# 1AC v USC KS – Harvard Doubles

## 1AC – Harvard

### Plan

#### Plan: The United States federal government should prohibit the refusal to license climate mitigation and adaptation technologies as an anticompetitive business practice.

### Solvency

#### The SQ denies antitrust remedies for patent abuse

Gunderson 14 [Adam, practicing attorney at the Gunderson Law Group, “Protecting the Environment by Addressing Market Failure in Intellectual Property Law: Why Compulsory Licensing of Green Technologies Might Make Sense in the United States: A Balancing Approach,” *BYU Law Review* 2014.3, p.679-81, JCR]

Concern over patent suppression is not hypothetical. There have been a number of documented cases in which this phenomenon has taken place. In each case, patent suppression has been a means of hindering the progress of new technologies. Inasmuch as patent law is authorized under the Constitution in order to “promote the progress science and the useful arts,” patent suppression—whereby patent holders purposefully acquire patents only to prohibit their use or development—is contrary to that purpose and represents a clear abuse of that law. This section briefly explores a few examples of patent suppression and explains how the current legal framework of intellectual property [IP] and antitrust law is generally insufficient to stop the abuse. Perhaps one of the most well-known examples of patent suppression was brought to the forefront of public attention by the film Who Killed the Electric Car. 42 This documentary details the development and eventual suppression of battery technology capable of powering zero-emission automobiles.43 According to the documentary, General Motors acquired a small battery technology company, Ovonics—which had made tremendous advances in battery technology—and began to develop an electric car that would eventually be named the EV-1.44 When California’s political climate and the looming threats of burdensome regulations made GM nervous about the timing of the technology’s release, Texaco (which was soon after acquired by Chevron) stepped in and purchased the rights to the battery technology in order to suppress it.45 Another example occurred in the light bulb industry in the early 1900s.46 General Electric, which had a large stake in the incandescent light bulb industry, purchased the patent for a moreefficient fluorescent light bulb.47 In order to maximize its profits for the incandescent light bulbs, General Electric sat on the patent for the fluorescent lights, refusing to either bring the technology to market itself or to license the technology to other market participants.48 Not until Sylvania, another electronics company, successfully marketed a similar technology did General Electric begin to use its patented florescent light bulb technology.49 Bell Telephone also implemented patent suppression techniques in order to preserve the status quo.50 A 1920s investigation by the federal government found that Bell Telephone had purchased and suppressed over 3,000 patents.51 Bell had developed a practice of acquiring patents for the sole purpose of keeping those technologies out of the hands of their competitors.52 The law regarding patent suppression has not always been clear and while it appears that antitrust remedies may be available as a means of preventing some instances of patent suppression, such remedies are still not generally available.53 In 1886, a federal district court held that a patent holder could only be guaranteed legal protection of its patent if the holder was actually using the patented technology.54 However, in 1908, the U.S. Supreme Court held that patent non-use does not foreclose the patent holder’s right to protection under the law.55 With the birth of antitrust law, new remedies became available to stop anticompetitive behavior through which powerful companies tried to eliminate competition.56 While it may appear that patent suppression would fall into this category of behavior, courts have demonstrated an unwillingness to apply antitrust remedies to cases of patent suppression.57 For example, in SCM v. Xerox, the Supreme Court held that so long as a patent is acquired legally, it is not a violation of antitrust law to use the patent to the “full extent allowed under patent law,” which includes preventing third parties from using a technology, even when the patent holder itself is not using the patented technology.58 The holding of this case has been followed in subsequent decisions and is still good law.59 Thus, despite the similarities between patent suppression and those problems generally meant to be addressed by antitrust laws, it seems that antitrust law by itself is insufficient to stop patent suppression.

#### Federal action on climate patent monopolization is a prereq to innovation and development

Cayton 20 [Samuel, Adjunct Prof at Seattle Univ School of Law, legal intern at the Media Law Group, “The ‘Green Patent Paradox’ and Fair Use: The Intellectual Property Solution to Fight Climate Change,” *Seattle Journal of Technology, Environmental & Innovation Law* 11.1, p.239-45, JCR]

Congress has the constitutional authority to create laws that advance the development of technology through patents.197 Therefore, the optimal step to promote the use of green patents is to pass a federal law that provides a defense to patent infringement for green technology. While fair use is not codified in any form within Title 35 of the U.S. Code, Congress has enacted patent provisions tailored for specific purposes that involve loosening patent protection for the rightsholder.198 For instance, the Patent Act permits infringement where secondary use is part of a process to obtain approval of a new drug from the Federal Drug Administration.199 Additionally, the Act limits a patentee’s ability to recover damages when a patented invention is used in a medical or surgical procedure.200 These statutory exceptions to patent infringement reflect the notion that American society values technologies that provide a public health benefit, even if it is at the expense of a patent holder’s right to exclude.201 To ensure that the policy motives around green technology in the American industries are captured, Congress should engage in extensive fact-finding through congressional hearings and research. A bill from either chamber should incorporate the international consensus that climate change is a global threat to the planet that also has the potential to jeopardize public health.202 It should also make clear that climate change is anthropogenic and has accelerated in part due to environmentally hazardous industrialization.203 Furthermore, the bill should capture factual findings that touch on the following: that technological innovation plays a vital role in mitigating the effects of climate change;204 that a mass expansion of environmentally sustainable technology is needed to substitute the environmentally hazardous technologies;205 and that altering the U.S. patent law is a necessary action to promote this expansion.206 These findings should also qualify that patent holders’ incentives are equally important to the development of an environmentally sustainable economy.207 The elements of fair use in the law should not only be specific enough to guide the courts in their analysis of whether the secondary user is privileged as a fair user of a green patent but also general enough to provide a working template for courts to use in infringement suits. Even if Congress does not implement a fair use doctrine for green patents–a probable scenario given its current state of dysfunction–the federal court system is also authorized to intervene on its own. Two justifications permit the courts to allow fair use in patent law: first, fair use in copyright law was originally judicially created208 before Congress codified it,209 and, second, federal courts have already ruled on patent infringement cases with outcomes that favor continued use by second-comers as seen in eBay and Paice. 210 Whether or not the primary authority comes from the legislature, courts should undergo the following analysis in its fair use defense: (1) Does the patent at issue cover a field of green technology? The first part of the analysis requires courts to determine whether the patent at issue covers environmental sustainability or protection. To properly guide their analysis, the courts would benefit from having Congress enumerate a non-exhaustive list of industries that can utilize a fair use defense, such as alternative energies, fuel-efficiency, GHG and pollution reductions, and so on. Nevertheless, courts are equally capable of making their own determination. (2) If the patent covers green technology, and the second-comer infringes on its use, is that user privileged as a fair user? Under this prong, the court will assess several considerations regarding the patent regime, much like Dean Emerita O’Rourke’s aforementioned proposal. However, the factors for this green patent fair use proposal will be tailored to capture the considerations of green technology industries. Although Congress should enumerate these factors into the law, the court can further develop and define them: (1) the market potential; (2) the patentee’s developments; (3) the purpose and nature of the secondary use; and (4) the interests of the patentee and industry. First, the court should consider the potential market impact of the patented technology at issue. To adequately assess this factor, experts in technological fields can testify in federal infringement suits and make reasonable valuations of the patented technology’s capabilities in the market. This judicial assessment can reveal the untapped potential that may justify secondary use. Second, the court should evaluate the patentee’s developments of each patent. This part of the test will determine whether the patentee is sitting on the patent or whether they are capitalizing on its potential found in factor one. This step in the test aims to remedy the concerns around the Green Patent Paradox by determining whether the patent holder is making the best use of the patent. If the patentee has no intention of using their patent to fill the market demand, then this factor would weigh strongly in favor of its fair use. Third, the court should look at the purpose and nature of the second-comer’s advance on the technology. This factor combines two of Dean Emerita O’Rourke’s factors211 and prompts the court to look at the secondary use itself. However, this part of the test is more tailored to the innovations in green technology. Ultimately, the crux of this factor is determining whether the secondary user’s use of the technology is meant to provide positive results for the sustainability market. For example, using lucrative solar panel technology that achieves an environmentally beneficial purpose can be deemed fairer than using an eco-friendly pet product that may be in a smaller potential market. Additionally, if the secondary user is mainly striving to achieve a particular sustainability standard for their innovative pursuit, rather than directly compete with the patent holder in the market, then this factor would weigh in favor of secondary use. Finally, the court should analyze whether permitting secondary use would drastically impact the interests of the patent holder or the green technology industry at large. Here, a court should consider the incentives, resources, and commercial interests of the patentee as well as the interests of the relevant green technology industries. If the patent holder has a legitimate reason to hold onto their patent rights, this factor would weigh strongly in favor of excluding the second-comer from using the technology without a license. Otherwise, this factor should be equally weighed together with the other three factors. (3) If the secondary user is a fair user, does justice require compensation for the patent holder? Because the second part of this proposal imposes a heightened standard against the patentee’s incentives, court-ordered royalties should remain an option much like Dean Emerita O’Rourke’s proposal.212 This part of the test recognizes that the fair use assessment is binary: secondary use of the green patent is either allowed or not allowed. Thus, awarding a modest, reasonable amount of royalties can offset any grievances that may arise if the patentee loses their exclusive right over the green patent at issue. Because the four factors in the second prong of this proposal are more strictly applied against the patent holder, rather than imposing the same four factors as Dean Emerita O’Rourke proposes, the court should instead determine on its own whether royalties should be awarded. However, depending on the capital and resources of the secondary user, these royalties should be limited so as not to chill the subsequent implementation of the green technology. B. Further Considerations This technology-specific proposal is designed to speed the process of implementing green technology in the U.S. while still recognizing that the patent scheme is inherently designed to promote innovation. Once secondary users are permitted to use patented green technology, they can actively work toward bringing the U.S. into a sustainable economy without fear of infringement action. Ultimately, the issues raised by the Green Patent Paradox would be resolved by this proposal, which seeks to streamline and advance outside innovation while ensuring patent holders arer sufficiently compensated. However, with any proposal, several considerations remain to be addressed. 1. The Patentee’s Rights Although this proposal directly addresses concerns surrounding the climate crisis, it must be acknowledged that many scholars are skeptical of both the expansion of patent rights beyond the patentee and the impact it would have on the patent incentive scheme.213 Patentees in the field of green technology have a particular incentive to hold onto their rights, especially companies with larger carbon footprints.214 Moreover, fair use of patented green technologies, unlike certain transformative uses of copyrighted works, would almost always be for commercial purposes. However, the overarching goal of this proposal is to change the dynamics within the green technology industry. As Dean Emerita O’Rourke points out, fair use would promote standard-setting whereby companies can set their own guidelines regarding the allocation of their intellectual property based on reasonable terms.215 Moreover, it would serve as a bargaining chip for licensing, which can reduce the royalty rate for second-comers.216 Hence, as this proposal promotes sharing within the private sector, companies can work together toward the common goal of combatting climate change. Another consideration involves whether to allow fair use if the patentee specifically refuses to license their patent to the infringer. In copyright law, a fair user of copyrighted work is still allowed to go forward with their derivative creation, regardless of whether the rightsholder denied that user permission.217 In recognition of the existential threat posed by the climate crisis, patent law should follow suit and bypass this potential concern. As previously mentioned, a patentee’s reasoning behind the refusal to license can be considered in the assessment of fair use or whether ongoing royalties should be awarded. 2. Implementation Additionally, even with fair use in patent law, the ITC’s independence from the federal judiciary remains a concern for expanding green technology to the market. Because of its independence, it is unknown whether it would incorporate fair use into its investigations, and thus, a plaintiff who loses in court may still use this alternate forum to preclude secondary use.218 To prevent a patent holder from utilizing other avenues to curb secondary use, this proposal will include guidelines on congressional action that would help establish boundaries on what the ITC can investigate regarding green technology. While it conducts its investigations, the ITC should recognize the global threat of climate change. Furthermore, because patents and trade secrets can protect the same subject matter,219 a prospective inventor could seek trade secret protection for their intellectual property to avoid the prospect of fair use by others.220 Thus, rather than apply for a patent, an inventor or company that invents a novel green technology could employ security measures to keep their idea secret and, in effect, the schematics of the invention would never reach public view and society would not benefit. However, trade secrets have their downsides as they can be difficult to enforce and risk losing their protections if others utilize the same idea.221 Additionally, from an investor’s perspective, the value of a patent is more tangible than the value of a trade secret.222 This realization is an important distinction given that green technology is a capital-intensive industry.223 Moreover, inventors in green technology industries can benefit from having their works made public because in the long run because public access “can support the diffusion and adaptation of existing green technologies that are in the public domain.”224 Lastly, concerns around timing need to be addressed. If Congress does not codify this proposal and leaves any developments to the courts, expansions of green technology will not accelerate at a necessary rate. Instead, a judicially created fair use doctrine for patent law may merely provide incremental change to green patents at best as it would only develop case-by-case through individual lawsuits.225 Regardless of whether federal institutions will initiate this proposal, industries at large should still strive to advance green technology at a rapid pace. Although inventors and entrepreneurs risk becoming defendants to patent infringement suits, eBay remains a shield for their technologies’ continued development.226 Eventually, the climate crisis’s growing threat will pressure the U.S. to tolerate transfers of patented green technology so that such technologies receive their highest and best use at the lowest cost to the patent holders and other users The world faces an imminent threat from climate change that requires drastic structural attention. The U.S. has always led the world in promoting and preserving global security, but political gridlock within the nation could stall the massive changes to steer the world in the right direction. Fortunately, the private sector has an equally important role and duty in the pursuit to reform various industries. However, while industry and entrepreneurship can further develop necessary green technology, a comprehensive transformation in the U.S. patent regime must take place in order to fix the inherent issues around secondary innovations. The Green Patent Paradox demonstrates that the patent system impedes innovation by allowing rights’ holders to sit on their patent rights further slowing the transition to an environmentally sustainable economy. Although eBay is a victory in that it helps encourage continued use of other patent holder’s green patents, the ITC functions as a loophole for patent holders who want to halt secondary users or pressure them to take unwanted licensing agreements. The public and private sectors have both revealed possible solutions in the wake of the climate crisis. While the public sector can fix the patent regime through various means, these solutions either have substantial barriers to becoming reality or pose implementation issues that inhibit inventor incentives. Even with goodwill gestures from large companies, not all businesses are positioned to donate their intellectual property. The doctrine of fair use does not exist in patent law under conceivable rationales even though many viable justifications support its application. However, the lurking effects of the climate crisis demonstrate the societal need to implement a system that tolerates secondary uses of patented green technologies.

#### The innovation disad doesn’t apply to new areas of research like climate tech – patent accessibility is key

Bernardini 21 [Jessica, JD from Lewis & Clark Law School, works at the small business legal clinic at the Patent Program at Lewis & Clark Law School, registered Professional Engineer and engineering consultant with focus on renewable energy development, “Leveraging Mandatory Licensing Under the Clean Air Act – A Novel Framework to Domestic Reduction of Greenhouse Gases,” *Environmental Law* 51.1, p.324-8, JCR]

The use of compulsory licensing would be especially valuable for forcing a patentee to work a patent in an area that is relatively new. Opponents of compulsory licensing believe it will reduce incentive for innovation and encourage inventors to maintain their knowledge as a trade secret rather than disclose through patents.153 And while obtaining a patent requires sufficient disclosure so that a “person having ordinary skill in the art” may practice the patent, disclosure (without actual reduction to practice and use in the industry) of newer technologies, such as carbon capture, is not as useful as it is for more established technologies. Consequently, in areas of newer technology, innovation is stifled when there is no practicing of the technology, which allows innovators to understand how the technology works.154 Especially in the case of newer technologies, compulsory licensing would actually support innovation by forcing the technology’s real-world application, thereby allowing other innovators to improve upon the technology. While the EPA has significant discretion in selecting a BSER, no existing precedent allows the EPA to establish regulations on the sole basis that a patent exists but has not been demonstrated to be technologically feasible, on even a very small scale. Therefore, the absence of a working requirement under the Patent Act jeopardizes the EPA’s ability to regulate GHGs.155 The Mandatory Licensing provision provides authority for the EPA to pursue mandatory licensing of patented technologies necessary to achieve emissions standards. Invocation of the provision does not require a showing that the patented technology has been adequately demonstrated.156 However, to establish the emission standards in the first place, the technology used to achieve the standards must have been adequately demonstrated (i.e. worked and put into practice even in some small fashion).157 If a technology has not been adequately demonstrated, it should not be considered by the EPA to be part of an emission reduction system.158 In this instance, a general compulsory licensing provision under the Patent Act would help work technologies, show them to be technologically feasible, and ultimately allow the EPA to consider them as part of a BSER. Opponents to compulsory licensing argue that it is unnecessary to invoke compulsory licensing to mitigate non-working of patents because inventors of useful inventions will want to recoup their investments and will do so through working or licensing of the patent.159 However, this argument fails to take into consideration that some entities will not want the patent to be put into use. When a patent is subject to use as part of an environmental regulation, its use would adequately demonstrate the patented material and make it readily available. Therefore, regulated entities would rather have these categories of patents suppressed in an attempt to avoid potential environmental regulation. Patent suppression by fossil-fuel companies has already occurred, as discovered by state prosecutors.160 The prosecutors were looking into whether fossil-fuel companies misled their investors by making statements dispelling climate change and the impacts that it would ultimately have on the companies’ viability.161 These investigations led to the discovery that these same companies patented carbon-capture technologies and never put them into use, suppressing them since the 1960’s.162 The non-working of patented carbon-capture technology is already occurring, possibly to keep patented technologies from EPA consideration. For example, Exxon has the highest number of patented carbon-capture technologies and is funneling millions into research,163 yet it does not operate any plant in the U.S. with large-scale carbon-capture. It is obvious that, with no regulatory driver to reduce carbon dioxide emissions and require the installation of carbon-capture technologies, industry will not utilize these technologies in the absence of a compliance threshold. The proposed framework provides a regulatory driver to implement the technologies. The emission threshold would deter patent suppression, and if not, then the second step of the framework— mandatory licensing—prevents suppression. Under the second step, the EPA would threaten to step in and require licensing of those technologies if industry was not willing to provide reasonable licenses to others in the industry. Refusal to license patents after the enactment of the new emission standards could have a detrimental effect on industry’s ability to comply with the strict standards. Once emission standards are in effect, patentees could reasonably license their patents to other industry participants without government intrusion or proceed to practice monopolistic market power. A refusal to license a patent could mean a unilateral outright refusal, or that restrictions on the patent use are unreasonable or the price to license is so prohibitive that it equates to an outright refusal.164 In the U.S., a refusal to license typically will not lead to a finding of monopolization unless there is a finding that the refusal is completely unrelated to the patent.165 It is unlikely that court-mandated compulsory licensing will be used to require licensing solely to address refusal to license or the use of monopolistic pricing. In Verizon Communications v. Law Offices of Curtis V. Trinko,166 the Supreme Court emphasized that “[t]he opportunity to charge monopoly prices . . . induces risk taking that produces innovation and economic growth.”167 Furthermore, monopolistic power alone is not unlawful, but rather it needs to be “accompanied by an element of anticompetitive conduct.”168 However, the Court goes on to clarify that, while the right to refuse to license with other firms may be allowed, it “does not mean that the right is unqualified.”169 Because the threshold for finding anticompetitive behavior by a patentee is quite high, it may be necessary to resort to statutorily authorized compulsory licensing to overcome monopolistic behavior and establish reasonable and fair licensing agreements. In addition to a refusal to license existing carbon-capture technologies, another opportunity exists for patent holders to further monopolize the market when existing patent holders build upon existing carbon-capture technologies. For example, companies are investing in research and development for scaling up and integrating carbon-capture into plant design, as opposed to retrofitting, and developing more integrated approaches to carbon-capture utilization.170 The ability to build upon existing patented technologies with no willingness to license (or work) these technologies is troublesome because these improvements will result in new patents which will be valid for up to another twenty years, the critical time period necessary for deployment of technologies that reduce emissions contributing to climate change.171 Even though statutory compulsory licensing has never been invoked by the government, some individuals contemplate the threat of compulsory licensing when considering the cost of their innovation.172 Their concern is that the government will step in before they can recoup their research and development costs. The potential negative effect of compulsory licensing on the incentives for innovation could be outweighed by the positive impact on innovation for an industry as a whole, particularly in the context of climate change action.173 The potential threat of compulsory licensing alone may be enough to encourage entities to license on more flexible terms to avoid governmental intrusion.174

#### If the federal government doesn’t act, the states will – and it will destabilize the entire patent system.

Mazur 07 [Tanya, attorney specializing in intellectual property law, winner of the Southern California Rising Star award in Intellectual Property Litigation, “Free for the ‘Taking’: Why States Should Not Be Able to Invoke Sovereign Immunity in Patent Infringement Disputes,” *The George Washington Law Review* 75.2, p.398-9, JCR]

There is a crisis looming on America’s horizon, whether in the form of bioterrorism, an avian flu pandemic, or the bankrupting of the federal government due to the aging population’s need for health care. All of these crises demand widespread access to patented inventions, such as pharmaceuticals, to prevent the enormous suffering of Americans. Emergency situations, such as the flu pandemic, will require production of patented products on a scale so massive that it would require circumventing a patent’s normal protections.2 Even the aging baby boomer population’s need for access to low-cost prescription drugs through programs like Medicare could be considered an emergency situation.3 Never before has the health and well-being of our nation been so inexorably linked to patented inventions. In recent years, Congress has attempted to address the coming crises and has proposed a number of changes to the patent laws; these changes, however, have failed to provide adequate solutions.4 States, therefore, are becoming increasingly proactive with regard to their residents’ needs in these crisis situations and are beginning to look to a loophole created by the Eleventh Amendment that exists in the patent laws.5 This loophole threatens to destabilize the United States’ incredibly successful patent system and the hundreds of years of technological innovation this system has provided to the nation.6 This Note examines the delicate balance between the public’s need for ready access to patented goods and the patent protections necessary to promote innovation, within the framework of the present patent system. Also discussed in this Note are problems that result from the approaches to patent “takings” and compulsory licensing that states and local governments have begun to employ. This Note proposes a vital amendment to the patent laws that would alleviate the aforementioned crises while still encouraging innovation and protecting the basic tenets of the patent system. Furthermore, this Note advocates that state sovereign immunity in patent cases be abrogated to curtail states’ abilities to impose compulsory licenses upon patent holders. By allowing only Congress to wield the power to extract compulsory licenses, rather than state or local governments or officers or appointees of the executive branch of the federal government, this proposal protects the sanctity and stability of the patent system. This protection furthers the aims of the Constitution and fosters the progress of the useful arts and sciences. In cases of national emergency, however, Congress would retain the authority to implement takings or compulsory licensing of patents.

### TRIPS

#### ‘Refusal to license’ has kept climate tech out of the hands of developing countries

Qin 18 [Dong, Assoc Prof at Nanjing Univ of Information Science & Technology, “After Paris: Do we need an international agreement on green compulsory licensing?” in *The Implementation of the Paris Agreement on Climate Change*, ed. Vesselin Popovski, p.183-7, JCR]

This patent suppression behaviour has many negative impacts on technology research, development and diffusion. For example, many patentees build patent thickets, which are thick patent webs consisting of various related and overlapping patents, so that their competitors will have much more trouble researching and developing new technologies. Facing patent thickets, firms can require access to dozens, hundreds or even thousands of patents to produce just one commercial product20. The most troublesome quality of a thicket is the risk that one may not be able to conclusively determine that all of the patents have already been read on a product or service21. Relevant patents can pop up and catch even sophisticated manufacturers by surprise22. Addressing this awkward situation, the Secretary General of the United Nations pointed out that the rise of strategic patenting and a series of legislative changes to expand monopoly rights had led to a very complex system of patents, which was increasingly geared to support the rights of incumbent large firms over new, smaller, innovative firms23. Additionally, the system in many countries had moved from its original objective of stimulating innovation through the provision of incentives to innovators, to preventing new domestic and foreign market entrants24. In many green industries, core technologies have already been monopolized by a few large companies. For example, the technologies in hybrid vehicles are very important for developing countries in reducing greenhouse gases under the Paris Agreement. However, more than 90% of patents in hybrid vehicles belong to companies in the United States, Germany and Japan25. It is very difficult for developing countries to get access to these technologies at affordable prices. In the field of LED, a kind of low-carbon light, some companies in developed countries monopolize most of the core technologies and never permit companies in developing countries to use their patents. Because of patent suppression, the technology gap between developing countries and developed countries keeps widening. On the one hand, patenting rates for clean energy technologies have increased faster than for other sectors, at a rate of about 20% per year since the adoption of the Kyoto Protocol by the United Nations Framework Convention on Climate Change, in 199726. On the other hand, most green technology patents continue to be controlled by only a few developed countries. According to statistics provided by the Secretary-General of the UN, six developed countries, including Japan, the United States, Germany, the Republic of Korea, the UK and France, account for almost 80% of all patent applications in clean energy technology27. Some other statistics show that developing countries own too few high-value inventions in the field of climate change technology. Taking China and Brazil as examples, the former owns only 2.3% high-value inventions in the field of climate change technology and the latter owns only 0.2%. Although green patent suppression is now very serious and has become an important barrier to technology transfer, it is not right to jump to the conclusion that the governments of parties to the UNFCCC are devoid of political willingness to deal with it. On the contrary, these governments have already shown some resolve on removing barriers to the international transfer of green technology. Article 4, para. 5, of the UNFCCC states that the developed countries shall take all practicable steps to promote, facilitate and finance the transfer of environmentally sound technologies to other parties, particularly developing countries, to enable them to implement the provisions of the Convention. Article 5 of the UNFCCC also states that the parties shall support international and intergovernmental efforts to strengthen national technical research capacities and capabilities, particularly in developing countries. Moreover, Article 10 of the Kyoto Protocol also rules that all parties shall take all practicable steps to promote, facilitate and finance the transfer of environmentally sound technologies pertinent to climate change, in particular to developing countries. The parties of the UNFCCC tried to develop more detailed plans to promote the international transfer of green technologies after the signing of the Kyoto Protocol in 1997. For example, the Conference of the Parties, on its seventh session held in Marrakesh from 29 October to 10 November 2001, made the decision on development and transfer of technologies (Decision 4/ CP.7)29. According to this decision, the parties would establish an expert group on technology transfer, the objective of which was enhancing the implementation of Article 4, para. 5, of the Convention, including, inter alia, by analysing and identifying ways to facilitate and advance technology-transfer activities. The decision also decided to urge developed country parties to provide technical assistance through existing bilateral and multilateral co-operative programmes. The decision even provided a framework for meaningful and effective actions to enhance the implementation of Article 4, para. 5, of the Convention30. According to the framework, all parties of the UNFCCC were urged to improve the enabling environments for technology transfer, which focused on government actions, such as fair-trade policies, removal of technical, legal and administrative barriers to technology transfer, sound economic policy, regulatory frameworks and transparency. Although many efforts have been made by the international community to promote international transfer of green technologies, the results are quite disappointing. For example, the Kyoto Protocol created the Clean Development Mechanism (CDM) to help developing countries to contribute to the ultimate objective of UNFCCC. According to Article 12 of the Kyoto Protocol, developing countries will benefit from CDM project activities resulting in certified emission reductions. Other countries that have qualified greenhouse gas reduction obligations may use the certified emission reductions accruing from s project activities to contribute to compliance with part of their own quantified emission limitation and reduction commitment. When the Clean Development Mechanism was designed during the negotiations of the Kyoto Protocol, almost all parties of the UNFCCC expected the mechanism to be a helpful tool in promoting green technology transfer between developed countries and developing countries. In fact, it was estimated that about 26% of the projects in relation to the CDM would involve at least some kind of technology transfer31. However, the results have proved very frustrating. Statistics shows that only 0.6% of projects involved technology transfer and the contribution of the CDM to technology transfer can at best be regarded as minimal32. Of course, the reasons for the frustrating results are many, but undoubtedly one of them is that some entities who own advanced green technologies have strong IP protection tactics, including building patent thickets, so that others have little opportunity to get technologies relating to their CDM projects. Yet another important reason why many efforts of the parties of the UNFCCC have been frustrated is that they only aim to regulate the behaviour of governments rather than the behaviour of patentees. However, the fact is that patentees, rather than governments, have the final say in green technology transfer. The right of patentees to refuse to share their patents with other people is strictly protected by the international intellectual property rights system. According to Article 28 of the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS), where the subject matter of a patent is a product, the owner of the patent has exclusive rights to prevent third parties from the acts of making, using, offering for sale, selling or importing for these purposes that product unless they have the consent of the owner. Where the subject matter of a patent is a process, the owner of the patent has exclusive rights to prevent third parties from the act of using the process unless they have the consent of the owner. Accordingly, the problem of green patent suppression can never be solved if the parties of UNFCCC cannot manage to improve the current IP system. If the owners of green technologies neither use their technologies nor permit others to use their technologies to reduce greenhouse gases, the goal of the Paris Agreement can never be fulfilled. If we want to make the Earth, which is becoming warmer and warmer, safer for us to live, attention should be paid not only to the protection of the private interests of patentees, but also to the protection of public interests.

#### This puts the US in breach of international obligations, which collapses climate treaty implementation globally – IP is the bottleneck

Zhou 19 [Chen, Assist Prof in the Law School of Xiamen Univ, “Can intellectual property rights within climate technology transfer work for the UNFCCC and the Paris Agreement?” *International Environmental Agreements: Politics, Law and Economics* 19.1, p.108-10, JCR]

Climate change is a well-researched issue both scientifically and in terms of legal scholarship. It is widely recognized that technological solutions play an important role in climate mitigation and adaptation. Due to historical and practical reasons, relevant technologies are distributing unevenly across the world.1 To combat climate change, the wide and rapid diffusion of such technologies is in the global self-interest (Watal 2010: 14). There is evidence that technology transfers increase the incentives for participation in multinational environment agreements (MEAs) (Shephard 2007: 10548). In the context of climate change, the United Nation Framework Convention on Climate Change (UNFCCC 1992) requires industrialized countries to facilitate technology transfers to developing countries to enable them to minimize their emissions of greenhouse gas emissions (GHGs). The 2015 Paris Agreement (Paris Agreement 2015) emphasizes this once more as it further commits the Parties to strengthening cooperation on climate technology. However, in reality, state-of-the-art climate mitigation and adaptation technologies are not being automatically transferred through business-as-usual practices where traditional legal protection of intellectual property (IP) operates under the Climate regime. In the light of the growing urgency of climate risks and damage and the emerging recognition of the potential violation of human rights, it is critical to examine what is the key bottleneck to technology transfer and how this can be addressed. Hence, this article explores how IP laws can be used by climate change policymakers in the post-Paris era to enhance technology transfer. To capture the entire picture, I use a statutory perspective to summarize and analyse the UNFCCC (see Sect. 2) and the WTO (see Sect. 3), the legal setting in which climate technology transfers operate, and explore possible solutions to situate IP in the context of climate change. In the context of climate change, technology transfer is predominantly regulated by the UNFCCC. Designed as a broad framework to comprehensively deal with the climate crisis, the UNFCCC has, since 1992, endeavoured to reduce GHG emissions through a range of solutions.2 As early as 1992, the UNFCCC shed light on technology as a solution by framing technology development and transfer as an essential international assistance tool. Two core articles were laid down to facilitate technology transfer: Article 4.5 and Article 4.7. Article 4.5 is cited as a classic clause and has been placed at the heart of the technology transfer commitment system.3 It obliges the developed country Parties of the UNFCCC (Annex I countries) to commit to technology transfer in order to fulfill the principle of common but differentiated responsibilities and respective capabilities. This principle aimed at substantive equity, international solidarity and assistance. To further confirm this commitment, Article 4.7, known as the conditionality clause, made the fulfilment of the developing countries’ commitments conditional on actions taken by developed countries.4 Under this Article, the developing country Parties could suspend the Convention’s implementation if the developed country Parties did not provide technology transfer and financial assistance. Therefore, it can be said that the conditionality clause makes technology transfer absolutely indispensable for the effective implementation of climate change agreements. A violation of the provisions on technology transfer might consequently constitute a material breach and would conflict with the purpose and objective of the Convention (Verhoosel 1998: 66).

#### The US leverages the WTO/TRIPS Agreement to block patent access – application of antitrust allows legal triggering of compulsory licensing

Ni 15 [Kuei-Jung, Prof of Law at the National Chiao Tung University School of Law’s Institute of Technology Law, “Legal Aspects (Barriers) of Granting Compulsory Licenses for Clean Technologies in Light of WTO/TRIPS Rules: Promise or Mirage?” *World Trade Review* 14.4, p.708-17, JCR]

The concept of developing countries granting themselves compulsory licenses and gaining access to climate-related technologies was an unwelcome, or even disturbing, proposal for developed countries and their resident companies who hold the IPRs for these technologies.32 They disagreed with the statement that an IPR constitutes a barrier to technology transfer and instead argued that poor IPR enforcement and high tariffs on environmental products should be blamed for the stalemate on transfers.33 On the basis of various promising instances in which Western companies have transferred clean technologies to and deployed them in emerging markets, Lane remains skeptical of the rhetoric that claims IPRs to be an obstacle to technology transfer and dissimilation.34 Thus far, the compulsory licensing of clean technologies seems not to have occurred, despite strong appeals by developing countries for the use of this mechanism. Although the UNFCCC does not have applicable rules specifically pertaining to the use of compulsory licenses per se, the WTO/TRIPS forum appears eligible to govern them, especially regarding the negotiation of a new agenda and law enforcement. The UNFCCC is the major global forum through which developing countries have consistently proposed using compulsory licenses as one means, among others, of gaining access to clean technologies. However, the climate regime does not specify any binding rules or disciplines for regulating the application of such a measure. Instead, the WTO/TRIPS is the competent regime governing the use by national authorities.35 In effect, all WTO members must guarantee that their national laws and measures relating to compulsory licenses are in compliance with the TRIPS obligations in question.36 During the mid-1990s, under the threat of economic sanctions resulting from US Section 301, the GATT Uruguay Round negotiations finally resulted in crafting comprehensive and multilateral protection for IPRs, which operates with an effective dispute settlement mechanism.37 The effectiveness of the TRIPS Agreement represents a triumph for developed countries, particularly the US, which have long called for strong global IP protection. The TRIPS Agreement specifies a minimum threshold of IP protection and enforcement by WTO members.38 To balance the rights of IP owners, most of whom are from developed nations, with the interests of general users and developing countries and to pursue members’ legitimate public objectives, certain measures limiting the prerogatives of IP owners are permissible, especially regarding their monopoly rights. A patentee may prevent others from using a patented technology before the patent expires.39 However, Article 30 of the TRIPS Agreement provides for exceptions to this right. In addition, patentees who are not using the patent themselves may authorize others to make use of their protected subject matter by voluntarily signing a licensing agreement.40 The freedom of contract that individuals and firms have in choosing their partners and deciding the content of deals would be constrained by the governmental authorization of compulsory licenses to other users. Article 31 of the TRIPS Agreement specifies the rules for implementing such licenses.41 An analysis of the structure of Article 31 of the TRIPS Agreement indicates that the provision does not explicitly provide grounds on which compulsory licenses can be based but simply specifies the 12 conditions with which WTO members ought to comply. All conditions are obligatory. Although the incorporation of compulsory licenses into the TRIPS Agreement is part of a balancing act for countering the predominant power of patentees, such a move should not be interpreted merely for the convenience of developing countries.43 The use of compulsory licenses is not intended to be a ‘free lunch’ because the challenges associated with observing the requirements are quite severe and the costs of implementing the collateral duties may be relatively high. The following sections first examine whether a new declaration or similar document is likely to be finalized to underpin developing countries’ proposal. The focus is then on the legal challenges in, and obstacles to, complying with the TRIPS obligations with reference to the compulsory licensing of Philips CD-R patents, which can serve as a benchmark practice. In response to the HIV/AIDS health crises affecting many developing countries, the WTO adopted the Declaration on TRIPS Agreement and Public Health at its 2001 Fourth Ministerial Conference in Doha. The conclusion of the agreement exemplified how the global IP regime can support, rather than hinder, access to the affordable medicines, most of which are covered by IPRs. Regardless of its legal status,44 the Declaration provides developing countries with powerful leverage and flexibility when interpreting and implementing their TRIPS obligations. The flexibilities elaborated by the Declaration consist of compulsory licenses. First, the right to grant compulsory licenses and the freedom to determine the grounds on which to do so are recognized.45 Second, the Declaration confirms the right of WTO members to define the circumstances that constitute a national emergency and explicitly equates public health crises to national emergencies.46 Third, because many members have insufficient manufacturing capacities, the Declaration requested that the TRIPS Council sort out a solution that makes compulsory licenses more effective for these countries.47 Overall, the flexible approach streamlines the compulsory licensing with a view to promoting access to essential drugs. The Doha’s position on global IP enforcement presents an opportunity for balancing private property rights with other societal values, such as human rights and environmental protection. The mandate on IP and public health signals that multilateral trade negotiations and law-making processes can accommodate the interests of developing countries when their demands are on strong moral and legal grounds. The successful experience in Doha provides momentum for developing countries to pursue other similar goals. Although the appeal for adopting a TRIPS declaration on IP and climate-related technologies seems acceptable, at least morally, the feasibility of concluding a similar text as for public health, especially in the WTO community, remains in doubt. From the perspective of international politics, the WTO members’ lack of political will to earnestly negotiate seems unchanged.48 In addition, as opposed to the mandate of the Doha Declaration, most free trade agreements (FTAs) concluded by the US after 2001 have constrained the use of compulsory licenses.49 The prevalence of alleged TRIPS-plus arrangements in US-initiated FTAs heralds greater difficulties ahead for adopting a new declaration on TRIPS-related social concerns at the WTO. Without the support of the US, it would be difficult to achieve a result that facilitates access to climate-related technologies in multilateral trade negotiations. Discrepancies between access to medicine and access to clean technologies and their products may create obstacles for constructing a new declaration. The possible discrepancies can be divided into three parts (Table 1). First, accessing patented drugs appears unaffordable for the public in developing countries, but whether climate-related technologies are too expensive is uncertain. Second, regarding emergency levels, there are strong moral and legal grounds for protecting people from public health crises by, among other approaches, using compulsory licenses as flexibly as possible. Without access to essential drugs, millions of people could die. However, climate change, despite its considerable impact on human society, is a gradual process and not an emergency similar to that of HIV/AIDS.50 In addition, the effective use of compulsory licenses depends on the presence of a competitive local production capacity. Given the relative infancy of climate-related technologies,51 manufacturing capacities for these products may be more insufficient or entirely absent in many developing countries. This limitation could make granting compulsory licenses less fruitful.52 By comparing the distinctive features of pharmaceutical and clean technologies, McManis and Contreras emphasize that market and patent coverage factors may considerably diminish the effects of green compulsory licensing as opposed to that of essential medicines.53 Thus, they are skeptical that ‘an international accord modeled on the Doha Declaration is achievable or desirable in the area of clean technologies’. 54 The authority to grant compulsory licenses lies with governments but is subject to a number of conditions that each WTO member is required to observe. The requirements, listed under Article 31 of the TRIPS Agreement, impose strict discipline on the members and provide competent national authorities with limited discretion. Observing the obligations is a twofold task: first, national authorities must determine the grounds on which such licenses are granted; second, they must fulfill each of the listed conditions, which begin with an appeal for granting the licenses in question and end on their termination. Article 31 does not explicitly regulate the right of members to stipulate the grounds for resorting to a compulsory license, nor does it provide definite parameters for determining the scope of the grounds, apart from the grounds for semiconductor technology.55 Such an omission causes ambiguity concerning the legality of the grounds chosen by national authorities under the TRIPS Agreement. During the Uruguay Round negotiations, most developed countries, including the US, favored a restrictive approach allowing only for matters of anti-trust, public non-commercial use, and national emergencies to legally trigger such licenses.56 In contrast, developing nations argued for an open approach under which there would not be any constraints regarding setting the grounds. In the end, the proposal to limit the grounds for issuing a compulsory license was not adopted. Instead, the final text on compulsory licenses focused on procedural matters and the substantial conditions to be observed.57The TRIPS preparatory work may support the assertion that the drafters had no definite intention of limiting the scope of the grounds.58 Subsequent developments regarding the interpretation of the TRIPS Agreement, particularly evident in the 2001 Doha Declaration, endorse the views of developing countries. However, the controversy regarding the legal status of the Doha text persists, and no judicial decisions have yet been made by the WTO relating to its legal authority. The US considers the Declaration to be a political statement that lacks any binding power on WTO members.59 By contrast, because the Declaration was adopted by consensus, developing countries claim that it represents a genuine and legitimate expectation among WTO members. Despite this disagreement, many academics consider the Declaration as a subsequent agreement that facilitates the interpretation of the TRIPS provisions in question.60 Irrespective of its function for treaty interpretation, debate continues regarding whether the Doha document can shape fields beyond the contexts of IP and public health. Countries in the midst of public health crises may encounter fewer challenges when availing themselves of the TRIPS flexibilities; however, when addressing situations that do not clearly represent public emergencies or that lack nearly uniform public support, a government’s selection of grounds may be severely questioned. Certain grounds specified in the patent laws of many developing countries are applied to balance the prerogatives of patent owners, such as their refusal to deal, failure to produce locally, and failure to obtain licenses under reasonable terms.61 The legality of invoking such grounds appears quite controversial. De Carvalho is strongly skeptical of the contention that countries are free to decide any grounds or can grant licenses on frivolous grounds.62 Considering that the use of compulsory licenses constitutes an exception to the normal exercise of patent rights, he argues that the grounds should be confined to exceptional or critical situations, such as national emergencies and public non-commercial use.63 According to de Carvalho’s argument, compulsory licenses should not be pursued to remedy individual benefit at the expense of eroding patentees’ right to license voluntarily (i.e., ‘say no to third parties’).64 Therefore, commercial disputes between licensees and patent owners, such as disputes over a refusal to license or failure to reach reasonable commercial deals, should not constitute a sufficient cause.65 After a Taiwanese business failed, after a considerable amount of time, to obtain licensing under reasonable commercial terms and conditions from Philips, the Taiwan Intellectual Property Office (TIPO) decided to grant compulsory licenses of the Philips CD-R patents to the local company. The action incited the critical complaints of both the patentee and the EC. The CD-R technologies and correlated patents were owned by Philips, which had acquired patent protection from the Taiwan Intellectual Property Office (TIPO) during the late 1980s.66 By the 1990s, CD-R production in Taiwan had increased considerably, with most production being licensed by Philips.67 However, Gigastorage, a Taiwanese CD-R manufacturer, was unable to reach a licensing deal with the patentee because of a disagreement over royalty rates. TIPO reviewed the appeal of Gigastorage for compulsory licensing of Philips’ five patents and determined the situation facing Gigastorage matched the grounds in question. TIPO’s interpretation as to what amounted to a reasonable commercial term was mainly subject to alleged suitable royalty rates. After reviewing the opinions and findings of public officials and professional institutions, TIPO concluded that Philips’ offer was not a fair and reasonable royalty arrangement.68 Because Gigastorage had spent almost a year engaging in negotiations with Philips, TIPO was satisfied that the period of negotiations had been considerable. In July 2004, according to Taiwan’s Patent Act,69 the decision of TIPO to grant the compulsory licenses was rendered.70 The EC protested that the reason used for triggering the compulsory licenses was a violation of the TRIPS agreement. The EC’s argument was largely based on a textual analysis and was offered with a view to preserving the patentee’s right to license voluntarily. First, the EC argued that Taiwan’s granting of compulsory licenses based on a failure to reach reasonable terms would diminish the protection extended to patent holders and that this effect conflicted with the essence of Article 28 of the TRIPS Agreement. In analyzing Article 28, the EC contended that the provision bestows on patent owners a freedom to license, which inherently carries with it a right to refuse to negotiate.71 Furthermore, the EC emphasized that Article 28 does not obligate patentees to engage in a licensing agreement but rather clearly states that patent owners have a right to do so.72 Second, the alleged ‘failure to obtain reasonable commercial terms’ was strictly categorized by the EC as a procedural condition as opposed to a substantial condition, which is one of the grounds for granting compulsory licenses. Because such a condition is explicitly specified in the first sentence of paragraph (b) of Article 31 as a procedural rule to be observed prior to an authorization of compulsory licenses, the EC insisted that it fell outside of what might be considered substantial grounds. The second sentence of the same paragraph stipulates that the obligation of WTO members to obtain licenses (voluntarily) under reasonable commercial terms in advance may be waived in the event of a national emergency or for public non-commercial use. According to paragraph (k), the members’ obligation to observe such conditions can also be waived when addressing an anti-trust situation. Reading the text restrictively, the EC insisted that Article 31 embodies the intent to distinguish such procedural elements from substantial grounds.73 Thus, the EC concluded that Taiwan’s allowance of Gigastorage’s failure to obtain licenses under reasonable commercial terms as grounds for issuing compulsory licenses was illegitimate. Climate change is a grave global concern; however, as mentioned previously, it may not, in terms of national emergencies, be universally recognized as equivalent to a global public health crisis because it affects countries differently and the problem persists over a long time frame. Some nations, such as small Micronesian island states, are obviously more vulnerable to the effects of climate change, whereas particularly well-developed countries can prove more resilient and adaptive to the challenges. Thus, most developed countries may not be persuaded by the arguments of developing countries and rising powers such as China and India, which attempt to equate the threat of climate change with more immediate national emergencies. Of course, the restrictive European approach toward establishing convincing grounds is open to dispute. In addition, whether a refusal to license or intransigence in negotiations on the part of rights holders constitutes sufficient reason to grant compulsory licenses remains controversial. It has been observed that the practice of refusing licensing for climate-related technologies may grow more common as companies find it profitable to invest in the technologies and ‘thus seek to maintain their competitive advantage’. 74 As tensions between developing countries (including their local companies) and climate-related technology owners increase, undercutting those IP rights by resorting to compulsory licenses under the guise of mitigating global warming will certainly provoke serious complaints from the governments of developed countries. Developed countries will not always ignore the granting of compulsory licenses on technologies critical to their industries and may opt for further legal action. The challenges to Taiwan’s authorization of the use of the Philips CD-R patents, as mentioned previously, could have become an international litigation brought to the WTO mainly because the format of the EC’s trade barrier report nearly constituted a complaint submitted to the WTO. More importantly, the proceedings that occurred both locally and internationally as a whole provide a vivid example of how difficult it is for a WTO member to satisfy the requirements for issuing compulsory licenses under the TRIPS Agreement.

#### The US stance generates massive political tension – countries will impose their own antitrust laws, leading to regulatory uncertainty and trade retaliation

Sarnoff & Chon 18 [Joshua, Prof of Law at Depaul College of Law, served as a Distinguished Scholar at the US Patent and Trademark Office, Margaret, Prof for the Pursuit of Justice at the Seattle Univ School of Law, “Innovation Law and Policy Choices for Climate Change-Related Public-Private Partnerships,” *The Cambridge Handbook of Public-Private Partnerships, Intellectual Property Governance, and Sustainable Development*, eds Margaret Chon et al, p.265-7, JCR]

As stated earlier, many people and institutions have recognized the unequal technology transfer framework for climate change and energy innovation. To address these concerns, numerous changes, some highly controversial, have been proposed to the global patent regime.130 These include: broad, categorical exclusions of environmentally sound or climate friendly technologies from the patent system; and regulation of licensing and market behaviors, including compulsory licensing, antitrust scrutiny, and price controls.131 These direct means of regulating prices and competition will remain legally available to governments that hope to induce – but may be forced to compel – more favorable licensing and pricing practices than would voluntarily occur.132

\*\*\*Begin Note 132\*\*\*

Concerns over IP rights and climate change technologies have already caused significant political tensions. At an earlier stage of international negotiations, the UNFCCC Ad Hoc Working Group on Long-term Cooperative Action (WG-LCA) considered various proposals that had been suggested by some countries in the South. These measures would have placed significant restrictions on the traditional operation of the patent system. The measures ranged from requiring patent pooling and royalty free compulsory licensing to excluding green technologies entirely from patenting – even retroactively revoking existing patent rights. See, e.g., Ad Hoc Working Group on Long-Term Cooperative Action Under the Convention, Ideas and proposals on the elements contained in paragraph 1 of the Bali Action Plan, 23 UNFCCC (2009); Ad Hoc Working Group on Long-Term Cooperative Action Under the Convention, Report of the Ad Hoc Working Group on Long-Term Cooperative Action under the Convention on its Seventh Session, UNFCCC Doc. No. FCCC/AWGLCA/2009/14, 156 (2009).

\*\*\*End Note 132\*\*\*

Although further amendment of the WTO Agreement on Trade Related Aspects of Intellectual Property (TRIPS Agreement) – as has been discussed by the United Nations Secretariat133 – is a theoretical possibility, consensus for adopting amendments in the short term is highly unlikely. Without such treaty amendments, countries (particularly those in the developing South) may seek to make greater use of existing TRIPS Agreement flexibilities to tailor their patent doctrines to assure access and to lower costs. They may adopt exclusions from patent eligibility, exceptions to patent rights, and alternatives to private licensing (such as a global technology pool). They also may expand access to publicly funded technologies to better promote technology development, transfer, and use.134 These options may provide greater ex ante predictability “in accessing technologies and [may] further enable much-needed research and development for local adaptation and dissemination, which would further reduce the cost of the technologies.” 135 Governments addressing private refusals to license patented technologies or high prices for access to those technologies may regulate such conduct directly, by adopting compulsory licenses or by imposing price control regulations.136 Alternatively, they may regulate such conduct indirectly, by treating restrictive or costly licensing as a competition violation (for example, as an abuse of dominant position) or by treating the patents themselves as essential facilities (that is, as products or services that are considered competitive necessities and for which access also can be required by compulsory licenses).13 Such direct or indirect regulation, moreover, may be largely ineffective in regard to assuring transfers of tacit knowledge.138 Both direct and indirect approaches to regulating access and prices will be highly controversial, and may threaten substantial trade retaliation or may prompt withholding by businesses of technology and foreign investment. Compulsory licensing, price regulation, and antitrust treatment have been repeatedly resisted by the United States and (somewhat less so) by other developed countries, particularly in foreign markets where the countries do not bear the costs but reap the benefits of technology exports.139 The developing South may be unwilling to resist such trade pressures, even if the threats and trade sanctions would be found illegal under WTO rules.140 These legal and political constraints bring us to proposals discussed in the next Part of this chapter, which emphasize private sector, voluntary initiatives to increase access and technology transfer, within a context of public sector laws and policies that promote innovation and access.

#### Wrecks the green tech market – need consistency to provide regulatory certainty

Choi 20 [Jay, University distinguished Prof in the Dept of Economics at Michigan State Univ, Prof in the School of Economics at Yonsei Univ, “Competition Law and Economics: International cooperation and convergence in competition policy,” in *Competition Law and Economics: Developments, Policies and Enforcement Trends in the US and Korea*, ed Jay Pil Choi et al, JCR]

Thus, it is a welcome development that more countries are adopting competition laws and plan to implement competition policies. For instance, when the International Competition Network (ICN, hereafter) was formed in 2001, only 16 competition agencies from 14 developed countries were participating members. The number now stands at 126 competition agencies from 111 jurisdictions (as of April 26, 2013).1 One of the most noteworthy developments on this front is China’s adoption of the Anti-Monopoly Law (AML), which took effect on August 1, 2008 after more than 10 years of drafting. However, promulgating competition law and setting up a competition agency, however, are not enough. In fact, mushrooming competition agencies in every country may turn out to be counterproductive if competition laws are applied in an inconsistent manner. As the globalization of the world economy entails a growing interdependence among national economies, a nation’s competition policies are no longer confined to domestic firms within the nation’s jurisdiction. With the prominence of multi-national firms, what counts is not the nationalities of firms but the locus of their economic effects. Antitrust authorities often take action against foreign firms if the firms affect competition in their jurisdictions. As a result, it is a distinct possibility that multinational firms may be subject to contradictory policies in the absence of policy harmonization among countries, which may significantly add to the complexity and costs of doing business and severely hamper the proper functioning of the market economy. In this paper, I discuss several issues that arise with “decentralized” enforcement of antitrust across jurisdictions due to the proliferation of independent antitrust authorities. These issues necessitate harmonization and coordination of policies in antitrust enforcement. However, divergence in economic conditions and policy goals in different jurisdictions presents a stumbling block in achieving harmonization in antitrust enforcement. Thankfully, economic analysis has a common methodology that is applicable across national boundaries in the assessment of antitrust enforcement effects. Antitrust law enforcement thus should be effects-based and be guided by the economic model of competition. The rest of the paper is organized as follows. In section II, I discuss potential pitfalls of antitrust proliferation with a focus on enforcement externalities. Section III considers specific enforcement areas in which enforcement externalities pose a serious problem. Section IV considers potential pathways to achieve policy harmonization across jurisdictions. I also briefly comments on the use of economics as a facilitating analytical tool in the harmonization of antitrust enforcement. Concluding remarks are contained in section V. The proliferation and potentially independent implementation of antitrust enforcement across more than a hundred different jurisdictions can lead to a variety of problematic issues, especially when the rules and enforcement procedures vary across jurisdictions. I will discuss some of the most important issues below, which call for harmonization of antitrust rules and cooperation among enforcement agencies. With the globalization of the economy and many multinational firms operating in so many different jurisdictions, the effects of an antitrust enforcement activity in one country is not necessarily confined to the country of enforcement. This often leads to what Geradin (2009) calls the “Strictest Regime Wins” problem and the risk of overregulation. To see the nature of the problem, imagine that there are two independent antitrust authorities in two different countries. Consider a unilateral conduct by a dominant firm such as tying or rebates. Let the effects of such a conduct on national welfare be W1 and W2, in country 1 and country 2, respectively. Such a conduct will be globally efficient if W1 + W2 ≥ 0. However, such a conduct will be prohibited and subject to antitrust enforcement in country i, if Wi < 0, where i = 1, 2. Suppose that a unilateral conduct confined to an individual country is not feasible. Then, the unilateral conduct in question will be allowed only when W1≥ 0 and W2 ≥ 0, 2 which is a more stringent condition to satisfy than W1 + W2 ≥ 0, and may lead to overregulation of unilateral conducts. The shaded areas in Figure 1 represent the overregulated areas. In both areas A and B, the unilateral conduct is globally efficient. However, the antitrust authority in country 1 prohibits such conduct in area A and the antitrust authority in country 2 does the same in area B. The same logic applies to other areas of antitrust enforcement. If we consider enforcement costs, the enforcement externalities can also lead to a collective decision dilemma and the concomitant free-rider problem in antitrust enforcement. To see this, let us now assume that the welfare effects of the unilateral conduct is the same and harmful for both countries, that is, W1 = W2 =W < 0. In addition, assume that there are enforcement costs C. Then, it is optimal to enforce against this conduct in one country as long as 2W + C < 0. There can be two types of inefficiencies. If W + C > 0 and 2W + C < 0, no country is willing to enforce against this conduct unilaterally because the cost of enforcement is not justified although the enforcement is globally efficient. In this case, the only way to enforce against this conduct is to share the enforcement costs between the two countries. If W + C < 0, each country is willing to unilaterally enforce against the conduct, but each country may have incentives to free ride on the other country’s enforcement efforts unless both countries can coordinate. Independent and uncoordinated antitrust enforcement can be a considerable burden for multinational firms operating in many different countries if the antitrust rules differ and/or procedural rules of enforcement vary across countries. Merger proposals may need to satisfy the conditions of the agency with the strictest antitrust rules. The same applies to unilateral conducts. A nightmare scenario may be the case where different agencies require conflicting rules that cannot be satisfied simultaneously. Multiple jurisdictions with independent agencies can also significantly increase the complexity of defense strategies of a firm that is investigated for an alleged antitrust violation. Defense lawyers need to be extra cautious so that a position taken in one country cannot be adversely used against the alleged company in other countries with different rules and procedures. The need to adopt a cohesive defense strategy in the face of many different antitrust rules may severely limit the ability to defend the alleged firms. Language can be another issue. The in-house general counsels of firms investigated for alleged conduct need to formulate coordinated defense strategies in multiple languages without anything being “lost in translation.” There is a broad consensus that the main objective of antitrust enforcement should be the protection of consumers. However, there may be countries that pursue additional or different objectives with antitrust policies, which would certainly create inconsistencies in the policy implementation. For instance, the newly enacted Antitrust Monopoly Law (AML) in China states that one of its objectives is to “promote the socialist market economy.“ Considering the growing importance and influence of the Chinese economy, it may be a concern if the antitrust authority in China actively pursues this objective, even though it is too early to tell. Its merger review also considers among other factors the "effect on the development of the national economy and public interest." It remains to be seen how this consideration will affect actual merger decisions in China. Even in countries where the stated goal of antitrust authorities is purely the protection of consumers, we cannot rule out the possibility that antitrust authorities misuse their power for other purposes or succumb to “regulatory capture,” to which any regulatory agency is susceptible. This possibility is especially worrisome in developing countries where antitrust authorities are not completely independent and usually political appointees. First, there is a concern that antitrust decisions can be used as a disguised protectionist policy. This is especially so in antitrust cases that pit domestic firms against foreign multinational firms and domestic firms have previously been shielded from foreign competition. In such cases, antitrust policy could be enforced in a discriminatory fashion against foreign companies as an instrument of protectionist policy. Second, politically-minded and overzealous enforcement officials may also see high-profile antitrust cases (especially those against foreign multinationals) as a stepping stone that leads to promotion in their bureaucratic or political career. They can use such an opportunity to portray themselves as crusaders who bravely stand against powerful foreign multinationals to protect domestic interests. There could be a race to be the toughest in an attempt to be a relevant player, which can preclude many pro-competitive mergers and single firm conducts. Finally, the lack of uniform antitrust enforcement across jurisdictions raises the possibility of “forum shopping” in the presence of antitrust enforcement externalities. With multiple antitrust authorities in different jurisdictions, competitors of the merging parties or an allegedly dominant firm have incentives to bring the case to the antitrust authority with the most sympathetic ear, which ensures that the strictest antitrust rule is enforced in the global economy. In this section, I focus on three important classes of antitrust enforcement in which enforcement externalities become a problem due to the proliferation of antitrust agencies. If multiple antitrust jurisdictions are in place, enforcement externalities naturally arise in cases of international mergers. The increasingly global nature of business transactions has resulted in a growing number of mergers falling under multiple jurisdictions and corresponding competition authorities. This inevitably invites potential conflicts among competition authorities. For instance, the European Commission can block or force changes to company mergers and takeovers, even when they do not involve any European firms, if they are deemed to adversely affect the competitive landscape in the European market.4 The same applies to US antitrust authorities such as the Department of Justice and the Federal Trade Commission. They routinely take actions against foreign firms if the firms’ actions harm competition and adversely affect consumers in the US market.5 The current situation naturally raises concerns about the potential for intergovernmental disagreements about the effects of antitrust actions. This type of potential conflict is best illustrated by the proposed merger between General Electric (GE) and Honeywell, which was approved in the U.S., but blocked by the European Commission.6 With the proliferation of antitrust authorities that enforce merger regulations, this type of conflict can only be magnified. As of 2001, the American Bar Association identified 46 international merger notification requirements.7 China is now an active player in this area. For instance, the Anti-Monopoly Bureau of the Ministry of Commerce (“MOFCOM”) reviews the filing of “concentration of operators” under the AML and recently denied the acquisition of Huiyuan by Coca-Cola by claiming that Coca-Cola would have the ability to transmit its dominant position in the soda soft beverage market into the juice beverage market. 8 The proliferation of decentralized antitrust enforcement agencies implies that any merger between large multinational firms that have a presence in any of these countries needs to notify and receive approvals without any single exception; any veto from any of these countries can torpedo the proposed merger. The problem with the current regime without any harmonization of policies is that any international merger will essentially be determined by the least permissive agency without any considerations of its effect on consumers in other jurisdictions. This decision mechanism is likely to be inefficient, and the degree of inefficiency will be exacerbated as more agencies are involved, since the view reflected in the decision would be the one most extreme. This is true even if all antitrust agencies pursue the same economic goal (either social or consumer welfare maximization) without any political considerations and the effects of mergers are uniform across jurisdictions. If we consider the outcome of each investigation as an independent estimate of the effects of the proposed merger, the best estimate in the statistical sense would be the average view unless there is any systematic bias in the evaluation process. With the current system, however, the merger enforcement would be driven by the first order statistic, i.e., by the competition authority with the most pessimistic view about the proposed merger. Even if there is no uncertainty in the evaluation of the effects of mergers, there could be conflicts if the effects of mergers are not uniform across jurisdictions. Suppose that there is a proposed merger that affects two countries, 1 and 2. The welfare impacts of the merger on each country are given by W1 and W2. As discussed above, the merger is globally efficient if and only if W1 + W2 ≥ 0. However, the merger will be approved if and only if W1≥ 0 and W2 ≥ 0 under the current system. The latter condition is more stringent than the former condition, which implies that efficient mergers can be blocked since each agent ignores external effects. Once again, the scope of this type of inefficiency certainly increases as more agencies are involved. The issue of externalities also arises in the context of single firm conduct. As in the merger cases, the decision of one agency may have positive or negative impacts on consumers in other jurisdictions. If a country has no antitrust enforcement, other countries’ enforcement against unilateral conduct can have positive effects on the country’s welfare. However, if the country also has an active enforcement agency and deeds a firm’s unilateral conduct efficient and welfare-enhancing, other countries’ enforcements against the same conduct can eliminate efficiency-enhancing business practice by the firm, leading to overregulation. Recent examples in which the U.S. antitrust agencies and the EC made divergent decisions include the British Airways conditional rebate case. In the US, the rebate scheme used by British Airways was deemed to be permissible but the same conduct was condemned to be anticompetitive by the EC.9 Intel was another case in which the conduct was deemed lawful in the US, but condemned to be anticompetitive in Europe and Korea. The Microsoft case is another example in which the company was subject to allegations of antitrust violations in multiple jurisdictions and faced different remedies that are not necessarily consistent. In antitrust cases that involve intellectual property rights [IPRs], additional issues may arise. As an example, consider the case of compulsory licensing as an antitrust remedy to solve an interoperability problem.10 When an “essential facility” is a physical property, the access can be limited to a particular geographic area. Thus, the issue of different antitrust approaches can be confined to the areas of dissonance without affecting others. In contrast, if the essential facility is intellectual property, limiting the use of the property in other areas or related fields may be difficult. To use the example of the Microsoft case in Europe, it would be impractical to enforce that the interoperability information shared with third party vendors of Windows server software be limited to the products sold only in Europe. Thus, compulsory licensing enforced in Europe can affect competitive conditions in other areas as well. This also raises the possibility of “forum shopping,” as explained above. With multiple antitrust authorities in different jurisdictions, competitors of the essential facility owner have incentives to bring the case to the antitrust authority with the most sympathetic ear for the competitors. This possibility highlights the need to harmonize competition policies across jurisdictions. There is a near consensus that the first priority of antitrust enforcement should be to combat price fixing, and the economic harms caused by hard core cartels are universally recognized. Thus, there is less conflict in this area among antitrust agencies. In addition, the enforcement in this area usually confers positive benefits on other countries. The main issue in this area is underenforcement rather than over-enforcement. When multinational firms operate in several jurisdictions in the presence of arbitrage opportunities across markets, the sustainability of collusion in one local market can be affected by the existence of collusion in other markets. Consider, for example, the vitamin cartel case of Empagran S.A. v. F. Hoffman-LaRoche. Empagran S.A. of Ecuador and other foreign companies (that purchase and resell vitamins) filed a suit against F. Hoffman-LaRoche of Switzerland and numerous other foreign companies for an alleged international price-fixing conspiracy.11 The case concerned a price-fixing conspiracy that allegedly took place overseas even though the case itself was filed in a US federal district court. The foreign plaintiffs, suing under the U.S. Foreign Trade Antitrust Improvement Act (FTAIA), claimed that "the cartel raised prices around the world in order to keep prices in equilibrium with United States prices in order to avoid a system of arbitrage" and therefore that "the foreign plaintiffs were injured as a direct result of the increases in United States prices even though they bought vitamins abroad." The interdependence of cartel stability across markets leads to potential externalities in antitrust enforcement across jurisdictions with independent antitrust authorities. For instance, cartel detection and desistance in one market can lead to cartel breakdown in other markets, conferring positive externalities. The domino effect may induce each antitrust agency to free ride on other agencies’ enforcement efforts. This calls for cooperation and coordination among antitrust agencies to eliminate a collective decision problem. To understand the nature of the free-rider problem when there are enforcement costs, consider the following simple cartel enforcement game. There are two antitrust agencies that must decide whether or not to spend resources on cartel detection and prosecution. For simplicity, let me assume that the welfare effect of a hardcore cartel on consumers is the same across jurisdictions. Let us denote the welfare loss due to the cartel in each country by L. The cartel should desist, but the agency’s enforcement cost is C. The game can be described by the following matrix (Table 1). Each enforcement agency independently decides whether or not to enforce. We assume that the cartel in both countries can be broken up by enforcement in any one of the two countries due to the domino effect. We further assume that L > C >0, which implies that the cartel enforcement is beneficial in each country if there is no other enforcement agency. There are multiple equilibria in this game, with two asymmetric pure strategy equilibria and one symmetric mixed strategy equilibrium. In the two asymmetric pure strategy equilibria, one agency enforces while the other chooses not to, and the resulting equilibrium is efficient. However, the most natural equilibrium may be the symmetric mixed strategy equilibrium since both agencies are symmetric in this game. Without any coordination and information sharing, the unique, symmetric equilibrium is that each agency enforces with probability p = L C L − . With the symmetric mixed strategy equilibrium, however, we have a coordination failure and the price fixing will continue with probability (1-p)2 . Another source of inefficiency with independent investigations is the possibility of duplicative efforts in the event that both agencies decide to enforce, which occurs with probability p 2 . In this stylized situation, it would be beneficial for both parties to consider the designation of a “lead agency” to eliminate duplication and streamline the process. All the reasons listed above support a more integrated approach in the enforcement of international mergers. In addition, information sharing among antitrust authorities would be a very important tool in the fight against hardcore cartels. Information sharing arrangements would allow antitrust agencies to coordinate their investigative strategies and provide them with access to subjects, evidence, and witnesses that are located outside each country’s borders.12 In previous sections, we pointed out potential perils from the proliferation of antitrust agencies and emphasized the need for policy harmonization and coordination across jurisdictions. It is important not to impose any additional burden on businesses with unnecessary regulatory uncertainty. Different substantive and procedural regimes make conducting businesses with an international locus of effects complex, time consuming, and expensive. Clear and consistent standards across jurisdictions will facilitate global businesses and eliminate any bureaucratic burdens associated with uncertainty. Given this broad consensus on the high desirability of a uniform substantive and procedural antitrust regime, the difficult question is a more practical one of how we can achieve the needed policy harmonization among countries with sovereign rights.

#### Slow growth goes nuclear – drives nationalist tensions, miscalculation, and makes cooperation impossible.

**Landay 17** (Jonathan – Reuters National Security Correspondent, 1/9/17, “U.S. intelligence study warns of growing conflict risk”, <https://www.reuters.com/article/us-usa-intelligence-future-idUSKBN14T1J4>)

WASHINGTON (Reuters) - The risk of conflicts between and within nations will increase over the next five years to levels not seen since the Cold War **as global growth slows**, the post-World War Two order erodes and anti-globalization fuels nationalism, said a U.S. intelligence report released on Monday. “These trends will converge at an unprecedented pace to make governing and cooperation harder and to change the nature of power – fundamentally altering the global landscape,” said “Global Trends: Paradox of Progress,” the sixth in a series of quadrennial studies by the U.S. National Intelligence Council. The findings, published less than two weeks before U.S. President-elect Donald Trump takes office on Jan. 20, outlined factors shaping a “dark and difficult near future,” including a more assertive Russia and China, regional conflicts, terrorism, rising income inequality, climate change and sluggish economic growth. Global Trends reports deliberately avoid analyzing U.S. policies or choices, but the latest study underscored the complex difficulties Trump must address in order to fulfill his vows to improve relations with Russia, level the economic playing field with China, return jobs to the United States and defeat terrorism. The National Intelligence Council comprises the senior U.S. regional and subject-matter intelligence analysts. It oversees the drafting of National Intelligence Estimates, which often synthesize work by all 17 intelligence agencies and are the most comprehensive analytic products of U.S intelligence. The study, which included interviews with academic experts as well as financial and political leaders worldwide, examined political, social, economic and technological trends that the authors project will shape the world from the present to 2035, and their potential impact. ‘INWARD-LOOKING WEST’ It said the threat of terrorism would grow in coming decades as small groups and individuals harnessed “new technologies, ideas and relationships.” Uncertainty about the United States, coupled with an “inward-looking West” and the weakening of international human rights and conflict prevention standards, will encourage China and Russia to challenge American influence, the study added. Those challenges “will stay below the threshold of hot war but bring profound risks of miscalculation,” the study warned. “Overconfidence that material strength can manage escalation will increase the risks of interstate conflict to levels not seen since the Cold War.” While “hot war” may be avoided, differences in values and interests among states and drives for regional dominance “are leading to a spheres of influence world,” it said, The latest Global Trends, the subject of a Washington conference, added that the situation also offered opportunities to governments, societies, groups and individuals to make choices that could bring “more hopeful, secure futures.” “As the paradox of progress implies, the same trends generating near-term risks also can create opportunities for better outcomes over the long term,” the study said. THE HOME FRONT The report also said that while globalization and technological advances had “enriched the richest” and raised billions from poverty, they had also “hollowed out” Western middle classes and ignited backlashes against globalization. Those trends have been compounded by the largest migrant flows in seven decades, which are stoking “nativist, anti-elite impulses.” “Slow growth plus technology-induced disruptions in job markets will threaten poverty reduction and drive tensions within countries in the years to come, fueling the very nationalism that contributes to tension between counties,” it said. The trends shaping the future include contractions in the working-age populations of wealthy countries and expansions in the same group in poorer nations, especially in Africa and South Asia, increasing economic, employment, urbanization and welfare pressures, the study said. The world will also continue to experience weak near-term growth as governments, institutions and businesses struggle to overcome fallout from the Great Recession, the study said. “Major economies will confront shrinking workforces and diminishing productivity gains while recovering from the 2008-09 financial crisis with high debt, weak demand, and doubts about globalization,” said the study. “China will attempt to shift to a consumer-driven economy from its longstanding export and investment focus. Lower growth will threaten poverty reduction in developing counties.” Governance will become more difficult as issues, including global climate change, environmental degradation and health threats demand collective action, the study added, while such cooperation becomes harder.

#### Concessions on IP licensing restores WTO credibility – key to pandemic recovery and ensures developing country transition to green tech

Okonjo-Iweala 21 (Ngozi Okonjo-Iweala, director-general of the World Trade Organization, 3-2-2021, Ngozi Okonjo-Iweala: WTO members must intensify co-operation, Financial Times, <https://www.ft.com/content/0654600f-92cc-47ad-bfe6-561db88f7019>, MAM)

On Monday I became the first woman and the first African to lead the World Trade Organization. Now we must roll up our sleeves and get to work. The WTO already faced acute challenges, and they have been **amplified by Covid-19.** The pandemic has wreaked havoc on the global economy, affecting supply chains and disrupting transport and travel. The crisis has upended trade and economic activities, leading to job losses and reduced incomes around the world. It has erased years of economic gains made by developing countries and even decades of growth in some low income and least-developed countries. There is hope on the horizon. The WTO expects world merchandise trade to rebound strongly this year. The IMF forecasts an 8 per cent growth in global trade volumes in 2021 and a 6 per cent growth in 2022. It estimates global gross domestic product to rebound from falling 4.4 per cent in 2020 to growing 5.5 per cent in 2021. However, for the global economy to return to sustained growth, we must intensify co-operation to ensure equitable and affordable access to vaccines, therapeutics and diagnostics. The WTO can and must play a more forceful role in encouraging members to minimise or remove export restrictions and prohibitions that hinder supply chains for medical goods and equipment. WTO members have a further responsibility to reject vaccine nationalism and protectionism while co-operating on promising new treatments and vaccines. We must find a “third way” on intellectual property that preserves the multilateral rules **that encourage research and innovation while promoting licensing agreements** to help scale-up manufacturing of medical products. Some pharmaceutical companies such as AstraZeneca, Johnson & Johnson and the Serum Institute of India are already doing this. More broadly, WTO members agree that the organisation needs reforms. But a lack of trust means they do not agree on what changes are needed or their sequencing. If we are to restore the WTO's credibility, we must set aside our differences and agree on reforms when trade ministers meet later this year. We must contribute to ocean sustainability by agreeing to eliminate harmful fisheries subsidies which lead to too many vessels chasing too few fish. A robust deal will signal that **the WTO is back** and that it can conclude a multilateral agreement vital for future generations. The WTO cannot afford to stumble over this; the negotiations have been going on for 20 years. This is far too long. Absent an agreement, there will be no fish left over which to argue. The dispute settlement system has been central to the security and predictability of multilateral trade. But it needs reform and ministers need to agree this year on the nature of these reforms and how to make them. The WTO rule book must be updated to take account of 21st-century realities such as the digital economy. The pandemic has accelerated the use of ecommerce, enabling women and small and medium-sized enterprises to participate in international trade. But we must bridge the digital divide that makes some developing countries reluctant to join the ecommerce negotiations. Negotiations among some WTO members on facilitating investment and removing regulatory red tape in services trade have continued fairly intensively despite the pandemic. Participants need to broaden the support for these initiatives and attract interest from developing countries with the aim of concluding talks by the end of the year. More can be done to ensure the WTO addresses the nexus between **trade and climate change**. Members should reactivate and broaden **the negotiations** on environmental goods and services. But climate-related restrictions cannot become disguised restrictions on trade, and we must assist developing countries as they transition to the use of more environmentally friendly technologies. The WTO’s work in new or innovative areas does not mean that we have forgotten traditional topics such as agriculture. Improving market access for export products and dealing with trade-distorting farm subsidies remain of paramount importance to developing and least-developed countries. One area ripe for early agreement involves the removal of export restrictions on farm products purchased for humanitarian purposes by the World Food Programme. Ensuring that government support for state-owned industrial enterprises does not distort competition is also a top priority for many WTO members. The WTO faces numerous tricky challenges, but **they are not insurmountable**. There is hope if we work together in a manner that builds trust and builds bridges.

#### Diverging climate policies between countries causes protectionist trade wars – a strong role carved out for the WTO is key.

Hufbauer 8/30 (Gary Clyde Hufbauer, Nonresident Senior Fellow; Peterson Institute for International Economics, 8-30-2021, Divergent climate change policies among countries could spark a trade war. The WTO should step in, PIIE, <https://www.piie.com/blogs/trade-and-investment-policy-watch/divergent-climate-change-policies-among-countries-could>, MAM)

The United States, China, and Europe have committed themselves to raising the penalty for carbon emissions but at different speeds and with different coverage and approaches. Raising the carbon penalty, through taxes, trading systems, or regulations will inevitably make home-produced goods and services more expensive. The fear therefore is that nations with less ambitious efforts will export goods that are cheaper because their penalties are less costly. This fear, in turn, inspires concern in other countries that their exports will be **unfairly penalized by protectionist measures**. For example, Europe is now threatening a new array of carbon tariffs, while the United States and China are threatening to retaliate. These threats could lead to an escalation of protectionist actions that would **undermine the world trading system.** One possible solution to this problem may be to bring in the World Trade Organization **(WTO)** to adjudicate differences while preserving momentum for tackling carbon emissions. Time is running out if the climate change agenda goals are to be met. The meeting of the 26th UN Climate Change Conference of the Parties (COP26), starting November 1 in Glasgow, **will provide a test** of whether these competing interests can be reconciled. Both the European Union and the United States have released border tax proposals as part of their green initiatives. The primary purpose of border adjustments is to prevent "carbon leakage"—shorthand for the risk that high-carbon imported goods, paying little or no carbon fees, will take market share from low-carbon fee-paying domestic firms, thereby defeating the effort to reduce global emissions while harming the domestic industry. But border tax proposals are controversial for two reasons: First, trading partners fear disguised protection that violates WTO rules; second, many observers believe that the proposals, if implemented, will provoke opposition and obstruct cooperative action to reduce global emissions. After a summer of fires, droughts, floods, and furnace-like temperatures, public demand for decisive measures is overwhelming. The heat wave sweeping northwestern North America in late June 2021 caused 569 heat-related deaths in British Columbia. Meanwhile, in mid-July, China faced devastating floods across central Henan province, leading to 302 deaths and 50 missing persons. Responding to these calamities, China, the United States, and the European Union have proposed updates to their emission reduction commitments, aligning with their own political and economic constraints. The table below summarizes the proposals.

#### Escalates to nuclear war

Nye and Kitfield 20 (Glenn; president of the Center for the Study of the Presidency & Congress and a former member of Congress, James Kitfield; ; senior fellow at CSPC, and a three time recipient of the Gerald R. Ford Award for Distinguished Reporting on National Defense, 12/10/2020, Biden’s First Move on Nuclear Weapons, Defense One, <https://www.defenseone.com/ideas/2020/12/bidens-first-move-nuclear-weapons/170652/>, MAM)

The world is currently living through a period of great instability as it copes with **the worst global pandemic** since 1918, **the worst economic** shock since the Great Depression, and **the worst tensions** in major power relations since the early days of the Cold War. These crises come at a time when the treaties and multilateral institutions that are the foundation of the international order and strategic stability are visibly weakening, and **in danger of collapse**. In the past such periods of deep economic distress and geopolitical tensions have given rise to dark political forces, and are **ripe for confrontation** among nation-states. History will not judge kindly American political leaders who stood idle while a nuclear arms race was added to that already volatile mix.

### Climate

#### Plan key to solve climate change – ‘refusal to license’ is the roadblock to all solutions

Cayton 20 [Samuel, Adjunct Prof at Seattle Univ School of Law, legal intern at the Media Law Group, “The ‘Green Patent Paradox’ and Fair Use: The Intellectual Property Solution to Fight Climate Change,” *Seattle Journal of Technology, Environmental & Innovation Law* 11.1, p.218-22, JCR]

The justification for a patent holder’s right to exclude rests on the principle that it promotes innovation by giving the inventor an incentive to use their invention and benefit the public.30 However, while patent law assumes patent holders will efficiently license their technologies to make the best use of its potential, this notion is not always true.31 Even with the U.S. antitrust system geared toward preventing an entity’s full market control over products, patent grants give the rightsholder the power to exclude others from unauthorized secondary use of that technology.32 Furthermore, the refusal to license is not a defense against patent infringement in a lawsuit.33 If this principle is carried out to its fullest extent, there could be a prohibitive effect on initiatives to combat climate change. Globally, companies have filed numerous green patents at varying rates among specific subsectors.34 While trends show that green patent applications are declining in part because of delays in research and development (R&D) and investment,35 certain technologies such as renewable energy are becoming “more profitable” and “less reliant on government subsidies.”36 Moreover, although the U.S. remains dependent on oil and thus resistant to transforming its energy system,37 these statistics demonstrate significant innovation within green technology. Although the U.S. is now very likely to rejoin the global efforts to combat climate change, the consensus remains that private sector innovation is needed to effectuate the challenges ahead.38 This tension between the rights of the patent holder and the need to use their green technology can be described as the Green Patent Paradox, whereby patented technologies geared toward mitigating the effects of climate change or substituting environmentally hazardous industries may not reach their full potential in part because patentees refrain from licensing their products. Whether a major crisis within the patent regime concerning green technology exists is still too early to determine.39 However, recent suits in federal court foreshadow the prospect of this issue developing in the years to come. With regard to patent reform specifically, progress has been made around the world to actively combat the effects of climate change.40 At the same time, many lawsuits have been filed and argued in federal court concerning secondary and more expansive uses of patented green technology. A patent holder is entitled to relief when a secondary user “makes, uses, offers to sell, or sells” the patented invention regardless of whether the secondary user possesses41 However, the degree to which patentees can gain relief was limited by the Supreme Court in eBay v. MercExchange whereby permanent injunctive relief in patent infringement suits must meet four basic requirements for an injunction.42 A heightened standard for plaintiffs means that secondary uses of patented technologies have a better chance of surviving infringement suits. For commentators as well as secondary users, this decision is seen as a partial victory because the patent infringement gravitated from the old standard which automatically gave injunctive relief to the plaintiff.43 Since eBay, many subsequent green patent infringement cases have come before federal courts, providing mixed signals for future developments of green technology.44 In 1992, Paice LLC, a startup company in the business of hybrid gas-electric vehicles, filed a patent for its developed hybrid technology.45 Paice’s patent application covered the utilization of an electric motor in conjunction with the standard internal combustion engine (ICE) that supplies additional power and transfers torque to the drive wheels of conventional automobiles.46 In 1994, the USPTO granted Patent No. 5,343,970 (“the ‘970 patent”) to Paice.47 One year later, Toyota started developing hybrid gas-electric vehicles in Japan and later launched the Prius in 1997, which was subsequently released to the U.S. in 2000.48 Paice founder, Dr. Alex Severinsky, met with representatives of Toyota USA to demonstrate Paice’s hybrid technology and offer a license agreement; however, Toyota refused because it had “no intention of developing [Paice’s] technology.”49 At subsequent meetings between the parties, Toyota acknowledging Paice’s strong contributions but still refusing its offer to license the patent.50 Thereafter, Paice filed suit against Toyota in the Eastern District of Texas for infringement of the ‘970 patent.51 Pursuant to eBay, the District Court denied permanent injunctive relief for Paice; however, the Court went on to hold that Toyota infringed on the patent rights of Paice and awarded ongoing royalties of $25 per infringing hybrid Toyota vehicle to Paice.52 On appeal, the Federal Circuit Court affirmed the denial of the injunction but remanded on the issue of royalties, holding that the District Court could not allow further use by Toyota without clarifying how to calculate the ongoing royalty.53 On remand, after providing the parties an opportunity to settle on a rate themselves, the District Court raised the ongoing royalties to $98 per hybrid vehicle.54 Paice demonstrates the sheer benefit that eBay has toward resolving the Green Patent Paradox. If Dr. Severinsky had his way, Toyota would not have been able to sell the Prius, Highlander, Lexus RH400h, or other hybrid models in the U.S.55 Given Toyota’s success and leadership in the fuel efficiency market, such a result could have imposed a severe impact on the climate.56 However, given Dr. Severinsky’s zealousness to hold dominion over the hybrid motor, this case also reveals the potential threat of a patent holder not fully utilizing their rights on the rights of valuable green patents. Infringement suits on green patents have also covered alternative energy. In 2002, General Electric (GE) obtained U.S. Patent No. 5,083,039 (the ‘039 patent),57 which covered a “wind turbine mechanism operating at variable speed under different wind condition[s].”58 This advancement was beneficial because U.S. electric companies previously had to adjust wind turbines based on “a standard fixed frequency [of 60Hz].”59 A few years later, GE and Mitsubishi, a Japanese wind turbine manufacturer, engaged in a patent dispute over the ‘039 patent. GE brought an infringement action against Mitsubishi.60 Mitsubishi countered by filing61 a complaint in the Western District of Arkansas, accusing GE of violating antitrust law by dominating the market of variable speed wind turbines.62 These suits illustrate what is considered “the beginning of an arms race for IP in the clean energy industry.”63 While these companies are advocating for what they believe are their rights to use this technology, the need to expand this technology in the pursuit of mitigating the effects of climate change is sidelined. The ‘039 patent is a quality patent that effectively blocked use by other companies wishing to achieve an energy quality standard without proper licensing.64 If a patent of this nature gets into the hands of an entity that sits on their intellectual property rights,65 then the benefits of the green technologies covered will not be imputed on society. While Paice and GE are two major lawsuits in the area of green technology, other forms of patent infringement actions have reached federal court involving a wide variety of green patents.66 For example, one technology that has gained success in the realm of alternative energy is energy-efficient lighting such as light-emitting diodes (LEDs). LEDs are an effective substitute for standard incandescent lightbulbs and are more environmentally friendly; producing more light per watt, emitting particular colors of light without utilizing other color filters, and radiating very little heat.67 Additionally, LEDs are eco-friendly substitutes for technologies such as traffic lights and cell phones.68 Given the potential widespread use of LEDs, patent infringement disputes are inevitable. In 2019 alone, Technical LED Intellectual Property and Lighting Science Group collectively filed nineteen patent infringement lawsuits against other companies, alleging that certain products infringe on their LED patents.69 Additionally, numerous infringement lawsuits have arisen in other green technology sectors such as solar power, batteries, and even eco-friendly pet products.70

#### IPR key to solve climate change – meets stakeholder interests and is necessary to disperse climate tech.

Rosencranz et al 18 [Armin, founder of Jindal Global School of Environment and Sustainability at OP Jindal Global University, Sangram Parab, P. Modi, A. Vora; OP Jindal Global University, January 2018, “Climate Change and the Patent Regime: Are Patents the Answer?” *Journal of Intellectual Property Rights* 23, MAM]

It is almost certain that developing countries desperately need greenhouse gas abatement technology. How will that happen? Clean energy is the answer. To get the technology, they'll need to create it themselves or buy it from the patent-holder. The avenues discussed above aim to enable developing countries to shift to clean energy, and thereby to make our planet a greener and safer place to live in. The advent of clean energy technologies is **inevitable.** The only question that needs to be addressed is **how the government will regulate this transition**. The faster that developing countries implement the transition, the better for everyone involved. How will that happen? Intellectual property laws are the answer. In this article, by comparing the success of IPR in the pharma and technology sectors, it is shown that IPR is the way forward in the energy sector as well. The trinity of patent pools, patent databases and compulsory licensing will ensure that the interests of all stakeholders are met and that clean energy is pushed forward. At the same time, the importance and benefits of providing a legal framework for transactions in this nascent sector; and that maintaining a level of regulation **is essential** to meet the aim of providing clean and environmentally-friendly technology are also highlighted. It may lead to a hope to start a conversation with this article and invite people to explore various strategies and policies to mitigate the effects of climate change. Time is of the essence — polar bears are in the path toward extinction in the North Pole as we speak — and any step taken away from fossil fuels, however small, is the way forward.

#### Aggressive action from the U.S. and China is necessary – patent access fast-tracks the process and gears competition towards solving climate change.

Ladislaw 21 (Sarah Ladislaw is senior vice president and director of the Energy Security and Climate Change Program at the Center for Strategic and International Studies, 1-21-2021, Productive Competition: A Framework for U.S.-China Engagement on Climate Change, CSIS, <https://www.csis.org/analysis/productive-competition-framework-us-china-engagement-climate-change>, MAM)

The United States and China remain two of the most important countries for addressing climate change. They are the largest greenhouse gas emitters globally, though China far surpasses the United States on a national basis, and the United States surpasses China on a per capita basis. They are both significant contributors to the creation of low-carbon energy technology. Here, too, China has surpassed the United States as both a market for clean energy technology and as a manufacturer of those technologies. From a scientific perspective, it is impossible to address climate change and the goal of keeping global temperature rise to less than 2 degrees Celsius above pre-industrial levels without **both China and the U**nited **S**tates taking aggressive action to reduce emissions within the next decade. There is precedent for cooperation between the United States and China on climate change: the partnership between the two during the Obama administration created the global political dynamic that enabled the Paris Agreement. Given the urgency of the task at hand and the diplomatic muscle memory of the Biden administration, it is tempting to once again seek bilateral cooperation between the United States and China as the anchor in a new model of global climate leadership. But times have changed. First, and most importantly, the relationship between China and the United States has grown much more contentious since the end of the Obama administration. Beijing’s economic, technological, and military power has grown along with its ability to assert its distinct agenda on the global stage. It is unclear which issues will take top priority for the Biden administration regarding U.S.-China relations, but there will be many areas where U.S. and Chinese interests will conflict, and even more where the two will regard each other as competitors. Still, some degree of compartmentalization will likely be necessary to manage a contentious but essential relationship. Worsening U.S.-China relations under the new administration will likely have significant repercussions for the climate agenda. Trade disputes, concerns over human rights, and national security concerns could all disrupt clean energy supply chains between the United States and China, not to mention other countries. National security and competitiveness pressure could lead to less collaboration between the U.S. and Chinese scientists and institutions. Second, how we think about the climate challenge is different too. The main goal is no longer to negotiate a global agreement but to deliver on the actions pledged in those agreements. The United States' reentry to the Paris Agreement is a positive first step, and it needs to submit a new pledge of climate action (National Determined Contribution) to the UN Framework Convention on Climate Change. Still, beyond that, the high-stakes items are not about negotiations and agreements. The economic and political atmosphere in which climate change exists is different too. Countries are still reeling from the Covid-19 pandemic. Even before the pandemic, countries were pulling back from one another due to a crisis of confidence in globalization and free trade sparked by inequality-fueled domestic populism. Add to this an unprecedented growth in climate activism in civil society, climate risk awareness in global financial institutions, and pledges to be carbon neutral by countries and significant corporations alike. The result is enormous pressure for actions that deliver economic and climate benefits to domestic constituencies. Europe, China, India, Japan, and the United States, among others, are adopting more industrial strategy-oriented models of climate action that seek to create clean energy economic opportunity as they do emissions reduction. At one point, the vision for reducing greenhouse gas emissions was through a system of globally linked carbon markets and integrated supply chains that would drop the cost of technology. Now countries exist in an uneven playing field consisting of varying approaches to dealing with climate change and rising incentives to compete to extract maximum domestic economic value from their climate investment and policies. This environment might foster less of a tendency toward bilateral cooperation, and instead toward competition. The goal should be to make it a productive competition where players compete to achieve good rather than destructive outcomes. In this case, the United States could challenge China to be the first country to reach net-zero greenhouse gas emissions and to be the top provider of clean energy technology solutions to the world. Others will compete too, of course—formidable challengers like Europe, India, South Korea, and Japan. This productive competition dynamic will still require some elements of cooperation as well as efforts to co-opt China. For example, the United States, China, and other countries should continue to facilitate cross-border collaboration on energy research and development. Here, cooperation among scientists, industries, and sectors is critical. When it comes to research-led innovation, there are no benefits to breaking down scientists and innovators' network, which will deliver the essential breakthroughs we need. The United States and China might also need to agree on some things, like new rules to ensure the multilateral financial, development, and trade systems encourage climate change measures. While concerns over China’s unfair trade practices are indeed valid, the United States should find ways to protect the climate agenda from these ongoing economic tensions. A strategy of working with like-minded countries to pressure China to come on board may be necessary. In the current trade environment, it is quite likely policies to manufacture and deploy clean energy technologies will run into trade barriers (as they have in the past) due to China's massive use of state subsidies to develop technologies and protect domestic industries. One way to avoid this is to **agree to a climate waiver** **under the** World Trade Organization (**WTO**), which would allow countries to subsidize and protect clean energy industries and technologies that help them to meet their climate commitments. Thus far, the European Union, Japan, and the United States have been leading the charge to reign in the Chinese overall state-led economic model using pressure in the WTO. Working within this group to propose a climate waiver to China would allow these countries to remain united on other aspects of their agenda while compelling China to address climate change. The United States might also want to find other ways to co-opt China into doing more positive things for the climate. For example, in the context of Covid-19 debt relief, the United States and other countries could pressure China to restructure existing debt holdings from developing countries into climate-beneficial projects. These so-called debt-for-climate swaps could be similar in format to the debt-for-nature swaps that became popular following the sovereign debt crisis of the 1980s. There may be other ways to co-opt Chinese investment in global infrastructure projects to be greener by granting them recognition for their green performance as part of a multilateral initiative. The first and most important part of this strategy is for the United States to get serious about its clean energy and climate policy and commit to being more competitive. The Biden administration has already pledged to do this as part of its Build Back Better plan, but there is reason to believe both parties in Congress could support some of this agenda. As I wrote in an earlier commentary on the topic, the last remaining bipartisan area of agreement in Washington concerns U.S. competitiveness relative to other countries, particularly China. As the American Council on Competitiveness notes, no matter the measure or sector of the economy, the United States is either newly lagging or weakening its leadership across the board. Before the end of 2020, Congress passed a clean energy innovation package that makes a substantial down payment toward a more competitive U.S. clean energy sector. But more must be done. The final thing to note is that there will likely still be areas where the United States and China simply cannot and will not trust each other. These could be concrete issues like the inclusion of Chinese-made equipment in our critical infrastructure, including the electric power grid. Or significant, principle-related matters like human rights violations in the clean energy supply chain for solar panels. There may be excellent reasons for the United States to confront China on a range of trade or security issues, but **getting tough on China is no substitute for launching a viable U.S. strategy to compete in** the field of **clean energy** technologies. A productive competition strategy means leaning into our instincts to compete with China but in a way that advances shared global interests.

#### Climate change causes extinction – feedback loops make adaptation impossible.

Beard et al. 21 (S.J. Beard; Senior Research Associate and Academic Programme Manager at the Centre for the Study of Existential Risk, S.J. Beard, Lauren Holt, Asaf Tzachor, Luke Kemp, Shahar Avin, Haydn Belfield; Centre for the Study of Existential Risk research associates, Phil Torres of Torres 16; visiting scholar at the Centre for the Study of Existential Risk at Leibniz Universität Hannover, Assessing climate change’s contribution to global catastrophic risk, Futures Volume 127, March 2021, 102673, [https://www.sciencedirect.com/science/article/pii/S0016328720301646#](https://www.sciencedirect.com/science/article/pii/S0016328720301646)!, MAM)

While most of the impacts of climate change so far have fallen within the range of what was experienced during the Holocene, the rate of change is **faster than** in **the Holocene** and we are now beginning to see climate change push **beyond these boundaries**. In the latest edition of the planetary boundaries’ framework, climate change is placed in the zone of increasing risk, implying that while this boundary has been breached, there remains some **potential** for normal functioning and recovery (Steffen et al., 2015). It thus lies between what the authors identify as the ‘safe zone’ and other ‘high risk’ transgressions, such as disruption to the biochemical flows of nitrogen and phosphorus and loss of biosphere integrity. As part of their discussion of BRIHN Baum and Handoh (2014) note that climate change is the planetary boundary for which the risk to humanity has received most meaningful consideration and they suggest that this attention is deserved. Yet little research attention has been paid to climate change’s extreme or catastrophic effects. Kareiva and Carranza (2018) argue that, despite currently falling outside of the area of high risk, climate change has the clear potential to push humanity across a threshold of irreversible loss by “changing major ocean circulation patterns, causing massive sea-level rise, and increasing the frequency and severity of extreme events… that displace people, and ruin economies.” Even if humanity was resilient to each of these individual impacts, a global catastrophe could occur if these impacts were to occur **rapidly and simultaneously**. One scenario that has received comparatively more attention is that of the global climate crossing a tipping point that would trigger environmental feedback loops (such as declining albedo from melting ice or the release of methane from clathrates) and cascading effects (such as shifting rainfall patterns that trigger desertification and soil erosion). After this point, anthropogenic activity may cease to be the main driver of climate change, making it accelerate and become harder to stop (King et al., 2015). Other scenarios can be discerned from the numerous historical cases in which the modest, usually regional, climatic changes experienced during the Holocene have been implicated in the collapse of previous societies, including the Anasazi, the Tiwanaku, the Akkadians, the Western Roman Empire, the lowland Maya, and dozens of others (Diamond, 2005, Fagan, 2008). These provide a precedent for how a changing climate can trigger or contribute to societal breakdown. At present, our understanding of this phenomena is limited, and the IPCC has labelled its findings as “low confidence” due to a lack of understanding of cause and effect and restrictions in historical data (Klein et al., 2014). Further study and cooperation between archaeologists, historians, climate scientists and global catastrophic risk scholars could overcome some of these limitations by identifying how the impacts of climate change translate into social transformation and collapse, and hence what the impacts of more rapid and extreme climatic changes might be. There is also the potential for larger studies into how global climate variations have coincided with collapse and violence at the regional level (Zhang, Chiyung, Chusheng, Yuanqing, & Fung, 2005; Zhang et al., 2006). However, these need to be interpreted and generalized with care given the differences between pre-industrial and modern societies. Societies also have a long history of adapting to, and recovering from, climate change induced collapses (McAnany and Yoffee, 2009). However, there are two reasons to be sceptical that such resilience can be easily extrapolated into the future. First, the relatively stable context of the Holocene, with well-functioning, resilient ecosystems, has greatly assisted recovery, while **anthropogenic climate change** is more rapid, pervasive, global, and severe. Large-scale states did not emerge until the onset of the Holocene (Richerson, Boyd, & Bettinger, 2001), and societies have since remained in a surprisingly narrow climatic niche of roughly 15 mean annual average temperature (Xu, Kohler, Lenton, Svenning, & Scheffer, 2020). A return to agrarian or hunter-gatherer lifestyles could thus have more devastating and long-lasting effects in a world of rapid climate change and ecological disruption (Gowdy, 2020).7 Second, modern human societies may have developed **hidden fragilities that amplify the shocks** posed by climate change (Mannheim 2020) and the complex, tightly-coupled and interdependent nature of our socio-economic systems makes it more likely that the failure of a few key states or industries due to climate change could cascade into a global collapse (Kemp, 2019). A third set of plausible scenarios stem from climate change’s broader environmental impacts. Apart from being a planetary boundary of its own, Steffen et al. (2015) point out that climate change is intimately connected with other planetary boundaries (see Table 1). Climate change is thus identified by the authors as one of two ‘core’ boundaries with the potential “to drive the Earth system into a new state should they be substantially and persistently transgressed.” This transformative potential was elaborated on in subsequent work exploring how the world could be pushed towards a ‘Hothouse Earth’ state, even with anthropogenic temperature rises as low as 2 ◦C (Steffen et al., 2018). The connection between climate change and biosphere integrity (the survival of complex adaptive ecosystems supporting diverse forms of life) is particularly strong. The IPCC is highly confident that climate change is adversely impacting terrestrial ecosystems, contributing to desertification and land degradation in many areas and changing the range, abundance and seasonality of many plant and animal species (Arneth et al., 2019). Similarly, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) has reported that climate change is restricting the range of nearly half the world’s threatened mammal species and a quarter of threatened birds, with marine, coastal, and arctic ecosystems worst affected (Diaz et al., 2019). According to one estimate, climate change could cause 15–37 % of all species to become ‘**committed to extinction’** by mid-century (Thomas et al., 2004). Disruption to biosphere integrity can have profound economic and social repercussions, ranging from **loss of ecosystem services and natural resources** to the **destruction of traditional knowledge and livelihoods.** For instance, desertification, which threatens a quarter of Earth’s land area and a fifth of the population, is already estimated to cost developing nations 4–8 % of their GDP (United Nations, 2011). Many other rapid regime shifts involving loss of biosphere integrity have been observed, including shifts in arid vegetation, freshwater eutrophication, and the collapse of fish populations (Amano et al. 2020). There is a theoretical possibility of still more profound regime shifts at the global level (Rocha, Peterson, Bodin, & Levin, 2018). However, the contribution of loss of biosphere integrity to GCR is yet to be assessed. Kareiva and Carranza (2018) argue that it is unlikely to threaten human civilization, due both to a lack of plausible mechanisms for this threat and the fact that “local and regional biodiversity is often staying the same because species from elsewhere replace local losses.” However, in their classification of GCRs, Avin et al. (2018) suggest the potential for ecological collapse to threaten the safety boundaries of multiple critical systems with diverse spread mechanisms at a range of scales, from the biogeochemical and anatomical to the ecological and sociotechnological. Note that both these studies were conducted for largely conceptual purposes and should not be taken as rigorous analyses of this risk, this topic warrants further investigation.

#### Each tenth of a degree matters and saves millions of lives

Aronoff & Denvir 21 [Kate, staff writer at the New Republic, writing fellow at In These Times, Daniel, visiting fellow in International and Public Affairs at Brown Univ, “Capitalism Can’t Fix the Climate Crisis,” *Jacobin*, 08/25/21, <https://jacobinmag.com/2021/08/capitalism-climate-crisis-global-green-new-deal-clean-energy-fossil-fuel-industry>, accessed 08/26/21, JCR]

The text of the Paris Agreement says that warming should be constrained to well below two degrees Celsius. 1.5 degrees is an aspiration. It’s good to understand where that demand comes from; it has been a standing call from the folks in climate-vulnerable countries in the Global South, for whom the difference between 1.5 and 2 degrees is huge. The folks talking about 1.5 degrees have been marching through the halls of UN climate talks, chanting “1.5 to survive,” because for low-lying island states, warming of 1.5 degrees represents an existential threat. Currently we are on track for about 1.1 degrees Celsius of warming. That gives us a punishingly short window in which to meet even two degrees, which is a bit of a fabrication; there’s some debate about where the two-degree target came from. Some people credit that to the economist William Nordhaus, who is not the most reliable source on a lot of these things. But there’s something comforting about a target. There’s something comforting about saying that this thing that is happening is far-off, and that we can potentially avoid it. We have a bit of time, and two degrees gives us more time than 1.5 degrees. Reaching targets has been the popular goal. That’s what you see in the fossil fuel industry assessments. But the conversation about targets can sometimes obscure what’s actually happening. It’s not as if somebody who is living through a hurricane or a natural disaster will say, “Oh no, we’ve hit two degrees Celsius.” The climate crisis is playing out all around us. There’s not a point at which we cross the boundary toward a disastrous future. Every tenth of a degree of warming that we avoid makes an enormous amount of difference, saving on the order of tens of thousands of lives. If we cross 1.5 or even two degrees of warming, it’s not that we should all pack up, go home, and wait to die. There are still millions of lives that can be saved by preventing each additional tenth of a degree of warming.

#### Climate change will exacerbate geopolitical tensions and lead to widespread wars

Busalacchi and Goodman 8/6 (Antonio Busalacchi - president of the University Corporation for Atmospheric Research and former co-chair of the National Research Council’s Committee on National Security Implications of Climate Change for U.S. Naval Forces, Sherri Goodman - senior fellow at the Wilson Center and the Center for Climate & Security and former U.S. deputy under secretary of defense (environmental security), 8-6-2021, Why National Security Agencies Must Analyze Climate Risks, Lawfare, <https://www.lawfareblog.com/why-national-security-agencies-must-analyze-climate-risks>) \*edited for ableist language\*

July marked the initial deadline for the Pentagon and other federal agencies to draw up plans for potential climate risks, under an executive order by President Biden. Such plans are an essential first step, but the greater challenge for national security agencies is to continue to redirect their focus to changing climate conditions that pose a complex, two-pronged threat: **social and political instability overseas and damage to U.S. infrastructure.** Climate change is accelerating geopolitical tensions in many regions of core strategic interest to the United States. Increasingly destructive storms, rising seas and the melting Arctic are fueling global tensions, with nations bracing for mass migrations of displaced people and vying to take advantage of newly accessible natural resources. Changing climate patterns have become a catalyst for internal conflicts and international unrest, with severe droughts playing a role in setting the stage for the Syrian civil war and shrinking lake levels in Lake Chad contributing to widespread violence across the four African nations of the lake’s basin. Even in places where climate change has not sparked conflicts directly, it looms as a threat multiplier, exacerbating competition for food and water and worsening ethnic tensions. The Defense Department highlighted these risks earlier this year in its first climate and environmental security tabletop exercise, known as Elliptic Thunder. Set in East Africa and based on climate, economic and population forecasts, the multiagency exercise highlighted the extent to which climate change can **worsen natural disasters** and **trigger regional instability**, opening the door for strategic rivals and **extremist groups** to gain power. Closer to home, altered weather patterns and warming temperatures are battering military installations across the nation. From the devastating impacts of Hurricane Michael on Tyndall Air Force Base in Florida to the thawing and erosion in Alaska that is undermining the foundations of vital radar facilities, climate change is costing billions of dollars while **degrading U.S. military readiness.** More broadly, coastal surges, floods, heat waves and wildfires are exacting a toll on U.S. transportation networks and energy systems, **threatening supply disruptions** and increasing the cost and complexity of potential defense operations. As climate change becomes a central focus for national security policymakers, scientists are gaining new insights into the complex interconnections of Earth’s climate system. By collaborating with a range of stakeholders, they also are helping to develop actionable projections of climate impacts in specific regions. In one notable breakthrough, for example, a research team drew on the complex interactions of the ocean and atmosphere to demonstrate that changes in Arctic sea ice coverage can be predicted several years in advance. This is critical for U.S. security interests at a time when changing ocean circulation patterns and salinity are affecting how submarines maintain their stealthy features and track Russian and other activity in the warming Arctic. **Russia is taking advantage of a warming climate to rearm in the Arctic,** conducting high-profile military exercises in the region earlier this year and launching increasingly powerful icebreakers while President Vladimir **Putin pledges to reinforce his nation’s presence** in the region. Also looming are growing international tensions over trillions of dollars of natural resources that are becoming more accessible because of retreating sea ice. Looking further into the future, scientists are studying how storms are likely to shift later this century in ways that may lead to widespread flooding or lightning-induced wildfires in parts of North America and overseas regions. This type of research is critical for designing more resilient infrastructure and anticipating shifts in weather patterns that can displace vulnerable populations. To enhance understanding of how the climate is likely to change and the extent to which **reductions in g**reen**h**ouse **g**as **emissions** could **lessen future impacts**, the government must boost funding for science in ways that can support decision-makers. The research and analysis community needs more powerful supercomputers, next-generation observing tools such as advanced satellites and enhanced models of regional climate conditions, along with improvements to such cutting-edge techniques as artificial intelligence. Investments in climate research and analytics will **more than pay for themselves** by producing increasingly detailed and reliable projections of the climate threats the U.S. faces at the regional scale at which decisions are made and conflict arises. This will produce economic benefits as well, with private firms already generating jobs that provide climate risk services to many sectors of the economy, from real estate to banking.

#### Expanding application of compulsory licensing would ensure needed access to environmental tech

Gunderson 14 [Adam, practicing attorney at the Gunderson Law Group, “Protecting the Environment by Addressing Market Failure in Intellectual Property Law: Why Compulsory Licensing of Green Technologies Might Make Sense in the United States: A Balancing Approach,” *BYU Law Review* 2014.3, p.683-4, JCR]

Broadening the application of compulsory licensing laws can help to reduce the suppression of important technologies; it is impossible to completely suppress a technology when the law requires that the holder license it to others. While there are some risks associated with expanding compulsory licensing,70 there are tremendous benefits as well. As discussed previously, the constitutional justification for the protection of a patent is to promote scientific and technological progress.71 Given the pressing nature of many of our environmental problems, progress in this area of science and technology is especially important. Expanding the application of compulsory licensing to include more green technologies will promote scientific and technological progress in solving environmental problems. Specifically, compulsory licensing can promote such progress by: 1) ensuring prompt access to important technologies, 2) increasing the likelihood of future innovation, and 3) decreasing judicial inefficiencies. The most obvious advantage of a compulsory licensing policy is that it ensures that technological advances cannot be suppressed. There is no progress when a patent holder obtains a patent and refuses to use the patented technology. In these instances, progress can be slowed by twenty years or more, as current patent laws give a filed patent a life of twenty years, and that timeline may also be extended for various reasons.72 Given the inherent urgency of solving certain environmental problems (such as climate change), a prolonged suppression of important technology could be detrimental. Any social costs associated with the expansion of compulsory licensing may be worthwhile if society can make swift progress in addressing environmental concerns—ending environmental tragedies decades earlier than otherwise possible.

#### Reliance on public sector funding will be too expensive and controversial. IP licensing and incentives will be key driver of tech adoption

Sarnoff & Chon 18 [Joshua, Prof of Law at Depaul College of Law, served as a Distinguished Scholar at the US Patent and Trademark Office, Margaret, Prof for the Pursuit of Justice at the Seattle Univ School of Law, “Innovation Law and Policy Choices for Climate Change-Related Public-Private Partnerships,” *The Cambridge Handbook of Public-Private Partnerships, Intellectual Property Governance, and Sustainable Development*, eds Margaret Chon et al, p.246-7. JCR]

The Paris Agreement placed substantial emphasis on R&D and technology transfer through private markets, contrary to competing recommendations to rely more on public funding11 and despite the many government alternatives that exist for funding technology development and transfer.12 In particular, governments can play an important role in stimulating innovation and technology transfer. Mechanisms that are available for governments to fund, develop, and transfer innovations include public provision of necessary infrastructure, subsidized research, and prioritized public procurement. All of these options can substitute for, supplement, or support market-driven intellectual property (IP) rights. But there are limits to government resources (particularly at local levels), and the public sector “does not always have the resources required to push through new projects independent of the IP-related costs involved.” 13 Given the political difficulties of committing to massive expenditures as public obligations, the choice to rely primarily on private markets and consequent IP rights to generate the bulk of the committed funding for climate change-related mitigation and adaptation technologies hardly comes as a surprise. Reliance on private sector development and transfer thus will encourage the acquisition of IP rights (of differing kinds, to differing degrees, and in various industries) in the hopes of appropriating greater economic returns. In turn, the costs of climate change mitigation and adaptation measures will depend in part on whether specific climate change technologies are subject to IP rights, on how those rights are licensed, and on what technological substitutes are affordably available.14 For example, widely cited assessments have assumed there would be price constraints on patented climate change technologies because of the availability of ready substitutes for existing technologies, or because of development of incremental rather than breakthrough technologies. But these assumptions may not always hold,15 as climate technologies are very diverse. These assumptions are particularly unlikely to be true if we move to novel geoengineering solutions that have not previously been deployed in markets, such as carbon capture and sequestration technologies or solar climate engineering methods (which include the use of aerosols or marine cloud brightening to increase the Earth’s albedo, i.e., reflectivity).16

# 2AC

## TRIPS – A1

### AT – Trade Liberalization

#### TRIPS has become an instrument of economic colonialism by reinforcing Western notions of IP – this has become a legal basis for political and economic pressure on independent states.

Rhanaian 10 (Andreas, University of Glasgow - School of Law, Neo-Colonial Aspects of Global Intellectual Property Protection, The Journal of World Intellectual Property, Vol. 12, No. 1, pp. 40-74, 2010 <https://papers.ssrn.com/sol3/papers.cfm?abstract_id=1629228>, MAM)

The TRIPs Agreement and the long-established intellectual property conventions which it incorporates serve as an essential device in the building and strengthening of an **informal empire of economic colonialism** by the industrialised nations in the non- Western world. These international instruments introduced or **reinforced Western style i**ntellectual **p**roperty rights in non-Western countries according to minimum standards which predominantly advance the interests of the intellectual property producing and -owning industrialised nations. One justification for this development has been the promotion of global technology transfer; an argument which overlooks the economic and social imbalances between industrialised and developing countries. Actual technology transfer is thus far less effective than perhaps envisaged. In fact, the principal concern in the drive for global intellectual property protection of a Western nature and Western level is the successful enforcement in developing countries of intellectual property rights which originate in the West or are owned by enterprises of industrialised nations. The intellectual property-owning enterprises are often large multi-national corporations which are able to wield impressive power by asserting worldwide their intellectual property rights that are backed by international conventions. These conventions are, in turn, **the legal basis for political and economic pressure** on formally independent and sovereign states. In this way, an informal system of socio-economic dependence with similarities to the colonial era is established. Formal imperialism has come to an end with decolonisation, but informal economic colonialism continues to exist and increases in its importance, and intellectual property rights play a far more significant role in this process than in the past. Informal colonialism does not seek formal political control in the dependent states, most commonly developing countries. This phenomenon can therefore be termed as neo-colonialism as opposed to the historical situation in the formal colonial (and later imperial) epoch, when, unlike today, national pride, international political power and prestige were at least as important as commercial success. Modern informal neo-colonialism establishes a network of economic, social, and consequently political, dependence which is increasingly based on licensing and enforcement of intellectual property rights. Western countries, especially the United States, now constantly press for higher levels of intellectual property protection **beyond** the standards of **TRIPs** in bilateral agreements and thus **consolidate the framework of dependence**. Connected with the present tendency towards the expansion of exclusive rights is another, less apparent, neo-colonial legislative project: the protection of “traditional cultural expressions”, in so far as this term is understood in the limited sense of what Western lawyers would loosely associate with traditional art and the scope of copyright protection. Again, this idea reflects colonial features. The protection of the “tradition” (essentially a Western construct) in fact creates this tradition and serves Western interests, and is to be administered by organs of the indigenous community in a kind of indirect rule. Modern non-Western art and its potentially critical force can in this way be defused, and the worldwide commodification of “ethnic” and “traditional/authentic” artefacts can be pursued even better, though with a moral label. The requirement of ascertaining the members of the indigenous community, the intended beneficiaries of this protection, invites racialist and segregationist legislation if this measure wants to be effective at all.

#### Well-regulated capitalism is possible, sustainable, and solves every existential threat – alternatives sacrifice millions to irreversible poverty.

Budolfson 21 (Mark Budolfson, Assistant Professor in the Department of Environmental and Occupational Health and Justice at the Rutgers School for Public Health and Center for Population–Level Bioethics., 5-7-2021, Arguments for Well-Regulated Capitalism, and Implications for Global Ethics, Food, Environment, Climate Change, and Beyond, Cambridge Core, <https://www.cambridge.org/core/journals/ethics-and-international-affairs/article/arguments-for-wellregulated-capitalism-and-implications-for-global-ethics-food-environment-climate-change-and-beyond/96F422D04E171EECDEF77312266AE9DD>) MAM

The Argument for Well-Regulated Capitalism

However, things are more complicated than the arguments above would suggest, and the benefits of capitalism, especially for the world's poorest and most vulnerable people, are in fact myriad and significant. In addition, as we will see in this section, many experts argue that **capitalism is not the fundamental cause** of the previously described problems but rather **an essential component of the best solutions** to them and of the best methods for promoting our goals of health, well-being, and justice.

To see where the defenders of capitalism are coming from, consider an analogy involving a response to a pandemic: if a country administered a rushed and untested vaccine to its population that ended up killing people, we would not say that vaccines were the problem. Instead, the problem would be the flawed and sloppy policies of vaccine implementation. Vaccines might easily remain absolutely essential to the correct response to such a pandemic and could also be essential to promoting health and flourishing, more generally.

The argument is similar with capitalism according to the leading mainstream arguments in favor of it: Capitalism is an essential part of the best society we could have, just like vaccines are an essential part of the best response to a pandemic such as COVID-19. But of course both capitalism and vaccines can be implemented poorly, and can even do harm, especially when combined with other incorrect policy decisions. But **that does not mean** that **we** should **turn against them**—quite the opposite. **Instead, we should embrace them as essential** to the best and most just outcomes for society, and educate ourselves and others on their importance and on how they must be properly designed and implemented with other policies in order to best help us all. In fact, the argument in favor of capitalism is even more dramatic because it claims that much more is at stake than even what is at stake in response to a global pandemic—what is at stake with capitalism is nothing less than whether the world's poorest and most vulnerable billion people **will remain in conditions of poverty and oppression, or** if they will instead finally **gain access to** what is minimally necessary for **basic health and wellbeing** and become increasingly affluent and empowered. The argument in favor of capitalism proceeds as follows:

Premise 1. Development and the past. Over the course of recorded human history, the majority of historical **increases in health, wellbeing, and justice have occurred** in the last two centuries, largely **as a result of societies adopting** or moving toward **capitalism**. Capitalism is a relevant cause of these improvements, in the sense that they could not have happened to such a degree if it were not for capitalism and would not have happened to the same degree **under any alternative** noncapitalist approach to structuring society. The argument in support of this premise relies on observed relationships across societies and centuries between indicators of degree of capitalism, wealth, investments in public goods, and outcomes for health, wellbeing, and justice, together with econometric analysis in support of the conclusion that the best explanation of these correlations and the underlying mechanism is that large increases in health, wellbeing, and justice are largely driven by increasing investments in public goods. The scale of increased wealth necessary to maximize these investments requires capitalism. Thus, as capitalist societies have become dramatically wealthier over the past hundred years (and wealthier than societies with alternative systems), this has allowed larger investments in public goods, which simply has not been possible in a sustained way in societies without the greater wealth that capitalism makes possible. Important investments in public goods include investments in basic medical knowledge, in health and nutrition programs, and in the institutional capacity and know-how to regulate society and capitalism itself. As a result, capitalism is a primary driver of positive outcomes in health and wellbeing (such as increased life expectancy, lowered child and maternal mortality, adequate calories per day, minimized infectious disease rates, a lower percentage and number of people in poverty, and more reported happiness);5 and in justice (such as reduced deaths from war and homicide; higher rankings in human rights indices; the reduced prevalence of racist, sexist, homophobic opinions in surveys; and higher literacy rates).6 These quantifiable positive consequences of global capitalism **dramatically outweigh the negative consequences** (such as deaths from pollution in the course of development), with the result that the net benefits from capitalism in terms of health, wellbeing, and justice have been greater than they would have been under any known noncapitalist approach to structuring society.7

Premise 2. Economics, ethics, and policy. Although capitalism has often been ill-regulated and therefore failed to maximize net benefits for health, wellbeing, and justice, it **can become well-regulated** so that it maximizes these societal goals, by including mechanisms identified by economists and other policy experts that do the following:

**optimally regulate negative effects such as pollution and monopoly power**, and invest in public goods such as education, basic healthcare, and fundamental research including biomedical knowledge (more generally, policies that correct the failures of free markets that economists have long recognized will arise from “externalities” in the absence of regulation);9

ensure equity and distributive justice (for example, via wealth redistribution);10

ensure basic rights, justice, and the rule of law independent of the market (for example, by an independent judiciary, bill of rights, property rights, and redistribution and other legislation to correct historical injustices due to colonialism, racism, and correct current and historical distortions that have prevented markets from being fair);11 and

ensure that there is no alternative way of structuring society that is more efficient or better promotes the equity, justice, and fairness goals outlined above (by allowing free exchange given the regulations mentioned).12

To summarize the implication of the first two premises, well-regulated capitalism is essential to best achieving our ethical goals—which is true even though capitalism has certainly not always been well regulated historically. **Society can still do much better** and remove the large deficits in terms of health, wellbeing, and justice that exist under the current inferior and imperfect versions of capitalism.

### AT: Trade !

### AT: Slow Growth

## Climate

#### CCS and natural gas technology make decarbonization possible – alternatives fail.

Munnings 20 (Clayton Munnings is a Research Associate at Resources for the Future (RFF), 12-16-2020, Wind, Solar, and Gas: Managing the Risks of America’s Clean Energy Transition, Progressive Policy Institute, <https://www.progressivepolicy.org/publication/wind-solar-and-gas-managing-the-risks-of-americas-clean-energy-transition/>) MAM

Models that simulate decarbonization of the electric sector typically include natural gas generation with CCS technologies. For example, a recent study by the University of California Berkeley Goldman School of Public Policy assessed the feasibility of a 90 percent clean United States electricity grid by 2035 and relied on natural gas with CCS to provide dispatchable power. To achieve a 100 percent clean electricity grid, the authors highlighted two options: (1) further investments in CCS for natural gas, or, (2) further reliance on expensive alternatives—such as hydrogen or storage—that doubled marginal abatement costs into the range of 100 to 125 dollars per ton. Unfortunately, the use of CCS lags far behind what is required to meet America’s carbon-reduction targets under the Paris Agreement. The Petra Nova coal plant in Texas is the only U.S fossil-fuel powered plant capable of generating and capturing carbon in large quantities, but its operations were suspended earlier this year amid low oil prices and falling demand for energy as a result of the pandemic. Outside of the electricity sector, the U.S. has 10 of the world’s 19 large- scale CCS projects. Most operate in natural gas processing plants, fertilizer production, synthetic natural gas production, or ethanol production. There are no CCS projects operating on natural gas generators in the United States. “Given the challenges now facing available firm low-carbon resources, it is tempting for policymakers, socially conscious businesses, and research efforts to bet exclusively on today’s apparent winners: solar photovoltaics, wind, and battery energy storage. **That would be a mistake**,” says Jenkins et al. (2020). Instead, the authors call for investing in a more **technically diverse approach,** which includes natural gas generation with CCS among other technologies, to secure low prices for zero-carbon electricity. Despite unfavorable economics today, the value of natural gas with CCS technology grows as renewable penetration or marginal costs of renewables become quite high. Therefore, Spokas et al. (2020) argue that **excluding CCS technologies from our decarbonization toolkit** based on present-day economics is likely shortsighted and fails to “recognize CCS may have significant value in the future and risks stunting CCS technology advancement.” A federal tax rule (45Q) provides an incentive for company investments in carbon sequestration. It is calculated by multiplying the metric tons of qualified carbon sequestered by a predetermined value. Depending on the type of project, the incentive ranges from $11.70 to $28.74 and rises annually accounting for inflation. The incentive requires secure geological storage of carbon emissions in deep saline formations, oil and gas reservoirs, or un-minable coal seams. The claimer of the credit must capture at least 500,000 metric tons of carbon annually. If the carbon captured somehow leaks out, the incentive must be repaid to the Treasury. At the state level, California has a low-carbon fuel standard that uses market trading to price credits for carbon savings. Credits recently have traded around $200 per ton. This also creates a strong incentive for producers to invest in CCS technologies, including direct air capture, CCS at oil and gas production facilities, and CCS at refineries. This patchwork of policies has led to an encouraging pipeline of new CCS projects across a broad range of geographies and technologies. The Clean Air Task Force’s CCUS Project Tracker reports 32 projects announced since 2018 that have the potential to sequester 40 million metric tons of carbon dioxide annually. Eight of these projects leverage financing through California’s low-carbon fuel standard in addition to using the federal 45Q incentive. Six of these projects aim to apply CCS technologies to natural gas power plants. Spokas et al. (2020) argue that CCS technology on natural gas plants is technically feasible and could break even from an economic perspective if they combine 45Q with enhanced oil recovery, which is the use of captured carbon to extract oil that could not have otherwise been extracted. Ultimately, natural gas generators with CCS must be deployed at scale to achieve an effective zero-carbon backstop for renewables. The policy and technical inertia surrounding CCS development must be expedited to ensure that CCS technologies develop quickly enough to be applied successfully to a natural gas generator as soon as possible. Therefore, **the federal** and state **policies that have spurred new CCS projects should be strengthened.** For example, the Clean Air Task Force has proposed a modification of the 45Q incentive to expand the effective window of eligibility for new CCS projects.

#### No climate modeling scenarios for 1.5 degrees that don’t include carbon capture

Aronoff & Denvir 21 [Kate, staff writer at the New Republic, writing fellow at In These Times, Daniel, visiting fellow in International and Public Affairs at Brown Univ, “Capitalism Can’t Fix the Climate Crisis,” *Jacobin*, 08/25/21, <https://jacobinmag.com/2021/08/capitalism-climate-crisis-global-green-new-deal-clean-energy-fossil-fuel-industry>, accessed 08/26/21, JCR]

DD: Those liberal myths would like people to be comforted by the fact that we can have the political economic order that we have now, but without climate change. What roles do carbon capture and geoengineering play? Might they be helpful tools, or are they just techno-fixes to a problem that’s fundamentally political and economic? KA: That has been a very controversial question on parts of the climate left. They can be useful tools — carbon capture, storage, and sequestration more so. But part of the problem is that the current industry-led conversation about carbon capture says that we can keep up business as usual if we just add in a lot of technology that doesn’t work at scale, and hope that at some point we can scale it up to levels we’ve never seen. Right now, that seems unfathomable, given the limited use that it has. At the same time, there is almost no climate modeling on a 1.5-degree scenario in particular, where there is no carbon capture and no direct air capture, which is another process that sucks carbon directly down from the atmosphere. We need some level of these technologies, and as a socialist, I want those conversations to be had on the Left, and not cede that ground to Occidental Petroleum or Exxon-Mobil, to determine who owns those technologies and who is profiting off of them. Kim Stanley Robinson has written that carbon sequestrations should be treated like a public utility, which is basically right. If this technology is so needed, why leave it up to companies that have spent decades lying about this problem and misleading the public?

#### The status quo cements climate nationalism. Aff is the only way to prevent intensification of xenophobic violence and climate nationalism.

Karlsson 16 [Rasmus, Senior lecturer in Political Science at Umea University, “The Environmental Risks of Incomplete Globalization,” *Globalizations*, http://bit.ly/2jS3RNS]

Every year, more and more people travel by airplane and are able to experience other countries and cultures first-hand. As the world gets smaller, it is becoming increasingly difficult to deny our common humanity and insist on the artificial segregation of people based on mere geographical luck. Yet, in terms of politics or ideology, there has been surprisingly little interest in even imagining a world with universal freedom of movement and shared prosperity. It is reasonable to think that this disinterest in part derives from deeply entrenched Malthusian beliefs and fears of a coming climate crisis. Malthusian discourse often portrays global climate change as ultimate evidence of irresponsibility, greed or even the “cancer stage of capitalism” (Barry, 2012:138). Such descriptions show little tolerance for learning or humility with regard to the difficulties of the task. There has never been a blueprint for how to build a prosperous planetary civilisation or for how to achieve technological maturity in a way that does not destroy the biosphere. Yet, in a world of seven billion actually existing people, the question is where to go from here? As discussed above, to try to reverse the great structural processes of modernity through intentional localisation does not only seem wholly politically unrealistic, it is also most unlikely to actually deliver greater resilience or environmental sustainability. Yet, the problem of lacking realism is just as acute for those advocating breakthrough innovation or seeking to more fully integrate the world (Karlsson, 2013). In a time of public austerity, rising xenophobia, and an almost complete absence of realistic yet transformative visions at the global level, it is not surprising that climate nationalist responses have emerged as the default policy orientation. While these responses may at best slow the rate of warming, they offer little hope for the 3.5 billion people who currently lack access to modern energy and, as such, they are likely to contribute to the creation of new patterns of climate injustice. They are also problematic in the sense that for every year that a more meaningful response is delayed, the need for CDR grows. Already now, such negative emissions technology has become more or less a necessity for achieving the two degree target according to the scenarios represented in the Intergovernmental Panel on Climate Change (IPCC) database (Anderson, 2015). Whereas breakthrough energy innovation could potentially offer a source of sustained global growth as energy would become significantly cheaper, CDR is always going to come at a net cost. If CDR eventually becomes unaffordable due to prolonged political procrastination and generally inefficient mitigation policies, it is likely that the political momentum will shift towards solar radiation management (SRM) and other more risky forms of climate engineering. Instead of fearfully backing into a warming future, there is an obvious need for bold and proactive political action (Garibaldi, 2014; Karlsson, 2016). Yet, as long as mitigation is perceived as a cost and something that runs counter to broader socio-economic goals, such action is unlikely. While accelerating the transition to a high-energy planet would undoubtedly put strong upward pressure on global emissions in the short run, it would also open up a political opportunity space for effective climate action that does not exist today. In a more equal and integrated world, there would be greater financial and human resources to combat climate change. Most of all, by providing a progressive account of globalisation, there would be a meaningful counter-narrative to both nationalist and neoliberal thinking. For some time it has become obvious that the welfare state stands at a disruptive juncture. Either it can try to protect itself from the world by imposing an international apartheid system as it falters under growing migratory pressure, rising costs for retirement, and a self-inflicted energy crisis or it can confront those fears with a politics of radical engagement and accelerate the transition to a world of universal affluence with an abundance of clean energy and open borders. Doing so would require reviving the belief in the public as an active political subject and defeating both neoliberal passivity and the divisive identity politics of contemporary environmentalism. To bring back high growth rates in the mature economies would require a fundamental reconfiguration away from supply-side economics to real wage growth, broad social investments, and accelerated modernisation (rather than as today, artificially delayed urbanisation and subsidies for low-productive jobs in rural economies). Finally, by providing universal welfare services, in particular education but also health care, social trust can be strengthened and corruption reduced (Rothstein, 2011) at the same time as the economy’s long-term growth potential can be increased. Yet, despite the remarkable scientific advancements of the last centuries, or even decades, Malthusians tend to reject the very possibility of universal affluence and what they pejoratively refer to as a “techno-fix” (Huesemann & Huesemann, 2011). Instead of uncertain technological innovation they like to see deep social changes, essentially a far-reaching epistemological homogenisation by which people everywhere adopt strict regimes of frugality and simplicity. However, just as the solution to the contradictions of capitalism in the 1930’s was neither individual moral reform of the capital-owners nor a socialist revolution of society as a whole but rather the institutionalisation of welfare-capitalism and liberal democracy, it seems far wiser to accept the existence of a pluralist society with competing conceptions of the good life and rather focus on applying technology in a conscious way to overcome environmental determinism. Obviously, this is also a question of political tactics. While ecosocialist literature tends to think of capitalism in the 21st century as a mere elite project, it seems fair to say that the logic of capital accumulation has become almost universal today with widely shared material aspirations reaching from home ownership to international travel. Similarly, large groups in the OECD-economies either have retired already or will do so in the coming decades with considerable expectations in terms of retirement income. Failure to deliver on these pension expectations would probably create a state of political crisis in which the “immigrants” but also the “environment” would be easy targets. For these, and many other reasons, it is not surprising that political elites remain deeply wedded to the idea of economic growth. Yet, insufficient demand due to rising inequality and a lack of social investments have made it difficult to deliver that growth. In the best of worlds, the need for growth could hypothetically make policy-makers more willing to challenge the prevailing supply-side paradigm but also consider the benefits of accelerating globalisation (or at least keeping them away from enacting protectionist measures). While it is obvious that economic growth does not benefit everyone equally, and that it can be source of environmental destruction, the same can be said about the lack of growth. A secular stagnation or even degrowth is certainly no guarantee for environmental protection or greater equality. If anything, the rich are likely to try to isolate themselves even more from the rest of society in case they feel threatened, in particular by moving overseas. It is also not surprising that the literature on degrowth has had almost nothing to say about how such strategies would play out at the international level (including what mechanisms that would be needed to prevent other states from taking military advantage of countries pursuing degrowth) or how exactly economic growth is to be “unlearned” at the micro level. Recognising the difficulties associated with imagining degrowth as an effective way of saving the global environment is not the same as defending “status quo” or embracing neoliberalism. As discussed above, it is the rather the failure of laissez-faire thinking that has made government intervention necessary to ensure both climate stability and a world with more equal opportunities. One common objection against climate innovation is that the real problem is not about limitations of renewable energy sources but about overcoming the entrenched interests of fossil industries. Yet, the fact that large multinational corporations such as ExxonMobil have vast political influence can also be seen as one of the reasons why technological change must be disruptive and go beyond, for instance,the scenariosin the IPCC database. Only by shocking markets through breakthrough innovation does it seem possible to break with the path dependence of existing energy systems in a way that would rapidly displace fossil fuels globally. In terms of strategy, it is also likely that fossil industries will be far more successful in thwarting the deployment of existing inferior technologies than in preventing a more general acceleration of science and technology, which would span multiple fields reaching from nanotechnology to basic physics (Victor, 2011:144) that are not immediately related to energy R&D and as such not subject to the same political economic constraints. In mainstream thinking, globalisation is primarily seen as a driver of environmental destruction as it disconnects “those who make decisions that generate ecological risks” from “the ecological victims who suffer” (Christoff & Eckersley, 2013:189). While few would dispute that globalisation has indeed contributed to the displacement of environmental harms as polluting industries have moved from rich to poor countries, a number of authors including Arthur Mol have argued that globalisation also has the potential of fostering environmental reform and facilitating ecological modernisation throughout the global economy (Mol, 2003). The aim of this paper has been to take that argument further yet by suggesting that the hope of an adequate response to many global environmental risks, and climate change in particular, in fact hinges on an accelerated rate of globalisation leading to economic convergence. A more equal and richer world would not only have better resources to deal with environmental stress and the need for climate adaptation, it would also compel policy-makers to actively pursue the development of breakthrough technologies that would once and for all resolve the climate/energy/population dilemma from the supply-side (Brook et al., 2014:2). By working from the supply-side rather than the demand-side, climate politics can finally be depolarised and the current logical schism between “believers” and “sceptics” can be overcome. Yet, it would be naïve to think that all would welcome a radicalisation of the modern project and the transition to a fully integrated high-energy planet. While such a future would probably reflect widely shared public aspirations to freedom of movement, material security, and environmental protection, cultural perfectionists are likely to decry the blandness of diversity in a world of open borders, eco-socialists are likely to see any “techno-fix” as merely a way of ducking responsibility for what they consider to be necessary social reforms, and libertarians are likely to criticise the government “overreach” implicit in the very notion of taking active responsibility for the global future. Another common objection against breakthrough innovation is that time is too short for fundamentally uncertain research. Such an objection would make perfect sense if there was any faster or safer route to restoring a safe climate and protecting the world against broader Anthropocene risks. This paper has argued that there is no such route, at least as long as the interests of people outside the OECD-countries are to be taken seriously. While sustained poverty abroad may seem to temporarily reduce the urgency of action, it will also lead to further lock-in of existing yet inferior technologies and increase the long-term need for CDR/SRM. The fundamental problem here is the scale illusion by which signals of relative local progress towards perceived “sustainability” overshadow other signals of absolute global failure. Just as the example of Iceland that currently has a 100% renewable electricity supply has not taken the world as a whole any closer to fossil independence, little if anything would be achieved if a handful of the world’s richest countries succeed in their transition to a nonscalable soft energy path. Yet, unfortunately, renewable energy but also the idea of “energy savings” continue to occupy a moral high-ground in the public imagination in ways that make meaningful action extremely difficult and obscure how much energy supply, but also overall consumption rates, must increase in the coming decades to ensure that everyone in the world has a chance of achieving a dignified livelihood. Essentially, by turning the traditional environmental idea of “intentional localisation” on its head, this paper has suggested that what most of all will determine humanity’s future in the Anthropocene is to what extent it will be possible to craft a new progressive narrative of global economic convergence capable of simultaneously overcoming Malthusian determinism and neoliberal ignorance of environmental realities. As Bruno Latour has noted, humanity has to learn to “love its monsters” rather than running away in panic from science and technology out of fear for the world that it has created (Latour, 2011). Only through a more conscious and reflexive relationship to technology is there any hope for humanity to realise its axiological potential (Bostrom, 2003) while building a world in which emancipative values, pluralism, and diversity can flourish.

#### Only way to solve climate is to use the technology available.

Aronoff & Denvir 21 [Kate, staff writer at the New Republic, writing fellow at In These Times, Daniel, visiting fellow in International and Public Affairs at Brown Univ, “Capitalism Can’t Fix the Climate Crisis,” *Jacobin*, 08/25/21, <https://jacobinmag.com/2021/08/capitalism-climate-crisis-global-green-new-deal-clean-energy-fossil-fuel-industry>, accessed 08/26/21, JCR]

DD: You write: “My argument in this book is not that capitalism has to end before the world can deal with the climate crisis. Dismantling a centuries-old system of production and distribution, and building a carbon-neutral and worker-owned alternative, is almost certainly not going to happen within the small window of time the world has to avert runaway disaster. The private sector will be a major part of the transition off of fossil fuels. Some people will get rich, and some unseemly actors will be involved. Capitalist production will build solar panels, wind turbines, and electric trains. But whether we deal with climate change or not can’t be held hostage to executives’ ability to turn a profit. To handle this crisis, capitalism will have to be replaced as society’s operating system, setting out goals other than the boundless accumulation of private wealth.” This argument provoked a bit of controversy in the audience a few years back in Chicago when we discussed it on a panel at the Socialism Conference. Both of us would love to live in a socialist world, and we’ve got to continue to fight for one. But why do you think that it’s important for people to understand that we need to deal with climate change before we win an entirely new mode of production? What’s entailed by the conclusion that we need to pursue radical social-democratic reforms on the road to socialism? Is this a theory of how radical social-democratic reforms can lead to socialism? Is it just a reality that the fast-ticking climate clock imposes on us? Or is it some of both? KA: It’s a reality. If the climate crisis were playing out over the course of two hundred, three hundred, or a thousand years, one could have an interesting theoretical debate about whether we should change the system we have and tweak it slightly in order to take on the crisis, or whether we should create an entirely new mode of production and build up a workaround alternative. Unfortunately, we just don’t have that time. The Intergovernmental Panel on Climate Change [IPCC] outlined in its 2018 report on 1.5 degrees Celsius that we had roughly twelve years. That is now nine years in which to rapidly decarbonize the global economy, which is an enormous challenge. In order to meet that ever-shrinking twelve-year window, we have to use the productive system in which we live — which is not my ideal situation, but then again, neither is global warming.

#### Transition is impossible during crisis – low-income countries are abandoned by the alternative.

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(Gabor, Maria, and Tamas, “How big is big enough? Toward a sustainable future by examining alternatives to the conventional economic growth paradigm”, published by ERP Environment and John Wiley & Sons Ltd, 4-25-2018, Wiley Online Library, acc. 6-25-2018)//kb

4.4 Shortcomings of the alternatives Alternatives to the conventional growth economy have much to offer, but they also face legitimate criticism, especially regarding their preconditions and the feasibility of the transition they propose. The first major, pragmatic critique of negative and zero growth is that transition is not very popular in times of crisis, and fear of unemployment and a decline in living standards may be major obstacles to change (Kallis et al., 2012). van den Bergh (2011) argues that alternative lifestyles have always existed, but—by definition—are not accepted by the majority. (However, many now mainstream ideas were once also considered insignificant, and a period of crisis can be seen as a window of opportunity for pushing changes through.) Second, Sorman and Giampietro (2013) warn that a transition can only be forced upon societies, but—for unspecified reasons—never achieved voluntarily or through collective choice. This approach suggests that it is highly unlikely that a negative or zero growth economy will ever arise voluntarily within cultures that are generally composed of individuals seeking ever‐higher levels of income and consumption (Buch‐Hansen, 2018; Hamilton & Denniss, 2005). Third, a lack of precise knowledge and successful narratives concerning alternatives is also an obstacle. Trainer (2010) claims that transitioning to a negative or zero growth economy voluntarily is very unlikely if practical experience is insufficient. Alexander (2013) also considers the lack of experience and infrastructure to be important obstacles to the creation of simpler lifestyles (e.g., it is difficult to exit car culture without the existence of safe and accessible cycle paths). Another major critique (based on Maslow's, 1954 thesis) is that voluntary reductions in consumption may be lucrative and attractive only in wealthy countries where basic needs are already satisfied, and thus the approach does not properly address sustainability problems in low‐income countries. Thus, the question of whether “developing” low‐income countries should develop according to the conventional (or positive) growth paradigm remains open. For countries which are in a state of overshoot, it can be argued that negative growth should continue until a “steady‐state” is reached—that is, when ecological limits are fully observed (e.g., Goodland and Daly, 1996)—but from a policy perspective, it is still difficult to know when this point has been achieved.

### AT: Cap Causes Warming

#### Preserving competition and innovation within the market economy creates solutions to climate change.

Bosch and Schmidt 19 (Stephan, Institute of Geography, Chair for Human Geography, University of Augsburg, and Matthias, Institute of Geography, Chair for Human Geography, University of Augsburg, “Is the post-fossil era necessarily post-capitalistic? – The robustness and capabilities of green capitalism”, Ecological Economics, Vol. 161, July) DB

Concerning the second dimension of criticism, Section 4 illustrates how the rejection of green capitalism overlooks promising approaches to surmounting the environmental crisis. On the one hand, we argue that in face of the given narrow time slot as well as the prevailing political strategies, it is more realistic and pragmatic to primarily assess the efficiency of market-oriented solutions. Even though in principle we take sufficiency to have the best effectiveness regarding the solution of ecological and social problems, we still do not count on people's willingness to live in greater moderation within due time. On the other hand, we therefore presume that there are no other suitable economic frame conditions for surmounting the crisis than those offered by the capitalist social order. This perspective is based on the assumption that innovations, which above all emanate from thriving economies (Wangler, 2013), are highly relevant for overcoming the environmental crisis. As growth, innovation, and the development of new industries are to be seen as directly related to the export sector as well as the utilisation of comparative advantages (Bathelt and Glückler, 2012), we therefore also strictly object to the concept of autonomy. Moreover, we take innovation and the aspects of growth, entrepreneurship, and democratic processes of negotiation related to it (cf. Gailing et al., 2013; Walter and Gutscher, 2013; Raven et al., 2016), to be essential for the implementation of regenerative energy systems and social welfare (Iversen, 2005; Nasirov et al., 2017). Our presumption that innovations occur more likely and more frequently within a capitalist, than in alternative social orders (e.g. Harris, 2013: socialist markets), is derived from Schumpeter's notion of competitive capitalism, which he distinctly sets apart from trustified capitalism. Competitive capitalism is about fertile destructive impulses emanating from enthusiastic entrepreneurs who are ready to take risks, and act solution-oriented. These impulses may revolutionise the economic process: “This process of Creative Destruction is the essential fact about capitalism” (Schumpeter, 2009). Based on Schumpeter's ‘theory of economic development’ (cf. Herzog and Honneth, 2016; Schumpeter, 1994; Schumpeter, 2009) – which, according to Marques (2008), represents the original idea of innovation-driven capitalism – we analyse capitalism's robustness to the downfall of fossil energy; moreover, we investigate its potential contributions to ecologic sustainability. Yet we want to go beyond Schumpeter's perspective, which fixes on the entrepreneur, and take a closer look at the role of state policy in Section 5. Our argument is that creative entrepreneurs and markets alone will not suffice to specifically and quickly initiate the change of the energy system driven by innovation. We state the thesis that an active role of the state is needed which relies on political continuity when it comes to promoting environmental innovation and creates stable institutional frame conditions. In a last step, we will show that during the deployment of regenerative energy systems, social aspects have hitherto been given too little attention by actors of state and politics and that national objectives were uncoupled from local contexts. To achieve a successful low-carbon transition, these deficits need to be corrected. In principle, this seems possible, as market-economically oriented regenerative energy systems have often been the result of open-minded democratic negotiations. In Section 6, the findings of the study will be summarised. 2. The crisis of fossil energies and capitalism Energy sources are a central element of humankind's materialistic history and elementary changes in the relevance of energy carriers have always led to extensive economic and societal transformations (Bridge et al., 2013). Exemplarily, the drastic increase in productivity during industrialisation cannot be explained without the revolutionary change of the energy system towards fossil fuels (Osterhammel, 2011). Ever since, economic growth is accompanied by an increasing consumption of finite energy resources and non-energetic primary materials (Altvater, 2005). Accordingly, questions of economic development must always be regarded in the context of the energy system, as well as the circulation of energetic and non-energetic crude materials within it (Meadows et al., 2004). Altvater (2007) takes the relationship between humans and nature to be crisis-laden because a limited stock of energy resources within the Earth's thin crust forms the basis of the present economic system. This limitation implied grave consequences for the global ecology. The apparently crisis-laden interrelation of nature and economy is also highlighted in ‘Anthropocene or Capitolocene?’ edited by Moore (2016), in which the impacts of capitalism are regarded as significant enough to be marked as their own geochronological era. The main point of criticism is capitalism's orientation to industrial scaling and quantitative growth (Mathews, 2011), which likely will end abruptly once Earth's limited capacities will have been depleted by the exponential growth of population and economy (Daly, 1995). Yet not only the finiteness of energy carriers, but also the accumulation of extreme meteorological incidents, mass mortality of species, and sea level rise represent impediments of stable economic growth (McCarthy, 2015). The scenarios concerning trends of the world's condition developed by the Club of Rome illustrate that keeping a high wealth level can only be accomplished if a radical change in societal attitude concerning the valuation of growth will take effect (Meadows et al., 2004). Stopping environmental destruction while maintaining the present economic system appears to be impossible, since fossil energy carriers provide globally acting companies with the opportunity to spatially separate production and consumption as well as to externalise the manifold ecological expenses (Chisholm, 1990). Bridge (2010) rates the heated debates about Peak Oil as ecologically motivated forebodings of a new energy order in which the modern industrial nations are going to free themselves of their dependence on oil. For Neomarxist groups, the end of the age of mineral oil even represents an apocalyptic turn of eras during which nature were going to take vengeance on the ecological arrogance of capitalism. According to Bettini and Karaliotas (2013), the narration of Peak Oil thereby attains a symbolism that reaches far beyond mathematical calculations of the scarcity of fossil energy sources, being extended to a general criticism of a system that is exclusively oriented on growth. McCarthy (2015) sees the chance of a post-fossil capitalism especially in the commodification of wind, sunlight, geothermal heat, and waves. This way, nature would again be introduced into the cycle of capital. Van den Bergh (2011) presumes that this may be a practicable approach, perceiving criticism of market economy and capitalism as too radical and warns of one-sidedly problematising growth without simultaneously pointing out realisable alternative ways. He therefore prefers the ‘a-growth-concept’, which assumes a neutral position on growth, trying to create social as well as ecological sustainability by means of pricing policy, environmental agreements, and education initiatives. The commodification of nature, however, is rejected by the degrowth movement, as the comparison of the Montreal Protocol, which is based on regulations (ozone) with the Kyoto Protocol based on trade had shown a greater effectiveness of regulative measures (Kallis, 2011). Concerning the market's capabilities, North (2010) additionally speaks of the neoliberal enthusiasts' mindless faith in technology, who were mistakenly convinced that creative destruction is sufficient to face the societal challenges posed by Peak Oil and the climate crisis. Sarkar and Kern (2008) limit the possibilities of the global community's further development to the two options ‘eco socialism’ or ‘barbarism’. This rhetoric stylises capitalism as the image of the enemy: on the one hand, it represents the cause of the global ecological crisis due to the exploitation of natural resources – and for that reason alone were not to be maintained (Daly, 2005) – while on the other hand not offering a suitable social framework for mastering the crisis (Kallis et al., 2009). Hence, the development of a symbiotic economy (Garcia-Olivares and Sole, 2015) rooted beyond obsessive economic growth (Buch-Hansen, 2018) is promoted. Renewable energies were apt to meet these requirements since they can be developed through collaborative bottom-up mechanisms on a communal level, therefore enabling the decentralisation and democratisation of energy supply (Rifkin, 2013). In fact, this may be an option. However, in the following, we want to demonstrate that capitalism is not only very robust to crises, but is also able to contribute to the solution of the environmental crisis. 3. Robustness of capitalism 3.1. Space-time compression We will now show that the possibility of increasing productivity does not end with the transition to a regenerative energy system, but only needs to be embedded into new logistic-infrastructural contexts. In this, we contradict Altvater (2007), Huber (2009) and North (2010), who claim that capitalism could expand only on the basis of fossil fuels, since, due to the global transportability of oil, gas, and coal, entrepreneurial actions are no longer bound to the local availability of energy resources, but range globally. Furthermore, the usage of fossil energy carriers is not subject to daily or seasonal fluctuations. Transportability and baseload capacity hence lead to space-time compression (Harvey, 1996), as products can be generated in ever shorter intervals of time. Following this logic, the limitation of the fossil resource basis inevitably brings about the end of the capitalistic system. It remains undisputed that energy flow within a solar-based energy system is hard to control (Georgescu-Roegen, 1971). Most forms of renewable energies are intermittent sources, whose contribution to the energy mix are subject to the rhythms of sun, wind, precipitation, and tides (Fares, 2015). Adapting energy production to demand, a fundamental prerequisite of continuous economic growth, thus becomes a major challenge. What Altvater (2007), Huber (2009) and North (2010) actually do not include in their considerations, are the numerous technological innovations for the stabilisation of regenerative energy systems. After all, with biomass and geothermal power, two energy carriers capable of providing base load are at hand (Matek and Gawell, 2015), which may, in the form of regenerative combined power plants, support the weather-dependent energy sources sun and wind (Palensky and Dietrich, 2011; Ramchurn et al., 2011). The numerous energy storage technologies are also important, albeit only few of these have reached industrial maturity. In principle, mechanical, chemical, electrical, or thermal kinds of storage are being discerned (Hadjipaschalis et al., 2009). Compressed air and pumped storage power plants with efficiency levels of up to 80% are especially promising (Anagnostopoulos and Papantonis, 2008). Research is also conducted on the conversion of surplus regenerative power into methane or hydrogen (Jensen et al., 2007), by which the bidirectional operation of the power and gas network is made possible, allowing for transportability as well as baseload capacity within large spatial units. Space-time availability may also be augmented by the development and capacity expansion of high-voltage transmission lines (Walter and Bosch, 2013). Harriss-White and Harriss (2007) have pointed out at an early point, that the existent grids, having been developed following a monopolistic logic, are outdated and incapable of integrating decentrally-produced electricity with strong fluctuations. These deficits, however, are successively being corrected. E.g., Germany's South, which is poor in wind but strong in terms of industry is being provided with direct access to the big wind energy off-shore potentials in the North as well as to the storage power plants in Scandinavia (cf. Fig. 1). The possibilities of intercontinental power transport from regenerative sources have been thoroughly investigated by DLR (2006) and Grossmann et al. (2014). Both energy storage and the development of the power grid thus will successively reverse the present space-time limitations of regenerative energy systems. The two domains, however, are not isolated from one another, but are coordinated via smart grids. Solomon and Krishna (2011) emphasise that smart grids are superbly suitable for the implementation of market-based approaches, so that an innovation-driven mass market for energy efficiency technologies could be anticipated. Smart grids also provide the possibility of no longer designing the mass production of renewable energy technologies on a fossil basis, but by the usage of renewable energy. While the production of the first generation of regenerative technologies was based on fossil energy, in future, the possibilities of energy storage, the almost unlimited energy potential of a solar-based economy, and the combination of both aspects through smart grids will ensure the flexible provision of regenerative energy at every production site without limits of time. Yet in order to optimise the flows of energy and material in smart grids, concepts of closed crude material cycles are needed, which, in the sense of the cradle-to-cradle approach (cf. Section 4), allow the reintroduction of used materials (e.g. old wind power plants made of renewable resources) to the biosphere. Thus, the problem of externalisation of ecological costs can be minimised. Summing up, the increase of productivity and stable economic growth within regenerative energy systems seems possible. Still, it remains to be emphasised that large-scale energy projects also entail negative social consequences. E.g., Yenneti et al. (2016) have shown that the Charanka solar park in Gujarat, India, was erected on areas that the local population's livelihood had depended on for decades. The refuse of access to these areas, as well as the inhabitants' successive dispossession through state measures thus are direct results of the Indian economy's ecological modernisation (Levien, 2013). In this context, Baka (2013) speaks of “energy dispossessions”, a phenomenon which has also been observed with large-scale wind energy parks (Avila, 2018; Cowell, 2010). The socio-material impact of economic modernisation on the local population, whose lives strongly depend on agricultural land use, are often insufficiently respected (Yenneti et al., 2016), so that the dubious impression was given that environmental protection and economic growth based on efficient technologies, competition, and state measures could go with one another without social side effects. Remarkably, the controversial energy mega-projects especially in the global South, are not the cause of the development of new power asymmetries and conflicts, but rather reproduce and harden long-standing social disparities and injustices (Avila, 2018). According to Bradley and Hedrén (2014), a low-carbon transition hence misses its aims if it is only about modernising the energy system without likewise transforming the underlying social structures. 3.2. Crisis as an element of capitalist social order We hold the view that the occurrence of crises in capitalism is not due to it being an ailing, doomed economic order; nor is it a proof of capitalism's ineptitude for meeting ecological challenges. Instead, we deem that crisis is a fundamental element of the capitalist social order that actually provides a chance for readjusting economic processes. Harvey (2011) explains that anything blocking the circulation and accumulation of capital may pose a threat to the capitalist system and induce a fundamental crisis. The finiteness of fossil fuels is a crisis of this kind (McCarthy, 2015). Altvater (2007) is convinced that capitalism will not be able to overcome this crisis; therefore, future technologic progress had to be embedded in a non-fossil, non-capitalist framework. Kallis (2011) also emphasises that the approach to a steady state (cf. Daly, 1991, Daly, 2005) will transform the institutional preconditions of property, work, banking, and distribution to such an extent that in the end, it will be impossible to still identify them as capitalistic. With regard to Kallis' doubts concerning the institutional robustness of capitalism, Schumpeter points out that precisely the ups and downs of industrial development, which are the outcomes of successful innovations' intensifying competition, enable progress (Herzog and Honneth, 2016). As crises therefore represent an immanent part of the capitalist system, an environmental and resources-related crisis caused by the capitalistic process does not provide sufficient evidence to suggest a possible downfall of the capitalistic social order. The crisis might even be taken as proof of an economic cycle, if it is regarded as a period of depression between the dwindling fossil and the emerging regenerative age. Böhm et al. (2012) and McCarthy (2015) confirm that capitalism is capable of overcoming even fundamental crises, actually using these as starting points of its further expansion. Concerning the environmental crisis, Harriss-White and Harriss (2007) also concede that the deployment of renewable energies holds the potential of founding a new form of capitalism that is characterised by a much lower degree of materialistic lavishness. Bettini and Karaliotas (2013) emphasise that from a neo-liberal point of view, the accusation of capitalism bringing about a resources-related and environmental crisis does not at all provoke self-doubts. Rather, it caused the profitable marketing of adequate approaches to solutions in the field of resource depletion and environmental impacts to move into economic focus. Even Altvater (2007) points out that the externalised effects of production and consumption on nature become relevant for companies once they jeopardise profitability and accumulation. In that case, environmental problems and their solutions can actually be made part of capitalist logic. Solomon and Krishna (2011) are convinced that in order to solve the environmental crisis, it were not even necessary to achieve further technologic breakthroughs, as the technologies needed for the remodeling of society towards energy efficiency were already mature and cost-efficient. Even if capitalism might be sufficiently robust, Kallis (2011) still takes the crisis as a chance to break up obstructive social and political lock-ins that have hitherto seemed unalterable and have lead into the crisis. Yet he does not regard the ability of social and political transformation to be inherent in the traits of market, but as a characteristic of a social order orientated towards degrowth. Certainly, Kallis is right in saying that the market is hard to control, making a concerted transformation towards sustainability difficult. Still his criticism only refers to that form of capitalism which Schumpeter characterised as trustified capitalism and which does lead to ecologically problematic lock-in effects. The criticism cannot, however, be applied to competitive capitalism, which generates those basic innovations giving rise to the revolutionary crises described as so fertile by Kallis (2011). Thus, an opportunity is provided for alternative social conditions to be brought about – but within the capitalist social order – and for substantiating these new conditions through further innovations. Innovations may emerge outside of competition and market economy, but will then lack the required frequency and force, as growth represents the most important incentive of innovation (Wangler, 2013). On the other hand, a continuous process of innovation again leads to growth, which may revolutionise the present social conditions, as Schumpeter states (Herzog and Honneth, 2016). Thereby, a new combination of the given means of production within new sites of production emerges, generating new goods, methods, and markets. Productive resources are applied to hitherto untested usages while being withdrawn from those usages they served before (Geels, 2011). What Kallis (2011) terms technological optimism with regard to the ecological innovative power of capitalism, is therefore technological realism in the context of Schumpeter's competitive capitalism. Without doubt, innovative boosts on the part of already established companies are also conceivable and may give rise to the possibility of maintaining trustified capitalism with its ecologically precarious structures. An example hereof is the innovation ‘Carbon Dioxide Capture and Storage’, by which the ecological impact of the emission intensive electrical conversion of coal is being reduced (Benson and Orr, 2008). Technological progress may hence stabilise the existent system of economy and policy that is accountable for the environmental crisis (Bettini and Karaliotas, 2013). In Schumpeter's view, however, the decisive economic order is competitive capitalism, which is characterised by the aggressive economic demeanour of new, innovative enterprises economically challenging the establishment (Herzog and Honneth, 2016). The start-ups of new companies, which are inseparably connected with the processes of innovation, withdraw production goods from the present capitalist system by underbidding, disturbing the former economic balance that is so destructive for nature. Competition is therefore essential for overcoming the environmental crisis. In that respect, the concept of ‘solidary economics’ and its precept of surmounting the allegedly ruthless principle of competition and emancipating oneself from the logic of the markets (Embshoff and Giegold, 2008), is counterproductive, as the renunciation of competition impedes the breakup of crusted economic structures, which thus continue to harm the environment. After all, the big energy providers' strategy was and is to hold on to the fossil-nuclear power plant pool for as long as possible, suppressing alternative concepts of energy supply (Gawel et al., 2012). A radical transformation of the energy system therefore cannot emerge from the existent structures, as Schumpeter assesses (Herzog and Honneth, 2016). Instead, innovative processes emerge outside of the old major companies until proceeding to attack the incumbent regime through the rededication of means of production (Geels, 2011). Innovative marketing strategies of small and middle scale businesses supplanting cumbersome large companies play an essential part especially in the field of renewable energies (Walsh, 2012). In this, competition is a decisive element that cannot easily be superseded. 4. Capabilities of green capitalism A competitive green capitalism develops great creativity by its high rate of innovation, which may also reinvent the relationship between humans and nature. We now want to exemplify how this might be brought about. Schumpeter holds the view that innovation is the result of the capitalistic entrepreneurial spirit, not the other way round (Herzog and Honneth, 2016). Technological and social progress hence are no independent variables materialising out of thin air, but arise from the logic of the capitalist process. Meadows et al. (2004) accept that innovations may relocate the limits of growth, making it possible to maintain the living standard by continuously reducing the consumption of crude materials and energy. However, one of the energy system's prevailing deficits is that depleted or not yet tapped resources are being (re-)obtained based on non-regenerative energy (Schwartzman, 2008), causing capitalistic production to be increasingly energetically inefficient (Murphy and Hall, 2011). Overcoming the energy crisis hence calls for the consideration of thermodynamic principles (Georgescu-Roegen, 1971, Georgescu-Roegen, 1986; Martinez-Alier, 1987). Harriss-White and Harriss (2007) see the deployment of renewable energies as a possibility of limiting the creation of entropy. Kaberger and Mansson (2001) have shown that innovative resources-saving material cycles may be possible and economical if they are based on the usage of the inexhaustible energy of irradiance. What is promising about this approach is that, due to research and development, the utilisation of solar energy becomes more and more efficient and lucrative (Schmid, 2016). Moreover, its inexhaustible potential allows for the exploitation of material resources even from deposits with extremely low crude material density. On a local level, the utilisation of solar energy may actually lead to a reduction of entropy (Ebeling et al., 1998; Kranert and Cord-Landwehr, 2010), as it is the case with the usage of waste heat of solar thermal power plants for the desalination of sea water (DLR, 2007). The integration of these capacities into smart grids and the associated remodeling of every production process to purely regenerative sources have been detailed in Section 3. We further argue that innovation surpasses conceivability. Even Harris (2010) sees a particularly high potential in unpredictable technological innovations to break through economic routine, thus encouraging further entrepreneurs in issuing their own innovations. Capitalism might thereby be provided with the chance to reduce its ecological exploitation. But innovation exceeds strictly technological aspects and may as well comprise social and institutional aspects (Arentsen and Bellekom, 2014). E.g., in the mobility sector, whose pollutant emissions have significantly contributed to the environmental crisis, innovations have led to new features of cargo and passenger transportation. This is illustrated by the example of car sharing as an innovative life style (Prettenthaler and Steininger, 1999) or bicycle-sharing schemes in urban areas (Midgley, 2011). Another representative case is the history of the ozone hole, which Meadows et al. (2004) describe as a history of civil success regarding the correction of a severe overshoot. Quite in the sense of Schumpeter, Meadows et al. (2004) name the ‘industry's creative heads’ as the crucial problem-solving determinant. Through the three innovative boosts ‘better insulation’, ‘reduced toxic substitute materials’, and ‘emission-free alternative substances’, it will be possible to rebuild the original density of the ozone layer by the mid-21st century. Remarkably, this is realised without abandoning the existent economic system. Furthermore, we argue that it is realistic to assume growth-oriented, competitive markets in the future, rather than socio-material conditions beyond them, which, as stated by Van den Bergh (2011) are completely uncertain as of now (e.g. Harris, 2013: socialist markets). We therefore hold the view that it is more pragmatic to design future mass markets in an eco-friendly way. Kallis (2011) rejects the possibility that the wonder of a dematerialised economy might occur, as improvements of efficiency were overcompensated by growing consumption. While dematerialisation may be tantamount to a wonder, researchers still do put effort into adjusting the materialised economy to ecological compatibility. One aspect is the thorough redefinition of nature protection, because nowadays, nature protection is reduced to the attempt of limiting the harmfulness of processes and products (Mulhall and Braungart, 2010). However, due to the potential creation of new mass markets for more eco-friendly and efficient processes or products, this strategy holds the danger of actually augmenting unwanted effects through rebound effects. In this regard, Alcott (2005) points to the Jevon's Paradox which says it is a great error to think that technologic innovations were going to reduce the consumption of resources. Polimeni et al. (2015) name the example of the Green Revolution: the remarkable increase of food production's area efficiency was not at all able to abate the problems of hunger and area consumption, as consequently, the population greatly increased. Likewise, a mass market of efficient and eco-friendly products would again lead to a massive amount of poison and waste, with disposed crude materials hardly being recycled. The ecological costs then would have to be externalised, which Sturm and Vogt (2011) regard as strong evidence of the failure of the market. The core problem hence lies in the fact that products are being produced exclusively for the technosphere (McDonough and Braungart, 2013). E.g., copper is almost universally applicable to and beneficial for technological systems, while in biological systems, this material is extremely poisonous. Thus, the aim must be to design products in a way that makes them equally usable in biosphere, i.e. subsequent to their technical usage. This calls for the development of a combined management of nutrients for techno- and biosphere. Human ways of living, the processes and products they are based on, may thereby be employed for the benefit of nature. The focus must therefore be put on those innovations that break up the present paradigm of environmental protection by realising products that create a useful material connection between techno- and biosphere. An example of this kind of creative destruction is the Austrian company Gugler, the first print shop worldwide that produces printing products free from harmful ingredients and exclusively with substances that can be biologically recycled (Gugler GmbH, 2018). E.g., the accruing sludge is returned to biosphere and the ash of burned printing products can be reused as a fertilizer. These conditions provide the possibility of designing economic activities to be ecologically compatible despite a high resource throughput.

### AT: Alt Causes