayed our efforts to combat climate change, and we do not have the time to continue the delay by attempting to surmount all the obstacles set out by cap-and-trade legislation. Immediate action can only be achieved by a carbon tax.

The carbon tax with reinvestment implements a downstream tax so that no person will be exempt from taxation. The revenue produced by the tax will be used for the immediate construction of low- or non-emitting power sources like nuclear, geothermal, wind, and solar facilities.

With the creation of new, clean energy sources, the environment will benefit from the guaranteed emission

222. Scotchmer, *supra* note 6 (describing the Acid Rain Program).

223. Avi-Yonah & Uhlmann, *supra* note 32, at 50; *see also* George Daskalakis & Raphael N. Markellos, *Are the European Carbon Markets Efficient?*, 17 *REV. OF FUTURES MARKETS* 103 (2008) (explaining why EU-ETS is not the success it claims to be).

224. Richards & Richards, *supra* note 114.

225. Zhang, *supra* note 42.

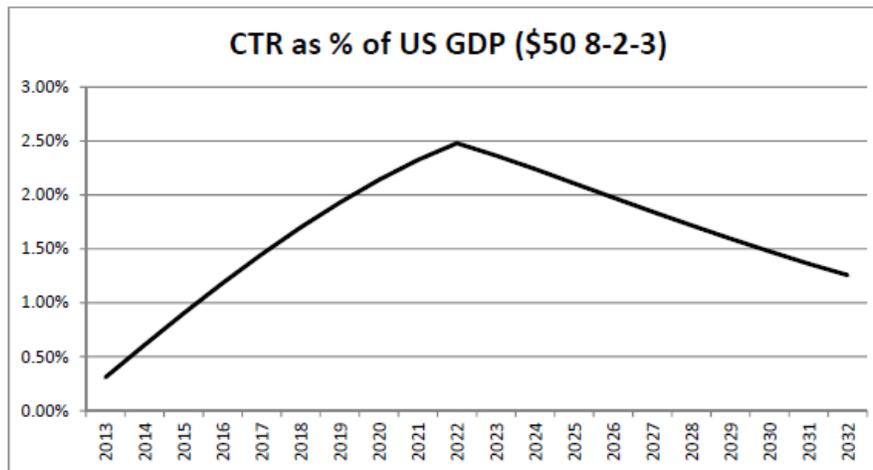
reductions. The public will benefit from the cheap energy prices that will arise from the new infrastructure. The economy will benefit from the creation of new jobs, and the nation will set a great example that will be followed by those nations that wish to continue exporting to the United States. Because the successes of the tax will encourage other countries to implement similar regulations, the carbon tax with reinvestment goes beyond domestic emission abatement and offers a global solution to climate change.

VIII. CARBON TAX WITH REINVESTMENT MODELS

As shown in the data, I performed regulatory streamlining in order to achieve a graphic range and to play with regulatory risks. The data is set-up to represent nuclear, wind/solar, and geothermal as the proposed clean energy facilities. The baseline model (8-2-3) assumes that the development of a nuclear power plant takes eight years (allowing two years for permitting, four for construction, and two for testing), two years for wind/solar (one year each for permitting and construction), and three years for geothermal (two years for permitting and one for construction). Because processes can happen quicker or slower than expected, I included a range within the graph. It can be noted that even with drastically slower results, the carbon tax with reinvestment's impact is significantly better than the leading Waxman-Markey proposal.²²⁶ Preserving the traditional benefits of a carbon tax, the carbon tax with reinvestment is the best option for climate change legislation in the United States.

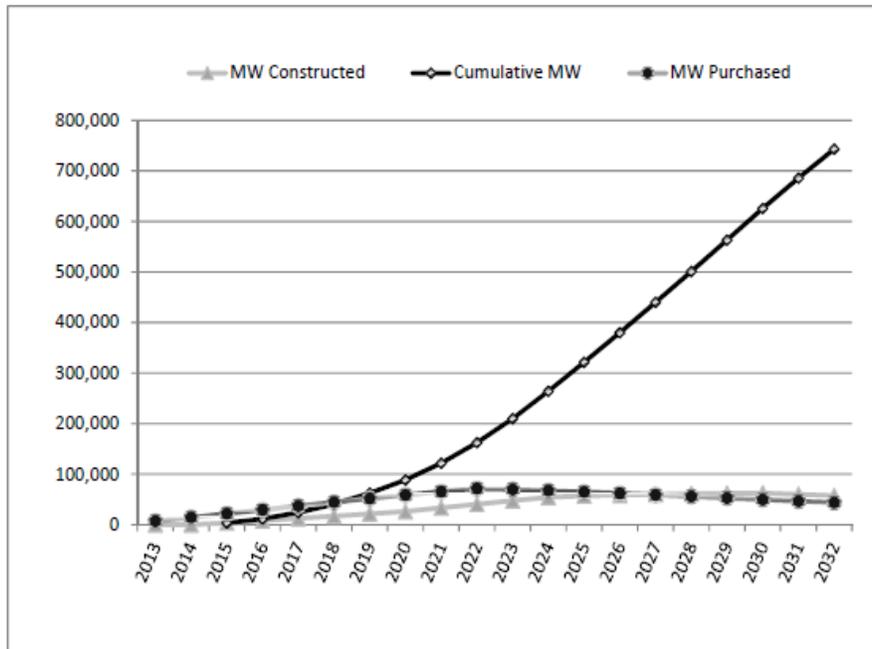
226. See *infra* Tables 1 & 2.

Figure 1: Estimated Carbon Tax Revenues as a Percent of GDP (2013-2032)



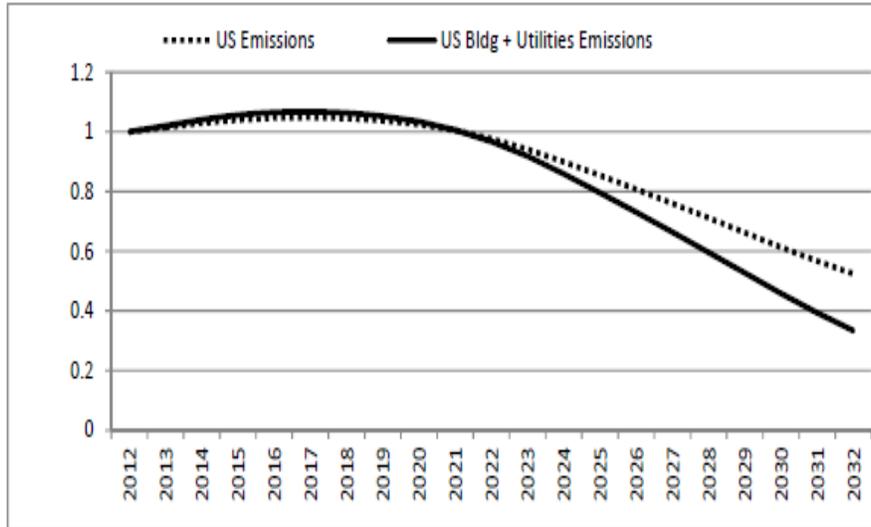
This figure indicates revenues collected each year as a percentage of GDP. Revenues are calculated as follows, starting at \$5/ton of GHG emissions in year 1, rising by \$5/ton each year until the carbon tax rate reaches \$50/ton in year 10. All goods and services, domestic and imported, are taxed based on emissions intensity. Emissions intensity is calculated as GDP/total economy emissions. From emissions intensity or \$ of output per ton of emissions it is then possible to calculate the implied emissions for each good or service.

Figure 2: Power Plant Purchases and Deliveries (Annual and Cumulative) in MW_e



This figure shows the amount of new power plants that can be ordered and constructed each year using the revenues from the CTR. The construction line trails orders indicating that a plant ordered needs to be constructed which takes a significant amount of time. While not calculated, every billion dollars in construction expenditure creates approximately 25,000 direct and indirect jobs, thus creating a potentially valuable stimulus to the economy.

Figure 3: Declining Emission Levels as Power Plants are Completed



This figure shows declining emissions in the Utility & Building sectors as well as across the entire U.S. This figure assumes the base case scenario, i.e. 8-2-3, where it takes eight, two, and three years respectively to order, permit, construct and bring online the nuclear, solar/wind, or geothermal power plant.

Table 1: Building and Utility Emissions (United States) in Year 2032

U.S. Building & Utility Emissions Based on Construction Strategy	Building & Utility Emission Levels in Year 2032 Compared to 2013
Business As Usual	120.82%
Waxman-Markey	69.97%
4-1-2 yrs	25.09%
4-2-2 yrs	25.19%
4-2-3 yrs	25.33%
4-3-4 yrs	25.86%
4-2-5 yrs	26.27%
8-1-2 yrs	32.7%
8-2-2 yrs	33.1%
8-2-3 yrs	33.4%
8-2-5 yrs	34.26%

8-3-4 yrs	34.4%
12-1-2 yrs	46.77%
12-2-2 yrs	47.54%
12-2-3 yrs	48.00%
12-3-4 yrs	49.67%
12-2-5 yrs	49.9%
12-4-6 yrs	55.3%
16-1-2 yrs	57.77%
16-2-2 yrs	58.75%
16-2-3 yrs	59.29%
16-3-4 yrs	61.20%
16-2-5 yrs	61.33%

Note: The emissions level for Building & Utility Emissions depends on the path taken in terms of how long it takes to permit, construct, test, and place new power facilities online. As the tax structure moves from \$5 to \$50 per ton, with a maximum of \$50 for the CTR (assumed to occur in year 10), the first number is the years for a nuclear power plant (with a range of 4-16 yrs), the second for solar/wind power plants (1-4 yrs) and the last for geothermal power plants (2-6 yrs). These numbers include the time to build transmission facilities if needed. Therefore, “4-1-2” is interpreted as follows, the model assumes it takes 4 years to build nuclear, 1 year to build large scale solar/wind, and 2 years to build geothermal power plants. Furthermore, all models exceed the proposed emissions reductions under Waxman-Markey. The primary difference is that these emissions reductions are achievable with today’s technology. Rapid permitting and construction (4-1-2) results in emissions by 2032 being 25.09% of 2013 emissions, a reduction of 74.91%.

Table 2: Total U.S. GHG Emissions in Year 2032

Total U.S. GHG Emissions Based on Construction Strategy	Total Emission Levels in Year 2032 Compared to 2013
Business As Usual	120.82%
Waxman-Markey	76.95%
4-1-2 yrs	46.49%
4-2-2 yrs	46.57%
4-2-3 yrs	46.66%

4-3-4 yrs	47.04%
4-2-5 yrs	47.34%
8-1-2 yrs	52.0%
8-2-2 yrs	52.2%
8-2-3 yrs	52.4%
8-2-5 yrs	53.04%
8-3-4 yrs	53.2%
12-1-2 yrs	61.98%
12-2-2 yrs	62.53%
12-2-3 yrs	62.86%
12-3-4 yrs	64.05%
12-2-5 yrs	64.2%
12-4-6 yrs	68.1%
16-1-2 yrs	69.84%
16-2-2 yrs	70.54%
16-2-3 yrs	70.92%
16-3-4 yrs	72.29%
16-2-5 yrs	72.38%

Note: This table includes all emissions (Buildings, Utilities, Transportation, and Land Use). Rapid permitting and construction (4-1-2) results in emissions by 2032 being 46.49% of 2013 emissions, a reduction of 53.51%.