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Three Structural Changes for a New System of International Climate Change Mitigation Agreements Based on the WTO Model

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ABSTRACT

Past policy approaches to achieving international climate change mitigation have restricted the means for achieving mitigation to broad emissions caps. These policies have ignored the true nature of the climate change mitigation problem and have failed. This Note proposes a new design for a climate change mitigation system. It begins by analyzing the basic assumptions of the current cursory approach and by reviewing structural problems with those assumptions. It then reviews the successful World Trade Organization (WTO) model as a possible alternative structure and uses realities of the climate change problem to show why such an alternative could work in the climate change context. This analysis suggests that three structural changes to the current climate change mitigation system would significantly improve the current approach. First, the system should allow for incremental mitigation. Second, the system should contain separate categories of agreements for energy decarbonization, efficiency and conservation, and natural sinks. Finally, the system should allow for the separate negotiation of certain issues within each category: basic principles, maximum achievable emissions reductions of each mitigation method, and "hog-trading" burden allocation. This Note calls for the creation of the World Climate Change Organization (WCCO) to facilitate and administer this collection of agreements.

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I. INTRODUCTION

Past and current international approaches to addressing climate change have correctly focused on the policy goals of climate change mitigation, but these approaches are fairly cursory and do not provide adequate means for achieving that goal. Climate change mitigation goals generally revolve around target atmospheric concentrations of

carbon dioxide equivalents (CO2eq).[1] Thus far, international approaches to addressing this goal have involved, with slight variation, a total cap on global CO2eq emissions or an economy-wide reduction of CO2eq emissions from some baseline level.[2] These approaches have typically ignored the complicated realities of the climate change problem and the variety of solutions required to achieve the ultimate goal.[3] This strategy seems to be based on the false assumption that the simplest and broadest policy is the best policy, but has thus far failed to achieve climate change mitigation targets, or indeed, to make any progress whatsoever toward those goals.[4]

It is time for the international community to abandon the failed emissions cap method and initiate the debate on other potential approaches. This Note argues that three structural changes in the climate change mitigation system could help create a more viable means of achieving climate change mitigation. It bases these suggestions on the complicated realities of the climate change puzzle and on an analysis of the successful World Trade Organization (WTO) model. The first change separates the end goal of a specific target atmospheric concentration of CO2eq from the immediate policy by allowing for incremental greenhouse gas (GHG) reduction. Such a policy is more viable in the immediate future and, moreover, partial progress toward an end goal may represent tangible progress.[5] The second change treats each of the three major methods for achieving climate change differently. It is highly unlikely that any one magic bullet will single-handedly meet any reasonable climate change

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1. *E.g.*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE [IPCC] WORKING GROUP III, CLIMATE CHANGE 2007: MITIGATION OF CLIMATE CHANGE 38, 39 tbl.TS.2 (Bert Metz & Ogunlade Davidson eds., 2007), *available at* http://www.ipcc.ch/publications_and_data/ar4/wg3/en/contents.html (discussing CO2eq reductions necessary to mitigation risk of climate change).

2. *See* Kyoto Protocol to the United Nations Framework Convention on Climate Change art. 4, Dec. 11, 1997, 37 I.L.M. 22 [hereinafter Kyoto Protocol] (describing commitments in terms of CO2eq emissions); United Nations Framework Convention on Climate Change [UNFCCC], Conference of the Parties, 15th Sess., Copenhagen, Den., Dec. 7–19, 2009, *Report of the Conference: Copenhagen Accord*, 4, 6, U.N. Doc. FCCC/CP/2009/11/Add.1 (Mar. 30, 2010) [hereinafter *Copenhagen Accord*] ("taking note of" a commitment of economy-wide emissions targets).

3. The approaches include the Kyoto Protocol negotiated under the United Nations Framework Convention on Climate Change. *See generally* Kyoto Protocol, *supra* note 2.

4. *See* Scott Barrett, *A Portfolio System of Climate Treaties*, 4 (Harvard Project on Int'l Climate Agreements, Discussion Paper No. 08–13, 2008), *available at* http://belfercenter.ksg.harvard.edu/ files/BarrettWeb4.pdf (discussing past unmet emissions reductions goals and compliance challenges under Kyoto).

5. *See* NICHOLAS STERN, STERN REVIEW: THE ECONOMICS OF CLIMATE CHANGE 195 box 8.1 (2006) (showing that a decreased probability of various magnitudes of temperature increases as the atmospheric stabilization level of CO2eq decreases).

mitigation target.[6] The international community, therefore, will have to employ multiple methods for reducing CO2eq emissions.[7] Each method warrants different and separate international approaches and agreements. The third change allows for separate negotiation of certain components within each mitigation category. Determining general policies for each category is a different issue than establishing technical feasibility of various emissions reductions, which is in turn a different issue than allocating the burden of such reductions among the various nations.[8] Separating certain negotiations could significantly improve the feasibility of negotiation success. The WTO model can provide insights for how each of these structural changes might affect the international approach to negotiations on climate change mitigation.[9]

With these structural changes in mind, this Note advocates for a system of inter-related international agreements under and administered by a new entity, the World Climate Change Organization (WCCO). The idea of a collection of climate change agreements has been advocated before by other scholars.[10] The difference here is that the present proposal explains how the collection of agreements should be divided and why. The proposed WCCO model would incorporate the current policies under the United Nations Framework Convention on Climate Change (UNFCCC),[11] but would supplement those policies a great deal. The new system would allow the international community to conceptually and practically separate the pieces of the puzzle the world can more conveniently solve separately. Ideally, the WCCO would provide an umbrella structure that establishes the ultimate climate change mitigation target as well as incremental goals and then facilitates various categories of agreements for individual methods for achieving the goals. This new model would allow the international community to come to an agreement more gradually, resolving what can be resolved

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6. Nathan S. Lewis, *Powering the Planet*, ENG'G & SCI., no. 2, 2007, at 12, 19 (showing the massive scale of changes required to meet the mitigation targets).

7. *See* S. Pacala & R. Socolow, *Stabilization Wedges: Solving the Climate Problem for the Next 50 Years with Current Technologies*, 305 SCIENCE 968, 969 (2004) (describing multiple currently available options to reduce emissions).

8. For example, it may be clear that a particular type of old, coal-fired electricity plant contributes to the problem, but it may be less clear whether a nation should bear the cost of replacing it.

9. Much of the analysis of the WTO model covers the agreement structure shown in a chart on the WTO website. *Understanding the WTO: The Agreements—Overview*, WORLD TRADE ORG., http://www.wto.org/english/thewto_e/whatis_e/tif_e/agrm1_e.htm (last visited Nov. 1, 2011).

10. *See* Barrett, *supra* note 4, at 6, 9 (arguing for agreements that cover different sectors of the economy and different gases).

11. United Nations Framework Convention on Climate Change, May 9, 1992, 1771 U.N.T.S. 107 [hereinafter UNFCCC].

today and postponing outstanding issues, while preventing the continual renegotiation of past issues.

Part II of this Note explains the background of the current international climate change situation, including some basic concepts of climate change science, and the policy goal of climate change mitigation. Part III considers the history of international climate change mitigation policy and considers some key reasons for the structural failures in the current system. Part IV analyzes the WTO model as a potential alternative to the present structure in the climate change context. Part V proposes three major structural changes to the present system—incremental mitigation, categories of mitigation methods, and key negotiation components—as a way to solve the problems with the present system. The section uses specific insights into the climate change problem, such as risk profiles,[12] climate change "wedges,"[13] and political feasibility, to show why these structural changes would improve the system. Finally, Part VI proposes and outlines a new WCCO international climate change mitigation system modeled on the WTO example to move past the current stalemate. This Note then considers whether the proposed system could fit under the umbrella of the existing UNFCCC and determines that the first step toward the new system is to modify the UNFCCC to make it more suitable as a multilateral umbrella treaty that can administer the WCCO system.[14]

II. CLIMATE CHANGE AND THE INTERNATIONAL MITIGATION POLICY GOAL

A. *Why Worry About a Little Climate Change?*

Climate change is a term that describes alterations in global weather patterns—such as temperature extremes, timing, and distribution; humidity concentrations affecting precipitation and drought; and other extreme weather events—averaged over time.[15]

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12. *See* STERN, *supra* note 5, at 195 box 8.1 (showing that the risk of temperature increase shifts with various levels of atmospheric CO2eq). This Note uses the term "risk shifting" to mean the gradual reduction in risk through achieving various target atmospheric concentrations of CO2eq.

13. *See* Pacala & Socolow, *supra* note 7, at 968 ("A 'wedge' represents an activity that reduces emissions to the atmosphere that starts at zero today and increases linearly until it accounts for 1 GtC/year of reduced carbon emissions in 50 years.").

14. UNFCCC, *supra* note 11.

15. *See* John P. Holdren, President & Dir., Woods Hole Research Ctr., Meeting the Climate-Change Challenge, Eighth Annual John H. Chafee Memorial Lecture on Science and the Environment (Jan. 17, 2008), *in* 8 MEETING THE CLIMATE-CHANGE

These changes can range in seriousness from slightly alarming to catastrophic.[16] Scientists measure and express these alterations in terms of changes in the global average surface temperature.[17] Policymakers seeking to address climate change are generally concerned about the already-measured, and predicted future, increase in the global average surface temperature, or "global warming," which is attributable to increased carbon dioxide (CO2) and other GHGs in the earth's atmosphere.[18] These increases are often expressed together as "CO2eq" or "CO2 equivalents."[19] GHGs, or gases that contribute to the "greenhouse effect," function in the atmosphere like glass on a greenhouse—they allow heat to reach the surface of the earth in the form of light, but they prevent heat from escaping the earth in the form of infrared rays.[20] Atmospheric levels of CO2eq have increased dramatically since the industrial revolution, causing this greenhouse, the earth, to store more heat.[21] While

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CHALLENGE 6 (2008) (offering a definition of climate change). Professor Holdren argues that "global climatic disruption" would be a more appropriate term for the phenomenon than the "climate change" misnomer. *Id.* at 5. There is some variation in the precise meaning of the term "climate change." Under the UNFCCC, "climate change" means change in climate attributable to human activity, as opposed to climate variability that occurs naturally. *See* UNFCCC, *supra* note 11, art. 1 para. 2. But the Intergovernmental Panel on Climate Change uses the term to mean any statistically significant variation in climate due to any cause. *See* IPCC, 16 YEARS OF SCIENTIFIC ASSESSMENT IN SUPPORT OF THE CLIMATE CONVENTION 4 (2004), *available at* http://www.ipcc.ch/pdf/10th-anniversary/anniversary-brochure.pdf. This Note adopts the former definition.

16. *See, e.g.*, Holdren, *supra* note 15, at 10–11 (describing changes ranging from the weakening of monsoons to the drying of the Amazon).

17. *Id.* at 6.

18. "Warming of the climate system is unequivocal, as is evident from observations of increases in global average air and ocean temperatures," IPCC, CLIMATE CHANGE 2007: SYNTHESIS REPORT 72 (2007), *available at* http://ipcc.ch/publications_and_data/ar4/syr/en/spm.html [hereinafter IPCC, CLIMATE CHANGE 2007]. "[T]he increase in global average temperatures . . . is *very likely* due to the observed increase in anthropogenic [human-caused] GHG concentrations." *Id.* at 39. Moreover, "[c]ontinued GHG emissions . . . would cause further warming and induce many changes in the global climate during the 21st century." *Id.* at 45; *see also* Al Gore, Op-Ed., *Moving Beyond Kyoto*, N.Y. TIMES, July 1, 2007, at 13 (expressing concern about CO2 emissions causing an increase in global temperature and discussing political challenges of moving beyond the Kyoto Protocol).

19. *See, e.g.*, Michael P. Vandenbergh et al., *Micro-Offsets and Macro-Transformation: An Inconvenient View of Climate Change Justice*, 33 HARV. ENVTL. L. REV. 303, 305 (2009) (describing atmospheric GHG levels in terms of "CO2eq").

20. *See The Greenhouse Effect and Greenhouse Gases*, WINDOWS TO THE UNIVERSE, http://www.windows2universe.org/earth/climate/greenhouse_effect_gases.html (last visited Nov. 1, 2011) (providing a very basic description of the greenhouse effect).

21. For example, the atmospheric levels of CO2, the most significant cause of climate change, have increased from about 280 parts per million (ppm) before the industrial age to 379 ppm in 2005. IPCC, CLIMATE CHANGE 2007, *supra* note 18, at 37; *see also* COUNCIL ON ENVTL. QUALITY, 1997 ANNUAL REPORT OF THE COUNCIL ON ENVIRONMENTAL QUALITY 194 (1997), *available at* http://ceq.hss.doe.gov/nepa/reports/

natural forces can explain some of the change in atmospheric CO2eq,[22] scientists know that most of the increase, especially with regard to CO2, is caused by human activity.[23]

Climate change inevitably affects many aspects of the earth's systems on which humanity depends. Scientists predict that climate change could cause disruption of ecosystems, shifts in crop productivity, sea level rise, higher concentrations of air pollution and infectious disease, shifts in precipitation causing both drought and flooding, and morbidity-level heat waves.[24] Of the predicted changes, the potential for a rise in sea level is perhaps the most alarming.[25] A commonly cited estimate for potential sea level rise ranges from 0.59 feet to 1.93 feet above 1990 levels by the year 2100; however, this estimate does not account for potential rise caused by the melting of Antarctica or Greenland, so the upper bound for sea level rise could be much higher.[26] Scientists have already observed increased global average temperatures, sea level rise, increased frequency of extreme weather events, and significant melting of glaciers.[27] Some recent changes in climate patterns, such as the extreme winter events in North America and Europe, may be part of this phenomenon.[28] These changes have the potential to displace millions of people, destroy

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1997/index.html (noting that global atmospheric levels of CO2 went from 280 ppm in the eighteenth century to 360 ppm in 1997); Pacala & Socolow, *supra* note 7, at 968 (noting that CO2 "is the dominant anthropogenic greenhouse gas").

22. *See* IPCC, CLIMATE CHANGE 2007, *supra* note 18, at 41 (comparing contributions of anthropogenic and natural forces to changes in the global climate).

23. This is because the *type* of CO2 found increasing in the atmosphere during a parallel increase in human-caused emissions lacks a carbon-14 molecule, which matches the type of carbon found in human-burned fossil fuel. Holdren, *supra* note 15, at 8.

24. IPCC, CLIMATE CHANGE 2007, *supra* note 18, at 48–51.

25. *See* Holdren, *supra* note 15, at 9–10 (explaining that the rate of sea level rise in the last decade has been twice the average for the 20th century and that this and other changes are already causing harm).

26. IPCC, CLIMATE CHANGE 2007, *supra* note 18, at 45 tbl.3.1 (listing a potential sea level rise range of 0.18 meters to 0.59 meters). *See also* Holdren, *supra* note 15, at 9–10 (noting the accelerated melting of Greenland and of the permafrost); Lewis, *supra* note 6, at 17–18 (explaining how melting of the permafrost would release trapped CO2, causing a non-linear feedback effect that would increase global warming).

27. *See* IPCC, CLIMATE CHANGE 2007, *supra* note 18, at 30–31, 33 (describing the observed effects of climate change). Scientists believe that recent extreme winter weather is also attributable to the climate change phenomenon. *See* Justin Gills, *Cold Jumps Arctic 'Fence,' Stoking Winter's Fury*, N.Y. TIMES, Jan. 24, 2011, at A1 (describing extremely cold winters in North America and Europe at the same time as unusually warm winters in Canada and Greenland, and explaining that "a pattern of atmospheric circulation that tends to keep frigid air penned in the Arctic has weakened," which may be linked to global warming patterns).

28. Gills, *supra* note 27.

complex ecosystems, and profoundly disturb the world economy.[29] Significantly, once the changes begin, they may be irreversible.[30]

While highly partisan public skepticism about the existence of climate change currently affects American politics,[31] the bulk of the science indicates that the warming phenomenon is quite real.[32] According to the Intergovernmental Panel on Climate Change (IPCC), the degree of scientific certainty that climate change is happening and that human activity is causing it has increased over the past couple decades to a very high level of certainty.[33] The National Academy of Science reviewed the IPCC's results at the direction of President George W. Bush and independently confirmed the panel's conclusions.[34] Reports issued by the U.S. government itself acknowledge that climate change is happening.[35] Researchers have tested and challenged the science behind climate change in many ways, yet no legitimate scientist has shown serious doubt that climate

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29. IPCC, CLIMATE CHANGE 2007, *supra* note 18, at 48.

30. *Id.* at 53–54.

31. *See* Brandon Keim, *The Psychology of Climate Change Denial*, WIRED (Dec. 9, 2009, 1:29 PM) http://www.wired.com/wiredscience/2009/12/climate-psychology (discussing the politics behind climate change denial).

32. *See, e.g.*, IPCC, CLIMATE CHANGE 2007, *supra* note 18, at 72 ("Warming of the climate system is unequivocal . . . ."); Holdren, *supra* note 15, at 7 (stating that "[t]he Earth *is* getting hotter").

33. *See* IPCC, CLIMATE CHANGE 2007, *supra* note 18, at 27, 72 (defining 'very likely' to mean at least 90 percent confidence level and noting that "[m]ost of the global average warming over the past 50 years is *very likely* due to anthropogenic GHG increases"); IPCC, CLIMATE CHANGE 2001: SYNTHESIS REPORT, SUMMARY FOR POLICYMAKERS 5 (2001), *available at* http://www.grida.no/ publications/other/ipcc_tar ("There is new and stronger evidence that most of the warming observed over the last 50 years is attributable to human activities."); IPCC, IPCC SECOND ASSESSMENT: CLIMATE CHANGE 1995, at 22 (1995), *available at* http://www.ipcc.ch/pdf/climate-changes-1995/ipcc-2nd-assessment/2nd-assessment-en.pdf ("The balance of evidence suggests a discernible human influence on global climate."). The World Meteorological Organization (WMO) and the United Nations Environmental Program (UNEP) created the IPCC in 1988 to provide comprehensive and objective information regarding the state of knowledge on climate change, possible impacts of climate change, and potential response strategies to any such climate change. *Organization, History*, IPCC, http://www.ipcc.ch/organization/organization_history.shtml (last visited Nov. 1, 2011); *see also News and Outreach, Publications and Data*, IPCC, http://www.ipcc.ch/ publications_and_data/publications_and_data.htm (last visited Nov. 1, 2011) (explaining the IPCC publication process, including government reviews).

34. *See* NAT'L RESEARCH COUNCIL, CLIMATE CHANGE SCIENCE 4, 22 (2011), *available at* http://www.gcrio.org/NRC/NRCclimatechange.pdf (noting that climate change is most likely due to human activity and would have "serious adverse societal and ecological impacts by the end of this century").

35. *See* COUNCIL ON ENVTL. QUALITY, *supra* note 21, at 194 (noting that global atmospheric levels of CO2 went from 280 ppm in the eighteenth century to 360 ppm in 1997).

change is happening or that it is caused by human activity.[36] Scientific researchers, who always seek to prove other scientists wrong, have a huge incentive to expose flaws in the climate change science; the lack of scientific doubt is thus especially poignant.

Climate change is clearly occurring and it is caused by CO2eq in the atmosphere, but it is less clear what amount of climate change will occur at various levels of atmospheric CO2eq.[37] Scientists do know enough to be able to express the uncertainties in terms of risk probabilities for varying atmospheric levels of CO2eq.[38] For example, there is a 99 percent chance that the global average temperature will increase at least 2 degrees Celsius (°C) if the atmospheric level of CO2eq reaches 550 parts per million (ppm), but there is only a 7 percent chance that it will increase 5°C at the same level.[39] Thus, while there is certainty about the phenomenon of climate change, there is less certainty as to the degree of catastrophic change that will result from it.

B. *Climate Change Mitigation as an International Policy Goal*

This Note accepts as a given that the policy goal of global climate change mitigation through CO2eq targets is optimal and analyzes potential policy strategies in terms of this goal. Conceptually, there are two major types of responses to the climate change problem: mitigation, which means preventing or reducing the amount of climate change that will occur, and adaptation, which means reducing the potential harmful impacts of climate change by protecting people and cities.[40] Of course, there is always a third possible response: do nothing and suffer.[41] Presumably, adaptation strategies and suffering in the wake of failure to act will vary depending on the amount of mitigation achieved.[42] These strategies are covered elsewhere and are not addressed in this Note.[43] The most commonly discussed mitigation strategy involves reducing human-

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36. *E.g.*, *id.* at 193–97 (verifying CO2eq emissions and concentration data, verifying increases in global average surface temperature, and providing no data contrary to the IPCC's findings).

37. *See generally* IPCC, CLIMATE CHANGE 2007, *supra* note 18.

38. *See* Vandenbergh et al., *supra* note 19, at 318 tbl.1 (citing Nicholas Stern, *The Economics of Climate Change*, 98 AM. ECON. REV. PAPERS & PROC. 1, 5 tbl.1 (2008)) (describing the likelihood of exceeding various temperature increases for different stabilization levels of CO2eq).

39. *Id.*

40. Holdren, *supra* note 15, at 13.

41. *Id.*

42. *See id.*

43. *See, e.g.*, *id.* (noting that mitigation, adaptation, and suffering are interdependent strategies).

caused CO2eq emissions to keep the atmospheric concentrations below some specified level in order to prevent more than a safe amount of global average temperature change.[44]

The target atmospheric concentrations should be set at a level to limit the global average surface temperature change to a level that will prevent "catastrophic climate changes," including high sea level rise, droughts, and other catastrophic weather events.[45] Many entities, both governmental and private, have articulated a goal of 2°C over pre-industrial levels, which would require a stabilization of atmospheric CO2eq at about 450 ppm.[46] Scientists believe that such stabilization will adequately reduce the risk of catastrophic changes, but even at this level, the risk of catastrophic climate change is significantly higher than the risk that one's house will burn down.[47] As of 2006, the level was already around 430 ppm, up from the pre-industrial level of 280 ppm.[48] Given the scale of this increase and continued development around the world, a CO2eq target level of 450 ppm may be impossible to achieve.[49] Some scholars and policy designers have begun to look at a 550 ppm or even a 650 ppm target.[50] Such increased targets may seem arbitrary, but even the higher targets can significantly decrease the risk of catastrophic climate change to a degree where the benefits of meeting these targets could be worth the effort.[51]

If the atmospheric concentrations are to remain below the 450 ppm level, scientists estimate that the developed, or "Annex I," countries must reduce emissions by 25–45 percent by 2020 and by 85–90 percent by 2050.[52] These numbers are based on a percentage reduction from some base level emissions rate, usually established for

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44. Even a group of financial investors responsible for $15 trillion in assets has pushed for climate change mitigation to avoid a financial crisis. Neela Banerjee, *International Investors Issue Global Warming Warning*, L.A. TIMES, Nov. 16, 2010, at B5.

45. *See, e.g.*, Holdren, *supra* note 15, at 15 (arguing for a target of 2°C because the severity of consequences would grow rapidly thereafter); Vandenbergh et al., *supra* note 19, at 305 (noting that many governmental and private parties have argued for a target of 2°C).

46. Vandenbergh et al., *supra* note 19, at 305.

47. *Id.* Some already think this level is impossible to achieve. *Id.*

48. Nicholas Stern, Editorial, *The Economics of Climate Change*, BUS. DAY, Nov. 2, 2006, at 13 (S. Afr.).

49. *See* Vandenbergh et al., *supra* note 19, at 315–17 (discussing some of the significant difficulties of meeting this target).

50. *Id.* at 306, 317.

51. *Id.* at 318 tbl.1.

52. Sujata Gupta et al., *Policies, Instruments and Co-operative Arrangements*, *in* IPCC WORKING GROUP III, *supra* note 1, at 776 fig.13.7. "Annex I" countries are those that were listed as developed countries in the UNFCCC. *See* UNFCCC, *supra* note 11, Annex I.

a particular year.[53] These reductions apply generally to all countries, regardless of whether the country in question is a developing or developed nation.[54] For the purposes of this Note, the exact reduction requirements for each country are not important. The basic concept is that climate change mitigation policy seeks to reduce the risk of catastrophic climate change by meeting a specified target maximum atmospheric concentration of CO2eq through significant reductions of human-caused CO2eq emissions at the same time as energy demand is expected to increase.[55]

This Note focuses on achieving the climate change mitigation policy goals through comprehensive, international, multi-lateral legal action.[56] While CO2eq emissions are produced locally, the physical nature of GHGs is that they disperse across the globe and affect the entire world.[57] Therefore, an international solution is necessary to prevent a classic tragedy of the commons problem.[58] This Note does not focus on private global action,[59] though legal policies that facilitate such private action could, in theory, be part of the policy architecture proposed by this Note.

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53. *See* Gupta et al., *supra* note 52, at 776 (showing percentage reductions from a 1990 baseline level).

54. *Id.*

55. IPCC WORKING GROUP III, *supra* note 1, at 99; Holdren, *supra* note 15, at 13.

56. Most international legal policy also focuses on this strategy, though the methods for doing so and mitigation targets vary. *See* Kyoto Protocol, *supra* note 2, art. 3(1) (requiring Annex I member countries to reduce aggregate CO2eq emissions); *Copenhagen Accord*, *supra* note 2, at 4–5 (agreeing that participating countries should take various steps toward mitigation).

57. IPCC, CLIMATE CHANGE 2007, *supra* note 18, paras. 1–3.

58. *See* Garrett Hardin, *The Tragedy of the Commons*, 162 SCIENCE 1243, 1243–48 (1968) (explaining the classic example of a tragedy of the commons). Currently, some countries contribute more than others to total global emissions. The exact distribution shifts depending on how one looks at the data, but the Unites States' share is large under any method of viewing the data. *See* U.S. ENERGY INFO. ADMIN., EMISSIONS OF GREENHOUSE GASES REPORT tbl. 3 (2007), *available at* http://www.eia.doe.gov/oiaf/1605/ggrpt/index.html (showing U.S. contribution to CO2 emissions at 20.3 percent of world totals in 2006, with European contribution at 15.3 percent, and Chinese contribution at 20.7 percent). Both developed and developing countries are expected to increase emissions dramatically in the next few decades. Lewis, *supra* note 6, at 15–16.

59. Thomas Dietz et al., *Household Actions can Provide a Behavioral Wedge to Rapidly Reduce US Carbon Emissions*, 106 PROC. NAT'L ACAD. SCI. 18,452, 18,452 (2009) (addressing private global action on CO2eq emissions reductions through the role of corporate governance and the supply chain).

III. INTERNATIONAL LEGAL ACTION AND THE CURRENT MITIGATION STRATEGY

While no attempt at international climate change mitigation has yet achieved an ultimate mitigation goal,[60] policymakers have made some attempts at doing so and some frameworks are already in place. These policies generally reflect a choice to pursue a "cap" approach.[61] In hindsight, the approach has not worked and should be abandoned. But before moving on, it is important first, to understand how the existing model works and second, to understand what key failures can have immediate implications for designing a new model.

A. *The UNFCCC and the Kyoto Protocol*

After the IPCC issued its first assessment report in 1990, explaining the human-induced greenhouse effect and predicting future climate change,[62] 195 countries, including the United States, adopted the United Nations Framework Convention on Climate Change (UNFCCC).[63] Under the UNFCCC, nations recognized that the global climate is a shared resource affected by GHG emissions and agreed to seek "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[64] The UNFCCC obligates parties to pursue climate change mitigation as a policy goal through international negotiation but does not set any specific numeric limits on GHG emissions or establish any means to achieve

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60. *See supra* note 21.

61. *See* Kyoto Protocol, *supra* note 2, art. 3(1).

62. *See* IPCC, IPCC FIRST ASSESSMENT REPORT 52 (1990), *available at* http://ipcc.ch/ipccreports/far/IPCC_1990_and_1992_Assessments/English/ipcc-90-92-assessments-overview.pdf.

63. *Status: United Nations Framework Convention on Climate Change*, UNITED NATIONS TREATY COLLECTION, http://treaties.un.org/pages/ViewDetailsIII.aspx?&src=UNTSONLINE&mtdsg_no=XXVII~7&chapter=27&Temp=mtdsg3&lang=en (last visited Nov. 1, 2011).

64. UNFCC, *supra* note 11, pmbl., art. 2. Countries also committed to gather and share information on how to deal with climate change, and to launch national strategies for dealing with climate change and their impacts. *Id.* art. 4. While the United States has not implemented many of its UNFCCC commitments, the United States participates in ongoing negotiations and publishes a report required under the treaty. *See generally* U.S. DEP'T OF STATE, U.S. CLIMATE ACTION REPORT 2002: THIRD NATIONAL COMMUNICATION OF THE UNITED STATES OF AMERICA UNDER THE UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE (2002). *See also UN Framework Convention on Climate Change*, U.S. ENVTL. PROTECTION AGENCY, http://www.epa.gov/climatechange/policy/ international_unfccc.html (last updated Apr. 14, 2011) (describing the annual inventory of GHG emissions prepared pursuant to U.S. obligations under the convention).

mitigation.[65] Essentially, the UNFCCC is an umbrella treaty that contemplates further treaties to specify the means of emissions reduction.[66]

In 1997, member nations signed another treaty, the Kyoto Protocol, which was negotiated under and linked to the UNFCCC.[67] The core of the Kyoto Protocol is the obligation that participating counties meet binding GHG reduction targets.[68] Generally, participating countries agreed to reduce overall global GHG emissions by at least 5 percent below 1990 baseline levels during the commitment period that ends in 2012.[69] Various countries have committed to varying portions of the global reduction, although developing countries are mostly exempted from the reductions.[70] Interestingly, the protocol also creates a "carbon market" through which countries can trade emissions rights,[71] giving participating countries the flexibility to "reduce" their own emissions by purchasing emissions reductions of another country.[72]

The general reasoning behind the Kyoto Protocol and the subsequent debate is fairly straightforward.[73] The policy goal, established through the UNFCCC, is to cap global atmospheric concentrations of CO2eq at a level sufficient to reduce the risk of catastrophic climate change.[74] A target goal is set at around 550 ppm,

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65. UNFCCC, *supra* note 11, art. 4.

66. IPCC WORKING GROUP III, *supra* note 1, at 99; *see also* UNFCCC, *supra* note 11, art. 4.

67. Kyoto Protocol, *supra* note 2. The United States signed the Kyoto Protocol, but never ratified it. Press Release, White House Office of the Press Sec'y, President Bush Discusses Global Climate Change (June 11, 2001), *available at* http://georgewbush-whitehouse.archives.gov/news/releases/2001/06/20010611-2.html (noting that both China and India, two high-emitting countries, are both entirely exempted from the Kyoto Protocol, which is why the Senate was unwilling to endorse the Protocol); S. Res. 98, 105th Cong. (1997) (enacted) (advising the Clinton Administration not to commit to binding limits without a commitment from certain developing countries).

68. Kyoto Protocol, *supra* note 2, art. 3.

69. *Id.*

70. *Id.*

71. *The Mechanisms Under the Kyoto Protocol: Emissions Trading, the Clean Development Mechanism and Joint Implementation*, UNFCCC, http://unfccc.int/kyoto_protocol/mechanisms/ items/1673.php (last visited Nov. 1, 2011).

72. Joseph E. Aldy & Robert N. Stavins, Designing the Post-Kyoto Climate Regime: Lessons from the Harvard Project on International Climate Agreements, at xi (Nov. 24, 2008) (unpublished interim report), *available at* http://belfercenter.ksg.harvard.edu/files/InterimReport081203Akikov6.pdf.

73. Most of this explanation is the author's own interpretation. For a similar interpretation, see Barrett, *supra* note 4, at 1,.

74. *See* Kyoto Protocol, *supra* note 2, art. 2(3) ("The Parties . . . shall strive to implement policies and measures under this Article in such a way as to minimize adverse effects . . . of climate change . . . .").

which is considered technically feasible.[75] It is not clear that any debated reduction actually achieves the 550 ppm target,[76] but assuming this reduction is possible, the rest of the solution is a simple math equation. Kyoto simply allocates the necessary reductions to various countries and leaves the details to each individual country.[77] This concept is conceptually simple and gives each nation tremendous flexibility in achieving its portion of the obligation.[78] But in the end, the Kyoto Protocol has accomplished very little toward the climate change mitigation goal, and it expires in 2012.[79]

According to their obligations under the UNFCCC, nations continue their ongoing climate change mitigation negotiations.[80] Negotiators travel to exotic places like Bonn, Tianjin, and Cancun in search of a new international agreement on climate change mitigation.[81] For all the success the negotiators have had, perhaps they have earned the "giant travelling circus" title that one observer used to describe them.[82] Arguably the biggest success so far was the Copenhagen Accord, a legally unenforceable political agreement in which certain countries agreed to "take note of" a reduction obligation.[83] Current negotiation attempts appear to be following the Kyoto Protocol model of specifying specific GHG emissions limits to

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75. Though 450 ppm is preferable, it may not be achievable, while a higher level of 750 ppm could be truly catastrophic. *See* Vandenbergh et al., *supra* note 19, at 318.

76. *See id.* at 315 n.54.

77. Kyoto Protocol, *supra* note 2, art 3(1), Annex B.

78. *See id.*

79. *Id.* art. 3(1) (establishing an end to the commitment period of 2012).

80. *See* UNFCCC, *supra* note 11, art. 4.

81. *The Carbon Footprint of Climate Change Delegates* (NPR radio broadcast Oct. 6, 2010), *available at* http://www.npr.org/templates/story/story.php?storyId=130384209.

82. *Id.*

83. *See Copenhagen Accord*, *supra* note 2, pmbl, para. 5 ("[n]oting" the results of the working groups, but agreeing to no binding commitments); Decision 2/CP.15 (stating that the Conference of the Parties "takes not of" the Copenhagen Accord). The United States' portion of the Copenhagen Accord GHG reductions is 17 percent below the 2005 baseline level. David Bielo, *U.S. Commits to Greenhouse Gas Cuts Under Copenhagen Climate Accord*, SCI. AM. (Jan. 29, 2010), *available at* http://www.scientificamerican.com/article.cfm?id=us-commits-to-greenhouse-gas-cuts-under-copenhagen-accord (explaining that the United States agreed to cut emissions to 4 percent below 1990 levels and also noting that the Copenhagen Accord is non-binding); Michael Wara, *Obama Offer at Copenhagen – 17 Percent*, ENVTL. & ENERGY INSIGHTS (Dec. 8, 2009), *available at* http://blogs.law.stanford.edu/enrlp/2009/12/08/obamas-offer-at-copenhagen-17-percent/ (noting that 4 percent below 1990 levels is equivalent to 17 percent below 2005 levels). If successful, this would still not achieve even the Kyoto goal of 5 percent below 1990 levels. *See supra* note 69.

achieve a specified target mitigation goal.[84] Negotiations also appear to be going nowhere and stand little chance of achieving the climate change mitigation goals.[85]

B. *How the Current Mitigation Strategy Fails to Reflect the True Nature of the Problem*

Other scholars have pointed out endless reasons for the failures of the current strategy, including the unwillingness of participating nations to commit even to vague obligations.[86] This Note focuses on a few specific aspects of the climate change puzzle not adequately accounted for in the current approach. With the benefit of hindsight, analyzing these missteps can have immediate implications for designing a new model of international climate change mitigation.

First, the current model appears to underestimate the gargantuan scale of the task of reaching climate change mitigation targets.[87] To understand the scope, consider what it would take to reach a reasonable target by 2050 through changes in energy alone, which accounts for 65 percent of total global GHG emissions.[88] By 2050, the expected world population of 10 billion, combined with economic growth, indicates that the total global energy demand could increase from 12 terawatts (TW) in 1990 to 28 TW in 2050.[89] To reach a 450 ppm CO2eq target, the target associated with the 2°C goal,[90] during the same period of time would require all of the new energy demand—plus a fair portion of the existing energy demand—to come from completely carbon free sources.[91] Even achieving the less desirable 650 ppm CO2eq target would require 15–20 TW of carbon-free power by 2050, which is more than all of the world's 1990

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84. *See* John M. Broder, *Global Climate Change Talks Begin in Cancun*, N.Y. TIMES, Nov. 29, 2010, at A12.

85. *See id.* (noting a pessimistic outlook on any breakthrough developments to come out of the Cancun negotiations).

86. As one article notes, the Kyoto Protocol does not restrain some of the world's largest emitters, either because these high-emitting nations did not ratify the treaty, because the obligations are generous, or because there is no enforcement mechanism. Aldy & Stavins, *supra* note 72, at xi. As another points out, negotiators gave the Kyoto Protocol non-binding obligations, no effective enforcement mechanism, and very little incentive for signing parties to participate at all. *See* Barrett *supra* note 4, at 4; *supra* note 67 and accompanying text. If the United States had committed to the Kyoto Protocol, it would have committed itself to binding obligations, but achieved very little in return.

87. *See* Lewis, *supra* note 6, at 16 (graphically showing the amount of clean energy necessary to meet various mitigation targets by 2050, assuming a "business as usual" projection of future energy consumption needs).

88. *See* STERN, *supra* note 5, at 171 box 7.1 & fig.7.1.

89. Lewis, *supra* note 6, at 15–16.

90. Vandenbergh et al., *supra* note 19, at 306.

91. Lewis, *supra* note 6, at 16–17.

demand.[92] Consider what sources could possibly provide all this carbon-free power. To achieve the 650 ppm CO2eq target through nuclear energy alone would require "the addition of a new, standard-sized (1000 megawatt) nuclear power plant every day for the next fifty years, in addition to substantial increases in efficiency and conservation."[93] To achieve the same target through solar energy alone would require "installing twenty-seven square kilometers of solar cells every day" for fifty years.[94]

The magnitude of the mitigation task does not mean it cannot be done, but it does shed some light on the wisdom of trying to accomplish this feat through a single international agreement. It is hard to imagine a nation that would be willing to commit itself to such a giant obligation all at once when other policies of the moment may seem more pressing.[95] An even bigger concern for these nations is the possibility of making the wrong choice. The Kyoto Protocol, for example, includes a mechanism where more developed nations could offset their own emissions reduction requirements by funding clean energy projects in developing nations.[96] But it turned out that this mechanism provided a way for nations to maneuver around the system, technically meeting obligations but not actually reducing emissions.[97] If nations commit themselves to a more binding but cursory policy that still does not work effectively, it could mean that they will spend tremendous amounts of money on another ineffective policy that achieves nothing toward the climate change mitigation goal. Another major problem with such a large-scale task is that the cost of opting in to the regulation regime could be remarkably high.[98] Nations should have the option of opting in at a price that they can digest. The proposed WCCO model could help resolve these problems.

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92. *Id.* at 18 ("So stabilizing at 550 ppm [CO2] will then require about 15 to 20 terawatts of carbon-free power in 2050."). Lewis's estimate is roughly equivalent to 650 ppm CO2eq. IPCC WORKING GROUP III, *supra* note 1, at 39 tbl.TS.2.

93. Vandenbergh et al., *supra* note 19, at 306.

94. *Id.*

95. Rebecca Lefton, *Shortsighted Budget Conversations Mean Cuts to Climate Assistance, Humanitarian Aid, and Disaster Response*, CTR. FOR AM. PROGRESS (Sept. 13, 2011), http://www.americanprogress.org/issues/2011/09/climate_aid.html (suggesting that other issues of the day, such as budgeting will take precedence over climate change).

96. Kyoto Protocol, *supra* note 2, art. 6(1).

97. Barrett, *supra* note 4, at 1, 5. The economic cost of mitigation is one of the major barriers to current climate change negotiations. *See id.* at 4 (noting that the primary deficiency in the Kyoto regime is its lack of economic-based incentives for both participation and compliance).

98. *See e.g.*, IPCC, CLIMATE CHANGE 2007, *supra* note 18, at 62 (noting that the economic impact of the Kyoto Protocol's first commitment could be as much as a 2 percent reduction in GDP for some countries).

A second piece of the climate change puzzle inadequately accounted for in current models is climate change risk profiles, which essentially leads to a misunderstanding of the nature of what climate change is supposed to achieve. Climate change mitigation policies essentially seek to *reduce the risk* of "dangerous anthropogenic interference with the climate system."[99] Recall that the various anticipated temperature increases basically summarize predicted and potentially devastating changes in the world climate system.[100] But, as Nate Lewis points out, "[i]t's hard to make predictions, especially about the future."[101] Because of some scientific uncertainties built into the models that correlate global atmospheric levels of CO2eq with global average temperature increase, the risk of temperature change shifts with varying target atmospheric levels.[102] For example, the likelihood of a 2°C increase is 78 percent at a target atmospheric level of 450 ppm CO2eq, 99 percent at a target level of 550 ppm CO2eq, and 100 percent at a target level of 650 ppm CO2eq.[103] But the likelihood of a more devastating 5°C temperature increase is 1 percent at a target atmospheric level of 450 ppm CO2eq, 7 percent at a target level of 550 ppm CO2eq, and 24 percent at a target level of 650 ppm CO2eq.[104] Recall also that it is not entirely clear *how catastrophic* a particular temperature increase would be—only that the greater the increase, the greater the catastrophe.[105]

The lesson to learn from these risk profiles is that it is probably no longer possible to *eliminate* the risk of climate change, only to reduce it.[106] And any significant reduction would reduce the risk. Debates over whether a 750 ppm atmospheric concentration of CO2eq is a safe target or whether a 450 ppm is an achievable target miss the point. These debates let the perfect be the enemy of the good. A policy that simply reduces, but does not eliminate, the risk of catastrophic climate change would still meet the policy goal of climate change mitigation.

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99. UNFCCC, *supra* note 11, pmbl., art. 2.

100. IPCC, CLIMATE CHANGE 2007, *supra* note 18, pt. 1.

101. Lewis, *supra* note 6, at 15.

102. *See supra* note 38.

103. Vandenbergh et al., *supra* note 19, at 318.

104. *Id.* At a 5°C increase, ice and snow may disappear around the world and sea levels could rise ten meters or more. *Id.*

105. For example, it is unclear whether the West Antarctic Ice Sheet will melt, causing additional sea level rise. Holdren, *supra* note 15, at 13.

106. This is because it is no longer technically feasible to reach even the 450 ppm target in which there is still a significant risk of a 2°C increase. Vandenbergh et al., *supra* note 19, at 305–06, 318 (noting that most policy architectures do not even purport to achieve a 450 ppm target and explaining the extremely aggressive assumptions required to even suggest meeting such a target).

The third problem inherent in the design of the current system is that it fails to provide practical answers about *how* to achieve mitigation. Participating nations are merely obligated to reduce GHG emissions by a certain amount.[107] The Kyoto Protocol is agnostic as to how nations meet the obligation.[108] For that matter, so is the climate, but that does not make it good policy. The UNFCCC only has broad and general guidance.[109] The omission of specific instructions for how to reduce GHG emissions provides participating nations with maximum flexibility. This makes a lot of sense in theory, but ultimate flexibility remains problematic.

Flexibility has not led to a broad and innovative array of ways to meet climate change goals.[110] Most nations have not met their climate change goals and some have announced that they do not plan to meet them.[111] Nations like the United States cannot even decide on a domestic policy to address the climate change problem.[112] The current debates are bogged down with questions of who bears more responsibility; China wants the developed world to make more dramatic emissions cuts and to shoulder some of the financial burden for the developing world while the United States wants China and the developing world to bear more of the burden.[113] Rather than talk about the *how*, parties seem to get stuck on the allocation, making the entire solution politically infeasible.

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107. *See* Kyoto Protocol, *supra* note 2, art. 3(1).

108. *See id.* (requiring only that countries not exceed their assigned amounts in the aggregate).

109. *See* UNFCCC, *supra* note 11, art. 2 (offering only the nonspecific concept of "stabilization of greenhouse gas concentrations" as a means toward the broad goal of "prevent[ing] dangerous anthropogenic interference with the climate system").

110. *See* Barrett, *supra* note 4, at 4–5 (noting, in particular, that although it makes some sense to express the targets in terms of broad emissions reductions, the current regime lacks of incentives for many of the largest emitters to participate or comply).

111. *Id.* at 5.

112. The leading climate change bill in Congress was sponsored by Republican John McCain and Independent Joe Lieberman in 2003, but now most Republicans won't go anywhere near a climate change bill. Ryan Lizza, *As the World Burns; The Political Scene*, NEW YORKER, Oct. 11, 2010, at 70, 70–80. Other bills also failed. *See* American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. § 713(a)(2)(B)(ii) (adopting threshold of 25,000 metric tons CO2eq annually); Clean Jobs and American Power Act, S. 1733, 111th Cong. § 713 (a)(2)(B)(ii) (2009) (same); Lieberman-Warner Climate Security Act of 2007, S. Res. 2191, 110th Cong., § 1112 (1)(A)(iii) (2008) (adopting threshold of 10,000 metric tons of CO2eq).

113. Jonathan Adams, *China's Climate Change Talks: What's Changed Since Copenhagen?*, CHRISTIAN SCI. MONITOR (Oct. 5, 2010), http://www.csmonitor.com/World/Asia-South-Central/2010/1005/China-s-climate-change-talks-What-s-changed-since-Copenhagen.

The lack of success of flexibility could perhaps be explained by various economics principles.[114] Perhaps the cognitive costs or transaction costs are simply too high for each nation to determine how to meet an obligation.[115] It is easier to debate away the obligation entirely. The American phenomenon of climate change "denialism" could also be a tragedy of cognitive costs—it is simply easier to believe climate change is not happening when it seems that nothing will fix the problem.[116] At the national and international level, cognitive costs can translate to elections, policy debates, cost–benefit analysis, political campaigns, and vast amounts of lobbying money. Another economics principle that could explain this problem is hyperbolic discounting. People always put a premium on a benefit today, like money, over a benefit at any point in the future.[117] More flexibility allows for exacerbation of this problem because people have no commitment device.[118]

These problems run throughout the very structure of the current system. What this all means is that the international community can begin to reconsider some of the basic assumptions behind the prevailing mitigation strategy. Is it really necessary for a single treaty to try to solve the entire climate change problem at once or could incremental improvement be more successful in the end? Is endless flexibility for signatory nations helpful or will it save cognitive costs and simplify the response to lay out the strategies in

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114. *See, e.g.*, *Carbon Footprint*, *supra* note 81 (noting the lack of success of current negotiations based on similar flexible strategies because of issues such as lack of political will, complexity, economic concerns, and fairness).

115. *Id.*

116. Other possible theories behind the "denialism" phenomenon are lobbyist and industry influence, personal convictions, limitations of national infrastructure and financial resources, and downright conspiracy. "The corporate lobbies that organize climate-change-denial campaigns are lavishly financed, outspending those supporting urgent action by 7 to 1. One result is the $550 billion a year in subsidies that the International Energy Agency estimates go to the fossil fuel sector of the energy industry." Mikhail Gorbachev, *Let's Get Serious About Climate Talks*, INT'L. HERALD TRIB., Nov. 4, 2010, at 14. There is evidence that one's "belief" in climate change hinges on one's world view. Christopher Joyce, *Belief in Climate Change Hinges on Worldview*, NAT'L PUB. RADIO (Feb. 23, 2010), http://www.npr.org/templates/story/story.php?storyId=124008307. "Should the public come to believe that the scientific issues are settled, their views about climate change will change accordingly. Therefore, *you need to continue to make the lack of scientific certainty a primary issue in the debate*, and defer to scientists and other experts in the field." Frank Luntz, *The Environment: Cleaner, Safer, Healthier America*, *in* LUNTZ RESEARCH COMPANIES: STRAIGHT TALK 131, 137 (2002), *available at* http://www.ewg.org/files/LuntzResearch_environment.pdf.

117. *See* Julie Rehmeyer, *'Discounting' the Future Cost of Climate Change*, SCI. NEWS (May 21, 2010), http://www.sciencenews.org/view/generic/id/59509/title/Math_Trek__Discounting_the_future_cost_of_climate_change (explaining time preferences and hyperbolic discounting in the climate change context).

118. *See, e.g.*, Gharad Bryan et al., *Commitment Devices*, 2 ANN. REV. ECON. 671, 674 (2010).

the international forum? Are there ways to design a system of negotiation to increase the likelihood of agreement? Could an alternative structure fix some of these problems?

IV. A THOUGHT EXPERIMENT WITH AN ALTERNATIVE STRUCTURE: THE WTO MODEL

The nations of the world are in a position where climate change mitigation goals are still desirable, but the simplest and most flexible policy of broad, global emissions caps has not worked and may never work.[119] It is time for the world to begin looking for other ways to achieve mitigation policy goals. Designers of the new model should certainly reconsider the basic assumptions behind the prevailing climate change mitigation strategy and account for the structural failures of the system, but they should go beyond this. Climate change is a time sensitive issue,[120] and trial and error is not the preferable method for creating a solution. To increase the likelihood of success on the next attempt, policymakers should look to other successful international policies and consider whether certain other techniques could solve the climate change puzzle.

This Note uses the World Trade Organization (WTO) model as a lens through which to consider how an alternative structure might work in the climate change context.[121] The WTO model is not a perfect parallel; the WTO addresses a free trade goal,[122] which inherently has different problems and incentives than the climate change mitigation goal. But the WTO model uses an interesting structure that could potentially work in other contexts. The WTO model is complicated, but a closer look reveals an elegant design structure that could potentially work in the climate change context. A few structural features of the WTO model are particularly relevant for the climate change context, given the failures of the existing system: first, the WTO model allows for incremental change over time;[123] second, the WTO model uses separate categories for the various strategies for achieving the free trade goal and treats each

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119. *See* Broder, *supra* note 84.

120. IPCC, CLIMATE CHANGE 2007, *supra* note 18, pt. 4.

121. Marrakesh Agreement Establishing the World Trade Organization, Apr. 15, 1994, 1867 U.N.T.S. 154 [hereinafter WTO Agreement].

122. *Id.* art. 2(1).

123. *See* G. GREGORY LETTERMAN, BASICS OF THE INTERNATIONAL SYSTEM OF CUSTOMS AND TARIFFS 41 (2001) (explaining that the WTO is not a fixed result, but a continuing process of interim negotiations and adjustments).

category as functionally and practically distinct;[124] and third, the WTO model allows for certain issues within each category to be separately negotiated.[125]

The WTO model is a system of interconnected international agreements with a long history.[126] The WTO was established in 1995 to administer the new General Agreement on Tariff and Trade, or "GATT 1994."[127] GATT 1994 replaced and advanced the same basic principles as the original GATT 1947.[128] The policy goals of GATT 1947 and GATT 1994 are the same, but the current WTO model and structure exists under GATT 1994.

GATT 1947, as well as GATT 1994, was a multilateral treaty system intended to meet the policy goals of expanding and liberalizing international trade.[129] These basic free trade goals were expected to secure the terms of world trade and to reform the formerly protectionist world of international commerce.[130] The mechanisms employed by GATT 1947 and the new WTO model to achieve these goals through can be expressed in four founding principles: trade must be conducted in a non-discriminatory way; imported items are not to be treated differently than domestic products once imported; domestic industry should only be given protection through customs tariffs; and each member-party must negotiate a maximum tariff schedule to become a member.[131]

These goals and principles appear deceptively simple. In fact, GATT 1947 had 126 states as parties and ultimately consisted of over 200 agreements, protocols, understandings, and other such documents.[132] Four "framework agreements" automatically bound all members, while many other agreements only applied to those nations that specifically agreed to be bound.[133] Eight successive multilateral negotiations gradually refined the rules and reduced barriers to trade.[134] The last of these, the "Uruguay Round" resulted in GATT

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124. *See Understanding the WTO: The Agreements—Overview*, *supra* note 9 (showing goods, services, and intellectual property as three distinct categories of agreements).

125. *Id.*; *see* LETTERMAN, *supra* note 123, at 36 (explaining that the WTO system uses focused negotiating rounds and even allows nations to individual commitments).

126. *Understanding the WTO: The Agreements—Overview*, *supra* note 9.

127. WTO Agreement, *supra* note 121; JOHN H. BARTON ET AL., THE EVOLUTION OF THE TRADE REGIME: POLITICS, LAW, AND ECONOMICS OF THE GATT AND THE WTO 5–6 (2006).

128. BARTON ET AL., *supra* note 127, at 5–6; LETTERMAN, *supra* note 123, at 39–41.

129. BARTON ET AL., *supra* note 127, at 5; LETTERMAN, *supra* note 123, at 32–33.

130. LETTERMAN, *supra* note 123, at 33.

131. *Id.* at 37–38.

132. *Id.* at 33.

133. *Id.* at 36–37.

134. *Id.* at 36.

1994 and the new WTO model as a package deal.[135] The new model makes some major structural changes.[136] It now binds all WTO members by integrating most of the agreements, it integrates the dispute mechanism and reporting requirements into the system, and it addresses the "free rider" problem by forcing developing countries to adhere to the free trade principles with fewer exceptions.[137]

The current WTO structure is a system of over sixty agreements that fall into six major categories: an umbrella agreement establishing the WTO, separate agreements for each of three areas that the WTO system covers (goods, services, and intellectual property), dispute settlement, and trade policy review.[138] Each broad area has its own category of agreements: broad principles agreements, extra agreements and annexes, and detailed schedules of commitments for each nation.[139] GATT is now the broad principles agreement for the goods area.[140] The General Agreement on Trade in Services (GATS) is the broad principles agreement for the services area.[141] And the Trade-Related Aspects of Intellectual Property Rights (TRIPS) is the broad principles agreement for the intellectual property area (although this category has no additional parts at this time).[142] A graph best explains this structure:

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135. *Id.* at 36, 39–41.

136. *Id.* at 41.

137. *Id.*

138. *Understanding the WTO: The Agreements—Overview*, *supra* note 9.

139. *Id.*

140. *Id.*

141. General Agreement on Trade in Services, art. 1, para. 1, Apr. 15, 1994, 1869 U.N.T.S. 183 [hereinafter GATS]; *Understanding the WTO: The Agreements—Overview*, *supra* note 9.

142. Agreement on Trade-Related Aspects of Intellectual Property Rights, art. 1, para. 2, Apr. 15, 1994, 1869 U.N.T.S. 299 [hereinafter TRIPS]; *Understanding the WTO: The Agreements—Overview*, *supra* note 9.

Umbrella	AGREEMENT ESTABLISHING WTO		
	Goods	Services	Intellectual property
Basic principles	GATT	GATS	TRIPS
Additional details	Other goods agreements and annexes	Services annexes	
Market access commitments	Countries' schedules of commitments	Countries' schedules of commitments(and MFN exemptions)	
Dispute settlement	DISPUTE SETTLEMENT		
Transparency	TRADE POLICY REVIEWS		

Figure 1[143]

The first structural feature that is particularly relevant to the climate change problem is that the WTO model allows incremental improvement.[144] Though the WTO model has one ultimate policy goal of free trade,[145] an entire system of agreements is geared toward achieving this goal.[146] Each agreement represents a step in the direction of the ultimate policy goal. For example, the GATS establishes the basic principles by which nations are to conduct trade in services.[147] This agreement does not reflect the whole of what is necessary to achieve free trade, nor even the whole of what is necessary to achieve free trade in regard to services.[148] Even the WTO agreement, which resulted from the eighth negotiation round, contemplates further negotiation to liberalize trade.[149]

Allowing for incremental change has clear advantages in the WTO context. By using policies that do not necessarily accomplish the

143. *Understanding the WTO: The Agreements—Overview*, *supra* note 9.
144. *See supra* note 123.
145. LETTERMAN, *supra* note 123, at 33.
146. *Understanding the WTO: The Agreements—Overview*, *supra* note 9.
147. GATS, *supra* note 141, art. 1, para. 1.
148. *See, e.g.*, *Understanding the WTO: The Agreements—Overview*, *supra* note 9 (showing other agreements under the "services" category).
149. LETTERMAN, *supra* note 123, at 40.

end goal on their own, the WTO model treats any progress toward free trade as real progress and has ultimately achieved far greater success than the original negotiations in the 1940s could have achieved.[150] GATT 1947 was originally intended to be an interim agreement, but it facilitated trade liberalization for decades and provided real solutions.[151] GATT 1947 did not include many of the originally intended features, but nations still treated the agreement as a worthwhile policy.[152] These ever-changing interim agreements and other plurilateral agreements that only bound the parties that agreed to them often served as "as an intermediate way station on the road to multilateral acceptance."[153] The result of this structural feature is what scholars call the "ratchet effect": once WTO members agree on a contentious issue, the issue becomes less contentious and parties move on to the next issue, never un-agreeing to the original issue.[154] The consensus that the international community has slowly built over the past six decades shows that it is possible to build momentum for consensus.[155] As any good sales person knows, one "yes" leads to another.

The second useful structural insight that is relevant to the climate change context is the WTO's use of separate categories for various strategies for achieving free trade.[156] Unlike current climate change policies that create a single, flexible emissions cap, the WTO system uses completely separate categories of agreements for sectors that are functionally unique.[157] While trade in goods, under the basic principles of GATT, was the only category incorporated into the system for many decades,[158] a services category was later added

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150. *Id.* at 33 (noting that although GATT 1947 was not perfect, it "did a remarkably good job of reforming what had, at its inception, been a very protectionist world," and that during its reign average tariffs fell from 40 percent to 5 percent, while the volume of international trade in good multiplied twenty-fold).

151. BARTON ET AL., *supra* note 127, at 5.

152. *See* LETTERMAN, *supra* note 123, at 34 (explaining that GATT 1947 was "a treaty without its planned administering organization and which covered only a part of its originally intended scope," but that it attracted twenty-three signatories at its origin).

153. *Id.* at 56–57.

154. *Handbook on Accession to the WTO: Introduction and Summary*, WORLD TRADE ORG., http://www.wto.org/english/thewto_e/acc_e/cbt_course_e/intro_e.htm (last visited Nov. 1, 2011) (explaining the ratchet effect); *see also* LETTERMAN, *supra* note 123, at 41 (noting that some issues that were contentious when GATT 1947 was enacted gradually became less important).

155. LETTERMAN, *supra* note 123, at 40–41 (noting the evolution over time).

156. *See supra* note 124.

157. *Understanding the WTO: The Agreements—Overview*, *supra* note 9.

158. GATT 1947, which regulated trade in goods, existed until it was replaced with GATT 1994. LETTERMAN, *supra* note 123, at 33–35. GATS, which regulates trade in services, did not exist until 1995. *See* GATS, *supra* note 141, art. 1, ¶ 1.

under GATS,[159] and an intellectual property category was added under TRIPS.[160] The system also has four unique categories that consist only of plurilateral agreements that do not apply to all WTO members.[161] Operating under the general principles, each category has its own system of extra agreements, annexes, and commitment schedules.[162] For example, the goods category has an array of agreements on such things as agriculture, anti-dumping, and rules of origin.[163]

In part, the various categories of the WTO system are a side effect of the historical coming of age of different sectors at different times. For example, the goods regime came at a time when most trade occurred in goods, developing through decades of negotiation rounds.[164] Eventually, services also played a key part in free trade.[165] A large share of foreign trade was in services itself and trade in goods to services provided across borders.[166] The WTO model allows the corresponding international regulatory regime to come of age at a pace appropriate for the sector. The goods category now includes a well-developed system under GATT.[167] In contrast, the services category, under the general principles of GATS is in its infancy.[168] Many types of services are still not covered by the treaty and negotiations continue on many aspects of services trade.[169] The intellectual property category, under TRIPS, is even less developed, currently consisting only of the broad principles category.[170] These sectors are also functionally different and have different issues associated with them; thus they must be treated differently.[171] The WTO model provides the flexibility to treat each sector separately based on these differences.

The third structural feature of the WTO model that is particularly relevant for the climate change problem is the ability of the system to allow for give and take within each categorical sector

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159. GATS, *supra* note 141; *Understanding the WTO: The Agreements—Overview*, *supra* note 9.

160. TRIPS, *supra* note 142, art. 1, ¶ 2.

161. *Understanding the WTO: The Agreements—Overview*, *supra* note 9.

162. *Id.*

163. *WTO Legal Texts*, WORLD TRADE ORG., http://www.wto.org/english/docs_e/legal_e/legal_e.htm#GATT94 (last visited Nov. 1, 2011).

164. *See* LETTERMAN, *supra* note 123, at 36 (explaining that the GATT regime was tweaked through numerous rounds of negotiation).

165. BARTON ET AL., *supra* note 127, at 127.

166. *Id.*

167. *WTO Legal Texts*, *supra* note 163.

168. BARTON ET AL., *supra* note 127, at 129.

169. *Id.*

170. *Understanding the WTO: The Agreements—Overview*, *supra* note 9.

171. *See id.* (listing various "additional details" that fall under the goods and services categories).

and for certain issues within each category to be separately negotiated.[172] Every sector category of agreements (goods, services, etc.) contains additional agreements and annexes that work out certain details.[173] For example, the goods category of agreements has separately negotiated agreements for trade in agriculture, for health regulations of farm products, and for anti-dumping issues.[174] The goods category also has a host of "interpretive understandings" covering such issues as balance-of-payment provisions and waivers of obligations.[175] Each category even has an array of separate commitment schedules for participating nations.[176] In the goods category, for example, the schedules consist of binding commitments on tariffs and quotas.[177] In the services category, these schedules address how much access a foreign services provider has to specific sectors.[178]

The benefit of this feature is that any issue that can stand alone can be separately negotiated in isolation of all other issues. The continuing negotiation process means that policymakers can add new agreements or new terms to each category without making major changes to the overall system.[179] In short, the continual negotiation process simplifies any particular negotiation and facilitates the gradual consensus discussed above. If an agreement on the details of trade in agriculture does not implicate trade in building materials, for example, then policymakers may improve the negotiation strategy by not discussing building materials in the agriculture negotiation. Of course, policymakers may find that combining certain issues into a single negotiation has strategic advantages. This may be what led to the WTO model's use of general principles agreements that establish basic principles for all other agreements in the category.[180]

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172. *Id.*; *see also* LETTERMAN, *supra* note 123, at 36 (explaining that the WTO system uses focused negotiating rounds and even allows nations to selectively commit to certain obligations).

173. *Understanding the WTO: The Agreements—Overview*, *supra* note 9.

174. *Id.*; *see also* Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, Apr. 15, 1994, 1867 U.N.T.S. 187 (separate agreement establishing a category of agreements for trades in goods).

175. LETTERMAN, *supra* note 123, at 42.

176. *Understanding the WTO: The Agreements—Overview*, *supra* note 9.

177. *Id.*

178. *Id.*

179. *See* LETTERMAN, *supra* note 123, at 41 (explaining that the WTO system is designed as a continuing process).

180. *See id.* at 37–38 (outlining the four essential principles underlying both GATT 1947 and the WTO Agreement).

V. THREE MAJOR STRUCTURAL CHANGES COULD SAVE INTERNATIONAL CLIMATE CHANGE MITIGATION

The three core structural features of the WTO model—accommodating incremental change over time, creating separate agreement categories for various sectors to be treated differently, and allowing certain issues within each category to be separately negotiated—could work quite well in the climate change mitigation context. Indeed, some version of such strategic structural changes to the current climate change mitigation strategy could help solve some of the major failures of the current approach.[181]

A. *Incremental GHG Reduction: The Mitigation Turtle, Not the Mitigation Hare*

In designing a new system for climate change mitigation, policymakers should follow the WTO example and pursue incremental reduction in GHG emissions rather than attempt to achieve all necessary reductions at one time. Such a policy shift in climate change mitigation techniques would both resolve some of the issues exhibited by the current prevailing technique and would allow for similar benefits to those realized in the WTO context.

Recall that the current model underestimates the dramatically large scope of the task of reaching climate change mitigation targets.[182] It hardly seems wise to attempt to solve the entire world climate change problem with a single emissions cap.[183] If the system were to allow for incremental reduction in GHG emissions, the world would not have to make an "all or nothing" choice. Such a system would also allow for adjustment based on success. If one of several incremental strategies works better than others, then future increments could focus on those strategies that actually work.

A strategy that seeks incremental change would also fit better into the climate change mitigation goal, based on risk profiles.[184] Such incremental reduction in GHG emissions would achieve real mitigation, meaning risk reduction, with every increment. An example best illustrates this point. Suppose current projections, based on current growth rates and emissions rates, suggest that atmospheric levels of CO2eq will reach 650 ppm by 2050. At this

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181. *See supra* Part III.B (discussing the shortcomings of the current regime to address climate change).

182. *See supra* Part III.B.

183. *See* Barrett, *supra* note 4, at 1 (arguing that climate change is too fundamental a problem to address it with a net emissions reduction such as that in the Kyoto regime).

184. *See supra* Part III.B.

level, there is a 100 percent probability of a 2°C increase and a 24 percent chance of a 5°C increase in the global average surface temperature.[185] If a particular increment or group of increments reduced current projections to 550 ppm CO2eq, the risk would shift to a 99 percent chance of a 2°C increase and a 7 percent chance of a 5°C increase in global average surface temperature.[186] With this incremental reduction in emissions, the likelihood of a 2°C increase hardly changes, but the likelihood of a 5°C increase, a number associated with a far greater degree of catastrophe,[187] decreases significantly. Thus the reduction *reduces the ultimate risk* of catastrophic climate change. Like with free trade in the WTO model, partial progress toward the ultimate mitigation goal may represent real progress.[188]

An incremental policy in the climate change context could also lead to the same ratchet effect experienced in the WTO context.[189] There are several possible explanations for why incremental emissions reductions could increase the likelihood of further emissions reductions. Success of initial emissions reductions could prove the effectiveness of such policies and build confidence in the feasibility of mitigation strategies. Additionally, if parties to an incremental agreement comply with obligations, it would be a sign of good faith to other parties that each member is serious about climate change mitigation, thus increasing confidence in compliance with potential future agreements.

Another way to think about the possible benefits of an incremental climate change mitigation strategy is to think of it as a commitment device. Under economic models of human time preferences, most people would prefer benefits now, such as more money or cheaper resources, to a benefit in the distant future.[190] This is true under the traditional economic concept of exponential discounting, which assumes that a person cares more about each time period than about the time period immediately after it; but it is also true in the possibly more accurate concept of hyperbolic discounting, which assumes that people put a premium on the current time period while hardly distinguishing between benefits at various times in the

185. Vandenbergh et al., *supra* note 19, at 318 tbl.1.

186. *Id.*

187. *Id.*

188. *See* STERN, *supra* note 5, at 195 box 8.1 (showing the broad range of risk associated with various CO2eq targets).

189. *See Handbook on Accession to the WTO*, *supra* note 154 (explaining that there has been something of a ratchet effect since the early beginnings of the WTO regime).

190. *See* Rehmeyer, *supra* note 117 (explaining time preferences and hyperbolic discounting in the climate change context).

future.[191] This means that most people procrastinate doing things such as addressing climate change that will produce future benefits because they always think it is better to "spend nothing to combat climate change now, but start to do so real soon, in that mythical future time when we acquire patience."[192] A commitment device is an arrangement in which a person makes something in the present more "expensive" in order to change the relationship between a benefit in the present and a benefit in the future.[193] Essentially, it locks a person into a course of action so that procrastination is not an option. Once an increment of mitigation is realized, the world would be locked into a course of action and any failure to realize enough mitigation to reduce the risk of climate change would forfeit the expense paid for the initial increment.[194] Additionally, with an incremental climate change mitigation strategy, each successive agreement to achieve an increment of GHG reduction would alter the "cost" of current benefits such that the relationship between the present and the future do not produce such drastic procrastination responses.

Some final potential benefits to an incremental GHG reduction policy are timing and appropriate regulation. Complex change to technology or infrastructure necessary to achieve substantial climate change mitigation will take time to implement.[195] Policies with short-term results could be implemented in the near-term, potentially at lower cost, reducing the global risk and buying time for the longer-term solutions.[196] The incremental solution could also potentially help avoid over-regulation because once enough mitigation is achieved, there will be no need to continue adding additional regulations.

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191. *Id.*

192. *Id. See generally* Larry Karp & Yacov Tsur, *Climate Policy When the Distant Future Matters: Catastrophic Events with Hyperbolic Discounting* (Feb. 2, 2007) (unpublished working paper), *available at* http://papers.ssrn.com/sol3/papers.cfm?abstract_id=961045&download=yes (providing another analysis on the economics of choice theory in the climate change context).

193. *See, e.g.*, Bryan et al., *supra* note 118, at 3 (providing a definition of a commitment device). In the economic context, the term "expensive" is often used to describe time or cognitive costs and not simply financial cost. *See id.* at 5–6 (listing several commitment devices involving time or cognitive costs rather than purely financial costs).

194. This would be similar to a "hard commitment" in which failure is punished with real economic penalties. *See id.* at 2.

195. Dietz et al., *supra* note 59, at 18,452.

196. *Id.*

B. *Categories of Mitigation Strategies that Establish the Methods for GHG Reduction*

Climate change policymakers should also follow the WTO example by creating separate agreement categories for various mitigation strategies. This would be the first step in providing practical answers for *how* to achieve mitigation, rather than simply specifying a general emissions cap.[197] As becomes clear below, the potential methods of mitigation are known, as is the fact that more than one method is required to reach mitigation targets. The world would do well to codify these methods and begin to discern principles and techniques for pursuing them.

One way to create distinct mitigation categories would be to divide the system by the many sources that contribute to global GHG emissions. In 2000, GHG emissions came from electricity generation (24 percent), industry (14 percent), transportation (14 percent), buildings (8 percent), and other energy related sources (5 percent).[198] Non-energy related sources contributed GHG emissions as well through land use (18 percent), agriculture (14 percent), and waste (3 percent).[199] This prompts some fairly simple comparisons to the WTO model. Energy, as such a large source of GHG emissions, could be viewed as a parallel to goods in the WTO context. A climate change mitigation policy could treat energy as its own category of agreements. It could also treat electricity generation, transportation, and industry each as separate categories of agreements.

Another, and probably better, way to create distinct mitigation categories would be to divide the system into the *types* of mitigation strategies. Because of the scope of the mitigation task,[200] the international community will have to employ multiple methods to reduce GHG emissions.[201] The various methods may warrant different and separate international approaches and could easily be conceptualized as separate categories in a system similar to the WTO model.

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197. *See supra* Part III.B.

198. STERN, *supra* note 5, at 171 fig.7.1; *see also* U.S. ENVTL. PROT. AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990–2008, at 2–26 (2010), *available at* http://www.epa.gov/climatechange/emissions/usinventoryreport.html (showing that the largest portions of U.S. emissions come from electricity generation and transportation).

199. STERN, *supra* note 5 at 171.

200. Lewis, *supra* note 6, at 15.

201. *See* Pacala & Socolow, *supra* note 7, at 968–70 (noting that seven climate change wedges are necessary to achieve stabilization).

The possible types of mitigation methods were explored in detail by Pacala and Socolow, who coined the term "stabilization wedge."[202] The "wedge" takes its name from the graphical representation of the concept.[203] The difference between no increase in GHG emissions (a flat line on a graph) and an increase in GHG emissions at the current rate (a diagonal line on a graph) creates a triangle.[204] The "wedges" represent one gigaton of carbon per year of reduced carbon emissions in fifty years.[205] According to the authors, seven "wedges" would achieve a roughly 600 ppm CO2eq target.[206] Seven years have passed since the article was published, so the actual number of wedges required may be slightly higher by now.[207] The authors also describe fifteen different possible "wedges" that can be achieved with current technology.[208] The fifteen wedges fall into three distinct categories: efficiency and conservation, decarbonization of electricity and fuels, and natural sinks (i.e., forest and soil management).[209] Thus, each of these three categories could make up a separate category of agreements in a larger mitigation system similar to the sector categories in the WTO model.

Several other benefits could potentially result from separating categories of mitigation methods this way. While the climate itself is agnostic as to what sector of the economy the GHG reductions should come from, certain types of emissions reductions may be practically easier to achieve. Energy conservation, for example, is cheaper and produces more immediate results than decarbonizing electricity and fuels.[210] Therefore, a category of agreements on conservation could be implemented more quickly and more aggressively than other categories. An added benefit of this method is that mitigation could begin in one category while the others are not yet resolved, thereby achieving incremental GHG reductions as advocated above and buying time for progress through the other categories.

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202. *Id.*
203. *Id.*
204. *Id.*
205. *Id.*
206. *Id.* Pacala and Socolow's target of 500 ppm CO2 is roughly equivalent to 600 ppm CO2eq. IPCC WORKING GROUP III, *supra* note 1, at 39 tbl.TS.2.
207. Pacala & Socolow, *supra* note 7.
208. *Id.* at 970 tbl.1.
209. *Id.* at 970–72.
210. *See* Dietz et al., *supra* note 59, at 18,452–53 (pointing out that behavioral changes in conservation can achieve quick results at a low cost).

C. *Improving Feasibility Through a Strategy of Key Negotiation Components*

As explained in Part III.B, one of the biggest problems with the current strategy for climate change mitigation is the failure of continuing negotiation and compliance.[211] Nations do not want to commit to further vague and amorphous emissions caps.[212] Policymakers could significantly improve the negotiation strategy by following the WTO model of allowing for certain components to be negotiated separately within each mitigation category. This is similar to, but not the same as allowing for incremental change. Individual separately negotiated components will not necessarily achieve *any* GHG reduction on their own. Rather, the purpose of negotiating components separately is to improve the negotiation strategy and to correct the political infeasibility problem.[213] This will only work if done the right way, which will require a consideration of which components should be negotiated together and which should be negotiated separately to achieve the optimal improvement in the negotiation strategy.

Three potential aspects stand out as potential areas for strategic negotiation components: general principles, technical agreements that establish realistically achievable reductions through various means, and burden allocation. It is important to note at the outset of this suggestion that these components are not necessarily dependent on one another for negotiation purposes. They are separate issues that *can* be treated separately. Additionally, and more importantly, separating these components could have strategically beneficial advantages that could help solve some of the more sticky feasibility issues.

This strategy could help the feasibility problem by narrowing the debate, reducing the cognitive costs of each particular agreement. A nation is more likely to be able to agree on a simple "basic principles of energy conservation" policy than on a policy that limits emissions across the entire economy. If the immediate negotiation solely concerns maximum achievable emissions reductions through clean coal, then there is little reason for the oil lobby to get involved in the debate. This solution would also reduce the cognitive costs of meeting

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211. *See supra* Part III.B.

212. *See Carbon Footprint*, *supra* note 81 (noting a desire to move away from past negotiation strategies); *see also* Kate Galbraith, *Getting Past the Politics of Climate Change*, N.Y. TIMES (Oct. 3 2010), http://www.nytimes.com/2010/10/04/business/energy-environment/04green.html?scp=1&sq=gettingpastthepoliticsofclimatechange&st=cse (suggesting that nations are posed to act, but noting that other countries may give up on the United States' participation).

213. *See supra* Part III.B.

an obligation once nations agree to it because the general principles for each strategy and the maximum achievable reduction through each means will already be established.

Another reason this could help the political feasibility problem is that it would help create better incentives for nations to commit and to meet commitments. Once basic principles and maximum achievable reductions are established, all that is left for nations to negotiate is which nation will make which reduction through what means. Burden allocation alone is a much simpler issue; removing technical feasibility and theoretical differences from the equation puts the focus on the narrow issue of whether a nation is willing to do its share. But this solution can go beyond narrowing by actually combining issues strategically in what this proposal refers to as "hog-trading." Once the options are real and tangible, the negotiations can come down to what nation A is willing to do in exchange for nation B's commitment. This shift could change the entire tragedy of the commons situation in the climate change mitigation context.

Finally, this solution allows for gradual consensus in the way that incremental change allows for gradual mitigation. Each new agreement will have a similar ratchet effect to the one explained above. If it becomes clear that the world is serious about resolving issues and about making progress, then it would become a more settled idea in the world psyche and perhaps public opinion would adapt accordingly.

Ultimately, for a climate change mitigation policy to succeed, both politically and functionally, it may be necessary to break it up into manageable chunks. The WTO model shows how the world could do this. By allowing for incremental mitigation, by creating categories of agreements for the various mitigation strategies, and by creating negotiation components within each strategy, policymakers can create a climate change mitigation system that achieves actual mitigation and builds support for additional progress.

VI. UNVEILING THE WORLD CLIMATE CHANGE ORGANIZATION TO ADMINISTER A BOLD NEW MITIGATION STRATEGY

It should be clear by now that the international community should abandon the failed emissions cap method of climate change mitigation policy and begin considering other approaches. With the above analysis and insights in hand, it is now possible to design a new international system for climate change mitigation. The new approach, dubbed the World Climate Change Organization model, would encompass a system of international climate change mitigation agreements using these three structural changes explained in the previous section: incremental emissions reduction, categories of

mitigation strategies, and separation of key components for negotiation strategy.

The system idea per se is not new. In a way, the UNFCCC and the Kyoto Protocol are systematic. The UNFCCC establishes an obligation for parties to negotiate further agreements on climate change mitigation.[214] It is an agreement to agree at a later date. The UNFCCC structure is very loose, however, and as is now evident, has had limited success.[215] Nor is the concept of using a collection of separate agreements that cover different issues a new idea. Another structure idea, dubbed the "portfolio approach" was proposed by Scott Barrett.[216] Barrett suggests a linked collection of agreements that cover various economic sectors, gases, and alternative mitigation means like geo-engineering.[217] He argues that the portfolio approach is a good idea because if efforts in one sector fail, efforts in other sectors would not be "pulled down with it."[218] However, Barrett does not provide further details or explain how the system would work.

The new mitigation system proposed here and explained in full detail below is different from these other approaches as it encompasses an entire system—a complete framework for international agreement on and regulation of climate change mitigation. The new system idea differs in other respects as well. It is based on the fundamental idea that functional decoupling of issues is the best way to get past the current climate change gridlock. By breaking parts such as mitigation and negotiation into manageable chunks and allowing binding, long-term agreement even though future negotiation remains necessary, the new system would prevent the perfect from being the enemy of the good. The new system idea is also rooted in some of the leading analysis on the climate change puzzle. Risk insights and climate change wedges are unique to climate change mitigation and the new system would account for them. Finally, the proposed system is modeled on an existing international regime that works. The WTO model has been facilitating free trade policy for over six decades.[219] Through that time, it has been continually tweaked and improved.[220] A long-lasting system that allows continual revision and improvement toward the

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214. *See, e.g.*, UNFCCC, *supra* note 11, art. 4(2)(d) (pledging to review and modify commitments already made); *see also* Barrett, *supra* note 4, at 1 (describing the "linear" structure to the current regime in which the UNFCCC establishes a long-term goal while Kyoto establishes a commitment under it).

215. *See* Barrett, *supra* note 4, at 1–2 (criticizing the minimal progress of the current regime).

216. *Id.*

217. *Id.* at 2–3.

218. *Id.* at 8.

219. LETTERMAN, *supra* note 123, at 33.

220. *Id.* at 36.

mitigation goal is precisely what is required in the climate change context.

A. *How the World Climate Change Organization Model Would Work*

This Note ultimately endorses the creation of a new international body called the World Climate Change Organization (WCCO) to administer the pursuit and development of multilateral agreements under each of three categories of climate change mitigation strategies: energy decarbonization, efficiency and conservation, and natural sinks.[221] Within each strategy, certain components should be individually and separately negotiated in the following order: (1) agreements on general principles for each mitigation strategy category (e.g., basic principles for energy decarbonization), (2) technical agreements for realistically achievable GHG reductions through all the means within a category (e.g., maximum achievable reductions through coal decarbonization), and (3) "hog-trading" agreements where nations negotiate individual obligations in exchange for other nations' obligations (e.g., the United States agrees to achieve X reduction through coal decarbonization while China agrees to achieve Y reduction through clean vehicles). All of these categories, agreements, and components should exist under an umbrella treaty that establishes the WCCO and facilitates the administration of agreements under the overarching treaty. Although not explored in detail, the WCCO system could also include some other features of the WTO model such as compliance or dispute resolution and reporting and transparency mechanisms.[222] The structure of the new WCCO system of agreements would look something like the following:

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221. These three categories of mitigation strategies reflect the three categories of techniques explained in the climate change wedge theories. *See* Pacala & Socolow, *supra* note 7, at 969.

222. *Understanding the WTO: The Agreements—Overview*, *supra* note 9. Kyoto has some teeth, but some argue that it is not effective. Barrett, *supra* note 4, at 4–5 (noting particularly its lack of any enforcement mechanism).

Umbrella	AGREEMENT ESTABLISHING WORLD CLIMATE CHANGE ORGANIZATION (WCCO)		
	Efficiency & Conservation	Energy Decarbonization	Natural Sinks
Basic principles	General Principles Agmt	General Principles Agmt	General Principles Agmt
Maximum Achievable Emissions Reductions (MEER)	MEER agreements for each potential means	MEER agreements for each potential means	MEER agreements for each potential means
Emissions reduction "hog-trading" commitments	Countries' commitment schedules	Countries' commitment schedules	Countries' commitment schedules
Dispute settlement	COMPLIANCE MECHANISM		
Transparency	REPORTING MECHANISM		

Figure 2[223]

The umbrella treaty that creates the WCCO would be the best tool for ensuring that the system allows for incremental mitigation. This would work similarly to the current WTO structure, in which the umbrella WTO Agreement establishes the free trade goal as well as ongoing negotiation targets for continuing trade liberalization.[224] Similarly, the WCCO umbrella treaty would establish both an ultimate mitigation target as well as the immediate goal of incremental mitigation. The ultimate mitigation target could be 450 ppm CO2eq or even 650 ppm CO2eq, depending on which goal the scientists find feasible and the policymakers find digestible. The incremental goals should be based on digestible and feasible chunks. Like the WTO model, the WCCO umbrella agreement should also provide a structure under which all other agreements should fit and establish the WCCO itself as the entity to facilitate negotiation and agreement.[225]

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223. This chart is based on the WTO agreement structure chart that is included in Part IV, *supra*.

224. WTO Agreement, *supra* note 121, pmbl.

225. *See id.* arts. 2–3.

Dividing the WCCO system by the three mitigation components—(1) energy decarbonization, (2) efficiency and conservation, and (3) natural sinks—would help to establish the means of mitigation. These strategies are each distinct, and it is not necessary to treat them the same. This sort of separation is successful in the WTO model, which separates goods, services, and intellectual property into different categories and treats each category differently under a different set of general principles.[226] One benefit of using the climate change "wedges" for the categories rather than other options is that it allows policy to be built around a type of solution instead of around the problem itself.[227] The conservation category may seem surprising because little international debate covers conservation, yet there seems to be no good reason for ignoring such low-hanging fruit.[228] Nations could easily implement conservation programs through technology development, infrastructure changes, citizen education, and incentives.[229] The conservation "wedges," for example, are improved fuel economy, reduced reliance on cars, more efficient buildings, and improved power plant efficiency.[230] There may also be a fifth "behavioral wedge" that includes policies for incentivizing changes in energy usage.[231] Indeed, many conservation methods will no doubt be easier, quicker and less expensive than other categories.[232] By including the efficiency and conservation strategy as a unique category under the WCCO, the system would signal that such a strategy is important and would facilitate possibly less costly means of GHG reduction.

This WCCO system would improve the political feasibility problem by establishing separate negotiations for certain components, namely general principles, maximum achievable emissions reductions, and "hog-trading" burden allocation agreements. This structural change would work slightly differently from, though similar to and using the same basic principle, as the WTO model. The WTO model uses general principles agreements for each category.[233] GATS, for example, establishes general principles for the services category, including basic rules for things like most-favored nation treatment, transparency, and disclosure of confidential information.[234] Each category in the WTO model has many separate

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226. *Understanding the WTO: The Agreements—Overview*, *supra* note 9.
227. *See* Pacala & Socolow, *supra* note 7, at 970–71.
228. Dietz et al., *supra* note 59, at 18,454.
229. *Id.* at 18,452.
230. *See* Pacala & Socolow, *supra* note 7, at 970.
231. Dietz et al., *supra* note 59, at 18,452.
232. *Id.*
233. *Understanding the WTO: The Agreements—Overview*, *supra* note 9.
234. GATS, *supra* note 141, arts. 1–3.

agreements covering details within the category.[235] Finally, each category includes commitment schedules for each member.[236] In the WCCO system, the general principles agreements would similarly establish basic rules for that particular mitigation strategy. A conservation general principles agreement for the efficiency and conservation category, for example, could include basic rules for seeking conservation through technological development or funding for infrastructure. Rather than following the WTO example for the other agreements, however, the WCCO system would only have two other types of agreements: those establishing technical achievability for GHG reductions and those where nations engage in hog-trading burden allocation. This would separate technical feasibility from actual commitment, taking one potential excuse out of the commitment discussion. With the hog-trading agreements specifically considering clear, established reductions through specific means, the negotiations could get a little bit more nuanced based on things like infrastructure and age of the existing system in each nation. More importantly, the negotiations could begin to work like functional markets, where obligations are exchanged for other obligations.

The benefits of the WCCO mitigation system are numerous. Because the new system would break many of the component parts into manageable chunks, negotiation and solutions could be more streamlined and the lobbying influence would be less significant for each portion. As agreements gradually go into effect, the world would begin to make progress on climate change mitigation and reduce the risk of catastrophic climate change sufficiently to buy time for agreement on more complicated issues. As nations agree to various issues, political momentum would build for more agreement through the sheer power of saying yes. Each agreement would have a ratchet effect in which progress already made would become difficult to negate. Rules for each type of issue could be tailored around the specific category or mitigation method. It is even possible that some of the policies would be more immediately viable because they have certain intrinsic benefits beyond climate change mitigation. For example, due to the projected increase in energy demand, more energy sources will be necessary regardless of climate change mitigation needs.[237] This new energy might as well come from more efficient sources, while benefitting the economy of nations that develop and export the new technology.

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235. *Understanding the WTO: The Agreements—Overview*, *supra* note 9.
236. *Id.*
237. Lewis, *supra* note 6, at 16.

B. *Building on Existing Progress: Integrating the UNFCCC into the World Climate Change Organization*

The UNFCCC is little more than recognition of climate change and an agreement that parties *should* do something about remedying the problem.[238] It purports to be a complete policy with principles for how to achieve climate change mitigation, but the actual commitments are couched in soft terms like "promote" and "cooperate."[239] The supposed commitments consist of things like adopting national policies to limit GHGs.[240] It basically sets goals and describes the problem, much in the way that a general principles agreement might set goals and targets under the WCCO system. In essence, it is really an umbrella agreement, contemplating future agreements, the first of which is the Kyoto Protocol.

The WTO Agreement is also an umbrella agreement that sets goals and describes the problem. First, it recognizes the goal of free trade.[241] But it also establishes that the WTO will provide a common institutional framework for trade related conduct of its members for legal instruments under the system.[242] It sets forth details for how the WTO will operate.[243] It also sets procedures for the negotiations of future agreements by members within the WTO system.[244] This agreement establishes the entire WTO system and the rules of procedure. It is a set of rules about making rules. It does not attempt to specify methods for meeting the free trade goals or set up specific commitments, nor does it cover enforcement mechanisms. All of those issues are resolved elsewhere in agreements that fall under this system.

While the UNFCCC has part of what is required in a WCCO umbrella agreement, it does not have everything that is needed. Thus, the first step in creating the new WCCO system is to amend the UNFCCC so that it more appropriately administers the WCCO system. The amended agreement should keep the description of the problem and the goals. It could also include an ultimate mitigation target and incremental goals. But the agreement should go no further in specifying methods of mitigation or commitments. Rather, it should establish a formal World Climate Change Organization that will provide a common institutional framework for climate change mitigation related conduct of its members and for legal instruments

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238. UNFCCC, *supra* note 11, pmbl., art. 3.
239. *Id.* arts. 3, 4(1).
240. *Id.* art. 4(2)(a).
241. WTO Agreement, *supra* note 121, pmbl.
242. *Id.* art. 2.
243. *Id.* arts. 2–9.
244. *Id.* art. 10.

under the system. Thus, it will become an organizational and administrative document.

VII. CONCLUSION

The existing international policies for affecting climate change mitigation have not worked and there is no indication that they will work in the future. The policies are too broad and too vague. They allow too much room for failure and consequently have never generated enough political momentum toward mitigation. The international community should abandon these failed policies and begin developing new policies that can achieve progress toward climate change mitigation. There is very little in the existing policy that is salvageable beyond the climate change mitigation goal. The rest is bogged down with political baggage. The international community should accept this failure and the lessons it provides and move on to a better solution. And the debate on better solutions must begin immediately. New policies take time to implement and the climate change clock is ticking. The longer it takes to begin mitigation, the more difficult mitigation will be to achieve.

In designing a new climate change mitigation system, it is wise to take note of other successful models. The WTO model is a very suitable role model for climate change mitigation policy because while it has one big, lofty goal—free trade—it recognizes that it is impossible to achieve the entire goal in one fell swoop. It allows the world to arrive at this ultimate free trade goal at different paces in different contexts. The current WTO model took decades to achieve. Luckily, policymakers in the climate change context can learn from the WTO model without taking decades to get there.

The proposed international climate change mitigation system, the WCCO, would follow the WTO model by not attempting to achieve the ultimate mitigation target all at once, but it would achieve incremental mitigation and would significantly increase the odds of achieving the ultimate goal. Each successive agreement under the system would either generate some degree of mitigation or would improve the chance for success of a partial mitigation effort. Each partial mitigation method would reduce the risk of catastrophic climate changes, buying time for other mitigation methods and building social acceptance for mitigation in general. This system will

allow parallel paths of progress toward the mitigation goal to proceed at varying paces, and ultimately achieve mitigation through small steps in the same direction.

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