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RECONCILING KING COAL AND CLIMATE CHANGE: A REGULATORY FRAMEWORK FOR CARBON CAPTURE AND STORAGE

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INTRODUCTION

The root cause of climate change is the buildup of heat-trapping greenhouse gases (GHGs), most significantly carbon dioxide (CO_2), in the Earth's atmosphere.[1] The accumulation of these gases creates a "thermal blanket" of sorts, resulting in excessive solar heat and energy in our atmosphere.[2] Coal-fired electric power plants are responsible for almost forty percent of GHG emissions in the U.S.[3] Mitigating the onset of climate change, therefore, will require vast reductions in GHG emissions in the power generation sector.

Our article presupposes that coal will continue to provide a primary fuel for power generation for years to come. Accepting the reality of coal-based electricity, we examine an emerging technology referred to as carbon capture and storage or carbon capture and geologic sequestration (in either case, CCS). CCS may become an important strategy to combat climate change because it can minimize CO_2 emissions from fossil-fuel-powered sources.[4] CCS involves removing or "capturing" the CO_2 emissions that are a by-product of all fossil-fuel combustion, compressing that gas, and ultimately injecting the CO_2 deep underground where it cannot escape into the atmosphere as a climate change agent.[5] CCS is hailed as a "bridge

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1. We prefer the term "climate change" to "global warming." While the phenomenon results in a general trend of increased global temperatures, the effects are not uniform. Because of warmer temperatures in some areas, ocean currents and atmospheric weather patterns will be disrupted, which could actually result in the cooling of some areas, such as western Europe. Thus "climate change" is more precise. *See* F. Giorgi et al., *Simulation of Regional Climate Change with Global Coupled Climate Models and Regional Modeling Techniques*, *in* THE REGIONAL EFFECTS OF CLIMATE CHANGE 427, 433 (Robert T. Watson et al. eds., 1998) (describing the potential for "a marked cooling over the northwest Atlantic throughout the year, which [could] . . . lead to a cooling over part of Europe in winter.").

2. Robert N. Stavins, *A Meaningful U.S. Cap-and-Trade System to Address Climate Change*, 32 HARV. ENVTL. L. REV. 293, 293 (2008).

3. Power plants alone generate approximately forty percent of total U.S. emissions. ENERGY INFO. ADMIN., ANNUAL ENERGY OUTLOOK, 13 (2007), http://www.eia.doe.gov/oiaf/archive/aeo07/pdf/0383(2007).pdf.

4. The Electric Power Research Institute speculates that "[t]he greatest reductions in future U.S. electric sector CO_2 emissions are likely to come from applying carbon CCS technologies to nearly all new coal-based power plants coming on-line after 2020." ELECTRIC POWER RESEARCH INSTITUTE, THE POWER TO REDUCE CO_2 EMISSIONS, 3 http://mydocs.epri.com/docs/public/DiscussionPaper2007.pdf (last visited Dec. 16, 2009). The recently enacted American Recovery and Reinvestment Act, the so-called "stimulus package," includes $3.4 billion for coal research and development, a portion of which "is expected to be used to fund projects under the Clean Coal Power Initiative program, focusing on projects that capture and sequester greenhouse gases." ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, SR-OIAF/2009-03, AN UPDATED ANNUAL ENERGY OUTLOOK REFERENCE CASE (2009), http://www.eia.doe.gov/oiaf/servicerpt/stimulus/arra.html.

5. *See infra* Part II for a technical primer on CCS and its use in conjunction with coal plants.

technology," a technology that will allow us to minimize global CO_2 emissions from fossil fuels such as coal or natural gas while cleaner, more renewable, energy resources are developed. With widespread use in the generation sector, it is possible that as much as ninety percent of CO_2 emissions from coal-fired power plants could be captured and safely sequestered using CCS.[6]

The conventional wisdom is that either Congress or the Environmental Protection Agency (EPA) will exact a charge on GHG emissions in the near future, in the form of a cap-and-trade or carbon tax system, or through rulemaking under the Clean Air Act.[7] A charge on GHG emissions would have the effect of making power generation more expensive, which would prompt power generating companies to seek ways, such as CCS, to reduce their CO_2 emissions and save money.[8] In light of the looming prospect of federal regulation, CCS is a promising technology that could allow our economy's industrial base to continue functioning.

Geologists are optimistic that CCS, utilized broadly in conjunction with new or existing power plants and industrial emitters, can safely and effectively sequester colossal volumes of CO_2.[9] CO_2 injection has been used successfully for decades to assist in oil recovery operations, though not for the primary purpose of permanent storage.[10] Large-scale injection and storage would allow industry to sequester CO_2 in the short term, while "greener," more sustainable power sources are developed for long-term use. Additionally, CCS technology, once fully developed, can be exported to large emitters such as China and India—nations that must be partners in our efforts to curb the global release of GHGs.

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6. U.S. Dep't of Energy, Nat'l Energy and Tech. Lab., Technologies: Carbon Sequestration, http://www.netl.doe.gov/technologies/carbon_seq.

7. Legislation to establish a cap-and-trade program for CO_2 emissions is currently being debated in the 111th Congress and is likely to be passed and signed into law in 2010. American Clean Energy and Security Act, H.R. 2454, 111th Cong. (2009). The EPA is also developing rules, pursuant to the Supreme Court's order in *Massachusetts v. EPA*, 549 U.S. 497, 533 (2007), to regulate GHGs for the first time. EPA regulation may occur only in the absence of congressional legislation, which would likely preempt EPA's authority to regulate in the area. *See* Juliet Eilperin, *EPA Presses Obama to Regulate Warming Under Clean Air Act*, WASH. POST, Mar. 24, 2009, at A1.

8. The relative advantages or disadvantages of various methods of GHG regulation is beyond the scope of this article. We do believe, however, that GHG regulation in some form is a prerequisite to industry wide use of CCS. Without a "charge" on CO_2 emissions, it is unlikely that industry will invest in and utilize CCS. The MIT Coal Energy Study Committee speculates that CCS becomes "cost competitive" when CO_2 emissions reach a price of thirty dollars per ton. MASS. INST. OF TECH., THE FUTURE OF COAL SUMMARY REPORT, at xi (2007), *available at* http://web.mit.edu/coal/The_Future_of_Coal_Summary_Report.pdf [hereinafter MIT REPORT].

9. *See id.* at xi–xii.

10. The success of "enhanced oil recovery" (EOR) using CCS indicates that CO_2 can be injected and stored safely. RICHARD C. MAXWELL ET AL., OIL AND GAS 13–14 (8th ed. 2007).

Ironically, the major impediments to the widespread deployment of CCS are not scientific or technological, but legal and regulatory. While scientists are confident that it will soon be possible to build or retrofit "capture-ready" power plants that can safely store vast quantities of CO_2 underground, there is no consistent legal framework to regulate these projects. Utilities that may be inclined to invest in capture technology do not yet know the rules by which they will be bound. A uniform regulatory framework is a prerequisite to large-scale investment in CCS.

Federal regulations and state common law do not contemplate the infinite geologic storage of gas, which would be required to prevent the gas from escaping and contributing to climate change. There is no precedent for many of the property law questions that would arise if such an escape occurred. Issues might include conflicts between owners of the surface, mineral, and adjacent estates, or subsurface trespass claims resulting from "migration"[11] of CO_2 underground. Further, the infinite storage of CO_2 creates many liability issues, including the question of infinite liability for parties who undertake CCS. Industry is naturally risk-averse. It is unlikely that CCS will flourish as long as there is legal uncertainty surrounding the acquisition of storage space, the injection process, and liability for post-injection incidents. This article examines these and other issues that act as disincentives to the large-scale deployment of CCS in the United States. We address several of the major legal and regulatory barriers individually, ultimately proposing model legislation that will enable effective regulation.

Part I begins by framing the challenges posed by global climate change and the options available to mitigate its effects. We examine the available sources of electric power generation, concluding that coal-based generation will be necessary to support our energy needs for some time to come. Our discussion makes clear how crucial CCS coupled with coal-based generation is to stabilizing global CO_2 levels.

Part II describes in technical detail how underground injection and storage actually works. In this Part, we outline the major legal and regulatory barriers and disincentives to CCS, including the novel property rights issues that will arise, the absence of a post-injection liability system, and the lack of a comprehensive permitting scheme for CCS.

Part III seeks to provide solutions—in the form of a model regulatory framework—that will facilitate the development of CCS technology. We explain how the current patchwork of state and federal regulations, most of which were drafted to regulate natural gas storage and transport or small-scale CO_2 injections in oil recovery operations, are inadequate for large-

11. "Migration" refers to the underground movement of sequestered CO_2.

scale CO_2 injection and perpetual storage. We evaluate two existing CCS bills, introduced in Wyoming and Kansas, and model legislation proposed by the Interstate Oil and Gas Compact Commission (IOGCC). Finally, expanding on these existing models, we provide our own legislative recommendations to clarify property rights questions and provide for the government assumption of long-term liability. Our goal for this article is to help create an effective regulatory framework that will allow CCS technology to develop and flourish and, ultimately, be used as a way to sequester GHG pollution worldwide.

I. CLIMATE CHANGE & CCS

There are many climate-altering GHGs, including CO_2, methane, nitrous oxide, and water vapor.[12] When concentrated in the Earth's atmosphere, these gases allow in solar heat and energy but prevent much of that energy from leaving the atmosphere, which results in a "greenhouse effect."[13] This phenomenon prevents the natural process in which solar heat that enters the atmosphere to warm the planet is then radiated or reflected back into space.[14]

Of the many climate-altering GHGs, CO_2 has the most significant impact. CO_2 from transportation and energy sources such as power plants comprises over eighty percent of climate-altering gases.[15] The accumulation of CO_2 is the primary driver of the greenhouse effect and climate change. Therefore, mitigating the effects of climate change will require reducing CO_2 emitted from energy sources, thereby reducing the buildup of atmospheric CO_2.

The Intergovernmental Panel on Climate Change (IPCC), Princeton's Carbon Mitigation Institute, and other prominent organizations suggest that annual GHG emissions will have to be significantly reduced from their current levels to stabilize the global climate and prevent the worst effects of

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12. INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 1995: THE SCIENCE OF CLIMATE CHANGE 14 (J.T. Houghton et al. eds., 1995).

13. To a certain extent, the greenhouse effect is a natural function and is necessary to sustain human life on the planet. The problem, however, is that today's "greenhouse" is trapping too much heat, and the earth is getting too warm. *See* U.S. Envtl. Prot. Agency, Climate Change Science, http://www.epa.gov/climatechange/science/index.html (last visited Oct. 26, 2009) (providing a basic overview of the process of climate change).

14. *Id.*

15. U.S. DEP'T OF ENERGY, ENERGY INFO. ADMIN., GREENHOUSE GASES, CLIMATE CHANGE, & ENERGY POLICY (2008), http://www.eia.doe.gov/bookshelf/brochures/greenhouse/Chapter1.htm (last visited Oct. 26, 2009).

climate change.[16] We use these stabilization models as a guide in our analysis. This part will first describe the options that exist to reduce CO_2 emissions and stabilize global GHG concentrations at sustainable levels, ultimately concluding that coal-powered generation with CCS will have to be part of a comprehensive GHG reduction strategy.

A. Global GHG Emissions and the Princeton Model

Of the myriad climate models and analyses, the Carbon Mitigation Initiative's "stabilization" concept, the so-called "Princeton Climate Game," provides the best illustration of the options available to address climate change.[17] The concept, created by Princeton's Carbon Mitigation Institute, sets a GHG target and then provides options for how to achieve that target.[18] As a starting point, the Princeton model suggests that to avoid the most catastrophic effects of climate change, global GHG concentrations will have to be stabilized at current levels for the next fifty years and then be reduced after 2060.[19]

Princeton's "stabilization first, reduction later" model may sound readily attainable, but it is actually quite ambitious. To reach a flat line of global GHG concentrations, we will have to reduce the projected global CO_2 emissions by seven billion tons each year, which will result in approximately 175 billion tons of carbon avoided by 2055.[20] This is the critical amount necessary to avoid the worst forecasted effects of climate change.

Princeton's interactive game allows users to determine which mitigation technologies or sources of power generation to use to reach stabilization.[21] The goal is an annual global reduction of seven billion tons of CO_2, but there are several ways to reach this number.[22] The choices available include nuclear power, renewable resources such as wind and solar farms, hydrologic and geothermal generation, reforestation or

16. *See* LENNY BERNSTEIN ET AL., CLIMATE CHANGE 2007: SYNTHESIS REPORT (Abdelkader Allali et al. eds., 2007), *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr.pdf (summarizing the effects of climate change and options for adaptation and mitigation).

17. *See* Carbon Mitigation Initiative, Princeton University, Stabilization Wedges, http://cmi.princeton.edu/wedges (last visited Oct. 26, 2009).

18. *Id.*

19. *Id.* at 1 (Potential catastrophic consequences of climate change include the loss of polar ice sheets, rising sea levels, and an increase in category five hurricanes. Changes in the sea level and weather patterns would have serious consequences on coastal communities, agriculture, and climate worldwide.).

20. *Id.* at 3.

21. *Id.*

22. *Id.*

afforestation, and coal combustion with CCS.[23] The Princeton game, which forces users to make choices about how to reach the necessary reduction level, reveals just how difficult of a challenge we face. The game illustrates that, even if we are able to maximize generation from renewable sources such as solar and wind power, coal with CCS will almost certainly have to be a part of the energy equation for years to come.

B. Coal as a Fuel Source[24]

Princeton's dispassionate assessment leads us to the conclusion that coal will not disappear as an energy source in the immediate future. Coal produces such a large percentage of electricity generation that other sources alone cannot meet the country's demands in the short term. Coal-burning power plants currently provide half of the electricity produced in the U.S. and are responsible for one-fourth of global carbon emissions.[25] Cleaner, carbon-neutral sources such as wind and solar energy, or the more controversial expansion of nuclear power generation, have the potential to replace most or all coal-generated power in the future.

But at present, the U.S. is not able to meet its base load power needs solely with renewable or carbon-neutral options.[26] The nation simply does not have the infrastructure to allow renewable energy sources such as wind and solar to replace fossil-fuel power generation in the near term. The expansion of nuclear generation faces still greater opposition across the political spectrum due to concerns over public health and national security.

Coal has strong political support throughout the country as America's only abundant domestic fossil energy resource. The coal industry is responsible for more than 80,000 jobs nationwide, contributing billions to the economies of coal-producing states.[27] Legislators from these regions will fight vigorously to ensure the continued viability of the coal industry.

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23. *Id.*

24. This article principally discusses the deployment of CCS in the context of coal-fired power plants. Although CCS technology can be applied to other industrial sources, such as ethanol and cement plants, power plants are by far the largest CO_2 emitters and thus are the focus of our discussion.

25. U.S. DEP'T OF ENERGY, ENERGY INFO. ADMIN., DOE/EIA-0383 (2009) ANNUAL ENERGY OUTLOOK, 52, 71 (2009), http://www.eia.doe.gov/oiaf/aeo/pdf/0383(2009).pdf.

26. Renewable generation, excluding hydrologic power, constituted only 2.5 percent of the U.S. energy portfolio in 2007. ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, OFFICE OF COAL, NUCLEAR, AND ALTERNATE FUELS, ENERGY POWER ANNUAL 2007, at 3 (2009) http://www.eia.doe.gov/cneaf/electricity/epa/epa_sum.html (last visited Oct. 29, 2009).

27. The industry's payroll is approximately $2 billion in West Virginia alone, and coal companies provide hundreds of millions in tax revenue to the state. WEST VIRGINIA OFFICE OF MINERS' HEALTH, SAFETY AND TRAINING, WEST VIRGINIA COAL MINING FACTS, http://www.wvminesafety.org/wvcoalfacts.htm (last visited Dec. 16, 2009).

As Mike Morris, Chief Executive Officer of American Electric Power, has stated, "We have 25 'coal states.' That's 50 Senators whose states depend on this economy."[28]

Another factor that is rarely considered is coal's prevalence as a fuel source in China, India, and the unindustrialized world. These nations, which account for three-fourths of global GHG emissions, will likely remain dependant on coal even while the U.S. is transitioning to carbon-neutral technology. During the transition period, advanced coal and capture technology must be fully developed and utilized in developing nations to mitigate their significant contribution to climate change.

Given these facts, it is prudent to assume that coal will be a substantial part of our global energy portfolio in the short term. We reject, as a false binary, the idea that confronting climate change requires a choice between promoting renewable resources *or* supporting carbon capture and advanced coal technology. In reality, reducing GHG emissions may require an "all of the above" approach that includes renewable energy, CCS, expanded nuclear generation, reforestation and afforestation, energy efficiency, and simple conservation. Therefore, it is prudent to consider ways to make coal combustion carbon-neutral in the short term while simultaneously working to develop truly clean, efficient sources of energy for deployment in the coming decades.

C. Carbon Capture and Storage Technology

If we accept the two fundamental premises already advanced in this article,[29] then we must work to facilitate the use of CCS in conjunction with existing and new power plants. CCS is currently the only technology that will allow power plants to burn coal without putting more CO_2 into the atmosphere.

This section begins with a necessary primer on CCS technology, including a discussion of pre-combustion and post-combustion capture, compression and transport, and underground injection and storage. This technical discussion lays a foundation for Part II, where we turn our attention to the two major obstacles and disincentives that prevent the widespread use of CCS.

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28. Alan Petrillo, Coal Is Still King, for Now: American Electric Power Discusses Sustainability at KLD Forum, http://blog.kld.com/climate-change/coal-is-still-king-for-now-american-electric-power-discusses-sustainability-at-kld-forum-part-one (Feb. 27, 2009).

29. First, drastic GHG reductions are immediately necessary to prevent the most dire consequences of climate change. Second, coal will remain a major source of global power generation during the coming decades.

1. CCS Technology Primer

Carbon capture and geologic sequestration, as discussed above, refers to the capture or removal of the carbon content from the combustion of fuels such as coal and the subsequent injection and storage of CO_2 underground. Capturing all or most of a power plant's CO_2 before it can be released into the atmosphere would allow the continued use of coal for power generation with significantly reduced GHG emissions. Typical CCS has four main phases: capture; compression; transport; and storage.

2. Gasification & Capture

Capture simply refers to the removal of the carbon content of coal before it is emitted as a GHG. The removal of the carbon from coal can occur either before or after combustion has taken place. Although CCS can be used with almost all power plants, the most efficient and cost-effective carbon capture occurs pre-combustion in conjunction with an Integrated Gasification and Combined Cycle (IGCC) power plant.[30]

IGCC plants are unique in that the coal fuel is heated and converted into a synthetic natural gas in a process called gasification before it is burned for power generation.[31] This process, which breaks down a carbon-based fuel into its chemical elements, allows for the pre-combustion removal of pollutants such as sulfur and nitrogen oxide (NO_X).[32] Removing impurities such as sulfur and NO_X makes combustion more efficient, yielding more heat and energy per combustible unit of fuel.[33]

The gasification process also produces a more concentrated, highly pressurized CO_2 stream, making CO_2 capture at an IGCC plant easier and more efficient.[34] A traditional pulverized coal (PC) plant, by contrast, burns coal without removing impurities such as sulfur and NO_X, resulting in less

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30. While it is possible to "retro-fit" traditional pulverized coal (PC) power plants, gasification technology lends itself most easily to CCS. Retrofitting a traditional pulverized coal plant could increase the cost of generation by eighty percent, while using CCS at an IGCC plant would only increase costs by twenty-five percent, or five to six cents/ kWh. Most utilities that plan to utilize CCS will almost certainly use CCS in conjunction with gasification plants. For these reasons, we will discuss the capture process in the context of IGCC plants. National Energy Technology Laboratory, Carbon Sequestration FAQ Information Portal, http://www.netl.doe.gov/technologies/carbon_seq/FAQs/benefits.html (last visited Dec. 29, 2009).

31. Most coal-fired power plants are classified as pulverized coal (PC) plants, which burn coal without gasification. *See* U.S. Dep't of Energy, Gasification Technology R&D, http://www.fossil.energy.gov/programs/powersystems/gasification/index.html (last visited Oct. 25, 2009) (describing the gasification process).

32. *Id.*

33. *Id.*

34. *Id.*

energy-efficient combustion and impure CO_2 emissions that are more difficult to capture and store. While there are currently only a few IGCC plants operating today, many more are proposed. This number could multiply exponentially should the U.S. place a charge on carbon emissions. The U.S. Department of Energy (DOE), moreover, is very supportive of gasification and has invested billions in IGCC development.[35]

3. Compression and Transport

After the CO_2 by-product is captured from coal combustion at an IGCC or PC plant, it must be compressed and transported via pipeline to an area where it can be safely sequestered and stored underground. Captured CO_2 is compressed, using an electric or steam-powered turbine, to pressures as dense as 2,000 psi.[36] The compressed CO_2 can be transported using a pipeline to an appropriate injection and storage location.[37] The length of the pipeline would depend on the location of an injection site possessing underground geology appropriate for CO_2 storage. Over 3600 miles of CO_2 pipeline currently exist for enhanced oil recovery (EOR) operations, and over 500,000 miles of pipeline exist for natural gas transport. Nonetheless, the country's pipeline infrastructure would have to be expanded dramatically to accommodate large-scale CCS.

4. Underground Injection and Storage

Actual sequestration occurs by injecting the compressed CO_2 deep underground into suitable rock formations, generally those formations that are porous enough to allow storage of large quantities of CO_2 and that are overlaid by an impermeable "caprock" to prevent leaking.[38] An ideal formation would be one capable of sequestering ninety-nine percent of injected CO_2 for a period of 1,000 years.[39] When injected at high pressure to depths in excess of 3,000 feet, the compressed CO_2 is in a supercritical

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35. DOE's clean coal research and development project, FutureGen, provides funding for IGCC plants equipped with CCS technology. U.S. Dep't of Energy, DOE Announces Restructured FutureGen Approach, *available at* http://www.energy.gov/news/5912.htm (last visited Oct. 25, 2009).

36. Philip M. Marston & Patricia A. Moore, *From EOR to CCS: The Evolving Legal and Regulatory Framework for Carbon Capture and Storage*, 29 ENERGY L.J. 421, 435 (2008).

37. *See id.* While it is possible to transport CO_2 by truck or ocean tanker, pipelines will be necessary to support large, continuous sequestration.

38. A deep saline aquifer, underneath an impermeable "caprock," is the preferred geology in which to store CO_2 because of its size, porosity, and depth. Deep saline formations allow sequestration thousands of feet below the surface, far below drinking water sources or other extractable minerals. *Id.* at 439.

39. *Id.* at 436.

state—making the gas behave more like a liquid—which allows permeation and absorption in porous rock.[40] After absorption in an appropriate rock formation, sequestered CO_2 will rarely move vertically, and all testing has indicated that stored CO_2 is unlikely to escape.[41] However, injection and storage can continue in a particular location only as long as there is remaining available pore space.

Once it is determined that the location has reached capacity and has sequestered the maximum amount of CO_2, the hole will be "plugged" with cement. Plugging the hole post-injection should prevent one of the biggest risks associated with CCS: non-performance. A non-performing site is one that allows injected CO_2 to migrate or escape from its underground storage space into the atmosphere.[42]

5. Existing Operations

Often the most readily available injection sites are those formations in which EOR operations have occurred. EOR involves injecting compressed CO_2 to aid in oil recovery and has been widely used since the 1970s. The same porous formations in which oil is stored are often suitable for CO_2 storage.[43] The geology of an area where there has been oil recovery, including its porosity, is also usually well known. For these reasons, and because gas pipeline infrastructure already exists in many of these locations, CCS pilot projects have often been coupled with existing EOR operations.[44]

The largest capture and storage operation in the world is at the Sleipner gas recovery facility in the North Sea. The Sleipner project is part of a natural gas (NG) production operation off the coast of Norway. NG is mined from beneath the ocean floor but, as is often the case with NG

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40. *Id.* at 426.

41. *Id.* at 436.

42. The need to avoid non-performance—which refers to any escape of sequestered CO_2—is driven by resource and economic safety concerns. For example, non-performing injection sites could cost operators money in a carbon charge scenario, and escaping CO_2 could also pose risks to groundwater supplies. See *infra* Part II.B.2 for a discussion of the risks and property law questions raised by CCS.

43. At an EOR site, compressed CO_2 is injected into the pore space for the purpose of displacing oil particles so that the minerals can be recovered at the surface. *Id.* at 427.

44. Battelle, a global engineering and research firm that has taken the lead in CCS development, operates several demonstration projects utilizing existing EOR infrastructure. One such project, in northern Michigan, utilizes a natural gas processing plant that is connected by pipeline to a deep injection well. MIDWEST REGIONAL CARBON SEQUESTRATION PARTNERSHIP, MICHIGAN BASIN FIELD DEMONSTRATION BRIEFING, 4 (2007), *available at* http://216.109.210.162/userdata/Michigan/Michigan%20Basin%20Briefing%203-20-07.pdf.

recovery, the recovered gas contains a high percentage of CO_2.[45] In order to reduce the NG's CO_2 content to a combustible and marketable level, the CO_2 is removed.[46] The Sleipner project is unique because the CO_2 that must be removed is not emitted into the atmosphere; instead it is captured and injected into permeable rock formations beneath the ocean floor.[47] At present, Sleipner and other similar projects safely sequester several million tons of CO_2 that would otherwise escape into the atmosphere.

Excluding EOR and NG operations, there are few CCS demonstration projects operating today in conjunction with existing power plants. American Electric Power's Mountaineer power facility in New Haven, West Virginia will be the first commercial use of CCS in conjunction with a coal-fired power plant in the United States.[48] The power plant was retrofitted for post-combustion capture, which will allow its existing exhaust stacks to capture CO_2 for underground injection.[49] Although the Mountaineer plant will be the nation's largest, it is not expected to sequester more than two percent of the plant's annual CO_2 emissions.[50]

6. Markets for Expansion

There are several reasons that the interest in geologic storage projects will increase dramatically in the near future. As described above, it is likely that Congress or EPA will exact some price on CO_2 emissions in an effort to attack climate change.[51] CCS becomes cost-competitive quickly when there is a charge on currently unregulated carbon emissions.[52] Regulation would also spur, as the threat of a carbon price appears to have done, the

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45. *See generally* KATIE WALTER, LAWRENCE LIVERMORE NAT'L LAB., A SOLUTION FOR CARBON DIOXIDE OVERLOAD (2000), https://www.llnl.gov/str/Johnson.html (last visited Nov. 3, 2009).

46. *Id.*

47. *Id.*

48. Melanie Warner, *Is America Ready to Quit Coal?*, N.Y. TIMES, Feb. 15, 2009, at BU1.

49. The Mountaineer plant will use a "chilled ammonia" process, whereby exhaust is cooled to allow the CO_2 to be absorbed and removed by an ammonia-based solvent called ammonia carbonate. *Id.*

50. *Id.*

51. EPA has publicly stated that CO_2 and other GHGs constitute a danger to human health, and the agency is beginning rulemaking to regulate the emission of these gases. *See* Proposed Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act, 74 Fed. Reg. 18,886 (Apr. 24, 2009).

52. If carbon regulations reach thirty dollars per ton of emissions or higher, industry may choose to utilize CCS as opposed to pay for emissions. *See* MIT REPORT, *supra* note 8, at xi. Moreover, the world's largest CCS operation was prompted by European carbon markets. The Sleipner project off the coast of Norway removes excess CO_2 from natural gas recovery and then injects the excess CO_2 beneath the ocean floor. The sequestration project was a direct response to Norway's fifty dollars per ton charge on CO_2 emissions. Bill Jeffrey, *Carbon Capture and Storage: Promising Technology, But Many Legal Questions Remain*, 29 ENERGY & MIN. L. FOUND Ch. 1 (2008).

construction of new IGCC plants.[53] Thus, the potential for CCS greatly increases as more IGCC plants that can be readily configured for carbon capture come on-line.

II. UNRESOLVED LEGAL AND REGULATORY CONCERNS: BARRIERS TO CCS DEPLOYMENT

The market potential for industry-wide CO_2 capture is promising, but many important questions remain. Although CO_2 has been injected for EOR operations for decades, injection for the specific purpose of long-term storage has only recently been contemplated. Sequestration of a meaningful portion of climate-altering GHGs will necessarily require CCS in conjunction with the very largest emitters, coal-fired power plants. CO_2 injection for permanent storage is very different from EOR, both in purpose and magnitude. The statutes and regulations that govern EOR operations are inadequate to properly regulate CCS operations because they do not account for long-term liability or property rights determinations for storage in formations deeper than oil deposits.

This regulatory void between seemingly analogous but inadequate EOR regulation and non-existent CCS regulation will not just result in inadequate government oversight. A lack of consistent rules for CCS could also prevent the widespread use of this technology. Even if carbon markets help make sequestration profitable, we believe that industry sources may not immediately invest in the technology without confidence in a regulatory framework that specifically addresses CCS. Further, it is important to implement a regulatory structure to govern CCS when a carbon emissions market is instituted so that there will be no delay in industry investment.

This section will discuss rules governing property rights and post-injection liability and monitoring, two critical issues that must be addressed before CCS technology can be widely deployed. These issues could be characterized as direct barriers and indirect disincentives. While uncertain liability is a significant disincentive and a de facto barrier to CCS, some unresolved property rights issues represent more direct obstacles. The unresolved issues we examine in Part II will form the basis for our legislative recommendations in Part III.

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53. For example, American Electric Power has indicated that it will build more IGCC plants in the future, which would be equipped with capture technology. *See* Press Release, American Electric Power, Statement of Michael Morris, CEO (June 18, 2007), *available at* http://www.aep.com/newsroom/newsreleases/?id=1377 (describing the reasons his company has chosen to pursue IGCC technology).

A. Unresolved Property Law

1. Storage Space Ownership and Mineral Severance

Ownership of the right to the underground pore space in which CO_2 would be stored is the most important unresolved property law question applicable to CO_2 storage. Does a landowner have a right to use the pore space that extends to the center of the earth, which may be granted to or withheld from others? Do holders of mineral rights or other subsurface interests have the right to underground storage as well as underground extraction? Does the public benefit of sequestering GHGs justify public ownership? The case law on these questions is largely unsettled.

Two types of storage space are most promising for CO_2 storage: (1) deep saline aquifers; and (2) depleted oil and gas fields.[54] As discussed elsewhere in this article, in EOR operations, CO_2 is pumped underground to displace cavern space and push oil or natural gas to the surface to increase drilling yields. This is a long-established technique for oil and gas development and inadvertently results in CO_2 storage in depleted oil and gas fields.[55] Injections dedicated to storage in deep saline aquifers are generally much deeper than those for EOR, which raises new property questions. For example, deep saline injections occur thousands of feet below the surface, largely beyond any strata associated with mineral or natural resource extraction. This distinction is important to understand the proper legal framework for sequestration as a large-scale carbon emission mitigation strategy.

We first turn our attention to deep saline aquifers. There is no reasonable expectation that these deep saline deposits will ever be utilized for any purpose other than the permanent sequestration of CO_2. As such, we should first look to the *ad coelum* doctrine for guidance on storage space rights in these deep rock formations.

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54. Deep saline aquifers are deep formations that exist far below usable water or hydrocarbon resources. Mark de Figueiredo & Adeeb Fadil, *Emerging Property and Liability Issues for Carbon Sequestration*, Bloomberg Sustainable Energy Law Report, Sept. 2008, *available at* http://www.stblaw.com/content/publications/pub762.pdf.

55. "The amount of CO_2 that has been incidentally stored in this fashion over the last several decades dwarfs the volumes injected by CCS pilot projects around the world." Marston & Moore, *supra* note 36, at 424–25.

a. Reconsidering the *Ad Coelum* Doctrine[56]

U.S. v. Causby, a takings case, is the first modern re-examination of the *ad coelum* doctrine by the United States Supreme Court.[57] In *Causby*, landowners near an airport used by the military alleged that frequent low-level flights interfered with the reasonable use of their property, resulting in a taking.[58]

In defense, the U.S. Government pointed to an aeronautical statute that granted any citizen of the United States "a public right of freedom of transit in air commerce through the navigable air space of the United States."[59] This act defined "navigable air space" as "air-space above the minimum safe altitudes of flight prescribed by the Civil Aeronautics Authority."[60] The Court found that even though the flights did occur at or above the minimum safe altitude, a taking had occurred.[61] For the purposes of our examination, the important aspect of *Causby* is not the takings determination, but the abandonment of the *ad coelum* doctrine:

> It is ancient doctrine that at common law ownership of the land extended to the periphery of the universe—*Cujus est solum ejus est usque ad coelum*. But that doctrine has no place in the modern world. The air is a public highway, as Congress has declared. Were that not true, every transcontinental flight would subject the operator to countless trespass suits. Common sense revolts at the idea. To recognize such private claims to the airspace would clog these highways, seriously interfere with their control and development in the public interest, and transfer into private ownership that to which only the public has a just claim.[62]

The Court abandoned the traditional doctrine of *ad coelum* with this holding. The prudential concerns of modern air travel, and the need to navigate through countless tracts of what the common law had once

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56. BLACK'S LAW DICTIONARY 378 (6th ed. 1990) (translating "Cujus est solum, ejus est usque ad coelum" as ownership of land that extends from the absolute depths of the earth to the periphery of the universe).

57. *See generally* United States v. Causby, 328 U.S. 256 (1946); John G. Sprankling, *Owning the Center of the Earth*, 55 UCLA L. REV. 979, 1000–01 (2008) (outlining ambiguities in the *ad coelum* doctrine as used in the lower courts before *Causby*).

58. *Causby*, 328 U.S. at 259.

59. *Id.* at 260.

60. *Id.*

61. *Id.* at 267.

62. *Id.* at 260–61.

recognized as privately owned property, was held paramount. The court also looked to use and enjoyment to determine whether a taking had occurred.[63] Assuming the elements of trespass, nuisance, or a taking are present, flights that interfere with use and enjoyment would constitute an invasion of a property right.

As a result of *Causby*, property rights above a land estate are no longer infinite today. Airspace becomes public at a point where the needs of modern air travel begin and where private use and enjoyment is no longer jeopardized.

b. Does *Causby* Apply to Deep Saline Aquifers?

Deep saline aquifers, the rock formations in which much of the CO_2 would be stored, are not perfectly analogous to public airspace. However, elements of *Causby*'s *ad coelum* analysis arguably could apply at these extreme depths. The argument that in a modern air-travel age, the outer reaches of airspace can be reserved for public use is equivalent to the argument that in the modern age of climate change mitigation, the deepest depths can be reserved for the public good of carbon sequestration. Furthermore, similar to the consideration that public airspace begins where reasonable surface use ends, one can assert that public CO_2 storage rights begin where economically exploitable mineral reserves and non-CO_2 storage opportunities underground end.

There are three essential differences between the *Causby* example and an example of modern CO_2 sequestration in deep saline aquifers. First, there is no fundamental legislation designating pore space for the public, as there was at the time of *Causby* designating airspace. Second, when dealing with underground CO_2 sequestration options, the "public highway" analogy fails. Indeed, the storage space for a particular injection zone will be privately controlled, meaning that CO_2 will be sequestered in a specific geologic location and expected to remain there or migrate only slightly. Storage spots for different actors will presumably not be allowed to overlap significantly. And third, while public airspace utilized for air travel is infinite, saline aquifer space used for CO_2 sequestration is vast but finite and as a result is more likely to be characterized as an insular property right.

However, while sequestration in the deepest strata may not conflict with the doctrine of *ad coelum*, sequestration activity will occur at a

63. *Id.* at 264–65.

number of different strata. Therefore, a discussion of various real property rights conflicts is necessary.

c. Storage Rights in Depleted Oil and Gas Fields?

The second type of space for CO_2 storage is depleted oil and gas formations.[64] These storage spaces are shallower than deep saline formations and can hold valuable resources closer to the surface. Although there is some case law regarding the underground injection and migration of natural gas, hazardous waste, and other materials, there are a variety of open questions surrounding CO_2 injection into these spaces. Tied up in these questions are mineral rights and extraction right implications, the severability of estates, trespass implications, eminent domain, and other legal and policy doctrines.

Modern property grants can be written to explicitly grant or withhold the right to inject and perpetually hold CO_2 in pore space. As a fundamental rule, the language of any property grant is controlling.[65] However, the vast majority of mineral rights grants were authored prior to the development of CO_2 storage techniques and, in many cases, prior even to natural gas storage techniques. Not surprisingly, there are many conflicting decisions on the basic storage question of who owns the rights to the storage space once mineral recovery is complete. Some courts have held that the surface owner retains injection and storage rights, while others have held that the rights are part of the reasonably anticipated mineral grant.[66]

d. Conflicting Case Law on Storage

Ellis v. Arkansas is the most prominent federal case on the question of pore space ownership. In *Ellis*, the U.S. District Court for the Eastern District of Oklahoma reviewed the injection and storage of natural gas by an oil and gas easement holder underneath the property of a surface owner.[67] The court found that "the parties did not intend that the mineral

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64. We use "depleted oil and gas formations" as a general term referencing strata that are closer to the surface than deep saline and, unlike deep saline formations, contain valuable, extractable resources.

65. RESTATEMENT (THIRD) OF PROP.: SERVITUDES § 4.1 (2000).

66. These differing views are referred to as the "American rule" and the "English rule." The American view holds that the surface owner retains ownership of the pore space after minerals are extracted, while the English view holds that the mineral lease holder retains ownership of the depleted pore space. *See* de Figueiredo, *supra* note 54.

67. Ellis v. Arkansas, 450 F. Supp. 412, 414 (D. Okla. 1978).

interest owner should have injection, storage or occupation rights" beyond the right to extract.[68] Thus, *Ellis* stands for the proposition that after oil and gas extraction is complete pursuant to the grant or lease, the remaining "porous spaces" belong to the surface owner.

A Texas case, however, provides a different holding on pore space ownership. In *Mapco v. Carter*, the Ninth District Court of Appeals of Texas decided an appeal from a judgment for a surface property owner against a mineral rights owner whose extraction opportunities had been exhausted. The mineral rights owner converted the mineral estate into a storage estate by storing natural gas, petroleum, and other hydrocarbons within a salt dome formation.[69] Two holdings in *Mapco* directly conflict with the *Ellis* decision. First, the court held that "[an] interest in minerals is an interest in real property."[70] Therefore, according to the *Mapco* court, a mineral interest holder has not only a right to explore, extract, and exhaust, but also a real property interest in the underlying minerals that exist independent of any extraction.[71]

The *Mapco* court also directs attention to the Texas Natural Resources Code as an expression of legislative public policy preference supporting this view. The court understands the code to present a strong public policy endorsement of underground storage of "natural gas and other comparable minerals."[72] The Texas legislature in the Natural Resources Code took up the question of storage and mineral rights explicitly, requiring that a mineral owner acquire sixty-seven percent of the mineral rights before storage could begin.[73]

In *Emeny v. The United States*, the U.S. Court of Claims took a different view.[74] The U.S. government, through various means, had acquired a series of oil and gas leases in a prominent helium and natural gas deposit in Texas and at a later point began using the field for helium storage.[75] The court viewed the question in simple terms, looking directly to the language of the lease and noting that there was a right to extract and use natural gas and other minerals but not a right to import and store. The court also recognized a right to "reasonable use" but no right beyond "mineral

68. *Id.* at 420–21.

69. Mapco v. Carter, 808 S.W.2d 262 (Tex. App. 1991).

70. *Id.* at 274.

71. *See id*. at 277 ("[Texas has] virtually uniformly followed the rule of law that mineral owners retain and still possess and own an ownership interest after the underground storage facility has been constructed and completed or the stratum depleted.").

72. *Id.* at 278.

73. *Id.*

74. Emeny v. United States, 412 F.2d 1319 (Ct.Cl. 1969).

75. *Id.* at 1322.

exploration and production."[76] The court concluded that the right to use the formation as a storage space rests with the surface owners, not the mineral right holders.[77]

Tate v. United Fuel Gas Company is a West Virginia case that reinforces the conception that pore space storage rights are left to the surface owners after the exhaustion of extraction opportunities.[78] In *Tate*, the Supreme Court of Appeals of West Virginia determined that the defendants' claim to own the space was extinguished after the extraction of minerals, and therefore their right to inject and store gas was inadequate according to the language of the grant.[79] The court made an important distinction regarding the purpose and process of extraction: "[S]o long as there remain recoverable minerals which are mined in good faith, the space may be used by the owner of the minerals."[80]

The various holdings of these cases illustrate the lack of a consistent national view of pore space ownership with respect to mineral rights leaseholders. Various courts, utilizing various factors, have awarded gas storage rights to surface and mineral holders alike.

2. Migrating CO_2: Trespass and Nuisance

Liability for trespass created by migrating CO_2 is another unresolved property issue. Geologically stored CO_2 can migrate laterally, sometimes unpredictably, from its original storage location. The question then arises: how will the potential for trespass and nuisance play a role in CO_2 storage operations? We can get a glimpse of this operation of law from an underground trespass case involving natural gas and other substances.

Chance v. BP Chemicals provides an analysis that is useful in conceptualizing a trespass action in the CO_2 injection and storage context.[81] The issue in *Chance* was that "deepwell injection" of hazardous materials had allegedly migrated under the plaintiff's property. The plaintiff brought actions in trespass, strict liability tort, nuisance, negligence, and fraudulent concealment.[82] In most ways, the court resolved the case in the manner typical of nuisance and trespass actions by enumerating and analyzing the specific elements of the claims. However, no trespass was established, largely because of evidentiary issues:

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76. *Id.* at 1323.
77. *Id.* at 1325.
78. Tate v. United Fuel Gas Co., 71 S.E.2d 65 (W.Va. 1952).
79. *Id.* at 71–72.
80. *Id.* at 71.
81. Chance v. BP Chemicals, Inc., 670 N.E.2d 985 (Ohio 1996).
82. *Id.* at 992.

> Our ultimate conclusion that appellants did not prove an actionable trespass is dictated by considering the sum total of the circumstances of this case, as we have done in our foregoing discussion. Appellee operates the wells pursuant to required permits; appellants' subsurface property rights are not absolute and in these circumstances are contingent upon interference with the reasonable and foreseeable use of the properties; the trespass alleged is an indirect one and, due to the type of invasion alleged, physical damage or actual interference with the reasonable and foreseeable use of the properties must be demonstrated; appellants' trespass claim is a novel one, of a type previously unrecognized by any court. When all of the circumstances of this case are considered, appellants' evidence of trespass was simply too speculative.[83]

Chance recognizes, as this article suggests, that the American revisions to the *ad coelum* doctrine place limits on the extent to which a surface owner can claim absolute rights in the depths below his or her property. The court emphasizes the importance of land use in its analysis: "The owner of land owns as much of the space above him as he uses, but only so long as he uses it."[84]

In *Chance*, the court made its *ad coelum* analysis in this context by conceptualizing the native brine not as the outermost reaches of "useable" space for the purposes of the *ad coelum* doctrine, but instead as "waters of the state," a statutory term that connotes a substantial degree of public sovereignty.[85]

The findings in *Chance* have several implications for CCS analysis. First, absent the explicit satisfaction of the traditional trespass elements, trespass actions will be unavailable to surface owners alleging trespass and harm by adjacent owners injecting and sequestering CO_2. Second, and more importantly for our discussion, deep saline aquifer injection may have a partial common law *ad coelum* exemption without attendant legislation because deep saline aquifers and native brine can be considered "waters of the state," or waters over which the public has ultimate sovereignty.

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83. *Id.* at 993.

84. *Id.* at 992 (quoting Hinman v. Pac. Air Transp., 84 F.2d 755, 758 (9th Cir. 1936)).

85. *Id.* ("Our analysis above concerning the native brine illustrates that appellants do not enjoy absolute ownership of waters of the state below their properties, and therefore underscores that their subsurface ownership rights are limited.").

B. Post-injection Liability for Non-performance: What Are the Risks?

There are many potential sources of liability that storage operators may face after CO_2 is injected underground.[86] Unlike the direct legal obstacles to storage outlined in our discussion of property rights above, unresolved liability issues can be characterized as indirect disincentives to CCS development. Potential operators of carbon storage projects have identified liability as a primary barrier to CCS.[87]

For the purposes of this paper, post-injection liability for non-performing sequestration operations applies solely to the party who must make economic restitution should there be a failure to retain the CO_2 as originally sequestered. A non-performing CCS operation is one that has not properly sequestered CO_2,either by allowing the gas to seep out and return to the atmosphere, migrate onto the property of another, or contaminate groundwater resources. Each of these scenarios has the potential to cost the operator money through legal damage awards or contract-type damages for non-compliance with a sequestration agreement.[88]

Considering a projected charge of less than thirty dollar per ton of CO_2, the incentives established by carbon regulation alone may be insufficient to foster private-sector investment in CCS.[89] Industry will want clear guidance on liability issues, either as they relate to the injection phase or to the long-term sequestration stage. Our discussion of liability with regard to CCS operations is limited to on-site, post-injection liability due to non-performance, which includes CO_2 leaks that contaminate water supplies, contribute to seismic activity, or result in other adverse effects on human health or the environment.[90] This section discusses potential contract, tort, and statutory liability for CCS, including contract liability for non-

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86. Liability could encompass pre-injection or "operational" liability as well. Operational liability generally refers to liability that could arise during the capture, transport, and injection phases. Because liability during these phases is often related to legal issues such as trespass, nuisance, and pore space ownership, we address these issues in our discussion of property rights. *See supra* Part II.A.

87. JENNIFER JOHNSON, GREAT PLAINS INST., PROJECT DEVELOPER INTERVIEWS 2–3 (2008), *prepared for* The Midwestern Governors Association Renewable Electricity and Advanced Coal with Carbon Capture Advisory Group.

88. Liability for non-compliance with a sequestration agreement, which would arise from the regulation of carbon emissions, will be discussed later. *See infra* Part II.B.2.

89. Legal uncertainty could also prevent the immediate utilization of CCS after carbon markets are established. A cost of thirty dollars per emitted ton of CO_2 has been identified as a possible probable price point, beyond which CCS becomes profitable. MIT REPORT, *supra* note 8.

90. *See supra* Part II.A (examining property rights issues, pre-injection liability issues, and issues that could arise during the capture and transport phases).

attainment, and tort and statutory liability for adverse impacts on human health, property, and ecology.

1. Contract Liability for Non-Attainment

Potential contract liability for non-attainment could prove to be a significant barrier to the utilization of capture technology. Non-attainment refers to non-performance resulting in contractual, but not necessarily tort, liability. A sequestration site that allows CO_2 to seep out from underground, ultimately returning to the atmosphere as a GHG, could be classified as both a non-performing site and a non-attainment site.

More specifically, non-attainment would occur in the context of national regulation of carbon emissions. Under such a national regulatory scheme, energy companies would likely receive a financial credit expressly conditioned upon their effective sequestration of CO_2. This kind of regulation, which could make it more cost effective to put CO_2 in the ground than in the air, could incentivize CCS. However, regulated sources will also need to ensure that CO_2 will not escape, resulting in money loss for non-sequestered CO_2. For example, a federal regulation which puts a national cap on CO_2 emissions will likely require emitters to pay a charge for CO_2 emissions emitted in excess of their allowances. Any emissions credit or financial incentive for industry to sequester carbon will be dependant on its complete, safe storage.[91]

2. Tort Liability for Health and Environmental Hazards

There is legal uncertainty regarding liability for the environmental and human health hazards associated with CO_2 injection and storage, such as groundwater contamination and induced seismic events. The inherent risks surrounding CCS will probably be similar to those related to existing EOR and natural gas storage operations. While EOR and natural gas storage operations have been safely used for decades, risk management for CCS is a somewhat novel question due to the unprecedented quantities of gas that would be sequestered and the requirement of near infinite storage.[92]

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91. It is also important to note how critical it is that commercial CCS achieve near-perfect rates of sequestration. Even if commercial CCS reaches a seemingly high industry-wide sequestration rate of 99 percent, over half of the sequestered CO_2 would reach the atmosphere within 100 years. Sumit Som, *Creating Safe and Effective Carbon Sequestration*, 17 N.Y.U. ENVTL. L.J. 961, 970 (2008) (internal citations omitted).

92. A moderately sized power plant, at a 500-megawatt generation capacity, would produce two to three million tons of CO_2 byproduct each year. MIT REPORT, *supra* note 8, at ix.

There are several potential sources of liability in tort, using negligence, trespass, or strict liability theories. Although some of the issues we address are unlikely to occur or cause substantial harm, they are nonetheless factors that must be considered and insured against before a CCS plan is undertaken by industry.

a. Risk of Catastrophic Carbon Escape

Because CO_2 is toxic at high concentrations, some fear that escaping CO_2 from a non-performing sequestration site could poison surrounding air supplies, potentially harming humans and animals.[93] The threat of catastrophic escape is often cited as an argument against CCS demonstration projects. The Lake Nyos disaster of 1986, in which volcanic activity led to a massive release of naturally occurring CO_2 from beneath an African lake, is often mentioned.[94]

The Lake Nyos incident was an earth science anomaly and not analogous to commercial CCS storage. At Lake Nyos, volcanic activity beneath the lake led to a buildup of pure CO_2, which was sequestered in the deepest waters of the lake and eventually escaped in a large poisonous cloud.[95] By contrast, any atmospheric releases of CO_2 at a non-performing CCS site would be small and incremental, not likely to result in harm like that at Lake Nyos. Captured CO_2 is injected while in a supercritical state (with both gaseous and liquid characteristics) and is stored as it permeates porous rock.[96] Thus, the stored CO_2 is not sequestered in vast underground reservoirs, and it is unlikely that a massive cloud of CO_2 could escape.

Despite the low probability of such events, the perceived risk of catastrophic release must be addressed as a liability issue. It is the type of occurrence that operators and potential insurers will have to consider before undertaking a CCS operation.

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93. Air becomes toxic when the CO_2 content of it approaches ten percent by volume. A typical unit of air is composed of approximately 21% oxygen and .038% CO_2. IPPC SPECIAL REPORT ON CARBON DIOXIDE CAPTURE AND STORAGE 391 (Bert Metz et. al. eds., 2005), *available at* http://www.ipcc.ch/pdf/special-reports/srccs/srccs_annex1.pdf.

94. "A cloudy toxic mixture of carbon dioxide and water droplets rose violently from Lake Nyos, Cameroon, on Thursday evening, August 21, 1986, killing over 1,700 people and an unknown number of livestock and other animals, mostly while they slept." *Killer Lakes of Cameroon*, SECURITAS MAGAZINE, Nov./Dec. 2005, *available at* http://www.semp.us/publications/securitas_reader.php?SecuritasID=24 (last visited Oct. 23, 2009).

95. *Id.*

96. In some cases, after the CO_2 permeates the porous rock, it will actually solidify, becoming a carbonate component of the rock formation itself.

b. Groundwater Contamination

A more plausible risk associated with CCS is groundwater contamination at non-performing sites. If injected CO_2 "migrates" from its injection point and comes into contact with an underground aquifer, it can effectively poison the water supply by causing acidification or by displacing brine.[97] Moreover, the CO_2 stream that is injected underground may contain impurities and toxins that can affect groundwater quality.[98] Any injection activity that has the potential to impact drinking water supplies would also be regulated by the Safe Drinking Water Act, and operators could be held liable under the statute for any impacts to aquifers.[99] Thus, CO_2 injection operators could be liable *ad infinitum* in tort and pursuant to federal statutes for any leakage that contaminates groundwater supplies.[100]

c. Induced Seismicity

Injecting large quantities of foreign substances deep underground, especially in earthquake-prone regions, could potentially trigger seismic activity.[101] Some fear that massive quantities of CO_2 could expand within porous rock, increase pressure, and possibly lead to earthquakes.[102] Most geologists, however, have concluded that this type of harm is an improbable result of CCS injections. The risk of "induced seismicity" will not likely deter serious operators or investors, but is more likely to be used as a rallying cry by environmental groups and citizen activists who are opposed to CCS.

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97. This risk occurs when the storage space is below or adjacent to drinking water supplies. "[T]he potential exists for injection to force native brines (naturally occurring salty water) into [drinking water supplies]." 73 Fed. Reg. 43,491, 43,497 (proposed July 25, 2008) (to be codified at 40 C.F.R. pts. 144 & 146).

98. *Id.*

99. 42 U.S.C. § 300h (2006).

100. *See id.*; Comprehensive Environmental Response, Compensation and Liability Act, 42 U.S.C. §§ 9601–9675 (2006); Resource Conservation and Recovery Act of 1976, 42 U.S.C. §§ 6901–6992k (2006).

101. In 1962, two minor earthquakes were triggered in Colorado as a result of deep well injections. However, seismic triggers can largely be prevented by proper geologic surveys prior to injection. Joel Sminchak et al., *Issues Related to Seismic Activity Induced by the Injection of CO_2 in Deep Saline Aquifers* (2001), *available at* http://www.netl.doe.gov/publications/proceedings/01/carbon_seq/p37.pdf.

102. *Id.* at 2.

d. Subsurface Trespass

The inconsistent precedent with regard to pore space ownership described above leaves open a possibility for subsurface trespass liability. Trespass is an unprivileged entrance upon the land of another, either by one's own person or by some other object. Generally, a landowner's property includes not only surface area, but also the usable airspace above and the usable subsurface below.[103] This means that a surface owner could maintain a trespass claim for the extraction of minerals underneath his land that have not been severed and for any migration of artificial substances within the usable subsurface. Harm to the owner is not required to maintain such a claim, but such harm could increase the amount of compensable damages for trespass.

Because CO_2 has the potential to migrate beyond the intended storage location of the pore space, it is possible that injected CO_2 could "trespass" into the pore space owned by a neighbor. At least one court has stated that CO_2 migration could support a trespass claim, although the claim asserted was outside the court's scope of review.[104] CO_2 migration, moreover, could lead to significant economic damages, especially if the migrating CO_2 impacts aquifers or if the rights to use pore space becomes a valuable, tradable resource in the future.[105]

3. Insuring for Infinite CO_2 Storage

It is worth emphasizing the fundamental liability posed by *long-term* CO_2 storage. Because of the purpose of CCS—near infinite storage of CO_2—each of the potential sources of liability will extend in perpetuity. To be effective as a climate mitigation strategy, CO_2 storage must be near infinite, and thus contract, tort, and statutory liability will extend long after the injection ends. In fact, all sources of liability will probably outlive the original operators of the CCS operation, making the prospect of insuring against liability even more daunting for private insurers. In Part III, we propose solutions to this problem whereby state or federal agencies assume liability for CO_2 storage in limited circumstances.

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103. Common law trespass is based on the historic *ad coelum* maxim. BLACK'S LAW DICTIONARY 378 (6th ed. 1990) (defining "Cujus est solum ejus est usque ad coelum et ad inferos" to mean that ownership of land includes not only the land's surface, but the sky above and the land below the property). *See also supra* Part II.A.1.a.

104. LeBlanc v. EPA, No. 08–3049, 2009 WL 331557, at *4–5 (6th Cir. Feb. 12, 2009).

105. In a carbon-constrained economy, for example, the property right to use pore space that is suitable for sequestration may become valuable. Thus, any interference with another's pore space could lead to liability and economic damages.

III. RECOMMENDATIONS FOR A NEW REGULATORY FRAMEWORK

The uncertain risks associated with CCS activity, both contractual and tortious, compounded by the necessity of infinite storage, clearly show the need for a uniform regulatory framework to govern CCS. We begin Part III with a survey of the existing law and regulation that currently govern CCS projects, and proposed state laws. While none of the statutes described provide a complete framework to govern CCS, the current patchwork of regulations contains some valuable ideas.

After reviewing existing and proposed regulation, we provide a model regulatory framework consisting of the essential elements that will allow CCS to develop into a viable industry. Most importantly, we suggest a system of government assumption of liability and clear definitions of property rights. Our recommendations are by no means exhaustive, but they represent the most fundamental components that we believe will be necessary to support meaningful investment in, and deployment of, this burgeoning technology. Finally, we recommend the creation of a CCS utility that can quickly and effectively facilitate CCS and assure its ultimate success.

A. Examples of Existing and Proposed Federal and State Regulations

1. Federal Underground Injection Control Program

EPA's Underground Injection Control (UIC) program,[106] which was promulgated in 1974 under the Safe Drinking Water Act (SDWA), currently provides the only federal regulations for injections pursuant to CCS activity.[107] The UIC regulates all underground injections that could affect the quality of drinking water resources in the United States. The UIC regulates five categories of wells.[108] Current CO_2 storage operations are regulated as Class V "experimental" wells, as CO_2 injections do not qualify under the existing well classifications.[109]

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106. 42 U.S.C. §§ 300h–300j (2006).

107. 40 C.F.R. § 144.3 (2008).

108. *Id.* § 146.5.

109. Wells for EOR, meanwhile, are regulated under Class II. Class V is used as a catch-all classification for the injection of non-hazardous wastes, such as CO_2, that are not regulated in Classes I – IV. Under the regulations, CCS injections are "[i]njection wells used in experimental technologies." *Id.* at § 146.5(e)(15).

Although EPA has proposed new rules that would create a new classification to cover CO_2 injections,[110] the UIC rules are ill-suited for CCS. The UIC provides only a partial regulatory framework and neglects to address many of the attendant issues that would be involved in CCS activity. The UIC program is limited in scope by its enabling statute, the SDWA, which gives EPA broad authority to regulate activities that may contaminate drinking water supplies, but does not give EPA enough authority to regulate other aspects of CCS. For example, injection for CO_2 storage would likely occur in rock formations that are much deeper than the drinking water resources that are the object of the SDWA.

Because the UIC program and EPA's proposed rules are focused solely on preventing harm to drinking water supplies, these rules alone are an inadequate regulatory framework to govern CCS.[111] The proposed rules do not address many important issues, such as long-term liability, post-injection monitoring, and property rights questions.[112]

2. American Clean Energy and Security Act

On June 26, 2009, the U.S. House of Representatives passed the Waxman-Markey American Clean Energy and Security Act, a comprehensive climate bill without historical precedent.[113] The 1,400-page bill devotes an entire subtitle to CCS regulation.[114] The climate bill amends the Clean Air Act to require the Administrator to establish a coordinated approach to certify and permit sites where geologic sequestration of carbon dioxide will occur.[115]

To address the issue of liability, the bill amends the SDWA standards in section 1421(e)(2) to require a demonstration of financial responsibility for CO_2 sequestration wells. Specifically, the bill requires an operator to maintain evidence of financial responsibility for "emergency and remedial response, well plugging, site closure and post-injection site care."[116] The

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110. 73 Fed. Reg. 43,491 (2008).

111. *Id.* ("The Agency proposes to tailor existing UIC program components so that they are appropriate for the unique nature of injecting large volumes of CO_2 into a variety of geological formations to ensure that USDWs are not endangered.").

112. *Id.* at 43,492 ("The SDWA does not provide authority to develop regulations for all areas related to [CCS, such as the following:] capture and transport of CO_2; determining property rights (i.e., to permit its use for ground storage and for possible storage credits); transfer of liability from one entity to another; and accounting or certification for greenhouse gas (GHG) reductions." *Id.* at 43,492.

113. H.R. 2454, 111th Cong. (2009). At the time of article submission, the House of Representatives had just recently passed the bill, and the bill had yet to be heard in the Senate.

114. *See id.* at Title 1, Subtitle B.

115. *See id.* § 112(a).

116. *Id.* § 112(b).

operator may establish financial responsibility "in accordance with regulations promulgated by the [EPA] Administrator [in a combination of any method]: insurance, guarantee, trust, standby trust, surety bond, letter of credit, qualification as a self-insurer, or any other method satisfactory to Administrator."[117]

While passage of the bill would further the ultimate goal of mitigating America's impact on the climate through its detailed carbon cap-and-trade regime and move America toward a clean energy future, its proposed CCS regulation is not by itself a complete regulatory framework. The bill does not attempt to address, either explicitly or through a federal framework for the states, the important issue of property rights in storage space. As explained below, addressing this issue is essential for proper deployment of CCS. Generally, the bill defers many of the regulatory details to a later date. It requires the Administrator to assemble a task force within six months of enactment to review existing statutory language for use in regulating CO_2 sequestration.[118] Further, the Administrator must consult with the heads of other relevant federal agencies and submit a report to Congress. The report must set forth a unified and comprehensive strategy to address the key legal and regulatory barriers to the commercial-scale deployment of carbon capture and sequestration.[119]

3. Interstate Oil and Gas Compact Commission

In 2007, the Interstate Oil and Gas Compact Commission (IOGCC), a multi-state government agency that promotes recovery of domestic oil and natural gas resources, proposed the most comprehensive regulatory model for CO_2 storage to date.[120] Under the IOGCC model, the states, acting as long-term "caretaker[s]," administer a "cradle to grave" regulatory system.[121] The model addresses the three major phases of a CCS project: pre-injection licensing; the storage phase; and long-term monitoring and liability.

In the pre-injection phase, the IOGCC model statute proposes to extend the right of eminent domain to operators so that they would be able to "acquire all surface and subsurface rights and interests necessary or useful

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117. *Id.*

118. *See id.* § 113(a)(1).

119. *See id.* § 111.

120. *See generally* Interstate Oil and Gas Compact Commission (IOGCC), Storage of Carbon Dioxide in Geologic Structures: A Legal and Regulatory Guide for States and Provinces (2007), http://iogcc.publishpath.com/Websites/iogcc/PDFS/2008-CO2-Storage-Legal-and-Regulatory-Guide-for-States-Full-Report.pdf [hereinafter IOGCC Guide].

121. *Id.* at 12.

for the purpose of operating the storage facility."[122] Thus, the IOGCC statute would afford CO_2 storage the high status of public use, sufficient to support the taking of private property.[123]

In the storage phase, the IOGCC model specifies procedures for permitting and operating CO_2 storage project wells to "safeguard life, health, property and the environment."[124] Further, the model specifies design standards that prevent CO_2 migration from injection wells.

For long-term monitoring and liability, the model creates a two-stage approach: closure and post-closure periods. The IOGCC statute proposes a ten-year closure period from the time the well is plugged. During the closure period, the operator would be responsible for both operational and well-specific bonds. After ten years, the liability would transfer from the storage operators to the state government for the post-closure period. The goal of the state-held liability in the post-closure period is meant to "allow for regulatory certainty by the industry and help to promote the development of [future] carbon dioxide storage."[125] The IOGCC also suggests a storage tax to be levied on a per-ton basis on all injected CO_2. The storage tax, which individual states would determine, would support the state regulatory agency's long-term modeling.[126]

While the IOGCC model is the most comprehensive to date, it is useful only as a model and not as a sole basis for regulation. Because the IOGCC is a compact made up of state agencies, it not surprising that the model suggests that states are best equipped to administer all phases of the program, even the long-term liability. And, the model fails to specify the role of the federal government.

4. Wyoming

In 2008, Wyoming became one of the first states to enact legislation for the specific purpose of regulating CCS operations, as opposed to EOR injections. Wyoming addresses the pore space ownership issue by vesting ownership in depleted oil and gas fields in the surface owners and by stating that the conveyance of mineral rights alone does not sever the

122. *Id.* at 33 n.3 ("[T]he [IOGCC] Task Force has concluded that the amalgamation of property rights is absolutely necessary . . . to operate a carbon dioxide storage project.").

123. *Id.* at 34.

124. *Id.*

125. *Id.* at 35.

126. *Id.* at 34.

surface owners' rights to the pore space.[127] Wyoming law also clearly defines pore space as a property right that "can be used as storage space for carbon dioxide or other substances."[128]

As for liability, the Wyoming statute provides for the development of a bonding system to "assure adequate financial resources are provided to pay for any mitigation or reclamation costs that the state may incur as a result of default by the permit holder."[129] In the statute's detailed permit application requirements, the applicant must show proof of bonding or financial assurance for construction, operation, and closing.[130]

Furthermore, the Wyoming statute requires an element of transparency. For an industry and an activity like CCS, where procedures are new to most communities and risks are unmeasured, public and landowner notice is crucial. The Act requires proof of notice to landowners, mineral claimants and owners, and the community through newspaper publication.[131]

5. Kansas

The Kansas House of Representatives recently proposed an alternative route to promote and regulate CCS. Kansas House Bill 2419, introduced in 2008, sought to provide direct incentives for CCS development. For example, the bill would have exempted from property taxation "any carbon capture, sequestration or utilization property," as well as "any electric generation unit which captures and sequesters all of its carbon dioxide and other emissions." The bill would further incentivize CCS and establish an income tax deduction on the amortizable costs of carbon dioxide capture, sequestration, and utilized machinery for a total of ten years.[132]

As for the regulatory aspects of CCS, the bill would fully empower the State Corporation Commission (the state's oil and gas industry regulator) to promulgate all applicable rules, including rules for site selection criteria, design requirements, safety, closure, and long-term monitoring.[133] However, unlike legislation in Wyoming or the IOGCC, the bill did not provide for full or partial release of liability. The bill only covers the

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127. Thus, Wyoming has codified the American rule of surface ownership in depleted pore space. *See* WYO. STAT. ANN. § 34-1-152(a)–(b) (2009) (defining "pore space" as "subsurface space which can be used as storage space for carbon dioxide or other substances").

128. *Id.*

129. *Id.* § 35-11-313(g)–(k).

130. *See* § 35-11-313(g) (directing the state oil and gas supervisor and the director of public health to promulgate rules prior to September 30, 2009 for a financial assurance program for CCS operations).

131. *Id.* § 35-11-313(f).

132. *See* Kansas H.B. 2419, at 3, New Sec. 7(a).

133. *See id.* at 1, New Sec. 2(b).

liability issue by requiring that the permittee provide proof of financial assurance to cover closure of the permitted facility.[134]

B. Fundamental Attributes of an Effective Regulatory System

The existing and proposed laws and regulations discussed above contain valuable components, but none represents a complete framework for CCS. Ultimately, government involvement will be necessary if CCS is to become a viable technology capable of mitigating the effects of climate change. To effectively deploy CCS, federal and state agencies should not only fund and incentivize CCS projects, but should also take a role in ensuring long-term liability and defining property rights. This government enterprise needs to be a flexible and cooperative arrangement between the federal government and the states.

While the law of property rights, contracts, and tort liability is historically within the domain of the states, the impact of carbon dioxide emissions is national, and for that matter, global. The transport, storage, and attendant contracts will undoubtedly have an interstate character. For these reasons, we believe that a federal CCS framework would pass constitutional muster as a necessary and proper means of carrying out Congress's power to regulate interstate and foreign commerce and fulfill responsibilities under treaties with other nations. Nonetheless, states could implement most of these recommendations in the absence of federal action.

1. Delineation of Property Rights and Eminent Domain

The ownership of the two different categories of pore space—oil and gas fields and deep saline aquifers—is the most critical property rights question for CCS deployment. To provide certainty for industry and landowners, a legislative package should unequivocally resolve basic property rights issues. Such legislation must begin with a clear expression that: 1) the deepest geologic reaches are reserved as public space for the widespread sequestration of CO_2; and 2) surface owners retain ownership of depleted oil and gas storage space.

a. Deep Saline Aquifers as Public Space

As we noted in our earlier discussion of the *ad coelum* doctrine and its modern revisions, property rights to the air and subsurface cannot extend

134. *See id.* at 1, New Sec. 2(e).

infinitely in the face of modern necessity.[135] Where the reasonable use of marketable underground assets ends, the public space designated for deep saline aquifer sequestration should begin. Therefore, legislation should define deep saline injection sites as public space for the purposes of prolonged carbon storage. This conclusion is based on modern conceptions of the *ad coelum* doctrine and legal recognition that the current body of common law can consider deep saline aquifers to be waters over which the public already enjoys a degree of sovereignty. Further, legislation can follow the fundamental logic of the federal statutes that appropriated American airspace for the public good of regional and continental air travel for all citizens. The Air Commerce Act of 1926,[136] and the Civil Aeronautics Act of 1938,[137] today known as the Federal Aviation Regulations, led directly to the *U.S. v. Causby* challenge discussed earlier in this article. Those statutes purported to give the United States "complete and exclusive national sovereignty in the air space" over all of the nation's real property.[138] The statutes granted any citizen of the United States "a public right of freedom of transit [in air commerce] through the navigable air space [of the United States]."[139] The statute goes on to define "navigable air space" as "airspace above the minimum safe altitudes of flight prescribed by the Civil Aeronautics Authority."[140]

The Acts declared that "such navigable airspace shall be subject to a public right of freedom of interstate and foreign air navigation."[141] They did not declare that the public appropriation of air space that the legislation represented did not constitute a taking under the strictures of the Fifth Amendment to the Constitution. As discussed above, the court in *Causby* upheld this legislation as a necessary and appropriate exercise of federal regulatory authority in a modern age, finding that the *ad coelum* doctrine needed to be reexamined in the age of air travel.

We recommend similar legislation, a "public space" statute that would utilize two legal and prudential rationales to make deep saline aquifer space available for the purpose of carbon sequestration and storage: the modern *ad coelum* doctrine, and the "waters of the state" analysis. First, this

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135. *See supra* Part II.A. (noting that modern air travel has required a reconsideration of the common law *ad coelum* doctrine, which held that a surface owner held an absolute right to the airspace above his/her property).

136. Air Commerce Act, 44 Stat. 568 (1926) (repealed 1938).

137. Civil Aeronautics Act, 52 Stat. 973 (1938) (current version at 49 U.S.C. § 40103 (2006)).

138. 49 U.S.C. § 176(a) (2000) (superseded by 49 U.S.C. 40103(a) (2006)) ("The United States Government has exclusive sovereignty of airspace of the United States.").

139. 49 U.S.C. § 40103(a)(2) (2006).

140. *Id.* § 180 (repealed 1958).

141. *Id.*

legislation would declare all American deep saline aquifer space beyond a professionally determined "economic viability zone" available for CO2 storage, assuming proper permitting and that state authority had granted an entity such a right. It would be essential to determine accurately the proper limits of the "economic viability zone" to avoid creating a compensable Fifth Amendment taking. If, for example, the designated public space overlapped with available and economically exploitable oil and gas reserves, a takings claim could arise.

Regarding space beyond the "economic viability zone," Congress could make several declarations. The first is that at a particular depth the federal government, individual state governments, or a regional governmental entity would have complete sovereignty over deep saline aquifers for the narrow purpose of CCS. The statute should specify the purpose and extent of the CCS activity as well. Specifically, the statute should declare sovereignty for express and narrow public good purposes. Sequestration for the sake of climate change prevention or mitigation should be the only permissible purpose.[142]

Our discussion of the Air Commerce Act of 1926 and the Civil Aeronautics Act of 1938 is generally instructive in the carbon sequestration and storage context. However, one major difference between those statutes and the "public space" statute we propose is the public right concept. The Air Commerce Act of 1926 and the Civil Aeronautics Act of 1938 grant the right to use to the public at large, subject to the litany of aviation regulations that make air travel and aviation generally safe in America.

Although it contemplates a public good that is as significant as the commerce associated with air travel, this CCS "public space" statute will not confer a general public right because CCS projects will most likely be large, centralized, and regional—not distributed and accessible to the public. So, although we anticipate the creation of a public good, there will not be a public right to use. Accordingly, the "public space" legislation must contain carefully devised structures and procedures to allocate sequestration rights. These procedures must not confer the right to sequester in a manner that puts individual private gain over the public good.

An additional legal justification to reclassify deep saline sequestration resources for public use exists in common law approaches to water rights. The alternative legal rationale for this legislation centers on deep saline

142. Though the purpose must be express and limited, in our view no limitations need to be placed on the motivation and operation of the entity fundamentally responsible for the sequestration activity with regard to profit making. We advocate for the creation of a non-profit "regional sequestration authority," but in our view a profit motivation does not obviate the public necessity and good of sequestration activity for the purposes of climate change prevention and mitigation.

aquifers and the public right of sovereignty associated with water in longstanding common law. In Ohio, for example, case law has recognized public sovereignty over "waters of the state,"[143] including deep saline aquifers. In the water rights context, the "public space" legislation must balance the states' traditional sovereignty over water resources with the needs and expectations of surface owners.

Because local, state, and national governments have traditionally retained varying degrees of sovereignty over water resources, there is some justification for the claim that common law doctrines already grant a degree of public sovereignty over the deep saline aquifer sequestration resource. Therefore, a CCS "public space" statute would, in many instances, simply clarify what is already law.

Such a statutory declaration would alleviate the threat of trespass claims for sequestered CO_2 that migrates within a deep saline aquifer. If private ownership were to extend to these deep and otherwise unusable formations, any excursions through these formations that cross property lines thousands of feet above could create innumerable trespass cases. Further, vesting rights in deep saline formations in the public would prevent holdout landowners from obstructing storage activity.

b. Depleted Oil and Gas Fields

Legislation should further establish that the surface owner will retain ownership of all pore space not appropriated to the public. This conclusion is consistent with a majority of state cases that follow the American Rule,[144] as well as consistent with the Wyoming CCS statute.[145] An explicit legislative declaration would resolve a host of jurisdictional conflicts and bring much needed uniformity to modern mineral right property questions. As a direct property question, this is clearly legislation that individual state legislatures can develop and promulgate.

As a recognized "stick" in the bundle of property rights, pore space in depleted oil and gas fields can be transferred separately from mineral reserves and the rest of the surface estates. Nevertheless, CCS statutes cannot infringe on the freedom of contract between two private parties or explicitly supersede common law property rights. Therefore, a caveat to the rule needs to state that the surface owner holds pore ownership unless

143. *See* Chance v. BP Chemicals, Inc., 670 N.E.2d 985, 992–93 (Ohio 1996) (citing O.R.C. § 6111.01(h)) ("[W]aters of the state include all waters regardless of the depth of the strata in which underground water is located.").

144. *See supra* Part II.

145. *See supra* Part III.A.3.

explicitly reserved otherwise in a grant, lease, or other instrument. In those particular situations, however, the CCS legislation should also require that instruments effective as of the date of the legislation describe the transfer in detail, and that the appropriate local office record these instruments.

To promote CCS, it is important that the surface owner retains an interest in order to keep transaction time and cost at a minimum. Surface ownership of pore space allows the CCS operator or utility to only purchase the rights from the surface owner, as well as enter into a contract with the owner for the lease of the surface footprint. This rule will streamline transactions by eliminating the need for the CCS operator to negotiate agreements with both the surface and mineral rights holder.

c. Takings and the Use of Eminent Domain

To promote orderly development and maximize the usefulness of pore spaces, legislation should also establish eminent domain as a viable option for the gathering of subsurface sequestration and storage rights under a public use theory. Carbon sequestration and storage is the legal and technical cousin of geologic natural gas storage in several important ways. Currently, eminent domain powers are available to entities looking to store and transport natural gas. The public benefits associated with geologic carbon sequestration and storage should qualify the activity for similar regulatory treatment. Current law may not allow regulators or storage utilities to exercise this control. However, once legislation develops eminent domain authority, the legal issues and concepts associated with this appropriation will resemble those associated with natural gas storage leases.

Accordingly, it is essential to review the legal ramifications of seizure of storage sites through eminent domain and the takings arguments that may accompany government appropriation of deep well sites for CO_2 storage through the guise of the Natural Gas Act.

The Natural Gas Act (NGA) of 1938 was the first instance of direct federal regulation of the natural gas industry.[146] Concern about the exercise of market power by interstate pipeline companies prompted the NGA, which gave the Federal Power Commission (FPC)[147] the authority to set "just and reasonable rates" for the transmission or sale of natural gas in interstate commerce.[148] The NGA also gave FPC the authority to grant certificates allowing construction and operation of facilities used in

146. *See* Energy Information Administration, http://www.eia.doe.gov/oil_gas/natural_gas/analysis_publications/ngmajorleg/ngact1938.html.

147. Subsequently the Federal Energy Regulatory Commission (FERC).

148. Energy Information Administration, *supra* note 146.

interstate gas transmission and to authorize the provision of services.[149] The FPC may issue a "certificate of public convenience and necessity" under Section 7 of the NGA, allowing pipeline companies to charge customers for some of the expenses incurred in pipeline construction and operation.[150] Certificate holders must have control of the area prescribed in the certificate. If the holder cannot acquire control by contract, or is unable to agree with the property owner about compensation for the necessary land or other property and the necessary right-of-way to construct, operate, and maintain a pipeline or pipelines for the transportation of natural gas, the holder may acquire the property through exercise of the right of eminent domain.[151] In order to use the power of eminent domain that the Natural Gas Act grants, the company seeking to condemn property must meet several requirements: (1) that it is a natural gas company regulated by FERC pursuant to the Natural Gas Act; (2) that it holds a valid certificate of public convenience and necessity from FERC for the storage field where condemnation is sought; (3) that the easement sought is in the certificated geologic formation; and (4) that the affected real property is within the "map area" of the storage field defined by the certificate of public convenience and necessity.[152]

Early courts interpreting the Natural Gas Act's eminent domain power held that the granting of such power to federal district courts did not constitute a taking of private property for private use, nor was it an invasion of rights reserved to states.[153] Similarly, these courts held that Congress can constitutionally bestow a right of condemnation upon private licensees that develop national policy regarding the interstate movement of natural gas.[154] The Supreme Court addressed the constitutionality of eminent domain in dicta, citing with approval the Sixth Circuit's holding that the language of the Natural Gas Act included the power to condemn property for underground natural gas storage and not merely interstate transportation.[155]

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149. *Id*.

150. 15 U.S.C. § 717f(c)–(d) (2006).

151. *Id.* § 717f(d).

152. David D. Noble, *Ten Years of Federal Underground Gas Storage Condemnations*, ENERGY & MIN. L. INST. Ch. 26. § 26.06 (1993).

153. Thatcher v. Tenn. Gas Transmission Co., 180 F.2d 644, 648 (5th Cir. 1950).

154. *See* Williams v. Transcon. Gas Pipe Line Corp., 89 F. Supp 485, 487 (W.D. S.C. 1950) (noting *Thatcher* and other decisions affirming Congress's authority to grant eminent domain powers to private licensees); *see also* Gas Transmission Co. v. Thatcher, 84 F. Supp. 344, 345 (W.D. La. 1949) (ruling that the Natural Gas Act gave the Federal Power Commission authority to condemn a fifty-foot right-of-way to construct a pipeline).

155. *See* Schneidewind v. ANR Pipeline Co., 485 U.S. 293, 295 n.1 (1988) ("Petitioners argued that Storage was not a natural gas company within the meaning of the NGA, contending that the storage of gas constitutes neither the transportation nor the sale of gas in interstate commerce."). Both courts

Therefore, an analogous federal statute authorizing eminent domain for CCS is workable and constitutionally sound.

Similarly, CCS legislation should specify that a properly permitted operator or utility must acquire all surface and subsurface rights necessary for operating the storage facility, including easements and rights-of-way across lands. IOGCC developed similar language and policy in its model CCS regulation. Furthermore, as was necessary in the context of delineating property rights, eminent domain for CCS must be codified with language qualifying that it does not infringe on any other common law property rights.

2. Financial Assurance and Limitations of Liability

The other important aspect of any CCS legislation is a mechanism that shifts liability from private actors to public ones. Government-based assurance and insurance are important catalysts for effective deployment of CCS. Further, the statute should arrange a two-tiered financial assurance and liability regime, similar to the IOGCC model. The structure we propose has precedent in federal laws related to coal reclamation and nuclear power and will guarantee that CCS operators have liability coverage for both short and long-term contract and tort liability.

a. CCS Bonding: A Federally Structured and State Implemented Scheme

Since a major contributor to CO_2 emissions is the coal-fueled energy sector, it is appropriate that a financial assurance structure should reflect the very structure that assures proper reclamation of coal mining sites. While states could develop a CCS bonding program, a federal bonding program that is standardized yet flexible for the needs of state law is preferable. The Surface Mining Control and Reclamation Act (SMCRA) provides a useful model.

The SMCRA grants states "exclusive jurisdiction over the regulation of surface . . . mining,"[156] but provides that if a state fails to submit a program for approval, the program is not approved, or the Secretary of the Interior withdraws the approval because of the inadequacy of the program,

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rejected this argument. *See* ANR Pipeline Co. v. Schneidewind, 627 F. Supp. 923, 925–26 (W.D. Mich. 1985); *see also* ANR Pipeline Co. v. Schneidewind, 801 F. 2d 228, 230 n.3 (6th Cir. 1986) (The court reasoned that "transportation" includes the storage of natural gas by stating: "Underground gas storage facilities are a necessary and integral part of the operation of piping gas from the area of production to the area of consumption.").

156. Surface Mining Control and Reclaimation Act of 1977 § 503(a), 30 U.S.C. § 1253(a) (2006).

exclusive jurisdiction resides in the federal government.[157] Similarly, in the context of CCS liability and insurance, a primacy state could exclusively administer a federal standard.

Using actual language from the SMCRA, federal CCS bonding legislation would require a permitted CCS operator or utility to file a bond for performance, payable to the United States or to the state, conditioned upon faithful performance of all the requirements in the injection permit.[158] The bond would cover both the land where the operator would initiate injection operations and the subsurface storage location within the permit's initial term.[159] As the operator conducts succeeding injection and storage operations within the permit area, the permittee would file additional bonds with the regulatory authority to cover such increments. The amount of the bond required for each bonded area would depend upon the amount of CO_2 being injected.[160]

An important issue with any bonding system is the duration of the bond requirement. The IOGCC's model provides an exemplary solution to this problem. The model offers a closure period of liability under the bond for the duration of the injection operation and closure of the well, followed by a period of ten years.[161] The ten-year period would obligate best practices and monitoring by the operator who will bear the liability for that period, but would also give the operator certainty that its obligations have ceased.

The federal CCS bonding program would allow the same flexibility for individual states as under the SMCRA, where the Secretary of the Interior may approve as part of a state or federal program an alternative system that will achieve the objectives and purposes of the coal reclamation bonding program. While the alternative bonding system has arguably failed to assure proper reclamation in many instances and has been the subject of years of litigation[162] and state inaction,[163] such flexibility is necessary in the context of the burgeoning CCS industry to quickly address the country's contribution to global climate change.

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157. *See id.* § 1254(a).

158. *Id.* § 1259(a).

159. *Id.*

160. *Id.*

161. IOGCC Guide at 120.

162. *See* Pa. Fed'n of Sportsmen's Clubs v. Hess, 297 F.3d 310 (3d Cir. 2002) (discussing an Eleventh Amendment challenge to Pennsylvania's SMCRA alternative bonding program).

163. Ohio's alternative bonding program has been in violation of SMCRA's minimum standards since it gained primacy in 1983, and despite threats by the Federal Office of Surface Mining to take over and federalize the program, Ohio has yet to fully comply.

b. Federal Indemnity: The Price-Anderson Analogy

After a bond is released, however, there must still be safeguards for the indefinite life of the CO_2 storage area covered. The goal is to contain CO_2 well beyond the lifespan of even the most well-managed and sustainable corporate entity. If the federal government wants to deploy CCS quickly and successfully, it should look to its nuclear power policy for guidance. The risks associated with CO_2 storage are by no means analogous to nuclear power generation. Nevertheless, since large-scale CCS is undoubtedly new and its long-term liability implications are uncertain, the federal government should consider implementing an indemnity scheme similar to one it implemented to ensure the operation of nuclear power facilities.

First passed in 1957, the Price-Anderson Nuclear Industries Indemnity Act governs liability-related issues for all non-military nuclear facilities constructed in the United States.[164] The Price-Anderson Act was enacted with two primary goals: 1) to encourage private industry to invest in and produce nuclear energy; and 2) to provide a procedure for compensating the public for personal injury and property damage in the event of a nuclear incident causing personal or economic harm.[165] Prior to the Price-Anderson Act, the unavailability of private insurance had exposed licensees to potentially crippling liability and thus created a "roadblock" to the development of nuclear power.[166] Secondly, because an operator's resources might well be exhausted at an early stage, claimants had little assurance that they would in fact be compensated.[167] The Price-Anderson Act addressed those problems by requiring financial protection, providing for government indemnity, and limiting liability.

A governmental assumption of perpetual liability for CO_2 storage would withstand a constitutional challenge before the United States Supreme Court. The Price-Anderson Act faced a similar challenge in 1978 in *Duke Power v. Carolina Environmental Study Group*. In this case, a nuclear power company with permits to construct two plants in the Carolinas appealed a district court opinion allowing certain environmental groups standing to argue permitting and procedural violations. Specifically, the groups argued that the government failed to take into account the severity of a possible nuclear incident and its cost to the public, violating

164. The Price-Anderson Act is named for Congressman Charles Melvin Price (D-Ill.) and Senator Clinton Presba Anderson (D-N.M.), both of whom eventually chaired Congress's Joint Committee on Atomic Energy.

165. 42 U.S.C. § 2012 (2006).

166. S. REP. NO. 85-296, 85th Cong., 1st Sess. 1 (1957).

167. Duke Power Co. v. Carolina Envtl. Study Group, Inc., 438 U.S 59, 69–70 (1978).

the public's constitutional rights of Due Process and equal protection under the Fifth Amendment.[168] The Supreme Court reversed, concluding that the legislative record supported a policy of encouraging nuclear development in the private sector and that indemnifying insured nuclear operators in the manner specified in the Act was a reasonable and rational alternative to compensating injured plaintiffs under the common law.[169] Specifically, the Court found that congressional assurance of a $560 million fund in the event of an incident was reasonable in the face of an unpredictable recovery cost, and was not arbitrary considering Congress's commitment to "take whatever action is deemed necessary and appropriate to protect the public from the consequences of a nuclear incident."[170]

The provisions of the Price-Anderson Act were tested less than a year later when an incident occurred at the Three Mile Island nuclear facility near Harrisburg, Pennsylvania. A partial core meltdown caused the release of what later was found to be a minimal amount of radiation that had "a negligible effect on the physical health of individuals," and "the major health effect of the accident was found to be mental stress."[171] Nevertheless, the Price-Anderson Act authorized more than $70 million in settlements and direct distributions from primary insurance sources between the first day of the incident and 1997. These payments covered immediate and delayed economic and physical harm, funded evacuations, and established an area health fund.[172]

The impetus for the Act was that investors were unwilling to accept the then-unmeasured risks of nuclear energy without some limitation on their liability. The direct correlation with CCS and its relatively lower, yet still unmeasured, risks should be evident.

While the Price-Anderson Act has faced stark opposition from both environmental organizations and independent think tanks,[173] a federal indemnification program for CCS tailored after Price-Anderson is ideal for deploying CCS technology. Unlike nuclear power generation and waste

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168. *Id.* at 91.

169. *Id.* at 83.

170. *Id.* at 91.

171. JOHN KEMENY, REPORT ON THE PRESIDENT'S COMMISSION ON THE ACCIDENT AT THREE MILE ISLAND, 12 (1979).

172. AM. NUCLEAR SOC'Y, THE PRICE-ANDERSON ACT, at 3 (2005), http://www.ans.org/pi/ps/docs/ps54.pdf.

173. For example, the Cato Institute and other conservative research organizations oppose Price-Anderson, arguing that providing a safety net for nuclear facility owners and operators encourages negligence, and that some provisions in the legislation act to indemnify the Department of Energy and private contractors even in the face of gross negligence and willful misconduct.

storage, sequestering carbon is a low-risk venture. Creating a federal indemnity scheme will ensure that its transaction costs are low.

3. Creating a Sequestration and Storage Utility

Federal or regional authorities should establish a geologic sequestration utility (GSU) program to facilitate and manage the rapid expansion of geologic sequestration, particularly in saline formations. The utility concept, originally developed by the Midwest Governors' Association (MGA),[174] would create a new public utility for the purpose of coordinating, regulating, and perhaps insuring an expanding CO_2 storage industry. A CO_2 storage utility would provide additional certainty to potential CCS operators, and a system of government regulation could assure skeptical citizens of the safety and feasibility of underground storage. A GSU would allow one regional body to coordinate and deploy most of the duties and responsibilities of the CCS industry. The new utility would create certainty by offering a known CO_2 storage option.

There are several options for a storage utility. The MGA model envisions the creation of a new agency solely devoted to CO_2 storage regulation. The MGA's proposed GSU would have expansive powers and obligations. For example, the MGA model would assume full liability for CCS projects and responsibility for site monitoring, develop and maintain a system of pipelines to transport CO_2 for injection, and purchase and lease all property rights necessary for CCS development.[175] A GSU such as the one proposed by the MGA could be used to implement and enforce many of our recommendations for government assumption of liability, but it would also presuppose significant government involvement as a market participant in CCS.

Another option would be to create a similar administrative body with advisory, not regulatory, authority. An advisory body could still provide important assistance and counseling to operators regarding the most daunting aspects of CCS, including licensing, permitting, acquiring sufficient surface and subsurface property rights, securing storage credits pursuant to national CO_2 regulation, and managing long-term liability. Establishing an advisory body, however, would not require the federal

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174. The Midwest Governor's Association has developed a draft proposal for a geologic storage utility. MGA Geologic Carbon Storage Utility Design Recommendations (Draft), (Mar. 17, 2009), http://www.midwesterngovernors.org/MGA%20Energy%20Initative/Renewable%20Electricity,%20Advanced%20Coal%20with%20Carbon%20Capture/mtg6/GCS%20utility%20design%20recommendations_3-17-09.pdf.

175. *Id.*

government to become an active market participant as a buyer and seller of storage rights. Therefore, the federal government could implement this type of body as a temporary compromise to facilitate private development of CCS until Congress determines the full federal role in areas such as liability management. Moreover, an advisory-type utility could be housed within one of several existing administrative agencies such as the FERC, the Department of the Interior, or the EPA.

In sum, the fundamental goals of the utility concept could be achieved through either the creation of a new agency with broad powers to acquire and lease property and assume liability for CO_2 injections, or through a less powerful advisory council—or by an amalgam of the two. Most importantly, the utility concept frees existing utilities and industries from the task of becoming experts in a completely new activity outside their core business. CCS is a complex undertaking, and the utility's role would be to reduce its complexity and to establish transparent oversight of multiple projects in a region.

CONCLUSION

In the United States and around the world, coal-generated electricity is the single largest source of GHG emissions. There is now a general agreement within the industry and across the political spectrum that stopping or slowing the effects of climate change will require vast reductions in the amount of CO_2 that coal-powered generation emits. Yet there remains significant debate over how to achieve these reductions.

Some advocates suggest abandoning the ugly legacy of coal altogether, instead focusing solely on the development of renewable power generation. They argue that promoting advanced coal technology only deepens the world's dependence on a harmful commodity. There is no doubt that coal mining is a destructive process. Mining for power generation eviscerates mountaintops and poisons whole streams, while coal combustion fouls the air and warms the planet. The environmental and economic scars that coal mining has inflicted upon Appalachia alone will take generations to heal.

But, as we argued Part I, it is unlikely that we can replace the full amount of power generated by coal in the short term. Coal will almost certainly provide a significant percentage of the world's electricity for years to come. Global climate change, therefore, requires a new pragmatism. We do not have the luxury to hope that the world will abandon coal as an energy source in the near term; instead, we must promote the immediate,

widespread deployment of the technologies that allow for cleaner, carbon-neutral coal combustion.

Carbon capture technology represents the potential to reduce CO_2 emissions and mitigate the harmful effects of the greatest contributors to climate change. Scientists and geologists are confident that deep geologic formations can safely and permanently store colossal quantities of CO_2. What is needed now is an appropriate legal framework to govern CCS. Our recommendations focus on what we view as the most important components of such a framework: clear, consistent definitions of property rights and a liability-limiting system whereby private operators can undertake storage operations with confidence.

Cleaner, carbon-neutral coal-fired generation will be an important first step in solving the global climate crisis. By addressing the regulatory void surrounding CCS through legislation and rulemaking, we can allow this promising technology to flourish in the United States and ultimately enable CCS to reduce GHG emissions worldwide.

LINKING A UNITED STATES GREENHOUSE GAS CAP-AND-TRADE SYSTEM AND THE EUROPEAN UNION'S EMISSIONS TRADING SCHEME

James Chapman*

Abstract

The use of market mechanisms in general, and emissions trading in particular, is seen as one of the most cost-effective ways to reduce greenhouse gas pollution, and many signs suggest that a cap-and-trade scheme may be established in the U.S. in the next few years. Linking separate emissions trading schemes together can further drive down the costs of abating pollution by creating a wider market, but there are a number of issues—political, technical, and environmental—which can either prevent a link from being established or can cause a link to have harmful effects. This paper examines how easily a U.S. emissions trading scheme, designed along the lines of recent legislative proposals with input from industry leaders, environmental advocates, and the Obama administration, could be linked to the largest existing emissions trading scheme, the European Union's Emissions Trading Scheme (EU ETS). This paper concludes that very little or no harmonization is required on a number of issues, such as cost containment, allocation methodology, coverage and non-compliance penalties, and that the thornier issues of cap and price levels and offset use can either be resolved or do not present insurmountable hurdles given the potential benefits of establishing a link. The political economy of linking, in terms of the domestic pressures affecting governments seeking a link, is examined and, while a complex set of incentives face both the U.S. and the EU, it appears that overall a link is not merely possible but likely within a decade of the creation of a U.S. system. However, this paper strongly urges that the issues raised are considered by policymakers when crafting a U.S. ETS in order to facilitate linking in the long run.

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INTRODUCTION

Many signs point to federal legislation creating a cap-and-trade emissions trading scheme (ETS) for greenhouse gas (GHG) emissions in the United States being passed in the not-too-distant future, not least the American Clean Energy and Security Act of 2009 clearing the House of Representatives,[1] and a similar bill headed towards the Senate floor early in 2010.[2] Increased domestic and international pressure may be sufficient to overcome the concerns produced by current economic woes and produce significant efforts toward cutting emissions to a more responsible level. Cap-and-trade systems, for a variety of reasons,[3] have emerged as the preferred method of abatement control, harnessing market forces to accomplish emission reductions where they are least expensive.

The next step after creating functional cap-and-trade schemes is to link them together. The economic theory underlying the benefits of distinct market-based mechanisms can be applied to links established between ETS systems, whereby permits issued in one system are valid for compliance in another.[4] Linking systems together, resulting in harmonization of allowance prices, brings a number of benefits. Economically, creating a larger market with a wider pool of abatement opportunities reduces total compliance costs,[5] inefficiency of cross-country emission allocation,[6] and price volatility,[7] as well as increasing market liquidity.[8] Normatively, there is a desirable equity in developed countries with similar levels of contribution to GHG stocks in proportion to the economic benefits they

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1. *See generally* American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009) (as passed by the House of Representatives on June 26, 2009).

2. *See generally* Clean Energy Jobs and American Power Act of 2009, S. 1733, 111th Cong. (2009) (as introduced into the Senate, Sept. 30, 2009).

3. Nathaniel O. Keohane, *Cap-and-Trade, Rehabilitated: Using Tradable Permits to Control U.S. Greenhouse Gases*, REV. ENVTL. ECON. POLICY, Winter 2009, at 42.

4. Niels Anger, *Emissions Trading Beyond Europe: Linking Schemes in a Post-Kyoto World*, 30 ENERGY ECONOMICS 2028, 2042 (2008).

5. *Id.* at 2046.

6. Adam Diamant, Manager of Econ. Analysis, Elec. Research Power Inst., Linking Global GHG Emissions Trading Markets: Issues and Approaches 6, 14 (Mar. 20, 2007), http://globalclimate.epri.com/PDF/Adam_Diamant_Linking_CCAR_Linking_Panel.pdf; BJART J. HOLTSMARK & DAG E. SOMMERVOLL, INTERNATIONAL EMISSIONS TRADING IN A NON-COOPERATIVE EQUILIBRIUM 22 (Statistics Norway, Research Dep't 2008), *available at* http://www.ssb.no/publikasjoner/DP/pdf/dp542.pdf.

7. VIVID ECONOMICS, OFFICE OF CLIMATE CHANGE, CARBON MARKETS IN SPACE AND TIME 5 (2009), *available at* http://www.vivideconomics.com/docs/Vivid%20Econ%20Carbon%20Markets.pdf.

8. *Id.* at 13.

have reaped from this pollution facing the same price on carbon.[9] Institutionally, there will be economies of scale in the provision of market infrastructure, such as trading platforms and standardized contracts.[10] Politically, this "bottom-up"[11] approach is becoming increasingly popular as a potential architecture for a global climate change regime, especially in the wake of the failed negotiations at Copenhagen in December 2009. This architecture does not require the consensus of an international agreement but rather bilateral/multilateral negotiations in which agreement can more easily be reached and that, in the process, help to lock in unilateral targets.[12] This is possibly the most realistic path to a unified international approach in the future.[13] This paper does not seek to support or question these benefits, which are assumed from the basic premise that linking, if correctly implemented, is generally desirable from the perspective of international climate policy.

Several proposals for a cap-and-trade system in the United States have been made and much ink has been spilled on analysis of these schemes on their own merits: how effectively they achieve their stated goals, the costs generated by the regulation, distributional effects, and so on. In contrast to this, given that linkage is explicitly contemplated by all the proposals,[14] comparatively little has been said either in academic analysis or, more

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9 United Nations Framework Convention on Climate Change (UNFCCC), art. 3(1), FCCC/INFORMAL/84 GE.05-062220 (E) 200705 (1992).

10. Guy Turner, *The Missing Link: Linking Emission Trading Schemes*, *in* INTERNATIONAL EMISSIONS TRADING ASSOCIATION GREENHOUSE GAS MARKET REPORT 2008: PIECING TOGETHER A COMPREHENSIVE INTERNATIONAL AGREEMENT FOR A TRULY GLOBAL CARBON MARKET 136, 137 (Kim Carnahan ed., 2008).

11. CHRISTIAN FLACHSLAND, OTTMAR EDENHOFER, MICHAEL JAKOB & JAN STECKEL, POTSDAM INS'T FOR CLIMATE IMPACT RESEARCH, DEVELOPING THE INTERNATIONAL CARBON MARKET: LINKING OPTIONS FOR THE EU 3 (2008), *available at* http://www.pik-potsdam.de/members/edenh/publications-1/carbon-market-08.

12. Wolfgang Sterk, Michael Mehling & Andreas Tuerk, *Prospects of Linking EU and U.S. Emission Trading Schemes: Comparing the Western Climate Initiative, the Waxman–Markey and the Lieberman–Warner Proposals* 2 (Apr. 24, 2009), *available at* http://climatestrategies.org/our-reports/category/33/143.html (follow "Download Now!" hyperlink); Christian Flachsland et al., *To Link or Not to Link: Benefits and Disadvantages of Linking Cap-and-Trade Systems*, 9 CLIMATE POLICY 358, 364 (2009).

13. *Nations May Form Global Carbon Market Without U.N. Deal*, REUTERS, June 12, 2009, http://www.reuters.com/article/environmentNews/idUSTRE55B67V20090612; Christian Flachsland, Ottamar Edenhofer & Robert Marschinski, *Global Trading Versus Linking: Architectures for International Emission Trading* 19 (Dec. 2, 2008), *available at* http://www.pik-potsdam.de/members/flachs/publikationen/linking-architectures-working-paper.

14 Dingell–Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. §§ 712(c)(3)(B), 761(a) (2008); America's Climate Security Act of 2007, S. 2191, 110th Cong. §§ 2501–2502(a) (2007); Low Carbon Economy Act of 2007, S. 1766, 110th Cong. § 501(d) (2007); American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 728(a)(2) (2009); Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. § 722(d)(3) (2009).

worryingly, in political discussions about how easily any of the proposed systems could be linked to other emissions trading systems, of which there is a steadily increasing number. The European Union's Emissions Trading Scheme (EU ETS) is the largest and highest-profile example,[15] and several countries plan to use emissions trading to help them achieve their goals under the Kyoto Protocol (Australia, Japan, and New Zealand, for example), and numerous initiatives have demonstrated domestic interest and capacity in the U.S., such as the Regional Greenhouse Gas Initiative (RGGI), the Western Climate Initiative (WCI), California Assembly Bill (AB) 32, and the Chicago Climate Exchange (CCX).[16] The aim of this paper is to examine how easily a federal U.S. ETS scheme could be linked to the EU ETS, creating the backbone of a de facto global carbon market,[17] given the benefits that such a link stands to produce.

This paper takes as its hypothesis that the likely elements of the U.S. ETS scheme, outlined in Section I, can be distilled from certain sources. Of the many proposals placed before Congress to date,[18] I consider the Discussion Draft for climate legislation released by Congressmen Dingell and Boucher (Dingell–Boucher),[19] the Lieberman–Warner Climate Security Act (Lieberman–Warner),[20] the Low Carbon Economy Act of 2007 (Bingaman–Specter),[21] and, most crucially, the recent American Clean Energy and Security Act of 2009 (Waxman–Markey), which passed the

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15. In 2008, the EU ETS represented 67% of the volume and 81% of the value of the global carbon market.

16 *See generally* RICHARD L. REVESZ, PHILIPPE SANDS & RICHARD B. STEWART EDS., ENVIRONMENTAL LAW, THE ECONOMY, AND SUSTAINABLE DEVELOPMENT: THE UNITED STATES, THE EUROPEAN UNION AND THE INTERNATIONAL COMMUNITY (2000) (analyzing environmental regulation in legal and political systems using examples from the United States, European Union, and international community); Press Release, Jos Delbeke, Deputy Director General, DG Env't, Introductory Remarks at the ICAP Global Carbon Market Forum: Putting the Emerging Global Carbon Market on a Solid Footing 3 (May 19, 2008), http://www.icapcarbonaction.com/index.php?option=com_content&view=article&id=6%3Awhat-is-icaps-goal&catid=2%3Apress-release&Itemid=34&lang=en (noting that the precursors for all of these schemes exist in emissions trading programs in the US).

17. Sterk et al., *supra* note 12; MARK LAZAROWICZ, GLOBAL CARBON TRADING: A FRAMEWORK FOR REDUCING EMISSIONS 44 (2009).

18 RESOURCES FOR THE FUTURE, SUMMARY OF MARKET-BASED CLIMATE CHANGE BILLS INTRODUCED IN THE 110TH CONGRESS 1 (Oct. 31, 2008), *available at* http://rff.org/News/Features?Documents/ccBills110thCongress.pdf.

19. *See generally* Dingell–Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. (2008) (introduced into the House of Representatives on Oct. 7, 2008).

20. *See generally* America's Climate Security Act of 2007, S. 2191, 110th Cong. (2007) (introduced into the Senate on Oct. 18, 2007).

21. *See generally* Low Carbon Economy Act of 2007, S. 1766, 110th Cong. (2007) (introduced into the Senate on July 11, 2007).

House of Representatives by a margin of 219–212 in June 2009,[22] and the Clean Energy Jobs and American Power Act introduced in the Senate by Senators Kerry and Boxer (Kerry–Boxer).[23] I will examine these in the light of public statements made by President Obama, his staff and members of the new administration, the most recent report on climate markets by the Government Accountability Office, and the U.S. Climate Action Partnership (USCAP) Blueprint for Legislative Action of 2009, which builds on the USCAP Call to Action from 2007.[24] Given the list of those who have already signed onto the USCAP document (including Duke Energy, Shell, BP, and Ford, as well as the Natural Resources Defense Council, Environmental Defense Fund, and World Resources Institute),[25] it is a fairly reliable indicator of the compromise demands of the large emitters and major players from the environmental lobby, whereas the others (especially Waxman–Markey for the House and Kerry–Boxer for the Senate) can be seen as reliable indicators of the strands of thought in Congress.

Three caveats to the use of these sources are the lack of clear and widespread public debate on the issues contained therein, the effect that the current economic situation—including its knock-on effects such as reduced oil prices—will have on these provisions, and the failure of all but one proposal to gain legislative support to date.[26] As to the first, the price and allocation method rather than the intricacies of the system will figure most prominently in any public discourse, rendering many of the points discussed below relatively unaffected by discussion in the media. As to the second and third, the low level of deviation of the USCAP Blueprint from the USCAP Call to Action, and Waxman–Markey (successfully passed by the House of Representatives) and Kerry–Boxer from previous legislative attempts, provides signs of hope that effects of the economic climate on the U.S. ETS will not be too severe and that the political atmosphere is now ripe to pass legislation previously seen as nonviable.

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22. *See generally* American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009) (approved by the House of Representatives on June 26, 2009).

23. *See generally* Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. (2009) (introduced in the Senate on Sept. 30, 2009).

24. *Comprehensive Regime, Ambitious Goals, in Waxman–Markey*, EXECUTIVE COUNSEL, Sept.–Oct. 2009, at 28, *available at* http://www.hunton.com/files/tbl_s47Details%5CFileUpload265%5C2678%5CExecCounsel_SeptOct2009_Waxman-Markey.pdf.

25 U.S. CLIMATE ACTION P'SHIP, A BLUEPRINT FOR LEGISLATIVE ACTION 25 (2009), *available at* http://www.us-cap.org/pdf/USCAP_Blueprint.pdf.

26. This includes not just the credit crisis and its knock-on effect but reduced oil prices in particular.

In Section II, I sketch out the salient corresponding features of the EU ETS based on the current plans for Phase III stemming from the EU ETS Review. In Section III, I examine the obstacles to linking systems together that have been suggested by the recent literature that would force a choice between not linking, harmonizing, or accepting differences,[27] before moving on to application of this theory in Section IV to a proposed link between the EU ETS and the U.S. ETS. Section V examines the politics of linking negotiations from several viewpoints. The Appendices provide greater detail on how the U.S. ETS and EU ETS in Sections I and II were constructed.

This paper concludes that a number of potential issues are resolved even before linking negotiations begin, due to the similarity of the two schemes in many respects. Both have mid- and long-term cap levels set, allowing high levels of investor trust and certainty. Coverage is wide enough in both systems to both demonstrate a serious commitment to abatement and encompass many competing carbon-intensive industries. The EU ETS will not be entirely dwarfed by its U.S. counterpart, and the disparity in size will wane with time. Auctioning has an increasing role in both systems, and both have chosen fixed rules over regulatory discretion. Both systems use the same basic units and the same Global Warming Potential (GWP) rates (used to compare the harm caused by different GHGs) from the Intergovernmental Panel on Climate Change (IPCC). Penalties for non-compliance will be similar in magnitude and type. Monitoring, reporting, and verification (MRV) will be high quality and rigidly enforced in both jurisdictions. Cost containment provisions are very similar, function according to fixed rules, and maintain environmental integrity. Both systems recognize the need to maintain the high quality of domestic and international offsets and reduce leakage as much as possible.

Despite these fortuitous examples of dovetailing, many thorny issues remain, most notably the cap levels and thus price paths. The EU ETS will probably have a consistently higher price than the U.S. ETS. As a result, both sides will experience a complex matrix of incentives regarding linking,

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27. This paper does not examine the legal aspects of creating a binding linking mandate between the EU and the U.S. from a legal perspective. *See* Sterk et al. *supra* note 12, at 23, 26–27; *see also Commission Staff Working Document Accompanying Document to the Proposal for a Directive of the European Parliament and of the Council Amending Directive 2003/87/EC So As to Improve and Extend the EU Greenhouse Gas Emission Allowance Trading System*, at 137, COM (2008) 16 final (Jan. 23, 2008) [hereinafter *Commission Staff Working Document*]; WILLIAM BLYTH & MARTINA BOSI, INT'L ENERGY AGENCY, LINKING NON-EU DOMESTIC EMISSIONS TRADING SCHEMES WITH THE EU EMISSIONS TRADING SCHEME 12 (2004) (noting the fact that the anticipated link cannot be operational before 2013 removes the problem of the legal structure of AAU transfers between Kyoto parties and non-parties).

depending on how the role of entities in the market (net buyer or seller) would change, how environmental groups perceive the politics underlying the link (subsidizing a sub-standard scheme or minimizing costs), and how governments will react to transatlantic wealth transfers. The level of offset use relative to the required reductions (supplementarity) may demonstrate a fundamental difference in ideology underlying the schemes, hinting at deep incompatibility, although the market reality of limited offset supply will count more toward encouraging linking than the limits will be able to discourage it.[28]

Bearing these similarities and differences in mind should be close to the forefront of policymakers' thoughts when designing and debating the U.S. ETS. Undoubtedly, such a system should consider domestic concerns to a large degree, and the structure of any system will inevitably reflect a delicate domestic political balance. However, given knowledge of the benefits linking has to offer and the likelihood of a global carbon market in the long-term, hurdles can be removed before their creation, as the U.S. ETS is still in embryonic form and thus susceptible to criticism from a linking perspective.[29] As all the proposed schemes explicitly permit allowances from other ETSs to be used for compliance, it would be at best unwise and at worst arrogant not to seriously contemplate prospects for linking in a system's construction.

The role of an international agreement in facilitating linking should not be understated. It would reduce many tensions over price paths and other more troubling issues that afflict both jurisdictions independently of the link but which could be inflamed by linking. This paper concludes that, once sufficient time has passed for both schemes to demonstrate institutional security, maturity, and market stability, a link is not only possible but probable within a decade, although it will start out as a limited link.

I. THE U.S. ETS

It should be stressed that the nature of this hypothetical U.S. ETS is not the main thrust of this paper's analysis; rather, it is used as a tentative basis for the study of linking possibilities. It is hoped that the examination of linking in the following sections sufficiently allows for assessing schemes

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28. Joe Delbeke, *The Potential Magnitude of Offset Demand in the Early Years*, CARBON MARKET N. AM., June 19, 2009, at 6, *available at* http://www.pointcarbon.com/polopoly_fs/1.1142246!CMNA20090610.pdf; *Industry Fears Offset Demand Can't Be Met*, CARBON MARKET N. AM., June 5, 2009, at 4, *available at* http://www.pointcarbon.com/polopoly_fs/1.1132316!CMNA20090605.pdf.

29. LAZAROWICZ, *supra* note 17, at 46.

that deviate from this U.S. ETS. The analysis behind this sketched outline of a U.S. ETS can be found in Appendix 1. Insofar as common features and themes could be found in the examined sources, they have been blended together to create an ETS that is both adequately detailed for examination from a linking perspective and a reasonable approximation to the likely federal system.

The U.S. ETS will require reductions below a 2005 baseline of 3% at the start of the scheme in 2012, 17%–20% in 2020, 42% in 2030 and 83% in 2050. The price path will begin in the middle of the $13–$30 range and ramp up toward the top of that range over the following decade, following the same path after that.[30] Compliance periods (blocks of years within which borrowing and banking rules are different from such rules between the blocks) will not be officially used, although there will be a regular review of the mechanism to assess its adequacy and different borrowing rules for different vintages, which may together demonstrate similar characteristics to commitment periods.[31] The U.S. ETS will cover at least 80% of GHG emissions from multiple gases over the course of 2012–2050, with a hybrid system regulating partly upstream (for transportation) and partly downstream (for large stationary sources).[32] Free allocation, using a mix of updated and historically benchmarked allocations, will be dominant at the outset, but in the long run the scheme will move from 20% auctioning at the outset toward full auctioning, rising by approximately 10% per decade. Strict regulation of free permit recipients will prevent significant incentive distortions resulting from free allocation.[33]

The facility to bank allowances will be unlimited.[34] Some short-term borrowing may be allowed, but mid-term borrowing will be restricted and

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30. ENVT'L. PROT. AGENCY, ANALYSIS OF THE AMERICAN CLEAN ENERGY AND SECURITY ACT OF 2009, H.R. 2454 IN THE 111TH CONGRESS, 3 (June 23, 2009), http://www.epa.gov/climatechange/economies/pdfs/HR2454_Analysis/pdf; *Obama Pressures Congress to Draft Carbon Cap-and-Trade Law*, CARBON MARKET N. AM., Feb. 27, 2009, at 1, *available at* http://www.pointcarbon.com/polopoly_fs/1.1066754!CMNA20090227.pdf; CONGRESSIONAL BUDGET OFFICE, COST ESTIMATE, H.R. 2454 AMERICAN CLEAN ENERGY AND SECURITY ACT OF 2009 AS ORDERED REPORTED BY THE H. COMM. ON ENERGY AND COMMERCE ON MAY 21, 2009, at 13 (June 5, 2009) [hereinafter CBO], http://www.cbo.gov/ftpdocs/102xx/doc10262/hr2454.pdf.

31. LAZAROWICZ, *supra* note 17, at 82.

32. CBO, *supra* note 30, at 5; U.S. CLIMATE ACTION P'SHIP, *supra* note 25, at 7.

33. A. Denny Ellerman, *Lessons for the United States from the European Union's CO2 Emissions Trading Scheme*, *in* CAP-AND-TRADE: CONTRIBUTIONS TO THE DESIGN OF A U.S. GREENHOUSE GAS PROGRAM 15 (2008) [hereinafter Ellerman in CAP-AND-TRADE].

34. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 725(a)(1)–(2), (c)(1) (2009); America's Climate Security Act of 2007, S. 2191, 110th Cong. § 2101 (2007); Low Carbon Economy Act of 2007, S. 1766, 110th Cong. § 103(a)(2) (2007); *see* Dingell–Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 715(a) (2008) (unlimited banking is subject to the Administrator requiring eventual retirement).

long-term borrowing will not be permitted at all.[35] A price ceiling that maintains environmental integrity will be instituted, such as a strategic allowance reserve, but set at a high price that can be triggered only by severe short-term price spikes.[36] There will be an auction reserve price, although it will be set below the lowest predicted bound of the price path.[37] There will be no unlimited safety valve. Market intervention measures will be limited to fixed rules rather than the exercise of administrative discretion.

Given cap levels, the use of offsets from domestic and international schemes will have lenient limits of 20%–30% compliance. There will be qualitative limits on all offsets and a conversion ratio of around 5:4 so that more offsets have to be surrendered than the amount emitted starting a few years into the scheme.[38] Links will be sought with other cap-and-trade systems that are at least as stringent as the U.S. ETS, with no limits on the use of such allowances.[39]

Non-compliance will be punished with a significant fine tied to allowance prices and a make-good provision.[40] MRV requirements will be strict and rigorous, requiring annual reporting that would be made public as soon as practically possible.[41] Unless a satisfactory international agreement is implemented, some border adjustment provision will be necessary in the future so that carbon-intensive products imported into the U.S. that are produced in a country without capped GHG emissions will require the surrender of special allowances to cover these emissions.[42]

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35. U.S. CLIMATE ACTION P'SHIP, *supra* note 25, at 8; U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, INTERNATIONAL CLIMATE CHANGE PROGRAMS: LESSONS LEARNED FROM THE EUROPEAN UNION'S EMISSION TRADING SCHEME AND THE KYOTO PROTOCOL'S CLEAN DEVELOPMENT MECHANISM 56 (2008).

36. *E.g.*, H.R. __ § 715(c)(2); S. 2191 § 2301; H.R. 2454 § 725(c)(1)–(2).

37. *E.g.*, H.R. __ § 716(c)(2); H.R. 2454 § 726(c)(2).

38. U.S. CLIMATE ACTION P'SHIP, *supra* note 25, at 9.

39. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 728(c)(2)(A) (2009); Dingell–Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 761(a) (2008); America's Climate Security Act of 2007, S. 2191, 110th Cong. § 2501 (2007); Low Carbon Economy Act of 2007, S. 1766, 110th Cong. § 501(d) (2007).

40. *E.g.*, S. 2191 § 1203(a)(2)(B)(i), (ii); H.R. 2454 § 723(b)(2); H.R. __ § 715(c)(1); S. 1766 § 602.

41. *E.g.*, H.R. 2454 § 713(b)(1)(N), (b)(2); H.R. __ § 703(b); S. 1766 § 601; S. 2191 §§ 1103(a), 1105(8).

42. *Climate Deal Key to Avoiding Carbon Tariffs: US Trade Official*, CARBON MARKET N. AM., Apr. 17, 2009, at 4, *available at* http://www.pointcarbon.com/polopoly_fs/1.1099451!CMNA20090417.pdf.

II. THE EU ETS[43]

The details of Phase III of the EU ETS, running from 2013 to 2020 (and, potentially, thereafter Phase IV), depend in some crucial ways on international negotiations. If an acceptable international agreement is reached in which developed countries cap their emissions and all large emitting countries abate their emissions according to their capacity, then there will be cuts of 30% below 1990 levels by 2020 for the entire European economy.[44] Without an agreement, the reduction will be 20% below 1990 levels, with sectors covered by the EU ETS expecting a 21% cut in emissions from 2005 levels.[45] In any event, a target of 60%–80% below 1990 levels by 2050 has been set, with the possibility of this target being raised to 95% depending on a satisfactory international agreement.[46] Although the economic downturn has caused a contraction of industrial activity and with it a reduction in European Union Allowance (EUA) price to fall well below €15 at the recent nadir, Phase III prices are expected to rise from around €25–€30 in 2013 towards €50–€60 by 2020.[47] The failure of the talks in Copenhagen will likely push the EU towards the lower bounds of these predictions.

Around 41% of emissions in the EU are currently covered by the scheme and are regulated entirely downstream, with plans to expand past the core emitting sectors to nearer 50% by 2013, including some gases (such as nitrous oxide) other than carbon dioxide, the only regulated gas at the moment.[48] Auctioning will play an increasingly large role, rising to 70% in 2020 and 100% in 2027.[49] Any remaining free allowance allocation

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43. A more detailed background to this summary can be found in Appendix 2.

44. Directive 2003/87/EC, art. 28(1) 2003 O.J. (L 275) 1, 37 (as amended June 25, 2009).

45. Citizens' Summary: EU Climate and Energy Package, http://ec.europa.eu/climateaction/docs/climate-energy_summary_en.pdf.

46. EUR. COMM'N, PROPOSAL FOR A DIRECTIVE OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL ON THE GEOLOGICAL STORAGE OF CARBON DIOXIDE AND AMENDING COUNCIL DIRECTIVES 85/337/EEC, 96/61/EC, DIRECTIVES 2000/60/EC, 2001/80/EC, 2004/35/EC, 2006/12/EC AND REGULATION (EC) NO. 1012/2006, at 2 (2008), *available at* http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2008:0018:FIN:EN:PDF; Matthew McDermott, *EU Offers 95% Emission Cuts by 2050, 30% by 2020—If Climate Deal Signed in Copenhagen*, TREEHUGGER.COM, Oct. 23, 2009, http://www/treehugger.com/files/2009/10/eu-offers-95-percent-emissions-reductions-2050.php.

47. OFFICE OF CLIMATE CHANGE, NEW CARBON FINANCE, AN ASSESSMENT OF THE IMPACT OF BANKING AND BORROWING RULES ON LINKING 12 (2009).

48. Press Release, European Union, Questions and Answers on the Revised EU Emissions Trading System 4 (Dec. 17, 2008), http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/796.

49. Directive 2003/87/EC, art. 10a(11), 2003 O.J. (L 275) 1, 19 (as amended June 25, 2009).

will use historical benchmarks.[50] Allowances can be banked for eight years within Phase III.[51] Short-term borrowing within the compliance period is allowed (although it is less effective as auctioning plays a larger role)[52] and there is no safety valve or allowance reserve. A price floor may be instituted through an auction reserve or clearing price (still to be established for Phase III), but prices are likely to remain well above this level.[53] There is the possibility for market intervention only in extreme price spikes (a trebling of price for six months compared to the average price for the two years preceding that period), and even then the remedy is early auctioning of allowances rather than a relaxation of the cap at the discretion of the authorities.[54]

There will be a domestic offset scheme,[55] and international offsets from the Clean Development Mechanism (CDM) and Joint Implementation (JI) will be allowed in Phase III, up to slightly over the limit allowed in total in Phase II or just over 11% of Phase II compliance, whichever is higher.[56] This limit will be increased by 50% if the international agreement mentioned above is concluded.[57] There will be qualitative limits on both domestic and international offsets,[58] but without any conversion ratio.[59] The regulator will remain bound to seek out links to similarly stringent trading schemes, although there is currently no provision for accepting allowances from other systems.[60] MRV methodology, already well developed, is in the process of being improved and harmonized,[61] and reported data is made public on a regular and timely basis.[62] The penalty for non-compliance is a

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50. *Id.* at art. 10a(2).

51. *Id.* at art 13(1).

52. Ellerman in CAP-AND-TRADE, *supra* note 33, at 30; Sterk et al., *supra* note 12, at 17.

53. Directive 2003/87/EC, art. 10(4), 2003 O.J. (L 275) (EC) 1, 16 (as amended June 25, 2009).

54. Directive 2009/29/EC, art. 1(29), 2009 O.J. (L 140) 63, 82–83.

55. *Commission Proposal for a Directive of the European Parliament and of the Council Amending Directive 2003/87/EC So As to Improve and Extend the Greenhouse Gas Emission Allowance Trading System of the Community*, 6–7, COM (2008) 16 final (Jan. 23, 2008), *available at* http://ec.europa.eu/environment/climat/emission/pdf/ets_revision_proposal.pdf [hereinafter *Commission Proposal*].

56. Directive 2009/29/EC, art. 1(13), 1(28), 2009 O.J. (L 140) 63, 77–78, 81–82.

57. *Id.* at art. 1(13).

58. *MEP Offset Proposal Could Disqualify 30% of CERs: Analysis*, CDM & JI MONITOR, Oct. 15, 2008, at 1.

59. Directive 2003/87/EC, art. 11a(2), 2003 O.J. (L 275) 1, 24 (as amended June 25, 2009).

60. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 28.

61. EUR. COMM'N, *supra* note 46, at 6; *Commission Proposal*, *supra* note 55, at 6.

62. *See* Decision 2007/589/EC, Annex I, 2007 O.J. (L 229) 1, 5–47 (outlining general monitoring and reporting requirements for the EU ETS).

make-good provision and a fine of €100, rising with inflation.[63] There will be no border adjustment measures.

III. THEORETICAL OBSTACLES TO LINKING

These obstacles can be roughly split into three categories: issues that relate to the political feasibility of creating a link; issues concerning market functionality once the link is established; and issues concerning the environmental impact of the link. Some issues will spill over into more than one area (for instance, cap level dictates the political issue of financial flows as well as the environmental issue of system stringency), but this basic categorization is useful when considering the role each issue will play in negotiations over linking and the creation of the U.S. ETS.

A. Political Feasibility

The two most crucial features in creating an ETS are the stringency of the caps and the coverage of the scheme. The former sets the price on carbon that covered entities face before linking (given domestic abatement opportunities), and the latter dictates the proportion of the economy under the cap, and thus the number of opportunities for abatement.[64] The two combined determine market size, and, to a large extent, this in turn dictates to which pre-link price the post-link price is closer (the first major issue: which market has greater "control" over price).[65] This feeds in to the direction and magnitude of cross-border financial flows once the link is established (the second major issue) and whether the price partially or fully harmonizes.[66] Price harmonization will occur through an entity in the system with the less stringent cap and lower allowance price selling allowances to an entity that faces a more onerous cap and a higher allowance price in the other system. The payments for these transfers aggregate to large wealth transfers across borders, which is a politically charged issue given that it is purely due to the politically chosen level of a

63. Directive 2003/87/EC, art. 16(3), 2003 O.J. (L 275) 1, 29 (as amended June 25, 2009).

64. JUDSON JAFFE & ROBERT N. STAVINS, HARVARD PROJECT ON INT'L CLIMATE AGREEMENTS, LINKAGE OF TRADABLE PERMIT SYSTEMS IN INTERNATIONAL CLIMATE POLICY ARCHITECTURE 40 (2008), *available at* http://belfercenter.ksg.harvard.edu/files/StavinsWeb6.pdf [hereinafter JAFFE & STAVINS 2008].

65. The larger market will have greater "gravitational pull" on price.

66. The price will partially harmonize if, when the maximum number of allowances permitted to cross the Atlantic have done so, the U.S. and EU allowance prices are still different.

system's "ambition."[67] Although certain industries can be excluded from the cap but subjected to other, potentially more stringent, measures (such as performance or technology standards), cap level and coverage together form a useful indicator of the level of political dedication to reducing GHG emissions, as a commitment is made about the maximum level of emissions from a given set of industries. The larger the set and the lower the emissions level, the more meaningful the commitment.

Allowance allocation may have limited effects on a link from an operational standpoint (as discussed below), but the link will mainly serve to highlight differences in allocation methods between the two systems that exist entirely independently of the link.[68] If, for example, free allowances are given to the electricity sector in one system but all allowances are auctioned in the other, the link will make the different levels of hardship faced by the electricity sectors in the two systems more contrasted. The other effect will be a distributional one, as a price shift caused by linking will affect those who buy or sell and receive allowances for free or bid for allowances, depending on the abatement opportunities at the facilities covered.[69] Thus, the allocation methodology presents essentially domestic political considerations that will not affect the functioning of the link.[70]

Indirect linking is a serious concern when considering establishing or maintaining a link. A variety of system features (price and cost containment mechanisms, for example) can pass across sets of links no matter how long the chain or how complex the network of markets. Even if there is no formal direct link between systems A and C, if there are A–B and B–C links, then A will find itself indirectly linked to C. In some cases this is beneficial because it can produce some of the advantages of linking without requiring the establishment of a direct link,[71] which may prove politically impossible to negotiate or technically too difficult to manage given a lack of impetus to harmonize. It may also conversely have the effect of producing some of the disadvantages of a badly thought-out link. If C's monitoring, reporting, and verification (MRV) requirements are below A's standards but B is amenable to both sets of standards, the indirect A–C link may lead to greater overall emissions, depending on how prices change within the system. The same goes for susceptibility to leakage or

67. JAFFE & STAVINS 2008, *supra* note 64, at 11; VIVID ECONOMICS, *supra* note 7, at 14.

68. BLYTH & BOSI, *supra* note 27, at 25–26.

69. Diamant, *supra* note 6, at 13; BLYTH & BOSI, *supra* note 27, at 9.

70. Michael Grubb & Karsten Neuhoff, *Allocation and Competitiveness in the E.U. Emissions Trading Scheme: Policy Overview*, 6 CLIMATE POLICY 7, 15 July (2006).

71. Flachsland, Edenhofer & Marschinski, *supra* note 13, at 12–14.

updating allowances, not to mention the potential for a safety valve to proliferate through a network of markets.

Loss of autonomy is a concern, as the link reduces the control that either regulator has over its own system. The issue of control comes up in two contexts. First, if one system has greater ad hoc control, this may be cause for concern for the other. The fact that systems seek links and not a merger is a strong indicator of this.[72] The existence of and adherence to agreed rules is crucial to maintain efficient investor certainty and market integrity, so any potential for discretionary action is problematic.[73] Second, each system will want assurances regarding the long-term predictability of the other system's characteristics,[74] most notably cap levels. Each regulator has an incentive to raise the domestic cap to reduce the environmental effectiveness and increase the value of the domestic system, generating financial transfers into that regulator's economy.[75] The role of agreements made in advance of linking should not be underestimated, especially if they have been negotiated and agreed upon in international fora.[76] If targets and timetables, such as those in the Kyoto Protocol, have been agreed upon, it makes it much harder for regulators to raise cap levels, gain economic advantages, and reduce the environmental benefits of the scheme.

B. Operational

It is important that the commodity is constant in the systems. An example of a basic mismatch would be if one system uses metric tons and the other imperial tons for each allowance. This can be rectified with an exchange rate across the link, or even upon surrender, but it is far easier to simplify matters by using the same measurement in each system.

Neither coverage[77] nor the point of regulation appears to affect the functioning of the link.[78] Abatement opportunities may be more numerous

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72. JAFFE & STAVINS 2008, *supra* note 64, at 11.

73. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 24, 29.

74. *Commission Staff Working Document*, *supra* note 27, at 136; Flachsland, Edenhofer & Marschinski, *supra* note 13, at 15.

75. Carsten Helm, *International Emissions Trading with Endogenous Allowance Choices*, 87 J. PUB. ECON. 2737, 2744–45 (2003) ("[E]ven if overall emissions are higher with trading, all countries may consent to it because their welfare without trading would be lower . . . if the efficiency gains are large so as to compensate the negative damage effect."); *see* Flachsland et al., *supra* note 12, at 361 (observing that international agreements reduce other incentives for administrators to raise caps).

76. JUDSON JAFFE & ROBERT STAVINS, INT'L EMISSIONS TRADING ASS'N, LINKING TRADABLE PERMIT SYSTEMS FOR GREENHOUSE GAS EMISSIONS 50 (2007), *available at* http://www.ieta.org/ieta/www/pages/getfile.php?docID=2733.

77. *Commission Staff Working Document*, *supra* note 27, at 133.

in a downstream-regulated, more populated system, which would potentially minimize the total costs of abatement as well as avoid anti-competitive market power concerns.[79] This may be balanced by the effect of increased total transaction costs on a more fragmented market. Efforts should be made to avoid trade in GHG-intensive products between systems where this leads to double or no counting of emissions due to different points of regulation. However, given that this problem will arise anyway, establishing a link provides more opportunities to coordinate efforts to prevent this from happening, thus reducing this concern.

The use of "updating allocations," where recent emissions data is used to establish the fair level of free allowance allocation to a covered entity, can lead to competitive distortions. The incentive structure sought by cap-and-trade systems is purely one where emitters will continue to abate until abatement becomes more expensive than the market price for the permit, bearing in mind the possibility of banking or borrowing, given future price paths. Covered entities subject to auctioning or historic emissions baselines (non-recent emissions data) face this decision. They will seek to minimize the total cost of abatement through distributing emissions in an efficient manner both spatially and temporally. However, emitters subject to updating allowance schemes have an extra incentive in this matrix. The more they pollute and surrender allowances, the more allowances they stand to receive in coming years from the system administrator. Thus, the "pollute" option is given greater value than it should have. This distortion may increase the total cost of compliance not just within a system but across a link. By shifting abatement away from its cheapest location, updating allowance allocation provides an unfair competitive advantage to firms in that system.[80]

There is no technical barrier to transferring allowances from one system to another, but certain decisions can facilitate market functionality. Experience suggests that, where systems want to link but remain distinct (rather than merging into one system), there should be individual registries for each system and a central registry that checks all transactions between entities in separate systems. Moreover, registry standards must be

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78. Judson Jaffe & Robert N. Stavins, *Linking a U.S. Cap-and-Trade System for Greenhouse Gas Emissions: Opportunities, Implications and Challenges* 25 (Reg-Mkts. Ctr. Working Paper No. 08-01), *available at* http://aei-brookings.org/admin/authorpdfs/redirect-safely.php?fname=..pdffiles/WP0801_topost.pdf; LAZAROWICZ, *supra* note 17, at 51.

79. JAFFE & STAVINS 2008, *supra* note 64, at 10.

80. JAFFE & STAVINS, *supra* note 76, at 40.

compatible.[81] The mechanics of units and transfer will be highly dependent upon the nature of the other elements of the link but can be easily adjusted accordingly.[82]

Some potential issues surround the use of commitment periods (blocks of years within which banking and borrowing rules are different from those rules governing banking and borrowing between such blocks). Heavy restrictions on cost containment between periods can lead to a price crash towards the end of a period and a price spike as soon as the new period starts with a tighter cap, neither of which is desirable due to the price shocks that will be suffered by the other system. If the periods in linked systems match up exactly this problem is exacerbated. Mismatched periods provide two advantages: the possibility of using the other system's cost containment features to prevent the price crash and spike so there is price continuity; and insight as to how a lower cap will affect prices, giving another set of data for mapping the marginal abatement cost (MAC) curves in more detail to better craft policy and investment decisions. If, however, only one of two linked systems uses commitment periods, this effect is drastically reduced. Moreover, as markets mature, the use of financial products in smoothing the jump in price from one period to the next should not be underestimated.[83]

Some systems exist alongside a variety of domestic measures designed to encourage GHG emissions abatement (such as an ETS with a low allowance price alongside carbon or energy taxes or a renewable portfolio standard),[84] or alternatively some systems may have a specific price path in mind to fulfill a particular goal through co-benefits from the ETS (such as a desired rate of technological innovation or creation of "green" jobs). If this is the case, then price harmonization may have the effect of defeating some of the specific objectives sought by the regulators, increasing total costs of abatement and decreasing total welfare by more than is gained from linking. As a recent report phrased it, where a system "designed to keep the price as low as possible . . . [is] linked to a system designed to produce high prices, to encourage green investment . . . the result is a weighted average of the two which satisfies neither party."[85] Similarly, there will be other regimes working alongside emissions trading (such as tax, environmental, exchange

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81. *Commission Staff Working Document*, *supra* note 27, at 134; Simon Marr, Directorate-Gen. for the Env't, Eur. Comm'n, *Linking the EU ETS: Opportunities and Challenges* 7 (June 14, 2007), *available at* http://ec.europa.eu/environment/climat/emission/pdf/4thmeeting/2a_marr.pdf.

82. FLACHSLAND, EDENHOFER, JAKOB & STECKEL, *supra* note 11, at 16.

83. Sterk et al., *supra* note 12, at 18.

84. JAFFE & STAVINS, *supra* note 76, at 49.

85. OFFICE OF CLIMATE CHANGE, *supra* note 47, at 40.

regulation, and corporate governance), and these should be examined for potential distortions in the link, which could lead to welfare losses exceeding welfare gains from linking.[86]

Penalties for non-compliance, on the other hand, can potentially have an effect on a link. For example, if one system has harsh penalties but the other system has a mere make-good provision, or even one with a nominal fine, a quasi-cost-containment mechanism could emerge and cross the link, circumventing deliberate limits placed on cost containment mechanisms.[87] Moreover, lenient non-compliance measures can be taken as evidence of a lack of commitment to significant action. Equivalent effectiveness of the non-compliance rules, irrespective of minor differences, is the benchmark for success.[88]

If one system is subject to considerable price volatility, linkage will not be desirable from the perspective of the other system, which will suffer increased volatility. Conversely, linking itself can help to reduce price fluctuations by providing a wider pool of abatement opportunities and thus greater market liquidity.[89] The reasons for any price instability[90] and the potential dampening effect of a link on this should be carefully examined. In the absence of a corrective mechanism for cross-country allocation (discussed below), the potential instability produced by international allowance trading interacting with exchange rates[91] is a good reason to use quantitative limits on the link until the phenomena surrounding linking are better understood and internal (cost containment) and external (financial products)[92] measures can be developed to provide some stability.

C. Environmental

Arguably, the most important environmental issue is the relative stringency of the caps, as this dictates the extent to which the system is restricting emissions below business-as-usual (BAU) levels. A stringent

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86. Mustafa Babiker, John M. Reilly & Laurent L. Viguier, *Is International Emissions Trading Always Beneficial?*, 25 ENERGY J. 33, 34, 53 (2004) (stating the impact of international emissions on welfare); Flachsland et al., *supra* note 12, at 360.

87. Sterk et al., *supra* note 12, at 20.

88. *Commission Staff Working Document*, *supra* note 27, at 135.

89. JAFFE & STAVINS, *supra* note 76, at 18.

90. *Id.* at 42. This could include unreliable, irregular, or opaque data publication in either system. The efficiency of the market depends upon an effective flow of information so the price can be accurately assessed.

91. Warwick J. McKibben & Peter J. Wilcoxen, *The Role of Economics in Climate Change Policy*, 16(2) J. OF ECON. PERSPECTIVES 107, 126 (Spring 2002).

92. MICHAEL MEHLING, GLOBAL CARBON MARKET INSTITUTIONS, AN ASSESSMENT OF GOVERNANCE CHALLENGES AND FUNCTIONS IN THE CARBON MARKET 20 (2009).

system will be hesitant to link to a lenient system not just due to the politico-economic concerns set out above but also due to the concerns over being seen as "subsidizing" the other system's failure to impose a satisfactory environmental standard. One view is that, regardless of linking, the same total cap will be imposed on emissions, as the more stringent system is powerless to dictate the other system's cap level. In another sense, there is a normative loss in accepting this political reality through linking, not to mention the long-term environmental advantages lost in reduced innovation incentivization by not having a high price on carbon in any jurisdiction. This is discussed in greater detail in Section IV.

Cost containment measures (such as safety valves, allowance reserves, banking, or borrowing) will migrate across the link just as the price will, regardless of whether this happens directly or indirectly.[93] Banking, borrowing, and limited reserves are less controversial, as they do not raise the total cap and can help to stabilize price paths.[94] However, the safety valve allows emissions to exceed the cap and so may prevent linking. On similar grounds of environmental effectiveness, even borrowing can be an obstacle to setting up a link.[95] The lower of two price ceilings will be effective in both systems until any reserve behind that ceiling is exhausted, giving substantial control over price to the system with the lower ceiling.[96]

Offsets have two particular issues. First, there is an inherent tension between the desire for a high price signal to drive investment and abatement in the core domestic emitting sectors and the need to provide cheap emissions reductions now through offsets while clean technology is being developed and deployed. The question is to what extent the emissions reductions below BAU levels required by the cap exceed the level of offsets allowed for compliance. Supplementarity[97] requires that the total emissions reductions below BAU levels are greater than the volume of offsets allowed for compliance in that system. Otherwise, there will be no need for any domestic emissions reductions (even though there will inevitably be some "low-hanging fruit" domestic abatement opportunities that are cheaper than

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93 Contracts can be formed between individuals in the two systems whereby the individual in the system with the cost-containment measure will act as a direct proxy for the individual without such facilities (direct). Alternatively, as a whole system the price effects of the cost-containment measures will migrate across the link and cause the facility to be used as if it were available in both systems (indirect).

94. Electric Power Research Institute, Interactions of Cost-Containment Measures and Linking of Greenhouse Gas Emissions Cap-and-Trade Programs, 2-7 to 2-8 (2006).

95. VIVID ECONOMICS, *supra* note 7, at 23; *see also infra* Appendix I Section D.

96. JAFFE & STAVINS, *supra* note 76, at 45.

97. Kyoto Protocol to the United Nations Framework Convention on Climate Change art. 17, Dec. 11, 1997, 37 I.L.M. 22 (1998).

offsets). Supplementarity looks to the primary purpose of an ETS. If it is seen primarily as about reducing emissions immediately, then supplementarity is not an issue, as offsets allow reductions to be achieved where they are cheapest. This has the added advantage of providing incentives for technological innovation in sectors or countries not covered by a cap. If, however, ETS systems are seen as mechanisms to drive investment in technology for a transition to a green domestic economy, then offsets should not detract from necessary resources being focused on reducing emissions domestically. Which of these two paths is followed in either system will affect the existence and degree of supplementarity, and, therefore, the willingness to link.

Second, there are concerns in all offset systems about additionality. If the credits eventually used to permit extra emissions in an ETS system do not represent true reductions, allowing these low-quality offsets into an ETS system will increase total emissions. Moreover, there is the potential problem of double counting, where offset projects could—through fraud or incompetence—produce credits that are used in more than one system, rewarding the same emissions reductions more than once.

Leakage (the extent to which emitting activities will shift outside the industrial sector or geographic area covered by the cap) is a concern, as the greater the extent of leakage, the less meaningful a stringent cap is and the greater the loss to the capped economy relative to uncapped economies.[98] Thus, prior to linking, the extent to which either system is susceptible to leakage and the likely price shift wrought by the link should be examined. If one system is more likely to leak and faces a higher price after the link, net leakage and thus total emissions will, in fact, be increased by the link, regardless of the cost savings in achieving a certain level of domestic reductions.[99] Predicting relative susceptibility to this effect has proven difficult.[100] Relevant factors that have been identified include global competitiveness (the ability to pass carbon costs to global consumers), carbon intensity (the level of GHG emissions required in the production process),[101] and offset use.[102] Unless leakage will be dramatically increased by joining markets together, this poses no serious issue, as the majority of

98. *See generally* EECP WORKING GROUP, REPORT OF THE AD HOC MEETING OF THE EECP WORKING GROUP ON EMISSIONS TRADING ON CARBON LEAKAGE AND AUCTIONING 1 (2008), *available at* http://ec.europa.eu/environment/climat/emission/pdf/finrep.pdf (discussing international concern about carbon leakage).

99. JAFFE & STAVINS, *supra* note 76, at 31.

100. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 22.

101. *Id.* at 11.

102. *More CERs Can Slow EU Carbon Leakage: Report*, CDI & JM MONITOR, Oct. 15, 2008, at 4.

leakage will occur independently of the link and mechanisms such as free allocation to vulnerable industries are in place to minimize leakage in any case.

Having MRV provisions of equivalent effectiveness in the two systems is very important for a number of reasons. First, from an environmental perspective, if more emissions are permitted through a lower price in the system with more relaxed MRV provisions, then it is likely that the link will raise total GHG emissions. Second, from a trust and competitiveness perspective,[103] a link is more likely to function well in the long term if all linked parties are sure that the commitments they have made are being followed.[104] There may be assurances and enforcement mechanisms envisioned between the regulators in the case of a significant breach of obligation by one system, but the key criterion is equivalent reliability and accuracy, regardless of differences in the methods used.[105]

D. Limits and Delays

To allay a majority of these concerns, limits can be placed on the link. Qualitative limits are not feasible in an ETS–ETS link, although they have been successfully employed in ETS–offset system links to ensure only credits from high-quality projects can be used to offset emissions.[106] Quantitative limits make more sense in an ETS–ETS link. They can result in partial price harmonization if the limits are tight enough to prevent a sufficient flow of allowances from one system to the other to equalize prices and can prevent cost containment measures from completely crossing from one system to the other.[107] The same comments apply to an exchange rate at the link, whereby more foreign allowances would have to be surrendered to cover a given level of pollution than domestic allowances. This would mean that increased use of the link would reduce total emissions, safeguarding environmental integrity concerns. However, the partial price harmonization it would create would limit the advantages that the link could potentially offer.

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103. EECP WORKING GROUP, *supra* note 98, at 3.

104. EUR. COMM'N, *supra* note 46, at 6.

MEHLING, *supra* note 92, at 22; LAZAROWICZ, *supra* note 17, at 47.

105. *Commission Staff Working Document*, *supra* note 27, at 135; JAFFE & STAVINS, *supra* note 77, at 41.

106. Directive 2003/87/EC, art. 11(b), 2003 O.J. (L 275) 1, 26 (as amended June 25, 2009). The mechanism for tagging based on CER serial numbers represents a successful qualitative filter.

107. Financial intermediaries will always play a role in offering effective cost-containment measures in either system independently, and a link will facilitate this role.

Given the relative novelty of global emissions trading, individual systems will want to build expertise and institutional capacity across the economy in a safe, controlled environment with as few complicating factors (such as linking) as possible at the outset.[108] Once expertise and certainty over the price path has reached a certain level, then linking becomes a more attractive option.[109] The same works in reverse: experienced systems will be reluctant to link to new systems without a sufficiently high pedigree of expertise or maturation. This will not be a permanent barrier to establishing a link but will justifiably delay links.

IV. PATHS AND OBSTACLES TO ESTABLISHING A LINK

A. System Features Unlikely to Prevent Linking

The U.S. ETS will not use compliance phases in a meaningful way like the EU ETS Phases I–II.[110] Instead, the annually decreasing U.S. cap will help to provide the long-term price stability that was missing from the first two EU ETS Phases. The longer EU compliance period (from 2012 to 2020), combined with an annually decreasing cap during and after Phase III[111] and banking of allowances across phase boundaries, should provide a long-term price signal[112] and reduce price volatility.[113]

A number of factors suggest that this latter concern will not be a major issue, even though volatility is set to increase as caps become tighter due to increased susceptibility to the effects of fundamentals like fuel prices and weather.[114] In the EU ETS, volatility has been no worse than that of other major commodities such as oil. Even a well-designed market will be inherently susceptible to some price volatility due to its interdependence with other volatile commodities.[115] The transparency derived from regular publication of emitter-level data in the EU ETS certainly helps the price

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108. *See* U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 7 (stating that the EU ETS Phase I is generally regarded as a rehearsal designed to set up the relevant infrastructure and knowledge base, rather than achieve emissions reductions immediately).

109. Flachsland, Edenhofer & Marschinski, *supra* note 13, at 16.

110. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 6.

111. *Commission Proposal*, *supra* note 55, at 16.

112. Ellerman in CAP-AND-TRADE, *supra* note 33, at 3.

113. VIVID ECONOMICS, *supra* note 7, at 20.

114. POINT CARBON, CARBON 2008: POST-2012 IS NOW, at 24 (2008), *available at* http://cbey.research.yale.edu/uploads/Carbon%20Finance%20Speaker%20Series/Point%20Carbon%202008–Post-2012%20is%20now.pdf.

115. MEHLING, *supra* note 92, at 32.

signal remain steady,[116] as it will in the U.S. ETS. As time goes by, financial intermediaries will provide an increasing variety of products to cushion the price.[117] Last, the link itself should further reduce price volatility by widening the market and improving liquidity.

Both systems see auctioning as the way forward in the long term, even if there is significant free allowance allocation in the short- to mid-term in the U.S. ETS. By the time that linking is seriously contemplated, the EU will be auctioning close to 70% of allowances and the U.S. close to 30%. EU emitters will complain less about buying allowances at auction if the price goes down after linking. All covered entities in the U.S., including those that would not be under the EU cap, will be pleased about receiving free allowances that are worth more due to the raised price, suggesting a possible reduction in domestic anti-linking sentiment. Although the EU will mostly auction and will use historic benchmarks for free allocation, the extent to which the U.S. system may use updating allowances should be examined for its potential to reduce cost savings from linking despite regulation of free allowance allocation to protect consumers. The price floor in the U.S. ETS, established by an auction reserve price, will not cross to the EU ETS, as the U.S. allowance price—unlikely to dip that low independently—will be even higher after linking.

The obligation on regulators in both systems to seek out links with other ETS systems should not produce indirect linking concerns. Currently, the EU ETS is linked to Kyoto's Clean Development Mechanism and the Joint Implementation mechanism (CDM/JI), and it is in the process of restricting Phase III credit use to higher-quality projects.[118] It is unlikely, given the demands of business for high levels of international offset use, that the U.S. will be able to avoid using large quantities of certified emission reductions (CERs) from the CDM (despite U.S. skepticism of the CDM to date), as no other international offset system has a similar institutional capacity and framework.[119] Indeed, one possible effect is that

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116. *Id.* at 29; LAZAROWICZ, *supra* note 17, at 21.

117. WORLD BANK, STATE AND TRENDS OF THE CARBON MARKET 2009, at 5, *available at* http://wbcarbonfinance.org/docs/State_Trends_of_the_Carbon_Market_2009-FINAL_26_May09.pdf.

118. MARKET ADVISORY COMMITTEE TO THE CALIFORNIA AIR RESOURCES BOARD, RECOMMENDATIONS FOR DESIGNING A GREENHOUSE GAS CAP-AND-TRADE SYSTEM FOR CALIFORNIA 72 (2007) [hereinafter MAC 2007], http://www.energy.ca.gov/2007publications/ARB-1000-2007-007/ARB-1000-2007-007.PDF (CER use in the EU ETS is seen as an obstacle to linking. This appears to have been superseded by the likelihood of a U.S. ETS–CDM link).

119. *See* U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 39 (stating that the overall effect of the CDM is unclear). Given the administrative difficulties seen to date, some projects in the CDM pipeline may abandon their application and seek certification in the U.S. instead, as some have reportedly done through CCX.

the sharing of the CDM by the U.S. ETS and the EU ETS may produce additional price harmonization beyond that achieved by the formal link—depending upon the cost of CERs, their long-term supply and demand, and the limits placed on their use in ETS systems.[120] Thus, until more links are established, neither system has current or foreseeable links to any other trading schemes that warrant concern.

Just as the method of transfer poses no problems but requires a choice as to method and equivalent registry standards,[121] so too must the registry framework be selected. The EU ETS currently uses the International Transaction Log (ITL), which is run by the United Nations, as the hub of the network of national registries, while the Community International Transaction Log (CITL), the previous European hub, checks the validity of all transfers.[122] With another system such as the CITL to check transfers, the ITL is a good candidate for the central hub of the proposed link, given its success in coordinating the CDM Registry, the EU ETS, the Kyoto assigned amount unit (AAU) systems, and other national registries.[123] Current EU plans to use the CITL as the central hub once more in 2013 demonstrate the ease with which the structure can be rearranged to suit various purposes—again showing that the mechanics of transfer pose no barrier to linking.[124]

The technical question of central registries leads to the administrative and institutional question of whether an oversight body is required to govern the link,[125] or to have some role in relation to the regulation of the systems themselves to "act as agent for the whole and educate, facilitate, and coordinate."[126] Concerns over autonomy suggest that a strong version of this type of authority is not viable for the link in the way that the

120. Flachsland, Edenhofer & Marschinski, *supra* note 13, at 14.

121. *Commission Staff Working Document*, *supr*a note 27, at 134.

122. Press Release, European Commission, Emissions Trading: EU Commission to Connect EU with UN Carbon Credit Registry (Aug. 6, 2008), http://www.europa-eu-un.org/articles/en/article_8072_en.htm.

123. Flachsland, Edenhofer & Marschinski, *supra* note 13, at 29 (The ITL's use of standards adopted under the Kyoto Protocol would not currently be binding on the U.S., which would have the option of using these standards from the outset of the ETS. However, as the anticipated link will be taking place beyond the remit of the Kyoto compliance period, it is unlikely that these, or related AAU concerns, will prove problematic.).

124. Alessandro Vitelli, *The ITL-CITL Connection's Impact on the Market*, IDEA CARBON, Aug. 6, 2008, *available at* http://communities.thomsonreuters.com/clientfiles/a05396f8-44d6-45cc-9abc-1fa99735e184/reuters%20commentary_6%20sug.pdf.

125. MEHLING, *supra* note 92, at 24.

126. A. Danny Ellerman, *The EU Emission Trading Scheme: Prototype of a Global System?* 12 (Harvard Project on Int'l Climate Agreements, Belfer Center for Sci. and Int'l Affairs, Harvard Kennedy School of Business, Discussion Paper 08-02, August 2008), *available at* http://belfercenter.ksg.harvard.edu/files/Ellerman_HPICA_2.pdf.

European Commission's authority is viable within the existing framework of the EU to regulate sovereign states' participation in the EU ETS. Indeed, there are good reasons for retaining local autonomy over the vast majority of ETS features so long as such regulation remains adequately effective.[127] However, the existence of a mere forum in which to collaborate, share information, and resolve issues would be inadequate. A "light touch" regulating body that falls in-between forum and regulator, to which each system has expressly delegated certain powers and responsibilities within a set procedural framework, could oversee the link and would also permit the introduction of other countries' schemes into the linked network at a later date.[128] The International Carbon Action Partnership (ICAP), a forum for governments to discuss linking, provides a useful prototype for such an entity, although it would doubtless require more mandatory elements of participation to regulate and coordinate effectively.[129]

There will undoubtedly be other regimes working alongside the trading systems, such as the sulfur dioxide trading program in the U.S., but neither experience with the EU ETS nor the literature on the EU and U.S. schemes has demonstrated the presence of any programs that have the potential to create substantial distortions upon linking.[130] Any system that can function side by side with an independent domestic climate market should not be able to affect a link substantially, although energy taxes in particular should be examined for any potentially distorting effects.[131]

For the purposes of non-compliance penalties, the U.S. ETS recognizes the need for a make-good provision plus a substantial fine.[132] So long as this is effective to deter non-compliance—as the stiff penalty and make-good provision has been to date in the EU ETS—the link will not be affected by any differences between EU and U.S. penalties.[133] In terms of

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127. LAZAROWICZ, *supra* note 17, at 82–83.

128. *Id.* at 83.

129. MEHLING, *supra* note 92, at 18.

130. COMM'N OF THE EUR. CMTYS., BUILDING A GLOBAL CARBON MARKET—REPORT PURSUANT TO ARTICLE 30 OF DIRECTIVE 2003/87/EC, at 9 (2006), *available at* http://ec.europa.eu/environment/climat/emission/pdf/com2006_676final_en.pdf; *see* William F. Pederson, *Adapting Environmental Law to Global Warming Controls*, 17 N.Y.U. ENVTL. L. J. 256, 259–60 (2008) (discussing simultaneous presence of a U.S. cap-and-trade system for sulfur dioxide emissions).

131. Babiker, Reilly & Viguier, *supra* note 86, at 53.

132. America's Climate Security Act of 2007, S. 2191, 110th Cong. § 1203(a)(2)(B)(i), (ii) (2007); American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 723(b)(2) (2009); Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. § 723 (2009); Dingell–Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 715(c)(1) (2008); Low Carbon Economy Act of 2007, S. 1766, 110th Cong. § 602 (2007).

133. *Commission Staff Working Document*, *supra* note 27, at 135; LAZAROWICZ, *supra* note 17, at 47.

MRV, the EU has had extensive experience in Phases I–II, and the harmonization of the member state actions in line with the published guidelines towards a more rigid system will present a clear, high standard across the EU.[134] The U.S. will have a solid knowledge base to use in designing MRV requirements from the EU ETS, the Kyoto framework, and from domestic systems such as the sulfur dioxide trading scheme, RGGI, and CCX.[135] Both systems require regular, transparent reporting of data that is made publicly available shortly after collation.[136] As MRV standards will be adequately high for both systems, there should be no issue here.[137] The same can be said for market regulation.[138] In the wake of the current financial crisis, by the time a link is operational it is highly likely that strong regulation of financial products will be implemented. It will be a matter of concern for linking only if either market looks susceptible to market manipulation or collapse. Given that serious efforts are underway to set up effective monitoring systems on both sides of the Atlantic, the ubiquitous "adequate effectiveness" criterion will likely be satisfied, although it will take time for faith in complex internationally linked markets to take hold after the recent economic crisis.[139]

Unlimited banking and limited short-term borrowing seem to be common features of both systems, as is the lack of a safety valve or extensive mid- to long-term borrowing facilities.[140] The structure of U.S. strategic allowance reserves will be clearly set out in advance and will be highly predictable,[141] and the same can be said for the triggering of the EU's mechanism in case of extreme price fluctuations.[142] However, it should be noted that the lower of the two reserves (the U.S. ETS's) will be the effective reserve price ceiling. Hence, the EU effort to place relief from high prices out of reach will be futile. The saving grace is that a very significant price spike will be required to trigger either mechanism. Moreover, the overall caps—and thus environmental integrity—are

134. MAC 2007, *supra* note 118 (the fears of "less rigorous monitoring standards" should be allayed by the time a link is seriously contemplated).

135. BLYTH & BOSI, *supra* note 27, at 11–12.

136. *See* LAZAROWICZ, *supra* note 17, at 21 (discussing reporting requirements for the EU ETS); *see, e.g.*, American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 713 (2009) (outlining greenhouse gas reporting requirements); America's Climate Security Act of 2008, S. 2191, 110th Cong. § 1103 (2008) (outlining GHG reporting requirements).

137. *Commission Staff Working Document*, *supra* note 27, at 135; LAZAROWICZ, *supra* note 17, at 47.

138. MEHLING, *supra* note 92, at 27.

139. Michael Grubb, *Linking Emissions Trading Schemes*, 9 CLIMATE POLICY 339, 340 (2009).

140. LAZAROWICZ, *supra* note 17, at 50.

141. VIVID ECONOMICS, *supra* note 7, at 26.

142. Directive 2009/29/EC, art. 1(29), 2009 O.J. (L 140) 63, 82–83.

maintained in both systems.[143] Indeed, linking reduces the chance of such a spike due to the increased price stability and predictability brought about through a larger, more liquid market.[144] There does not appear to be pressure in either system to deviate from this path, so cost containment propagation poses only one hurdle that is relatively low.

Because the U.S. will face a higher price it will see more leakage, a matter of great concern to industry and politicians alike. As mentioned above, leakage is difficult to monitor and predict effectively, but the key point to bear in mind is that the majority of leakage will occur independently of the link.[145] The sole concern is the net alteration in levels of leakage resulting from a price change upon linking, balanced between an increase in the U.S. and a decrease in the EU. As the EU and U.S. attempt to stem the flow of leakage through free allowances to vulnerable industries and the U.S. looks to receive significant financial flows as a result of an EU–U.S. link, it is tentatively suggested that this will not significantly alter the incentives faced by either party in the decision to link.[146]

B. Obstacles to a Successful Link

In terms of prices, targets, and timetables, it is clear that a "perfect balance of efforts is very unlikely to be achieved."[147] Linking two systems together will naturally involve some compromise in this area,[148] which attempts to respect the preferences of all concerned parties.[149] It would

143. *See* American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 726(g)(2) (2009) Indeed, if Waxman–Markey is used as the model, the use of auction proceeds from the U.S. safety reserve will be restricted to the purchase of reduced emissions from deforestation and degradation credits which will be retired using a 80% conversion ratio, meaning that use of the U.S. safety reserve not only maintains the total U.S. cap, but reduces global emissions. *Id. See also* Sterk et al., *supra* note 12, at 14; *Senate Price Control Won't Stop Linkage*, CARBON MARKET N. AM., Oct. 23, 2009, at 4, *available at* http://www.pointcarbon.com/polopoly_fs/1.1263039!CMNA20091023.pdf.

144. LAZAROWICZ, *supra* note 17, at 50.

145. *GMF Event Examines Economic Competitiveness and Cap-and-Trade Policy on Capitol Hill*, German Marshall Fund, Mar. 26, 2009, http://www.gmfus.org/event/detail.cfm?id=566&parent_type=E.

146. *See* Flachsland, Edenhofer & Marschinski, *supra* note 13, at 26 (discussing the effect on the EU ETS of linking to a partner ETS with less stringent goals).

147. Sterk et al., *supra* note 12, at 15; *Commission Staff Working Document*, *supra* note 27, at 135.

148. BLYTH & BOSI, *supra* note 27, at 34–35.

149. KAROLINE HAEGSTAD FLÅM, A MULTI-LEVEL ANALYSIS OF THE EU LINKING DIRECTIVE PROCESS: THE CONTROVERSIAL CONNECTION BETWEEN EU AND GLOBAL CLIMATE POLICY 10 (2007), *available at* http://www.fni.no/doc&pdf/FNI-R0807.pdf.

appear that the EU scheme is more stringent,[150] using an earlier and thus lower baseline, pushing for deeper emissions cuts, using a higher price ceiling, and allowing fewer international offsets than the U.S. This is even more likely to be the case if the EU finds that the highly anticipated international agreement is acceptable and so lowers its cap to 30% reductions in 2020 and 95% in 2050, although this is looking less likely in the wake of Copenhagen. Moreover, there will be a greater supply of cheap abatement in the U.S. due to greater coverage and the guaranteed availability of offsets from agriculture.[151] Until the U.S. ETS and EU ETS Phase III are operational and abatement opportunities are fully explored, divining relative abatement costs—and the price of carbon—is educated guesswork, especially on the U.S. side.[152] Still, current guesswork fairly consistently predicts that the EU ETS will turn out to be more stringent.[153]

Whether this disparity, and the resulting flow of capital from the EU to the U.S. upon linking,[154] is a serious obstacle depends to a large extent on the total emissions reductions of both parties over time[155] as well as international negotiations.[156] Even if the U.S. fails to achieve the EU's ambitious target for all developed countries of 30% below 1990 levels by 2020,[157] if binding international targets and timetables can be agreed upon—these being the EU's current focus[158] and President Obama's stated goal[159]—then the issue of cap stringency is likely to recede, as cap levels

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150. Sterk et al., *supra* note 12, at 15–16; POINT CARBON, CARBON 2008, *supra* note 114, at 45; POINT CARBON, CARBON 2009: EMISSION TRADING COMING HOME, 28 (2009), *available at* http://www.pointcarbon.com/research/carbonmarketresearch/analyst/1.1083366.

151. OFFICE OF CLIMATE CHANGE, *supra* note 47, at 27, 33. It must be noted that this model assumes a less stringent U.S. ETS. The model assumes 10% reductions by 2020, whereas this paper assumes closer to 20%.

152. *See* Sterk et al., *supra* note 12, at 15–16 (discussing carbon price forecasting of the various U.S. schemes).

153. POINT CARBON, CARBON 2009, *supra* note 150, at 28.

154. JAFFE & STAVINS 2008, *supra* note 64, at 11.

155. Lisa Friedman & Jean-Marie Macabrey, *Negotiations: Europeans Grapple As U.S. Lowers Expectations on Midterm Emissions Targets*, CLIMATEWIRE, Mar. 10, 2009, http://www.eenews.com/climatewire/2009/03/10/6/.

156. Flachsland, Edenhofer & Marschinki, *supra* note 13, at 16, 29; JAFFE & STAVINS 2008, *supra* note 64, at 19.

157. *Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions, Towards a Comprehensive Climate Change Agreement in Copenhagen*, at 5, COM (2009) 39 final (Jan. 28, 2009) [hereinafter *Communication*].

158. *See id.* at 2 (stating that developed countries should reduce their emissions to 30% below 1990 levels by 2020).

159. *See Obama to Poznam Delegates: U.S. Will Engage in Climate Talks*, CARBON MARKET N. AM., Nov. 21, 2008, at 3 (stating that the United States will be actively involved in international negotiations to "help lead the world toward a new era of global cooperation on climate change"),

will already have been settled. This will be the case regardless of the order of domestic legislation and international agreement so long as both materialize. However, for the time being it would appear more realistic to proceed on the assumption that such an international agreement may not provide a guiding hand for linking negotiations.

The expected coverage figures (U.S. 80% and EU 50%) demonstrate that both systems have taken on substantial commitments.[160] The disparity is not likely to be a contentious point for the U.S., especially as the EU is clearly in a constant review process of expanding coverage, starting from wholly downstream regulation and thus taking longer to move to more upstream regulation in order to widen coverage.[161] Assuming cooperation is maintained on trade in carbon-intensive products, it is no obstacle that the EU ETS is regulated downstream at large emitters while the U.S. ETS is likely to be a hybrid system in terms of the point of regulation.

Coverage will also have an effect on market size, dictating whether the EU or the U.S. will experience a greater price change upon linking. The U.S. will be the larger market for the foreseeable future. The table below gives approximations of the size of the EU market calculated by allowance volume relative to the U.S. market in 2020, assuming coverage in the U.S. and the EU is approximately 80% and 50% respectively.[162] Despite the difference in market size, price effects of the link will be felt on both sides of the link, ensuring reduced total costs of compliance. Moreover, as the EU expands its coverage further and the U.S. makes deeper reductions, the disparity will be further reduced.[163]

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available at http://www.pointcarbon.com/polopoly_fs/1.1008624!CMNA20081121.pdf; *Congressional Aides Lower Expectations for U.S. Climate Bill*, CARBON MARKET N. AM., Dec. 12, 2008, at 3, *available at* http://www.pointcarbon.com/polopoly_fs/1.1021161!CMNA20081212.pdf; *Obama Administration Takes on Climate Change*, CARBON MARKET N. AM., Jan. 30, 2009, at 1, *available at* http://www.pointcarbon.com/polopoly_fs/1.1047201!CMNA20090130.pdf; *see also Nominations: Hearing Before the Senate Committee on Foreign Relations*, 111th Cong. 11 (2009) (statement of Sen. Hillary Rodham Clinton, nominee, Secretary of State), *available at* http://foreign.senate.gov/testimony/2009/ClintonTestimony090113.pdf (stating that the U.S. must be a leader in developing and implementing a coordinated response to climate change).

160. CBO, *supra* note 30, at 5 (stating predicted coverage under Waxman–Markey); *Commission Staff Working Document*, *supra* note 27, at 13 (outlining EU ETS coverage).

161. Flachsland, Edenhofer & Marschinski, *supra* note 13, at 21.

162. CBO, *supra* note 30, at 5 (stating predicted coverage under Waxman–Markey); *Commission Staff Working Document*, *supra* note 27, at 13 (outlining EU ETS coverage).

163. LAZAROWICZ, *supra* note 17, at 1 (stating that there is minimal trade in sectors covered by the U.S. ETS but not by the EU ETS, further reducing concerns over coverage disparity).

Table 1. Approximate figures.

	Waxman–Markey	Kerry–Boxer	Lieberman–Warner	Dingell–Boucher	USCAP (14% below 2005)	USCAP (20% below 2005)
EU (20% below 2005)	34%	35%	35%	30%	37%	40%
EU (30% below 2005)	30%	31%	31%	27%	33%	36%

These conclusions are confirmed by a recent report from the UK's Office of Climate Change.[164] Although the models differ slightly from the U.S. ETS suggested in Section I,[165] the quantitative conclusions bear a striking resemblance to the qualitative analysis immediately above. For example, one of the results is that the predicted allowance prices in the EU and U.S. are €62 and €19 respectively in 2020, but the linked price will be far closer to the U.S. price at €31.[166]

This disparity in market sizes will cause some concern for the EU due to the reduced control over its trading system. However, in order to further investor trust, price predictability, and market integrity, rules have been chosen over ad hoc discretion throughout both systems. No doubt further assurances concerning the long-term predictability of the linked systems will be necessary as a condition precedent to linking, in addition to the absence of intervention measures.[167] Because the U.S. ETS seeks a predictable long-term price path to drive investment and the EU is likely to formulate at least mid-term plans before 2012 (and the annual reductions in Phase III are already scheduled to continue past 2020), in addition to the potential for renegotiating the link at a later date, worries over loss of control should not outweigh the advantages of linking.

164. OFFICE OF CLIMATE CHANGE, *supra* note 47, at 35.

165. *See id.* at 4 (stating that less stringent cap levels, such as 10% below 2005 by 2020, lead to a larger market with greater gravitational pull on price and a lower allowance price).

166. *Id.* at 35 fig.11, 42 tbl.14. There will not be a convergence based purely on market size and initial allowance prices due to the shape of the MAC curves.

167. *Commission Staff Working Document*, *supra* note 27, at 135, 137.

One possible issue is the equivalence of GHGs.[168] The majority of the market is concerned with carbon dioxide emissions, but the same conversion factors for other gases are used in both systems, namely those most recently adopted in the IPCC's Fourth Assessment Report.[169] From a legal perspective, however, the EU ETS would not link to a system where allowances were not backed by AAUs.[170] This makes it an absolute requirement of linking that either the U.S. becomes a signatory to Kyoto or the EU and the U.S. be bound by Kyoto's successor under the United Nation's Framework Convention on Climate Change (UNFCCC) and the link established after 2012, of which the latter is a far more likely option. Thus, linking provides an extra incentive for the U.S. to enter into an international agreement.

EU and U.S. regulators are increasingly wary of the shortfalls of offsets, even though both systems will involve a domestic offset system and use international offsets.[171] Much of the criticism leveled at the EU ETS has involved the fact that the emissions reductions have been mostly achieved through foreign offsets, reducing the need to develop new technology that cuts emissions domestically.[172] Although the level of CER/emissions reduction unit (ERU) use in Phase III depends on the level of use in Phase II, the EU has explicitly limited supplementarity concerns by preventing offsets from accounting for more than half of the 2008–2020 reductions.[173] Moreover, although exactly how a domestic offset scheme will fit into this framework has yet to be seen, the lower level of coverage in the EU could lead to offsets being granted for projects in the EU that would be covered by the U.S. cap, further reducing supplementarity concerns in the EU. By way of contrast, the proportion of offsets allowed for compliance in the U.S. ETS may exceed the required reductions in order

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168. Directive 2003/87/EC, art. 3(j), 2003 O.J. (L 275) 32, 35; Dingell-Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 702 (2008); American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 711(a), (b)(1) (2009); America's Climate Security Act of 2007, S. 2191, 110th Cong. § 4(5) (2007); Low Carbon Economy Act of 2007, S. 1766, 110th Cong. § 501(d)(2) (2007). The EU ETS, Waxman–Markey, Dingell–Boucher, Lieberman–Warner, and Bingaman–Specter all use metric tons of carbon dioxide equivalent, rendering basic commodity mass-concerns void.

169. LAZAROWICZ, *supra* note 17, at 47. Copenhagen would be a useful juncture at which to bring the CDM in line with current science. *Id.*

170. *Commission Staff Working Document*, *supra* note 27, at 134, 136.

171. Sterk et al., *supra* note 12, at 9–11, 22.

172. *Commission Proposal*, *supra* note 55, at 10.

173. *Emissions in Remission? Looking at—and Through—an EU recession*, GLOBAL MARKETS RESEARCH, Oct. 15, 2008, at 17, *available at* http://www.dbcca.com/dbcca/EN_media?Mark_Lewis_151008_DB_Emissions_in_Remission.pdf. *But see id.* at 3 (stating that the recession may reduce business-as-usual predictions, so offsets will constitute more of the reductions).

to achieve politically the desired cap level.[174] Thus, the EU quantitative limits on offsets are rendered far less meaningful.[175]

However, a number of factors suggest that this concern is partly misplaced. First, even if the U.S. offset use limit is not supplemental to domestic mitigation, if the aggregate level of emission reductions called for in the two systems is greater than the aggregate level of offset use, some supplementarity remains. Second, the U.S. ETS' use of a conversion rate for international offsets will ensure that increased offset use reduces total global emissions, rather than maintaining a steady level.[176] This conversion rate, due to likely price differences, will not be open to gaming.[177] Third, there will be many domestic abatement opportunities that remain cheaper than offset prices and so will be exploited. Finally, and most importantly, the probable functioning of the market must be examined. The supply of qualitatively acceptable international offsets is currently far below even half a billion tons per year[178] and will likely remain that way for some time to come.[179] Furthermore, a similar comment concerning a shortfall in supply from domestic U.S. offsets can be made, especially if quality checks are rigorous. To conclude, whether the amount of offset use proves to be a problem depends more on the level of offset use than the legal limits if

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174. U.S. CLIMATE ACTION P'SHIP, *supra* note 25, at 5.

175. LAZAROWICZ, *supra* note 17, at 48.

176. Maria Bendana, *Strong Push for Reducing Deforestation in 1st Draft U.S. Climate Bill*, FOREST CARBON PORTAL, Apr. 2, 2009, http://www.forestcarbonportal.com/article.php?item=366.

177. The concern of circumventing the conversion rate on offsets used by Waxman–Markey by laundering CERs through the EU ETS is a false one. In order for laundering to take place, the limit on CER use in the EU ETS could not have been reached, otherwise no CERs could enter the EU ETS to be converted into EUAs to sell across the Atlantic. If this limit were not reached, the U.S. allowance price would have to be higher than the EUA price for entities bringing CERs into the EU ETS to gain more by selling them in the U.S. than in the EU, and this is not contemplated for many years to come, if at all. Even if this were the case, the fact that the U.S. allowance price remained above the EUA price must mean that a limit on the link had been reached – i.e., no more EUAs could be used for compliance in the U.S. ETS due to the lack of full price harmonization. If no more EUAs can enter the U.S. ETS, then no laundering can take place. Doubtless, some "laundering" through strategic banking of CERs might take place, but this could be detected by market regulators, or avoided through setting vintage limits on permit storage.

178. *See, e.g.*, LAZAROWICZ, *supra* note 17, at 73. According to the UNFCCC, the average annual CER output of the entire CDM is currently under 280 million tons. This includes project types now considered unacceptable for compliance, such as those involving HFC-23, indicating that the real supply may be even lower. *Id.*

179. NAT'L COMM'N ON ENERGY POLICY, FORGING THE CLIMATE CONSENSUS: DOMESTIC AND INTERNATIONAL OFFSETS 3 (2009); Joe Delbeke, *The Potential Magnitude of Offset Demand in the Early Years*, CARBON MARKET N. AM., June 19, 2009, at 6, *available at* http://www.pointcarbon.com/polopoly_fs/1.1142246!CMNA20090610.pdf; *Industry Fears Offset Demand Can't Be Met*, CARBON MARKET N. AM., June 5, 2009, at 4, *available at* http://www.pointcarbon.com/polopoly_fs/1.1132316!CMNA20090605.pdf.

these limits are never reached, and current information suggests that they will not be.

The problem of supplementarity is separate from concerns about offsets of dubious quality that do not represent real reductions. The U.S. is aware of the pitfalls of the CDM,[180] and it will attempt to avoid them in its domestic offset scheme. Both the U.S. and the EU[181] seem to agree that an adequate supply of good-quality international offsets is needed, which may be best brought about through reform of the CDM itself, bolstered by the use of qualitative limits on linkage that restrict the use of credits from projects using questionable methodologies for existing projects and credits. Both sides will want to ensure that all other ETS schemes using CERs replicate these limits, as qualitative restrictions could be subverted by low-quality credits being used in other systems.[182] This concern exists independently of a link, and it would be a stumbling block if one system were to accept low-quality credits that could effectively then be used for compliance in the other by freeing up allowances for sale from the more lax system.[183] If an EU ETS–U.S. ETS link increased the volume of low-quality CERs entering the U.S. ETS due to more relaxed standards and a raised price in the U.S., the link could itself further thwart EU efforts. Thus, the EU would have to accept the limits on domestic and international offsets in the U.S. ETS before linking, which may prove difficult until the U.S. can demonstrate—along with its level of maturity—that its offset usage policy is acceptable. These concerns apply equally to concerns in either system about domestic offsets, such as the Land Use, Land Use Change and Forestry (LULUCF) offsets anticipated in recent U.S. bills, and can only be addressed in time when the quality of offset certification can be demonstrated.[184] However, if the EU is both attempting to improve offset quality across the board and expand the range of project types it will accept (including forestry, although wariness surrounding offset crediting for Reduced Emissions from Deforestation and forest Degradation (REDD)

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180. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 7.

181. *Communication*, *supra* note 157, at 11.

182. LAZAROWICZ, *supra* note 17, at 48.

183. BLYTH & BOSI, *supra* note 27, at 20; *see* OFFICE OF CLIMATE CHANGE, *supra* note 47, at 40 (stating that when systems with different borrowing rules are linked there will be no difference in the price or emissions outcomes if the systems are designed with a stringent cap).

184. Press Release, Int'l Emissions Trading Ass'n, IETA Positions on the European Commission's Communication "Towards a Comprehensive Climate Change Agreement in Copenhagen," at 7 (Mar. 2009), *available at* http://www.ieta.org/ieta/www/pages/getfile.php?docID=3255; Michael Mehling & Andreas Tuerk, Guest Commentary, *Linking Carbon Markets—A New Hope for Global Emissions Trading?*, CARBON MARKET N. AM., Apr. 24, 2009, at 6, *available at* http://www.pointcarbon.com/polopoly_fs/1.1104027!CMNA20090424.pdf.

projects remains), then this tension should be eased.[185] In conclusion, offsets, although appearing to pose a number of significant issues, in fact offer rather few obstacles, all of which can be adequately dealt with in due course.

C. A Realistic Pathway

As a well established system, the EU has some expertise and knowledge of the workings of an ETS system. While few regard the EU ETS as a mature market,[186] for some time it will have more experience, maturity, and collected data upon which to base decisions than the U.S. system. EU concerns about linking to the U.S. ETS before the latter has demonstrated its stability will push links back several years,[187] and the U.S. system is highly unlikely to be functional before 2012. Moreover, market participants will require sufficient notice of a link in order to adjust investments and price paths to the likely post-link direction.[188] The year 2015 has been mooted by the EU as a target for linking, albeit an ambitious one rooted in assumptions concerning the start date of a U.S. scheme that are now unlikely to come to pass.[189]

The difficult issues mentioned in this section may require a limit on any link at its outset.[190] In the absence of greater harmony than the systems currently demonstrate, neither system will want to shake off its independence and surrender to unlimited linking, but both regulators will want enough trade to be permitted between the systems to make the effort of creating a link worthwhile in terms of managing volatility and reducing total costs of compliance. A limit will restrict the financial flows across borders and will allow for the regime to be developed over time, as an understanding of abatement opportunities in different countries grows. If the prices are naturally close enough, full price harmonization is possible, even with a limited link. This limit will serve to minimize all the concerns mentioned to such a level that linking is deemed acceptable on both sides. It should be noted that, for the time being, the U.S. limit is likely to be

185. Sterk et al., *supra* note 12, at 11.

186. POINT CARBON, CARBON 2008, *supra* note 114, at 10 (stating that under 20% of respondents thought that the EU ETS was a mature market).

187. FLACHSLAND, EDENHOFER, JAKOB & STECKEL, *supra* note 11, at 29; Grubb, *supra* note 139, at 340.

188. LAZAROWICZ, *supra* note 17, at 51.

189. *Id.* at 33; *Communication*, *supra* note 157, at 13.

190. The U.S. system will probably have a limit built into the legislation, although this is unlikely to matter, as the likely direction of allowance flow will be U.S. allowances into the EU ETS rather than EUAs into the U.S. ETS.

redundant. The number of U.S. allowances permitted for compliance in the EU ETS will be the crucial figure due to the likely direction of allowance flow. Following the U.S. lead, rather than a quantitative quota, the EU could consider the use of a conversion factor on imports of U.S. allowances, so that the link could, though its very existence, reduce total emissions. This gives the EU a very strong hand in linking negotiations.

V. THE POLITICAL ECONOMY OF LINKING NEGOTIATIONS

This analysis suggests that both sides are faced with complex incentives. The EU in particular faces a difficult choice in deciding to link that will only become clear once the U.S. scheme is instituted and demonstrates maturation and willingness to negotiate. Linking may only be possible with a combination of tight limits, concessions, side payments, and one of the mechanisms suggested in this article to reduce the more serious drawbacks of linking.

It is clear that the U.S. ETS will only link to a comparable ETS scheme. Waxman–Markey will only accept allowances from systems that are "at least as stringent"[191] as the one in the U.S. Lieberman–Warner requires international allowances to come from a system of "comparable stringency,"[192] including comparable MRV provisions. Bingaman–Specter requires international allowances to come from a system with "a level of environmental integrity that is not less than the level of environmental integrity of [the Bingaman–Specter Bill]."[193] Under Dingell–Boucher, for foreign allowances to be used for compliance, the scheme must be at least as "stringent" as the U.S. ETS.[194] Full evaluation of these terms would certainly involve looking at the stringency of the cap, coverage, MRV, non-compliance provisions, and probably many more factors outlined elsewhere in this paper. As the EU ETS appears to be at least as, if not more, stringent on most relevant metrics, this criterion is very likely to be satisfied.

The EU ETS Review has stated that the EU ETS "should be able to link to other mandatory emission trading systems capping absolute emissions,"[195] but internal discussions on linking have stressed the same

191. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 728(a)(2) (2009).

192. America's Climate Security Act of 2007, S. 2191, 110th Cong. § 2502(b)(2) (2007).

193. Low Carbon Economy Act of 2007, S. 1766, 110th Cong. § 501(d) (2007).

194. Dingell–Boucher Cap and Trade Bill Discussion Draft, H.R. __, 110th Cong. § 761(a)(2) (2008).

195. *Commission Proposal*, *supra* note 55, at 10.

factors as those outlined in Section III.[196] The decision about whether to link will be made on a "case-by-case basis,"[197] but the Review stated that all of the concerns outlined in Section III would be balanced when considering a link—implying a willingness to compromise but not capitulate.[198]

A. Internal Pressures: The Emitter and Household Level

Proceeding on the basis that the EUA price will initially be higher than the U.S. permit price once the markets are joined, entities in the U.S. will face a higher post-link price on carbon as EU emitters buy cheap allowances from the U.S. system. If there is full auctioning, all U.S. emitters will be against the link, with all EU emitters for it. Assuming some allowances are given away for free, due to a higher post-link price there will be opposition to the link from U.S. net buyers of permits. Those U.S. emitters who are net sellers at the post-link price, however, will be pro-linking. There will be significant pressure to link from net allowance buyers in the EU who face a lower compliance cost and opposition from net sellers who will receive less revenue from selling their permits. Emitters whose post-link position shifts in the EU (seller to buyer) will oppose the link, and those who shift in the U.S. (buyer to seller) will support the link. Regardless of auctioning methodology, all parties will be attracted to the harmonized price faced by emitters in the same industrial sector in the two separate systems, thereby reducing competitiveness concerns as well as increasing price stability.

Given probable market sizes, the price deviation will be greater for the EU, so the pressure to link from covered entities in the EU will be more significant than the pressure against a link from their counterparts in the U.S. On the other hand, greater coverage in the U.S. ETS will generate more emitters affected by the price change, who are likely to lobby the regulator. Moreover, due to greater coverage and thus greater integration of the ETS in the economy, consumers will be more affected by price shifts in the U.S., producing another power base that may oppose linking, especially in relation to electricity costs.[199] This could be offset by diverting the increased auction revenues in the U.S. back to consumers, or by effective

196. EECP WORKING GROUP, *supra* note 98, at 2–4; *Commission Staff Working Document*, *supra* note 27, at 134.

197. *Commission Staff Working Document*, *supra* note 27, at 133.

198. *Id.*

199. *See* Sterk et al., *supra* note 12, at 8, 16 (stating that electricity generators included opportunity costs of allowances in product prices under the EU ETS); *see also U.S. Carbon Price Could Send Power Prices Soaring: Report*, CARBON MARKET N. AM., Jan. 30, 2009, at 4, *available at* http://www.pointcarbon.com/polopoly_fs/1.1047201!CMNA20090130.pdf.

use of the regulation intended to protect consumers from rises in energy prices.

B. Net Financial Gains and Losses: The Market Level

Upon linking, the EU faces a wealth transfer to the U.S. from the aggregated payments for U.S. allowances.[200] If, averaged over time, the systems are approximately equal in stringency (with approximately equal price paths), then these financial flows will balance out, merely maximizing the efficiency of the market by pushing abatement to its very cheapest location. However, if one system is consistently more stringent than the other—as the EU ETS appears to be—then there will be a sustained flow of capital out of the more stringent system, clearly a political stumbling block as it is due to a difference in politically-decided levels of ambition.[201] Assuming a limit of 5% of compliance is used, with an average annual cap of 1,846 allowances in the EU ETS Phase III,[202] 923 million allowances from the U.S. ETS could be used for compliance annually in the former system. If prices are driven up by the tighter cap to the predicted €30,[203] then even if the link reduces the EUA price to €25, the EU could face a drain of up to €18 billion to the U.S over the eight-year compliance period. This is not a particularly high figure when spread across many European nations, especially when one considers that GDP for the EU was over $18 trillion in 2008.[204] Such financial flows across borders have proven to be among the least politically troubling aspects of the EU ETS, although in the European context—not present in an EU–U.S. link—the absence of widespread auctioning and overallocation have all played a significant part in reducing these concerns.[205] A crucially related result of the inter-system transfers is that auction revenues will drop for the EU ETS,[206] making it more difficult to channel funds to adversely affected consumers.

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200. Sterk et. al., *supra* note 12, at 3.

201. VIVID ECONOMICS, *supra* note 7, at 14.

202. Press Release, European Union, Questions and Answers on the Revised EU Emissions Trading System (Dec. 17, 2008), *available at* http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/796.

203. POINT CARBON, CARBON 2008, *supra* note 114, at 31.

204. April 2008, WORLD ECON. OUTLOOK DATABASE (Int'l Monetary Fund, Washington, D.C.) Apr. 2008, *available at* http://www.imf.org/external/pubs/ft/weo/2008/01/weodata.weorpt.aspx?sy=2006&ey=2013&scsm=1&ssd=1&sort=country&ds=.&br=1&c=998&s=NGDPD&grp=1&a=1&pr.x=40&pr.y=5 (last visited Oct. 17, 2009).

205. A. Danny Ellerman, *supra* note 126, at 23.

206. The EUA price will be lowered after linking, and for the same number of allowances distributed by regulators with a lower price attached to each one, the auction revenue will be reduced.

One way to get around this is through a burden-sharing agreement, where the total EU and U.S. cap is respected, but caps for each jurisdiction can be redistributed.[207] This would involve the likely number of permits to be brought into the "short" jurisdiction being "transferred" from the regulator of the "long" jurisdiction to the other free of charge before auctioning took place. This should not affect the price, as the same number of permits exists in the linked system after the transfer, but it raises questions of how this would be regulated in the absence of a body to oversee the link. This solution, despite the equitable distribution of burdens it entails, is not a likely scenario, given the value of such permits from domestic auctioning.[208] Another solution is to calculate the annual wealth transfer and have the U.S. regulator make a direct payment to the EU regulator once auction proceeds have been collected the following year—an even less likely option, given how explicit this would make the wealth transfer. A third option is to regard this as a necessary evil and a burden to be shouldered by the EU.

C. Anchoring: The International Level

The "first mover"[209] anchoring effect of the EU ETS should not be underestimated. It is the most attractive linking partner from the perspective of other systems[210] due to its size and system characteristics, and, due to its level of maturation, it is more likely to have attracted links with other systems (such as Japan, Australia, and New Zealand) through ICAP than the U.S. ETS by the time that a U.S. ETS–EU ETS link is viable. Other systems are more likely to harmonize along EU lines than vice versa due to the EU ETS's size. Therefore, U.S. legislators looking to the future should seek to set up the U.S. ETS in such a way that its features are amenable to all potential linking partners, whose creation will have been guided by the EU ETS's structure. This advantage accruing to the EU ETS flows not only from the credibility it has gained from making the first serious forays into determined abatement efforts but also the ability to silently shape future ETS structures. For this very reason, it is hoped that

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207. This could be achieved along the lines of the Burden Sharing Agreement that reallocated commitments under Kyoto within the EU.

208. There is also an element of moral hazard in providing a solution for the U.S. to avoid ratcheting its cap down to a level where the EU considers linking appropriate.

209. *See House Climate Bill Clears First Major Hurdle*, CARBON MARKET N. AM., May 22, 2009, *available at* http://www.pointcarbon.com/polopoly_fs/1.1123351!CMNA20090522.pdf (stating that there are many advantages to being the first mover, not least the anchoring effect).

210. *Kyoto May Be Replaced by 7 Carbon Markets—Barclays*, CLIMATEWIRE, Oct. 19, 2009, http://www.eenews.net/climatewire/2009/10/19/9.

those designing a cap-and-trade bill undertake the kind of analysis this paper suggests.

One serious caveat to this is the potential effect of "border adjustment" anchoring. Jurisdictions looking to maintain competitive trade with the U.S. may seek to demonstrate the equivalence of their own domestic emissions trading schemes to the U.S. ETS. They are likely to do this by following the structure of the latter scheme in order to avoid the penalty of having to surrender special allowances to cover products exported to the U.S.[211] This effect may act as a significant counterweight to the anchoring mentioned above, assuming there are some features of the "first mover" that are not comparable to or more stringent than the U.S. scheme (such as coverage or MRV). The potential losses to trade from an inadequate abatement regime, irrespective of any links, may be sufficient to override the desire for compatible linking to schemes with "first mover" characteristics.

Two limits on the dominance of "border adjustment" over "first mover" anchoring are timing and the nature of the measures affected by these different effects. First, if the U.S. is slow to move towards successfully signing a bill into law (as appears likely),[212] let alone establishing an ETS, domestic pressure will have tipped other countries towards establishing schemes of their own, which will not be contingent upon an ephemeral U.S. ETS. Therefore, the only possible effect felt on these schemes will be that of the EU ETS. Second, the "first mover" effect is more targeted towards operational and environmental obstacles to linking, such as commodity type, cost containment measures, and MRV regimes. The fact that linking is unlikely to change cap levels on either side of the link is desirable to reduce costs and volatility. This means that obstacles to linking that can be cleared early on will be. On the other hand, the border adjustment effect, while taking these obstacles into account, is primarily motivated by coverage and cap stringency. The real concern of the U.S. is whether foreign competitors are faced with a similar price on carbon, and, despite the language in the bills, the details of the scheme are less important.[213] Thus, these two effects could be seen simultaneously on different sectors of a regime.

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211. *Canada Seeks to Align GHG Laws with the US*, CARBON MARKET N. AM., Apr. 17, 2009, at 1, *available at* http://www.pointcarbon.com/polopoly_fs/1.1099451!CMNA20090417.pdf (stating that signs are already emerging that indicate Canada will be guided by this concern).

212. Darren Samuelson, *Reid Plans Global Warming Floor Debate 'Sometime in the Spring,'* E&E NEWS PM, Nov. 17, 2009, http://www.eenews.net/eenewspm/2009/11/17/1.

213. *See generally* U.S. GOV'T ACCOUTABILITIY OFFICE, GAO-09-274R, CLIMATE CHANGE TRADE MEASURES: CONSIDERATIONS FOR U.S. POLICY MAKERS (2009) (questioning the potential impact of GHG emission pricing between U.S. and foreign competitors).

D. Subsidization: The Ethical/Environmental Level

There is some force to an argument that the EU would be subsidizing the less stringent U.S. scheme not just financially, but normatively and environmentally. The EU would subsidize this scheme by creating a market that reaches a medium level of effort by combining a high level of effort on the EU side and a lower one on the U.S. side, primarily in terms of cap levels but also concerning offset use and other system characteristics. Harmonization of the carbon price does not reflect the underlying difference in domestic pressure to abate, but rather masks it. Indeed, establishing a link signals approval of the other scheme's targets.[214]

Two rebuttals can be made to this line of thinking. First, experience in the EU to date suggests that there has been little or no mention of the subsidization argument, or of the accompanying financial flows, despite the divergent effort levels among states according to the Burden Sharing Agreement; however, we must recognize how different an EU ETS–U.S. ETS link would be to the arrangement among EU member states. Second, outside the European context it should be recognized that a scheme's structure may not be particularly susceptible to variation by another state, especially if caps are set in an international agreement. Overall, the same amount of abatement will occur with or without the link, so refusing the benefits from linking appears almost petulant in the face of reality. This argument could be rephrased in the following terms: despite the "subsidization" argument, an inability to alter another country's regulatory autonomy should not stand in the way of reaping a series of benefits from linking systems— whilst still acknowledging that there is at some level a betrayal of domestic values.

However, this paper suggests an alternative approach. While it may be difficult to change another country's cap levels and system structure, linking may be the very pivot with which such change can be most easily effected. The EU can claim leader status on GHG mitigation efforts on four grounds. First, the EU has engaged in emissions trading and reduction since 2005, and is on track to achieve its commitments under the Kyoto Protocol (leakage and offset issues aside.) The EU program appears to be meeting its goal as compared to the historically meager U.S. constructive involvement in climate change domestically and internationally. Second, the fact that the U.S. has not seriously engaged in abatement to date means that any apparent deep cuts below BAU levels reflect a prolonged history of greater investment in carbon-intensive facilities, and thus normatively count

214. Flachsland et al., *supra* note 12, at 363.

for less. Third, the EU has opted for a stringent scheme not only to reduce emissions in the short term but, crucially, to incentivize investment and research in abatement technology and infrastructure, even if this effect has not fully emerged yet. This scheme aims to capture many of the benefits of this positive externality domestically, such as intellectual property rights to technology that can be licensed abroad and domestic "green" jobs. This benefit from linking will disappear if, through linking, the EUA price drops significantly, as nowhere will there be a sufficiently strong price on carbon to fuel this drive for the required new technology and infrastructure. Fourth, due to the expected direction of allowance flows the EU is in the position of being able to dictate the terms of a linking agreement, as no EUAs will be required in the U.S. ETS but U.S. allowances would be in demand in the EU ETS post-linking.

This leader status could be exercised to make greater stringency on the part of the U.S. a condition of linking. Some recent estimates of the cost savings available from an EU–U.S. link range from 30% (where the systems are similar) to 50% (where one ETS is noticeably more stringent than the other).[215] Environmentalists on both sides will correctly contend that, due to reduced total costs of compliance, the total cap—specifically, the U.S. cap—could be reduced so that greater emissions reductions can be achieved for closer to the total cost levels seen as acceptable prior to linking. Indeed, the same report estimates that the total cap could be reduced by 1 gigaton if the total pre-linking costs were to be imposed post-linking.[216] Although this sacrifices some long-term regulatory certainty in ensuring adequate levels of investment in low-carbon technology and infrastructure, it is no doubt possible to use timely notification and both internal and external cost containment measures to ensure a stable price path. Moreover, the worry about regulatory uncertainty is usually concerned more with under-investment (causing high prices in the long term), whereas this approach would incentivize over-investment as a precaution (producing, if anything, lower prices in the long term). If this path were taken, the U.S. could genuinely claim—although it would not be alone in this claim—to be at the forefront of mitigation efforts and enjoy the normative, political, and economic force associated with that position.

215. LAZAROWICZ, *supra* note 17, at 41.
216. *Id.* at 42.

CONCLUSION

Much of the foregoing analysis is highly speculative. The hypothetical U.S. ETS is far from definite, although becoming more so. Parts of this paper will hopefully become outdated shortly, as an ETS system is successfully set up in the U.S. While certain features and lines of reasoning within the sources this paper examines seem fairly constant, the political atmosphere in which any legislation is passed will be very different than the one in which the last round of proposals failed, whether due to their structure or the hostile legislative atmosphere. The effect of the economic crisis on ETS legislation still proves problematic and continues to be the focus of debate rather than the requirements of science or amenability to linking. On the international level, we have yet to see what the EU and the U.S. will agree upon, but also the extent to which other emitters can be brought into abatement efforts. The long-term fallout from Copenhagen is still too uncertain to contribute in a meaningful way to this paper's analysis except to note the glaringly obvious lack of targets. Most crucially, the price paths of the EU ETS in Phase III and the U.S. ETS after a few years of operation are still speculative and at best constrained by fairly wide bounds, ignoring some inevitable price volatility.

The importance of linking should not be overstated. It is a useful tool to achieve significant cost reductions but should not be sought at the expense of resources that could be deployed in more useful areas, such as actually implementing abatement.[217] Linking will only be a feasible option once price stability, institutional security, and market maturity have been demonstrated on both sides of the Atlantic. More importantly, the advantages of efficiency gains and reduced total costs of compliance can be offset by increased total emissions under certain conditions, although these are unlikely to materialize.[218] As limits on any link will almost certainly be put in place, the benefits a link will yield will be similarly limited.

However, this paper concludes that a link between the EU ETS and the U.S. ETS is more than a mere possibility. Once systems have emerged on either side of the Atlantic, regulators will seek links for a variety of reasons, not least of which include reducing the total costs of abatement and price volatility. These reasons for seeking a link remain beneficial even if caps are allocated "fairly" with equal burdens (and so minimal inter-system transfers) in mind.[219] This paper has hopefully demonstrated that the

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217. EECP WORKING GROUP, *supra* note 98, at 2.

218. HOLTSMARK & SOMMERVOLL, *supra* note 6, at 22.

219. *See Commission Staff Working Document accompanying the Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee*

operational obstacles are few and avoidable, whatever form the U.S. system takes within the range of options considered. Furthermore, the more problematic political and environmental issues, while significant, are not insurmountable. No harmonization is required on a wide variety of each system's facets, such as cost containment, allocation, non-compliance, and MRV.

System stringency (mainly through cap levels) is the serious sticking point, as market realities (especially after the filter of qualitative limits) will prevent offsets from stymieing linking negotiations. The EU will be amenable to a range of emission reduction paths contemplated by the U.S. in order to bring the latter into meaningful global efforts, with linking as one logical step in the process of forging a global response to a global problem. Even before the details of the U.S. scheme have taken shape, the European Commission's avowed intent to enter into "bilateral partnerships with the U.S. . . . to share experience on designing domestic emissions trading systems and to facilitate the creation of a robust OECD-wide carbon market by 2015"[220] hints strongly at the enthusiasm of the EU to link. However, the opportunity should be seized by the U.S. to engage in serious efforts to join the EU's firm stance on deep emissions reductions through tighter caps, less offset use, and a lower price ceiling. There is a host of good reasons for the U.S. to push for a more stringent system aside from the facilitation of linking (to begin with, responding to scientific evidence of climate change and signaling the willingness of the U.S. to strive for global leadership in this field). This paper merely seeks to illustrate one particular reason to push for a more environmentally effective system. If this path is not taken, it is likely the EU and others will make such a path the required one for a link, and it will be far more difficult for the U.S. to switch later on than to start out on the right track.

The benefits of linking, such as the reduction of total compliance costs and volatility, will hopefully suffice to outweigh the perceived downsides, such as complex domestic pressures or the potential need for harmonization. Moreover, limits on the link can be employed to keep any downsides firmly under control. An EU ETS–U.S. ETS link will be one of the most significant steps taken towards unifying the global response to climate change, sending a strong political signal internationally.[221] Such a link will pave the way for further action if considered in depth by those tasked with creating the U.S. ETS and those in charge of policy thereafter.

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and the Committee of the Regions, 30 COM (2009) 39 final (Jan. 8, 2009) (allowing for emissions trading between countries with cap-and-trade systems creating a mechanism for reduction obligations).

220. *Communication*, *supra* note 157, at 5.

221. Flachsland et al., *supra* note 12, at 366.

It is hoped that this paper's analysis proves to be of some use in crafting an ETS that is more amenable to linking, and thus more environmentally effective.

APPENDIX 1: THE U.S. ETS

Most proposals have assumed that a federal ETS would be implemented. For the sake of simplicity I assume that the U.S. ETS will be a uniform system set up by federal legislation,[222] not a set of linked distinct markets with different rules set up at a regional or state level or regulation by EPA under the Clean Air Act. Legislators will be required to grapple with the difficult issue of preemption and the endangerment finding,[223] but these discussions lie outside the scope of this paper.

A. Price, Targets, and Timetables

The table below outlines the targets and timetables from the sources examined in this paper in terms of the percentage reduction from emissions levels in the given baseline year. The more recent of these, at the top of the table, are indicative of the most likely path of the U.S. ETS.[224]

Table 2. Targets and timetables from the sources examined in this paper in terms of the percentage reduction from emissions levels in the given baseline year.

	Baseline	2012	2020	2030	2050
Waxman–Markey	2005	3	17	42	83
Kerry–Boxer	2005	3	20	42	83
USCAP	2005	0	14–20	42	80
Lieberman–Warner	2005	4	19	36	71
Dingell–Boucher	2005	19	6	44	80
Bingaman–Specter	2006	-7	0	32	60

222. Meghan McGuiness & A. Danny Ellerman, *The Effects of Interactions Between Federal and State Climate Policies*, *in* CAP-AND-TRADE: CONTRIBUTIONS TO THE DESIGN OF A U.S. GREENHOUSE GAS PROGRAM 95 (2008) (suggesting that, from an economic perspective alone, preemption is preferable).

223. *Climate Change Policy to Battle Economic Downturn in 2009*, CARBON MARKET N. AM., Jan. 9, 2009, at 1, *available at* http://www.pointcarbon.com/polopoly_fs/1.1033448!CMNA20000109.pdf (stating that RGGI may seek inclusion in a federal system on its own terms).

224. OFFICE OF MANAGEMENT & BUDGET, A NEW ERA OF RESPONSIBILITY: REVIEWING AMERICA'S PROMISE, 21 (2009), *available at* http://www.whitehouse.gov/omb/assets/fy2010_new_era/A_New_Era_of_Responsibility2.pdf.

Bingaman–Specter, the least stringent, requires reductions to 2006 levels by 2020 and 1990 levels by 2030.[225] Dingell–Boucher and Lieberman–Warner use 2005 as a baseline and commence in 2012.[226] The former aims for 7% reductions in 2020 and 80% in 2050, while the latter aims for 16% reductions in 2020 and 70% in 2050.[227] USCAP calls for reductions of 14–20% below 2005 levels by 2020 and 80% reductions below 2005 levels by 2050.[228] President Obama's more stringent target, similar to the California's AB 32,[229] requires 80% below 1990 levels by 2050.[230]

Waxman–Markey[231] and Kerry–Boxer[232] follow the recent budget proposals[233] in pointing towards stringency, expecting targets of 14% below 2005 levels by 2020 and 83% by 2050. All of these suggestions follow the U.S. Government Accountability Office's (GAO) recommendation of a long-term price signal to drive investment in technology from an early stage.[234] President Obama's proposed path requires a 40% reduction below BAU by 2020,[235] although the USCAP suggestion is closer to 20% reductions below BAU by 2020.[236]

Studies have attempted to model the allowance prices in various permutations of the bills. The Environmental Protection Agency (EPA) estimated allowances under Bingaman–Specter to cost $57–$61 in 2030 (in 2005 dollars), over three times the Technology Accelerator Payment value.[237] Similarly, the EPA predicted prices of $46–$73 in 2030 under

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225. Low Carbon Economy Act of 2007, S. 1766, 110th Cong. § 101 (2007).

226. Dingell–Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 711(a) (2008); America's Climate Security Act of 2007, S. 2191, 110th Cong. § 1201(a).

227. U.S. Climate Action P'ship, Issue Overview: Comparison of Emission Targets 1 (2009), *available at* http://www.pewclimate.org/docUploads/USCAP-Issue-Brief-Target-Comparison.pdf.

228. U.S. CLIMATE ACTION P'SHIP, *supra* note 25, at 5.

229. MAC 2007, *supra* note 118, at 2; CARBON MARKET N. AM., Dec. 12, 2008, *supra* note 159, at 3.

230. Obama for America, Barack Obama and Joe Biden: New Energy for America, 2 (Aug. 3, 2008) http://www.barackobama.com/pdf/factsheet_energy_speech_080308.pdf.

231. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. §§ 702(2), (4), 703(2)(4) (2009).

232. Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. § 703 (2009).

233. OFFICE OF MANAGEMENT & BUDGET, *supra* note 227, at 21.

234. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 54.

235. FLACHSLAND, EDENHOFER, JAKOB & STECKEL, *supra* note 11, at 15; CARBON MARKET N. AM., Nov. 21, 2008, *supra* note 159, at 3.

236. H. Josef Hebert, *Waxman Promises Quick Action on Climate*, ASSOCIATED PRESS, Jan. 15, 2009, *available at* http://www.breitbart.com/article.php?id=d95nne8o0&show_article=1.

237. U.S. ENVT'L. PROT. AGENCY, OFFICE OF ATMOSPHERIC PROGRAMS, EPA ANALYSIS OF THE LOW CARBON ECONOMY ACT OF 2007, 33 (2008), *available at* http://www.epa.gov/climatechange/economic/pdfs/S1766_EPA_Analysis.pdf.

Lieberman–Warner.[238] However, reflecting the influence of a variety of factors (such as the economic downturn), the EPA estimated allowance prices under Waxman–Markey to be $13–$24 in 2015 and $16–$30 in 2020, although the high end of these price ranges is dramatically lowered by increased international offset use.[239] The Congressional Budget Office's analysis placed the same bill's allowances at $16 in 2012 and $26 in 2019.[240] The Congressional Research Service generalized from these studies that the broad consensus seemed to suggest that under Waxman–Markey prices "generally fall within a band (between $13 and $21 in 2015), and increase at a steady rate through 2050 (between 4% and 6% annually)."[241] Point Carbon estimated allowance prices to average $15 between 2012 and 2019 under Kerry–Boxer, approaching $20 by 2020.[242] The EPA has stated (before releasing a full analysis of Kerry–Boxer) that allowance prices would be approximately 1% higher than in Waxman–Markey due to the similarity of the two bills.[243]

A report by New Energy Finance pegged the federal U.S. allowance price at €15–€20 by 2020.[244] Recent budget proposals suggest that allowance prices will be at least $13.70 in 2012, rising to around $16.50 by 2020.[245] These more recent predictions suggest that the allowance price will remain close to the auction reserve price for the first decade of the scheme, with allowances from the early years banked for compliance later on.[246] It is difficult to make any certain predictions about a likely price under the U.S. ETS, due not only to modeling constraints, but also to the uncertainty about the direction of the global economy.[247]

Only the USCAP Blueprint suggests that multi-year compliance periods like the EU ETS's phases should be used, and that the "rolling two-year

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238. U.S. ENVTL. PROT. AGENCY, EPA ANALYSIS OF THE LIEBERMAN-WARNER CLIMATE SECURITY ACT OF 2008, at 27 (Mar. 14, 2008), http://www.epa.gov/climatechange/downloads/s2191_EPA_Analysis.pdf.

239. U.S. ENVTL. PROT. AGENCY, ANALYSIS OF THE AMERICAN CLEAN ENERGY AND SECURITY ACT OF 2009, H.R. 2454 IN THE 111TH CONGRESS, 3 (June 23, 2009), http://www.epa.gov/climatechange/economies/pdfs/HR2454_Analysis/pdf.

240. CBO, *supra* note 30, at 13.

241. CONGRESSIONAL RESEARCH SERVICE, CLIMATE CHANGE: COSTS AND BENEFITS OF THE CAP-AND-TRADE PROVISIONS OF H.R. 2454, at 39 (2009).

242. *Senate Bill Pegs Carbon at $15 a Tonne: Report*, CARBON MARKET N. AM., Oct. 9, 2009, at 1, *available at* http://www.pointcarbon.com/polopoly_fs/1.1246345!CMNA20091009.pdf.

243. U.S. ENVTL. PROT. AGENCY, ECONOMIC IMPACT OF S. 1733: THE CLEAN JOBS AND AMERICAN POWER ACT OF 2009, at 3 (Oct. 23, 2009), http://www.epa.gov/climatechange/economics/pdfs/EPA_S1733_Analysis.pdf.

244. NEW ENERGY FINANCE, GLOBAL CARBON QUARTERLY Q3 2009, at 19 (2009).

245. CARBON MARKET N. AM., Feb. 27, 2009, *supra* note 30, at 1.

246. CARBON MARKET N. AM., Oct. 9, 2009, *supra* note 243, at 1.

247. U.S. ENVTL. PROT. AGENCY, *supra* note 240, at 8.

compliance period" in Waxman–Markey and Kerry–Boxer is just a result of the borrowing rules rather than a concerted effort to use such periods.[248] Even if such periods are used, the desire for a long-term price signal will minimize restrictions on banking between periods, vastly reducing their importance. However, the requirement of regular review of the system's adequacy,[249] with the associated impetus for action upon its recommendations, may have a similar effect.[250]

B. Coverage

Waxman–Markey, Dingell–Boucher, Lieberman–Warner, and Bingaman–Specter all include requiring over 80% of emissions under the cap by 2015.[251] President Obama's plan is for an "economy-wide"[252] scheme, and it is likely that in order to achieve his dramatic emissions reductions, coverage will indeed have to be wide.[253] The USCAP proposes the same, with the scheme covering large stationary emitters downstream (such as power stations) and other fossil fuel use upstream (such as transportation fuel production).[254] The GAO report echoes these sentiments in its recommendation that coverage be as wide as possible to maximize cost abatement opportunities, but with reliable MRV as a limiting factor.[255] Some areas will be more suited to offset schemes or technology standards, such as agriculture or refrigerant gases.[256] However, as the impetus from major emitters and the environmental lobby is for wide coverage, their wishes are likely to be respected. To achieve the desired coverage, the point of regulation for all five bills is a hybrid of upstream and downstream regulation.[257] A variety of GHGs are regulated by all the bills (as wide

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248. U.S. CLIMATE ACTION P'SHIP, *supra* note 25, at 8.

249. *E.g.*, American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 705 (2009); Low Carbon Economy Act of 2007, S. 1766, 110th Cong. § 501(a)(2) (2007).

250. LAZAROWICZ, *supra* note 17, at 82.

251. CBO, *supra* note 30, at 5 (stating that Waxman–Markey will cover 72% of U.S. GHG emissions in 2012, 78% in 2015, and 86% in 2020).

252. Obama for America, *supra* note 231, at 2.

253. Ellerman in CAP-AND-TRADE, *supra* note 33, at 29; CARBON MARKET N. AM., Feb. 27, 2009, *supra* note 30, at 1.

254. U.S. CLIMATE ACTION P'SHIP, *supra* note 25, at 7 (emphasizing that large emitters are defined as those emitting over 25,000 tons of carbon dioxide equivalent per annum for existing sources and 10,000 tons of carbon dioxide equivalent per annum for new sources).

255. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 27–28.

256. *Id.* at 27. Methane, a hard gas to reliably monitor, forms approximately 8% of all GHG emissions from the U.S.

257. Joe Lieberman, *Frequently Asked Questions on Global Climate Change and the Lieberman-Warner Climate Security Act*, at 9, *available at* http://lieberman.senate.gov/documents/lwcsafaq.pdf (last visited Dec. 16, 2009); Questions and Answers

coverage would require), although hydrofluorocarbons (HFCs) are omitted from a number of them.[258] All bills except Waxman–Markey[259] and Kerry–Boxer[260] leave the GWP determination to the EPA Administrator or President,[261] but as Waxman–Markey and the EU ETS use the most up-to-date figures from the IPCC's Fourth Assessment Report,[262] these are probably the figures that will be used.

C. Allocation

The three pre-2009 bills all envisioned the role of free allowance distribution declining over time, reflecting the "political necessity of a high degree of initial free allocation."[263] Around 20% of allowances are auctioned at the outset of each of these schemes, with this proportion increasing steadily. Although during the presidential campaign, Obama and his administration consistently took a firm line on 100% auctioning from the start,[264] rent-seeking during the legislative process reduced this number in Waxman–Markey to 19% auctioning from 2012 through 2025 and 40% from 2012 through 2050.[265] The USCAP proposal suggests that a "significant portion" of allocated allowances should be free to help more affected areas of the country and reward early action using new technology, with auctioning playing a greater role as time goes on.[266] This proposal supports the GAO Report's conclusion that auctioning is, a preferable option in the long term since it avoids the incentive-distorting effect of updating allowances, which the U.S. system may well feature despite

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Regarding the "Low Carbon Economy Act of 2007," at 10, *available at* http://energy.senate.gov/public/_files/ClimateBillFrequentlyAskedQuestions.pdf (last visited Dec. 16, 2009); American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 722(a) (2009).

258. Carbon dioxide counts for around 80% of U.S. GHG emissions.; American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. §§ 332, 619 (2009) (regulating HFCs under the Clean Air Act as ozone-depleting substances, bringing them outside the ETS entirely).

259. H.R. 2454 § 712(b)(1)–(2).

260. Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. § 712 (2009).

261. America's Climate Security Act of 2007, S. 2191, 110th Cong. § 4(10) (2007); Low Carbon Economy Act of 2007, S. 1766, 110th Cong. § 3(2) (2007); Dingell-Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 701(b)(2) (2008).

262. LAZAROWICZ, *supra* note 17, at 47.

263. Ellerman in CAP-AND-TRADE, *supra* note 33, at 15.

264. Obama for America, *supra* note 231, at 2–3; CARBON MARKET N. AM., Feb. 27, 2009, *supra* note 30, at 1; OFFICE OF MANAGEMENT & BUDGET, *supra* note 225, at 21; Alex Kaplun, *OMB Chief Defends Obama Admin Carbon Auction Plans*, E&E NEWS PM, Mar. 3, 2009, http://www.eenews.net/eenewspm/2009/03/03/5.

265. JOHN LARSEN & ROBERT HEILMAYR, WRI BRIEF ASSESSMENT OF ALLOWANCE DISTRIBUTION UNDER H.R. 2454, THE AMERICAN CLEAN ENERGY AND SECURITY ACT 3 (2009), *available at* http://www.wri.org/publication/usclimatetargets/allowance-distribution.

266. U.S. CLIMATE ACTION P'SHIP, *supra* note 25, at 11.

attempts to strictly regulate the recipients of free allowances.[267] Waxman–Markey and Kerry–Boxer both use a mix of updating and historically benchmarked allocations.[268] As allocation methodology has been one of the most contentious political elements among those supporting the bill, we can expect to see some mixture of the two. However, predicting exactly how the bill will look at the end of the legislative process is too difficult to be worthwhile.

D. Cost Containment

All five bills[269] and the USCAP Blueprint[270] allow unlimited banking. In light of these sources and the GAO's mention of "the importance of long-term certainty in encouraging investments in low-carbon technologies,"[271] unlimited banking will certainly feature in the U.S. ETS.

Waxman–Markey and Kerry–Boxer allow unlimited interest-free borrowing of allowances from the following year's vintage of allowances.[272] Both Dingell–Boucher and Lieberman–Warner have borrowing facilities for up to 15% of compliance in any year, imposing 8%[273] and 10%[274] interest per annum respectively; for vintages 1–5 years in the future, Waxman–Markey and Kerry–Boxer follow Dingell–Boucher's provisions.[275] None of these three employ a safety valve; whereas Bingaman–Specter does not allow borrowing but has what amounts to a safety valve set at $12 per ton rising 5% per annum above inflation. Given President Obama's targets and emphasis on environmental results, the use of a safety valve is highly unlikely. However, other methods of cost containment are available, as seen in Dingell–Boucher, Lieberman–Warner, Kerry–Boxer, and Waxman–Markey, all of which use a strategic allowance reserve as USCAP recommends. This is a pool of allowances that are set

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267. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 28.

268. American Clean Energy and Security Act, H.R. 2454, 111th Cong. § 783(b)(2), (3), (c) (2009); American Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. § 772(b)(2), (c) (2009).

269. H.R. 2454 § 725(a)(1)–(2); America's Climate Security Act of 2007, S. 2191, 110th Cong. § 2101 (2007); *see* Dingell–Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 715(a) (2008) (unlimited banking is subject to the Administrator requiring eventual retirement).

270. U.S. CLIMATE ACTION P'SHIP, *supra* note 25, at 8.

271. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 56.

272. H.R. 2454 § 725(c)(1); S. 1733, 111th Cong. § 725(c)(1). This borrowing has implications for the allocation methodology adopted.

273. Dingell–Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 715(c)(2) (2008).

274. America's Climate Security Act of 2007, S. 2191, 110th Cong. §§ 2301, 2303 (2007).

275. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 725(c)(2)(A), (C) (2009).

aside each year and auctioned regularly according to fixed rules at a predetermined trigger price (somewhere between $20 and $30 rising 5% over inflation in Dingell–Boucher;[276] 60% above the thirty-six month average daily closing price in Waxman–Markey;[277] and $28 in 2012 rising 5% over inflation per annum between 2012 and 2017 and rising to 7% thereafter in Kerry–Boxer).[278] This would be very difficult to trigger except in the case of extreme short-term price spikes: Waxman–Markey's reserve could only be triggered by a steady price increase of 100% per annum for three years. The idea that prices will quadruple during this short period at a steady rate is inconceivable.

According to the price estimates above, any auction reserve price will be followed for the first few years of the scheme and will not deviate far from it within the scheme's first couple of decades. Kerry–Boxer suggests $10 (in 2005 dollars) in 2012 rising 5% above inflation per annum.[279] Waxman–Markey opts for the same, but using 2009 dollars.[280] Lieberman–Warner omitted such a reserve price. Dingell–Boucher also did not call for a reserve price, but it remained open to the EPA Administrator to require one.[281] Bingaman–Specter did not have a price floor, but it envisioned far lower prices than the other bills, so low prices were considered less of an issue.[282] This move towards a "soft" price collar is seen as necessary to achieve sufficient political support for the bill to pass.[283]

Borrowing, with a suitable level of interest as above, could certainly help stabilize the long-term price path called for by the GAO, although the potential for "debtor" companies to subsequently disappear or lobby for raised caps is an issue that could severely compromise environmental effectiveness.[284] In addition, the calls for a high price signal spurring investment in domestic abatement would be ignored if excessive borrowing were allowed, and greater levels of auctioning prevent borrowing from taking place. For these reasons, long-term borrowing is an unlikely candidate for inclusion in the U.S. ETS, although the short and restricted

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276. Dingell–Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 716(c)(2) (2008).

277. H.R. 2454 §726(c)(2).

278. Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. § 726 (2009).

279. *Id.* at § 778(d).

280. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 791(d) (2009).

281. Dingell-Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 730(b) (2008).

282. Low Carbon Economy Act of 2007, S. 1766, 110th Cong. § 208 (2007).

283. Timothy Gardner, *Fight Looms on U.S. Climate Price Controls*, REUTERS, Sept. 30, 2009, http://www.reuters.com/article/GCA-GreenBusiness/idUSTRE58T6XU20090930.

284. FLACHSLAND, EDENHOFER, JAKOB & STECKEL, *supra* note 11, at 19, 47.

mid-term borrowing in Waxman–Markey and Kerry–Boxer could provide a balanced solution.

The likelihood of using market intervention measures, through which the regulator can interfere in the workings of the market if conditions become unfavorable, is not yet clear. Lieberman–Warner used a Carbon Market Efficiency Board to temporarily increase the use of banking, borrowing, and offsets,[285] and the USCAP Blueprint has suggested a similar mechanism through the strategic offset and allowance reserve pool that can be accessed at the regulator's discretion.[286] However, the other bills, in abstaining from the use of discretionary market intervention, stress the need for clear rules in order to produce the long-term price signal GAO requires of a carbon market,[287] even if this involves set cost containment measures such as safety valves or strategic allowance reserves. Whether the Blueprint's proposal can be formulated in a sufficiently predictable, clear, and environmentally effective manner to satisfy these calls has yet to be seen. As discussed later, however, the effect on linking prospects of market intervention measures should be sufficient to focus the minds of the legislators on the use of rules rather than discretion.

E. Offsets

Waxman–Markey allows two billion tons of offsets to be used for compliance each year, split equally between domestic and international offsets, following USCAP's lead.[288] This amounts to a limit of just under 30% compliance at the scheme's outset, falling to a minimum of 27% by the middle of the next decade and rising steadily thereafter. A conversion rate of 1.25 international offsets for one ton of emissions from 2018 means that 20% of all retired international offsets will not be used for compliance; this increased offset use will lower the total level of global emissions.[289] There is no statutory limit on the number of international allowances permitted for compliance, but a regulator can impose such a limit under this scheme.[290] Kerry–Boxer follows Waxman–Markey in all of the above provisions except that its domestic international ratio is 3:1 rather than

285. America's Climate Security Act of 2007, S. 2191, 110th Cong. § 2604(a)(1)(A), (B), (E) (2007).

286. U.S. CLIMATE ACTION P'SHIP, *supra* note 25, at 10.

287. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 24.

288. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 722(d)(1) (2009).

289. *Id.* § 722(d)(1)(A).

290. *Id.* § 728(d).

1:1.[291] Up to 750 million extra international offsets can be used if there are fewer than 900 million domestic offsets in a year.[292]

Dingell–Boucher sees an increasing role to be played by offsets, rising from 5% of each entity's compliance between 2013 and 2017 up to 15% from 2018 to 2020[293]—in addition to the unlimited use of foreign allowances. Lieberman–Warner allows 15% of compliance to be satisfied through domestic offsets,[294] 15% through foreign offsets,[295] and 2.5% through international forest carbon credits.[296] International allowances and international forest carbon credits can reach these limits if the regulator issues fewer offsets than the limits allow, with unused amounts carrying over to the following year.[297] There is no limit on the use of domestic offsets under Bingaman–Specter, and the President can institute a scheme to allow up to 10% of compliance to be covered by international offsets.

The GAO suggests that offsets are not a reliable long-term approach to mitigating emissions, as they can serve to "undermine the system's integrity,"[298] although it accepts that an improved CDM may offer some benefits during the transition period to a low-carbon economy.[299] The USCAP Blueprint calls for the EPA to regulate the use of offsets.[300] International offsets would have to satisfy the qualitative standards required under the domestic offset scheme and over time would be accepted only from states that have undertaken to reduce their emissions.[301] An annual limit of 1.5 billion tons of domestic offsets, and the same limit on international offsets, would be in place alongside a total offset cap of 2–3 billion tons.[302] Moreover, upon a price spike, emitters would have access to a reserve of offsets above the annual limit and allowances borrowed from a future compliance period. If granted, a request for offsets or allowances could have substantially harmful effects on the market similar to those seen

291. Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. § 722(d)(1)(A) (2009).

292. *Id.* § 722(d)(1)(C).

293. Dingell–Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 712(c) (2008).

294. America's Climate Security Act of 2007, S. 2191, 110th Cong. § 2402(a) (2007) (presumably due to their higher reliability than that of international offsets).

295. *Id.* § 2501.

296. *Id.* § 3803.

297. *Id.* § 321(3)(b).

298. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 56.

299. *Id.* at 55.

300. U.S. CLIMATE ACTION P'SHIP, *supra* note 25, at 9.

301. *Id.* ("environmentally additional, verifiable, permanent, measurable and enforceable").

302. *Id.*

in EU ETS Phase I, as the USCAP limit requires reductions below BAU of 2.5–3 billion tons by 2020.[303]

From all of the above, it appears quite evident that offsets will have a significant role to play in the U.S. ETS system, most likely along the lines of Waxman–Markey's and Kerry–Boxer's provisions.

F. Links to Other Systems

Most of the details regarding offsets and allowances from other schemes are laid out above, suggesting the likelihood of linking to the CDM and other major offset systems, as well as to ETS schemes. The regulator is obligated to seek out links to suitable ETS schemes under Waxman–Markey, Dingell–Boucher, Lieberman–Warner, and Bingaman–Specter.[304] The USCAP paper explicitly calls for links to other emissions trading systems,[305] and Obama's comments regarding an "effective and equitable global program" that can "bring all the major emitting nations together to develop effective emissions reduction efforts"[306] are a strong signal that international cooperation could involve linking. Although the GAO report is wary of the downsides of linking, especially cost containment propagation, it does note the potential to improve cost-effectiveness.[307]

G. Non-Compliance and Monitoring, Reporting, and Verification

Under Lieberman–Warner, the fine for non-compliance is either $200 or three times the market price, whichever is higher, plus an interest-free, make-good provision.[308] Waxman–Markey requires a fine of double the auction price and an interest-free, make-good penalty.[309] Kerry–Boxer requires a fine of double the fair market value of an allowance plus an

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303. BUREAU OF OCEANS AND INT'L. ENV'T. AND SCI. AFFAIRS, U.S. DEP'T. OF STATE, U.S. CLIMATE ACTION REPORT—2006: FOURTH CLIMATE ACTION REPORT TO THE UN FRAMEWORK CONVENTION ON CLIMATE CHANGE 60 (2006), *available at* http://www.state.gov/g/oes/rls/rpts/car/index.htm.

304. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 728(c)(2)(A) (2009); Dingell–Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 761(a) (2008); America's Climate Security Act of 2007, S. 2191, 110th Cong. § 2501 (2007); Low Carbon Economy Act of 2007, S. 1766, 110th Cong. § 501(d) (2007); Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. § 728(a) (2009).

305. U.S. CLIMATE ACTION P'SHIP, *supra* note 25, at 3, 6.

306. Obama for America, *supra* note 231, at 3.

307. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 30.

308. S. 2191 § 1203(a)(2)(B)(i), (ii).

309. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 723(b)(2) (2009).

interest-free, make-good provision.[310] Dingell–Boucher is less punitive, with an interest-free, make-good requirement plus a fine of 50% of the fair market value of an allowance.[311] Bingaman–Specter requires the payment of three times the safety valve price in the year of non-compliance.[312] USCAP makes no mention of non-compliance measures. It has been suggested that one key aspect of a successful emissions trading program is an onerous non-compliance penalty,[313] and there is little doubt that, when combined with effective MRV, it would certainly strengthen the system. The level of penalty for non-compliance must exceed a mere make-good provision so as to prevent it from effectively becoming a safety valve.

It is not currently possible to comment on MRV in the U.S. ETS except to say that the audacious coverage plans may be cause for concern that even a predominantly upstream hybrid point of regulation cannot entirely allay. Moreover, any domestic offset schemes will be subject to the usual host of worries about MRV in offset schemes, although experience from existing GHG ETS schemes and emissions trading schemes in the U.S. will be invaluable in constructing a solid MRV framework.

Waxman–Markey and Kerry–Boxer require quarterly reporting,[314] and Dingell–Boucher requires annual reporting,[315] whereas Bingaman–Specter[316] and Lieberman–Warner[317] leave reporting and publication of data to be decided by the EPA Administrator. All bills except Bingaman–Specter require the publication of emissions data on the internet as soon as possible after receipt by the Administrator.[318] These requirements suggest that the U.S. ETS will feature at least annual reporting that is entirely public and transparent.

H. Border Adjustments

To prevent leakage, and its economic and environmental downsides, the four earliest bills require allowances from a special reserve to be surrendered for goods with embedded carbon entering the U.S. from

310. Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. § 723 (2009).

311. Dingell–Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 715(c)(1) (2008).

312. Low Carbon Economy Act of 2007, S. 1766, 110th Cong. § 602 (2007).

313. REVESZ, SANDS & STEWART, *supra* note 16, at 13.

314. H.R. 2454 § 713(b)(2); S. 1733 § 713(b)(2)(B).

315. H.R. __ § 703(b).

316. S. 1766 § 601.

317. America's Climate Security Act of 2007, S. 2191, 110th Cong. § 1103(a) (2007).

318. American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 713(b)(1)(N) (2009); S. 2191 § 1105(8); Dingell–Boucher Cap-and-Trade Bill Discussion Draft, H.R. __, 110th Cong. § 408 (2008); Low Carbon Economy Act of 2007, S. 1766, 110th Cong. § 601 (2007).

countries that have not taken sufficient action to mitigate their emissions,[319] with such a provision expected in Kerry–Boxer.[320] The USCAP has hinted at support for similar measures.[321] The GAO has noted the potential benefits of including this in the U.S. ETS, but, along with USCAP, notes the potential violations of World Trade Organization law that could render these actions illegal—not to mention the possibility of retaliatory trade measures.[322] In recent interviews, Obama has stated his opposition to these measures and his hope that the Senate version of the bill will not include them.[323]

All of these sources have as their best scenario an international agreement with binding caps on all countries, nullifying the need for any such border measures. However, some border adjustment tariff or allowance reserve will probably be included to garner sufficient support for the legislation to pass.

APPENDIX 2: THE EU ETS

A. Price, Targets, and Timetables

The EU ETS is currently in its second Phase, covering the Kyoto commitment period of 2008–2012. Phase II requires net emissions reductions of 8% below 1990 levels across the EU in line with the Kyoto Protocol and the subsequent Burden Sharing Agreement, which reapportions commitments under the Kyoto Protocol between Member States.[324] EUAs have been trading within the €20–€30 range for much of the current phase,[325] although the economic downturn has lowered the price significantly. Market participants predicted in early 2008 that 2010 EUA prices would be around €24 and 2020 EUA prices would be around €35.[326] Predictions of even higher prices were made in 2008, including 2020 prices of €67 (Deutsche Bank)[327] and €45–€79.3 (SocGen),[328] and if an

319. H.R. 2454 § 768; H.R. __ § 786; S. 1766 § 502; S. 2191 § 1306.

320. Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. § 765 (2009).

321. U.S. CLIMATE ACTION P'SHIP, *supra* note 25, at 4.

322. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 29.

323. John M. Broder, *Obama Opposes Trade Sanctions in Climate Bill*, N.Y. TIMES, June 28, 2009, http://www.nytimes.com/2009/06/29/us/politics/29climate.html.

324. Decision 2002/358/EC, art. 2, 2002 O.J. (L 130) 1, 3.

325. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 33.

326. POINT CARBON, CARBON 2008, *supra* note 114, at 31.

327. Deutsche Bank, *EUA Prices of € 100/t or More Are Possible Under Certain Scenarios*, CO_2-HANDEL.DE, May 30, 2008, http://co2-handel.de/article58_8839.html.

international agreement is reached and 30% reductions are required, €93.8 (SocGen).[329] However, due to a combination of factors (including energy prices peaking in 2008, the recession, steady output from the CDM, and increased flexibility in proposals for Phase III), the likely price has been suggested to move from the lower reaches of a €20–€40 range[330] in 2013 toward €60 by 2020.[331] Below is a recent collection of expected prices from various financial institutions for EUAs in 2012, before Phase III begins and the cap is lowered.[332] It should be noted that the banking of EUAs and CERs will be employed to keep the price path relatively continuous.

Table 3. A recent collection of expected prices from various financial institutions for EUAs in 2012, before Phase III begins and the cap is lowered.

Institution	*Estimated EUA Price in 2012*
Barcap	24
COER2	28–32
Citi	25
Daiwa	12
PointCarbon	26
Sagacarbon	26
SocGen/Orbeo	20
UBS	35

The third phase, 2013 to 2020, is currently taking shape and much rests on what is agreed upon in international negotiations which remain without a clear outcome even after Copenhagen. If no agreement is reached, the EU has pledged to reduce emissions to 20% below 1990 levels during this period, but the Council of Ministers has pledged a 30% reduction below 1990 levels if an acceptable international agreement can be reached in which other developed countries take on similar commitments, and more economically advanced developing countries contribute according to their

328. *European Carbon Prices to Quadruple by 2020—SocGen*, REUTERS UK, Oct. 10, 2008, http://uk.reuters.com/article/idUKLA12666420081010.

329. *Id.*

330. MICHAEL GRUBB, CARBON PRICES IN PHASE III OF THE EU ETS, CLIMATE STRATEGIES BRIEFING NOTE, 4 (2008), *available at* http://www.climatestrategies.org/component/reports/category/47/69.html.

331. OFFICE OF CLIMATE CHANGE, *supra* note 47, at 42 tbl.14.

332. Poll: EU Carbon Emissions—EUA Forecasts to 2020, THOMSON REUTERS, Sept. 25, 2009, http://in.reuters.com/article/oilRpt/idINLG61152420090218.

capacities and responsibilities.[333] Moreover, the Council of Ministers has pledged to reduce emissions by 60%–80% compared to 1990 levels by 2050, with the potential of 95% cuts by 2050 if a suitable international agreement can be forged.[334] These extra cuts appear increasingly unlikely as the probability of a satisfactory international agreement dwindles. The core pledge implies a reduction below BAU levels of 25%–35% up to 2020,[335] with reduction projected beyond 2020 in a linear fashion.[336]

B. Coverage

The EU ETS covers the twenty-seven member states of the EU, regulating all emitters over twenty MW,[337] amounting to approximately 41% of EU emissions.[338] It regulates downstream at emitter level and covers only carbon dioxide.[339] Plans for Phase III are to increase coverage of other gases and sectors by around 7%, with every increase in coverage accompanied by rigorous checks to ensure that newly covered sectors are capable of reliable MRV.[340] GWP ratios are taken from the IPCC's Fourth Assessment Report.[341]

C. Allocation

In the previous phase of 2005–2007 (effectively a rehearsal period)[342] and the current phase, member states had to formulate National Allocation Plans (NAPs), which set out how their countries would conform to requirements both in terms of the regulated (ETS) and non-regulated (other

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333. Citizens' Summary: EU Climate and Energy Package, http://ec.europa.eu/climateaction/docs/climate-energy_summary_en.pdf; Directive 2003/87/EC, art. 28(1), 2003 O.J. (L 275) 1, 37–38 (as amended June 25, 2009).

334. EUR. COMM'N, *supra* note 46, at 2; McDermott, *supra* note 47.

335. FLACHSLAND, EDENHOFER, JAKOB & STECKEL, *supra* note 11, at 15.

336. Memoranda from the European Comm'n, Question and Answers on the Commission's Proposal to Revise the EU Emissions Trading System, at 2, Memo/08/35 35 (Jan. 23, 2008); *Commission Proposal*, *supra* note 55, at 14.

337. A new threshold of 10,000 tons of carbon dioxide per annum is also being considered for Phase III to include more emitters.

338. *Commission Staff Working Document*, *supra* note 27, at 13.

339. Directive 2003/87/EC, Annex 1, 2003 O.J. (L275) 1, 43 (as amended June 25, 2009).

340. EUR. COMM'N, *supra* note 46, at 4 (carbon dioxide emissions from petrochemicals; ammonia and aluminum; nitrous oxide emissions from production of industrial acids; and PFC emissions from the aluminum sector).

341. LAZAROWICZ, *supra* note 17, at 47; FLACHSLAND, EDENHOFER, JAKOB & STECKEL, *supra* note 11, at 18; *Commission Proposal*, *supra* note 55, at 14 (discussing that these checks help to avoid gaming, especially in offset registration).

342. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 5.

policies) sectors.[343] These plans, including how many allowances were to be issued, were sent to the European Commission and assessed against the list of twelve criteria in Annex III of the ETS Directive.[344] If the Commission approved the NAP, the plan was entered into the central registry overseeing the EU ETS, the Community International Transaction Log (CITL), as well as the national registry of the emitter's country. Otherwise the Commission rejected the plan and required a new one to be submitted.

This system will be overhauled in Phase III, with the Commission taking a much more central role in setting the total cap and annual national caps, and with auctioning playing an increasingly important role in allowance allocation—from around 70% in 2020 to total auctioning by 2027.[345] The key decision in whether to auction or distribute free of charge is the likely leakage caused by auctioning, with the goal of minimizing leakage.[346] Free allowance allocation is based on historical benchmarks rather than on an updating basis.[347] Thus, the EU will be able to present a far more united, uniform, and decisive front in negotiations than if the decentralized NAP process was still in place.[348]

D. Cost Containment

The EU ETS has no safety valve and no price floor once allowances are distributed, and any auction reserve price that is set will be far below expected prices.[349] No borrowing is allowed between phases, but borrowing within phases (limited to the year ahead)[350] will be reduced as auctioning takes on a larger role.[351] Allowances can be banked for eight years in Phase III,[352] and Phase III plans do not limit banking of unused allowances from Phase II to help prevent a price crash, as was seen at the end of Phase I.[353] There are no market intervention measures.

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343. Directive 2003/87/EC, art. 9, 2003 O.J. (L 275) 32, 35.

344. *Id*. at Annex III.

345. Press Release, European Union, Questions and Answers on the Revised EU Emissions Trading System 4 (Dec. 17, 2008), *available at* http://europa.eu/rapid/pressReleasesAction.do?reference=MEMO/08/796.

346. Directive 2009/29/EC, art. 1(12), 2009 O.J. (L 140) 63, 72.

347. *Id*. at art. 10a(2).

348. *Commission Staff Working Document*, *supra* note 27, at 136.

349. Directive 2003/87/EC, art. 10(4), 2003 O.J. (L 275) 1, 16 (as amended June 25, 2009).

350. Ellerman in CAP-AND-TRADE, *supra* note 33, at 30.

351. Sterk et al., *supra* note 12, at 17.

352. Directive 2003/87/EC, art. 13(1), 2003 O.J. (L 275) 1, 27 (as amended June 25, 2009).

353. A. DANNY ELLERMAN & PAUL L. JOSKOW, THE EUROPEAN UNION'S EMISSIONS TRADING SYSTEM IN PERSPECTIVE 13 (2008).

E. Offsets

There is currently no domestic offset program in the EU ETS (although ERUs from Kyoto's Joint Implementation (JI) mechanism are permitted if produced by installations not covered by the cap),[354] but the EU ETS Review has proposed a domestic offset scheme for Phase III.[355] CERs from the CDM and ERUs from JI can be surrendered for compliance up to the amount allowed in NAPs,[356] and Kyoto credit validity is set to continue beyond 2012.[357] The EU ETS has provided the strongest price signal for CERs to date, hence the extent to which CERs have tracked the EUA price.[358]

If the 20% reduction target is used, concerns that excessive offset use will prevent reductions from being achieved will lead to further limits on offset use. The European Commission has recommended that the level of offsets allowed for use in Phase III should be the higher number of those allowed but not used in Phase II and a percentage not below 11% of the allocation for Phase II.[359] During Phase II, approximately 1.4 billion CERs and ERUs were permitted for compliance. Currently, if a satisfactory international agreement can be reached and the 30% target is used, the number of offsets allowed for compliance will be increased by 50%. Both of these scenarios are restricted by the requirement that no more than half of the EU-wide reductions from 2008 to 2020 are achieved through offsets.[360]

There have been tentative suggestions about heightened qualitative limits on which CERs and ERUs can be accepted for compliance[361] over and above the requirements under the current Linking Directive (no nuclear credits, LULUCF credits,[362] or hydroelectric plants over twenty megawatts that do not comply with rigorous environmental standards).[363] Members of the European Parliament (MEPs) have called for only "high quality" credits to be used from 2013, assuming an international agreement does not

354. Directive 2003/87/EC, art. 11b(2), 2003 O.J. (L 275) 1, 26 (as amended June 25, 2009).

355. *Commission Proposal*, *supra* note 55, at 11.

356. POINT CARBON, CARBON 2008, *supra* note 114, at 28 (around 10% in each country).

357. COMM'N. OF THE EUR. CMTYS., *supra* note 130, at 8.

358. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 33.

359. Directive 2009/29/EC, art. 1(13), 1(28), 2009 O.J. (L 140) 63, 77–78, 81–82.

360. *Id.* at art. 1(13).

361. CDM & JI MONITOR, *supra* note 58, at 1.

362. *See* Directive 2004/101/EC, art 1(2), 2004 O.J. (L 338) 18, 21 (amending Directive 2003/87/EC to include art. 11a(3)(a)).

363. *See id*. (amending Directive 2003/87/EC to include art. 11b(6)). The 2000 "Dams and Development" Report by the World Commission on Dams is taken as the benchmark.

materialize.[364] Although no guidance has emerged on what this standard would entail (aside from the Commission's suggestion that use of project-based CERs from more advanced developing countries should be phased out in favor of sector-based CERs),[365] some have suggested that it could rule out 20%–30% of all CERs;[366] even if a successor to Kyoto is in place, this call represents real worries within the EU about offset quality.[367] The Phase III proposals also require CERs to come from host countries that have ratified the new international agreement.[368]

F. Links to Other Systems

The EU ETS is currently linked only to the CDM and JI.[369] The ETS Directive obliges the EU to seek links with other systems hosted by Annex B countries,[370] and the EU ETS Review has called for "all barriers to linking EU ETS" to other ETS systems to be "removed."[371] Recently, the Commission has reiterated its commitment to creating an "OECD-wide carbon market by 2015."[372] Much depends on what is agreed to over the next few months and whether any international agreement will cause effective ETS systems to be set up elsewhere that satisfy EU criteria for linking.[373] The enthusiasm to link when it is appropriate can be seen in the European Commission's and ten member states' participation in ICAP, since ICAP seeks to "create an international forum of governments and public authorities that are engaged in the process of designing or implementing carbon markets . . . to discuss relevant questions on the design, compatibility and potential linkage of regional carbon markets."[374] The success of this forum in establishing links could determine the likelihood and timeframe of a U.S.–EU link.

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364. *Commission Proposal*, *supra* note 55, at 10, 18.
365. *Communication*, *supra* note 157, at 11.
366. *Id.* at 2.
367. *Commission Staff Working Document*, *supra* note 27, at 145.
368. *Commission Proposal*, *supra* note 55, at 10–11.
369. *See* Directive 2004/101/EC, 2004 O.J. (L 338) 18 (amending Directive 2003/87/EC).
370. Directive 2003/87/EC, art. 25(1), 2003 O.J. (L 275) 1, 35 (as amended June 25, 2009).
371. *Commission Staff Working Document*, *supra* note 27, at 164.
372. *Communication*, *supra* note 157, at 11.
373. *Commission Staff Working Document*, *supra* note 27, at 132.
374. INT'L CARBON ACTION P'SHIP, POLITICAL DECLARATION (2007), http://www.icapcarbonaction.com/index.php?option=com_content&view=article&id=12&Itemid=4&lang=en.

G. MRV and Non-Compliance

Plans are underway to harmonize and centralize the EU ETS in Phase III, reducing member state discretion about MRV methodology in NAPs.[375] Overall, MRV expertise has been developed to a high level, partly by limiting coverage to large emitters and by requiring that all emitters covered can be reliably monitored. These developments will ensure that this high standard is applied to any new sectors included.[376] Reports are made annually, and the reported data has to be published no later than three months after the end of the calendar year.[377]

There is a make-good provision and a penalty of €100 per allowance for non-compliance during Phase II.[378] During Phase III these fines will be indexed to the Eurozone inflation rate.[379] In addition, the regulator publishes details of non-compliant firms, so those firms cannot secretly pass non-compliance penalty costs to consumers.[380]

H. Border Adjustments

The EU ETS does not use border adjustments and has no plans to do so.[381]

375. *Commission Proposal*, *supra* note 55, at 6.

376. U.S. GOV'T ACCOUNTABILITY OFFICE, GAO-09-151, *supra* note 35, at 28.

377. Decision 2007/589/EC, Annex I(8), 2007 O.J. (L 229) 1, 25.

378. Directive 2003/87/EC, art. 16(3), 2003 O.J. (L 275) 1, 29 (as amended June 25, 2009).

379. *Id*. at art. 16(4).

380. *Id*. at art. 16(2).

381. *Carbon Tariffs Falling Out of Favour As Trade War Looms*, EURACTIV.COM, July 28, 2009, http://www.euractiv.com/en/climate-change/carbon-tariffs-falling-favour-trade-war-looms/article-184449; *European Enviro Minister Disproves [sic] of Carbon Tariffs*, CLIMATEWIRE, Oct. 16, 2009, http://www.eenews.net/climatewire/2009/10/16/7.

THE INTERNATIONAL JOINT COMMISSION'S ROLE IN THE UNITED STATES-CANADA TRANSBOUNDARY AIR POLLUTION CONTROL REGIME: A CENTURY OF EXPERIENCE TO GUIDE THE FUTURE

Jason Buhi & Lin Feng*

Abstract

The International Joint Commission (IJC), a bilateral institution established to manage the shared water resources of the United States and Canada, is celebrating its centennial. Despite its original mandate, the IJC also earned a prominent role in the governance of transboundary air pollution between the two nations. This article reviews the evolution of that particular function, evaluating the IJC's role in the international transboundary air pollution regime with an eye to the challenges apparent at the dawn of its second century. The birth of the IJC and its original mandate under the 1909 Boundary Waters Treaty are introduced first. Next, every reference made to the IJC directly confronting air pollution is presented and analyzed. A pattern of increasing responsibility is traced from Trail Smelter through the series of three Detroit-St. Clair River Region references, then beyond the Great Lakes Water Quality Agreements to the 1991 U.S.-Canada Air Quality Agreement. After evaluating those experiences, four proposals are distilled that would help to restore the IJC to the forefront of the U.S.-Canada transboundary air pollution control regime. Namely, the "precautionary principle" of international environmental law should be directly applied when drafting future references for

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submission to the IJC; the evidentiary value of IJC reports should be recognized in domestic courts on both sides of the border (especially in the context of the transboundary litigation provisions recorded in section 115 of the U.S. Clean Air Act and section 21.1 of the Canadian Clean Air Act); the Boundary Waters Treaty should be revised to transform IJC arbitration into an attractive alternative to litigation; and the IJC should be granted all of its familiar roles vis-à-vis the upcoming transboundary air pollution cap and trade program.

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INTRODUCTION

Few institutions have had a greater impact on the development of modern transboundary law than the International Joint Commission (IJC). Founded in 1909 as a humble forum for the settlement of water disputes between Canada and the United States, the IJC quickly ascended to the forefront of international environmental law. Although the vast majority of disputes referred to the IJC still concern water rights, the IJC also earned a prominent role in the transboundary air pollution control regime. Now, on its centennial anniversary, the time has come for a complete study of this particular function. It is that history—the successes and failures of the IJC in dealing with transboundary air pollution—which will be reviewed within this article and evaluated with an eye to the challenges apparent at the dawn of the IJC's second century.

After this brief introduction, the second section of this article will discuss the birth of the IJC and its original mandate under its enabling document, the 1909 Boundary Waters Treaty. The third section will discuss all the references made to the IJC directly confronting air pollution during its first century of operation and the IJC's evolving role vis-à-vis those challenges.[1] The IJC was called upon, just several years after its establishment, to directly settle the archetype transboundary air pollution dispute. In doing so, the IJC and its successor tribunal canonized lasting precedents in the field of international environmental law. The "polluter pays" and "extraterritorial responsibility" doctrines elaborated in the *Trail Smelter* cases have been incorporated into the rich chain of environmental literature developed under the auspices of the United Nations. After *Trail Smelter*, a series of three Detroit-St. Clair River region air quality references proved the IJC's effectiveness in solving transboundary air pollution disputes. Each reference granted progressively more power to the IJC by increasing its scope of inquiry and conduct, as the governments responded to weaknesses within the IJC's mandate. In addition, three bilateral agreements expanded the IJC's responsibilities during those years. The Great Lakes Water Quality Agreement of 1972 opened IJC proceedings to the public eye and transformed the IJC into a custodian of public discourse. Its 1978 successor explicitly acknowledged the linkage between air and water pollution, citing the interconnected role of both within a broader and more realistic definition of "ecosystem." Lastly, the 1991 U.S.-Canada Air Quality Agreement (AQA) reaffirmed the governments' faith in the IJC by once again calling upon it to handle mass publication of recommendations, manage public reaction to the findings, and entrust it with a prominent role in dispute resolution. In the performance of all of these tasks, the IJC has been lauded for its independence and professionalism.

The final section will suggest in greater detail four modest proposals to reward the IJC for a century of outstanding service and restore it to the forefront of the U.S.-Canada transboundary air pollution control regime. In order to equip the IJC with the tools it will need to make a difference in its second century, the errors of its first century must be corrected. First, the

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1. This analysis was facilitated when the IJC published its complete set of reports online in recognition of this auspicious anniversary. *See* Int'l Joint Comm'n, Boundary Waters Treaty, A Century of Cooperation Protecting Our Shared Waters, http://bwt.ijc.org (last visited Oct. 25, 2009). The first IJC report was published in 1914. The IJC appropriately launched its new web portal in conjunction with World Water Day (Mar. 22, 2009), because the IJC's primary purview is over shared water resources.

"precautionary principle" of international environmental law should be directly applied when drafting future references for submission to the IJC. Second, the evidentiary value of IJC reports should be recognized in domestic courts on both sides of the border, especially in the context of the transboundary air pollution litigation provisions recorded in section 115 of the U.S. Clean Air Act and section 21.1 of the Canadian Clean Air Act. Third, a slight tweaking as part of a modernization of the Boundary Waters Treaty could easily transform the IJC's Article X arbitration option into an attractive alternative to litigation. Finally, the IJC should be granted all of its familiar roles vis-à-vis the upcoming transboundary air pollution cap-and-trade system proposed as part of the 2003 AQA Border Air Quality Strategy. Indeed, the IJC may even be utilized again as a manager of public discourse in the expected transboundary carbon cap-and-trade system currently being discussed between the governments. This is not a radical proposal; it would not be the first time that the IJC has been granted new subject matter beyond the original wording of the 1909 Boundary Waters Treaty.

I. THE BOUNDARY WATERS TREATY AND THE BIRTH OF THE IJC

The birth and development of U.S.-Canada transboundary air pollution policy is intimately rooted in the history of their bilateral water pollution regime. Decades before they ever considered the direct effects of transboundary air pollution, the governments had established formal methods for managing their shared water resources. After all, four of the Great Lakes and hundreds of smaller waterways form a large part of the 5,525-mile (8,891 kilometer) boundary.[2] The International Waterways Commission (IWC) was created in 1903 to address the issues of conflicting usage rights between the two nations,[3] but soon thereafter the IWC advocated the formation of a more permanent body. Within a few years, such a body was created with the ratification of the 1909 Boundary Waters Treaty (BWT).[4] Though primarily concerned with regulating navigation

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2. Int'l Boundary Comm'n, http://www.internationalboundarycommission.org (last visited Oct. 25, 2009).

3. *See* Jennifer Woodward, *International Pollution Control: The United States and Canada - The International Joint Commission*, 9 N.Y.L. SCH. J. INT'L & COMP. L. 325, 326 (1988) (citing INT'L JOINT COMM'N, SIXTH ANNUAL REPORT ON WATER QUALITY 10 (1978)).

4. Noah D. Hall, *The Evolving Role of Citizens in United States-Canadian International Environmental Law Compliance*, 24 PACE ENVTL. L. REV. 131, 138 (2007).

and water use along the border,[5] the BWT addresses transboundary pollution in the second paragraph of Article IV.[6]

The BWT's most important contribution is the establishment of the IJC, a bilateral panel to which the nations can submit transboundary pollution claims for study or resolution.[7] The United States and Canada each appoint three Commissioners who meet at least semiannually,[8] and who are presided over by a chairman from the country in which the present meeting is held.[9] Article VIII of the BWT assigns jurisdiction over the "use or obstruction or diversion of the waters" to the IJC,[10] while Articles IX and X grant broad authority to investigate any other questions or matters referred to it by either nation.[11] Article IX responses are non-binding and do not possess the color of law.[12] Furthermore, the IJC can only make recommendations on matters of fact and circumstance that have been

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5. Treaty Between the United States and Great Britain Relating to Boundary Waters Between the United States and Canada, U.S.-U.K., Preliminary Article, Jan. 11, 1909, 36 Stat. 2448 [hereinafter Boundary Waters Treaty] ("For the purposes of this treaty, boundary waters are defined as the waters from main shore to main shore of the lakes and rivers and connecting waterways, or the portions thereof, along which the international boundary between the United States and the Dominion of Canada passes, including all bays, arms, and inlets thereof, but not including tributary waters which in their natural channels would flow into such lakes, rivers, and waterways, or waters flowing from such lakes, rivers, and waterways, or the waters of rivers flowing across the boundary.").

6. "It is further agreed that the waters herein defined as boundary waters and waters flowing across the boundary shall not be polluted on either side to the injury of health or property on the other." *Id.* at art. IV.

7. *Id.* at art. VII.

8. *Id.*

9. Jeffrey L. Roelofs, *United States-Canada Air Quality Agreement: A Framework for Addressing Transboundary Air Pollution Problems*, 26 CORNELL INT'L L.J. 421 (1993) (citing Timothy M. Gulden, *Transfrontier Pollution and the International Joint Commission: A Superior Means of Dispute Resolution*, 17 SW. U.L. REV. 43, 58 (1987)).

10. Boundary Waters Treaty, *supra* note 5, art. VIII.

11. Article X states in part:

> [A]ny other questions or matters of difference arising between them involving the rights, obligations, or interests of either in relation to the other or to the inhabitants of the other, along the common frontier between the United States and the Dominion of Canada, shall be referred from time to time to the International Joint Commission for examination and report, whenever either [party] shall request that such questions or matters of difference be so referred." Id. at art. IX. Article X states in part: "Any questions or matters of difference arising between the High Contracting Parties involving the rights, obligations, or interests of the United States or of the Dominion of Canada either in relation to each other or to their respective inhabitants, may be referred for decision to the International Joint Commission by the consent of the two Parties . . . .

Id. at art. X.

12. *Id.* at art. IX. IJC recommendations made pursuant to Article IX are not binding on either party.

explicitly referred.[13] While Article IX requires a reference from only one country,[14] this has always been done bilaterally as a matter of custom.[15] Matters may be submitted to binding arbitration under Article X only if both countries formally grant jurisdiction to the tribunal,[16] but this procedure has never been utilized before.[17]

Nevertheless, the IJC has admirably performed such a useful function that it remains sufficiently funded, supported, and operable over one century after its original creation.[18] It has been commended for its objective leadership on environmental issues many times,[19] as numerous references have been made to the IJC for non-binding investigative reports and studies pursuant to article IX.[20] The procedure itself has resulted in many positive outcomes, as Professor Noah D. Hall states:

> [The] bilateral approach has strengthened the credibility of IJC reports and recommendations and ensured sufficient funding for its efforts. These non-binding reports and studies, along with the objective recommendations that are often requested, have proven valuable in diplomatically resolving numerous international environmental disputes and crafting new policies in both countries to prevent environmental harms from occurring. As such, the IJC enjoys a well-deserved reputation for objective work, supported by the best science available and free from political biases, and serves as an important source of

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13. "Such reports of the Commission shall not be regarded as decisions of the questions or matters so submitted either on the facts or the law, and shall in no way have the character of an arbitral award." *Id.*

14. *Id.*

15. Noah D. Hall, *Toward a New Horizontal Federalism: Interstate Water Management in the Great Lakes Region*, 77 U. COLO. L. REV. 405, 418 (2006) [hereinafter Hall 2006].

16. To submit a matter to binding IJC arbitration, the advice and consent of the United States Senate must be acquired, making such submissions unlikely. Boundary Waters Treaty, *supra* note 5, art. X. The consent of the U.S. Senate requires a two-thirds majority vote. U.S. CONST. art II, § 2, cl. 2. For an article IX review, consent of the United States Senate is not required. Boundary Waters Treaty, *supra* note 5, art. IX.

17. Hall 2006, *supra* note 15.

18. *See* Int'l Joint Comm'n, http://www.ijc.org/en/home/main_accueil.htm (last visited Oct. 25, 2009) (demonstrating the IJC's continuous existence).

19. Barry Sadler, *The Management of Canada-U.S. Boundary Waters: Retrospect and Prospect*, 26 NAT. RESOURCES J. 359, 370–72 (1986).

20. Hall 2006, *supra* note 15, at 418 n.71.

> information for both the public and decision-makers in the United States and Canada.[21]

Of the numerous references made to the IJC over its first century, five dealt directly with transboundary air pollution. In addition, the 1978 Great Lakes Water Quality Agreement made reference to the IJC insofar as air pollution serves as a precursor to water ecosystem contamination. The next section will explore the venerable history of the IJC's role in the U.S.-Canada transboundary air pollution regime.

II. THE IJC AND TRANSBOUNDARY AIR POLLUTION ISSUES

The IJC has been called upon five times in its history to directly manage or resolve transboundary air pollution issues between the United States and Canada. In fact, the governments called upon the IJC to resolve an air pollution complaint against a smelter located at Trail, British Columbia shortly after the IJC was created. In so doing, the original *Trail Smelter* case became the most famous dispute the IJC has ever had to resolve.[22]

A. Docket 25R (1928): Trail Smelter

The zinc and lead smelter at Trail, British Columbia, Canada was the largest in the entire British Empire. It operated along the Columbia River, only seven miles (eleven kilometers) north of the Washington State boundary.[23] After two 409-foot high smokestacks were installed in 1925 and 1927,[24] spewing sulfur dioxide pollution over a wider area,[25] farmers located in the United States sought redress.

Existing legal remedies were inadequate. Canada only allowed suits for injury to land in the jurisdiction where the land was located, so the U.S. farmers would have been unable to sustain a nuisance suit in British Columbia.[26] Even if a Washington court had accepted jurisdiction, its

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21. Hall, *supra* note 4, at 140–41.

22. Libin Zhang, Pakootas v. Teck Cominco Metals, Ltd., 31 HARV. ENVTL. L. REV. 545, 554 (2007).

23. Trail Smelter Case (United States v. Canada) 3 R.I.A.A. 1905 (Trail Smelter Arb. Trib. 1941).

24. *Id.* at 1917.

25. *Id.*

26. Hall, *supra* note 4, at 142 ("British Columbia courts would decline to assert jurisdiction in any action to recover for the property damage in Washington because of the rule announced by the

judgment would have been impossible to enforce against a Canadian company without significant physical assets within its jurisdiction.[27] Frustrated, the Washington farmers convinced the State Department to take up their cause with the Canadian government.[28] In December 1927, the U.S. government formally asserted that the smelter's increased and elevated sulfur dioxide emissions were flowing south and damaging the trees of the Columbia River valley—a resource critical to the local logging, farming, and cattle grazing industries.[29]

In 1928 the two sides agreed to refer the case to the IJC for an appraisal of the facts, liabilities, and damages under Article IX of the BWT. In 1931, the IJC asserted that the Canadians owed the United States $350,000 for economic damages caused to the Washington farmers and recommended that pollution control measures be undertaken.[30] This holding established the "polluter pays" principle for resolving transboundary environmental disputes, but it failed to provide ongoing relief to the citizens of Washington. Thus, the State Department reopened the issue with the Canadian government in 1933. Unfortunately, for the sake of directly analyzing the Article X procedure, that reference was not made to the IJC itself. Instead, the original IJC ruling and subsequent diplomatic negotiations led the two nations to convene a new, three-member arbitration tribunal for settlement of claims for damages. [31] Nonetheless, this decision is worth examining because it was born under the original IJC decision, refers to the earlier IJC findings as precedent, and may very well indicate the composition of an Article X reference to the IJC. The new tribunal was composed of an American, a Canadian, and an independent chairman (in

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House of Lords in British South Africa Co. v. Companhia de Mocambique, [1893] A.C. 602. That case held that suits for damage to foreign lands are local actions and must be brought in the state where the land is located.") (quoting EDITH BROWN WEISS ET AL., INTERNATIONAL ENVIRONMENTAL LAW AND POLICY 246 (1998)).

27. Washington State had no long-arm statute that would have permitted a Washington court to assert jurisdiction over the Canadian smelter. EDITH BROWN WEISS ET AL., INTERNATIONAL ENVIRONMENTAL LAW AND POLICY 246 (1998).

28. With no domestic litigation options, the United States intervened on behalf of the Washington State landowners under the legal construct of espousal, in which the nation state takes on an international claim on behalf of its private citizens. RESTATEMENT (THIRD) OF THE FOREIGN RELATIONS LAW OF THE UNITED STATES § 902 cmt. i (1987).

29. Trail Smelter Case (United States v. Canada) 3 R.I.A.A. 1905, 1944 (Trail Smelter Arb. Trib. 1941).

30. *Id.* at 1918–19.

31. Convention Between the United States of America and the Dominion of Canada Relative to the Establishment of a Tribunal to Decide Questions of Indemnity and Future Regime Arising from the Operation of Smelter at Trail, British Columbia, U.S.-Can., Apr. 15, 1935, 49 Stat. 3245.

this case, a Belgian national).[32] The Tribunal was charged with determining what indemnity should be paid for damages caused by the Trail smelter after January 1, 1932; whether the Canadian "[s]melter should be required to refrain from causing damage in the State of Washington in the future"; and "what measures or regime, if any, should be adopted or maintained by the Trail Smelter."[33]

In doing so, the Tribunal was directed to "apply the law and practice followed in dealing with cognate questions in the United States of America as well as international law and practice, and . . . give consideration to the desire of the high contracting parties to reach a solution just to all parties concerned."[34] Legally speaking, the Tribunal first concluded that there was no need to choose between the law of the United States or international law to decide the case, "as the law followed in the United States in dealing with the quasi-sovereign rights of the States of the Union, in the matter of air pollution, whilst more definite, is in conformity with the general rules of international law."[35] The Tribunal next quoted an eminent contemporary legal authority who wrote that "[a] State owes at all times a duty to protect other States against injurious acts by individuals from within its jurisdiction."[36] To support that supposition, the Tribunal cited an early case from the Federal Court of Switzerland used to abate a transboundary hazard, in that case projectiles emanating from a shooting range. The court stated that "[t]his right (sovereignty) excludes . . . . not only the usurpation and exercise of sovereign rights (of another State) . . . . but also an actual encroachment which might prejudice the natural use of territory and free movement of its inhabitants."[37] Finally, the Tribunal canvassed United States Supreme Court decisions regarding interstate pollution, including cases both between two states and between state and local governments or private parties.[38] One of these cases held that "[i]t is a fair and reasonable

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32. Trail Smelter Case (United States v. Canada) 3 R.I.A.A. 1905, 1911 (Trail Smelter Arb. Trib. 1941).

33. *Id.* at 1908.

34. *Id.*

35. *Id.* at 1963.

36. *Id.* (quoting CLYDE EAGLETON, THE RESPONSIBILITY OF STATES IN INTERNATIONAL LAW 80 (1928)).

37. *Id.*

38. *Id.* at 1964–66. The listed cases are *Missouri v. Illinois*, 200 U.S. 496, 521 (1906); *Georgia v. Tenn. Copper Co.*, 206 U.S. 230 (1907); and *New York v. New Jersey*, 256 U.S. 296, 309 (1921).

It should be noted that two of the U.S. Supreme Court cases cited by the Tribunal were originally thrown out for lack of conclusive or acceptable proof of damages claimed. Thus the IJC, followed by the Trail Tribunal, painstakingly conducted meticulous information gathering on the

demand on the part of a sovereign that the air over its territory should not be polluted on a great scale by sulphurous acid gas . . . or threatened by the act of persons beyond its control . . . ."[39] The Tribunal synthesized these various precedents and distilled the following fundamental principle for transboundary pollution disputes:

> [U]nder the principles of international law, as well as of the law of the United States, no State has the right to use or permit the use of its territory in such a manner as to cause injury by fumes in or to the territory of another or the properties or persons therein, when the case is of serious consequence and the injury is established by clear and convincing evidence.[40]

Ultimately, the Tribunal's 1941 decision (*Trail Smelter II*) awarded another US$78,000 to the United States and, more importantly, prescribed a set of ongoing operational guidelines with which the smelter was required to comply.[41] To prevent further damage to the State of Washington, the Tribunal mandated specific maximum pollution limits,[42] as well as that the Trail smelter install equipment to gauge the local wind speed, wind direction, atmospheric pressure, barometric pressure, and sulfur dioxide concentrations.[43] Copies of these reports were supplied to both governments on a monthly basis to ensure that the Trail smelter's toxic emissions remained within prescribed limits.[44] If the smelter could not comply, further compensation would be awarded to the United States.[45] Both sides agreed to the terms of this arrangement, causing the environment to improve and the political controversy to subside.

Today, the entire *Trail Smelter* process is widely hailed for its result. It was the first international ruling on transboundary air pollution and thus will forever remain an important textbook case on environmental law. However, the *Trail Smelter* procedure has not proven useful as a recurring

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geography, ecology, and topography of the affected regions as well as clear and convincing statistical evidence before reaching conclusions.

39. *Georgia v. Tenn. Copper Co.*, 206 U.S. at 238.

40. Trail Smelter Case (United States v. Canada) 3 R.I.A.A. 1905, 1965 (Trail Smelter Arb. Trib. 1941).

41. *Id.*

42. *Id.* at 1933, 1980.

43. *Id.* at 1974–75.

44. *Id.* at 1975.

45. *Id.* at 1980.

method for resolving international environmental disputes.[46] Nonetheless, the major "polluter pays" and "extraterritorial responsibility" precedents have been enshrined in numerous international declarations in recent decades, most significantly in the United Nations Stockholm Declaration of 1972 and its progeny.[47]

B. The Three Detroit-St. Clair River Region References

The IJC was called upon to address another specific air pollution problem before the end of the 1940s, but that reference would prove to be a more challenging and elusive task. Responding to public concern, the Canadian government began complaining that substantial quantities of sulfur dioxide and smoke from industrial Detroit, Michigan were drifting across the border and damaging Canadian territory as early as 1934. Canada specifically alleged that the concentrations of pollutants exceeded

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46. Indeed, it has not been used again. Perhaps the closest example came in 1965 with the creation of the Lake Ontario Claims Tribunal to hear claims arising from the Gut Dam on the St. Lawrence River. It was also a three-person arbitral tribunal charged with assessing damages for transboundary harm, but the claims it reviewed arose from an action of the Canadian government, not private actors. *See* Canada-United States Settlement of Gut Dam Claims, Report to the Agent of the United States Before the Lake Ontario Claims Tribunal (Sept. 27, 1968), 8 I.L.M. 118.

Professor Knox finds the procedure deficient in three primary areas: use of a non-binding forum, lack of standing for the aggrieved private parties themselves, and recourse to domestic laws instead of an international legal standard. John H. Knox, *The Flawed* Trail Smelter *Procedure: The Wrong Tribunal, the Wrong Parties, and the Wrong Law*, *in* TRANSBOUNDARY HARM IN INTERNATIONAL LAW 66–67 (Rebecca M. Bratspies & Russell A. Miller eds., 2006). While acknowledging that a procedure will not be certain to succeed merely because it uses opposite techniques, Knox concludes that "they are more likely to meet the minimum criteria for success: a willingness of governments to create them and of private parties to use them." *Id.* at 75.

47. U.N. Env't Programme [UNEP], *Declaration of the United Nations Conference on the Human Environment* (June 16, 1972), *available at* http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=97&ArticleID=1503. Like *Trail Smelter* before it, the Stockholm Declaration acknowledges the right of independent states to use their resources as they choose, but qualifies that right by restricting sovereigns' resource exploitation to those usages that have a negligible impact on the rights of other states. Principles 21 and 22 elaborate a state's external responsibility to protect the environment:

> Principle 21: States have, in accordance with the Charter of the United Nations and the principles of international law, the sovereign right to exploit their own resources pursuant to their own environmental policies, and the responsibility to ensure that activities within their jurisdiction or control do not cause damage to the environment of other States or of areas beyond the limits of national jurisdiction.

Id. This principle has since been reaffirmed in numerous other charters and declarations, most notably in Principle 2 of the Rio Declaration on Environment and Development, U.N. Doc A/Conf.151/26 (1992), 31 I.L.M. 874, 876 (1992) [hereinafter Rio Declaration], and RESTATEMENT (THIRD) OF THE FOREIGN RELATIONS LAW OF THE UNITED STATES § 601 (1987).

the maximum found near the operation of the now famous Trail smelter to support its claim.[48] The governments officially referred the problem to the IJC for investigation and report in January, 1949. This began a series of three references, each of which granted increasing authority to the IJC to monitor and report on regional air pollution. The first reference came in 1949 and would be followed in 1966 and 1975.

1. Docket 61R (1949): The Detroit River Vessel Reference

The 1949 reference charged the IJC with determining whether the air in the vicinity of Detroit was being polluted by "smoke, soot, fly ash or other impurities" in quantities detrimental to the public health, safety, or general welfare of citizens or property on either side of the border.[49] However, the IJC was constrained to limit their proposed remedial measures to mitigate smoke emissions from ships plying the Detroit River.[50] An interim IJC report released in 1952 plainly stated that this narrow reference diverted attention from the more serious sources of the air pollution problem by concentrating only on ships.[51] Nonetheless, the IJC performed its narrow duty and published its report under the reference in 1960 (1960 Report). The panel recommended several remedial measures to the governments, including: the adoption of objectives for smoke emission from vessels plying the Detroit River;[52] the deletion of preferential regulations for hand-fired vessels;[53] the development of administrative and legal procedures for dealing with non-compliance;[54] and continuing IJC surveillance of vessel air pollution emissions on the Detroit River.[55]

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48. *See* Int'l Joint Comm'n, *Termination of the Commission Activities on Vessel Smoke Surveillance in the Detroit River Area Under the 1949 Air Pollution Reference*, at 1 (1967), http://bwt.ijc.org/docket_table/attachments/Docket%2061/Docket%2061%20Air%20Pollution%20Final%20Report%201967.pdf (discussing the air pollution problem in the cities of Detroit and Windsor) [hereinafter 1966 Report].

49. "The Commission was asked specifically to recommend preventive or remedial measures with regard to the emission of smoke by vessels plying the Detroit River." *Id*.

50. *Id.*

51. Interim Report of October 22, 1952, *as quoted in* Int'l Joint Comm'n, *Transboundary Air Pollution Detroit and St. Clair River Areas Report*, at 2 (1972) [hereinafter 1972 Report].

52. 1966 Report, *supra* note 48. These were set annually and made gradually more stringent by the IJC between 1952 and 1957. 1972 Report, *supra* note 51.

53. Such vessels, although comprising only ten percent of the ship traffic on the water, were accountable for two-thirds of the smoke. 1966 Report, *supra* note 48, at 3.

54. *Id.* at 1.

55. These would take place until appropriate machinery could be set up to establish the control of such pollution "on a satisfactory working basis." *Id.*

The governments acted upon the findings and by 1966 the IJC concluded that the objectives of the 1949 reference had been met. It published a report praising both governments for their efforts.[56] The United States was lauded for its passage of the 1963 Clean Air Act, which affirmed a responsibility for air pollution that rested primarily with state and local governments.[57] Accordingly, the State of Michigan was recognized for its consideration of state-wide regulation, while Wayne County and the City of Detroit were praised for passing stringent air pollution regulations.[58] The IJC noted that suits were being initiated against violating polluters with increasing frequency in American courts.[59] Canada, meanwhile, passed federal legislation in 1964 regulating smoke from ships within one mile of Canadian land.[60] As a result of this and the termination of hand-fired vessel regulatory exceptions, the IJC's Technical Advisory Board on Air Pollution reported that in 1950, when systematic observations of vessel smoke began, less than ten percent of the vessel passages were considered acceptable, whereas that number improved to about seventy percent by 1966.[61] The governments concurred in the IJC's conclusions and terminated its surveillance of vessel smoke emissions.[62]

In addition, to reiterate its point that the 1949 reference was inadequate, the IJC stated conclusively in its 1960 Report that the major factors responsible for regional air pollution were the relatively high levels of fuel consumption, dust fall, airborne particulates, and sulfur dioxide from inland industrial installations. The findings indicated that solid fuel consumption by vessels was only 1.5% of the total fuel burned in the region.[63] In doing so, the IJC may have technically pushed the limits of its Article IX authority to report only "upon the facts and circumstances of the particular questions and matters referred."[64] Although no immediate action was taken, the governments ultimately concurred in the IJC's assessment. They submitted an amended reference in 1966.

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56. *Id.* at 6.
57. *Id.* at 4.
58. *Id.*
59. *Id.*
60. *Id.*
61. *Id.* at 2.
62. *Id.* at 5.
63. Int'l Joint Comm'n Report of June 27, 1960, *as quoted in* 1972 Report, *supra* note 51, at 2.
64. Boundary Waters Treaty, *supra* note 5, art. IX ("The International Joint Commission is authorized in each case so referred to examine into and report upon the facts and circumstances of the particular questions and matters referred, together with such conclusions and recommendations as may be appropriate, subject, however, to any restrictions or exceptions which may be imposed with respect thereto by the terms of the reference.").

2. Docket 85R (1966): The Second Detroit-St. Clair River Region Reference

The second reference on air pollution in the Detroit-St. Clair River region was submitted as Docket 85 in 1966.[65] Heeding the IJC's recommendation of an expanded mandate and recognizing the region's rapidly deteriorating air quality, the governments instructed the IJC to determine:

> 1) Is the air over and in the vicinity of Port Huron-Sarnia and Detroit-Windsor being polluted on either side of the International Boundary by quantities of air contaminants that are detrimental to the public health, safety, or general welfare of citizens or property on either side of the International Boundary?
>
> 2) What sources are contributing to this pollution and to what extent?
>
> 3) What preventative or remedial measures would be most practicable from economic, sanitary, and other points of view?
>
> 4) What is the probably total cost of implementing the measures?[66]

In accordance with usual procedure in such investigations, the IJC established the International St. Clair-Detroit River Areas Air Pollution Control Board in 1966, staffed by environmental officials from both nations. These officials established a number of committees composed of industry representatives, academics, and bureaucrats from a variety of fields.[67] The Board began its investigation and submitted semiannual reports while the IJC began holding public hearings in June 1967.[68] The Board's reports and public testimony were incorporated in the IJC's final report in 1972.[69]

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65. Int'l Joint Comm'n, Docket 85R: Port Huron-Sarnia/Detroit Windsor, http://bwt.ijc.org/index.php?page=dockets&hl=eng&pageNum=5 (last visited Oct. 25, 2009).

66. 1972 Report, *supra* note 51, at 3.

67. *Id.* at 6.

68. *Id.* at 4.

69. *See id.* at 11–16 (detailing the public hearings process).

The 1972 final report provided a detailed study responding to the questions posed. It presented scientific confirmation of the existence of an air pollution crisis in response to Question 1,[70] and then quantified the extent of the problem in response to Question 2.[71] To that end, the IJC identified and analyzed the concentration and effects of particulate matter, sulfur dioxide, and odor-causing volatile substances across the region,[72] and it detailed the scientific studies conducted on both sides of the border.[73] The IJC surveyed and listed the air quality standards currently in effect in both nations in response to Question 3.[74] Based on these standards, the IJC recommended general and specific air quality objectives to be adopted by the federal, state, and provincial governments.[75] Finally, in response to Question 4, the IJC estimated that the total economic impact of these standards was $150 million.[76]

In addition, the IJC made several miscellaneous recommendations. It insisted that the preventive and remedial measures be implemented at the earliest practicable date.[77] The governments were encouraged to establish a permanent network of air quality monitoring stations,[78] develop consistent standards on both sides of the border,[79] cooperate and coordinate at all levels of government,[80] and ascertain with more certainty the detrimental effects of airborne contaminants.[81] Once again, the IJC specifically

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70. *Id.* at 55.

71. *Id.* at 55–56 ("With regard to the Detroit River area the Commission finds that of the 258,200 tons of particulates emitted in 1967, 231,500 tons originated in the United States and 26,700 tons in Canada; and of the 550,700 tons of sulfur oxides emitted in 1967, 516,600 tons originated in the United States and 34,100 tons in Canada. The principal sources are the steam-electric power plants and metallurgical industries in Wayne County, Michigan. With regard to the St. Clair River area the Commission finds that of the 50,800 tons of particulates emitted in 1967, 26,600 originated in Canada and 24,200 originated in the United States; and of the 372,600 tons of sulfur oxides emitted in 1967, 272,900 tons originated in the United States and 99,600 tons originated in Canada. The principal sources are the steam-electric power plants in Michigan and the oil refineries and chemical industries near Sarnia. The principal offensive odors originated at a chemical plant and petroleum refineries near Sarnia.").

72. *See id.* at 17–19 (analyzing the harmful effects of particulate matter, sulfur dioxide, and odors).

73. *See id.* at 24–46 (describing the effects of air pollution in the Detroit River and St. Clair River areas).

74. *Id.* at 21–23.

75. *Id.* at 60–61.

76. *Id.* at 57.

77. *Id.*

78. *Id.*

79. *Id.*

80. *Id.* at 58.

81. *Id.*

requested more authority to continue addressing the regional air quality crisis. The IJC sought the tools it would need to properly coordinate ongoing surveillance of regional air quality, rapidly exchange information between the governments, and monitor the implementation of preventive and remedial measures.[82] Once again, the governments acquiesced to the request.

3. Docket 99R (1975): The Third Detroit-St. Clair River Region Reference

The third reference was made for the IJC to examine and report the state of air quality on an ongoing basis in the Detroit-Windsor and Port Huron-Sarnia areas in 1975.[83] Specific emphasis was to be placed on ambient air quality trends and the emissions of three particular nuisances: sulfur dioxide, suspended particulates, and odors.[84] The IJC reported annually on regional trends and the achievement of the specific objectives vis-à-vis these three concerns between 1975 and 1983.

The IJC concluded in 1984 that the domestic regulatory programs and control strategies adopted, combined with the closing of many factories due to economic conditions and the installation of upgraded pollution control systems, resulted in significant improvements in emission levels.[85] These improvements were sustained for several years and, not anticipating this trend to reverse, the IJC submitted that its mission was complete under the 1975 reference.[86] However, the IJC noted that more attention was needed on a much wider range of pollutants, particularly toxic and hazardous substances.[87] In essence, the IJC once again challenged the governments to present an expanded reference addressing more pollutants. And, once again, it would not take long for the governments to respond positively.

The impetus came in 1988, when the City of Detroit erected a municipal solid waste and energy recovery facility, one of the largest incinerators of its type in the world.[88] Local residents, environmental groups, and government agencies expressed concerns about the health

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82. *Id.* at 57–58.

83. Int'l Joint Comm'n, *Final Report Pursuant to the July 8, 1975 Reference on the State of Air Quality in the Detroit-Windsor and Port Huron-Sarnia Areas*, at 1 (Jan. 19, 1984), *available at* http://www.ijc.org/php/publications/pdf/ID566.pdf.

84. *Id.* at 2.

85. *Id.*

86. *Id.* at 3–4.

87. *Id.* at 4.

88. Int'l Joint Comm'n, *Air Quality in the Detroit-Windsor/Port Huron-Sarnia Region Report*, at 1 (Feb. 1992), *available at* http://www.ijc.org/php/publications/pdf/ID563.pdf.

effects of such a facility. The governments officially requested that the IJC recommence work under the 1975 reference on the state of air quality in the Detroit-Windsor and Port Huron-Sarnia areas.[89] The IJC was specifically directed to investigate "the actual and potential hazards posed to human health and the environment from airborne emissions . . . ."[90]

> To initiate studies under the Reference, the Commission appointed an advisory board of federal, state, provincial and academic experts. The board completed a preliminary screening of available information on a list of 125 chemicals known to be present in the ambient air of the region, and reported its conclusions and recommendations to the Commission in December 11, 1990.[91]

The chemicals on the list were those found in Title III of the United States Clean Air Act.[92]

In its final report, published in February 1991, the IJC made nineteen recommendations to the governments for improving regional air quality.[93] After publication, the IJC held two open meetings to gauge public reaction, as required by the 1972 Great Lakes Water Quality Agreement.

As the discussion above demonstrates, the Detroit-Windsor references showcase the effectiveness of the IJC vis-à-vis air pollution. The IJC met every challenge with scientific professionalism and significantly helped to bring about improvements in air pollution density, monitoring procedures, and public awareness throughout the process. The IJC was only hampered by the governments' initial conservative references. The governments should learn from this experience to be more vigilant and progressive in tackling new pollution threats in the future by granting the IJC broader mandates.

C. The Great Lakes Water Quality Agreements of 1972 and 1978

Even as the three Detroit-St. Clair River references were underway, the governments issued a new joint reference to the IJC to investigate pollution in Lake Erie, Lake Ontario, and the international section of the St.

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89. *Id.* at 19–22.
90. *Id.* at vii.
91. *Id.*
92. *Id.* at 3.
93. *Id.* at viii–ix.

Lawrence River.[94] The reference was submitted in 1964 as a response to a surging wave of citizen activism. In 1971, the IJC finally issued a report that recommended new water quality control programs and identified the need for a new agreement to coordinate higher levels of cooperative action.[95] After two years of negotiation, the Great Lakes Water Quality Agreement (GLWQA) was signed in 1972.[96]

The 1972 GLWQA "reaffirms the rights and obligation[s] of Canada and the United States under the BWT and has become a major focus of Commission activity."[97] It set forth general and specific water quality objectives,[98] mainly focusing on waterborne phosphorous pollution.[99] In so doing, the GLWQA made the IJC responsible for collecting, analyzing, and disseminating water quality data, monitoring water quality programs, and providing advice and recommendations to the governments for attaining their objectives.[100] However, the GLWQA was short lived. In 1978, the two governments updated and replaced the 1972 Agreement.[101] The new GLWQA shifted the focus from phosphorus to a broader range of toxic and hazardous polluting substances, impressively charging that "[t]he discharge of toxic substances in toxic amounts be prohibited and the discharge of any or all persistent toxic substances be virtually eliminated."[102] This statement is the first direct application of the "precautionary principle" of international environmental law to the U.S.-Canada transboundary regime, a fact that will be discussed later in greater detail. The new GLWQA also included timelines for the development of municipal and industrial pollution abatement and control programs.[103]

Most important to this phase of our analysis, the 1978 GLWQA incorporated a reference for the IJC to consider impacts of air pollution on the Great Lakes ecosystem to the extent that air pollutants are precursors to

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94. Int'l Joint Comm'n, *Pollution of Lake Erie, Lake Ontario and the International Section of the St. Lawrence River*, at 95–97 (1971), *available at* http://www.ijc.org/php/publications/pdf/ID364.pdf.

95. *Id.* at 89–92.

96. Great Lakes Water Quality Agreement, U.S.-Can., Apr. 15, 1972, 23.1 U.S.T. 301 [hereinafter GLWQA72].

97. Great Lakes Water Quality Agreement, U.S.-Can., Nov. 22, 1978, 30 U.S.T. 1383 [hereinafter GLWQA78].

98. GLWQA72, *supra* note 96, at 304–05.

99. *Id.* at 324.

100. It also provided for the establishment of two boards to advise the IJC: the Great Lakes Water Quality Board and the Great Lakes Science Advisory Board. *Id*. at 309–10.

101. GLWQA78, *supra* note 97.

102. *Id.* at 1387.

103. *Id.* at 1421.

water problems.[104] This represents a more complete and holistic view through the use of the term "ecosystem," defined as the interacting components of air, land, water, and living organisms.[105] Thus, the entire ecosystem was incorporated into the GLWQA's goal "to restore and maintain the chemical, physical, and biological integrity of the waters of the Great Lakes Basin Ecosystem."[106]

Furthermore, the GLWQA delegated new responsibilities to the IJC, especially with regard to the role of citizen participation in future IJC undertakings. The GLWQA opened the IJC to the public with the directive: "[T]he Commission may exercise all of the powers conferred upon it by the Boundary Waters Treaty and by any legislation passed pursuant thereto including the power to conduct public hearings and to compel the testimony of witnesses and the production of documents."[107] This is regarded by some as its most significant structural contribution to the transboundary environmental regime:[108]

> With increased public participation comes increased accountability on the part of both federal governments to comply with their joint responsibilities under the GLWQA. Equally important, the GLWQA has helped create an informed and engaged citizenry on both sides of the border, which has led to the increased role for citizen enforcement.[109]

Other commentators also laud this addition, noting that none of the previous environmental agreements and treaties between the United States

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104. *Id.* at 1391–93.

105. *Id.* at 1385.

106. *Id.* at 1387.

107. *Id.* at 1394.

108. *E.g.*, Hall, *supra* note 4, at 149–50.

109. Since 1972 the citizen-participation provisions have become ingrained, and the IJC affirmed its commitment to the public in its Ninth Biennial Report:

> The public's right and ability to participate in governmental processes and environmental decisions that affect it must be sustained and nurtured.
>
> ….
>
> The Commission urges governments to continue to effectively communicate information that the public needs and has come to expect, and to provide opportunities to be held publicly accountable for their work under the Agreement.

Int'l Joint Comm'n, *Ninth Biennial Report on Great Lakes Water Quality: Achieving the Future—How to Do It: Perspective and Orientation* (1998), *available at* http://www.ijc.org/php/publications/html/9br/achievee.html.

and Canada required public participation in reviewing and assessing compliance.[110] Indeed, that duty would soon be reinforced and expanded.

D. Docket 112R (1991): The U.S.-Canada Air Quality Agreement

The 1991 U.S.-Canada Air Quality Agreement (AQA),[111] a bilateral executive agreement, covers all forms of transboundary air pollution between the two countries.[112] It was the result of a decade of diplomatic commitments, negotiations, and compromises that began with the 1980 Memorandum of Intent and ended with the 1990 U.S. Clean Air Act Amendments.[113] The AQA established a framework for addressing shared transboundary air pollution and set out clear and firm objectives for emissions reductions. In doing so, the IJC is called upon to assist the governments in the implementation of the AQA.

The AQA begins with both countries reaffirming the principle of state extraterritorial responsibility established in *Trail Smelter* and adopted internationally in the Stockholm Declaration, stating the countries' "[d]esir[e] that emissions of air pollutants from sources within their countries not result in significant transboundary air pollution" . . . ."[114] The countries reaffirmed their commitment to Principle 21 of the Stockholm Declaration, as well as:

> [T]heir tradition of environmental cooperation as reflected in the Boundary Waters Treaty of 1909, the Trail Smelter Arbitration of 1941, the Great Lakes Water Quality Agreement of 1978, as amended, the Memorandum of

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110. *See, e.g.*, Roelofs, *supra* note 9, at 448–49 (declaring the mandatory consultation requirement a significant improvement).

111. Agreement on Air Quality, U.S.-Can., Mar. 13, 1991, 30 I.L.M. 676 [hereinafter AQA].

112. *Id.* at 679.

113. "[A]n International Joint Commission study [revealed] that a high proportion of pollutants entering the Great Lakes came from atmospheric pollutants." Roelofs, *supra* note 9, at 439. The report triggered public concern and, in turn, the establishment of the Bilateral Research Consultation Group on Long-Range Transport of Air Pollutants. Canada and the United States issued a 1979 Joint Statement on Transboundary Air Quality in which both countries committed to reduce certain types of transboundary air pollution. Joint Statement on Transboundary Air Quality by the Government of Canada and the Government of the United States of America, July 26, 1979, *reprinted in* Environmental and Health Affairs, 1979 DIGEST OF UNITED STATES PRACTICE IN INTERNATIONAL LAW § 1, at 1612–13. This led to the 1980 Memorandum of Intent between the Governments of the United States and Canada Concerning Transboundary Air Pollution, Aug. 5, 1980, 32 U.S.T. 2521. The 1980 Memorandum evidenced a commitment to develop a comprehensive bilateral agreement to combat transboundary air pollution, which ultimately became the 1991 U.S.-Canada Air Quality Agreement.

114. AQA, *supra* note 111, at 678.

> Intent Concerning Transboundary Air Pollution of 1980, [and] the ECE Convention on Long-Range Transboundary Air Pollution of 1979.[115]

While the overall objectives listed in a common preamble are the same, the AQA provides that the parties are responsible for establishing their own objectives for reducing or limiting air pollutants.[116] The two nations take different specific steps because their contributions to transboundary air pollution are asymmetrical. The United States selected standards identical to those achievable under Title IV of the 1990 Clean Air Act Amendments, making their passage the necessary prerequisite.[117] Beyond that, Annex 1 of the AQA contains specific objectives for each country for sulphur dioxide and nitrogen oxide emissions limitations.[118] These commitments are more stringent than any required by any other agreement to which the governments are parties.[119] And, "by including target emission standards and deadlines for achieving the stated levels in Annex 1**,** the parties created a binding obligation."[120]

Because the Canadians and Americans had successfully used the IJC to resolve boundary issues in the past, expanding the IJC's role in transboundary air pollution disputes was welcomed. Building on the increased role that citizens played in the IJC's work on the GLWQA, the AQA mandates a role for citizens in the IJC's duties. The IJC is required "to invite comments, including through public hearings as appropriate, on each progress report prepared by the Air Quality Committee pursuant to Article VIII . . . ."[121] The IJC must then submit to the two countries "a synthesis of the views" of the public and publish this synthesis after

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115. *Id.*

116. *Id.* at 680.

117. *Id.* at 685–86.

118. *Id.* at 685–89. In regard to sulfur dioxide (SO_2), the United States resolved to make a reduction of 10 million tons below 1980 emissions levels by 2000, and a permanent cap of 8.95 million tons per year for electric utilities by 2010. *Id.* at 685–86. Canada pledged to reduce SO_2 emissions in the seven easternmost provinces to 2.3 million tons by 1994 and a similar annual cap in effect until 1999. *Id.* at 686. It pledged a permanent national emissions cap of 3.2 million tons per year by 2000. *Id.* In regard to nitrous oxides (NO_X), the emissions reductions plans are a lot more complicated because stationary sources (power plants) and mobile sources (cars and trucks) are regulated separately. *Id.* at 686–88. In essence, the U.S. pledged a total annual emissions reduction of 2 million tons from 1980 levels by 2000, while Canada pledged a cap of 870,000 tons by 2000. *Id.*

119. Roelofs, *supra* note 9, at 445.

120. Mark L. Glode & Beverly Nelson Glode, *Transboundary Pollution: Acid Rain and United States-Canadian Relations*, 20 B.C. ENVTL. AFF. L. REV. 1, 32 (1993).

121. AQA, *supra* note 111, at 682.

submission to the two governments.[122] To aid in this task, the AQA creates a new Air Quality Committee (AQC), composed of an equal number of members representing each government, to review progress towards implementation of the AQA's terms and provide public notice of achievements.[123] The Deputy Assistant Secretary for Environmental Policy heads the U.S. delegation and serves as co-chair of the AQC with the Assistant Deputy Minister of Environment Canada.[124] The AQC is responsible for reviewing implementation and submitting progress reports to the parties and the IJC biannually,[125] and the IJC publishes these reports openly.[126]

Furthermore, the AQA imposes mandatory consultation requirements regarding the contents of these reports. These consultations must take place "as soon as practicable, but in any event not later than thirty days from the date of receipt of the request for consultations, unless otherwise agreed by the Parties."[127] Consultation is also required concerning proposals or changes in laws, regulations, or policies that "would be likely to affect significantly transboundary air pollution."[128] In addition, negotiations to resolve disputes arising over the "interpretation or the implementation" of the AQA must take place within ninety days.[129] If the parties fail to resolve any of these disputes by consultation and negotiation, they must consider submitting the dispute to the IJC or to "another agreed form of dispute resolution."[130] One commentator believes that this is an invitation to utilize the type of tribunal used in the *Trail Smelter II* case.[131] The AQA also provides that the parties may refer to the IJC any other matters "as may be appropriate for the effective implementation of this Agreement"[132] in

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122. *Id.*

123. *Id.* at 682.

124. U.S. State Dep't, U.S.-Canada Air Quality Agreement, *available at* http://www.state.gov/g/oes/env/ 83011.htm (last visited Dec. 16, 2009).

125. AQA, *supra* note 111, at 682.

126. *Id.*

127. *Id.* at 683.

128. *Id.* at 680. A weakness of these provisions is a lingering ambiguity as to what constitutes "significant transboundary air pollution." *Id.* This leaves each nation with broad discretion in making the determination as to whether a particular action should be subject to the assessment, notification, and mitigation requirements. *Id.*

129. *Id.* at 683–84.

130. *Id.* at 684. *See also* Roelofs, *supra* note 9, at 450 n.254 (citing the *Trail Smelter* arbitration procedure).

131. Roelofs "assume[s] that this referral provision is a reflection of the type of action taken in the Trail Smelter Cases." Roelofs, *supra* note 9, at 446 n.235.

132. AQA, *supra* note 111, at 682. Similar provisions can be found in the Boundary Waters Treaty, *supra* note 5, at 2452, and the GLWQA78, *supra* note 97, at 1394.

accordance with the applicable provisions of the 1909 BWT.[133] Thus, the AQA not only regulates behavior but also provides consultation and enforcement mechanisms through the IJC. As such, the AQA assures that citizens, interest groups, and each government, including each government's lower federal tiers, can exert pressure on the other party to effectuate the objectives of the AQA.[134]

In many ways the AQA is a vast improvement over past attempts to address transboundary air pollution problems. As a practical matter, it has been eminently successful in achieving its stated goals.[135] As those goals are achieved, the framework possesses the adaptability necessary to set higher standards as science dictates.[136] Theoretically speaking, the AQA strengthens the international environmental law principle of state extraterritorial responsibility and establishes an effective bilateral framework for addressing the problems of transboundary air pollution. The assessment and notification provisions, in concert with mandatory consultation requirements, provide each government with some means to influence pollution-related activities in the other country. The AQA uses the IJC to serve as a mediator and exposes the entire review process to public scrutiny. In doing so, it has added another effective check and balance to the framework in which present and future transboundary air pollution problems occurring between the United States and Canada will be resolved. As a result, the IJC has been charged with a new and important role in resolving U.S.-Canada transboundary air pollution problems.

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133. AQA, *supr*a note 111, at 683–84.

134. Roelofs, *supra* note 9, at 449.

135. Emissions of both NO_X and SO_2 have been drastically reduced. Envtl. Prot. Agency, Cap and Trade: Acid Rain Program Results, *available at* http://www.epa.gov/airmarkets/cap-trade/docs/ctresults.pdf [hereinafter Acid Rain Program Results]. In the United States, NO_X emissions from power plants in 2002 were 33 percent below 1990 levels, and SO_2 levels were 40 percent below what they were in 1990. *Id.* Canada has similarly reduced NO_X and SO_2 emissions. U.S. State Dep't, U.S.-Canada Air Quality Agreement, *supra* note 125. An additional Annex to the Agreement addressed Scientific Cooperation, and in 1997 the Parties signed a "Commitment to Develop a Joint Plan of Action for Addressing Transboundary Air Pollution" to address the shared problems of ground-level ozone and particulate matter. *Id.*

136. The AQA requires that the two countries review the terms of the document every five years in order to make adjustments dictated by time and new information. AQA, *supra* note 111, at 683; Glode, *supra* note 120. Indeed, the subsequent years saw a quick rate of progress and additional Annexes. Acid Rain Program Results, *supra* note 135. The United States and Canada signed an Ozone Annex to the AQA in December 2000 to reduce emissions of the precursors to ground-level ozone. Currently, the two countries are considering an additional annex to control particulate matter. *Id.*

III. THE IJC'S SECOND CENTURY

If the IJC's second century of transboundary air pollution management is to be as prolific as its first, the governments must recognize both the successes and shortcomings of the present IJC model as well as the gravity of transboundary pollution problems that are yet to be properly addressed. Thus far, the IJC has proven to be indispensible in the pursuit of a healthy transboundary environmental balance. Today, the model should be equipped with the tools necessary to confront the challenges that lie ahead.

Several shortcomings have been identified by commentators and critics upon review of IJC operations. Some lament that the IJC decisions adopted under Article IX are non-binding and do not possess the color of law.[137] Others point out that the IJC members are political appointees. Despite pledging to perform their duties in an impartial manner, it is unlikely that the IJC would ever take a hard-line position and risk angering either country given its dependence on the services of national officials.[138] We believe that the IJC's limitation to make recommendations only on matters explicitly referred to it severely retarded environmental progress during the era of the three Detroit-St. Clair River Region references.

For the IJC to maintain the role it has earned, four main suggestions should be heeded. First and foremost, the governments must be vigilant and forward-thinking in drafting references to the IJC. In the future, the precautionary principle of international environmental law should be directly applied when drafting references for submission. Second, the IJC's lack of binding decision-making power has sometimes led to lax application of its suggestions. IJC reports should have recognized evidentiary value in suits brought under section 115 of the U.S. Clean Air Act and section 21.1 of its Canadian counterpart. Third, a simple tweaking of Article X of the BWT would make in-house arbitration a more attractive dispute resolution procedure compared to transboundary litigation. Finally, the IJC should be granted all of its familiar roles vis-à-vis the upcoming transboundary air pollution cap-and-trade system suggested by the 2003 AQA Border Air Quality Strategy. Indeed, the IJC could be utilized in the expected transboundary carbon cap-and-trade system currently being discussed by the governments. The latter is not a radical proposal; it would not be the first time that the IJC has been granted new subject matter beyond the original wording of the 1909 BWT.

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137. Glode, *supra* note 120, at 33.
138. *Id.* at 34.

A. The Governments Should Incorporate the Precautionary Principle in Drafting Future IJC References

As the history of the three Detroit-St. Clair River references and the two Great Lakes Water Quality Agreements proves, the governments should be more imaginative and progressive when submitting references to the IJC in order to conserve resources and avoid having to resubmit them later. As stated, the 1949 reference charged the IJC with determining whether the air in the vicinity of Detroit-Windsor was being polluted but limited the IJC inquiry to smoke emissions from ships plying the Detroit River.[139] Seventeen years later, a broader mandate finally came. It would be another nine years before the IJC's request to conduct ongoing monitoring of air pollution was granted. All in all, it took twenty-six years for the IJC to accumulate the authority it needed to sufficiently police the air quality of the Detroit-Windsor corridor—over two and a half decades where progress could have been made more quickly.

During those years and beyond, environmental and public health activists struggled to find ways to protect health and the environment when facing scientific uncertainty about cause and effect. Luckily, international environmental law norms already provide guidance that, if followed, would help prevent the sometimes irreparable damage caused by lengthy delays. Indeed, along with the "polluter pays" and "extraterritorial responsibility" principles of international environmental law established in *Trail Smelter* and incorporated into the various United Nations conventions on the environment,[140] there is also an established "precautionary principle." This principle, which has since become a critical part of environmental agreements throughout the world, offers the public and decision-makers a forceful, common-sense approach to environmental and public health problems.

The precautionary principle was born in the Germanic legal tradition[141] and spread throughout Europe in the early 1970s to provide environmental

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139. 1966 Report, *supra* note 48.

140. The "polluter pays" principle is codified in the Rio Declaration at Principle 16; "extraterritorial responsibility" is codified in Principle 2. Rio Declaration, *supra* note 47, at 876–79.

141. The precautionary principle is rooted in the German principle of Vorsorge, meaning precaution or foresight. Charmian Barton, *The Status of the Precautionary Principle in Australia: Its Emergence in Legislation and As a Common Law Doctrine*, 22 HARV. ENVTL. L. REV. 509, 514 (1998) (citing Sonja Boehmer-Christiansen, *The Precautionary Principle in Germany: Enabling Government*, *in* INTERPRETING THE PRECAUTIONARY PRINCIPLE 38 (Tim O'Riordan & James Cameron eds., 1994).

risk managers with a tool for decision-making on environmental threats.[142] It was codified as Principle 15 of the 1992 Rio Declaration on the Environment and Development: "In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation."[143]

This was the first codification of the precautionary principle on a global scale. Since then it has been incorporated into numerous conventions, statutes, and court decisions around the world,[144] causing many scholars to argue that it may have already achieved the status of customary international law.[145] That longstanding academic debate must remain outside of the scope of this paper. The authors highlight the obvious, however, in noting that years of human exposure to toxic industrial pollutants would have been avoided if such a common-sense approach had been applied earlier in the Great Lakes Region.

The United States's relationship with the principle is convoluted. The United States should be honor-bound to apply the precautionary principle because it signed and ratified the Rio Declaration[146] as well as the United

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142. Thomas Lundmark, *Systemizing Environmental Law on a German Model*, 7 DICK. J. ENVTL. L. & POL'Y 1, 11 (1998); DAVID FREESTONE & ELLEN HEY, THE PRECAUTIONARY PRINCIPLE AND INTERNATIONAL LAW, at 4 (1996).

143. *See* Rio Declaration, *supra* note 47, at 879.

144. The Principle was integrated into numerous international conventions and agreements, including the Bergen declaration on sustainable development (Bergen Ministerial Declaration on Sustainable Development in the ECE Region, 6, Aug. 1990, *in* 1 Y.B. INT'L ENVTL. L. 429, 431 (1990)), the Maastricht Treaty on the European Union (The Treaty on the European Union, 7, Feb. 1992, 35 O.J. (C 191) 29, *available at* http://eur-lex.europa.eu/en/treaties/dat/11992M/tif/JOC_1992_191__1_EN_0001.pdf), the Barcelona Convention (Convention for the Protection of the Mediterranean Sea Against Pollution, 1976, *available at* http://195.97.36.231/dbases/webdocs/BCP/BC76_eng.pdf), and the Global Climate Change Convention (United Nations Framework Convention on Climate Change, 1776 U.N.T.S. 107, 170, *available at* http://unfccc.int/resource/docs/convkp/conveng.pdf [hereinafter UNFCCC]). Furthermore, the European Union expressly adopted the Principle in its February 2000 "Communication from the Commission on the Precautionary Principle." *Communication from the Commission on the Precautionary Principle*, at 3, COM (2000) 1 final (Feb.2, 2000), *available at* http://ec.europa.eu/dgs/health_consumer/library/pub/pub07_en.pdf.

145. To prove the status of customary international law, it must be demonstrated that a) it was the practice of all or nearly all states, and b) that these states applied it because they believed they were legally bound to do so. PHILIPPE SANDS, PRINCIPLES OF INTERNATIONAL ENVIRONMENTAL LAW VOL. 1 143–45 (Vaughan Lowe & Dominic McGoldrick eds., 1995). This sense of legal obligation, or opinio juris, arises when states no longer feel free to deviate from the practice of customs and habits. BARRY E. CARTER ET AL., INTERNATIONAL LAW 122 (4th ed. 1991).

146. JOEL TICKNER ET AL., THE PRECAUTIONARY PRINCIPLE IN ACTION: A HANDBOOK 2 (Science and Environmental Health Network ed., 1999).

Nations Framework Convention on Climate Change.[147] Despite these acceptances of the principle, however, minimal effort has been made to implement it. It is not expressly acknowledged in the laws of the United States, though much national environmental legislation possesses a precautionary nature.[148] Furthermore, some American courts have demonstrated hostility towards its application or recognizing its status as customary law.[149] Canadian legislators and courts have each been more sympathetic to the explicit recognition of the principle than their American counterparts,[150] writing it into the very fabric of the Canadian

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147. UNFCCC, *supra* note 144. Article 3 of the United Nations Framework Convention on Climate Change also contains a precautionary principle. This treaty was also a product of the 1992 Rio Conference. The treaty aims to stabilize greenhouse gas concentrations but contains no binding provisions; the principal update which added mandatory steps was the Kyoto Protocol.

148. Kannan cites provisions of the National Environmental Policy Act, Clean Water Act, Occupational Safety and Health Act (OSHA), and Pollution Prevention Act of 1990 as examples. *See* Philip M. Kannan, *The Precautionary Principle, More Than a Cameo Appearance in United States Environmental Law?*, 31 WM. & MARY ENVTL. L. & POL'Y REV. 409, 430–31 (2007). A more recent example is Article 3 of the United Nations Framework Convention on Climate Change. UNFCC, *supra* note 144.

149. To recognize its standing as customary law would be to suggest that the United States must officially abide by it. The U.S. Supreme Court stated in *The Paquete Habana*, 175 U.S. 677, 700 (1900), that customary international law may become part of domestic law:

> International law is part of our law, and must be ascertained and administered by the courts of justice of appropriate jurisdiction, as often as question of right depending upon it are duly presented for their determination. For this purpose, where there is no treaty, and no controlling executive or legislative act or judicial decision, resort must be had to the customs and usages of civilized nations.

Thus, when confronted with the principle in *Beanal v. Freeport-McMoran, Inc.*, 197 F.3d 161, 167 (5th Cir. 1999), the United States Fifth Circuit Court of Appeals held that the principle could not achieve customary international law status because of its ambiguous nature. The court explained:

> [The plaintiff] fail[ed] to show that [the precautionary principles stated in The Rio Declaration and other treaties] enjoy universal acceptance in the international community. The sources of international law cited by [the plaintiff] and the amici merely refer to a general sense of environmental responsibility and state abstract rights and liberties devoid of articulable or discernable standards and regulations to identify practices that constitute international environmental abuses or torts.

In so concluding, the Fifth Circuit rejected arguments that the precautionary principle is opinio juris: followed by most states out of a sense of legal obligation.

150. The principle has been codified into even more Canadian legislation, including the Oceans Act, 1996 S.C., ch. 31, pmbl ¶ 6 (Can.), *available at* http://laws.justice.gc.ca/PDF/Statute/O/O-2.4.pdf., and the Endangered Species Act, 1998 S.N.S, ch. 11, §§ 2(1)(h), 11(1) (Can.), *available at* http://www.gov.ns.ca/legislature/legc/bills/57th_1st/3rd_read/b065.htm. *See also* Kathryn Chapman, *114957 Canada Ltée (Spray-Tech, Société d'arrosage) v. Hudson (ville): Application of the Precautionary Principle in Domestic Law*, 15 CAN. J. ADMIN. L. & PRAC. 123, 124 (2001) ("[T]he Supreme Court of Canada may have taken a step towards affirming this principle in Canadian jurisprudence as an element of customary international law . . . .").

Environmental Protection Act.[151] Thus, acceptance of the principle is far more advanced in Canada than it is in the United States.

Nevertheless, the precautionary principle was applied between the governments with the signing of the GLWQA in 1978. That understanding established the goal of eliminating virtually all discharges of toxins into the Great Lakes. Under the GLWQA, the IJC was designated to conduct research and issue statements on the quality of the lakes and threats to that quality. In its Sixth Biennial Report on Great Lakes Water Quality, the IJC noted that attempts to control the release of toxic substances into the Great Lakes Basin had failed miserably and stated: "[A]ll persistent toxic substances are dangerous to the environment, deleterious to the human condition, and can no longer be tolerated in the ecosystem, whether or not unassailable scientific proof of acute or chronic damage is universally accepted."[152]

Since then, conditions have generally improved. History evinces that the precautionary principle has had a positive effect when applied along the U.S.-Canada border. It should be automatically considered and given the fullest possible legal effect when drafting future references to the IJC in order to save valuable time and protect human health. An explicit way to reflect the adoption of the principle would be to codify it into new laws, regulations, or a binding treaty, opportunities which the upcoming adoption of new transboundary cap-and-trade mechanisms will soon yield.

B. The Governments Should Recognize the Evidentiary Value of IJC Decisions in Domestic Courts and Make IJC-Sponsored Arbitration a More Attractive Alternative to Litigation

The IJC lacks binding mechanisms and independent enforcement power by design. The failure of governments to bring claims of environmental harm against one another is most often attributed to the fear of reciprocal claims.[153] The IJC is trusted as a safe harbor in which to diplomatically resolve transboundary disputes precisely because it lacks binding power. The most telling example of this is the fact that the Article X binding

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151. Environmental Protection Act, 1999 S.C., ch. 33, § 2(1)(a) (Can.), *available at* http://www.laws.justice.gc.ca/PDF/Statute/C/C-15.31.pdf.

152. Int'l Joint Comm'n, Sixth Biennial Report Under the Great Lakes Water Quality Agreement of 1978 to the Governments of the United States and Canada, *available at* http://www.ijc.org/php/publications/html/6bre.html (last visited Oct. 24, 2009).

153. Knox, *supra* note 46, at 71, 73.

arbitration procedure has never been utilized.[154] However, after a century of excellent work, IJC reports should be officially recognized as valid evidence in suits brought under section 15 of the U.S. Clean Air Act and section 21.1 of the Canadian Clean Air Act. In addition, the Article X procedure should be tweaked to make binding IJC arbitration a streamlined and more attractive alternative to litigation. These steps should be taken now that both administrations appear to be more amenable to liberal environmental policies.

1. The Governments Should Recognize the Evidentiary Value of IJC Decisions in Their Domestic Courts

Section 115 of the 1977 U.S. Clean Air Act Amendment provides that if the EPA Administrator receives notice from an international agency that pollution originating from the United States endangered the public welfare of a foreign country, the Administrator must require the offending state(s) to submit a revised action plan (a State Implementation Plan, or SIP) addressing the problem.[155] In order to trigger this section, the injured foreign state must have provided the United States with reciprocal rights.[156] Within a few years of this codification, a section 115 suit was filed in the United States District Court for the District of Columbia to compel EPA Administrator Lee M. Thomas to order the offending states to revise their SIPs.[157] The district court in *New York v. Thomas* had to decide first whether the litigants satisfied the requirements of section 115 and, if so, what actions the EPA Administrator must take.[158] Thus, the court examined

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154. Hall 2006, *supr*a note 15.

155. Clean Air Act, 42 U.S.C. § 7415(a) (2006) ("Whenever the Administrator, upon receipt of reports, surveys or studies from any duly constituted international agency has reason to believe that any air pollutant or pollutants emitted in the United States cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare in a foreign country or whenever the Secretary of State requests him to do so with respect to such pollution which the Secretary of State alleges is of such a nature, the Administrator shall give formal notification thereof to the Governor of the State in which such emissions originate.").

156. 42 U.S.C. § 7415(c) ("This section shall apply only to a foreign country which the Administrator determines has given the United States essentially the same rights with respect to the prevention or control of air pollution occurring in that country as is given that country by this section.").

157. New York v. Thomas, 613 F. Supp. 1472, 1476 (D.D.C. 1985), *rev'd*, 802 F.2d 1443 (D.C. Cir. 1986).

158. *Id*. at 1481–82.

section 115 and elaborated upon three prongs contained within: harm, reciprocity,[159] and duty.[160]

To satisfy the evidence-of-harm requirement of section 115(a), the district court interpreted the text of the statute to hold that the Administrator only need have "reason to believe that any air pollutant or pollutants emitted in the United States cause or contribute to air pollution which may reasonably be anticipated to endanger public health or welfare in a foreign country."[161] To meet this evidentiary standard, the plaintiffs submitted a speech by former EPA Administrator Douglas M. Costle in which he publicly announced that "acid deposition is endangering public welfare in the United States and Canada . . . sources contribute to the problem not only in the country where they are located but also in the neighboring country,"[162] and that "section 115 authority could appropriately be used to develop solutions." Costle claimed that he based his findings on a report issued by the IJC,[163] and the court accepted this submission of evidence by the plaintiffs.

On appeal, the United States Court of Appeals for the District of Columbia reversed the district court's decision in *Thomas*.[164] The decision, written by Judge Antonin Scalia (now a United States Supreme Court Justice), dismissed the case as involving "an unusual statute executed in an

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159. *Id.* at 1481–83. The court found that section 21.1 of the Canadian Clean Air Act contained similar provisions to section 115 of the United States Clean Air Act that satisfied the reciprocity requirement of section 115(c). *Id.* at 1483–84.

Under section 21.1(1), if the Environmental Minister determines that "an air contaminant emitted . . . in Canada creates or contributes to the creation of air pollution that may reasonably be expected to constitute a significant danger to the health, safety or welfare of persons in any other country," he shall "recommend to the cabinet . . . such specific emission standards . . . as he may consider appropriate for the elimination or significant reduction of that danger." An Act to Amend the Clean Air Act, 1980 C. Gaz., ch. 45 s. 3. Except with regard to federal sources, the Minister must first give the province an opportunity to remedy the situation. *Id.* If the province fails to do so, and the complaining country provides reciprocal rights, Environment Canada is then authorized to prescribe specific emission standards. *Id.*

160. New York v. Thomas, 613 F. Supp. at 1486. The Clean Air Act clearly directs the EPA Administrator to commence the process of requiring offending states to revise their respective SIPs. 42 U.S.C. § 7415(b). Consequently, the court ordered the EPA Administrator to provide such notice to the state governors responsible for the conditions encompassed by the Costle determinations. New York v. Thomas, 613 F.Supp. at 1486.

161. § 7415(a).

162. Letter from Douglas Costle, Administrator of the E.P.A., to Edmund Muskie, Secretary of State (Jan. 13, 1981), *reprinted in* New York v. Thomas, 613 F. Supp. at 1488. *See* Letter from Douglas Costle, Administrator of the E.P.A., to George Mitchell, United States Senate (Jan. 13, 1981), *reprinted in* New York v. Thomas, 613 F. Supp. at 1488 ("Section 115 authority could appropriately be used to develop solutions.").

163. New York v. Thomas, 613 F. Supp. at 1476.

164. Thomas v. New York, 802 F.2d 1443, 1448 (D.C. Cir. 1986).

unexpected manner."[165] The appeals court concluded that Costle's findings could not serve as the basis for the judicial relief sought by the plaintiffs because they were not made in accordance with the notice and public comment requirements of the Administrative Procedure Act.[166] Thus, the appellate court found it unnecessary to address the other merits of the case, and the Canadian government did not intervene.[167] While Costle's speech alone may not be sufficient evidence, the IJC report he claimed to base his speech on should have been recognized if it were submitted.

IJC reports possess a long and respected history. While their evidentiary value is not, unfortunately, the only judicial hurdle to a section 115 suit at the present time,[168] a sympathetic majority may now exist in the high offices of American federal government to reclaim section 115 for the future. As of now, it has never been conclusively established whether section 115 of the Clean Air Act can serve as a means of resolving transboundary air pollution issues. One way to resolve this uncertainty would be to afford evidentiary weight to IJC findings. In turn, individual IJC reports would begin to have legal value. Stronger and well-reasoned IJC decisions may become binding in concert with judicial proceedings, but only when all other standing requirements are met. Thus, a clarification of section 115 by reevaluating the legal value of IJC decisions would create a powerful new partnership for transboundary environmental protection.

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165. *Id.* at 1446.

166. *Id.* at 1446–48; Administrative Procedure Act, 5 U.S.C. § 553 (2006).

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> Notwithstanding the question of sovereignty, Canada's intervention in the American legal system could possibly ignite similar action by the United States under the reciprocity provisions of the Canadian Clean Air Act. More important, by accepting the jurisdiction of the United States court system in the Thomas case, Canada would waive any immunity afforded by the act of state and sovereign immunity doctrines against counterclaims for damages caused in the United States by Canadian pollutants. These two possibilities are sufficient to make application of municipal law a less than desirable dispute resolution mechanism for addressing transboundary air pollution."

Glode, *supra* note 120, at 24.

168. In *Her Majesty the Queen in Right of Ontario v. U.S. EPA*, 912 F.2d 1525, 1535 (D.C. Cir. 1990), the D.C. Circuit Court of Appeals again rejected a Canadian attempt to utilize section 115. The Province of Ontario accused the EPA of acting arbitrarily by denying its request, and that of the state of New York, and sought to require the EPA to make endangerment and reciprocity findings under section 115. *Id.* at 1530. The court concluded that unless the EPA was prepared to identify specific sources in specific states as contributors to air pollution endangering public health or welfare in Canada, and to call for additional controls on those sources, there would be no point in issuing the endangerment and reciprocity findings. *Id.* at 1534–35.

2. The Governments Should Tweak the Boundary Waters Treaty to Make IJC-Sponsored Arbitration a More Attractive Alternative to Litigation

Transboundary litigation, under any circumstances, is a messy proposition. Arbitration is preferable for reasons of speed, cost, control, privacy, and technical specialization. While the BWT contains provisions for IJC-sponsored arbitration, the *Trail Smelter* cases revealed the existence of two simple procedural errors with the Article X mechanism. A new and independent tribunal was established for two reasons. First, the consent of neither the U.S. Senate nor the Canadian Parliament was necessary to legitimize the proceeding. Second, as IJC delegates are officials appointed by their home government, it is unlikely that they would vote against their sponsor nation. Thus, this and every Article X referral would probably result in a split decision. A simple solution could fix these apparent problems: the text of Article X of the BWT should be amended in two places.

First, the last clause of the first paragraph should be amended to reflect modern geopolitical realities, both globally and domestically. That clause reads:

> Any questions or matters of difference arising between the High Contracting Parties involving the rights, obligations, or interests of the United States or of the Dominion of Canada either in relation to each other or to their respective inhabitants, may be referred for decision to the International Joint Commission by the consent of the two Parties, *it being understood that on the part of the United States any such action will be by and with the advice and consent of the Senate, and on the part of His Majesty's Government with the consent of the Governor General in Council*.[169]

As environmental issues have become so divisive as to result in deadlock in the chambers of both governments, the BWT should be amended to permit the executives and their ministerial agents—the U.S. Secretary of State and the Canadian Minister of Foreign Affairs—to make executive referrals to the IJC under Article X. This is precisely what happened in *Trail Smelter*, when the President of the United States and the King of Great Britain concluded a separate convention to enable such a

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169. Boundary Waters Treaty, *supra* note 5, art. X (emphasis added).

proceeding.[170] If this step were to be taken, the advantages would include the benefit of a clear procedure, the saving of political and diplomatic resources, and even a possibility for the development of IJC precedent. Furthermore, the number of cases submitted to the IJC would likely remain low, as the executives alone would have to bear the political risk of referral. If a major case were referred to the IJC in an unpopular or negligent manner, the executives would still be accountable to the political will of their peoples as evinced through the constitutional distribution of checks and balances. Conversely, the checks on the IJC are, and would remain, the prospects of a lack of referrals, reduced funding, re-staffing, and/or even disbandment if trust in that institution were to be abused.

Second, the probability of ineffective conferencing is high at present because the IJC panel is composed of an even number of bureaucrats appointed from each nation. The *Trail Smelter* tribunal remedied the possibility of endless indecision by allowing one participant from each country and an independent chairman from a neutral, third-party state (in that case, a Belgian national).[171] The text of Article X does anticipate a course of action in the event of paralysis, but that procedure requires a new submission to a sole arbitrator.[172] This option may be undesirable because of the inherent uncertainty of the result and the feeling that the governments have lost control of the process. The governments should replace this provision with a streamlined process: any dispute sent to the IJC under Article X should be submitted immediately to an adjudicatory panel. That panel, like the one established in 1935, should contain an even number of delegates from both sides (at the least one and at the most three), as well as a neutral arbitrator from a third-party state to serve as chairman. That would reduce the two-tier process to one single step and assure the

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170. Convention Relative to the Establishment of a Tribunal to Decide Questions of Indemnity and Future Regime Arising from the Operation of Smelter at Trail, British Columbia, U.S.-Can., Apr. 15, 1935, 49 Stat. 3245.

171. Trail Smelter Case (United States v. Canada) 3 R.I.A.A. 1905, 1911 (Trail Smelter Arb. Trib. 1941).

172.

> If the said Commission is equally divided . . . it shall be the duty of the Commissioners to make a joint report to both Governments, or separate reports to their respective Governments, showing the different conclusions arrived at with regard to the matters or questions referred, which questions or matters shall thereupon be referred for decision by the High Contracting Parties to an umpire chosen in accordance with the procedure prescribed in the fourth, fifth and sixth paragraphs of Article XLV of the Hague Convention for the pacific settlement of international disputes . . . .

Boundary Waters Treaty, *supra* note 5, art. X.

governments that they will not be in danger of losing control of the process to an outsider.

For the aforementioned reasons, Article X, as written, is impractical. Indeed, it has never been used in the 100 years of IJC operations. The governments should learn from the *Trail Smelter* experience and take this historic opportunity to rewrite Article X of the BWT in order to make IJC-sponsored arbitration an attractive alternative to litigation.

C. The Governments Should Assign the IJC a Prominent Role in Future Transboundary Cap and Trade Regimes

Inspired in part by the positive impact of the concentrated attention on regional air quality around the Great Lakes, Canada and the United States announced three major air quality pilot projects under the AQA's *Border Air Quality Strategy* in 2003.[173] Two of the three programs contribute to achieve the AQA's objectives by focusing extra attention, planning, monitoring, reporting, and enforcement resources on particularly problematic spots along the US-Canadian border.[174] The third major initiative is a joint study exploring the feasibility of transboundary emissions trading for NO_X (nitrogen oxides) and SO_2 (sulfur dioxide).[175] In addition, there are high hopes for implementation of a transboundary cap-and-trade regime for carbon emissions by 2012.

The impetus for the transboundary air pollution cap-and-trade feasibility study was the success of present cap-and-trade systems utilized in the United States.[176] Those programs are administered solely by the U.S. EPA, which is responsible in all aspects for gathering reports, ensuring

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173. Canada-U.S. Border Air Quality Strategy Projects, http://www.epa.gov/airmarkt/progsregs/usca/pilotproject.html (last visited Aug. 29, 2009).

174. GEORGIA BASIN-PUGET SOUND INTERNATIONAL AIRSHED STRATEGY, June 2005, http://www.epa.gov/r10earth/psgb/media/pdf/international_airshed_strategy.pdf; GREAT LAKES BASIN AIRSHED MANAGEMENT FRAMEWORK PILOT PROJECT, June 2003, http://www.epa.gov/airmarkt/progsregs/usca/docs/glb.pdf.

175. U.S. EPA, UNITED STATES-CANADA EMISSIONS CAP AND TRADING FEASIBILITY STUDY, BORDER AIR QUALITY STRATEGY (2005), http://www.epa.gov/airmarkets/progsregs/usca/docs/feasstudy.pdf [hereinafter FEASIBILITY STUDY].

176. The two existing U.S. cap-and-trade programs are the Acid Rain Program and the NO_X Budget Program, both under Title IV of the 1990 Clean Air Act Amendments, 42 U.S.C. § 7651 (2006). The Acid Rain Program limits the amount of SO_2 that can be emitted from U.S. coal-burning electric power plants. In 2010 the national cap will be reset to 8.95 million tons—about 1/2 the 1980 amount. Since its implementation in 1995, the U.S. Acid Rain Program sources have reduced SO_2 emissions by 49 percent from 1980 levels and 43 percent from 1990 levels. U.S. EPA, ACID RAIN AND RELATED PROGRAMS: 2007 PROGRESS REPORT 6 (2007), *available at* http://www.epa.gov/airmarkt/progress/docs/2007ARPReport.pdf.

compliance, pursuing penalties, and managing public concern. The focus of the new transboundary study has been electricity generators that burn fossil fuels, and many significant obstacles to implementation have been identified.[177] For example, the national legal frameworks were assessed for gaps that would need to be addressed, and both countries were confronted with a need to implement regulatory changes to ensure that the allowances issued by the other country would be equivalent for harmonized recognition, trading, and enforcement purposes.[178] None of these challenges are insurmountable. While primary compliance and enforcement duties should remain the purview of the national-level regulators, IJC recommendations and public diplomacy skills would doubtlessly prove as beneficial to this regime as they have to other transboundary issues in the past.

Additionally, Canadian Prime Minister Stephen Harper indicated willingness to join the United States in forming a transboundary carbon emission cap-and-trade program days after President Obama's election victory.[179] Canadian climate-change policy has already been advanced at the provincial level. British Columbia imposed a carbon tax on fossil fuels in summer 2008, around the same time that Ontario and Quebec agreed to establish a bilateral cap-and-trade system. All together, four provinces are committed to a cap-and-trade system with seven U.S. states under the Western Climate Initiative (WCI), and this union may serve as a precursor to national or bilateral plans.[180] The WCI is due to start in 2012, the expected launch date for a U.S. federal system, leading some to think the WCI will simply be subsumed into the latter.[181]

The IJC can surely make positive contributions to either regime as it has so many times in the past. This humble review of the first 100 years, with its special emphasis on positive contributions to transboundary air pollution regulation, proves that the IJC has a continuing and indispensible role to play in future developments. First, there is no reason to deny the IJC

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177. FEASIBILITY STUDY, *supra* note 175, at ix.

178. *Id.* at ix–x.

179. CBC News, Canada to Push Climate Agreement with Obama Government, Nov. 5, 2008, http://www.cbc.ca/canada/story/2008/11/05/canada-us-environment.html?ref=rss (last visited April 7, 2009).

180. History of Western Climate Initiative, http://www.westernclimateinitiative.org/wci-partners (last visited Dec. 16, 2009).

181. *See* Comments of the Western Power Trading Forum to the Western Climate Initiative on the Development of a Regional Cap and Trade Program 3, http://www.westernclimateinitiative.org/ewebeditpro/ items/O104F14495.pdf (last visited April 7, 2009).

its usual responsibilities of ongoing monitoring, research, publication, and dialog. While the IJC has not had a role in the purely domestic U.S. cap-and-trade programs, its ability to harmonize information and resources for a transboundary audience should be incorporated into the international regime. Second, the IJC consultation and dispute resolution procedures should once again be incorporated into the new regime to provide a forum for diffusing any situations which may arise, as they were under the AQA. Third, assigning these roles to the IJC would ensure a high level of quality and professionalism while bringing the resources and experience of the IJC staffers to bear on a related issue. This, as well as the wealth of experience the IJC has had in making recommendations, would assist the EPA and Ministry of Environment greatly in administering programs. More imaginatively, once the realm of cap-and-trade has been entered into, the IJC may be utilized to help manage the public's concern over carbon emissions and global warming. This is not a radical suggestion, as it obviously would not be the first time that the IJC has been assigned an area of authority not originally delegated under the BWT. Indeed, scientific advances inform us that global warming must logically be included in any new evaluation of the evolving definition of "ecosystem" promulgated under the 1978 GLWQA, especially if the precautionary principle is brought to bear. As such, the governments must include carbon reduction strategies within their comprehensive ecosystem plans. The people of both nations would benefit if the IJC should find itself with these new areas of vigilance under its umbrella.

CONCLUSION

Professor Wolf stated upon the IJC's centennial celebration, "I can attest that the models and approaches that the IJC has pioneered and implemented over the years have contributed not only to 100 years of peaceful and productive management of U.S.-Canadian shared water resources, but have informed collaborations in often tense basins around the world."[182] The same can emphatically be said for the IJC's contributions to transboundary air quality management.

Decades of involvement in air pollution matters placed the IJC at the forefront of global transboundary air pollution. Within years of the IJC's

182. Press Release, Int'l Joint Comm'n, New Website Launched on World Water Day to Mark Centennial of Boundary Waters Treaty and Post 100 Years of IJC Reports Online for the First Time (Mar. 20, 2009), http://www.ijc.org/rel/news/2009/090319_e.htm.

establishment in the 1909 BWT it was called upon to directly settle a case of first impression concerning transboundary air pollution. In doing so, it canonized important and lasting precedents to the field of international environmental law. Its record since then has been no less impressive or important. The three Detroit-St. Clair River references prove the IJC's effectiveness and passion for solving transboundary air pollution disputes while demonstrating that another important environmental law norm—the precautionary principle—must be applied to all IJC submissions. The GLWQA of 1972 transformed the IJC into a manager of public record, and its 1978 successor explicitly acknowledged the linkage between air and water pollution, citing the interconnectivity of different elements within an ecosystem. In addition, the 1991 U.S.-Canada Air Quality Agreement reaffirmed the governments' faith in the IJC by once again assigning it prominent public diplomacy and dispute resolution functions.

On its 100th anniversary the time is right for an evaluation and retooling. If the IJC's second century is as prolific as its first, the governments must equip the IJC with the authority it will need to continue to make a positive difference. First and foremost, the governments must be more vigilant and forward-thinking in drafting new IJC referrals. To enable this, the international environmental law precautionary principle should be directly applied when composing future references for submission. Second, the evidentiary value of IJC reports should be recognized in domestic courts on both sides of the border, especially in the context of section 115 of the U.S. Clean Air Act and section 21.1 of the Canadian Clean Air Act. A slight tweaking as part of a modernization of the BWT could also easily transform the IJC's Article X arbitration option into an attractive alternative to litigation. Lastly, the IJC should be granted all of its familiar roles vis-à-vis the upcoming transboundary air pollution cap-and-trade system reviewed under the 2003 AQA Border Air Quality Strategy. Indeed, the IJC could even be utilized in the expected transboundary carbon cap-and-trade system currently being discussed by the U.S. and Canadian governments. The IJC has already proven its adaptability and utility to new subject matter beyond the original grant of the 1909 BWT. We now celebrate that venerable history and hope that these humble suggestions may help to empower the IJC to continue its role as guardian of the U.S.-Canada transboundary environment for the foreseeable future.

LOCAL PROTECTION OF NATURAL RESOURCES AFTER *JAM GOLF*: STANDARDS AND STANDARD OF REVIEW

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Many thanks to the organizers and presenters at the JAM Golf LLC. v. City of South Burlington: Lessons for Vermont Communities workshop, held at Vermont Law School on March 20, 2009, whose comments significantly contributed to the ideas in this article: John Austin, Director of Wildlife, Vermont Department of Fish & Wildlife; Jim Barlow, Senior Attorney, Municipal Assistance Center, Vermont League of Cities & Towns; Tim Duane, Associate Professor of Law, Vermont Law School; Peg Elmer, Associate Director, Land Use Institute, Vermont Law School; Jamey Fidel, Forest and Biodiversity Program Director & Legal Counsel, Vermont Natural Resources Council; Jens Hilke, Conservation Planning Biologist, Vermont Department of Fish & Wildlife; Julie Beth Hinds, Senior Project Manager, VHB Pioneer; Sharon Murray, Principle, Front Porch Community Planning; Brian Shupe, Sustainable Communities Program Director, Vermont Natural Resources Council; Steve Stitzel, Stitzel, Page & Fletcher, P.C.; Kinvin Wroth, Director, Land Use Institute, Vermont Law School.

INTRODUCTION

In 2005, the developer J.A. McDonald asked the City of South Burlington's development review board to allow an expansion of the Vermont National Country Club from 296 to 306 house sites.[1] The ten additional lots would be developed on a portion of the property called the "woodland."[2] The woodland contains the last remaining knoll of trees on the property and is adjacent to wetlands and open space on the golf course fairway.[3] The Country Club is a planned residential development (PRD) in South Burlington.[4]

A PRD allows landowner flexibility by waiving traditional zoning regulations in order to promote another public benefit such as open space or conservation.[5] The City of South Burlington identified the woodland knoll of trees as an important area to be preserved.[6] As a result, the City denied the amended PRD application to build the ten additional house sites.[7] Part of the City's argument was based on its zoning ordinance, section 26.151(g), "which requires PRD designs to '*protect important* natural resources including streams, wetlands, scenic views, wildlife habitats and special features such as mature maple groves or unique geologic features.'"[8]

The City argued that the knoll of trees was an important natural resource because the trees provided a wildlife-corridor link between a forest and other wildlife habitat.[9] The City presented evidence of wildlife including deer, turkey, birds, and other animals that took advantage of berries, nuts, and shrubs on the property.[10] The development review board

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1. *In re* JAM Golf, L.L.C., 2008 VT 110, ¶ 2, 969 A.2d 47, 49.
2. *Id.*
3. *See id.* ¶ 3, 969 A.2d at 49 (describing the property's spatial orientation with reference to nearby terrain and vegetation).
4. *Id.* ¶ 2, 969 A.2d at 49.
5. *See* VT STAT. ANN. tit. 24, § 4417(a)(5) (2007) (Vermont approves PUDs "[t]o provide for the conservation of open space features recognized as worthy of conservation in the municipal plan and bylaws, such as the preservation of agricultural land, forest land, trails, and other recreational resources, critical and sensitive natural areas, scenic resources, and protection from natural hazards."); DANIEL R. MANDELKER, PLANNED UNIT DEVELOPMENTS 3–5 (2007) (discussing another state's intended purpose for PUDs).
6. *See* Steve Stitzel, Partner, Stitzel, Page & Fletcher, P.C., Address at the Vermont Law School Planning Workshop: JAM Golf LLC. vs. City of South Burlington: Lessons for Vermont Communities, at 3 (Mar. 20, 2009) (transcript available at www.vermontlaw.edu/Documents/JAM%20Golf%20notes(0).pdf) (explaining that the "prominent knoll of trees . . . [was] to be preserved as important to the preexisting natural landscape of the project").
7. *JAM Golf*, ¶ 4, 969 A.2d at 49.
8. *Id.* ¶ 12, 969 A.2d at 51 (emphasis added).
9. *Id.* ¶¶ 1–11, 969 A.2d at 49–51.
10. *Id.* ¶ 10, 969 A.2d at 51.

(DRB) and the Vermont Environmental Court both supported the City of South Burlington's decision to deny the application.[11]

JAM Golf appealed to the Vermont Supreme Court, arguing that the lower court and DRB misinterpreted the word "important" because it was unclear whether this knoll of trees was important.[12] The court agreed with the developer and stated that section 26.151 is flawed "since it provides no standards for the court to apply in determining what would constitute a failure to *'protect' the listed resources*."[13] The court decided the standards in the City of South Burlington's ordinance were not clear enough to give notice of what developers can and cannot do.[14] While the court found the language to be ambiguous, the City found the language appropriate given the flexible nature of PRDs.[15] The Court's decision highlights the difficulty of balancing the need to protect local natural resources with the need to give notice of the types of development allowed.

Municipalities have two main concerns after the *JAM Golf* decision. First, towns wonder whether their municipal standards will be struck down in court for being too vague. Second, towns worry about a loss of local control as decisions about the towns are made by courts without local input. This paper discusses opportunities to address both of these concerns.

First, this paper considers opportunities for towns to reduce vagueness in their municipal standards by improving specificity in town plans, zoning ordinances, and during the application process for PRDs and subdivisions.

Second, on-the-record review (OTR) is considered as an opportunity for towns to preserve local input during the appeals process. In Vermont, when a land use decision is appealed, the decision is heard in the environmental court and then in the Vermont Supreme Court.

The appellate courts typically review the decisions de novo.[16] A de novo standard of review means that the appellate court will accept new

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11. *Id.* ¶ 4, 969 A.2d at 49.

12. *Id.* ¶¶ 10–14, 969 A.2d at 51–52.

13. *Id.* ¶ 13, 969 A.2d at 52 (emphasis added).

14. *Id.* ¶ 14, 969 A.2d at 52; *see* Stitzel, *supra* note 6, at 4–5 (discussing the Vermont Supreme Court's determination that section 26.151 was unconstitutional due to its lack of standards).

15. *See* Julie Beth Hinds, Senior Project Manager, VHB Pioneer, *supra* note 6, at 16–17 ("The whole point of PRDs is to choose the most important pieces of land to set aside and develop those that are consistent with community planning principles. This was a suburban PRD with a six-page decision explaining the community's rationale. The community's decision directed to staff, which was explained in the general decision—they can't take this piece for housing.").

16. *See, e.g.*, TOWN OF RANDOLPH, VT., ZONING REGULATIONS art. III, § 3.6(B) (2005), *available at* http://resources.vlct.org/u/Randolph_ZR_2005.pdf; TOWN OF LUDLOW, VT., ZONING AND FLOOD HAZARD REGULATIONS art. 2, § 270.8 (2005), *available at* http://resources.vlct.org/u/Ludlow_ZR_2005.pdf; E-mail from Fred Dunnington, Chair of the Development Review Board for the Town of Middlebury, Vt., to author (Apr. 16, 2009, 17:12 EST) (on

evidence and have old evidence presented again as if in a new trial.[17] During de novo review the appellate court will not read transcripts from the local planning commission or development review board (DRB). In contrast, municipalities have the opportunity to request that appeals be heard on the record.[18] OTR means that the appellate court's review is limited to evidence originally presented and recorded at the local level. The record includes transcripts and evidence from the DRB deliberations, including local testimony. In OTR the appellate court will give deference to local decisions.[19] The court will only reverse the decision if the DRB interpreted evidence or the application of bylaws improperly.[20] In addition to local control, municipalities also consider the effect of OTR on citizen participation, cost, and complexity of the development process.

I. SPECIFIC STANDARDS

The drafting of specific standards is easier said than done. Language must be broad enough to be adaptable to unique and changing circumstances, yet specific enough so that local officials have guidelines to make consistent and fair decisions.[21] Drafting language to protect natural resources is complicated given the differences in biodiversity on each unique parcel of land.[22] The process is further complicated because drafters are often non-lawyer volunteers.[23] Good drafting is important in general, but with land use decisions, any ambiguity or uncertainty is decided in

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file with author) (discussing Middlebury's adoption of OTR); *see also infra* note 142 (discussing Brattleboro's recent adoption of OTR).

17. *See On the Record Review*, MUNICIPAL ASSISTANCE CENTER TECHNICAL PAPER #4 (Vt. League of Cities & Towns, Montpelier, Vt.) Mar. 2008, *available at* http://resources.vlct.org/u/On%20the%20Record3_08.pdf; *see also* VT. STAT. ANN. tit. 24, § 4461(a)–(b) (2007).

18. VT. STAT. ANN. tit. 24, § 4471(b) (2009) (listing the authority to have appeals heard on the record).

19. *Id.*

20. *Id.*

21. *See* Town of Westford v. Kilburne, 131 Vt. 120, 124–25, 300 A.2d 523, 526 (Vt. 1973) (stating that zoning ordinances "should be general enough to avoid inflexible results, yet . . . they should not leave the door open to unbridled discrimination"); *see also* Jim Barlow, *What the* JAM Golf *Decision Will Mean for Your Municipality*, VLCT NEWS (Vermont League of Cities & Towns, Montpelier, Vt.), (Mar. 2009), at 3, *available at* http://resources.vlct.org/u/ATL_09-03%20JAM%20Golf.pdf.

22. *See* Jens Hilke, Conservation Planning Biologist, Vt. Dep't of Fish & Wildlife, *supra* note 6, at 16–17 (discussing the difficulty in drafting legal terms given the ambiguity found in nature and the difficulty determining the appropriate protection needed to protect natural resources).

23. Jim Barlow, Senior Attorney, Municipal Assistance Center, Vt. League of Cities & Towns, *supra* note 6, at 9 ("Most of the people drafting these bylaws are volunteers. They are not professionals."); Sharon Murray, Principle, Front Porch Cty. Planning, *supra* note 6, at 18.

favor of the property owner.[24] A town's best intentions to protect natural resources will mean nothing unless those intentions are stated clearly in the town's plan and zoning ordinances. This section will discuss ways to improve clarity during various stages of the planning process including the town plan, the zoning ordinance, and the application process.

A. Town Plan

A town plan provides the framework and policy direction for a town's land use decisions.[25] The plan allows residents to decide by consensus what is vital to the long-term health of the community.[26] Specificity in the town plan is important because a town cannot legally enact zoning laws to protect natural resources unless the resources are discussed and identified in the town plan.[27] If a municipality has a town plan, the plan must include a statement of objectives, policies, and programs to guide the future growth and to protect the environment.[28] The plan must also include a map of present and future land uses including the identification of open spaces, wetland protection, and other conservation purposes.[29]

1. Statement of Objectives, Policies, and Programs

The trend in Vermont towns is to identify the importance of habitat protection in the town plan but without specificity. In Vermont, 223 of 251 towns have a town plan and ninety-one percent of Vermont town plans identify the importance of wildlife and/or fish habitat protection in their statement of objectives. [30] While a majority of towns have goals to protect

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24. Murphy Motor Sales, Inc. v. First Nat'l Bank of St. Johnsbury, 122 Vt. 121, 124, 165 A.2d 341, 343 (Vt. 1960) (citing Kubby v. Hammond, 198 P.2d 134 (Ariz. 1948)); *see* Glabach v. Sardelli, 132 Vt. 490, 494, 321 A.2d 1, 4 (Vt. 1974) ("[Z]oning ordinances are to be strictly construed in view of the fact that they are in derogation of common law property rights . . . .").

25. *See* RANDALL ARENDT, GROWING GREENER: PUTTING CONSERVATION INTO LOCAL PLANS AND ORDINANCES 19–20 (1999) (considering ways to use town plans and ordinances for conservation purposes); *see also* Kalakowski v. John A. Russell Corp., 137 Vt. 219, 225, 401 A.2d 906, 910 (Vt. 1979) ("The plan is merely an overall guide to community development.").

26. ARENDT, *supra* note 25, at 7 (explaining ways town plans allow communities to choose for the future).

27. VT. STAT. ANN. tit. 24, § 4401 (2007); JOHN M. AUSTIN ET AL., VT. DEP'T OF FISH & WILDLIFE & AGENCY OF NATURAL RES., CONSERVING VERMONT'S NATURAL HERITAGE: A GUIDE TO COMMUNITY-BASED PLANNING FOR THE CONSERVATION OF VERMONT'S FISH, WILDLIFE, AND BIOLOGICAL DIVERSITY 121 (2004) ("The natural resources important to a community must be discussed and identified in the town plan to legally justify enacting local laws to protect these resources.").

28. VT. STAT. ANN. tit. 24, § 4382(a)(1)–(a)(2) (2007).

29. *Id.*

30. AUSTIN, *supra* note 27, at 27.

wildlife, these goals tend to be broad and aspirational rather than specific. An example of a broad goal to protect wildlife comes from the Town of Randolph. The Randolph Town Plan includes the goal of "maintain[ing] and enhanc[ing] wildlife habitat through informed decision making and public education."[31] The majority of towns do not identify specific stewardship goals.[32] A municipality can improve specificity by indicating in its town plan the desire to protect particular resources. The Fish and Wildlife Department gives thirty-six sample conservation goals in its manual "Conserving Vermont's Natural Heritage."[33] In *JAM Golf*, the City of South Burlington wished to protect the knoll of trees in part to preserve mast-stand habitat.[34] Specific conservation goals for mast stands could include maintenance and protection of the functional integrity of all mast stands in a town, or an increase in acres of mast stand habitat that are either under long-term stewardship or permanently conserved within the town.[35] Some towns have adopted one or two stewardship goals based on their most important local priorities.[36] For example, Shrewsbury has identified the protection of bear corridors as a town goal. The adoption of multiple specific conservation goals will give better guidance to courts than goals to support local habitat in a broader ecological context.

2. Identification of Open Spaces, Wetland Protection, and Other Conservation Purposes

A town plan must also include a map of present and future land uses including the identification of open spaces, wetland protection, and other conservation purposes.[37] Only fifty-two percent of town plans have mapped habitat data.[38] Most inventory data is from state sources, primarily the Vermont Fish and Wildlife Department.[39] While state data is beneficial, local input adds value to the quality of data used to make planning decisions. One option to assist towns in collecting and identifying local conservation information is to create a conservation commission. A conservation commission can make an inventory of natural resources within

31. RANDOLPH, VT., TOWN PLAN ch. 2., cl. 7 (2004).

32. Telephone Interview with Jens Hilke, Conservation Planning Biologist, Vt. Dep't of Fish & Wildlife (Sept. 3, 2009).

33. AUSTIN, *supra* note 27, at 108–10.

34. *See In re* JAM Golf, L.L.C., 2008 VT 110, ¶ 3 & n.1, 969 A.2d 47, 49 (Vt. 2008) (describing the ecological value of mast trees).

35. AUSTIN, *supra* note 27, at 89–91.

36. Hilke, *supra* note 32.

37. VT. STAT. ANN. tit. 24, § 4382(a)(2) (2009).

38. AUSTIN, *supra* note 27, at 27.

39. *Id.*

the town and advise the planning commission of protection priorities.[40] Only sixty-five of Vermont's towns have a conservation commission.[41] In addition, the State provides training on fieldwork-based data evaluation called "ground truthing."[42] Data on location can verify the existence of natural resources within the town when towns use state aerial photography or satellite imagery. The identification of specific resources within the towns gives guidance to the court on local priorities.[43]

B. Zoning Bylaws

Zoning bylaws provide the regulatory standards for protection of natural resource that residents, developers, and courts must follow. A zoning ordinance determines what types of uses are authorized in different parts of town.[44] The town can protect forested areas by identifying them as a conservation district and preventing new development in that area.[45] The town can also restrict people-intensive activities near important habitat through density requirements.[46]

Zoning bylaws can be clarified and made more effective in several ways including: 1) the use of purpose statements; 2) specific guidance; 3) plain language; and 4) a process to modify and amend PRDs.

1. Purpose Statement

A statement describing the goals of a section in an ordinance will help the court interpret the rules under the section.[47] Purpose statements are often relied on by courts as grounds for upholding decisions and should be used for both the entire zoning code and for each zoning district.[48] An example of a purpose statement for the entire zoning ordinance is "to implement the comprehensive [town] plan." A reference to the town plan is recommended because courts look at a town's zoning rules as a whole to

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40. VT. STAT. ANN. tit. 24, § 4505 (2007) (listing the powers and duties of conservation commissions).

41. VT. LEAGUE OF CITIES & TOWNS, 2008 VERMONT MUNICIPAL LAND USE REGULATION PRACTICES AND FEES 5–9 (2009).

42. Hilke, *supra* note 32; *see generally* Vt. Dep't of Fish & Wildlife, Wildlife Programs: Field Work 2004, http://www.vtfishandwildlife.com/cwp_inventory.cfm#field_work (last visited Dec. 12, 2009).

43. *Id.*

44. *See* tit. 24, § 4414 (2007) (listing the permissible types of zoning regulations).

45. *Id.* § 4414(1)(B).

46. *Id.* § 4414(1)(A).

47. CHARLES A. LERABLE, PREPARING A CONVENTIONAL ZONING ORDINANCE 11 (1995).

48. *Id.*

understand the overall intent of the town regulations.[49] Purpose statements for specific districts instruct the community on the function of different parts of town. If a town desires a particular residential district to promote pedestrian access, the city can state that the purpose of the district is to promote mixed-use development. In this district, the court will decide unclear rules in favor of mixed-use development.

2. Specific Guidance

In addition to considering the town plan goals and the purpose statement, the Vermont Supreme Court has been very clear about the need for specific standards.[50] The court has not defined what is meant by a specific standard. In fact, critics of the decision tease the court for being "unclear about telling local governments to not be unclear."[51]

Although case law does not provide a "specific unambiguous bylaw" standard, previous decisions do provide guidance as to the types of bylaws the Vermont Supreme Court finds sufficiently specific. The court decided that certain steep-slope standards from the County of Bennington were specific.[52] Section 5.8 of the Bennington Regional County regional plan states: "On slopes greater than twenty percent, residential development should not be permitted."[53] The court decided the measurable twenty percent policy was specific enough to give the court guidance.[54] In contrast, the court determined that the Waitsfield town bylaws on steep slopes were abstract.[55] The Waitsfield town plan stated the goal: "[T]o

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49. *In re* Vt. Nat'l Bank, 157 Vt. 306, 312, 597 A.2d 317, 320 (Vt. 1991) ("We consider the whole of the ordinance and try to give effect to every part.") (citing Slocum v. Dep't of Soc. Welfare, 154 Vt. 474, 478, 580 A.2d 951, 956 (Vt. 1990)).

50. *See In re* MBL Ass'n, 166 Vt. 606, 607, 693 A.2d 698, 700 (Vt. 1997) (requiring language that "is clear and unqualified, and creates no ambiguity"); *In re* Molgano, 163 Vt. 25, 30–31, 653 A.2d 772, 775 (Vt. 1994) (holding that broad policy statements phrased as "nonregulatory abstractions" may not be given "the legal force of zoning laws"); *In re* Kisiel, 172 Vt. 124, 129, 772 A.2d 135, 140 (Vt. 2000) (explaining bylaws which "are designed to implement the town plan, and may provide meaning where the plan is ambiguous") (citing *Molgano*, 163 Vt. at 30–31, 653 A.2d at 775); *In re* Miserocchi, 170 Vt. 320, 325, 749 A.2d 607, 611 (Vt. 2000) (explaining how the absence of specific standards in zoning ordinances allows decisions to be rationalized "ad hoc . . . den[ying] the applicant due process of law"); Town of Westford v. Kilburn, 131 Vt. 120, 124, 300 A.2d 523, 526 (Vt. 1973) ("When no such guiding standards are spelled out by the legislative body, the door is opened to the exercise of . . . discretion in an arbitrary or discriminatory fashion.").

51. *See* Barlow, *supra* note 6.

52. *In re* Green Peak Estates, 154 Vt. 363, 368–69, 577 A.2d 676, 679 (Vt. 1990).

53. *Id.*

54. *Id. But see* Murray, *supra* note 6, at 20 (questioning the practicality of testing the gradient of slopes depending on whether it requires hiring an engineer and whether the gradient mean is pre- or post-construction).

55. *Kisiel*, 172 Vt. at 128, 772 A.2d at 139.

protect Waitsfield's fragile resources and sensitive natural areas" and "[p]revent the creation of parcels which will result in development on *steep slopes.*"[56] Given that the Waitsfield town plan did not define the gradient of a "steep" slope, the court decided that the ordinance did not provide any specific standards.[57]

In re Pierce Subdivision Application demonstrates the Vermont Supreme Court's finding of specificity in a bylaw related to density restrictions.[58] *In re Pierce* involved a PRD in which the Ferrisburg Planning Commission waived the two and five acre minimum lot size requirements to promote conservation of open space.[59] The developer agreed to protect seventy-six percent of the PRD as open space.[60] A neighbor appealed the waivers, arguing that the calculations used to determine the number of lots allowed should not have included the untraveled portion of a right-of-way.[61]

The court addressed whether the bylaws provided the Commission with sufficient overall standards to grant a PRD permit and decided that the Ferrisburg bylaws did give sufficient guidance.[62] The Ferrisburg bylaws stated that "any open space land will be evaluated as to its agricultural, forestry and ecological quality."[63] This bylaw is similar to the broad "protect important natural resources" guideline from *JAM Golf*.[64] Contrary to South Burlington's ordinance, the Ferrisburg ordinance had specific guidance related to the disputed issue. The Ferrisburg ordinance included specific standards relating to the density of housing.[65] Section 5.21(D) states that "each dwelling unit shall have a minimum two acre lot exclusively associated with it and must comply with" it and "the minimum acreage for a PRD shall be 25 acres and a minimum of 60% of the total parcel shall remain undeveloped."[66] These specific requirements were enough for the court to determine that the Ferrisburg bylaws met the need

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56. *Id.* (emphasis in original).

57. *Id.* ("The parties are thus left to debate the Town's intent, with landowners claiming that the Town intended to apply the prohibition only to 'extreme' slopes with grades over 25 percent, and the Town asserting that the prohibition includes slopes characterized as 'severe,' i.e., having grades between 15 and 25 percent.").

58. *In re* Pierce Subdivision Application, 2008 VT 100, 965 A.2d 468.

59. *Id.* ¶¶ 1–5, 965 A.2d at 469–70.

60. *Id.* ¶ 3, 965 A.2d at 470.

61. *Id.*

62. *Id.* ¶¶ 24, 30, 965 A.2d at 475, 477.

63. *Id.* ¶ 22, 965 A.2d at 474.

64. *JAM Golf*, ¶ 12, 969 A.2d at 51.

65. *Pierce Subdivision Application*, 2008 VT 100, ¶ 14, 965 A.2d at 472.

66. *Id.* ¶ 23, 965 A.2d at 475.

of providing guidance to the Commission without defeating the flexible nature of the PRD.[67]

In contrast to the *In re Pierce* decision, the court in *In re Molgano* found that the density restrictions in the town of Manchester were ambiguous.[68] Section 4.2(2) of the Manchester town plan states that "[z]oning dimensional requirements should encourage a relatively low density of development while promoting open-space preservation along the highways."[69] Here, the broad statement to encourage low density was considered a "nonregulatory abstraction" and not given the "legal force of zoning laws."[70]

In addition to the PUD ordinance in South Burlington, the bylaws for the towns of Royalton and Clarendon are examples of court findings of vagueness. The Royalton town plan required commercial development to be located close to town villages "where feasible."[71] This bylaw did not give sufficient guidance on where development would be allowed. According to the court, it was uncertain if the drafters of the town plan intended the phrase "where feasible" to refer to "economic feasibility, physical feasibility, some combination of both, or perhaps some other measure of feasibility altogether."[72] Similarly, the court determined the bylaws of Clarendon to be ambiguous.[73] The bylaws were intended to protect the rural character of a particular district but did not include a specific policy to exclude industrial development.[74] When an applicant wished to build an asphalt plant, the court was not satisfied that the language "to promote residential and '*other compatible uses*'" excluded industrial development.[75] The court determined that "other compatible uses" was an abstract policy and a broad goal lacking specific policies or standards required by the court.[76]

Improving specificity in bylaws is not an exact science and a purpose statement may not be enough. Measurable objectives such as the following are necessary: twenty percent gradient; sixty percent of the parcel; a minimum of twenty-five acres; and a definition-of-terms section.

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67. *Id.* ¶¶ 24, 30, 965 A.2d at 475, 477.

68. *In re* Molgano, 163 Vt. 25, 30–31, 653 A.2d 772, 775 (Vt. 1994).

69. *Id.* at 30–31, 653 A.2d at 775.

70. *Id.* at 30–31, 653 A.2d at 775.

71. *In re* Times & Seasons, L.L.C., 2008 VT 7, ¶ 5, 950 A.2d 1189, 1193.

72. *Id.* ¶ 23, 950 A.2d at 1198.

73. *In re* John A. Russell Corp., 2003 VT 93, ¶ 19, 838 A.2d 906, 913.

74. *Id.* ¶ 19, 838 A.2d at 912.

75. *Id.* ¶ 19, 838 A.2d at 912–13 (emphasis added) (referring to the town plan's usage of the phrase "other compatible uses").

76. *Id.*

3. Plain Language

To avoid confusion in the interpretation of standards, certain rules of construction should be followed. Courts read bylaws according to their plain and ordinary meaning.[77] The first way to make sure that terms are clear is to define them.[78] Words that may be familiar to lawyers or planners are not always familiar to the development community or citizens.[79] This is especially true with scientific and technical terms but has been equally controversial for words that appear to be less technical. For example, when talking about trees, does the ordinance mean any trees, only old growth trees, or a minimum number of trees?

Another way to clarify language is to use the active voice. The active voice is clearer and avoids ambiguity about who is supposed to do what.[80] For example, if a document says that "[t]he plan must be submitted," it is unclear who is supposed to submit the plan. In the active voice, the same phrase would read, "[t]he applicant must submit the plan." Proscriptive language also helps specify the meaning of an ordinance. Instead of recommending that a plan should be submitted, the ordinance would be more effective and clear if it requires a plan "shall" be submitted.[81] For example, the bylaws of the Town of Andover provide that during site plan review the commission "*may*" require wildlife habitat to be included in the site plan.[82] The word, "may," implies that providing information on wildlife habitat is optional as opposed to required.

C. Planned Residential Developments

To improve specificity, municipalities can also consider the language in bylaws related to planned residential developments. Towns can identify the particular natural resources they would like to protect in the original agreement between the developer and the town. Typically, PRDs require at least half of the parcel to be protected for open space or conservation.[83] In addition to specifying a percentage of the lot that is to be preserved, a

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77. *In re* Vt. Nat'l Bank, 157 Vt. 306, 312, 597 A.2d 317, 320 (Vt. 1991) (citing Slocum v. Dep't of Soc. Welfare, 154 Vt. 474, 478, 580 A.2d 951, 956 (Vt. 1990)).

78. Murray, *supra* note 6, at 19; *see* THE PLAIN LANGUAGE ACTION & INFORMATION NETWORK, FEDERAL PLAIN LANGUAGE GUIDELINES, http://www.plainlanguage.gov/howto/guidelines/bigdoc/fullbigdoc.pdf.

79. Murray, *supra* note 6, at 19.

80. *Id.*; FEDERAL PLAIN LANGUAGE GUIDELINES, *supra* note 78, at 21.

81. Murray, *supra* note 6, at 19.

82. ANDOVER, VT., ZONING REGULATIONS § 630 (2003), *available at* http://resources.vlct.org/u/Andover_ZB_2003.pdf (emphasis added).

83. AUSTIN, *supra* note 27, at 124.

municipality can also identify areas of land with the greatest conservation value. The protection of natural resources is more efficient when the planning commission can "identify areas of land with greatest conservation value, rather than the land . . . that is the most convenient for subdivision design."[84]

The City of Montpelier has recognized the importance of this policy in their cluster development plan.[85] The plan requires development to be concentrated on areas that protect parts of the property that are environmentally significant.[86] The plan then specifies the areas of high natural resource value including, but not limited to, meadows and wildlife corridors.[87]

Additionally, it is important to have a process for making decisions if the developer wishes to modify or amend the agreement. The *JAM Golf* decision demonstrates how on appeal a court may not consider the PRD development as a whole. Julie Beth Hinds, planning director for South Burlington at the time of the case, recommended that "[a]ll bylaws need to say, any amendment shall take into consideration all lands involved in the PUD."[88] Alternatively, the bylaws could also limit amendments to minor changes that could not reasonably have been anticipated during the approval process.[89] In order to give more guidance to developers and courts, towns can list the types of changes that would be considered a minor amendment. For example, minor amendments will not increase or decrease the density, lot size, or reduce open-space areas subject to conservation or buffering.[90] Another option is to not allow major amendments at all, but rather require a new development plan. Bylaws may also include a requirement for notice and hearing procedures before certain types of amendments are approved.[91]

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84. *Id*.

85. MONTPELIER, VT., ZONING AND SUBDIVISION REGULATIONS art. 7 § 713(E)(1)–(2) (2008), *available at* http://www.montpelier-vt.org/upload/groups/60/files/Document_Library/Montpelier_ZoningRegs_14May2008_Article07.pdf.

86. *Id.*

87. *Id.*

88. Julie Beth Hinds, Senior Project Manager, VHB Pioneer, *supra* note 6, at 17.

89. MANDELKER, *supra* note 5, at 50 (providing examples of restrictive amendment policies).

90. *Id.* at 50–51.

91. *Id.* at 50 (supplying an example from Manatee, Florida).

D. Application Process for a Subdivision or PUD Subdivision Ordinance

A town can protect natural resources by requesting that certain criteria be met during the application process. First, a town can require an applicant to provide wildlife information, a map, or a checklist with standards that will be used.[92] In Vermont, a list of criteria is required by state law, which states: "The bylaws shall specify the maps, data, and other information to be presented with applications for site plan approval and a review process."[93] Vermont law does not require the criteria to include information related to natural resources, but many towns still include wildlife information as a criterion.[94] Second, a town may require an applicant to submit an analysis of the impacts of development on wildlife, though few towns actually require applicants to engage in this analysis. Currently, Bennington requires a developer to identify potential impacts to particular natural areas and include management techniques that ensure the long-term protection of the resources.[95] Finally, a town can require an agency or individual with expertise to review an application or accept recommendations from the conservation commission.

Towns have several options to improve the clarity of their bylaws and improve protection of natural resources. First, a town can identify specific stewardship goals in the town plan. Second, the town can provide guidance by adding purpose statements to both the entire zoning ordinance and to specific zoning districts. Third, the town can improve natural resource inventories by creating conservation commissions or obtain "ground truthing" training from the state. Fourth, the town can reduce ambiguity in

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92. CHRISTOPHER J. DUERKSEN ET AL., HABITAT PROTECTION PLANNING: WHERE THE WILD THINGS ARE 31 (1997).

93. VT. STAT. ANN. tit. 24, § 4416 (2007).

94. *See, e.g.*, MONTPELIER, VT., ZONING AND SUBDIVISION REGULATIONS art. 3, § 308(F)(1), tbl. 401 (2008), *available* at http://www.montpelier-vt.org/upload/groups/60/files/Document_Library/Montpelier_ZoningRegs_14May2008.pdf (Montpelier's application for a PUD or subdivision permit requires an environmental features inventory "[o]n a plan at the same scale as the base plans delineat[ing] significant natural resources; wetlands; shoreline management areas; water courses; rare, threatened or endangered plant and animal species; geological sites; historic sites; scenic roads; agricultural lands; open spaces; view sheds; streams; bodies of water; woodlands; flood hazard areas; slopes with gradients greater than 20%; south-facing slopes; significant trees; significant wildlife habitats, and wellhead protection areas; and ridge lines.").

95. BENNINGTON, VT., LAND USE AND DEVELOPMENT REGULATIONS art. 8, § 8.3(C) (2006), *available at* http://resources.vlct.org/u/Bennington_LUDR_2006.pdf ("For any subdivision encompassing all or a portion of an identified natural area, the Development Review Board shall require the submission of a management plan to identify potential impacts to the identified natural area(s) and land management techniques that will be implemented to ensure the long term protection of the resource.").

bylaws by using objective measures such as qualitative criteria. Fifth, a town can require certain criteria during the application process including wildlife inventories, impacts to wildlife, and recommendations from the conservation commission. All of these tools will benefit the development community and courts by providing clearer guidance on what types of development are allowed, as well as additional protection to natural resources.

II. ON-THE-RECORD REVIEW

Even using the strategies from the previous section, the best drafting is still open to interpretation. The drafters may not anticipate all uses for the property or have the financial resources to inventory all natural resources in the area. In addition to writing more specific bylaws, a town should consider a switch to on-the-record review.[96] Instead of ignoring the deliberations at the local level, an appellate court reviewing a decision on the record will have more awareness of the local process. Julie Beth Hinds said that "[t]here was no 'On-the-record review and we didn't have any standing or presence. There was no room for our local decision.'"[97] Local control is a primary reason towns decide to switch to OTR. In addition to local control, a town should also consider whether the adoption of OTR would decrease citizen participation, have a financial impact, or complicate the development process.

A. Local Control

In February of 2009, Brattleboro became the twelfth town to adopt OTR.[98] Brattleboro switched to OTR primarily to maintain local control and give more weight to the findings of Brattleboro's DRB.[99] The DRB sensed that the local work would be ignored, the proceedings would be repeated without local input, and local sentiment would be lost.[100] For

96. VT. STAT. ANN. tit. 24, § 4471(b) (2007) (providing the authority for appeals to be heard on the record); *see* VT. LEAGUE OF CITIES & TOWNS, *supra* note 41.

97. Julie Beth Hinds, Senior Project Manager, VHB Pioneer, *supra* note 6, at 17.

98. *See* BRATTLEBORO SELECTBOARD, REGULAR MEETING MINUTES FEB. 3, 2009, at 4, *available at* http://brattleboro.govoffice.com/vertical/Sites/%7BF60A5D5E-AC5C-4F97-891A-615C172A5783%7D/uploads/%7BC8E0FF34-3CF6-4814-81C8-E43CB46A5E30%7D.PDF (motion to adopt OTR granted).

99. *Id.* at 3 ("Without [on the record review] their [DRB's] decision effectively goes away as well as all the evidence that was ever submitted to the Board. It would be as if the DRB hearing never took place.").

100. *Id.*

example, an appellate court would not know where people walk their dogs or the location of local swimming holes.

Likewise, Middlebury also switched to OTR based on local control because of their experience with a controversial development.[101] Middlebury's DRB denied a hotel development.[102] Instead of an appeal to the environmental court, the developer attempted to settle with the Middlebury Select Board through the town attorney.[103] The DRB did not have an opportunity to review the terms of the settlement, and no public hearing occurred.[104] Ultimately, the environmental court upheld the denial, but the lack of participation by the DRB and public demonstrated the need for OTR.[105] While responding to comments about *JAM Golf*, Jim Barlow, an attorney with Vermont League of Cities and Towns who helps towns with development review, noted: "If there is ambiguity in our bylaws, someone else will be able to interpret ambiguity. It may be interpreted in our favor and it might not and then our logic won't be applied at all."[106] In the case of OTR, local logic will be applied as long as the decision is consistent with the town bylaws.[107]

B. Citizen Participation

Another consideration regarding whether to have appeals heard through OTR is the effect on citizen participation. There is a legitimate fear that the OTR process may impair the ability of local citizens to weigh in on development matters based on formality and finality.

The OTR process is more formal than a traditional commission or board meeting in most towns. The process requires the preparation of documents and testimony that will be saved as evidence in case of an appeal. According to the Sustainable Communities program, "[OTR] will, bring greater formality and complexity to . . . proceedings, further discouraging citizens and neighbors from participating in the review of

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101. E-mail from Fred Dunnington, *supra* note 16.
102. *Id.*
103. *Id.*
104. *Id.*
105. *Id.*
106. Jim Barlow, Senior Attorney, Vt. League of Cities & Towns, *supra* note 6, at 10.
107. Posting of Mark Leonard, Zoning Administrator, Town of Morristown, mleonard@PWSHIFT.com, to vtzoningadmins@list.uvm.edu, Vermont Zoning Administrators Listserv (Apr. 14, 2006) (on file with author) ("With 'on the record' review of MAPA proceedings, the court does not weigh the relative merits of the case before it. Rather, it is only supposed to review the record and determine that the DRB correctly applied the town's bylaws in reaching its decision.").

projects that will affect their property, community and possibly their livelihood."[108]

The finality of the decision is another concern. Citizen groups tend to delay paying for expert consultants until their case reaches the court level. OTR would require citizen groups to pay for attorneys upfront at the local board level and pay more attention to notices. If citizens fail to take notice of a development or delay getting involved in the development proceedings, it could be detrimental by limiting the citizens' opportunity to present evidence. Given that there is no second chance to present evidence, citizen groups may suffer from insufficient notice. A town may alleviate some concerns associated with OTR by restricting its use for only large developments. For example, a town could require OTR for subdivision and PRD applications only. The town could then provide additional notice for these proceedings.

C. Money

The financial cost of adopting OTR appears to be minimal. In fact, there is a potential savings of municipal attorneys' fees. According to Tom Jackman, the former planning director for the Town of Stowe, "When we do get appealed, the DRB decision carries much more weight and we haven't lost yet. The decline in appeals has been significant and that alone has probably wound up saving us a good deal of money."[109] The Planning Commission from the Town of Derby believes that "preventing De Novo hearings is well worth the effort and in the long run less expensive in legal costs."[110] In Randolph, the legal costs per appeal were also lower. The cost did not increase except for the $300 to $500 spent on audio equipment.[111] A town's primary financial risk when adopting OTR is that the record will be inadequate. With an inadequate record, the environmental court will

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108. Vt. Natural Res. Council, *The Facts vs. Governor Douglas – Talking Points*, Jan. 28, 2009, http://www.vnrc.org/article/articleview/23814.

109. Posting of Tom Jackman, Director of Planning, Town of Stowe, tjackman@townofstowevermont.org, to vtzoningadmins@list.uvm.edu**,** Vermont Zoning Administrators Listserv (Apr. 14, 2006) (on file with author).

110. Posting of JC Brimmer, Zoning Administrator, Town of Derby, derbyza@adelphia.net, to vtzoningadmins@list.uvm.edu, Vermont Zoning Administrators Listserv (Apr. 17, 2006) (on file with author).

111. Posting of Mardee Sanchez, Zoning Administrator, Town of Randolph, mardee@municipaloffice.randolph.vt.us, to vtzoningadmins@list.uvm.edu, Vermont Zoning Administrators Listserv (Apr. 24, 2006) (on file with author) ("It hasn't increased our cost except for the $300 - $500 we spent on good audio equipment . . . I don't spend any more time assisting the DRB now than I did pre-MAPA. We haven't had to hire a staff attorney to help with the decisions or running of the meetings. And as the appeal process is shorter (presumably and for the most part) because it is on the record, I think the legal costs per appeal are actually less.").

remand the case, and there will be additional costs to rehear the case. Many communities feel the financial risk is also low given the infrequency of remand. The remand cost is negligible when compared to the potential savings in attorneys' fees.

D. Complexity of the Development Process: Adopting the Municipal Administrative Procedure Act

Municipal experiences with implementing OTR range from completely positive to completely frustrating. The difference in experiences relates to the procedures already in place. If a town has already adopted the Municipal Administrative Procedure Act (MAPA), the switch to OTR may be fairly painless.

If a town decides to have courts review their decisions OTR, there are several steps it must take: adopt MAPA, define the magnitude of the development subject to OTR, adopt OTR, and improve the record creation and retention processes.[112]

The first step to qualify for OTR is for the town to adopt MAPA. MAPA can be adopted by vote or by a legislative body acting on its behalf.[113] The vote needs to be a majority vote of legally registered voters at a duly warned special or annual meeting.[114] MAPA includes the following provisions:

1) Policies against ex parte communication and conflicts of interest;[115]
2) Notice requirements;[116]
3) Procedural requirements related to how the meeting is conducted;[117]
4) Basic rules of evidence: "All testimony of witnesses and parties must be made under oath or affirmation."[118] Evidence that is "irrelevant or overly repetitious can be excluded."[119] While generally the rules of

112. VT. STAT. ANN. tit. 24, § 4471(b) (2007) ("If the municipal legislative body has determined (or been instructed by the voters) to provide that appeals of certain appropriate municipal panel determinations shall be on the record, has defined what magnitude or nature of development proposal shall be subject to the production of an adequate record by the panel, and has provided that the municipal administrative procedure act shall apply in these instances, then an appeal from such a decision of an appropriate municipal panel shall be taken on the record in accordance with the Vermont Rules of Civil Procedure.").

113. VT. STAT. ANN. tit. 24, § 1202(a) (2005).

114. *Id.*

115. *Id.* § 1203.

116. *Id.* § 1204(a).

117. *Id.* § 1205.

118. *Id.* § 1206(a).

119. *Id.* § 1206(b).

evidence need to be applied, MAPA allows certain types of evidence to be admitted if it is the type of evidence that a reasonably prudent person would have relied on.[120] For example, hearsay could be considered evidence even though it would generally violate rules of evidence;[121]
5) Members are not allowed to participate in the decision unless they "have heard all testimony and reviewed all other evidence submitted for the board's decision" either in person, by recording, or transcripts;[122]
6) The "final decision in a contested hearing needs to be in writing and shall separately state findings of fact and conclusions of law." Copies need to be delivered to each party.[123]

The second step is for the town to define the magnitude or nature of development proposals that would be subject to OTR. The definition adopted can be broad to include all projects or very narrow to include very few projects. For example, a town could require only PRDs to be heard OTR. A town may also consider the following for on-the-record review: site plan review; conditional-use review; design review; preliminary and final subdivision review; local Act 250 Review; and/or appeals and variance requests.[124] The municipality must then designate that appeals be heard OTR either through a resolution, the adoption of a bylaw, or as otherwise instructed by voters.[125]

Finally, a town must take further steps to ensure that its meetings produce an adequate record for court review. In order to preserve the record, a town must record the proceedings.[126] Municipalities that do not have recording equipment will need to invest in equipment that is dependable and capable of producing a clear record. Staff and board members may need initial training to ensure the clarity of the record.

In addition to the production of a recording, the proceeding evidence must also be clearly presented. Training efforts for towns switching to

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120. *Id.* ("When necessary to ascertain facts not reasonably susceptible of proof under those rules, evidence not admissible under those rules may be admitted if it is of a type commonly relied upon by reasonably prudent people in the conduct of their affairs.").

121. TECHNICAL PAPER #4, *supra* note 17, at 3.

122. tit. 24, § 1208.

123. VT. STAT. ANN. tit. 24, § 1209(a), (e) (2007).

124. VT. LAND USE EDUC. & TRAINING COLLABORATIVE, MANUAL OF PROCEDURES FOR ADMINISTRATION AND ENFORCEMENT OF VERMONT ZONING BYLAWS UNDER 24 V.S.A. 117, 119 (2005), *available at* http://vpic.info/pubs/admin_manual.doc.

125. *Id.*

126. *See In re* Dunnett, 172 Vt. 196, 198, 776 A.2d 406, 409 (Vt. 2001) (noting the environmental court's holding "that the board's practice of simply keeping minutes of hearings as opposed to audio or video recordings did not satisfy the requirements that proceedings 'be recorded' found in the Municipal Administrative Procedure Act").

OTR should include training on how to speak clearly and into a microphone. Currently some cities that record meetings only have one microphone placed in front of the chair. Other testimony, even of other board members, ends up being muffled. One solution to this problem is to either have multiple microphones, or to assign a staff member or volunteer make sure that the person speaking has a microphone.

Another issue is to make sure that the recording device is working properly. Proceedings should be recessed if tapes need to be changed or there are brief technical delays so that no testimony is missed. The main difficulty for many cities will be to clearly identify who is talking and what they are talking about. The board chair should require people to identify themselves, where they live, and then ask people to not talk over one another. The chair should also describe what is going on in the meeting. For example, the chair could note for the record that "Mr. Witness is referring to x plan or y document."[127] The chair is not the only one who needs to be specific about who is being identified. If one party is clear and the other party is not, then the clear party will have an advantage during the appeals process.

In addition to identifying who is speaking, the speaker also needs to identify which documents are being discussed. People are accustomed to using body language such as pointing to a map. When the dispute is OTR however; body language needs to be translated to the record. For example, instead of pointing to a map, the speaker should say the name of the document, the page number, and any other identifying subsection or grid that could help a court determine to what a witness was referring.[128]

The complexity of implementing these new procedures will depend on the procedures already in use. For some towns, the only difference between OTR and de novo review is the purchase of audio recording equipment. For example, in the Town of Stowe the process did not fundamentally change, since the Town already had MAPA procedures in place and the primary difference was the purchase of audio recording equipment.[129]

Contrary to Stowe's experience, Town of Morristown found the process to be more complicated. Morristown was the first town to have a decision reviewed by the Vermont Environmental Court OTR. It is possible that this contributed to the technical expertise needed. The court stated that "because this is the first on-the-record appeal to proceed to consideration in

127. DWIGHT H. MERRIAM, THE COMPLETE GUIDE TO ZONING 173–80 (2005).
128. *Id.*
129. Posting of Tom Jackman, *supra* note 109.

this Court, the state of the record has become confused."[130] Morristown found that the court expected the kind of technical detail in the findings and conclusions that it sees from legal filings.[131] The Town experienced difficulty meeting the standards, in part because volunteers and a nonlegal professional zoning administrator staff the DRB. Morristown expressed concern that hiring additional professional assistance to help with the writing processes and preservation of the record would diminish the role of volunteer boards.[132]

In re Leikert represents one of the challenges presented by OTR.[133] The Leikert family requested a conditional-use permit to operate an auto repair shop within their home.[134] The Morristown DRB denied the request, which the Leikerts appealed to the environmental court. Since the initial Morristown hearing was not recorded, the environmental court remanded the matter to the DRB for another hearing to create an adequate record.[135] Eventually, the case reached the Vermont Supreme Court, where it was remanded again in order for the DRB to complete its findings and conclusions.[136] Although the Town based its decision on the adverse effect on traffic and the character of the neighborhood, the court reasoned that the DRB did not provide evidence to show that traffic would be affected.[137] The court recognized that "developmental review boards are often made up mostly of lay people, many of whom have limited experience or training in adjudicative matters. But property owners are entitled to a decision that leaves them with an understanding of how a board's decision was reached based on the evidence submitted."[138] This decision was not the first time the court noted the importance of a DRB in explaining its reasoning. In 1990, the Vermont Supreme Court stated in the case of *In re Petition of Town of Sherburne* that when a board adequately explains its findings, those

130. *In re* J.D. Assoc., No. 83-5-99, at 1 (Vt. Envtl. Ct. May 15, 2001), *available at* http://vermontjudiciary.org/GTC/Environmental/Opinions.aspx (follow "Filing Year: 2001" hyperlink; then follow "Appeal of J.D. Associates" hyperlink).

131. Posting of Mark Leonard, *supra* note 107.

132. *Id.*

133. *In re* Leikert, No. 2004-213, 2004 WL 5582097 (Vt. Nov. 2004).

134. *Id.* at *1.

135. *Id.*

136. *Id.* at *2.

137. *Id.* at *2 ("As for traffic, the DRB stated that there would be limited visibility for vehicles entering and leaving the Leikerts' residence, which is located at the crest of a steep hill. Although this single sentence provides some basis for the DRB's decision regarding the effect of the proposal on traffic, it says virtually nothing about the state of the evidence on this subject.").

138. *Id.* at *2.

findings will generally be upheld even if the record "contains conflicting evidence."[139]

In addition to explaining the findings, the DRB is also required to file briefs according to the Vermont Rules of Appellate Procedure (VRAP).[140] Adherence to VRAP is required for all appeals, but with OTR, failure to comply can result in the case being remanded. If the case is remanded, the local board will incur the additional costs of listening to testimony and repeating procedures. In the case of *In re Ledgewood Condo PUD*, the court stated, "Briefs submitted for on-the-record appeals must conform to the VRAP and are required to contain a 'statement of the issues, table of contents and authorities, a statement of the case, an argument that must among other things contain citations to the record, appropriate authorities and statutes.'"[141] In addition to the purchase of audio equipment, a town may consider staff and volunteer capacity to prepare briefs in conformance with VRAP.

For some towns, the additional procedures are not worth the effort, especially because of the low rate of appeal. Former Brattleboro DRB chair David Gartensteinin said, "[OTR] would be 'solving a problem that did not exist.'"[142] Thomas Durkin, one of two judges at the Vermont Environmental Court, agreed, noting that "it is important to . . . [consider] the scale of the problem the DRB was seeking to solve."[143]

On January 8, 2009, Governor Douglas stated in his inaugural address that "we must expedite the chilling and costly effect of our lengthy appeals process by instituting 'on-the-record review' – one formal hearing where all evidence is submitted and examined."[144] Despite many proponents of OTR, there has been little interest overall. Only thirteen cities have adopted

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139. *In re* Town of Sherburne, 154 Vt. 596, 605, 581 A.2d 274, 279 (Vt. 1990).

140. Vt. R.App. P. 28.

141. *In re* Ledgewood Condo Planned Unit Dev. Conditional Use Application, No. 150-7-07, at 6 (Vt. Envtl. Ct. Aug. 26, 2008), *available at* http://vermontjudiciary.org/GTC/Environmental/Opinions.aspx (follow "Filing Year: 2008" hyperlink; then follow "Ledgewood Condo PUD CU Amend Application" hyperlink). (quoting *In re* Miller Conditional Use Application, No. 59-3-07, slip op. at 3–6 (Vt. Envtl. Ct. Nov. 5, 2007), *available at* http://vermontjudiciary.org/GTC/Environmental/Opinions.aspx (follow "Filing Year: 2007" hyperlink; then follow "Miller Conditional Use Application (After Remand)" hyperlink).

142. Lise, *Brattleboro Selectboard Meeting: DRB Finally Gets on the Record Review—But What Does It All Mean?*, iBrattleboro.com, Feb. 4, 2009, http://www.ibrattleboro.com/article.php/20090203235610876.

143. *Id*.

144. Governor James H. Douglas, Inaugural Address, at 13 (2009), (transcript available at http://governor.vermont.gov/speeches/Inaugural_2009.pdf).

OTR.[145] The Natural Resource Board tried offering OTR proceedings as a three-year pilot project and no cities signed up for the program.[146]

Despite the lack of participation, there are good reasons to make the switch. The primary reason is to keep local control. The *JAM Golf* decision may increase the number of appeals. Towns may prefer to decide these matters locally to the extent possible, even if it means agreeing to additional procedures, because it is the locals who will be most affected by the outcome. When making the decision to adopt OTR, towns should consider: the size of the municipality; the rate of development; the frequency of appeals and the available staff resources; the importance of citizen participation and local control; and the procedures already in place.

CONCLUSION

The *JAM Golf* case is an opportunity. Towns now have an incentive to clarify their standards and evaluate the way in which their appeals are reviewed. While the rate of appeal is low, even a few land use decisions can have a profound impact on the character of a community and the protection of resources. The *JAM Golf* decision is likely to increase the number of appeals.[147] Developers now know about the potential to have a decision thrown out based on vague city standards.[148] Practitioners have already noticed development attorneys asking city attorneys about their standards.[149] In addition, an applicant from a de novo community may appeal in hopes of a more favorable opinion. Courts will continue requiring specificity in town bylaws. Towns have the chance to think about what natural resources are locally valuable; map the resources; and specifically protect those resources in their town plan, zoning ordinance, and application process. Towns also have the chance to retain more local control during the appeals process. As development pressures increase, the protection of local natural resources may depend on the ability of towns to carefully consider the measures taken after *JAM Golf*.

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145. Lise, *supra* note 142.

146. E-mail from Michael Zahner, Executive Director, Vt, Natural Res. Board, to author (Apr. 13, 2009) (on file with author).

147. *What the* JAM Golf *Decision Will Mean for Your Municipality*, *supra* note 21.

148. *Id.*

149. *See* Gerry Tarrant, *supra* note 6 (explaining that lawyers are beginning to ask, "[W]hat are your standards?").

REDUCING TRANSPORTATION CARBON EMISSIONS: THE LATENT POTENTIAL FOR NEW ENGLAND

Genesis Wren Miller*

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INTRODUCTION

There is no doubt that there is increasing awareness and concern about global climate change and all of its impending consequences.[1] Widely accepted research indicates that climate change results from a buildup of carbon dioxide in our atmosphere, which humans have precipitated through various aspects of modern living.[2] Science suggests that we are at a crucial

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1. *See generally* INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT SUMMARY FOR POLICY MAKERS (2007) [hereinafter IPCC REPORT], *available at* http://www.ipcc.ch/pdf/assessment-report/ar4/syr/ar4_syr_spm.pdf (reporting on the most recent scientific findings of anticipated global effects of climate change).

2. *See* OFFICE OF TRANSP. & AIR QUALITY, U.S. ENVTL. PROT. AGENCY, PUB. NO. EPA 420 R 06 003, GREENHOUSE GAS EMISSIONS FROM THE U.S. TRANSPORTATION SECTOR 1990–2003, at 3 (2006) [hereinafter TRANSPORTATION GHG EMISSIONS REPORT] (describing how human contributions to atmospheric concentrations of carbon dioxide (CO_2) result in global warming by creating positive

point in time at which we can still cut carbon emissions to alleviate the impending consequences of climate change. However, if we do not act soon, it may well be too late.[3]

The information dispersed about climate change and its multifaceted impacts has prompted action at various levels of government.[4] Unfortunately, the federal government has neglected to act and the states have been first to implement instrumental legislation.[5] State, local, and regional governments have legislatively set carbon-reduction goals and implemented comprehensive and unique state and regional plans designed to address climate change. Further, these governments have taken steps to establish emissions inventories, develop mitigation action plans, enact sector-specific policies, and partner with other governments.[6]

Because of the magnitude and complexity of human-induced climate change, there is no single, quick fix to reverse the impending threat. Instead, for humans to combat global warming, we must take action to address the various sectors of carbon emissions.[7] One recent stride in legislation is California's Senate Bill (SB) 375, a new anti-sprawl law that aims to reduce carbon emissions from the transportation sector.[8]

This Note suggests that New England must also seek to reduce transportation carbon emissions and that it should do so as a region. Part I briefly describes the problem. Part II explains the existing framework in which New England works collectively to address climate change. Part III discusses the approach California has taken with SB 375. Part IV explores

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radiative forcing); *see also* IPCC REPORT, *supra* note 1, at 5 (noting that concentrations of certain greenhouse gases in the atmosphere "far exceed pre-industrial values" because of human activity).

3. *See* IPCC REPORT, *supra* note 1, at 19 ("Delayed emission reductions significantly constrain the opportunities to achieve lower stabilisation levels and increase the risk of more severe climate change impacts.").

4. U.S. CLIMATE ACTION NETWORK, TURNING THE TIDE: ESTABLISHING MANDATORY CLIMATE POLICY IN THE UNITED STATES 5 (2005), *available at* http://www.usclimatenetwork.org/resource-database/turningtidefull.pdf (noting the proliferation of municipal, state, and regional governmental policies aimed at reducing greenhouse gas emissions).

5. *Id.*; WILLIAM ANDREEN ET AL., CENTER FOR PROGRESSIVE REFORM, COOPERATIVE FEDERALISM AND CLIMATE CHANGE: WHY FEDERAL, STATE, AND LOCAL GOVERNMENTS MUST CONTINUE TO PARTNER 3 (2008).

6. *See* U.S. CLIMATE ACTION NETWORK, *supra* note 4, at 5–12 (discussing various approaches that state, regional, and municipal governments have taken to address climate change); *see also* ANDREEN ET AL., *supra* note 5, at 4.

7. UNITED STATES CLIMATE ACTION P'SHIP, A CALL FOR ACTION 9, http://docs.nrdc.org/globalwarming/files/glo_07012201A.pdf (last visited Nov. 23, 2009) (suggesting sector-specific policies and measures).

8. S. 375, 2007–2008 Leg. Sess. (Cal. 2008), *available at* http://leginfo.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_bill_20080930_chaptered.pdf; *see* Kevin Yamamura, *Governor Signs Anti-Sprawl Bill*, SACRAMENTO BEE, Oct. 1, 2008, at 1A, *available at* http://postcarboncities.net/node/3681.

how New England could use existing mechanisms to address the issue of transportation emissions, including how the California legislation could be a component of that process.

I. BACKGROUND: GLOBAL WARMING & LAND USE THAT LEADS TO INCREASED CARBON EMISSIONS

Science has established that human-induced climate change is a reality. Scientists agree that various human activities release greenhouse gas (GHG) emissions, and that the quality and quantity of human activity has resulted in increasing concentrations of GHGs in the atmosphere.[9] In 2007, the Intergovernmental Panel on Climate Change (IPCC) stated that the "[w]arming of the climate system is unequivocal."[10] The IPCC reports that global GHG emissions from human activities have increased 70% from pre-industrial times.[11] IPCC also reports a very high confidence that the overall net effect of human activities has been one of warming.[12]

While there are multiple forms of GHG emissions, carbon dioxide (CO_2) is the predominant GHG emitted by human sources.[13] One of the leading sources of CO_2 emissions fostering climate change is emissions from the transportation sector. The Environmental Protection Agency (EPA) attributes the overall rise of GHGs in the U.S. to increased CO_2 emissions from increasing fossil fuel combustion.[14] The EPA notes that land-use patterns that are heavily car dependent have developed across the country, such that "transportation is the second largest contributor of GHG emissions, in part due to dispersed land-use patterns that create high levels of vehicle miles traveled (VMT)."[15] The EPA reported in 2006 that "transportation is a vital part of the economy and is essential for everyday activities, [but] it is also a significant source of [GHG] emissions."[16] "In 2003, the transportation sector accounted for about 27 percent of total U.S.

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9. TRANSPORTATION GHG EMISSIONS REPORT, *supra* note 2, at 3.
10. IPCC REPORT, *supra* note 1, at 2.
11. *Id.*
12. *Id.* at 5.
13. TRANSPORTATION GHG EMISSIONS REPORT, *supra* note 2.
14. *Id.* at 6.
15. Alice Kaswan, *Environmental Justice and Domestic Climate Change Policy*, 38 ENVTL. L. REP. NEWS & ANALYSIS 10,287, 10,311 (2008), *available at* http://www.elr.info/articles/vol38/38.10287.pdf (citing U.S. ENVTL. PROT. AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2005 ES-14 (2007), *available at* www.epa.gov/climatechange/emissions/downloads06/07ES.pdf).
16. TRANSPORTATION GHG EMISSIONS REPORT, *supra* note 2, at 1.

GHG emissions."[17] Specifically, 81% of those emissions were released from "on-road" vehicles like cars, trucks, buses, and motorcycles.[18] Moreover, this massive sector of emissions "increased more in absolute terms than any other sector . . . from 1990 to 2003."[19]

Transportation-sector emissions are a major aspect of human-induced climate change whether you live in California or New England. In California, "the transportation sector is the single largest category of California's GHG emissions, producing 41 percent of the state's total emissions in 2004."[20] Likewise, the transportation sector is the single largest source of GHG emissions in New England.[21] According to the Vermont Agency of Transportation, the transportation sector represents the single largest source of GHG emissions (44%) in Vermont.[22] According to the Vermont Agency of Natural Resources, the transportation sector is the "fastest growing source of carbon dioxide (CO_2) emissions."[23] It appears that the situation is only worsening, as "[t]he increase in vehicle miles traveled (VMT) in Vermont was over 30 percent between 1991 and 2001."[24]

Furthermore, in New Hampshire, transportation is the largest contributor to GHG emissions among state energy sectors (41%), and is the fastest growing sector.[25] Evidenced by citizens' travel habits in New Hampshire, only 1% of the commuting population uses public transportation; 91% of the population commutes by car, truck, or van; 8% carpool; and 83% of the population drives alone.[26] "Long distance drives to

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17. *Id.*

18. *Id.* at 7.

19. *Id.* at 6.

20. CAL. ENERGY COMM'N, INVENTORY OF CALIFORNIA GREENHOUSE GAS EMISSIONS AND SINKS: 1990 TO 2004, at ii (2006), *available at* http://www.energy.ca.gov/2006publications/CEC-600-2006-013/CEC-600-2006-013-SF.PDF.

21. CONSERVATION LAW FOUND., NEW ENGLAND'S DOWN PAYMENT ON THE FUTURE, at 1 [hereinafter CLF REPORT], *available at* http://www.clf.org/resources/reports/docs/5steps5years.pdf.

22. CENTER FOR CLIMATE STRATEGIES, FINAL VERMONT GREENHOUSE GAS INVENTORY & REFERENCE CASE PROJECTIONS, 1990–2030, at C-1 (2007), *available at* http://www.anr.state.vt.us/air/Planning/docs/Final%20VT%20GHG%20Inventory%20&%20Projection.pdf.

23. VT. AGENCY OF NATURAL RES., AIR POLLUTION CONTROL DIVISION, STATE FILINGS FOR RECENTLY ADOPTED AND PROPOSED REGULATIONS — LOW EMISSION VEHICLES, SUBCHAPTER XI, SCIENTIFIC INFORMATION STATEMENT ATTACHMENT A, at 1 (2008), *available at* http://www.anr.state.vt.us/air/docs/Scientific%20Statement%20Attachment%20A.pdf.

24. *Id.*

25. New Hampshire Public Interest Research Group (NHPIRG) News Room, *Long Commutes, Sprawling Development, Lack of Transportation Options Are "Driving Global Warming"*, Feb. 7, 2006, http://www.nhpirg.org/NH.asp?id2=21827 [hereinafter NHPIRG News Room].

26. New Hampshire State Transportation Energy Statistics, http://www.eredux.com/states/transportation.php?id=1151&state=NEW%HAMPSHIRE&PHPSESSID=574n4glho3toudioc6bf9g52q0 (last visited Jan. 5, 2010).

and from work, growing 'ex-urban' sprawl development, and a lack of alternative transportation options for commuters are among the leading causes of this troubling statewide trend."[27]

The nature of the problem is pervasive because, throughout the country, the existing sprawl-like land-use patterns are heavily car-dependent.[28] While the exact nature of the sprawl in New England may be different from the sprawl in California, the problem remains the same: existing development patterns are not designed to be carbon-efficient, and have instead resulted in increasing VMT.[29]

Scientists anticipate that the undesirable consequences of climate change will be felt throughout the world, with such diverse effects as: increased mortalities from floods, droughts, and heat waves; increased damage from storms; increased disturbance of ecosystems with greater numbers of extinction; loss of coastal wetlands; additional stress on water resources; and increased burdens from malnutrition and infectious diseases.[30]

Likewise, New England is not sheltered from the effects of global warming. Scientists expect that New England will suffer unique, regionally relevant consequences of climate change, such as the depletion of natural resources that define the region, rising sea levels, and rising temperatures that will alter the seasons.[31] More specifically, consequences may include "significant warming, deteriorating air quality . . . a combination of droughts and flooding, changes in the character of forests, and the probable spread of Lyme Disease and toxic algal blooms."[32] Climate change could also "produce a shorter ski season, allow incursion of warmer climate tree species which would replace the current mix of hardwoods that produce [New England's] spectacular fall foliage, and result in a dramatic change in the quality and quantity of maple sap."[33]

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27. NHPIRG News Room, *supra* note 25.

28. Kaswan, *supra* note 15.

29. *Id.*; *see* ANDREEN ET AL., *supra* note 5, at 13 (identifying urban sprawl as contributing to CO_2 emissions by creating inefficient traffic patterns).

30. *See* IPCC REPORT, *supra* note 1, at 10 (outlining various anticipated impacts of climate change).

31. CLF REPORT, *supra* note 21.

32. VT. AGENCY OF NATURAL RES., *supra* note 23 (citing Eric Barron, *Chapter Four: Potential Consequences of Climate Variability and Change for the Northeastern United States*, *in* CLIMATE CHANGE IMPACTS ON THE UNITED STATES: THE POTENTIAL CONSEQUENCES OF CLIMATE VARIABILITY AND CHANGE 109, 111, 113, 125, 128 (2001)).

33. *Id.* (citing OFFICE OF POLICY, U.S. ENVTL. PROT. AGENCY, PUB. NO. EPA 236-F-98-007AA, CLIMATE CHANGE AND VERMONT 3–4 (1998)).

These impacts will have significant and extensive effects on New Englanders' quality of life and cost of living.[34] Not only will these impacts affect New England residents' enjoyment of their home environment, but the implications for New England's tourism revenue are enormous. In Vermont, tourism is the state's largest industry, employing 23% of the population,[35] and it generates $1.4 billion in personal income and $267 million in indirect business tax.[36] Dr. Kenneth D. Kimball, director of research for the Appalachian Mountain Club, reports that climate change could affect various aspects of recreational tourism in New England, ranging from fishing, skiing, hiking, and camping, to general sight-seeing.[37] He further notes that "the recreation and tourism industry . . . is very dependent on a highly mobile public using the automobile as its primary source of transportation to travel long distances."[38]

Thus, there are environmental and economic incentives for New England to address the issues of transportation planning and transportation emissions resulting from sprawling land-use patterns that result in high VMT. In its 2007 report, the IPCC described key mitigation technologies, policies, and potential mitigating measures that, if implemented, could alleviate the effects of climate change.[39] In addition to switching to more fuel-efficient cars, the IPCC suggested shifting from a road-transport system to a public-transport system and developing other alternative modes of transportation.[40] The IPCC also suggested influencing community mobility needs through land-use and transportation planning has proven to be environmentally effective.[41] Planning for transportation at the local, state, and regional level will help New England give its citizens greater access to the region while successfully striving to meet carbon reduction goals.

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34. COMM. ON THE ENV'T & THE NE. INT'L COMM. ON ENERGY OF THE CONFERENCE OF NEW ENGLAND GOVERNORS & E. CANADIAN PREMIERS, CLIMATE CHANGE ACTION PLAN 2001, at 3 (2001) [hereinafter CCAP], *available at* http://www.negc.org/documents/NEG-ECP%20CCAP.PDF.

35. TUN LIN ET AL., THE IMPACT OF THE TOURISM SECTOR ON THE VERMONT ECONOMY: THE INPUT-OUTPUT ANALYSIS 6 (1999), *available at* http://purl.umn.edu/21618; Vermont Economy: Agriculture and Industry in Vermont, http://www.e-referencedesk.com/resources/state-economy/vermont.html (last visited Dec. 25, 2009).

36. LIN ET AL., *supra* note 35.

37. KENNETH D. KIMBALL, *New England Regional Climate Change Impacts on Recreation and Tourism, in* NEW ENGLAND REGIONAL CLIMATE CHANGE IMPACTS WORKSHOP SUMMARY REPORT, SEPTEMBER 3–5, at 129–31 (1997), *available at* http://www.necci.sr.unh.edu/necci-report/kimball.pdf.

38. *Id.* at 131.

39. IPCC REPORT, *supra* note 1, at 17 tbl.4.2.

40. *Id.*

41. *Id.*

II. THE EXISTING FRAMEWORK IN NEW ENGLAND AND THE CURRENT APPROACH FOR ADDRESSING CLIMATE CHANGE

More and more cities, states, and citizens are aware of the impending consequences of human-induced climate change and are committed to making carbon-emissions reductions.[42] Despite clear acknowledgment of financial and environmental costs associated with high VMT, the New England states have not effectively reduced VMT, and by extension, transportation emissions. Structurally, New England citizens are, in essence, without the means to reduce this aspect of their carbon footprint. However, the foundation does exist for New England to make strides, as a region, in addressing this formidable source of emissions. Governors of the New England states have successfully collaborated in forming a Climate Change Action Plan (CCAP), and have implemented a Regional Greenhouse Gas Initiative (RGGI).[43] Both the CCAP and RGGI demonstrate cooperative capabilities to address climate change issues as a region.

In 2001, New England Governors took initial steps by joining with the Eastern Canadian Premiers (NEG/ECP) in committing to a CCAP.[44] The Plan stated the following:

> [C]limate science indicates that aggressive action is needed to reduce [GHG] emissions . . . [and that] due to the uncertainty of corresponding actions on a worldwide basis, and the lengthy response time necessary for climate actions to have an impact, it is also prudent for our jurisdictions to undertake adaptive measures to mitigate the impacts of climate change.[45]

The NEG/ECP anticipated a "30% increase in CO_2 emissions from New England between 2000 and 2020 in the absence of mitigating action."[46] They also listed specific ways that the regional plan could tackle various

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42. GREAT LAKES INST. FOR ENVTL. RESEARCH, STATE OF THE STRAIT: STATUS AND TRENDS OF KEY INDICATORS 76 (John H. Harting et al. eds., 2007), *available at* http://www.epa.gov/med/grosseile_site/indicators/sos/carbon.pdf ("[M]any cities and states across the country have prepared greenhouse gas inventories; and many are actively pursuing programs and policies that will result in greenhouse gas emission reductions.").

43. CLF REPORT, *supra* note 21, at 2. RGGI is a cooperative effort to address emissions from participating states' electricity power plants. Note that RGGI includes more than just the New England states. *See* Regional Greenhouse Gas Initiative, http://www.rggi.org/states (last visited Jan. 5, 2010).

44. CCAP, *supra* note 34, at 1 (agreeing to the CCAP).

45. *Id.* at 1–2.

46. *Id.* at 2.

aspects of global warming that were within their control.[47] They called for formulating: (1) a coordinated regional plan for reducing GHGs; (2) a commitment from the region as a whole to a specific reduction target; and (3) a commitment from each state to maintain its own plan for GHG reductions.[48]

The CCAP created a basis for action and set forth guiding principles and regional goals while also providing for variability among the states and provinces. Under the agreement, each state and province will initiate "a coordinated set of policies and actions aimed at advancing [the] common goals . . . [and] each jurisdiction will choose additional measures to contribute towards the regional target."[49] The plan set forth: (1) a short-term goal to reduce GHG emissions to 1990 levels by 2010; (2) a mid-term goal to reduce GHG emissions by at least 10% below 1990 levels by 2020; and (3) a long-term goal to eliminate any dangerous threat to the climate, which they approximated would require reductions of 75–85% below current levels.[50]

The Plan included nine "action items" crafted to guide the New England states and Eastern Canadian provinces in reaching the designated goals. Action item number eight, entitled "A Decrease in the Transportation Sector's Growth in GHG Emissions," was based on the NEG/ECP recognition that "transportation is the single largest source of primary energy consumption and [GHGs]."[51] The specific recommendations for accomplishing a decrease in emissions included the promotion of compact development, transit/pedestrian development, "smart growth" measures, initiation of programs designed to manage and reduce transportation demand, and enhancement of mass-transit infrastructure.[52]

The NEG/ECP charged the Committee on the Environment and the Northeast International Committee on Energy (NICE) with implementing the plan, and established the Climate Change Steering Committee for implementation of climate change projects.[53] The Steering Committee then established focused work groups for each of the items identified in the plan, and each group was responsible for formulating recommendations for

47. *Id.*

48. *See id.* (accomplishing these goals through a coordinated process that entails disclosing progress and sharing information among the states).

49. *Id.* at 5.

50. *Id.* at 7.

51. *Id.* at 17.

52. *Id.*

53. CONFERENCE OF NEW ENGLAND GOVERNORS & E. CANADIAN PREMIERS, REPORT TO NEW ENGLAND EASTERN CANADIAN PREMIERS ON CLIMATE CHANGE PROJECTS 1 (2002), *available at* http://www.negc.org/documents/850088026.pdf.

action.[54] The Transportation Work Group created two work items: (1) developing mechanisms to promote cleaner and more efficient vehicles; and (2) exploring land-use and development models "that could contribute to the design of potential incentives and performance-based practices to encourage a reduction in [VMT]."[55]

Despite the CCAP's acknowledgement of the problem of transportation emissions and their link to climate change and the nature of possible solutions, the region has failed to meet the targets established by the plan and GHG emissions for the region have actually increased over the past seven years.[56] While some of the states' emissions have leveled off, not a single state is on track to meet their emissions-reduction goals.[57] According to the 2007 Climate Change Action Report Card "[GHG] emissions from transportation are both the largest and fastest rising."[58] The report also notes that the major cause of this rise is the increased consumption of gas and diesel from escalating VMT.[59]

In 2007, the NEG and ECP each affirmed their commitment to the goals set forth in the 2001 CCAP.[60] It was a hollow affirmation though, considering that the agreement has not successfully tackled the problem of transportation emissions thus far. Reaffirming the agreement likely will not change the problem. The Climate Change Action Report Card highlights failures of the states to reach their designated goals and notes, that while some effective policies are in place, no state or province is doing enough.[61] The Report Card states that it is imperative that the region implement policies that reduce sprawl and encourage clean public transit.[62] Specifically, VMT must decrease (something no state or province has done) and "policies must be implemented that encourage smart growth that connects housing, jobs and transit, thereby reducing sprawl."[63] The Conservation Law Foundation agrees and states that "New England can meet the significant challenges posed by the climate change crisis only if it stops and ultimately reverses the troubling trend of increased VMT."[64]

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54. *Id.*
55. *Id.* at 2.
56. CLF REPORT, *supra* note 21, at 2.
57. KATY KROTTINGER ET AL., NEW ENGLAND AND EASTERN CANADA CLIMATE CHANGE ACTION REPORT CARD 2007: FOURTH ASSESSMENT OF THE REGION'S PROGRESS TOWARDS GHG EMISSION REDUCTION TARGETS 3 (2007).
58. *Id.* at 6.
59. *Id.*
60. *Id.* at 9.
61. *Id.* at 7.
62. *Id.* at 6.
63. *Id.* at 7.
64. CLF REPORT, *supra* note 21, at 6.

The clear directive to reduce overall GHG emissions is in sharp contrast to the grades the states received for their progress toward their 2010 targets. Maine, New Hampshire, Rhode Island, and Vermont all received "F's." Connecticut earned a "D," while Massachusetts got the highest grade, a "C."[65] In their respective efforts to reduce GHG emissions specifically from the transportation sector, no state earned higher than a "C-."[66] By these measures, the voluntary commitment made by the NEG/ECP has been ineffective at best. The 2007 Report Card shows that, six years after signing the plan, the states are not on track: "The necessary policies are not in place, and global warming emissions are far from under control. To get back on track, it is going to take real leadership and mandatory policies."[67]

On this existing platform of cooperation, New England must embark on mandatory emissions-reduction goals, accompanied with structural solutions for reducing transportation emissions. The lack of success of the CCAP thus far indicates that real obstacles stand in the way of formulating fast and efficient solutions for transportation-emissions reductions. A regional approach would allow New England to make meaningful carbon reductions and would allow for variation, flexibility, and adaptability.[68] Nicholas Lutsey and Daniel Sperling of the Institute of Transportation Studies state that "[i]f the 17 states that have set their own GHG emission-reduction targets . . . in fact were to achieve those targets, nationwide U.S. GHG emissions would be stabilized at 2010 levels by 2020."[69]

With a binding commitment to an emissions-reduction target and the use of an anti-sprawl approach, the states could plan at local, state, and regional levels to alter existing land-use patterns to ease the existing dependence on cars for transportation. This Note assumes that the threat of climate change is significant enough to motivate the New England States to conjure up the necessary political will to expand existing cooperative efforts. When and if that becomes the case, California has paved the way for New England.

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65. KROTTINGER, *supra* note 57, at 10.

66. *Id.* at 13–18.

67. *Id.* at 8.

68. ANDREEN ET AL., *supra* note 5, at 6–7.

69. *Id.* at 3–4 (quoting Nicholas Lutsey & Daniel Sperling, *America's Bottom-up Climate Change Mitigation Policy*, 36 ENERGY POL'Y 673, 683 (2008)).

III. CALIFORNIA'S ANTI-SPRAWL LEGISLATION: SENATE BILL 375

California continues to be a groundbreaker in addressing global warming at the state level. On September 30, 2008, Governor Arnold Schwarzenegger signed into law Senate Bill (SB) 375,[70] a bill described as "anti-sprawl legislation" because it aims to address the link between sprawl and GHG emissions.[71] Using its predecessor landmark bill, Assembly Bill (AB) 32,[72] the California Global Warming Solutions Act of 2006, as a springboard, the legislature adopted SB 375 to reduce carbon emissions by recognizing and addressing the connection between land-use development and transportation.[73] The bill will accomplish this reduction by channeling billions of dollars in state and federal transportation subsidies toward projects that are in accordance with planning efforts to reduce transportation.[74] The legislation will "tie tens of billions of dollars to state and federal transportation funding based on compliance with efforts to reduce sprawl, and by extension, commutes."[75]

In 2006, California passed AB 32,[76] legislation that set a statewide cap on carbon emissions with the goal of reducing carbon emissions to 1990 levels by 2020.[77] AB 32 was a clear, affirmative stance on global warming that spawned a forum for SB 375 to become law. Senate Bill 375 was pushed forward and eventually adopted in large part because the state had determined that it would not be able to meet its GHG-emissions-reduction goals under AB 32 without making significant changes in the state's land-use and transportation policies.[78] The state formally acknowledged that "[s]pending less time on the road is the single-most powerful way for California to reduce its carbon footprint."[79] Senator Darrell Steinberg from

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70. S. 375, 2007–2008 Leg. Sess. (Cal. 2008), *available at* http://leginfo.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_bill_20080930_chaptered.pdf; *see* Yamamura, *supra* note 8.

71. Aurelio Rojas, *Foes Back Anti-Sprawl Measure: Builders, Environmentalists Unite Behind Steinberg's Bill*, SACRAMENTO BEE, Aug. 7, 2008, at A3.

72. A.B. 32, 2005–2006 Leg. Sess. (Cal. 2006), *available at* http://leginfo.ca.gov/pub/05-06/bill/asm/ab_0001-0050/ab_32_bill_20060927_chaptered.pdf.

73. S. 375.

74. Felicity Barringer, *California Moves on Bill to Curb Sprawl and Emissions*, N.Y. TIMES, Aug. 29, 2008, at A12, *available at* http://www.nytimes.com/2008/08/29/us/29sprawl.html.

75. *California Weighs Anti-Sprawl Legislation*, HYBRID CARS, Sept. 1, 2008, http://www.hybridcars.com/incentives-laws/california-weighing-anti-sprawl-legislation-24924.html.

76. A.B. 32.

77. Press Release, State of Cal., Office of the Governor, Governor Schwarzenegger Signs Sweeping Legislation to Reduce Greenhouse Gas Emissions through Land-Use (Sept. 30, 2008), *available at* http://gov.ca.gov/press-release/10697.

78. *Id.*

79. Office of the Governor, State of Cal., Senate Bill 375: Redesigning Communities to Reduce Greenhouse Gases (2008), http://gov.ca.gov/index.php?/text/fact-sheet/10707.

Sacramento spent two years reworking and perfecting SB 375, and it is the first piece of legislation in the U.S. to try to derive GHG reductions from the transportation sector by channeling funding for regional land-use planning.[80] The hope is that the bill will help to transform the state's communities and provide a wider range of alternative transportation options that are sustainable.[81]

A. How Is SB 375 Structured, and What Will it Do?

The new California law addresses transportation emissions using a cluster or multimedia approach.[82] Three regulatory and permit processes are brought together under the bill and are synchronized to achieve carbon reductions.[83] "One focuses on regional planning: how land use should be split among industry, agriculture, homes, open space and commercial centers. Another governs where roads and bridges are built. A third sets out housing needs and responsibilities—for instance, how much affordable housing a community must allow."[84] The bill seeks to do this by directing the seventeen metropolitan planning organizations in California to meet targets set by state air regulators to reduce GHG emissions.[85] The metropolitan planning organizations are then required to draw up transportation and land-use plans to show how they will meet the designated target.[86]

William Fulton, the founder of the California Planning and Development Report, provides an analysis of the bill that focuses on five key aspects: (1) the creation of regional targets for GHG emissions tied to land use; (2) the requirement that regional planning agencies create a plan to meet the designated targets; (3) the requirement that regional transportation funding decisions be consistent with the plan; (4) the linking of housing efforts and transportation planning; and (5) the exemptions from the California Environmental Quality Act (CEQA) for projects that are in line with the regional plan.[87] For the purposes of this Note, the most

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80. Editorial, *California Bill Attacks Sprawl*, L.A. TIMES, Aug. 28, 2008, *available at* http://www.latimes.com/news/opinion/la-ed-planning28-2008aug28,0,165826,print.story.

81. OFFICE OF THE GOVERNOR, *supra* note 79.

82. *See* DAVID FIRESTONE & FRANK REED, ENVIRONMENTAL LAW FOR NON-LAWYERS 72–75 (4th ed. 2008) (describing the multimedia or cluster approach).

83. Barringer, *supra* note 74.

84. *Id.*

85. *California Bill Attacks Sprawl*, *supra* note 80.

86. *Id.*

87. Bill Fulton, *SB 375 Is Now Law—But What Will It Do?*, CAL. PLANNING & DEV. REPORT, Oct. 1, 2008, http://www.cp-dr.com/node/2140.

important aspects are the first, second, and third (the fourth and fifth are mentioned below because they were instrumental in the success of the bill).

Regarding the establishment of targets, the law calls for the California Air Resources Board (CARB) to set emissions targets for each of the eighteen metropolitan planning organizations (MPO).[88] Each MPO is then required to prepare a "sustainable communities strategy" to reduce VMT to reach the designated target.[89] If the strategy fails to demonstrate how the target will be reached, then the MPO must also include an alternative planning strategy that will demonstrate how the reductions will be achieved by alternative development patterns, infrastructure, or additional transportation policy measures.[90] Once the sustainable communities strategy is developed it becomes part of the Regional Transportation Plan (RTP) and "tethers the sustainable strategy to federal transportation planning law."[91] The complying local governments will be eligible to receive funds from the state's $5 billion dollar annual transportation fund, and developers of these projects will benefit from a streamlined permitting process and relief from certain CEQA reviews.[92]

Fulton's analysis notes, however, that the bill does not actually alter the existing regional planning structure that delegates decision-making authority to local officials sitting as MPO board members.[93] He reports that local government lobbyists were successful in having language put into SB 375 stating that the sustainable communities strategy is not a land-use plan and does not confer any land-use authority to the MPOs.[94] The author of SB 375, Senator Steinberg, has stated that the bill's requirement is in fact that the MPOs show that their plans will result in a reduction in carbon emissions by engaging regions in a process of regional planning.[95] In actuality, under the law, "[n]either a sustainable communities strategy nor an alternative planning strategy regulates the use of land, nor . . . shall either one be subject to any state approval."[96] According to Fulton, this

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88. OFFICE OF THE GOVERNOR, *supra* note 79.

89. *Id.*

90. Fulton, *supra* note 87; S. 375 § 4(b)(2)(H), 2007–2008 Leg. Sess. (Cal. 2008) Cal. Stat. ch. 728, *available at* http://leginfo.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_bill_20080930_chaptered.pdf.

91. Fulton, *supra* note 87.

92. Rojas, *supra* note 71.

93. Fulton, *supra* note 87.

94. *Id.*

95. *SB 375 Connects Land Use and AB 32 Implementation*, THE PLANNING REPORT (July 2007) [hereinafter THE PLANNING REPORT], *available at* http://www.planningreport.com/tpr/?module=displaystory&story_id=1257&format=html.

96. S. 375 § 4(b)(2)(J), 2007–2008 Leg. Sess. (Cal. 2008) Cal. Stat. ch. 728, *available at* http://leginfo.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_bill_20080930_chaptered.pdf.

means that "the only thing SB 375 says is that the Regional Transportation Plan has to be internally consistent—meaning the action items and financing decisions called for in the RTP must be consistent with the Sustainable Communities Strategy."[97]

B. Why Is SB 375 Significant?

As the first in the nation, SB 375 is potentially the most far-reaching anti-sprawl legislation to date.[98] Despite any shortcomings the bill may have, it is a commendable first attempt at addressing transportation sector emissions, and California has been a true pioneer in trying to address this uncharted topic. At the very least, the bill provides a model that any willing state or region could use to create its own legislative effort to employ land-use planning to bring about carbon reductions from transportation. In reference to the bill, Senator Steinberg stated that SB 375 engages "regions in a process . . . which essentially says that we need to plan as a region, not just as individual cities and counties. Air quality, traffic congestion, and carbon know no artificial boundaries. These issues must be tackled regionally."[99]

SB 375 took years to develop and Senator Steinberg had to work hard to get the support necessary to get it passed, rewriting the bill five times to quiet opposition from builders and municipal governments.[100] The building industry feared that their projects would suffer delays, and local officials were uncomfortable with giving any of their zoning powers and transportation planning authority to the state.[101] The bill now specifically contains provisions that preserve local governments' land-use authority,[102] and provide certain breaks for complying builders.[103] The local planning bodies can approve any new development they want, but the plans that are in accordance with the regional sustainable communities strategy are the

97. Fulton, *supra* note 87.

98. Cary Lowe, *Redefining Growth*, SAN DIEGO UNION TRIB., Oct. 17, 2008, *available at* http://legacy.signonsandiego.com/uniontrib/20081017/news_lz1e17lowe.html; OFFICE OF THE GOVERNOR, *supra* note 79.

99. THE PLANNING REPORT, *supra* note 95.

100. *California Bill Attacks Sprawl*, *supra* note 80.

101. Margot Roosevelt, *Legislature Takes Aim at Urban Sprawl*, L.A. TIMES, Aug. 21, 2008, at B1, *available at* http://articles.latimes.com/2008/aug/21/local/me-sprawl21.

102. TOM ADAMS, AMANDA EAKEN & ANN NOTTHOFF, COMMUNITIES TACKLE GLOBAL WARMING: A GUIDE TO CALIFORNIA'S SB 375, at 16 (2009), *available at* http://www.nrdc.org/globalwarming/sb375/files/sb375.pdf.

103. Rojas, *supra* note 71.

first to receive transportation funds and are permitted to bypass certain regulatory requirements.[104]

Still, there are various opponents to the bill. The California Chamber of Commerce and some commercial builders are critical of SB 375, arguing that it creates two separate GHG-reduction processes that require compliance (AB 32 as well as specific regional targets).[105] Others argue that commercial developments should also be able to benefit from relaxed CEQA requirements,[106] and some local officials take issue with the bill for fear that they may lose their transportation funding, while others simply don't like the idea of state-issued regional targets.[107]

IV. NEW ENGLAND MOVING FORWARD

Despite various differences between California and New England, the focal commonality is that both have acknowledged that the transportation sector is a major source of GHG emissions. Aside from the fact that New England is a collection of independent states, the key difference is that the New England region has not made an effective attempt to reduce transportation emissions. In contrast, Senator Steinberg carefully crafted California's SB 375 to curb transportation emissions by acknowledging the direct connection between VMT and land-use patterns, and it is the first bill in the nation to tackle the relationship between land-use planning and GHG emissions.[108] New England has failed to formulate any policies or legislation recognizing this clear relationship, but now it has the benefit of learning from California's model as it searches for a regionally tailored solution of its own.

This Note suggests that New England could follow California's lead by setting mandatory regional and state-specific emissions targets, including regional targets within the states, and by collectively agreeing to channel both state and federal funding towards areas that have designed sustainable communities strategies aimed at achieving those targets. Using SB 375 as a starting point, New England could break new ground by not only agreeing to propose a bill similar to SB 375 at the state level, but also by agreeing to create transportation plans that coordinate and plan for the region as a

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104. *California Bill Attacks Sprawl*, *supra* note 80.

105. S. 375, 2007–2008 Leg. Sess. (Cal. 2008), *available at* http://leginfo.ca.gov/pub/07-08/bill/sen/sb_0351-0400/sb_375_bill_20080930_chaptered.pdf; *see* Yamamura, *supra* note 8.

106. S. 375; *see* Yamamura, *supra* note 8.

107. S. 375; *see* Yamamura, *supra* note 8.

108. OFFICE OF THE GOVERNOR, *supra* note 79.

whole. This Note lays out two frameworks under which New England could accomplish these regional transportation reductions at both the state and regional level.

This Note suggests a coordinated regional approach to addressing transportation emissions for four main reasons. First, the New England states collectively form a region that could implement a meaningful plan to reduce carbon emissions from transportation. With a total area only approximately half the size of California,[109] the region is small enough to be manageable but still large enough to accomplish measurable carbon reductions.[110] Second, the New England states demonstrated their cooperative capabilities when they joined together in implementing the RGGI and voluntarily committed to goals under the CCAP. These two cooperative initiatives demonstrate that there is potential for this kind of comprehensive, New England-wide, land-use planning approach.

Third, the borders of many of the New England states are often permeated to satisfy citizens' transportation needs. For example, in New Hampshire "Massachusetts-bound commuters produced about one-quarter of the carbon dioxide emissions from all New Hampshire commuters, and two to three times as much carbon dioxide as a commuter traveling within New Hampshire."[111] It is common in New England for people to live in one state and work in another or to have transportation needs that frequently involve crossing state borders. In this way, the New England states are inextricably linked, and coordinating planning efforts as a region will only help to reduce GHG emissions from transportation. Lastly, "[b]ecause the effects of climate change will not be uniform, strategies for dealing with and adapting to the effects of climate change will differ from region to region."[112] Thus, cooperating and planning on a regional level will allow the states to collectively deal with climate change adaptation and mitigation in a flexible, localized fashion (as opposed to nationwide).

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109. *See generally* U.S. States: Area and Ranking, http://enchantedlearning.com/usa/states/area.shtml (last visited Dec. 25, 2009) (providing the surface area of each state in the Union).

110. *See generally The State of New England: A Fact Sheet*, CONNECTION: NEW ENGLAND'S J. OF HIGHER EDUC. & DEV., Spring 1999, at 47, *available at* http://www.nebhe.org/info/pdf/nejhe/Connection_Spring99.pdf (last visited Dec. 25, 2009) (reporting that New England has a total population of over 13 million people and a surface area of over 66,000 square miles).

111. NHPIRG News Room, *supra* note 25.

112. ANDREEN ET AL., *supra* note 5, at 2.

A. New England's Present Paradigm

As a region, New England has various land-use patterns comprised of many different kinds of sprawl: urban, suburban, and rural. Living in the quaint old towns that dot the New England region requires a great deal of driving, thereby resulting in high VMT. According to the Conservation Law Foundation (CLF), New England has utterly failed to make public-transportation funding a priority and has instead poured the states' limited resources into subsidies for the highway system.[113] This has left New England residents virtually car-dependent.

There is increasing awareness of the threat of climate change and the urgency of reducing carbon emissions.[114] Currently, the options are limited for New Englanders who desire to reduce their carbon footprint. A recent report from CLF states that "[a]s a region, New England spends approximately 75 percent of transportation funding on highways and highway-related projects, leaving only 25 percent for public transportation projects that give people the opportunity to drive less."[115] They further note that the problem is even more pronounced in the rural areas of northern New England.[116] It is apparent that planning needs to change so that residents will have the means to reduce their transportation emissions. CLF asserts that "the New England states must stop subsidizing the highway-centric, sprawl-inducing transportation system that dominates the region,"[117] and notes that creating and increasing the availability of and access to public transportation is one of the most effective ways to reduce VMT.[118]

Based on the 2007 Climate Change Action Report Card, it is evident that reducing transportation-sector emissions, like SB 375 recognizes, is a key component for New England in striving to meet the designated emissions-reduction goals set by the NEG/ECP. CLF explains that such changes are possible because "[a]s a region, New England was already substantially developed long before the automobile, and many of our cities and towns are well suited to transit."[119] However, emissions have risen since the 2001 NEG/ECP voluntary agreement to reduce GHG emissions in

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113. CLF REPORT, *supra* note 21, at 7.

114. *See generally* World Public Opinion.org, International Polling on Climate Change , http://www.worldpublicopinion.org/pipa/pdf/dec07/CCDigest_Dec07_rpt.pdf (last visited Nov. 19, 2008) (reporting on public opinion by compiling different polls).

115. CLF REPORT, *supra* note 21, at 7.

116. *Id.*

117. *Id.*

118. *Id.* at 6.

119. *Id.*

the region by 75–85% in the long-term and specifically to 1990 levels by 2010.[120] It is time to discover ways to actually reduce transportation emissions and VMT.

Structurally, planning takes place in New England in a fashion similar to California. In northern New England, MPOs already exist in towns with more than 50,000 people,[121] and funding for MPOs comes primarily from the Federal Highway and Transit funds, with states and municipalities contributing or matching where they can.[122] In more rural areas, regional planning bodies undertake the bulk of transportation planning.[123] Thus, implementing a bill similar to California's SB 375 in New England would not require extensive reworking of existing planning structures to use sustainable community strategies as a way of allocating funding.

B. Mechanisms for Reducing Regional Carbon Emissions

The NEG/ECP and the CAP provided a foundation for addressing climate change and transportation emissions in particular. To move forward as a region on this issue, the New England states should cooperate as a region and make an effort to reduce carbon emissions from transportation by examining, assessing, and learning from SB 375. While the states could each simply use SB 375 as a model and agree to adopt similar legislation in their respective states, this Note suggests two specific ways that the New England states could collectively address transportation-emissions reductions through regional planning as well. New England could use this rare piece of legislation to formulate and implement its own tailored approach by either creating a memorandum of understanding (MOU), which was the model used for the RGGI, or by entering into an interstate compact. Under either of these approaches, it would be invaluable for the joining states to learn from SB 375 as the states collectively attempt to reduce these emissions throughout New England.

Under either of these approaches, New England would face decisions that California did not face, such as how and to what extent it wishes to coordinate the various state needs into an overarching regional transportation plan that meets the needs of the region as a whole. Further, New England states will need to consider to what extent the overarching

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120. KROTINGER, *supra* note 57.

121. DEFENDERS OF WILDLIFE, TRANSPORTATION PLANNING 101, at 1, http://www.defenders.org/resources/publications/programs_and_policy/habitat_conservation/habitat_and_highways/6001/ne/transportation_planning_101.pdf.

122. *Id.* at 8.

123. *Id.*

program will be entitled to state funds and whether any funds would be pooled. At the very least, the New England states could cooperate in one of these two ways to collectively adopt the principles established in SB 375 as a means for transforming the goals set forth by the states in the 2001 CCAP into mandatory targets and to effectively strive to meet targets at local, state and regional levels.

Building off the ideas established in the CCAP and the structure provided in SB 375, the states could use one of these two avenues to agree to hold their respective state planning organizations responsible for establishing plans capable of reaching the designated local, state, and regional targets. They could then agree that those who formulate such plans will be the first to receive state and federal transportation grants and funding. To accomplish this regional cooperation, states could create a model MOU or interstate compact to design a regional plan aimed at meeting the regional-reduction target. On the regional and state levels, the New England states could commit to tying both state and federal funding to sustainable transportation projects. It is worth noting that by forming a New England regional plan, the states may be eligible for certain additional funds from the Federal Highway Trust Fund.[124] Moreover, instituting regional cooperation may allow the states to more easily develop and establish an emissions inventory and use their partnership to leverage reductions.[125]

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124. *See* U.S. DEPT. OF TRANSP., THE SAFE, ACCOUNTABLE, FLEXIBLE, AND EFFICIENT TRANSPORTATION EQUITY ACT OF 2003: SECTION-BY-SECTION ANALYSIS 8–9 (2003), [hereinafter SAFETEA], *available at* http://www.fhwa.dot.gov/reauthorization/safetea_analysis.pdf (creating special incentives and allocating funds under sections 1701 and 1703, Subtitle G–Program Efficiencies and Improvements–Operations for improvements to regional transportation systems). More specifically, SAFETEA similarly creates incentives and allocates funds under the section 1806 Multi-state Corridor Planning Program and the section 1816 transportation, community, and system preservation program to do the following:

> [F]acilitate the planning, development, and implementation of strategies by States, Metropolitan Planning Organizations, Federally recognized tribes, and local governments to integrate transportation, community, and system preservation plans and practices that improve the efficiency of the transportation system; reduce the impacts of transportation on the environment; reduce the need for costly future investments in public infrastructure; provide efficient access to jobs, services, and centers of trade; and examine development patterns and identify strategies to encourage private sector development patterns which achieve these goals.

Id. at 49–50, 56–57.

125. ANDREEN ET AL., *supra* note 5, at 4.

1. Using RGGI As a Model

One way that New England could collectively achieve transportation-emissions reductions is to use a RGGI-like approach. This would entail: constructing a MOU stating the overall environmental goal; instituting a regional transportation-emissions cap as well as individual state-emissions caps; setting a compliance period; and creating a regional organization for ongoing administration.[126] To reach the individual and/or collective targets, each signatory state could commit to proposing for legislative and/or regulatory approval a program plan aimed at stabilizing and reducing CO_2 emissions from transportation.[127] SB 375 would serve states seeking to implement regional transportation plans by acting as a template for a Model Rule that could be proposed to state legislative and regulatory bodies.

The states developed a Model Rule under RGGI, and each state committed to release the draft Model Rule for public review and comment in their respective states within ninety days after the MOU was signed.[128] The states agreed that a revised Model Rule would be developed and released no later than forty-five days after the close of the public comment period and consultation among the signatory states.[129] The states developed the Model Rule "to serve as the framework for the creation of necessary statutory and/or regulatory authority to establish the Program."[130] Armed with the Model Rule, the states committed to establishing the program by statute and/or regulation and to have the state component in place no later than December 31, 2008.[131]

To establish a regional transportation plan, the states could formulate a Model Rule for each state to solicit public notice and comment. Following the RGGI format, each state could commit to establishing—via statute or regulation—the Program Plan, and to implementing the individual state component as soon as practicable but no later than a designated date. As an existing framework, SB 375 may be valued for how it carefully preserves local planning freedom while working toward a common goal of smarter, more deliberate, coordinated, and sustainable communities. Specifically, SB 375 does not mandate any one approach. The bill seeks reductions by

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126. *See* REGIONAL GREENHOUSE GAS INITIATIVE, MEMORANDUM OF UNDERSTANDING 1, *available at* http://rggi.org/cos/mou_12_20_05.pdf (outlining RGGI's model MOU between New England states).

127. The states could reach this target by substituting the RGGI trading program for a regional transportation planning program. *See id.* at 2.

128. *Id.* at 7.

129. *Id.*

130. *Id.* at 6–7.

131. *Id.* at 7.

simply encouraging sustainable regional land-use planning practices and channeling funding towards these projects.[132] The bill contains provisions that would reserve local government land-use authority and that would otherwise appear to allow for considerable flexibility.[133] This aspect of the bill may be particularly attractive if the states want to form a program plan that preserves each state's freedom and provides flexibility. Further, an MOU and Model Rule would create a time line to motivate state action.

2. Forming an Interstate Compact

An alternative avenue that the states could pursue is entering into an interstate compact, which, if achieved, would likely be a more powerful agreement format. An interstate compact is in effect a contract between two or more states.[134] Once formulated, the compact carries the force of statutory law and allows states to set a standard or cooperate in an important policy area.[135] Compacts are commonly used to "establish a formal, legal relationship among states to attempt to address common problems, or promote a common agenda; create independent multistate governmental authorities (such as commissions); . . . [or] establish uniform guidelines, standards or procedures for agencies in the compact's member states."[136]

In Article I, Section 10, Clause 3, the United States Constitution gives states the power to enter into interstate compacts, but the compact requires congressional approval if it would encroach on the federal government's power.[137] The National Center for Interstate Compacts (NCIC) states that such compacts "are powerful, durable, flexible tools to promote and ensure cooperation among the states, while avoiding federal intervention and preemption of state powers."[138] Furthermore, states have created compacts to address the issue of transportation, and there are already more than thirty existing regional interstate compacts involving more than eight states.[139] While perhaps not necessary in this hypothetical case, if Congress approved

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132. Fulton, *supra* note 87.

133. ADAMS, *supra* note 102, at 17.

134. The Nat'l Ctr. for Interstate Compacts, Fact Sheet, http://www.csg.org/programs/policyprograms/NCIC/default.aspx (follow "Resources" hyperlink; then follow "Compact Fact Sheet" hyperlink).

135. *Id.*

136. *Id.*

137. *Id.* (citing U.S. CONST. art. I, § 10, cl. 3).

138. *Id.*

139. *Id.*

the compact, the states would be assured that the federal government would honor their efforts.

To enter into an interstate compact, states must cooperate to set forth an agreement and then formulate the compact itself. "The compact should contain the minimum basics upon which the compact needs to operate, both in terms of the agreement between states and the operation of a governing body."[140] This generally includes setting forth the purpose and the administrative structure of the compact, establishing an intergovernmental agency, designating how funds will be used, and determining personnel needs.[141]

The compact serves as a framework and the rules provide flexibility by allowing the states to make adjustments without having to go back to the individual legislatures for approval for every change.[142] The NCIC notes that to ensure success of a modern compact, the compact should have strong governance and administration to address state regulatory issues. This requires carefully designing and tailoring the governing body to the precise issue and objective.[143] Therefore, if the states determined that a governing body was necessary, the compact itself would establish the governing entity and should describe its powers and duties.[144] Generally, "[n]o two compacts are alike,"[145] and the New England states would have a great deal of freedom and flexibility to construct the compact to suit their needs. The major drawback of an interstate compact is the lengthy amount of time it could take to develop and implement.[146] In the case of climate change, time is of the essence. Further, while congressional approval may not be necessary depending on the precise nature of the compact, it would certainly help to solidify and validate the agreement to protect the compact in the event that the federal government institutes climate change actions or policies in the future.[147]

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140. The Nat'l Ctr. for Interstate Compacts, Developing the Right Structure for Success 1, [hereinafter Developing the Right Structure for Success], http://www.csg.org/programs/ncic/documents/Success.pdf.

141. The Nat'l Ctr. for Interstate Compacts, What Makes an Interstate Compact?, [hereinafter What Makes an Interstate Compact?], http://www.csg.org/programs/ncic/documents/MakesCompact.pdf.

142. Developing the Right Structure for Success, *supra* note 140.

143. *See generally id.* (laying out the possible components for developing the governing body).

144. *See id.* at 1–3.

145. What Makes an Interstate Compact?, *supra* note 141.

146. The Nat'l Ctr. for Interstate Compacts, Council of State Gov'ts, Ten Frequently Asked Questions 2, http://www.csg.org/programs/ncic/documents/compactFAQ.pdf.

147. *See generally id.* (stating that for some regulatory compacts, congressional consent is required for the compact to be effective, and that compacts enable states to act jointly outside of the federal process while respecting Congress's view).

CONCLUSION

Climate change is by far the most overarching environmental issue of our time. There is no single catch-all solution for how humans can address the problem and reduce human carbon emissions, but one of the key solutions will be finding ways to reduce the carbon emissions from the excessive burning of fossil fuels, of which transportation is a dominant source. One sure way to do that is to reduce VMT by changing the way we develop land. For New England, the potential exists for a collective approach through a commitment to achieving a mandatory carbon-reduction goal. The continued failure to address the correlation between 1) poorly planned, sprawling land development, 2) increased VMT, and 3) transportation emissions, will only hurt our pocketbooks and our collective environmental conscience.

Science indicates that the window of time to act is closing quickly. To achieve its reduction goals, New England needs to take affirmative action to address GHG emissions and actually establish a framework for reducing transportation emissions. By either creating an interstate compact or a MOU, the New England states could cooperatively commit to actually reaching the goals of the 2001 CCAP agreement. Such an agreement or MOU could build off of the CCAP and lay the groundwork for each participating state to adopt the principles embodied in SB 375, thereby reducing transportation emissions by channeling money to development projects that aim to create sustainable communities throughout the region.