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# BALANCING INTELLECTUAL PROPERTY RIGHTS AND CLEAN TECHNOLOGY DEVELOPMENT: ENCOURAGING COOPERATION

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## INTRODUCTION

The advent of the technological age has been tremendously helpful for human development. Beyond smartphones and ultra-definition televisions, much of today's emerging technology can be used to combat many of the world's problems.[1] However, the availability of advanced technological developments is not evenly distributed between developed and developing nations.[2] As such, developed nations tend to be better equipped to tackle problems that are shared by all.[3]

Conceivably, the most efficient way to aid developing countries in their technological struggles is to have developed nations transfer technology and expertise to them, rather than having the developing nations conduct the research and investment themselves.[4] However, intellectual property rights (IPRs) seem to pose an obstacle in global development.

This comment will focus on the clash between intellectual property rights and technology transfer within the context of climate change. Climate change will be one of the most significant problems humanity will have to grapple with in the coming years. Former Supreme Court Justice John Paul Stevens encapsulated both the effect of greenhouse gases (GHGs) and the threat they pose, when he took judicial notice that:

> A well-documented rise in global temperatures has coincided with a significant increase in the concentration of carbon dioxide in the atmosphere. Respected scientists believe the two trends are related. For when carbon dioxide is released into the atmosphere, it acts like the

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1 Wendy Koch, *How Technology Can Halt Climate Change*, USA TODAY (Dec. 30, 2013, 10:05 PM), http://www.usatoday.com/story/news/nation/2013/12/30/climate-change-technologies/4041931/.

2 L. A. Ogunsola, *Information and Communication Technologies and the Effects of Globalization: Twenty-First Century "Digital Slavery" for Developing Countries – Myth or Reality?*, ELECTRONIC J. ACAD. & SPECIAL LIBRARIANSHIP, http://southernlibrarianship.icaap.org/content/v06n01/ogunsola_l01.htm (last visited Aug. 3, 2016).

3 *See id.*; *see generally* A. S. Sinanan, *Under-Developed Territories of the Commonwealth*, 2 J. INTER-AM. STUD. 183 (1960).

4 *See United Nations Conference on Trade and Development: Draft Texts Submitted to the Intergovernmental Group of Experts on an International Code of Conduct on Transfer of Technology*, 17 INT'L LEGAL MATERIALS 453, 453, 455 (1978).

> ceiling of a greenhouse, trapping solar energy and retarding the escape of reflected heat.[5]

The heating of the earth will pose a threat to the health and livelihood of people across the globe—in both developed and developing countries.[6] In fact, it is estimated that the effects of climate change could place up to 100 million people in poverty by the year 2030.[7]

As such, it is imperative that humanity find a way to collaborate in combating climate change. This Comment does not suggest that IPRs need to be destroyed to successfully develop new technologies and make them available to developing as well as developed countries; rather, the crux of this comment lies in the exploration of the interplay between the preservation of IPRs to encourage innovation and the diffusion of such technology to parts of the world that need it.

Because the subject of climate change is so complex, this comment tackles the issue of IPRs and climate change in two parts. First, this comment traces the development of the conflict between IPRs and climate change through world agreements. Second, this comment explores the possible ways in which IPRs and technology transfer can be harmonized in the context of climate change. This comment is neither exhaustive of the solutions available to combat climate change, nor is it an exhaustive account of climate change; it presents one facet of climate change—technology development and transfer—and posits possible remedies.

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5 Massachusetts v. EPA, 549 U.S. 497, 501 (2007).

6 *Climate Change Overview*, WORLD BANK, http://www.worldbank.org/en/topic/climatechange/overview (last updated Oct. 23, 2015); *see* Guanhong Wei, PREZI.COM, https://prezi.com/08van_44mdod/in-the-first-eight-months-of-2015-the-world-has-seen-more-t/ (last updated Nov. 23, 2015) (The World Bank notes, "Immediate global action is needed to slow the growth in greenhouse gas emissions this decade and to help countries prepare for a 2°C warmer world and adapt to changes that are already locked in.").

7 Justin Worland, *Climate Change Could Drive More Than 100 Million Into Poverty By 2030, Report Says*, TIME MAG. (Nov. 8, 2015), http://time.com/4104289/climate-change-poverty-world-bank/ (citing Stephanie Hallegatte et al., *Shock Waves Managing the Impacts of Climate Change on Poverty*, WORLD BANK GROUP (2016), https://openknowledge.worldbank.org/bitstream/handle/10986/22787/9781464806735.pdf (noting that "globally, poor households are more vulnerable to increases in food prices, and poor communities are often built in areas most susceptible to the risks of climate change like flooding.")).

Thus, the majority of this comment will discuss technologies that are best suited for responding to climate change through mitigation and adaptation. These two approaches to dealing with climate change involve the reduction and stabilization of GHGs and humanity's gradual adaptation to the climate change effects that are already irreversible.[8] Furthermore, this comment analyzes IPRs and climate change with the objective of reconciling the two to better human health.

## I. THE DEVELOPMENT OF TECHNOLOGY TRANSFER AND IPRS IN THE GLOBAL CONVERSATION

### A. The UNFCCC— The Beginning of the Global Conversation

The United Nations Framework on Climate Change Conference (UNFCCC) began the major global conversation on combating climate change.[9] Dating back to 1992, the UNFCCC is a global treaty—signed by 192 countries, including the U.S. and Russia—that seeks universal cooperation to address climate change.[10] The UNFCCC members acknowledged that "the largest share of historical and current global emissions of greenhouse gases has originated in developed countries."[11] Because of this imbalance in historical GHG contributions and the varying capabilities of each nation, the developed parties to the UNFCCC noted that addressing climate change would require different levels of commitment: the concept of common but differentiated responsibilities.[12]

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8 *Responding to Climate Change*, NASA, http://climate.nasa.gov/solutions/adaptation-mitigation/ (last updated Oct. 5, 2016).

9 *Background on the UNFCCC: The International Response to Climate Change*, UNITED NATIONS FRAMEWORK ON CLIMATE CHANGE, http://unfccc.int/essential_background/items/6031.php (last visited Aug. 4, 2016).

10 *Id.*

11 United Nations Framework Convention on Climate Change, 2, May 9, 1992, S. TREATY DOC. NO. 102–38, 1771 U.N.T.S. 107.

12 *Id.* at Art. 3.

The concept of common but differentiated responsibilities is based "upon both historical responsibility of States and differing capacities of states to address climate change."[13] In other words, the UNFCCC set out varying levels of responsibility among the parties depending on their historical contributions to climate change and their ability to address it.[14] As such, developed countries, because of their "technical and economic capacity to address climate change," took the lead role under the framework of the UNFCCC.[15]

To further delineate this differentiation of responsibility, the UNFCCC designated Annex I and non-Annex I parties, and a party's expected commitment level depended on its location within this designation.[16] Non-Annex I parties were those countries with developing economies, while Annex I parties were mostly developed countries.[17] Thus, the UNFCCC aimed to take a cooperative approach to addressing climate change, where the countries with the most resources—and typically the most historical pollution—would bear the most responsibility and be in charge of aiding other less-capable countries.[18]

The UNFCCC saw a clash between the interests of developed and developing countries regarding IPRs and the development, transfer, and implementation of clean technologies. The parties to the Conference resolved that developed countries, due to their advanced capabilities and access to resources, would facilitate the Transfer of Technology (TT) to aid developing countries.[19]

The conflict further developed along the proposed operation of the TT. Developing countries argued that "to implement the

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13 KELLY MCMANUS, THE PRINCIPLE OF 'COMMON BUT DIFFERENTIATED RESPONSIBILITY' AND THE UNFCCC 2, (Climatico Special Features 2009).

14 PIETER PAUW ET AL., DIFFERENT PERSPECTIVES ON DIFFERENTIATED RESPONSIBILITIES: A STATE OF THE ART REVIEW OF THE NOTION OF COMMON BUT DIFFERENTIATED RESPONSIBILITIES IN INTERNATIONAL NEGOTIATIONS 1 (German Dev. Inst. 2014).

15 MCMANUS, *supra* note 13, at 2.

16 *Parties and Observers*, UNITED NATIONS FRAMEWORK ON CLIMATE CHANGE, http://unfccc.int/parties_and_observers/items/2704.php (last visited Nov. 21, 2015).

17 *Id.*

18 PAUW ET AL., *supra* note 14, at 1.

19 United Nations Framework Convention on Climate Change, *supra* note 11, at Art. 4.

Convention, they needed access to environmentally sound technologies at an affordable cost."[20] As a result, they pushed for more lax TT rules that made it easier for Non-Annex I countries to have access to the technology and know-how of developed countries.[21] In fact, "in some cases [developing countries] even argu[ed] for 'assured access to technology or compulsory licensing'" on the part of developed countries.[22]

On the other hand, developed countries were concerned with the effects that lax rules would have on innovation and stressed "the need to protect intellectual property rights in order to preserve incentives for innovation."[23] Consequently, developed countries favored "technology cooperation rather than transfer."[24]

The conflict between the two groups centered on the availability of technology and its accessibility. In short, developing countries feared that their developed counter-parts would frustrate climate efforts by making access to adequate technology nearly impossible. On the other hand, developed countries were concerned that a reduction in IPRs would discourage innovation and slow down domestic technological development.

Ultimately, the two groups agreed on the following terms concerning TT in Section 4.5:

> The developed country Parties and other developed Parties included in Annex II shall take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, *or access to*, environmentally sound technologies and knowhow to other Parties, particularly developing country Parties, to enable them to implement the provisions of the Convention. In this process, the developed country Parties shall support the development and enhancement of endogenous capacities and technologies of developing country Parties.[25]

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20 MATTHEW RIMMER, INTELLECTUAL PROPERTY AND CLIMATE CHANGE: INVENTING CLEAN TECHNOLOGIES 42 (2011) (Quoting Daniel Bodansky (citation omitted)).

21 ENVIRONMENTAL TECHNOLOGIES, INTELLECTUAL PROPERTY AND CLIMATE CHANGE 66 (Abbe E.L. Brown ed., 2013) [hereinafter INTELLECTUAL PROPERTY].

22 RIMMER, *supra* note 20, at 42 (quoting Daniel Bodansky (citation omitted)).

23 *Id.*

24 *Id.*

25 United Nations Framework Convention on Climate Change, *supra* note 11, at Art. 4

Section 4.5 aims to reconcile both positions into a comprehensive scheme.[26] However, it closely follows the rest of the original UNFCCC in placing soft requirements on countries to actually comply with TT.[27] Because the UNFCCC itself "contains no enforcement mechanisms[,] . . . the treaty is considered legally non-binding."[28] Section 4.5—though arguably a step in the right direction—did not fully resolve the issue of TT.[29]

Despite its lack of strict enforcement mechanisms, the UNFCCC remains a significant treaty.[30] First, it provides the background framework for future climate change accords by setting goals that are universally accepted.[31] Second, it serves as an initial glimpse into the IPRs issues that would resurface in later conventions.[32] The UNFCCC began the global conversation on climate change and set the stage for future conventions, which the UNFCCC also accounted for in the form of structured meetings of the parties every set period of years.[33]

### B. The Kyoto Protocol, IPRs, and TT

The Kyoto Protocol ("Kyoto") was the next major development in the international response to climate change. Seeking to remedy the faults of the UNFCCC, the parties to the original UNFCCC met again in 1997 to discuss further steps to take in addressing climate change.[34]

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(emphasis added).

26 *See generally id.* (explaining that developed and developing countries have come up with a scheme concerning transfer of technology).

27 Xueman Wang & Glenn Wiser, *The Implementation and Compliance Regimes under the Climate Change Convention and Its Kyoto Protocol*, 11 REV. EUR. COMMUNITY & INT'L ENVTL. L. 181, 184 (2002).

28 *United Nations Framework Convention on Climate Change*, ENV'T & ECOLOGY, http://environment-ecology.com/climate-change/599-united-nations-framework-convention-on-climate-change.html (last visited Nov. 21, 2015) [hereinafter ENV'T & ECOLOGY].

29 *Id.*

30 Wang & Wiser, *supra* note 27, at 181.

31 INTELLECTUAL PROPERTY, *supra* note 21, at 85.

32 RIMMER, *supra* note 20, at 42–43.

33 *See generally* ENV'T & ECOLOGY, *supra* note 28 (The [UNFCCC] treaty provides for updates (called 'protocols') every five or so years to assess progress and develop new objectives based on changing circumstances).

34 UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, FACT SHEET: THE KYOTO

Of course, the issue of TT between developed and developing countries resurfaced. The final agreement of Kyoto illustrates the progress and compromises the parties made to build upon the UNFCCC. The agreement states that the parties will:

> Cooperate in the promotion of effective modalities for the development, application and diffusion of, and take all practicable steps to promote, facilitate and finance, as appropriate, the transfer of, or access to, environmentally sound technologies, know-how, practices and processes pertinent to climate change, in particular to developing countries, including the formulation of policies and programmes for the effective transfer of environmentally sound technologies that are publicly owned or in the public domain and the creation of an enabling environment for the private sector, to promote and enhance the transfer of, and access to, environmentally sound technologies.[35]

Kyoto is an example of a more bi-lateral approach to climate change. Noticeably, while the UNFCCC had placed most of the burden of developing technology on developed countries, the Kyoto Protocol emphasizes a more uniform approach in addressing climate change. Gone are UNFCCC words like "support." Instead Kyoto conspicuously notes that this new agreement will have all countries "cooperate" in addressing climate change.[36]

The Kyoto Protocol further delineated this cooperation by creating asymmetric duties for non-annex I and annex I parties that reassert the concept that developed countries, because they have historically contributed more to climate deterioration, must make more efforts to combat climate change.[37] While the UNFCCC was mostly silent with respect to developing countries taking an active role in addressing climate change, the Kyoto Protocol brought them to the forefront. Scholars note that Kyoto established that "[i]t is the responsibility of developing countries to develop in a sustainable manner and take measures to adapt to the effects of climate change."[38] Further, the

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PROTOCOL 1 (2011).

35 Kyoto Protocol to the United Nations Framework Convention on Climate Change, Art. 10(c), Dec. 11, 1997, U.N. Doc. FCCC/CP/1997/7/Add.1, 37 I.L.M. 22 (1998).

36 *See id.*

37 *See* FACT SHEET: THE KYOTO PROTOCOL, *supra* note 34, at 1.

38 MCMANUS, *supra* note 13, at 3.

Kyoto Protocol reaffirmed that the objective of developed countries was to "commit to mitigating their emissions."[39]

In short, Kyoto established clearer objectives for countries to combat climate change and made the process more cooperative. Still, there is a disjunction between the goal of transferring technology and the actual practicalities of such an endeavor. The former does not guarantee the latter. The UNFCCC also emphasized the "transfer of . . . environmentally sound technologies, [and] know-how" to developing countries.[40] Unfortunately, it did not provide a mechanism for doing so.[41]

Perhaps one of the most of innovative parts of the Kyoto Protocol is the Clean Development Mechanism (CDM). Contained in Article 12, the CDM establishes a mechanism where developed countries can make progress towards meeting their climate change goals by engaging in projects in developing countries that result in "certified emission reductions" in the latter.[42] Essentially, the CDM allows developed countries to fulfill their commitments—the mitigation of emissions—under the Kyoto Protocol by helping developing countries reduce their emissions.

The CDM itself established a framework by which developed countries can engage in environmental projects within developing countries. First, each party involved in the project must participate willingly.[43] In other words, both the host country and the investing (developed) country must want the particular environmental project.

Second, the project must yield "[r]eal, measurable, and long-term benefits related to the mitigation of climate change."[44] More than just a temporary solution for a global problem, the parties that engaged in projects in developing nations had to show that the project would actually provide tangible help to the developing country in combating climate change.

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39 *Id.*

40 Kyoto Protocol to the United Nations Framework Convention on Climate Change, *supra* note 35, at 8.

41 *Id.*

42 *Id.* at 15–16.

43 *Id.*

44 *Id.* at 12.

Lastly, the reduced emissions needed to be in addition to those that would have otherwise occurred without any intervention.[45] In other words, if the developing country would have reduced the same amount of GHGs with or without the proposed project of the developed country, then the project could not qualify under the CDM.

Following these requirements yields the following framework:[46] A developed country wants to engage in a CDM project to meet its commitment under the Kyoto Protocol. This developed country consults with a developing country and both agree to implement the proposed project. The project needs to yield a real, measurable, and long-term positive effect on the developing country.[47] Furthermore, it must yield a reduction in GHGs that is beyond what the developing country would reduce by itself.

Assuming the proposed project meets all three requirements, the developed country can move ahead with the project under the CDM. The CDM framework aims to produce the most effective projects. As such, the CDM requires each potential project to "qualify through a rigorous and public registration and issuance process."[48] Further, the CDM serves to "encourage firms in the private sector to contribute to emission reduction efforts through investments in developing countries."[49] In essence, successful cooperation between private firms and governments allows a win-win situation where firms gain business and governments benefit from the "less bureaucratic and more results-oriented approach" that firms make possible.[50] Thus, the CDM creates a process by which countries can more readily cooperate to combat climate change.

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45 *Id.*

46 *See generally* THE CLIMATE CHANGE WORKING GRP. AND AFRICAN TASK FORCE OF THE U.N.'S ENV'T PROGRAMME FIN. INITIATIVE, AND YET IT MOVES: SUCCESS STORIES AND DRIVERS OF CDM PROJECT DEVELOPMENT IN SUB-SAHARAN AFRICA (2011) (The report presents and examines the obstacles and implementation of multiple examples of successful CDM projects).

47 *Id.*

48 *Id.*

49 RIMMER, *supra* note 20, at 43.

50 U.N.'S ENV'T PROGRAMME, INTRODUCTION TO THE CDM 20 (2002), http://unfccc.int/files/cooperation_and_support/capacity_building/application/pdf/unepcdmintro.pdf (last visited Mar. 3, 2015).

While not a perfect solution, the CDM furthers the UNFCCC's attempt to reconcile the conflict between developed and developing countries concerning the transfer of green technology and IPRs. Not only that, if the UNFCCC marked a universal agreement that climate change was occurring and that something needed to be done about it, then Kyoto builds upon the words of the UNFCCC and calls for actual global action.

### C. Kyoto's Impact

As mentioned above, Kyoto focused on taking practical steps to combating climate change, with the focus on the "pragmatic objectives rather [than intractable] ideological disputes."[51] The major question becomes whether this new approach to combating climate change, having developed countries and developing countries cooperate through the CDM, has had any lasting positive effects.

It is difficult to determine what effects the CDM had at its start. Even scholars studying the CDM three years after Kyoto noted that the "possible uses of technology transfers [were] not well defined and not easily subjected to economic analysis."[52] Even today, the picture is not clear. There are mixed opinions on whether the Kyoto Protocol's CDM has led to any positive impact on climate change efforts. On the one hand, there are some who consider the implementation of the CDM a success, and estimate that by the end of the commitment period (Dec. 2012) the CDM led to "2 billion certified emissions reductions" and that its framework would "rally new funding for clean technologies."[53]

On the other hand, detractors have noted that by 2012 the "sum of emissions from nations with Kyoto targets ha[d] fallen significantly . . . [but] emissions in the rest of the world have increased sharply."[54] While the Kyoto Protocol and the CDM may have reduced the emissions from those who were parties to it, the increased emissions

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51 INTELLECTUAL PROPERTY, *supra* note 21, at 12.

52 Mustafa Babiker et al., *The Kyoto Protocol and Developing Countries,* 28 ENERGY POL'Y 525, 526 (2000).

53 INTELLECTUAL PROPERTY, *supra* note 21, at 132.

54 Duncan Clark, *Has the Kyoto Protocol made any difference to carbon emissions?*, GUARDIAN (Nov. 26, 2012, 5:39 AM), http://www.theguardian.com/environment/blog/2012/nov/26/kyoto-protocol-carbon-emissions.

from other nations, who were not subject to it, may have offset any gains.[55] Within Kyoto itself, not all nations received the same task of reducing emissions. Nonetheless, this does not mean that the CDM or Kyoto itself was a failure. If anything, the lesson that Kyoto teaches is that climate change requires more global cooperation than previously thought.

### D. Post Kyoto – The Ongoing Struggle of Technology Transfer Between Developed and Developing Countries

Kyoto took on the issue of TT and "significantly increased its role in climate change."[56] However, this does not mean that much progress has been made since Kyoto to harmonize IPRs and climate change. Rather than going through every convention since Kyoto, the UNFCCC convention at Cancun serves as a snapshot of the ongoing clash between developed and developing countries concerning the transfer of clean technologies.

At the Cancun convention, "the issue of IPRs was one of the most divisive in the technology negotiations."[57] The same conflict over making technology accessible while still protecting IPRs enough to foster innovation dominated discussions, with "developing countries [pressing] for considerations of IPRs as one of the possible barriers to technology transfer, whilst developed countries oppos[ed] such a view."[58]

Still, the conversation is not as muddy as it used to be. It has been over twenty years since the Kyoto Protocol was enacted, and even if some things were not clear then, the balance of technology is now more clearly one sided. A submission to the Technology Executive Committee, points to IPRs as being a barrier to the development and transfer of technology.[59] It notes that the majority of green technology

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55 As mentioned above, developing countries were not necessarily tasked with reducing emissions; rather Kyoto's restrictions on emissions were only really imposed on developed countries. Countries such as China, Russia, and India (some of the largest polluters today) were not—and still are not—part of the delineated developed countries. *See id.*

56 INTELLECTUAL PROPERTY, *supra* note 21, at 132.

57 *Id.* at 70 (quoting Abdel Latif (citation omitted)).

58 *Id.*

59 THIRD WORLD NETWORK, CLIMATE CHANGE AND TECHNOLOGY TRANSFER: ADDRESSING

patents are held by developed countries, and the rights of access to these technologies are impeded.[60] The report goes on to note that effective combating of climate change will require "worldwide deployment of climate friendly technologies."[61] In short, it is not enough for only developed countries to combat climate change.[62]

## II. POTENTIAL SOLUTIONS TO DEVELOPING AND ACCESSING CLEAN TECHNOLOGY

Climate Scientists at the University of Chicago warn that "there's not a lot of time to make changes," as the planet could experience significant changes if the Earth warms more than two degrees Celsius during this century.[63] As such, the following approaches are presented with the aim of looking for the most effective method to combat climate change through international cooperation.

### A. The Public Option—The Case for a Cross-Government Approach to Research

The first possible solution addresses the issue of IPRs in the development of green technology by avoiding IPRs altogether. This is the public option, an approach that deals with a concerted inter-governmental effort to innovate clean technologies. Much of the work required to mitigate and adapt to climate change is in research, i.e. discovering new green technologies.[64] While there are already green technologies available, more will be needed "to make fuels with nearly

INTELLECTUAL PROPERTY ISSUES 11 (2012).

60 *Id.* at 7.

61 *Id.* at 2.

62 *See* MCMANUS, *supra* note 13.

63 Koch, *supra* note 1 ("'We're halfway there,' Archer says, adding the planet could reach that mark as soon as 2040 if carbon emissions continue their current climb. 'This is just the fire alarm. This is not the fire,' he says, adding it will become costlier to cut emissions the closer the flames come.").

64 *See generally* Damon Beres, *Can Tech Stop Climate Change? We Asked an Expert*, HUFFINGTON POST (Dec. 14, 2015, 8:35 PM), http://www.huffingtonpost.com/entry/tech-climate-change_us_566f2719e4b0fccee16f7215.

zero emissions."[65] Consequently, public option revolves around the stimulation and encouragement of research and discovery of cleaner and more efficient technologies.

Interestingly, IPRs hardly pose a problem in the public option because cooperation and public policy are essential. In fact, even scholars who argue for strong IPRs as an incentive to increase research and development, "acknowledge that in the case of basic scientific research, State or charitable funding may be more effective."[66] Before tackling the complicated issue of IPRs, countries could, through the proper application of public policy, create an atmosphere that is conducive to the successful development of clean technologies.

China is an example of a country that creates an environment conducive to the successful development of clean technologies. In 2006, China surpassed the U.S. in $CO_2$ emissions, becoming the world's largest polluter.[67] Yet, by 2011 China's government was investing a lofty sum of over $50 billion into the research and development of clean energy every year.[68] In addition to this recurring investment, China created long-term incentives, "such as its target goal to get 20% of its energy from renewable sources by 2030."[69] These initiatives allowed China to become the top international location for green

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65 Koch, *supra* note 1 ("'The good news: We already know how to do a lot,' says Jane Long, who's leading the California Council on Science and Technology's study on how the state can meet its pledge to slash emissions 80% from 1990 levels by 2050. Even so, she says breakthrough technologies, requiring a public and private partnership, will be needed to make fuels with nearly zero emissions.").

66 IAN EAGLES & LOUISE LONGDIN, REFUSALS TO LICENSE INTELLECTUAL PROPERTY: TESTING THE LIMITS OF LAW AND ECONOMICS 104 (2011) (citing KENNETH J. ARROW, *Economic Welfare and the Allocation of Resources for Invention*, THE RATE AND DIRECTION OF INVENTIVE ACTIVITY: ECONOMIC AND SOCIAL FACTORS 609 (Nat'l Bureau of Economic Research, Princeton, 1962).

67 John Vidal & David Adam, *China Overtakes US as World's Biggest CO2 Emitter*, GUARDIAN (June 19, 2007, 1:23 PM), http://www.theguardian.com/environment/2007/jun/19/china.usnews.

68 Julio Friedmann, *How Chinese Innovation is Changing Green Technology*, FOREIGN AFF. (Dec. 13, 2011), https://www.foreignaffairs.com/articles/china/2011-12-13/how-chinese-innovation-changing-green-technology.

69 Steve Hargreaves, *China Trounces US in Green Energy Investments*, CNN MONEY (Apr. 17, 2013, 9:55 AM), http://money.cnn.com/2013/04/17/news/economy/china-green-energy/ (noting that "'When a country has a strong target and a consistent policy, investors will go invest,' said Phyllis Cuttino, director of the clean energy program at Pew.").

technology investments in 2012.[70] To date, China remains a major investor in green technology with solar energy being one of its fastest growing areas.[71] Perhaps it is too soon to determine whether this type of government action will be successful in spurring innovation in the long-term, but China shows no sign of slowing down its commitment.[72] China has already committed to spending $2.5 trillion over the next fifteen years.[73] In short, China is demonstrative of the positive effect that state investment can have on the research and development of cleaner technologies.

Furthermore, it is important to note that China's approach is not merely tossing money at the problem. Rather, it is employing a combination of monetary and public policy approaches.[74] The key concept of this comment is that one need not choose only a single approach to bolster clean technological development, rather this comment adheres to the contention that the solution to clean technological development will utilize multiple approaches. China's approach demonstrates that State involvement can make a difference in combating climate change through technological development.

### B. International Support Structures

Another public route to combating climate change through technological development is to act through an international agency. An arm of the United Nations, the World Intellectual Property Organization (WIPO), deals with Intellectual Property (IP) and focuses

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70 *Id.*

71 Eva Grey, *China's Energy Revolution*, POWER TECHNOLOGY.COM (Aug. 11, 2015), http://www.power-technology.com/features/featurechinas-energy-revolution-4643231/ ("[A]ccording to the head of the International Energy Agency (IEA), China 'deserves more credit' for its renewable efforts. Speaking to the BBC, Maria van der Hoeven brought home a less-known fact about the country's approach to energy production: China is the world's biggest investor in clean energy, with more funds spent on renewable sources than the US and Europe put together.").

72 *See* Elizabeth C. Economy, *China's Environmental Challenge: Political, Social, and Economic Implications*, COUNCIL ON FOREIGN REL. (Jan. 27, 2003), http://www.cfr.org/china/chinas-environmental-challenge-political-social-economic-implications/p5573.

73 Kenneth Rapoza, *China to Spend Trillions on 'Green Tech'*, FORBES (Aug. 11, 2015, 9:32 AM), http://www.forbes.com/sites/kenrapoza/2015/08/11/china-to-spend-trillions-on-green-tech/#27736c596356398480896356.

74 *See supra* notes 66–69.

on developing a "balanced and accessible international intellectual property system, which rewards creativity, stimulates innovation, and contributes to economic development while safeguarding the public interest."[75] WIPO's intrinsic reason *d'être* is to balance IPRs and the needs of humanity, which makes it the ideal international agency to tackle the development of clean technologies.[76] Indeed, many consider WIPO to be the agency with the relevant expertise when it comes to IP.[77]

The most significant advantage of WIPO's involvement comes from the agency's ability to implement programs beyond the local level. As discussed above, one of the problems that arises in combating climate change is that newer and cleaner technology sometimes does not reach the places where it is needed the most—developing countries. While localized efforts (such as China's example) may help an individual country develop cleaner technology, this does not mean that the new technologies reach the international stage. Thus, one of WIPO's powers is the ability to establish Technology Transfer Offices (TTOs) within individual countries to facilitate technology transfer and further cross-country cooperation.[78] These TTOs allow WIPO to encourage and aid with innovation at a local level—at universities and research organizations within countries.[79]

There are both positive and negative implications to TTOs. On the one hand, TTOs have been proven to help stimulate local economies through increased research development.[80] However, developing

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75 INTELLECTUAL PROPERTY, *supra* note 21, at 97.

76 *See id.*

77 *Id.*

78 TOM PETER MIGUN OGADA, METHODOLOGY FOR THE DEV. OF NAT'L INTELLECTUAL PROP. 38 (2016), http://www.wipo.int/edocs/pubdocs/en/wipo_pub_958_3.pdf.

79 See *id*.

80 *Id.* ("During fiscal year 2008, 595 companies were created on foot of research carried out in US universities, according to the AUTM U.S. Licensing Activity Survey: FY2008, released by the Association of University Technology Managers, Deerfield, Illinois. Almost three-fourths (72[%]) of these companies confirmed their primary place of business as being within the university's home state—further evidence that university TTOs also contribute to local economic development.").

countries must still face and overcome several barriers to fully benefit from establishing TTOs.[81]

While TTOs may stimulate technological development in different countries, this does not mean that those technologies are then transferred between countries. The main objective of TTOs remains "to improve the dissemination of knowledge . . . in order to grow the economy and create both jobs and new enterprises" of their country of residence.[82] Further, the cost of maintaining a TTO is significant, as most require "a period of eight to ten years" in order to "generate a sufficient income to sustain [their] operating costs and yield a dividend."[83] This means that many countries with fewer financial resources are not able to access a TTO.[84] Thus, TTOs do not provide the complete answer to dealing with the development of cleaner technologies, but they at least set the groundwork for what an international agency—with expanded funding—could do.

WIPO's international usefulness is further demonstrated by its ability to help mediate disputes across borders through its "dispute resolution services."[85] WIPO has been criticized as being an agency that places too much emphasis on the strengthening of IPRs at the expense of serving humanity's needs.[86] However, WIPO's international scope allows for the agency to play at least a supporting role in the development of cleaner technologies, because of the malleability of the support services that it provides.

In particular, its dispute resolution support services "can be specifically targeted to disputes arising in the transfer of 'green'

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81 *Id.* at 21.

82 *Id.* at 40 (Although, WIPO does provide licensing assistance through its technology licensing offices. *See id.* at 38).

83 *Id.*

84 OGADA, *supra* note 78, at 40 ("For example, a developed country's invention disclosure rate of 40 to 50 per 100 million US dollars of research expenditure may serve as a deterrent to establishing TTOs in a developing country which has a meager research budget.").

85 *WIPO's Contribution to Meeting the Challenges of Climate Change*, WORLD INTELL. PROP. ORG., http://www.wipo.int/about-wipo/en/climate_change_conf_09.html (last visited Oct. 14, 2015).

86 RIMMER, *supra* note 20, at 147–151.

technologies."[87] The boldest claim in this Comment may very well be that WIPO is a sleeping giant in the world of clean technology development. Though WIPO may not be prepared to take the lead role on a local level, the structure of WIPO makes it uniquely suited to facilitate communication and transfer of clean technologies across countries.[88]

### C. Structured Competition—The Next Big Thing

Because the issue of climate change is something that affects us all, we either all benefit from solving it or we all suffer the consequences of ignoring it. Therefore, a concerted and structured effort may yield better results than various isolated policies. Rather than leaving each country and company to determine the best way to develop clean technologies, a structured collaboration of nations could more readily focus global resources into a concentrated research and development effort. This could be accomplished by avoiding needless "duplication of effort among nations," and by making up for any "lack of alignment of expertise."[89]

Such a concerted effort may seem contrary to the competitive nature of the modern world, but Rimmer presents an instance of international cooperation: the Manhattan Project. Undertaken in the middle of World War II, the Manhattan Project is an example of "an international collaboration hosted by the United States, generating the first atomic weapons and developing the technology for nuclear power."[90]

It is not entirely radical or novel to believe that such a concerted effort could be both possible and successful. Indeed, scholars have grappled with this possibility since 2006, but not all the analysis has been positive.[91] The most compelling argument in Yang's essay against

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87 *WIPO's Contribution to Meeting the Challenges of Climate Change*, *supra* note 85.

88 *Id.* (As examples, look to WIPO's ability to "provide capacity building support for the management and transfer of technologies reducing greenhouse gas emissions, including assistance in drafting IP clauses in technology transfer agreements" and its ability to "serve as the international forum for IP and technology transfer discussions.").

89 INTELLECTUAL PROPERTY, *supra* note 21, at 49.

90 *Id.* at 50.

91 Chi-Jen Yang, *A "Manhattan Project" for Climate Change?*, CLIMATE CHANGE, Jan. 2007, at 199,

a "Manhattan project for climate change" is that "[t]he lack of market demand is the greatest barrier for innovations in greenhouse gas mitigation technology."[92] In other words, the concern has been that the technologies developed in a Manhattan Project-like effort will not survive in the market. The fear is that if the market does not have a need for these cleaner technologies, then they will prove to be failures.

Still, by 2010, this concept began to change as scientists and scholars stressed the urgency of climate change and expressed their discontent with world progress.[93] These scholars see international treaties and accords, such as the Kyoto Protocol, as yielding only "many speeches and grandiose commitments" while leading to "no real change in the situation that will only get worse."[94] If international commitments are not doing enough, then a concerted effort to tackle the problem directly and definitively may very well be a welcomed change of pace.

The idea that a "New Manhattan Project" could provide the best solution to climate change technological development seems to only have increased in recent years.[95] Essentially, the appeal of this possible solution to the development of technologies that combat climate change lies in the belief that a controlled approach focuses all energy

203 (noting that "[t]he symbolism of the Manhattan Project is powerful yet its application to greenhouse gases is a serious mistake because it fails to reflect the broader socioeconomic context of the climate problem.").

92 *Id.* (Yang demonstrates a preference for addressing climate change through international agreements like the Kyoto Protocol and notes that "[u]sing a Manhattan Project for climate change as a metaphoric alternative to the Kyoto Protocol is likely to deflect policymakers in counterproductive directions.").

93 Michael Intriligator & Dagobert Brito, *Why We Need a New Manhattan Project to Address Climate Change*, HUFFINGTON POST, http://www.huffingtonpost.com/michael-d-intriligator/why-we-need-a-new-manhatt_b_544464.html (last updated May 25, 2011).

94 *Id.*

95 *See* Naomi Oreskes, *We Need a New Manhattan Project to Deal with Climate Change*, N.Y. TIMES (Nov. 14, 2013), http://www.nytimes.com/roomfordebate/2013/11/14/is-nuclear-power-the-answer-to-climate-change/we-need-a-new-manhattan-project-to-deal-with-climate-change (noting that "[t]he approach taken [in the Manhattan Project] was not to decide in advance which technological approach was most likely to succeed, but to try them all . . . it worked."); *see also* Tom Delay, *Why is There no Manhattan Project to Tackle Climate Change?*, GUARDIAN (Mar. 11, 2014), http://www.theguardian.com/environment/blog/2014/mar/11/why-no-manhattan-project-climate-change (arguing that humanity must "build a new consensus forged around the belief that we can deliver technological solutions to climate change and these solutions will deliver economic prosperity in the long-term.").

and resources into a prioritized area. To drive innovation, "[a] central government or sponsor funding attracts research efforts and structures competition and encourages collaboration amongst researchers."[96] Such a project would require many nations agreeing to work together for the common good, similar to the United Nations—whose success record is rather mixed.[97] But this does not mean that such global cooperation is impossible.[98]

Once a program like the Manhattan Project gets off the ground, humanity should see progress in clean technological development because this accumulation of international resources can target issues that are "beyond the innovative capacity of the individual nation-states participating in resolution of the targeted programs."[99] Regardless of its viability, this possible solution continues to gain traction. Bill Gates, the Microsoft billionaire, renewed the call for an international concerted effort in a 2015 interview.[100]

Gates argues that in order to survive, "human beings [must] invent their way out of the coming collision with planetary climate change."[101] He went on to note that this concerted effort to "invent ourselves out of climate change" must be larger than the Manhattan Project, pointing out that the Manhattan Project had only one objective: to develop nuclear capabilities.[102] On the other hand, due to the variety of ways in which climate change affects humanity—through ocean acidification, air quality, etc.—the international concerted effort needs a higher degree of cooperation and investment.[103]

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96 INTELLECTUAL PROPERTY, *supra* note 21, at 50.

97 *See* Richard Spencer, *UN at 70: Five Greatest Successes and Failures*, TELEGRAPH (Sept. 15, 2015, 7:00 AM), http://www.telegraph.co.uk/news/worldnews/europe/switzerland/11700969/UN-at-70-Five-greatest-successes-and-failures.html.

98 *Id.*

99 INTELLECTUAL PROPERTY, *supra* note 21, at 50.

100 James Bennet, *'We Need an Energy Miracle,'* ATLANTIC, Nov. 2015, http://www.theatlantic.com/magazine/archive/2015/11/we-need-an-energy-miracle/407881/.

101 *Id.*

102 *Id.*

103 *Id.* (Gates explains that "what we're asking ourselves to do here is change energy—and that includes all of transport, all of electricity, all of household usage, and all of industrial usage. And those are all huge areas of usage . . . [t]here's opportunities to conserve that are really good. But the world is going to consume much more energy [thirty] years from now than it

Still, Gates and others remain optimistic that such an international effort will happen. This Comment posits that an international concerted effort to develop clean technology to combat climate change is the Schrodinger's cat of all the possible solutions presented here: it exists and does not exist at the same time. In other words, it is both encouraging to imagine the progress that such a program could achieve and discouraging to consider humanity's recent cooperation record. Nonetheless, Gates serves as evidence that the possibility of this solution is still very much alive and seems to only be increasing.

### D. The Patent Commons—A Public-Collaboration of Private Industry

The final possible solution covered by this comment lies in the initiative of private companies to collaborate for the public good, through participation in a Patent Commons—a collection of useable patents contributed by corporations. One example of this is the Eco-Patent Commons (EPC) initiative created by a handful of private companies, including Sony and IBM, in 2008.[104] The EPC is a place where companies can post their patents, "for free use by anyone," and it was "designed to facilitate the use of existing innovation that is protective of the environment, and encourages collaboration for new innovation."[105]

In other words, the EPC was created with the aim of establishing a repository of useable technologies that could help combat climate change and encourage even further innovation in clean technologies.[106] However, even at the time, it was unclear how such a system could work, whether many companies would in fact be willing to participate, and what types of technologies participating companies

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does today.").

104 *See generally About the Eco-Patent Commons*, ECO-PATENT COMMONS, https://ecopatentcommons.org/about-eco-patent-commons (last visited Oct. 15, 2015).

105 *The Eco-Patent Commons*, ECO-PATENT COMMONS, https://ecopatentcommons.org/ (last visited Oct. 15, 2015).

106 *About the Eco-Patent Commons, supra* note 104 (noting that the mission of the Eco-Patent Commons is "*to manage a collection of patents pledged for unencumbered use by companies and intellectual property rights holders around the world to make it easier and faster to innovate and implement industrial processes that improve and protect the global environment.*").

would in fact contribute to the EPC.[107] The obvious concerns are that companies will simply not participate or that they will participate but contribute relatively useless technologies.

Indeed, scholars have found that the technologies available in the EPC typically fall within one of two categories. First, the companies who post patents on the EPC, "grant royalty-free access to potentially useful, although only moderately valuable, green patents that cover technologies they are not able to use [themselves]."[108] A University of California, Berkeley study found that companies tend to contribute patents that could be useful in the development of clean technology.[109] However, the patents are not very valuable.[110]

Second, the patents that companies contribute to the EPC come with a caveat. These patents, are "derivative of previous technologies and somewhat narrower . . . suggesting that they are not for very radical inventions."[111] Thus, it seems that companies have been willing to participate in a program like the EPC, but they are cautious not to contribute anything that could lead to a major breakthrough in clean technology and cause them to lose out on the fruits of that innovation.

Instead, they play it safe and present patents similar to previous technologies that will not radically change the field. As such, the overall impact of the EPC on clean technological development has been very tepid.[112] Indeed, the setback of creating a program like the EPC is that companies may not necessarily contribute the most useful technologies. Still, if companies can seriously commit to the program, by promoting the patents that they post and suggesting applications of those patents, scholars at Berkeley believe that a program like the EPC can encourage innovation by "attract[ing] collaborators and

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107 Krishna Srinivas, *Sink or Swim: Eco-patent Commons and the Transfer for Environmentally Sustainable Technologies*, BIORES, May 2008, at 2.

108 Bronwyn Hall & Christian Helmers, *Innovation and Diffusion of Clean/Green Technology: Can Patent Commons Help?*, 66 J. ENVTL. ECON. & MGMT. 33, 48 (2013).

109 *Id.* at 47–48 (The patents that companies contribute to the EPC are not their worst patents, as they "are largely indistinguishable from the average patent of a pledging firm's portfolio.").

110 *See id.* at 48.

111 *Id.*

112 *See id.*

encourag[ing] exchange."[113] So, while it is still too early to determine whether the EPC will prove to be a success or a failure, the basic idea of having a common pool of technologies is, thus far, a good one.

Furthermore, recent events have revitalized the idea of a private collaboration in the form of a patent-commons. In 2014, Elon Musk made his Tesla patents available to the public, "in the spirit of the open source movement, for the advancement of electric vehicle technology."[114] Musk stated that he wanted to promote a shift to electric cars, noting that, "people [don't really] appreciate the gravity of what is going on [and] . . . how much inertia the climate has."[115] Whether one considers the EPC a success or not, the idea of an open commons is certainly gaining momentum. However, Musk has taken his own approach to this concept.

From a financial perspective, Musk noted that Tesla aimed to stay at the forefront of the industry by continuing to further innovate their cars, thereby making the release of the Tesla patents a catalyst to increase "the velocity of innovation."[116] The idea is that a patent commons (a common pool of available technologies for all to use and build upon) can benefit the contributing companies because, if the patent is a good one (such as the Tesla patent), then it will drive market adoption, generating more business for the company.

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113 *See id.*

114 Elon Musk, *All Our Patent Are Belong to You*, TESLA MOTORS (June 12, 2014), http://www.teslamotors.com/blog/all-our-patent-are-belong-you (Musk wrote in his letter to the public, "When I [Musk] started out with my first company, Zip2, I thought patents were a good thing and worked hard to obtain them. And maybe they were good long ago, but too often these days they serve merely to stifle progress, entrench the positions of giant corporations and enrich those in the legal profession, rather than the actual inventors . . . [t]echnology leadership is not defined by patents . . . but rather by the ability of a company to attract and motivate the world's most talented engineers. We [Tesla] believe that applying the open source philosophy to our patents will strengthen rather than diminish Tesla's position in this regard.").

115 Ashlee Vance, *Why Elon Musk Just Opened Tesla's Patents to His Biggest Rivals*, BLOOMBERG BUS. (June 12, 2014), http://www.bloomberg.com/bw/articles/2014-06-12/why-elon-musk-just-opened-teslas-patents-to-his-biggest-rivals.

116 *Id.* (noting that "Musk would like to see the industry step up its game and move from treating electric vehicles like a hobby to making them a top priority.").

Furthermore, Toyota announced in early 2015 that it would also make available 5,650 patents relating to hydrogen-fuel cars.[117] Much like Tesla, Toyota's move aims to sway the market to adopt a new form of technology.[118] To conclude, patent commons, although their effects are not yet determinable, may prove to be the perfect vehicle for corporate action in the development of clean technology. Patent commons could be advantageous for both companies wanting to push the market in a certain technological direction, and for the public in need of cleaner technologies to combat and adapt to climate change.

## CONCLUSION

The issues of intellectual property rights and sustainable development have been steadily positioning themselves at the center of climate change negotiations. The Kyoto Protocol developed the first real mechanism that attempted to harmonize both issues. However, a more aggressive and collaborative approach is needed to fully prepare humanity to combat and adapt to climate change. There is no reason to think we are limited to only the solutions presented in this comment. In fact, what this comment advocates for is a concerted effort across multiple nations to encourage the development of clean technologies. Thus, a combination of approaches would probably be the most effective and comprehensive way to push humanity in the right direction by encouraging innovation across public and private sectors on an international scale.

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117 Richard Chirgwin, *Toyota to Tesla: We can Play the Free Patent Game as Well*, REGISTER (Jan. 7, 2015), http://www.theregister.co.uk/2015/01/07/toyota_to_tesla_we_can_play_the_free_patent_game_as_well/.

118 *Id*. (Toyota noted that a successful launch of hydrogen fuel cell vehicles will require "a concerted and unconventional collaboration between automakers, government regulators, academia, and energy providers.").