

# Sustainable Development Law & Policy

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# SUSTAINABLE DEVELOPMENT LAW & POLICY



EXPLORING HOW TODAY'S DEVELOPMENT AFFECTS FUTURE GENERATIONS AROUND THE GLOBE

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# EDITORS' NOTE

**S**ustainable Development Law & Policy publishes a Climate Law Reporter each year with a goal of providing practitioners and academia around the world with an accessible and concise report on the current state of climate law. After taking stock and regrouping following the UNFCCC negotiations in Copenhagen, the international community began to focus on the December 2010 meeting in Cancún, Mexico. With the continued inability of the U.S. Congress to pass a climate bill, expectations were not high going into the Cancún negotiations. Although Parties moved forward with the acceptance of numerous Agreements and Decisions, a successor to the Kyoto Protocol with the continuation of a bifurcated approach—different obligations and responsibilities for developed and developing countries—appeared even more uncertain. As the international community looks toward the 2011 negotiations in Durban, South Africa, expectations are again increasing.

One of the major challenges to reaching an international binding agreement over the past ten years has been the opposition by the United States. But in more recent years the international community has also come to recognize China as a countervailing force. This issue of the Climate Law Reporter includes proposals for climate change mitigation, as well as shifting approaches to address climate policy and effects of climate change. One of our authors reviews the tension between the United States and China on “green technology” and questions whether the portrayal of a “green energy race” is accurate or advantageous for either country. Other articles focus on climate change mitigation mechanisms such as the role of due process in the carbon markets; which metrics are best for additionality of carbon sequestration projects; the inclusion of other ecosystems and services beyond the confines of current forestry programs including reducing emissions from deforestation and forest degradation (“REDD”) programs; and even if private property monetization of carbon reduction is an approach we should pursue. Another article performs a comparative analysis of the successes and failures of climate change litigation tactics across venues and continents, while one author suggests that litigation and legislation might not be necessary because the U.S. President already has authority under existing national security laws to mitigate the threat of climate change. Additionally, one article focuses on an aspect of human rights challenges inherent in climate change—developing country use of clean energy technologies that are protected by intellectual property rights, frequently held by developed countries thousands of miles away. Two authors focus on Africa, where

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impacts from climate changes are disproportionate compared with the continent’s contribution. These articles review the key challenges and prospects in sustaining the outcomes of the seventh African Development Forum to address climate change, and the effects of establishing renewable energy feed in tariffs in South Africa.

As the climate conference in South Africa approaches and the international community again prepares for negotiations extending into the early mornings, we must remember that while climate change is most often seen as an international issue, actions, agreements, and compromises at all levels are required to succeed in our efforts to mitigate climate change.



Paulo A. Lopes  
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Melissa Blue Sky  
Editor-In-Chief

# ABOUT SDLP

*Sustainable Development Law & Policy* (ISSN 1552-3721) is a student-run initiative at American University Washington College of Law published three times each academic year, with occasional special editions and two annual foreign language translations. The journal publishes articles and essays that focus on reconciling the tensions between environmental sustainability, economic development, and human welfare. It embraces an interdisciplinary focus to provide a broad view of current legal, political, and social developments. Our mission is to serve as a valuable resource for practitioners, policy makers, and concerned citizens promoting sustainable development throughout the world.

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# CHINA'S GREENTECH PROGRAMS AND THE USTR INVESTIGATION\*

by Joel B. Eisen\*\*

## INTRODUCTION

Since the Renewable Energy Law went into effect in 2006, the Chinese government has implemented numerous laws and programs designed to encourage renewables.<sup>1</sup> While China has made strong progress, many factors will influence the nation's future success in renewable energy deployment, including the need for consistent pricing policies to stimulate private sector development and the need to upgrade the country's transmission grid.<sup>2</sup>

The issue of China's support for renewables has taken center stage in a United States Trade Representative ("USTR") complaint alleging that China unfairly subsidizes its greentech industries, in violation of its obligations as a member of the World Trade Organization ("WTO").<sup>3</sup> Well before that investigation began, numerous Americans believed the United States was less engaged in greentech promotion than China,<sup>4</sup> and many feel the United States is falling behind. *New York Times* columnist Thomas L. Friedman has been perhaps the most active proponent of this view,<sup>5</sup> but he has plenty of company. If recent reports are to be believed, China could be generating more electricity from renewables in 2020 than any other nation on Earth. It has also advanced rapidly in private sector spending on renewable energy technology and research and development spending.

Many observers state that the two nations are engaged in a new "green energy race."<sup>6</sup> This term deliberately invokes the "space race" competition between the U.S.S.R. and the United States to achieve milestones in space after the 1957 launch of the Sputnik satellite. To simplify matters a bit, there are two related but different arguments being made. The first is that China will dominate the global market for greentech, diminishing American companies' ability to compete with Chinese firms. This, of course, is the bedrock principle of the USTR investigation, and must be considered in the context of the complex relationship between the two nations. The United States has departed from its "courtship" of China, criticizing it for its currency stance and other economic policies.<sup>7</sup>

To some, "losing" the race and falling behind the Chinese would have serious consequences for national supremacy. Even senior military leaders recognize that the United States is jeopardizing its future by not taking appropriate steps to address the dire situation presented by climate change. In this view, failing to transition to a clean energy economy would leave the United States vulnerable to ceding its position as a major world power.

Playing into fears about China provided a convenient means of political theater in the 2010 election season,<sup>8</sup> but portraying China's ascendancy in greentech as a national threat will have

unacceptable costs. Given our nations' pressing needs to address climate change, it would be much more productive to forego the rhetoric of the greentech war and support both nations' greentech initiatives. Moreover, the reasons given for why China is "winning" the "race" are not yet completely convincing.

Invoking a race metaphor may be less productive than capturing national attention in the United States with concrete, clear domestic goals. I believe that the United States should articulate a single, clear national goal, just as it did with space research in the Cold War era. Elsewhere, I have argued for the creation of "solar utilities"<sup>9</sup> that would deliver greentech in the residential setting by consolidating all of the functions of financing, installing, and servicing in single entities that would ramp up to utility-size scale in individual areas. This is the sort of idea that could capture the popular imagination and lead to more greentech development in the United States than casting China as a competitor.

## GEOPOLITICAL COMPETITION IN GREENTECH?: SUITABILITY OF THE "SPACE RACE" METAPHOR

The idea that the United States and China are in a competition for greentech supremacy has many adherents. A recent Internet search for "China" and "green energy race" yielded over 300,000 results, with most of the top one hundred having titles such as "Who's Winning the Clean Energy Race?,"<sup>10</sup> "Is China Beating the U.S. in Green Technology Development?,"<sup>11</sup> and so forth. The "China as green competitor" narrative has captivated journalists,<sup>12</sup> bloggers,<sup>13</sup> politicians,<sup>14</sup> environmentalists,<sup>15</sup> think tanks,<sup>16</sup> executives of venture capital and energy companies,<sup>17</sup> financial market analysts and commentators,<sup>18</sup> and many others. The USTR investigation is yet another measure of

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\* Excerpted from "The New Energy Geopolitics?: China, Renewable Energy, and the 'Greentech Race,'" 74 *Chicago-Kent L. Rev.* \_\_\_\_ (2011).

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the strength of the race idea. Some say the race is already over. One observer notes, “[t]he United States ceded its leadership in the production of clean energy technologies during the past decade of neglect.”<sup>19</sup>

#### WHAT IS THE “RACE,” AND IS CHINA “WINNING”?

In the space race, there were concrete goals in physical space: put satellites and humans in orbit, and land a man on the moon. Here, it is not so clear. What is the competition with *China*? To have more solar panels and wind turbines in place? More governmental and private investment in greentech? More greentech-friendly governmental policies? All of the above? Those writing about it often have different agendas. Companies want more investment in greentech and more access to China’s markets. Environmentalists want more active federal policies to encourage deployment of renewables. Free traders want barriers to trade removed.

Consider a threshold question: Why are we competing with China? European nations<sup>20</sup> have had greentech policies for many years, have seen strong growth in greentech, and have generated much electricity from renewables.<sup>21</sup> Some observers note that the race is not with one nation but many,<sup>22</sup> yet the prevailing comparison is to China. There is something more to the “race” metaphor, then, than growth in greentech. As in the space race, there is the pervasive sense that if China has more extensive greentech investments and deployment than we do, there will be drastic consequences for national power and wealth. Denmark and Germany attract less attention than China because they pose less of a threat to the United States’ superpower status.<sup>23</sup>

Evaluating the “race” claims on their merits, it is hardly clear that the United States is “losing” to China. The differences between the two nations are much more subtle than they appear in the prevailing narrative.<sup>24</sup>

#### *Growth of China’s Greentech Industry*

One fear is that multinational companies will find it difficult to sell their greentech in China, and Chinese companies will flood the United States with their products. This fear reflects broader American unease about China’s potential for global economic dominance. In 1979, China began to experiment with the free market, and since then, has experienced robust growth.<sup>25</sup> In 2010, China’s economy had become the world’s second largest, surpassing Japan’s.<sup>26</sup> China’s “pace of industrialization is significantly faster than that experienced by other countries throughout history.”<sup>27</sup> So much of China’s manufacturing output is already sold in the United States that observers believe we are “joined at the hip economically.”<sup>28</sup> Many believe domestic products cannot compete against those manufactured in China due to China’s advantages in less expensive labor, more lax protections of intellectual property, fixed currency rates (until very recently), and weaker environmental protections.<sup>29</sup> In the depths of a recession in the United States, descriptions of growing Chinese greentech firms invoke images of a rising Asian industrial juggernaut.

Is greentech destined to be another area in which the Chinese overpower American firms? China’s 2007 “Medium and Long-Term Development Plan for Renewable Energy in China”

contained an explicit goal to develop a domestic renewables sector.<sup>30</sup> China’s wind turbine industry rose from virtual nonexistence to become a major player in the global market in less than five years. In 2009, three of the largest wind turbine manufacturers in the world were Chinese.<sup>31</sup> China leads the world market for solar photovoltaics (“PV”) cells and modules, producing more than forty percent.<sup>32</sup> Chinese firms’ share of the domestic market has increased rapidly,<sup>33</sup> and Chinese companies have become major players around the globe.<sup>34</sup>

The USTR petition details a growing imbalance in “environmental goods” between the United States and China,<sup>35</sup> but in some categories, Chinese firms have been less successful in the United States. Chinese firms sold only 28 megawatt (“MW”) worth of wind turbines outside of China in 2009.<sup>36</sup> Some predict an upswing in Chinese greentech exports to the United States,<sup>37</sup> and at least one high-profile proposed project involving Chinese technology has attracted negative attention.<sup>38</sup>

Another factor cited in the USTR investigation is that the Chinese government appears to be shutting foreign manufacturers out of its domestic market.<sup>39</sup> Official Chinese government policy promotes “indigenous innovation,” calling for reliance on foreign technology to decrease to thirty percent or less.<sup>40</sup> Foreign observers report that it has become more difficult for foreign companies to get their technology accepted in domestic projects.<sup>41</sup> A recent report states that thirty-six government regulations promote domestic greentech and hamper foreign firms’ ability to compete in China.<sup>42</sup> The USTR investigation petition claims, for example, that the indigenous innovation policy gives Chinese firms a five to ten percent advantage in wind turbine procurement processes.<sup>43</sup> Encouraging announcements of joint ventures and other developments seem to contradict this protectionist trend.<sup>44</sup> China has dropped a requirement that seventy percent of the components in wind turbines come from domestic sources.<sup>45</sup> Agreements between American companies such as First Solar<sup>46</sup> and Chinese local governments to develop renewable energy projects point to a potentially large market for American greentech in China.<sup>47</sup> Perhaps ironically, however, the USTR investigation complaint cites the First Solar memorandum of understanding to develop a 2 gigawatt (“GW”) solar project as impermissible under the WTO because First Solar agreed to work to support China’s domestic industries.<sup>48</sup>

The concern seems to be that Chinese firms will dominate the global greentech market if current growth rates continue. However, some signs in the past year point to overbuilding and overcapacity in the wind industry, and a possible retrenchment and consolidation. In mid-2010, concern about the failure to agree on a climate change agreement and projections of slowing demand in China for wind energy made for an uncertain business climate for wind energy companies.<sup>49</sup> The top three IPOs in 2010 in global greentech were by Chinese companies.<sup>50</sup> Other firms moved forward with their offerings,<sup>51</sup> but a planned initial public offering for one firm had to be scrapped in mid-2010 due to unfavorable market conditions.<sup>52</sup>

There is also evidence that Chinese firms are not yet competitive in certain market segments. Some provincial utilities

have chosen Western wind turbines due to superior control systems and longer experience with manufacturing larger turbine sizes.<sup>53</sup> As recently as 2009, Chinese wind turbines were less capable than their foreign counterparts,<sup>54</sup> as measured by lower capacity factors (the percentage of time that turbines operate to generate electricity).<sup>55</sup>

Chinese firms often do not hold key technology patents that would enable them to develop more sophisticated equipment.<sup>56</sup> Firms have grown rapidly through acquiring manufacturing equipment and capitalizing on advantages such as their lower cost of labor.<sup>57</sup> As a result, they have a leadership position in “downstream” areas of the PV production chain, but lag behind in “upstream” areas requiring more technological skill, such as silicon purification, ingot, and wafer manufacturing.<sup>58</sup> In 2009, American companies held the top ten cited patents worldwide in solar technology.<sup>59</sup>

Many familiar with China believe that it is only a matter of time before Chinese greentech improves through importing foreign technology and assimilating it. Even if Chinese solar and wind technology improves, however, the greentech industry in the United States is growing.<sup>60</sup> The cost advantages of Chinese firms may eventually fade,<sup>61</sup> or the gap may close. Chinese workers increasingly are demanding higher wages and better working conditions.<sup>62</sup> Some greentech, like larger components of wind turbines, is heavy and expensive to transport.<sup>63</sup> In the American market, the costs of shipping large turbines from China might outweigh higher domestic labor costs. And American greentech firms enjoy other cost advantages, such as preferential tax policies.<sup>64</sup>

On the whole, then, Chinese firms are not yet invincible juggernauts displacing their foreign counterparts. There is obvious concern, as the USTR investigation and high-level discussions and trade missions suggest.<sup>65</sup> Some retort that fear of Chinese firms is as overblown as rhetoric in the 1980s claiming that mighty Japan was about to dominate the world economic scene.<sup>66</sup> Setting up China as an economic bogeyman has a potential drawback: it could imperil the bumpy economic relationship between the two nations. Some have argued that for this reason alone, it would be best to drop the rhetoric about a green energy race.<sup>67</sup>

### *Central Government Support*

Observers believe China’s national government offers consistent and committed support to the greentech sector. In this view, a Communist nation with a central government planning process can develop renewables far more quickly.<sup>68</sup> However, the reality is that China occasionally struggles to find consistency in its greentech policies. Some have led to considerable progress,<sup>69</sup> such as the Renewable Energy Law and the 2009 stimulus package,<sup>70</sup> but others, including reorganizations of the governmental energy bureaucracy, have been less successful.<sup>71</sup>

The most frequently cited instance of government support is direct financial aid, in the form of low-interest loans, export promotion, and other aid such as subsidized land made available to developers.<sup>72</sup> The USTR complaint cites “prohibited subsidies to green technology”<sup>73</sup> that include the Ministry of

Finance’s “Special Fund for Wind Manufacturing,” the Ministry of Finance and Ministry of Commerce’s “Export Product Research and Development Fund,” and the provision of financing through export credits by China’s Export-Import Bank.<sup>74</sup> The state-owned China Development Bank made \$42 billion in loans in 2010 to solar and wind energy companies,<sup>75</sup> a sum that exceeds comparable financing levels in the United States.<sup>76</sup>

Yet some other policies, such as pricing for electricity generated from renewables added to the national electricity grid, have been anything but consistently encouraging. Over the past two years, prices in China’s feed-in tariff for solar have been inconsistent.<sup>77</sup> A project priced in late summer 2010 involved a feed-in tariff of 0.73 renminbi (RMB, \$0.108 at 6.8 RMB to the dollar) per kilowatt-hour.<sup>78</sup> This was more than one-third less than a previous project’s winning bid, which suggests the winning bidder may have been a state-owned enterprise (“SOE”) that could undercut a private company’s bid. This hybrid system of state-owned and private companies competing for the same projects is cited in the USTR complaint as disfavoring competition.<sup>79</sup> It is an ongoing challenge to China’s energy system,<sup>80</sup> and as one report observes, “lack of competition reduces efficiencies and innovation that come from open and competitive markets.”<sup>81</sup>

Until 2009, a bidding tender system was also in place for electricity generated from wind turbines above 50 MW. That system was criticized for failing to promote wind power development.<sup>82</sup> For smaller wind installations, provincial governments set pricing policies on a project specific basis, which provided little long-run guidance on pricing. A new system of “zonal tariffs” largely replaced the previous pricing scheme, but it is too early to tell whether it will encourage more wind power development.

No fewer than nineteen governmental bodies have responsibility for some aspect of greentech policy.<sup>83</sup> There are inevitable delays in coordination. Ambitious announcements are not always translated quickly into concrete policies.<sup>84</sup> National proclamations tend to be broad frameworks requiring implementation by administrative organs of the national government. Unlike the American system, where public involvement can help steer actions of administrative agencies, the Chinese government has little accountability to accomplish its advertised objectives.<sup>85</sup> Key personnel changes in the inner circle of the Chinese Communist Party can make for policy reversals or alterations.

The Chinese government’s top-down nature creates enormous reliance on provincial and local governments to implement national policies. Robust policy announcements by Beijing do not easily translate to the provinces,<sup>86</sup> and coordination between national and local officials is difficult.<sup>87</sup> Local officials often have incentives to prefer projects that can deliver short-term profits,<sup>88</sup> not renewable energy projects that might not pan out for years.<sup>89</sup> Some local governments have direct conflicts of interest between responsibilities to promote SOEs and mandates to implement national policies.<sup>90</sup>

The perception that China’s government is unwaveringly committed to supporting greentech is often accepted uncritically, without these or any other caveats. Observers often jump

to conclusions that might be erroneous or oversimplified. It is difficult to obtain accurate information from China's national government, which is secretive and prone to releases of propaganda (as any reader of Xinhua knows).<sup>91</sup> Information routinely available in the West is often protected in China as state secrets, and recent efforts to promote a freedom of information regime<sup>92</sup> show how difficult it is to understand governmental actions.<sup>93</sup> According to the USTR petition, "there is a lack of official, detailed information regarding the terms upon which financing is provided by China ExIm Bank."<sup>94</sup> Thus, sweeping pronouncements about the Chinese government's intentions and policies should be avoided when possible.

### *The Results Speak for Themselves . . . Or Do They?*

By some metrics, Chinese greentech progress is impressive. In 2009, China obtained a larger share of electricity from renewable sources than the United States (17% versus 8.8%),<sup>95</sup> but this figure is skewed by the predominance of hydroelectric generation in China,<sup>96</sup> especially the mammoth Three Gorges Dam project.<sup>97</sup> China added 13.8 GW of new wind power capacity to 10.0 GW for the United States in 2009,<sup>98</sup> but its installed total capacity still trailed that of the United States (35.1 GW versus 25.8 GW). Those numbers cannot be compared directly, as China's wind projects have been less efficient.<sup>99</sup> In 2009, China had a mere 0.4 GW of grid-connected solar PV capacity,<sup>100</sup> though it pledged to meet a much higher target by 2020.<sup>101</sup> The United States had a larger 1.2 GW of installed PV capacity, still far less than world leader Germany's 9.8 GW.<sup>102</sup>

At present, then, China is not outstripping the United States in total installed capacity, but it might if it achieves its ambitious targets for 2020—30 GW for wind (or possibly 100 GW, according to recent reports) and 1.8 GW for solar PV (or possibly as much as an astounding 20 GW).<sup>103</sup> However, much of the increase will be in hydropower.<sup>104</sup> And apples should be compared to apples: Europe and the United States also plan to increase installed capacity substantially above current levels by 2020.<sup>105</sup>

Some point to a different metric. Asset financing levels in China have recently outpaced those of American firms.<sup>106</sup> According to a recent report,<sup>107</sup> in 2009, Chinese spending (excluding R&D) totaled \$34.6 billion to \$18.6 billion for the United States.<sup>108</sup> As the spending levels are within the same order of magnitude, it does not seem that this is reason for panic. The real fear seems to be that if the United States does not adopt progressive climate measures (including a cap-and-trade law), it will fall further behind China.<sup>109</sup> The market data seems to capture the spirit of American inaction on renewables, but does it matter, except for international bragging rights, whether the United States or China occupies the top spot in solar and wind investment or installed capacity?

Total investment figures or gigawatts of renewable energy capacity installed do not tell us how China is moving toward reducing its usage of fossil fuels and achieving climate goals. China is adding renewable energy capacity rapidly, but is much more dependent on conventional fossil fuel generation than the

United States. Coal accounts for a staggering seventy percent of the nation's electricity generation capacity.<sup>110</sup> Even large deployment of renewables will not enable China to reduce that number substantially over the next decade.<sup>111</sup> And that only tells part of the story. China's growth and increasing appetite of its citizens for modern conveniences has resulted in rapid increases in energy demand.<sup>112</sup> In 2010, China achieved the dubious milestone of surpassing the United States as the world's largest primary energy user.<sup>113</sup> Its industries are far less energy-efficient than those in the United States and Japan.<sup>114</sup> The government's initiatives have helped,<sup>115</sup> but China still has a long way to go.

To satisfy its increasing energy demand, China has added more conventional generation capacity than greentech.<sup>116</sup> An article on China and greentech stated that, "China's investment in renewable energy and other green technologies is miniscule compared to the resources devoted to its continued building of coal-fired power plants and efforts to secure dirty oil shale supplies in Canada and elsewhere."<sup>117</sup> In 2009, China began construction of a mammoth 13.6 GW power base fueled by coal in Gansu province, the same location planned for a much-praised 10 GW wind farm.<sup>118</sup> New investments in conventional technology made up over one-third of the 134.4 billion RMB (just under twenty billion dollars) in the first half of 2010.<sup>119</sup> As of 2010, China "uses more coal than the United States, Europe, and Japan combined."<sup>120</sup> That context should be a central part of any discussion that touts China's achievements in deploying solar panels and wind turbines or in greentech financing levels.

### INVOKING THE SPACE RACE METAPHOR IS COUNTER-PRODUCTIVE FOR ADDRESSING CLIMATE CHANGE

While many believe the United States is losing the green energy race, the reality does not yet match the rhetoric.<sup>121</sup> However, there is more at stake. We need to confront a powerful reality: the United States and China are interdependent, not independent competitors.<sup>122</sup> We *need* China to take the very actions some posit as competition. This makes the USTR investigation especially unwelcome.<sup>123</sup> Without its greentech efforts and other measures<sup>124</sup> such as its announced goal to reduce the "carbon intensity" of its economy (CO<sub>2</sub> emissions per unit of GDP),<sup>125</sup> China's increasing energy demand and spending on conventional technology would add considerably to greenhouse gas emissions.<sup>126</sup>

There will be no effective global reduction of emissions that does not include the United States and China,<sup>127</sup> because they are by far the world's two largest emitters of greenhouse gases.<sup>128</sup> Failure by either nation to reduce its emissions would imperil the entire global effort.<sup>129</sup> We should encourage and support China's efforts, not consider them a threat to our national wellbeing.<sup>130</sup> Rather than creating the scorched earth of a "greentech war,"<sup>131</sup> both nations can benefit from collaboration.<sup>132</sup> The urgency to do this is compelling. No nation has ever had to address such daunting environmental challenges at the same time as it has pursued such rapid growth.<sup>133</sup> This poses major hurdles to tackling climate change that must be surmounted by nations working together. And there are not just two



nations involved, but the whole world.<sup>134</sup> Rather than creating a two-nation race, we should encourage China's domestic policies and the climate change collaborations of the "BRIC" developing economies (Brazil, Russia, and India, in addition to China).<sup>135</sup>

Nationalistic rhetoric on climate change would be especially unfortunate for the U.S.-China relationship on climate matters. The two nations have ongoing tensions on a whole host of sensitive topics,<sup>136</sup> but have worked productively with each other to address climate change.<sup>137</sup> In the two-year period of international negotiations between the promulgation of the Bali Action Plan and the December 2009 Copenhagen summit, talks took place under the auspices of the U.S.-China Strategic and Economic Dialogue.<sup>138</sup> Discussions also took place during 2009 with world leaders at the Pittsburgh G-20 summit<sup>139</sup> and at the Major Economies Forum on Energy and Climate.<sup>140</sup> The two nations have pledged several times to take mutual action to address climate change,<sup>141</sup> and while the promises are often hortatory, the ongoing discussion does have important value in strengthening the bilateral relationship.<sup>142</sup> Advocating competition with the Chinese undercuts these activities. Continued antagonistic rhetoric about a clean energy race will also make it difficult to conduct cooperative efforts in energy and environmental matters. Unlike the near-complete scientific secrecy that marked the Cold War era,<sup>143</sup> China and the United States are working to develop technology together.

Some even argue that China's programs to promote renewables can be good for the United States' economy.<sup>144</sup> The Council on Foreign Relations' Michael Levi, argues that "it's quite possible for the United States and China both to win, with China lowering the cost of relatively low-tech parts of the value chain, in turn growing the market for the higher-tech parts that are still handled by the United States."<sup>145</sup> Levi compares this to other situations in which China manufactures products developed in the United States.

Finally, greentech warring makes it more difficult to reach a global climate agreement. According to some accounts, China's foot-dragging<sup>146</sup> and refusal to adopt binding reduction targets was in part responsible for the failure of the Copenhagen Accord to incorporate global binding limits.<sup>147</sup> As China's economy continues its rapid growth, there will be even greater demand for it to agree to limit emissions.<sup>148</sup> Castigating it for its greentech policies could foster a climate of distrust and delay further progress on a post-Kyoto agreement.

For all of these reasons, the symbolism of the space race is simply not helpful in a discussion of global climate change.

### *Lessons for Energy Policy From the "Space Race"*

Blaming China deflects attention from our own inability to develop progressive policies on renewables and climate change. Numerous observers have noted that we lack a stable set of policies to encourage greentech research, development, and deployment.<sup>149</sup> While we have done well to invent new technologies,<sup>150</sup> our efforts to advance them to the commercial stage and promote their deployment are "fragmented," spread among numerous agencies, and lacking coordination.<sup>151</sup> As many have

noted, "[g]overnment policies can provide a strong impetus for constructing renewable generation facilities," and there is a wide variety of potential incentives, including support for research and development, tax incentives, government procurement policies, renewable portfolio standards ("RPSs"), carbon cap-and-trade programs, and feed-in tariffs.<sup>152</sup> Federal spending on renewable energy is both anemic in its overall levels<sup>153</sup> and, even after the added billions of dollars in the 2009 stimulus package,<sup>154</sup> well behind that devoted to fossil fuels.<sup>155</sup> Federal tax policy for renewables is inconsistently supportive,<sup>156</sup> and in some years, many new projects come to fruition, but the pipeline often dries up.<sup>157</sup> The cyclical pace of support "clearly illustrates the consequences of on-again, off-again short-term federal incentives for wind as a market signal."<sup>158</sup>

Some Obama administration actions are similar to actions taken in response to Sputnik, such as the creation of a Cabinet-level position to address climate change, which echoes governmental reorganizations taken in the late 1950s. One action that is especially comparable and noteworthy is the funding of the Advanced Research Projects Agency-Energy ("ARPA-E") with four hundred million dollars from the American Recovery and Reinvestment Act ("ARRA") stimulus package. ARPA-E's name and mission deliberately echo that of the Advanced Research Projects Agency ("ARPA")<sup>159</sup> created after Sputnik in the Department of Defense.


The moon landing was the product of an amalgamation of many disparate efforts to develop different types of technologies. So too is energy research and development. Like the Apollo program, it is not clear at the outset which technology will prevail, so we need to work on a variety of fronts over a long period of time. Programs established in the stimulus package are temporary, not the comprehensive approach we need.<sup>160</sup>

Much of our effort to develop greentech is mired in a rut. No climate bill, renewable electricity standard, or national feed-in tariff is forthcoming.<sup>161</sup> Progress toward a stand-alone national renewable electricity standard is doubtful.<sup>162</sup> Many have noted the failure of federal leadership<sup>163</sup> and the actions of progressive states that have stepped into the void with their own programs.<sup>164</sup> These policies are not uniform throughout the country. A national program may achieve results that piecemeal state and regional efforts underway cannot.<sup>165</sup>

How can we make more progress? Addressing climate change requires the kind of committed and strong support from the federal government that the space program received throughout the 1960s.<sup>166</sup> The race is really to meet a national goal that we have articulated and that is in our national self-interest, whether or not it has geopolitical significance. We put a man on the moon in part because we were captivated by the idea of a simple, clear goal. I have focused on one idea that could catalyze a push toward rapidly increasing development of renewables: a "solar utility" that would reduce the upfront cost of panels to nearly zero by subsidizing and installing them at houses.<sup>167</sup>

## Conclusion

China has become a major player in greentech in a short amount of time. If it could keep up its breakneck pace of growth it might look like it has pulled far ahead of us in the new “green energy race,” but at present the picture is more muddled. The “space race” metaphor and the USTR investigation are

counterproductive in that they pit the two nations against each other, when they should emphasize interdependence and cooperation. In the end, competing with China in greentech is about as useful as “energy independence.” It may be much more productive to convince Americans that their nation’s future depends on investment in renewables through a specific national goal. 

# Endnotes: China’s Greentech Programs and the USTR Investigation

<sup>1</sup> See generally Joel B. Eisen, *China’s Renewable Energy Law: A Platform for Green Leadership?*, 35 WM. & MARY ENVTL. L. & POL’Y REV. 1 (2010).

<sup>2</sup> *Id.*

<sup>3</sup> *United States Launches Section 301 Investigation into China’s Policies Affecting Trade and Investment in Green Technologies*, OFF. U.S. TRADE REPRESENTATIVE (Oct. 15, 2010), <http://www.ustr.gov/node/6223>. A full discussion of this investigation under prevailing trade law is beyond the scope of this article.

<sup>4</sup> See, e.g., Thomas L. Friedman, *Failure Is Not an Option*, N.Y. TIMES, Apr. 27, 2010, <http://www.nytimes.com/2010/04/28/opinion/28friedman.html?ref=thomaslfriedman> (opening the column with “China is having a good week in America. Yes it is. I’d even suggest that there is some high-fiving going on in Beijing. I mean, wouldn’t you if you saw America’s Democratic and Republican leaders conspiring to ensure that America cedes the next great global industry—E.T., energy technology—to China?”).

<sup>5</sup> Friedman has written often in his column about the need for American energy policy to move forward expeditiously, frequently contrasting America’s lack of progress unfavorably with China’s policies. See Christina Larson, *America’s Unfounded Fears of a Green-Tech Race with China*, YALE ENV’T 360 (Feb. 8, 2010), <http://e360.yale.edu/content/feature.msp?id=2238> (stating that “Friedman has used the bully pulpit of his influential *New York Times* column to warn that the United States is engaged in a global green-tech competition with China, whose potential dominance represents a ‘new Sputnik’”). Friedman has written numerous columns in the first half of 2010 alone that mention China’s energy ascendancy. See, e.g., Thomas L. Friedman, *We’re Gonna Be Sorry*, N.Y. TIMES, Jul. 24, 2010, <http://www.nytimes.com/2010/07/25/opinion/25friedman.html?ref=thomaslfriedman>; Thomas L. Friedman, *What 7 Republicans Could Do*, N.Y. TIMES, Jul. 20, 2010, <http://www.nytimes.com/2010/07/21/opinion/21friedman.html?ref=thomaslfriedman> (noting that “by 2012, China should pretty much own the clean-tech industry”); Thomas L. Friedman, *No Fooling Mother Nature*, N.Y. TIMES, May 4, 2010, <http://www.nytimes.com/2010/05/05/opinion/05friedman.html?ref=thomaslfriedman>; Friedman, *supra* note 4; Thomas L. Friedman, *Global Weirding Is Here*, N.Y. TIMES, Feb. 17, 2010, <http://www.nytimes.com/2010/02/17/opinion/17friedman.html?ref=thomaslfriedman> (“China . . . is investing heavily in clean-tech, efficiency and high-speed rail. It sees the future trends and is betting on them. Indeed, I suspect China is quietly laughing at us right now.”).

<sup>6</sup> See *infra* notes 10–24 and accompanying text.

<sup>7</sup> Sewell Chan & Keith Bradsher, *U.S. to Investigate China’s Clean Energy Aid*, N.Y. TIMES, Oct. 15, 2010, <http://www.nytimes.com/2010/10/16/business/16wind.html>. Note this comment from Rep. Charles Schumer, however: “An investigation into China’s illegal subsidies for its clean energy industry is overdue, but it’s no substitute for dealing with China’s currency manipulation.” *Id.*

<sup>8</sup> See CAGWmedia, *Chinese Professor*, YOUTUBE (Oct. 20, 2010), <http://www.youtube.com/watch?v=OTSQozWP-rM>.

<sup>9</sup> Joel B. Eisen, *Can Urban Solar Become a “Disruptive” Technology?: The Case for Solar Utilities*, 24 NOTRE DAME J.L., ETHICS & PUB. POL’Y 53 (2010).

<sup>10</sup> THE PEW CHARITABLE TRUSTS, WHO’S WINNING THE CLEAN ENERGY RACE?: GROWTH, COMPETITION AND OPPORTUNITY IN THE WORLD’S LARGEST ECONOMIES 7 (2010), [http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Global\\_warming/G-20%20Report.pdf](http://www.pewtrusts.org/uploadedFiles/wwwpewtrustsorg/Reports/Global_warming/G-20%20Report.pdf) (containing a section titled “China Takes the Lead, While the U.S. Slips”).

<sup>11</sup> *Is China Beating the U.S. in Green Technology Development?*, BUILDAROO.COM (Mar. 7, 2010), <http://buildaroo.com/news/article/china-green-technology-development>.

<sup>12</sup> See e.g., Keith Bradsher, *On Clean Energy, China Skirts Rules*, N.Y. TIMES, Sept. 8, 2010, [http://www.nytimes.com/2010/09/09/business/global/09trade.html?pagewanted=1&\\_r=1&ref=keith\\_bradsher](http://www.nytimes.com/2010/09/09/business/global/09trade.html?pagewanted=1&_r=1&ref=keith_bradsher); Keith Bradsher, *China Leading Global Race to Make Clean Energy*, N.Y. TIMES, Jan. 30, 2010, <http://www.nytimes.com/2010/01/31/business/energy-environment/31renew.html>; Kent Garber, *U.S. Lacks a Coherent Clean Energy Strategy: China Is the Main Competitor in the Global Energy Race*, U.S. NEWS & WORLD REP., May 7, 2010, <http://politics.usnews.com/news/energy/articles/2010/05/07/us-lacks-a-coherent-clean-energy-strategy.html>; Evan Osnos, *Letter from China: Green-Tech Space Race*, NEW YORKER, Apr. 21, 2009, <http://www.newyorker.com/online/blogs/evanosnos/2009/04/greentech-space-race.html>; Bruce Usher, *Red China, Green China*, N.Y. TIMES, May 6, 2010, <http://www.nytimes.com/2010/05/07/opinion/07Usher.html> (observing that “[b]y giving China more time to develop its capacity while neglecting our own, America is not just losing the clean-tech race, it’s forfeiting it”); Gerard Wynn, *Is Clean Tech China’s Moon Shot?*, REUTERS, Jan. 28, 2010, <http://www.reuters.com/article/idUSTRE60R02520100128>; *supra* note 5 and accompanying text (including Thomas Friedman’s *New York Times* columns).

<sup>13</sup> Richard Brubaker, *Will China Surpass the US as a Superpower?*, ALL ROADS LEAD TO CHINA (Jul. 16, 2010, 6:22), <http://www.allroadsleadtochina.com/2010/07/16/will-china-surpass-the-us-as-a-superpower>; Derek Thompson, *Is China Winning the Energy Race?*, THE ATLANTIC (Jun. 17, 2010, 2:25 PM), <http://www.theatlantic.com/business/archive/2010/06/is-china-winning-the-energy-race/58321>, *republished* by Julian L. Wong, *Interview with The Atlantic on China and the Clean Energy Race*, GREEN LEAP FORWARD (Jul. 8, 2010), <http://green-leapforward.com/2010/07/08/interview-with-the-atlantic-on-china-and-the-clean-energy-race>.

<sup>14</sup> Rep. Ed Markey, *Landing a Clean Energy Victory*, HUFFINGTON POST (Jul. 20, 2009, 9:57 AM), [http://www.huffingtonpost.com/rep-ed-markey/landing-a-clean-energy-vi\\_b\\_240938.html](http://www.huffingtonpost.com/rep-ed-markey/landing-a-clean-energy-vi_b_240938.html).

<sup>15</sup> Frances Beinecke, *In the Clean Energy Race, Jobs Can Stay in America*, SWITCHBOARD: NAT. RESOURCES DEF. COUNCIL STAFF BLOG (Feb. 23, 2010), [http://switchboard.nrdc.org/blogs/fbeinecke/in\\_the\\_clean\\_energy\\_race\\_with.html](http://switchboard.nrdc.org/blogs/fbeinecke/in_the_clean_energy_race_with.html) (providing commentary by Frances Beinecke, President of the Natural Resources Defense Council); Robert F. Kennedy, Jr., *The New Arms Race*, HUFFINGTON POST (Nov. 19, 2009, 3:11 PM), [http://www.huffingtonpost.com/robert-f-kennedy-jr/the-new-arms-race\\_b\\_364211.html](http://www.huffingtonpost.com/robert-f-kennedy-jr/the-new-arms-race_b_364211.html).

<sup>16</sup> Daniel J. Weiss & Susan Lyon, *Running for First in the Clean-Energy Race*, CTR. FOR AM. PROGRESS (Jan. 28, 2010), [http://www.americanprogress.org/issues/2010/01/sotu\\_energy.html](http://www.americanprogress.org/issues/2010/01/sotu_energy.html). The Center’s “Out of the Running” report, as discussed below, analyzes the race in detail. ROB ATKINSON ET AL., BREAKTHROUGH INST. & THE INFO. TECH. & INNOVATION FOUND., RISING TIGERS SLEEPING GIANT: ASIAN NATIONS SET TO DOMINATE THE CLEAN ENERGY RACE BY OUT-INVESTING THE UNITED STATES (2009), [http://thebreakthrough.org/blog/Rising\\_Tigers.pdf](http://thebreakthrough.org/blog/Rising_Tigers.pdf); Van Jones & Pan Jiahua, Inst. for Pub. Policy Research, *Climate Change, Innovation and the Clean Energy Race*, GOV MONITOR (May 23, 2010), [http://www.the-govmonitor.com/world\\_news/britain/climate-change-innovation-and-the-clean-energy-race-31528.html](http://www.the-govmonitor.com/world_news/britain/climate-change-innovation-and-the-clean-energy-race-31528.html).

<sup>17</sup> John Doerr & Jeff Immelt, *Falling Behind On Green Tech*, WASH. POST, Aug. 3, 2009, <http://www.washingtonpost.com/wp-dyn/content/article/2009/08/02/AR2009080201563.html> (providing commentary by John Doerr, partner in the venture capital firm Kleiner Perkins Caufield & Byers, and by Jeff Immelt, chairman and chief executive of General Electric, a major manufacturer of wind turbine equipment).

<sup>18</sup> Eric Pooley, *Senate Inaction Cedes U.S. Energy Race to China*, BLOOMBERG, Jul. 29, 2010, <http://www.bloomberg.com/news/2010-07-30/senate-inaction-cedes-u-s-energy-race-to-china-commentary-by-eric-pooley.html>; Kerri Shannon,

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# DUE PROCESS RIGHTS IN THE CARBON MARKETS

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## INTRODUCTION

The compliance and voluntary carbon markets are facing an identity crisis. Despite minor victories following the 16th Conference of the Parties of the United Nations Framework Convention on Climate Change in Cancun, Mexico, the voluntary carbon markets are attempting to grow in an uncertain regulatory world where the fate of the Kyoto Protocol and its market mechanisms hang in the balance. At the same time, the voluntary carbon markets have been able to survive through flexibility and strong self-governance.

Critics initially attacked the fledgling voluntary market for its lack of conformity to rules and attentiveness to real environmental action. Now, as the voluntary markets mature, stricter codes of conduct are emerging. Many of the almost two-dozen carbon offset certification standards that exist in the voluntary carbon markets today seek to establish credibility and accountability for voluntary environmental commitments. They seek to enforce their rules through transparency and reputation to ensure that these commitments are fulfilled in a real and verifiable way. Indeed, social and environmental product certification systems that include third-party auditing “are remarkable for their similarity to state-based regulatory and legal systems.”<sup>1</sup> But are the legal systems similar? Certainly, the successful certification standards have “establish[ed] their own governing systems, largely independent of state governments, with the regulatory capacity to back up those obligations with enforceable rules.”<sup>2</sup> But what happens when the certification standard makes a mistake in enforcement?

Several voluntary certification standards include dispute resolution mechanisms for private parties harmed by an adverse decision from an auditor or the standard itself during the certification process. However, these dispute resolution mechanisms vary widely and encompass diverse degrees and notions of due process rights. The available dispute resolution mechanisms in the voluntary carbon markets are important because they can serve as models for how dispute resolution will be addressed by the compliance markets, and, in particular, the Clean Development Mechanism (“CDM”) under the Kyoto Protocol,<sup>3</sup> which is currently framing its own appeals procedure for private parties.<sup>4</sup>

This article explores due process rights in the carbon markets and discusses how innovation in the voluntary markets can set an important example for the compliance markets. This article provides an overview of the carbon markets and then examines whether the four leading offset certification standards in the voluntary carbon markets have achieved enough credibility and status to influence the CDM’s governance structure for the resolution of conflicts. Finally, it outlines the appeals procedures currently available in the voluntary market and advocates for

their continued development in both the voluntary market and the CDM.

## AN OVERVIEW OF THE CARBON MARKETS

### THE COMPLIANCE CARBON MARKETS

There are two types of carbon markets: compliance and voluntary. Compliance markets are government-mandated cap-and-trade programs. The cap-and-trade programs established by the Kyoto Protocol,<sup>5</sup> the European Union Emissions Trading System (“EU ETS”),<sup>6</sup> and the Regional Greenhouse Gas Initiative (“RGGI”) in the northeastern United States<sup>7</sup> are examples of compliance carbon markets. To date, the success of these markets has been mixed. Although these programs have proven that carbon is a viable commodity that can attract significant capital, several problems have repeatedly plagued these markets, including the ability to set appropriate caps to enable real emissions reductions over time.<sup>8</sup>

Carbon offsets, which must be certified by a third-party certification standard, are integral to any cap-and-trade program. “Certification standards” are independent organizations that provide the guarantee that a carbon offset project has achieved the promised emissions reductions.<sup>9</sup> When a project’s emissions reductions have been verified against a standard’s rules and requirements, the standard will issue the project carbon credits equivalent to the emission reductions achieved.<sup>10</sup> The credits are then considered “certified” and the credits can either be sold or “retired.”<sup>11</sup>

### CDM Process of Certification

The most prominent carbon offset certification standard in the compliance markets is the CDM. The Kyoto Protocol permits Annex I Parties (developed countries) to satisfy part of their emissions reduction targets by using Certified Emissions Reductions (“CERs”) created by registered CDM project activities.<sup>12</sup> The CDM is a global market-based mechanism overseen by the CDM Executive Board (“EB”), which facilitates the creation and issuance of CERs from eligible CDM project activities.<sup>13</sup> Before a CDM project can begin to generate CERs, it must proceed through the CDM project cycle. As a preliminary matter, the nation hosting the CDM project must belong to the Kyoto Protocol as a non-Annex I (developing) country.<sup>14</sup> After the project is designed using an approved methodology that quantifies the

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emissions reductions, a designated operational entity (“DOE”) is appointed to act as an independent auditor to validate and subsequently request registration of the proposed CDM project activity.<sup>15</sup> The DOE then submits a validation report to the EB, thereby confirming that certain preset requirements are met.<sup>16</sup> The EB then decides whether to formally accept the DOE’s recommendation and if so, it “must register CDM projects within eight weeks of the [DOE’s] request unless three members of the CDM Executive Board, or a CDM participant, require a review of the proposed activity.”<sup>17</sup>

Once registered, the project participants implement the CDM project. A second and different DOE is appointed to monitor the project during implementation and to ultimately confirm that the project’s resulting greenhouse gas (“GHG”) reductions are real, measurable, and verifiable below an approved baseline.<sup>18</sup> This second DOE requests the EB to issue CERs after it is satisfied that the GHG reductions are “appropriate”.<sup>19</sup> There is then a fifteen-day window during which time a three-member panel of the EB or a CDM participant can request a review of the DOE’s findings.<sup>20</sup> However, “[b]ecause the scope of the review is limited to issues of fraud, malfeasance, or incompetence of the [second DOE], issuance of CER[s] by the Executive Board . . . is almost . . . automatic.”<sup>21</sup> If no review is requested, the CER “issuance is considered final.”<sup>22</sup>

## THE VOLUNTARY CARBON MARKETS

In contrast to the compliance markets, voluntary carbon markets do not impose a mandatory cap on greenhouse gas emissions. Instead, they rely on participants’ voluntary commitments to reduce emissions. A unique dynamic has developed between these two types of markets in which the voluntary markets often appear to act as a test-drive for companies facing the prospect of the enactment of complex, and sometimes confusing, compliance markets.<sup>23</sup> Indeed, the voluntary markets buoyed the credibility of the overall carbon markets when the compliance markets were most vulnerable. This was particularly evident following the failures at the 15th Conference of the Parties (“COP15”) where regulators hesitantly noted the Copenhagen Accord.<sup>24</sup> The robust growth of the voluntary markets is thus a logical response to the Kyoto Protocol’s complex rules, disparate enforcement and inefficiencies that have resulted in CDM capacity bottlenecks and slowed credit issuances.<sup>25</sup>

In the past, the voluntary markets were accessed through the Chicago Climate Exchange (“CCX”), a voluntary but legally binding cap-and-trade program, or through an over-the-counter (“OTC”) purchase or sale. However, CCX’s emissions trading program shut its doors at the end of 2010.<sup>26</sup> Consequently, OTC transactions will now dominate the market.

Most of the transactions in the OTC market involve offset credits from third-party certification standards.<sup>27</sup> In 2008 and 2009, more than ninety percent of the credits transacted in the voluntary markets were certified by a third-party standard.<sup>28</sup> Over the last few years, the following certification standards have emerged as leaders in the voluntary market: the Verified Carbon Standard (“VCS”), the Climate Action Reserve

(“CAR”), the American Carbon Registry (“ACR”), and the Gold Standard (“GS”).<sup>29</sup>

The VCS was launched in 2007.<sup>30</sup> It was founded by The Climate Group, the International Emissions Trading Association, and the World Business Council for Sustainable Development.<sup>31</sup> The World Economic Forum and approximately one thousand carbon market stakeholders also assisted in developing the standard.<sup>32</sup> VCS issues credits called Verified Carbon Units (“VCUs”) for carbon offset projects throughout the world that can demonstrate emissions reductions that are real, measurable, permanent, additional, independently verified, unique, transparent, and conservative.<sup>33</sup>

CAR, formerly the California Climate Action Registry (“CCAR”), was established in 2001 after a group of CEOs lobbied the state of California to create a mechanism by which they could track their firms’ early emissions reductions in anticipation of the future state and potential federal regulation.<sup>34</sup> CCAR was thus born from a state mandate.<sup>35</sup> The program eventually separated from the state to be incorporated as a nonprofit organization and, in 2009, the organization began transitioning its tracking and inventory operations to The Climate Registry, a national nonprofit body established in 2007 that was actually modeled after CCAR.<sup>36</sup> In turn, CAR flip-flopped its role as part of CCAR to become the new parent organization focusing on developing an offset credit, Climate Reserve Tonnes (“CRT”) that apply to GHG reduction projects within North America.<sup>37</sup>

ACR was established in 1996 by the Environmental Defense Fund and Environmental Resources Trust.<sup>38</sup> It was the first of its kind in the United States and over the last fifteen years, it has issued over thirty million offset credits.<sup>39</sup> These credits, called Emission Reduction Tons (“ERTs”), are issued in accordance with ACR’s requirement that reductions are “real, measurable, permanent, in excess of regulatory requirements and common practice, additional to business-as-usual, net of leakage, verified by a competent independent third party, and used only once.”<sup>40</sup> ACR’s reach is not limited to the United States and accepts international projects.<sup>41</sup> In 2007, ACR became an “enterprise” of Winrock International, an American nonprofit organization working globally to “empower the disadvantaged, increase economic opportunity, and sustain natural resources.”<sup>42</sup>

The GS Foundation, which manages the GS carbon certification scheme, was founded in 2003 by a network of large non-governmental organizations (“NGO”), including the Worldwide Fund for Nature, Helio International, and SouthSouthNorth, in response to criticism that the Kyoto Protocol’s CDM did not adequately address sustainable development.<sup>43</sup> These NGOs developed the GS as a complement to renewable energy or energy efficiency CDM projects through the addition of a sustainability assessment.<sup>44</sup> If a project proponent successfully applied the GS’s sustainability assessment to its CDM project, then the GS would provide the CDM project with an additional GS label.<sup>45</sup> The project could then sell the GS-labeled CERs for an additional premium in the marketplace.<sup>46</sup> Subsequently, in 2006, the GS launched its voluntary standard whereby it issues GS Voluntary Emission Reductions (“VERs”) to renewable energy or



energy efficiency projects that successfully meet the Standard's rigorous technical and sustainable development criteria.<sup>47</sup>

Unlike the CDM, which was born out of climate diplomacy and is therefore vulnerable to global politicking, VCS, CAR, ACR, and GS operate in an unregulated market, free from bureaucracy, political hostage-taking, and other possible effects of governmental intervention. This gives VCS, CAR, ACR, and GS freedom to respond to market demands through innovation, limited only by their own creativity and available resources. As such, these standards can experiment with a variety of governance, financial, and technical mechanisms. Indeed, experiments in the voluntary carbon markets—the successes and failures alike—can set examples for the compliance markets as they develop over time.

These third party standards play another critical role in the voluntary markets, acting as civil regulatory bodies to build consumer trust by ensuring a consistent level of quality. Thus, voluntary certification standards become “distinctive . . . because they transform the global marketplace by developing ‘deliberative and adaptive governance institutions designed to embed social and environmental norms in the global marketplace that derive authority directly from interested audiences, includ[ing] those they seek to regulate, [but do not derive their authority] from sovereign states.’”<sup>48</sup> Such non-state global governance institutions are known as non-state market driven (“NSMD”) governance systems.<sup>49</sup> The application of the NSMD analysis to voluntary carbon certification standards is appropriate because the framework was originally developed to explain forest certification, which is similar to carbon certification.<sup>50</sup>

VCS, CAR, ACR, and GS must establish credibility, build consumer trust, develop a strong reputation in the marketplace, and operate with a certain degree of political integrity to be considered as relevant and appropriate examples for the CDM. The NSMD governance system, an academic analytical framework, provides a framework from within which to measure these characteristics.

### THE NSMD FRAMEWORK— A MEASURE OF MARKET CREDIBILITY

It is generally accepted that a NSMD system displays five features.<sup>51</sup> First, a NSMD system's authority is not derived from the state.<sup>52</sup> That is, “there is no use of state sovereignty to enforce compliance.”<sup>53</sup> This element is arguably the most important because of the lack of a connection with the state, which distinguishes NSMD systems from public-private partnerships or, in the case of carbon markets, the standard-setting CDM, which derives its authority from an international agreement between nations.<sup>54</sup> Second, NSMD systems must have established governance mechanisms,<sup>55</sup> whereby “NSMD institutions constitute governing arenas in which . . . adaptation, inclusion, and learning over time occur . . . across a wide range of stakeholders.”<sup>56</sup> At its core, this element rests on democratic ideals of fairness, accountability and transparency, and its intent is to promote “good practice” and “practical reason.”<sup>57</sup> Third, the NSMD's authority is market-based,<sup>58</sup> deriving its power from the market

and civil society.<sup>59</sup> Fourth, the NSMD is concerned with social impacts.<sup>60</sup> A NSMD governance system seeks to address global issues that private firms are not incentivized to address, and which governments may not have the capacity or, in the case of climate change mitigation in the United States, the political will to remedy.<sup>61</sup> Finally, the NSMD system has enforcement mechanisms and mandatory requirements.<sup>62</sup> These are rules and regulations where compliance can be verified and non-compliance can be punished.<sup>63</sup> “Once firms sign on, they are subject to governance, rules and enforcement that have more in common with state regulation than standards of voluntary bodies that can be abandoned with little consequence.”<sup>64</sup>

While the NSMD framework omits any *express* reference to due process rights for the NSMD system's constituents, it is recognized that “entities that are affected by the decisions of a regulatory body [should] have access to a full and fair review of the decision in question.”<sup>65</sup> If NSMD systems are akin to democratic regulatory bodies, then it would seem logical to expressly incorporate the protection of individual rights into the NSMD theoretical analysis. The exclusion of due process principles would appear to contravene the democratic ideals upon which the NSMD systems are founded and rely.

It is possible that the second element of a NSMD system, related to governance mechanisms, could be interpreted to include due process rights. Within the governance aspect, “good practice” is defined in terms of “fairness and procedural legitimacy,” but there is no consensus as to how to achieve it.<sup>66</sup> Likewise, “practical reason” relates to ideas of procedural fairness.

Practical reason builds on the notion that reasons derive from interpretative and dialogical processes (e.g., legal processes) in which intersubjectively validated knowledge and normative understandings of fairness play a role. [Practical reason] . . . concerns the episodic requirements for democratic practice, which . . . requires “discursive validation” [and] “ideal speech” conditions where validity claims can be assessed.<sup>67</sup>

In other words, constituents should be afforded the opportunity to challenge validity claims and be heard.<sup>68</sup> “Practical reason,” however, is interpreted on a case-by-case basis in accordance with specific historical context and cultural values.<sup>69</sup>

Status as a NSMD system is important as these certification systems pursue legitimacy as civil regulatory bodies.<sup>70</sup> Otherwise, standards that cannot meet the NSMD test risk categorization as merely a string of coordinated activities adopted by self-serving stakeholders. Under the existing five-part test, three out of the four voluntary certification standards have the elements of a NSMD system and one standard, CAR, which has gained credibility through its connections with the State of California, may be more aptly described as a public-private partnership.

### VCS

Under the five-part NSMD test, VCS meets all of the requirements. As an industry-created standard, its power is not derived from the state. It is governed by the VCS Standard

2007.1 and Program Guidelines 2007.1,<sup>71</sup> which outline the rules and methodologies required of project developers, verifiers, and validators.<sup>72</sup> VCS meets the third element of the original NSMD analysis because its authority is derived from the market. In 2009, VCS held thirty-five percent of the transaction volume in the voluntary market.<sup>73</sup> VCS also meets the fourth and fifth NSMD elements because it is concerned with the social domain (its mission is climate change mitigation) and its rules are enforceable. The VCS Secretariat operates the Standard on a day-to-day basis and is responsible for, *inter alia*, a mechanism to license auditors as VCS validators and verifiers.<sup>74</sup> In addition, “[t]he VCS Board reserves the right to sanction validators and verifiers, project proponents and registry operators based on evidence of an improper procedure.”<sup>75</sup>

## CAR

The first NSMD prong, prohibiting the standard to have derived any power from the state, is where CAR falls short because it was created by the State of California. Despite its subsequent separation from the state to become an independent nonprofit organization, CAR is still recognized and rewarded for its early connection, and may thus be more appropriately categorized as a public-private partnership.<sup>76</sup> *In arguendo*, supposing CAR did comply with the first NSMD prong, the standard would easily satisfy the remaining original requirements: CAR has established its own governance mechanisms with the Verification Program Manual and Climate Action Reserve Program Manual; its power is market-based (it had thirty-one percent of the voluntary market share in 2009);<sup>77</sup> it is concerned with climate change, and it has instituted enforcement mechanisms and mandatory requirements in the form of a detailed program schedule and penalty structure.<sup>78</sup>

## ACR

Like VCS, ACR also meets the five NSMD requirements. First, as a standard founded and owned by NGOs, its power is not state-based. Second, it also has strict rules. Generally, ACR’s project cycle is similar to that used by VCS.<sup>79</sup> ACR easily meets the third and fourth elements because its authority is market-based, with four percent of the voluntary market share, and its mission is also to mitigate climate change.<sup>80</sup> ACR’s rules are enforceable, but it relies primarily on domestic courts. The Guidelines specifically state that any legal responsibilities or rights of ACR or parties involved (verifiers, proponents, members, etc.) are outlined in the contractual agreements they sign with one another.<sup>81</sup> For example, the attestation agreement signed by parties seeking to become ACR-approved verifiers requires the parties to obtain their own liability insurance, agree to limit ACR’s liability, indemnify ACR, and submit any claims that may not otherwise be provided for in the contractual language to the courts and laws of Arkansas.<sup>82</sup>

## GS

The GS also meets the five-part NSMD test. First, like ACR, GS was founded by NGOs. Second, it has strict governance mechanisms. The Gold Standard Requirements (“GSR”) detail

a multi-step project cycle for its voluntary standard in which the project proponent must first assess the eligibility of the project against the GS’s criteria, including strict rules regarding additionality and sustainable development.<sup>83</sup> The third NSMD factor, requiring market-based authority, is also satisfied here. In 2009, GS accounted for seven percent of the transaction volume in the voluntary market.<sup>84</sup> Fourth, the GS mission’s concern for social impacts is two-fold: it seeks to promote sustainable development and mitigate climate change through its offset projects. Finally, the GS rules are enforceable. The GS Terms and Conditions (“GSTC”) provide that a breach of its rules may be “prosecuted as a violation of [GS’s] intellectual property rights.”<sup>85</sup> In addition, Section 10 of the GSTC addresses sanctions, including fines and/or the freezing of a GS registry account, for a violation of the GS’s rules.<sup>86</sup>

## PRIVATE PARTY DISPUTE RESOLUTION MECHANISMS IN THE CARBON MARKETS

There are several types of potential disputes that may arise between a private party project proponent and a certification standard.<sup>87</sup> The first type involves the investment relationship.<sup>88</sup> Project development requires large up-front capital expenditures and, because certification is a time-consuming process, investors may not see returns for a few years. Consequently, even a slight delay may change the investment analysis. Second, disputes can arise over registration, issuance, or revocation decisions.<sup>89</sup> These disputes could involve a myriad of scenarios, such as when a standard rejects a project, revokes credits based on changes to the project, or where one project participant claims that the certification standard issued credits to the wrong party. Third, disagreements over bookkeeping could escalate into a potential dispute over, for example, an allegedly erroneous transfer.<sup>90</sup> Fourth, a certification standard may invalidate credits where it has reason to believe the project documentation was fraudulent.<sup>91</sup> Finally, disputes could arise in connection with the validation or verification reports from the third-party auditor on issues including, but not limited to, carbon quantification or the correct application of a methodology. A dispute could also arise when the certification standard accepts an allegedly defective validation or verification report.

Litigation may be the obvious recourse in the event of a dispute between a private party project proponent and a certification standard. However, here, litigation may be an inadequate mechanism for several reasons. A compliance market certification standard, such as the Clean Development Mechanism, may be afforded sovereign immunity.<sup>92</sup> In the case of a private certification standard, domestic court systems may not have the technical expertise to properly adjudicate registration, issuance, revocation, or auditing decisions, and hiring the appropriate expert witnesses can be expensive for both sides. Furthermore, project proponents may not reside in the same country as the private certification standard, and a foreign party may distrust the ability of a foreign court to be impartial.<sup>93</sup> Private arbitration may be a better forum for disputes with public or private certification standards because it has the potential to be less time

consuming and less expensive than litigation, parties can select independent, technically qualified judges, and some arbitration bodies provide standing to both public and private parties.<sup>94</sup> More importantly, unlike potentially hostile foreign courts, a project proponent will not question the allegiance of an arbitrator if it was involved in the selection process.<sup>95</sup> On the other hand, private arbitration may not be well suited to resolve disputes between project proponents and a certification standard because of the lack of uniform decision-making and difficulty for the prevailing party to enforce an award.<sup>96</sup> Instead, an independent internal dispute mechanism, tailored to the standard's rules, could be the best forum for resolving such disputes.<sup>97</sup>

#### DISPUTE RESOLUTION UNDER THE CDM

The significance of the CDM lies in the way it marries the public and private sector. "The CDM is unique in regulating a market dominated by private players that depend, in the creation of the market's underlying asset, on a United Nations committee, the CDM Executive Board that approves calculation methods and projects."<sup>98</sup> However, as the CDM grows—at the time of this writing, over 2,000 projects have been registered and the pipeline of undeveloped projects is equal or greater in size<sup>99</sup>—questions about the CDM's governance structure have arisen. In particular, the EB functions as a regulatory agency issuing decisions and creating rules that have financial and legal implications for private parties.<sup>100</sup> But, unlike many regulatory agencies that operate in accordance with democratic notions of good governance, including "legality, certainty, formal equality, accountability, due process and access to justice," the EB is not subject to the same governance controls.<sup>101</sup> Compounding the problem, there is no independent tribunal for reviewing the EB's decisions and, consequently, CDM project proponents have little, if any, due process rights.<sup>102</sup>

#### DISPUTE RESOLUTION IN THE VOLUNTARY CARBON MARKETS

VCS, CAR, ACR, and GS have all developed their own frameworks for appeals. Likewise, the CDM is following suit in developing an appeals process and can look to the voluntary market for guidance.<sup>103</sup> Understanding how the different certification standards address due process rights may provide insight into how the CDM should evolve.

##### VCS

The VCS Program Guidelines acknowledge the possibility of disagreements between project proponents and the validators and verifiers empowered to certify their project under the VCS Standard.<sup>104</sup> Contractual disputes under the VCS program involving verifiers, validators, and project participants are generally governed by English law and will be heard exclusively in English courts.<sup>105</sup> The VCS Guidelines do provide "an appeal process for cases where project proponents feel that the validator or verifier [has] misinterpreted the VCS Program and all avenues of discussion with the validator or verifier have been exhausted."<sup>106</sup> In those instances, "[t]he VCS Association will commission an independent consultant to perform this review.

The independent consultant will be selected by the VCS Secretariat and paid for by the project proponent demanding the review."<sup>107</sup> Ultimately, though, the final decision rests with the VCS Board.<sup>108</sup>

##### CAR

CAR offers a means of recourse for parties adversely affected by its decisions that is tailored for the specifics of its program.<sup>109</sup> For example, CAR explains that disputes between a verifier and project developer are to be handled by the verifier's internal procedures, but nonetheless offers itself as an informational resource to assist in the resolution process.<sup>110</sup> However, if the parties cannot reach resolution through private negotiation, then the parties can look to CAR to play the roles of judge, jury, and prosecuting attorney.<sup>111</sup> Once the verification is complete, a committee of at least three CAR staff members will review the submitted paperwork and interview the verifiers and project developers involved before issuing a final, written determination.<sup>112</sup>

Likewise, disagreements with regard to CAR's decisions affecting verifiers and project developers are also addressed in CAR's Verification Guidelines.<sup>113</sup> Upon written request for appeal, CAR will assemble a Dispute Resolution Committee containing "an odd number of individuals, including at least one Reserve staff member not directly involved in the case, one Reserve Board member, [and] a representative from an appropriate oversight agency—potentially . . . [a] regulatory or government agency—that is knowledgeable of Reserve policies and procedures."<sup>114</sup> The Dispute Resolution Committee will review all relevant paperwork and is authorized to consult outside experts.<sup>115</sup> A decision is reached by majority vote and is considered final and not appealable.<sup>116</sup>

##### ACR

ACR, unlike its aforementioned counterparts, does not detail any appeal process in its Program Guidelines and although the framework for the program provides project developers opportunities to resolve issues discovered in the verification process, there is no express recourse in the event of a material disagreement or breakdown of communication.<sup>117</sup> Instead, as discussed above, ACR relies primarily on domestic courts for dispute resolution.

##### GS

GS also provides an appeals process that protects constituents' due process rights in a manner akin to traditional governmental regulatory bodies. In July 2010, GS released a proposal for an appeals procedure to provide project developers with recourse against adverse decisions by GS regarding registration, issuance, or labeling.<sup>118</sup> The purpose of the appeals procedure is to "fill the gap in remedies between the decisions from the certification standard and the consequences for project developers."<sup>119</sup> It is the first of its kind in the voluntary carbon markets.<sup>120</sup>

Although the GS appeals process is in its pilot phase, it is currently the most developed dispute resolution mechanism in the voluntary carbon markets. If successful, it can serve as an



example for other certification standards—both in the compliance and voluntary markets—that do not currently afford their project proponents the same level of independent review.

The GS Rules for Appeals on Registration, Issuance and Labeling (“Arbitration Rules”), which are based on the International Bureau of the Permanent Court of Arbitration’s (“PCA”) “Optional Rules for Arbitration of Disputes Relating to the Environment and/or Natural Resources,” (“Environmental Rules”), will govern the arbitration procedure.<sup>121</sup> Created in 2001, the Environmental Rules fill a gap in international environmental dispute resolution by providing a forum in which governments, NGOs, private entities, and individuals can seek redress.<sup>122</sup> Certain changes have been made to the Environmental Rules to account for the particular characteristics of GS projects and the GS project cycle.<sup>123</sup>

Initially, the scope of the proposed appellate procedure would be limited to project proponents, project applicants, and project owners.<sup>124</sup> These parties would be required to submit their disagreement with a GS decision to mediation within six weeks.<sup>125</sup> If the mediation proves unsuccessful, the parties would have the option to appeal the dispute to the PCA at the Peace Palace in The Hague, who will serve as the registrar of proceedings and will channel communications between or among the parties.<sup>126</sup>

In accordance with the GS Arbitration Rules, the parties will have the option to choose one arbitrator or a tribunal of three arbitrators, with opportunities to challenge the appointment

of an arbitrator on various grounds.<sup>127</sup> The arbitrators will be appointed from a list of specialized arbitrators to be created and maintained by a neutral appointing committee.<sup>128</sup> Hearings may be held in person, or via telecommunication and parties may call experts to provide evidence during the hearings.<sup>129</sup>

With regard to the award, the purpose of the arbitration procedure is not to award damages or pecuniary compensation.<sup>130</sup> Rather, the award will determine whether the adverse decision was well-founded and in accordance with the relevant version of the GSRs.<sup>131</sup> If it is determined that the adverse decision was not well-founded or it violated the relevant GSRs, the arbitration tribunal may issue an alternative decision or provide for an alternative action.<sup>132</sup>

## CONCLUSION

The right to due process is fundamental to democratic ideals and governance systems. As the compliance markets and, in particular, the CDM, evolve, they will likely seek to incorporate mechanisms to protect individual procedural rights. Those best positioned to play the part of role model are CAR, ACR, VCS, and GS, having all achieved a level of market credibility measured by the NSMD framework. However, the appeals procedures provided for by these four standards vary widely. The voluntary carbon markets, and the offset certification standards that operate within them, are gaining credibility and can set the tone for the compliance markets.



# Endnotes: Due Process Rights in the Carbon Markets

<sup>1</sup> Steven Bernstein, *When Is Non-State Global Governance Really Governance?* 2010 UTAH L. REV. 91, 104 (2010) (citing Errol Meidinger, *Beyond Westphalia: Competitive Legalization in Emerging Transnational Regulatory Systems*, in LAW AND LEGALIZATION IN TRANSNATIONAL RELATIONS 121, 121 (Christian Brutsch & Dirk Lehmkuhl eds., 2007)).

<sup>2</sup> *Id.* (citing Benjamin Cashore, *Legitimacy and the Privatization of Environmental Governance: How Non-State Market Driven (NSMD) Governance Systems Gain Rule-Making Authority*, 14 GOVERNANCE 502 (2002)).

<sup>3</sup> The Kyoto Protocol, which established the most prominent international carbon market, is an international agreement linked to the United Nations Framework Convention on Climate Change that was adopted on December 11, 1997 and later entered into force on February 16, 2005. For the purpose of determining national commitments, the 185 nations that have ratified the Protocol are categorized as an Annex I country, an Annex II country or a developing country. To aid nations in attaining their emissions targets, the Protocol created two offset mechanisms: the Clean Development Mechanism (“CDM”), and Joint Implementation (“JI”). *See generally* Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 11, 1997, 32 Stat. 97, 34 U.N.T.S. 243 [hereinafter Kyoto Protocol].

<sup>4</sup> *See Procedures for Appeals in Accordance with the CMP Requests in Paragraphs 42-43 of Decision 2/CMP.5*, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE [hereinafter *Procedures for Appeals*], [http://cdm.unfccc.int/public\\_inputs/2010/cmp5\\_para42\\_43/index.html](http://cdm.unfccc.int/public_inputs/2010/cmp5_para42_43/index.html) (last visited Jan. 19, 2011).

<sup>5</sup> *See generally*, Kyoto Protocol, *supra* note 3.

<sup>6</sup> *See Emissions Trading System*, EUROPEAN COMM’N, [http://ec.europa.eu/clima/policies/ets/index\\_en.htm](http://ec.europa.eu/clima/policies/ets/index_en.htm) (last visited Jan. 28, 2011).

<sup>7</sup> *See* REGIONAL GREENHOUSE GAS INITIATIVE, <http://www.rggi.org/home> (last visited Jan. 28, 2011).

<sup>8</sup> *See, e.g.*, RGGI Oversupply Risks Being “Reminiscent of Phase 1 of EU ETS” – Observer, CARBON FINANCE (Sept. 3, 2008), <http://www.carbon-financeonline.com/index.cfm?section=lead&action=view&id=11498>.

<sup>9</sup> *See generally* RICARDO BAYON ET AL., VOLUNTARY CARBON MARKETS: AN INTERNATIONAL BUSINESS GUIDE TO WHAT THEY ARE AND HOW THEY WORK 22-23 (2007).

<sup>10</sup> *Id.* at 22.

<sup>11</sup> Once a carbon credit is retired, it cannot be re-sold. Companies, organizations, governments, or individuals looking to reduce their carbon footprint must retire a corresponding number of carbon credits. *See id.* at 31.

<sup>12</sup> *See* Rolf H. Weber & Aline Darbellay, *Regulation and Financial Intermediation in the Kyoto Protocol’s Clean Development Mechanism*, 22 GEO. INT’L ENVTL. L. REV. 271, 279-80 (2010) (explaining that “[o]ne CER represents one ton of carbon dioxide equivalent . . . . No tangible certificate is created upon issuance, but an electronic database tracks the output of CER. Carbon units are accounting units that have their own unique serial numbers and are tracked and recorded through the CDM registry or any subsequent registry. CER are transferable and can be traded in the carbon market.”).

<sup>13</sup> *Id.* at 278-79; Kyoto Protocol, *supra* note 3, at art. 12, ¶ 1.

<sup>14</sup> Kyoto Protocol, *supra* note 3, at art. 12, ¶ 3; *See generally* Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, *Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol on its First Session, Montreal, Can., Nov. 28-Dec. 10, 2005*, ¶¶ 28-31, U.N. Doc. FCC/KP/CMP/2005/8/Add.1 (Mar. 30, 2006), [hereinafter *UNFCCC Report*], <http://cdm.unfccc.int/Reference/COPMOP/08a01.pdf>.

<sup>15</sup> *Id.* at 14-15.

<sup>16</sup> Weber & Darbellay, *supra* note 12, at 278 (explaining that DOEs are designated by the CDM Executive Board); *UNFCCC Report*, *supra* note 14, ¶¶ 27(e), 35-40; Kyoto Protocol, *supra* note 3, at art. 12, ¶ 5.

<sup>17</sup> Weber & Darbellay, *supra* note 12, at 278; *UNFCCC Report*, *supra* note 14, ¶¶ 36,43; Kyoto Protocol *supra* note 3, at art. 12, ¶ 5(c).

<sup>18</sup> Weber & Darbellay, *supra* note 12, at 279; *UNFCCC Report*, *supra* note 14, ¶¶ 44-47; Kyoto Protocol *supra* note 3, at art. 12, ¶ 5(b).

<sup>19</sup> Weber & Darbellay, *supra* note 12, at 279.

<sup>20</sup> *Id.*

<sup>21</sup> *Id.*



# CARBON REDUCTION PROJECTS AND THE CONCEPT OF ADDITIONALITY

by Brian Joseph McFarland\*

## INTRODUCTION

Carbon reduction projects follow a cycle that includes conceptualization, due diligence, implementation, documentation, audit or validation, and finally certification, with the eventual issuance of verified, serialized carbon reduction credits, also known as carbon offsets. To fulfill this process, there are several technical elements that must be addressed: monitoring or measurement, reporting, and verification (“MRV”), permanence (i.e. ensuring the project’s duration), leakage (i.e. addressing negative and identifying positive offsite impacts), and additionality.

Additionality is a test that a carbon reduction project must meet to ensure the project would not have been implemented without the revenue of the carbon markets.<sup>1</sup> This test of additionality must be satisfied if the project is being submitted to the voluntary carbon markets—for which, voluntary buyers want to be ensured their donations actually matter for a project—or to the compliance markets since buyers need to be confident that regulators will accept their carbon reduction purchase.

It is important to further note that all of the most prominent carbon reduction certification standards—again, whether a compliance market under the Kyoto Protocol or an internationally recognized voluntary standard—require some type of additionality test. This includes, but is not limited to, the following certification standards: the American Carbon Registry (“ACR”),<sup>2</sup> Center for Resource Solutions (“CRS”),<sup>3</sup> Green-e Climate Protocol for Renewable Energy,<sup>4</sup> Chicago Climate Exchange (“CCX”),<sup>5</sup> Clean Development Mechanism (“CDM”),<sup>6</sup> Climate Action Reserve (“CAR”),<sup>7</sup> Climate, Community and Biodiversity Standard (“CCBS”),<sup>8</sup> Gold Standard,<sup>9</sup> Regional Greenhouse Gas Initiative (“RGGI”),<sup>10</sup> and the Verified Carbon Standard (“VCS”).<sup>11</sup>

Additionality is an important requirement because if non-additional (i.e. “business-as-usual”) projects are eligible for carbon finance, then the net amount of greenhouse gas emissions will continue to increase and the environmental integrity of carbon reduction projects will be called into question. For example, if a project was already far exceeding its industry average return on investment and was implemented over fifty years ago when no carbon markets existed, why should this particular project also be eligible for additional revenue from the carbon markets? Similarly, if an activity was legally required, then why should this activity of a regulated entity also be eligible for additional revenue from the carbon markets? The challenge with additionality, however, is that one must prove a counterfactual argument (i.e. what would have otherwise happened in the absence of a

project) to ensure the project provides carbon reductions that would not have otherwise occurred. This article explores the different concepts of additionality, while acknowledging its controversial elements and proposing inclusion of some important considerations to ensure net emissions reductions.

## LEGAL OR REGULATORY ADDITIONALITY

Legal additionality, or what is sometimes referred to as regulatory additionality or surplus, is perhaps the most objective type of additionality. If a law exists and a given activity is regulated, then the project is most likely not eligible for carbon finance. Therefore, for a project to meet the legal additionality standard, it must provide carbon reductions beyond those required by law.<sup>12</sup>

To put this in context, the U.S. Environmental Protection Agency (“EPA”) regulates large municipal solid waste (“MSW”) landfills, and according to the Climate Action Reserve’s Landfill Project Protocol Version 3.0, “[t]here are several EPA regulations for MSW landfills that have a bearing on the eligibility of methane collection and destruction projects as voluntary GHG reduction projects.”<sup>13</sup>

Two challenges with legal additionality are that on one hand, the concept might create perverse incentives, and on the other hand, sometimes following the law is not common practice. With the first idea in mind, the Montreal Protocol is an international treaty designed to phase out the production of ozone depleting substances (“ODS”).<sup>14</sup> While the United States, Canada, and European nations have phased out the production of hydrofluorocarbons (“HFC”), which are ODSs and greenhouse gases, the largest contributor of certified emission reductions (“CER”) under the Kyoto Protocol’s Clean Development Mechanism are from HFC projects in China and India.<sup>15</sup> Since legal additionality would rule out the eligibility of HFC projects hosted in China and India if these countries were to pass

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domestic laws eliminating the production of HFCs, they have little incentive to begin regulating HFCs. If they did pass regulations, China and India would experience a reduction of foreign investment towards the purchase of these carbon reduction credits and would need to use their own public funds to phase out HFCs. Due to the perception that manufacturers are actually producing excess HFCs, the European Union Emission Trading Scheme will no longer accept these HFC reduction credits beginning in 2013.<sup>16</sup> Another example of this legal additionality challenge is the tough predicament a government might face when contemplating the passage of a strict feed-in tariff or an aggressive renewable portfolio standard. Such a passage would effectively legally require an increase in renewable energy production, however, there would be fewer carbon reduction credits from these renewable energy sources eligible for purchase from international buyers.

On the second challenge of additionality, there are legal reserve requirements on private property in Brazil. Depending on the region (e.g. Amazon Region versus Cerrado Region), a landowner is restricted from using twenty to eighty percent of his or her land.<sup>17</sup> However, it is a somewhat common practice—particularly in the remote Amazon—to illegally clear forests from the legal reserve.<sup>18</sup> Now, if such practices are deemed to be common, should legal additionality still apply and thus prevent the reforestation of this fallow land using carbon finance?

Corruption also presents challenges for ensuring the legal additionality of a project. There are currently carbon reduction projects either certified or under development in Ethiopia, Nicaragua, the Philippines, Kenya, and Venezuela.<sup>19</sup> Yet, Transparency International's Global Corruption Report 2009 rates Ethiopia as the 126th most corrupt country out of 180 countries, Nicaragua as the 134th, the Philippines as the 141st, Kenya as the 147th, and Venezuela as the 158th.<sup>20</sup> Where projects provide much needed financing in developing countries with already corrupt infrastructures, there may be a disincentive to upgrade or improve legal frameworks that could reduce the number of carbon reduction projects.

The evolving regional compliance carbon markets of the U.S.—which are the Western Climate Initiative (“WCI”), the Regional Greenhouse Gas Initiative (“RGGI”), and the Mid-western Greenhouse Gas Reduction Accord (“Accord”)—have Canadian Provinces and Mexican States as either participants or observers.<sup>21</sup> As these regional programs transform, it will be interesting to see how state or national laws, and thus legal additionality, will be applied.

### COMMON PRACTICE OR TECHNOLOGICAL ADDITIONALITY

Common practice additionality, which could incorporate either the technological or market penetration of a given project type based on its geography, is another objective additionality test. The aspect of geography is important because what is prevalent in one location—for example, wind turbines in Texas or solar photovoltaic systems in California—might not be so prevalent in other locations (i.e. such as New Hampshire or Alaska).

According to the American Carbon Registry's standard, common practice is determined by whether there is “widespread deployment of the project . . . within the relevant geographic area.”<sup>22</sup> Similarly, the Verified Carbon Standard defines it as one which is “not common practice in the sector/region, compared with projects that have received no carbon finance.”<sup>23</sup>

Yet, how does one define common practice and what specifically would be the particular geographic focus (i.e. a country, state, local electric grid)? Perhaps one of most controversial examples surrounding common practice was the Chicago Climate Exchange's acceptance of soil conservation carbon reduction projects (i.e. also known as no-till), which were previously enrolled in the U.S. Department of Agriculture's Conservation Reserve Program.<sup>24</sup> Under this program, farmers were rewarded by the purchase of their carbon reduction credits for activities that they were already undertaking without revenue from the carbon markets.<sup>25</sup> If a regulated industry is allowed to emit greenhouse gas emissions because they are supporting non-additional carbon offset projects, then the environmental integrity of the system should be called into question because the net greenhouse gas emissions will continue to increase. Climate Action Reserve (“Reserve”) aptly points out that there are many difficulties in actually defining the common practice of a region.<sup>26</sup>

According to Derek Six, the Portfolio Manager for Environmental Credit Corporation, the best assessment of additionality would be the use of a market penetration approach.<sup>27</sup> Such an approach, which is similar to common practice, would incorporate knowledge and technology barriers to implementation, along with financial aspects of additionality.<sup>28</sup> For example, agricultural methane destruction or agricultural methane gas-to-energy projects are only installed on about 0.5% of U.S. farms.<sup>29</sup> Thus under a market penetration approach, all agricultural methane destruction and agricultural methane gas-to-energy projects would be eligible for carbon finance whether or not there were projects clustered in a specific region (e.g. California) or whether a particular project had a slightly higher financial return (i.e. financial additionality).

### FINANCIAL ADDITIONALITY

Many carbon market participants are averse to the concept of financial additionality, which is much more subjective than legal additionality or common practice. Likewise, financial additionality is difficult to determine due to matters of confidentiality, proprietary internal business decisions, and the potential use of arbitrary metrics. The Clean Development Mechanism, which refers to financial additionality as the investment analysis, considers whether the project would have been financially attractive without the revenue from carbon reduction credits.<sup>30</sup>

The Verified Carbon Standard considers financial additionality, which it defines as an investment barrier and a subset of implementation barriers.<sup>31</sup> The American Carbon Registry also considers financial additionality a subset of implementation barriers and asks whether funding from carbon reduction credits will incentivize the project's implementation.<sup>32</sup>

Confidential and proprietary internal business matters that make financial additionality a subjective and difficult assessment include, but are not limited to:

- Capital budgeting decisions (i.e. which projects will get funded and why?)
- Financing sources (e.g. banks, internal funds, venture capitalists)
- Portfolio of available projects (i.e. what alternative investments/projects are possible?)
- Required internal rate of return (“IRR”), return on assets (“ROA”), return on equity (“ROE”), and/or payback period (i.e. which metric does a firm use and what is the requirement?)

While the Clean Development Mechanism has an extensive discussion on appropriate metrics for financial additionality (i.e. discount rates and benchmarks), arbitrary metrics such as the following could be used as justification for allowing or not allowing a project to count as eligible for carbon finance:

- Companies of the same size (e.g. in terms of money and/or employees)
- Geographical location (e.g. country, sub-national, local electric grid)
- Length of time company is in business
- Public vs. private ownership

This said, how do you compare a small, specialized renewable energy company to a large, diversified provider? Similarly, do start-ups differ from “well-established” companies enough to present a challenge when comparing financial additionality thresholds? Also, how does the ownership structure (i.e. non-profit, limited liability corporation, type C corporation, public-owned entity, joint-ownership) impact financial decisions and thus, financial additionality?

Applying financial additionality across a broad spectrum of project types is another significant challenge, posing many serious questions. Likewise, why should carbon markets reward projects that demonstrate the poorest financials? If two different projects existed and with one thousand dollars, one could reduce one thousand metric tons of carbon dioxide and the other could reduce one hundred metric tons, why should the one hundred metric tons project be considered more financially additional? On the other hand, why reward projects that already have “superior” returns and that existed before the formation of carbon markets (i.e. a question which relates to voluntary buyers wanting their donations to matter)?

Financial additionality should be phased out of future certification standards and new revisions of current certification standards, a position supported by Green-e Climate.<sup>33</sup>

### PROJECT-BY-PROJECT ADDITIONALITY

Under the project-by-project test for additionality, each project individually undergoes a series of additionality tests according to the given standard. Two main standards, which apply a project-by-project additionality test, are the Clean Development Mechanism and the Verified Carbon Standard. The Clean Development Mechanism is the carbon reduction standard for

Certified Emission Reductions (“CER”) for the Kyoto Protocol’s international compliance market.<sup>34</sup> In contrast, the Verified Carbon Standard is the leading voluntary carbon markets standard, in terms of market share, and has adopted methodologies from the CDM.<sup>35</sup>

Essentially, project proponents—whether referring to investors, project developers, landowners or buyers—need to assess whether each and every individual project meets the additionality tests. Such a process can be expensive, time-consuming (i.e. reduces scalability and time-to-market), and difficult for both the general public and local communities to grasp. Furthermore, it is difficult for auditors to determine an individual project’s subjective assertions, especially with regard to financial additionality.

### PERFORMANCE OR SECTORAL ADDITIONALITY

Many current and evolving certification standards—including the Regional Greenhouse Gas Initiative, the Western Climate Initiative, and the Climate Action Reserve—are adopting performance or sectoral approaches to additionality. Essentially, such performance or sectoral approaches use a uniform additionality test or benchmark, which could be based on an industry or geographic region. It is important to note, the same additionality criteria—such as legal, common practice/technology, and financial—can be applied to a performance or sectoral approach, the main difference is that such criteria are not uniquely applied to each single project. Under the Regional Greenhouse Gas Initiative (“RGGI”) offset projects may not be government ordered projects, may not receive incentives from RGGI auction proceeds, and must meet certain requirements to qualify.<sup>36</sup>

Recent discussions of the WCI indicate that it will attempt to set a standardized baseline for offset protocols that reflect the strictest regulatory and legal requirements.<sup>37</sup> The Climate Action Reserve uses standardized performance based tests for additionality because they are administratively easier to implement and less subjective.<sup>38</sup>

For the level of scalability required to address global climate change, there needs to be a near-full transition to sectoral or performance benchmarks for additionality. To this end, one of the decisions made at the sixteenth session of the Conference of the Parties of the United Nations Framework Convention on Climate Change in Cancun, Mexico, was for the Clean Development Mechanism to work towards standardized baselines and additionality tests.<sup>39</sup> Similarly, the Verified Carbon Standard has convened a steering committee, which is developing “VCS requirements and guidance on performance benchmark and technology test approaches to baselines/additionality.”<sup>40</sup>

### CONCLUSION

Carbon reduction credits, also known as carbon offsets, are an effective cost-containment mechanism and have the potential to produce greenhouse gas reductions alongside a host of co-benefits (e.g. local jobs, technology transfer, reforestation critical wildlife habitat). However, the general public, regulators, and environmentalists do not want to hear, “well we were already doing the project and we are doing nothing different, but now



we are getting revenue from the carbon markets.” To ensure overall reductions in greenhouse gas emissions, additionality is a useful technical tool to ensure the integrity of carbon reduction

projects, but certification standards should be less concerned about financial additionality and more focused on transitioning to sectoral or performance approaches.



# Endnotes: Carbon Reduction Projects and the Concept of Additionality

<sup>1</sup> See WORLD BUS. COUNCIL FOR SUSTAINABLE DEV., CDM PROJECT DEVELOPERS WORKSHOP 6 (2005), <http://www.wbcsd.org/DocRoot/oMH7wF8hI2xp8Upd-jTQY/additionality.pdf>.

<sup>2</sup> See *Standards and Methodologies*, AM. CARBON REGISTRY (last visited Jan. 25, 2011) <http://www.americancarbonregistry.org/carbon-accounting>.

<sup>3</sup> See CTR. FOR RES. SOLUTIONS, <http://www.resource-solutions.org> (last visited Feb. 27, 2011).

<sup>4</sup> See *Climate Standards and Governing Documents*, GREEN-E, [http://www.green-e.org/getcert\\_ghg\\_standard.shtml](http://www.green-e.org/getcert_ghg_standard.shtml) (last visited Jan. 25, 2011). CRS also operates the Green-e Energy program to certify Renewable Energy Certificates (“RECs”), which are in a different environmental asset class than carbon reduction credits. There are different mechanisms—such as technology type and project start date—to determine eligibility of REC projects.

<sup>5</sup> *CCX Offsets Program*, THE CHICAGO CLIMATE EXCHANGE, <http://theccx.com/content.jsf?id=23> (last visited Jan. 25, 2011).

<sup>6</sup> *CDM Methodologies*, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, <http://cdm.unfccc.int/methodologies/index.html> (last visited Jan. 25, 2011).

<sup>7</sup> *Protocols*, CLIMATE ACTION RESERVE, <http://www.climateactionreserve.org/how/protocols/> (last visited Jan. 25, 2011).

<sup>8</sup> *The CCB Standards*, CLIMATE, COMMUNITY & BIODIVERSITY ALLIANCE, <http://climate-standards.org/standards/index.html> (last visited Jan. 25, 2011).

<sup>9</sup> *Gold Standard Version 2.1*, GOLD STANDARD, <http://www.cdmgoldstandard.org/Current-GS-Rules.102.0.html> (last visited Jan. 30, 2011).

<sup>10</sup> *Offset Requirements*, REGIONAL GREENHOUSE GAS INITIATIVE, [http://rggi.org/market/offsets/offset\\_requirements](http://rggi.org/market/offsets/offset_requirements) (last visited Jan. 25, 2011).

<sup>11</sup> *Methodologies*, VERIFIED CARBON STANDARD, <http://www.v-c-s.org/methodologies.html> (last visited Jan. 25, 2011).

<sup>12</sup> For example, the American Carbon Registry’s standard asks the following question: “Regulatory Surplus: Is there an existing law, regulation, statute, legal ruling, or other regulatory framework in effect now or as of the project start date that mandates the project or effectively requires the GHG emissions reductions? Yes = Fail; No = Pass.” AM. CARBON REGISTRY, AM. CARBON REGISTRY 2.1, at 23 (2010), <http://www.americancarbonregistry.org/carbon-accounting/ACR%20Standard%20v2.1%20Oct%202010.pdf>. Similarly, the Verified Carbon Standard states: “Test 1—The Project Test: Step 1: Regulatory Surplus: The project shall not be mandated by any enforced law, statute or other regulatory framework.” VCS ASSOCIATION, VOLUNTARY CARBON STANDARD 2007.1, at 16 (2008), [http://www.v-c-s.org/docs/Voluntary%20Carbon%20Standard%202007\\_1.pdf](http://www.v-c-s.org/docs/Voluntary%20Carbon%20Standard%202007_1.pdf). The full name of the VCS changed from Voluntary Carbon Standard to Verified Carbon Standard in 2011; therefore reports cited include the former designation while websites include the latter.

<sup>13</sup> CLIMATE ACTION RESERVE, LANDFILL PROJECT PROTOCOL VERSION 3.0, at 9 (2009), [http://www.climateactionreserve.org/wp-content/uploads/2011/01/Landfill\\_Project\\_Protocol\\_V3.0\\_010411\\_Package1.pdf](http://www.climateactionreserve.org/wp-content/uploads/2011/01/Landfill_Project_Protocol_V3.0_010411_Package1.pdf). “These regulations include:

- New Source Performance Standards (NSPS) for MSW Landfills, codified in 40 CFR 60 subpart WWW – Targets landfills that commenced construction or made modifications after May 1991
- Emission Guidelines (EG) for MSW Landfills, codified in 40 CFR 60 subpart Cc. – Targets existing landfills that commenced construction before May 30, 1991, but accepted waste after November 8, 1987
- The National Emission Standards for Hazardous Air Pollutants (NESHAP), codified in 40 CFR 63 subpart AAAA – Regulates new and existing landfills.”

<sup>14</sup> Montreal Protocol on Substances that Deplete the Ozone Layer, Sept. 16, 1987, 1522 U.N.T.S. 3, 1 as amended at London 1990, Copenhagen 1992, Vienna 1995, Montreal 1997, Beijing 1999 (2000), <http://www.unep.org/ozone/pdfs/montreal-protocol2000.pdf>.

<sup>15</sup> See *India’s Growing Carbon Offset Market*, REUTERS, June 22, 2010, [http://in.reuters.com/article/2010/06/22/idINIndia-49524120100622?feedType=RSS&feedName=topNews&utm\\_source=feedburner&utm\\_medium=feed&utm\\_campaign=Feed:d3AReuters2FINtopNews28News2FIN2FTopNews29](http://in.reuters.com/article/2010/06/22/idINIndia-49524120100622?feedType=RSS&feedName=topNews&utm_source=feedburner&utm_medium=feed&utm_campaign=Feed:d3AReuters2FINtopNews28News2FIN2FTopNews29); see also *Issuance Certified Emission Reductions (CERs)*, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, [http://cdm.unfccc.int/Issuance/cers\\_iss.html](http://cdm.unfccc.int/Issuance/cers_iss.html) (last visited Feb. 27, 2011) (listing all credits issued under CDM).

<sup>16</sup> Press Release, Europa, Emissions Trading: Commission Welcomes Vote to Ban Certain Industrial Gas Credits (Jan. 21, 2011), <http://europa.eu/rapid/press-ReleasesAction.do?reference=IP/11/56>.

<sup>17</sup> Lee Alston & Bernardo Mueller, *Legal Reserve Requirements in Brazilian Forests: Path Dependent Evolution of De Facto Legis.*, 8 REVISTA ECONOMIA 25, 26 (Dec. 2007), [http://www.anpec.org.br/revista/vol8/vol8n4p25\\_53.pdf](http://www.anpec.org.br/revista/vol8/vol8n4p25_53.pdf).

<sup>18</sup> See generally Rhett Butler, *Deforestation in the Amazon*, MONGABAY, <http://www.mongabay.com/brazil.html> (last visited Jan. 25, 2011).

<sup>19</sup> See, e.g., *The Kasigau Corridor REDD Project – Phase I Rukinga Sanctuary*, VERIFIED CARBON STANDARD, <https://vcsprojectdatabase1.apx.com/mymodule/ProjectDoc/EditProjectDoc.asp?id=562> (last visited Feb. 25, 2011) (providing details of a project in Kenya); *Gold Standard CDM/JI Projects*, THE GOLD STANDARD, <https://gs1.apx.com/myModule/rpt/myrpt.asp?r=113> (last visited Feb. 25, 2011) (listing projects in Venezuela, Philippines, Nicaragua, Kenya, and Ethiopia); *CCB Projects*, THE CLIMATE, COMMUNITY & BIODIVERSITY ALLIANCE, <http://www.climate-standards.org/projects/index.html> (last visited Feb. 25, 2011) (listing projects in Kenya, Nicaragua, Philippines, and Ethiopia).

<sup>20</sup> TRANSPARENCY INT’L, GLOBAL CORRUPTION REPORT 176, 184, 227, 243, 290 (2009), <http://www.transparency.org/content/download/46187/739801>.

<sup>21</sup> See *Map of WCI Partners and Observers*, W. CLIMATE INITIATIVE (2010), <http://www.westernclimateinitiative.org/wci-partners-and-observers-map>.

<sup>22</sup> AM. CARBON REGISTRY, *supra* note 12, at 23.

<sup>23</sup> VCS ASSOCIATION, *supra* note 12, at 16.

<sup>24</sup> See *Chicago Climate Exchange*, THE CLIMATE INST., [http://climate.org/climatelab/Chicago\\_Climate\\_Exchange](http://climate.org/climatelab/Chicago_Climate_Exchange) (last visited Jan. 25, 2011).

<sup>25</sup> Jeff Goodell, *Capital Pollution Solution?*, N.Y. TIMES, July 30, 2006, [http://www.nytimes.com/2006/07/30/magazine/30carbon.html?pagewanted=3&\\_r=1](http://www.nytimes.com/2006/07/30/magazine/30carbon.html?pagewanted=3&_r=1).

<sup>26</sup> See CLIMATE ACTION RESERVE, CLIMATE ACTION RESERVE PROGRAM MANUAL 9 (Mar. 16, 2010), [http://www.climateactionreserve.org/wp-content/uploads/2009/04/Climate\\_Action\\_Reserve\\_Program\\_Manual\\_031610.pdf](http://www.climateactionreserve.org/wp-content/uploads/2009/04/Climate_Action_Reserve_Program_Manual_031610.pdf).

<sup>27</sup> Interview with Derek Six, Portfolio Manager, Environmental Credit Corp (Dec. 8, 2010).

<sup>28</sup> *Id.*

<sup>29</sup> *Id.*

<sup>30</sup> See CDM-EXECUTIVE BOARD, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, TOOL FOR THE DEMONSTRATION AND ASSESSMENT OF ADDITIONALITY 5 (2008), <http://cdm.unfccc.int/methodologies/PAMethodologies/tools/am-tool-01-v5.2.pdf>.

<sup>31</sup> VCS ASSOCIATION, *supra* note 12, at 16.

<sup>32</sup> AM. CARBON REGISTRY, *supra*, note 12, at 23.

<sup>33</sup> See CTR. FOR RESOURCE SOLUTIONS, GREEN-E CLIMATE PROTOCOL FOR RENEWABLE ENERGY 6 (2010), <http://www.green-e.org/docs/climate/Green-eClimate-ProtocolforRenewableEnergy.pdf>.

<sup>34</sup> *Clean Development Mechanism*, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, [http://unfccc.int/kyoto\\_protocol/mechanisms/clean\\_development\\_mechanism/items/2718.php](http://unfccc.int/kyoto_protocol/mechanisms/clean_development_mechanism/items/2718.php) (last visited Jan. 25, 2011).

<sup>35</sup> To access the individual Project Design Documents (“PDDs”) and see specifically how project-by-project additionality is applied, see *Project Cycle Search*, CLEAN DEVELOPMENT MECHANISM, <http://cdm.unfccc.int/Projects/projsearch.html> (last visited Feb. 25, 2011); *Public Reports Access*, VERIFIED CARBON STANDARD, <http://www.vcsprojectdatabase.org/resources/AccessReports.asp> (last visited Feb. 25, 2011).

<sup>36</sup> *Offset Requirements*, REGIONAL GREENHOUSE GAS INITIATIVE, [http://rggi.org/market/offsets/offset\\_requirements](http://rggi.org/market/offsets/offset_requirements) (last visited Jan. 15, 2011).

<sup>37</sup> See W. CLIMATE INITIATIVE, OFFSETS SYSTEM ESSENTIAL ELEMENTS FINAL RECOMMENDATIONS PAPER 4 (2010), <http://www.westernclimateinitiative.org/component/remository/func-startdown/277/>.

<sup>38</sup> CLIMATE ACTION RESERVE, *supra* note 26, at 7.

<sup>39</sup> See generally *Report of the 58th Meeting of the CDM Executive Board Released*, IISD LINKAGES (Nov. 26, 2010), <http://www.iisd.ca/recent/recentmeetings.aspx?id=5>.

<sup>40</sup> *New Requirements and Rules Being Developed by the VCSA*, VERIFIED CARBON STANDARD, <http://v-c-s.org/methodologies.html> (last visited Jan. 15, 2011).



# CLIMATE CHANGE:

## GOVERNMENT, PRIVATE PROPERTY, AND INDIVIDUAL ACTION\*

by Paul Babie\*\*

### INTRODUCTION

Climate change is a private property problem. Some may react strongly to such a bold claim—after all, private property is seen as a solution to the crisis, as illustrated by the current fascination with the “commodification”<sup>1</sup> and “proptertization”<sup>2</sup> of carbon through “cap-and-trade”<sup>3</sup> schemes.<sup>4</sup> Notwithstanding the current fashionability of legislative responses to climate change, in the last year governments seem to be backing away from taking bold action.

In late 2009, the United Nations climate talks in Copenhagen failed to produce a successor agreement to the Kyoto Protocol<sup>5</sup>—participants opted instead for a weak political agreement.<sup>6</sup> Throughout 2010, this compounded the inability of national governments, especially those of the major developed nations such as the United States<sup>7</sup> and Australia,<sup>8</sup> to mitigate greenhouse gas (“GHG”) emissions through “cap-and-trade” legislation aimed at permitting the purchase and sale of rights to emit GHG.<sup>9</sup> Governments let their initiatives lapse.<sup>10</sup> Some more cynical might say the failure of Copenhagen galvanized the resolve of such governments to oppose mitigating legislation of any kind.<sup>11</sup> Finally, at the end of 2010, the Cancún UN climate talks, rather than focusing on mitigation through binding political agreement, issued a set of agreements, a major portion of which aims at adaptation to the changes wrought by the un-mitigated emission of GHG.<sup>12</sup>

As matters currently stand, as of January 1, 2013, the day Kyoto expires, the world will have no binding limits on GHG.<sup>13</sup> For many,<sup>14</sup> this fact causes real alarm. And it ought to, for this governmental failure stands as a depressing indictment of the effects on people of anthropogenic climate change. Bjørn Lomberg, the self-proclaimed “skeptical environmentalist,”<sup>15</sup> puts it this way:

The risks of unchecked global warming are now widely acknowledged: a rise in sea levels threatening the existence of some low-lying coastal communities; pressure on freshwater resources, making food production more difficult in some countries and possibly becoming a source of societal conflict; changing weather patterns providing favorable conditions for the spread of malaria. To make matters worse, the effects will be felt most in those parts of the world which are home to the poorest people who are least able to protect themselves and who bear the least responsibility for the build-up of greenhouse gases . . . Concern has been great, but humanity has so far done very little that will actually

prevent these outcomes. Carbon emissions have kept increasing, despite repeated promises of cuts.<sup>16</sup>

Another way of looking at humanity’s inaction may simply be the recognition, by governments if not yet by humanity as a whole, that what is necessary is nothing short of wholesale change to the dominant concept of private property. This brief essay aims to explain why private property, touted as recently as last year as the saviour to the challenge posed by climate change, may in fact be the source of the problem and why we need to take individual, personal action rather than wait for governments to act for us.

### WHAT PRIVATE PROPERTY IS

We begin with liberal theory, from which the dominant contemporary concept of private property emerges.<sup>17</sup> Liberalism concerns itself with the establishment and maintenance of a political and legal order which, among other things, secures individual freedom in choosing a “life project”—the values and ends of a preferred way of life.<sup>18</sup> In order for life to have meaning, some control over the use of goods and resources is necessary; private property is liberalism’s means of ensuring that individuals enjoy choice over goods and resources so as to allow them to fulfill their life project.<sup>19</sup>

In simple terms, the liberal conception of private property is a “bundle” of legal relations (or rights) created, conferred, and enforced by the state (through law) between people in relation to the control of goods and resources.<sup>20</sup> At a minimum, these rights typically include use, exclusivity, and disposition.<sup>21</sup> One can use one’s car (or, with few exceptions, any other tangible or intangible good, resource, or item of social wealth), for example, to the exclusion of all others, and may dispose of it. The holder may exercise these rights in any way to satisfy personal preferences and desires.<sup>22</sup> Alternatively, crafting this in a way that comports with the language of liberal theory—rights are the shorthand way of saying that individuals enjoy choice about the control and use of goods and resources in accordance with and to give meaning to a chosen life project.

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\* This is a revised version of Paul Babie, *Private Property: the Solution or the Source of the Problem?*, 2 *AMSTERDAM L. F.*, no. 2, 2010 at 17, <http://ojs.uvu.vu.nl/alf/article/view/124/231>.

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Notice, though, that in this definition, such rights exist only as a product of relationship between individuals. This is significant, for it focuses our attention on the fact that where there is a right (choice) to do something, there is a corresponding duty (a lack of choice) to refrain from interfering with the interest protected by the right.<sup>23</sup> Rights would clearly be meaningless if this were not so. As concerns a particular good or resource, then, the liberal individual holds choice, while all others (the community, society) are burdened with a lack of it. C. Edwin Baker summarizes the idea of rights and relationship this way: “[private] property [i]s a claim that other people ought to accede to the will of the owner, which can be a person, a group, or some other entity. A specific property right amounts to the *decisionmaking authority* of the holder of that right.”<sup>24</sup>

Private property, then, is not merely about the control and use of goods and resources, but also significantly about controlling the lives of others.<sup>25</sup> Using evocative and graphic language, Roberto Mangabeira Unger puts it this way:

[t]he right [choice] is a loaded gun that the rightholder [the holder of choice] may shoot at will in his corner of town. Outside that corner the other licensed gunmen may shoot him down. But the give-and-take of communal life and its characteristic concern for the actual effect of any decision upon the other person are incompatible with this view of right . . . .<sup>26</sup>

Identifying the importance of relationship reveals the fact that private property and non-property rights overlap; choices made by those with the former have the potential to create negative outcomes—consequences, or what economists call “externalities”—for those with the latter.<sup>27</sup> At the highest level of generality, Unger’s “gunman” is vested with absolute discretion to “an absolute claim to a divisible portion of social capital[]” and that “[i]n this zone the rightholder [can] avoid any tangle of claims to mutual responsibility.”<sup>28</sup> The individual revels in “a zone of unchecked discretionary action that others, whether private citizens or governmental officials, may not invade.”<sup>29</sup>

Every legal system acknowledges this problem and, in doing so, seems to accept that with rights come obligations towards others.<sup>30</sup> The state, through law, creates private property, just as through that same law (what is more commonly known as regulation), it is said to mediate the socially contingent boundary between private property and non-property holders. This is, in fact, the essence of private property—state conferral of self-serving rights that come with obligations towards others.<sup>31</sup>

Yet there is something much more disturbing lurking just below the surface of what appears to be state control aimed at preventing harmful outcomes like those of climate change. What is really being conferred by private property is what Duncan Kennedy calls the legal ground rules giving “permissions to injure” others, to cause legalised injury.<sup>32</sup> This is insidious, for “we don’t think of [them] as ground rules at all, by contrast with ground rules of prohibition. This is Wesley Hohfeld’s insight: the legal order permits as well as prohibits, in the simple-minded sense that it *could* prohibit, but judges and legislators reject

demands from those injured that the injurers be restrained.”<sup>33</sup> And they are invisible, in the sense, that

when lawmakers do nothing, they appear to have nothing to do with the outcome. But when one thinks that many other forms of injury are prohibited, it becomes clear that inaction is a policy, and that law is responsible for the outcome, at least in the abstract sense that the law could have made it otherwise . . . . It is clear that lawmakers *could* require almost anything. When they require nothing, it looks as though the law is uninvolved in the situation, though the legal decision not to impose a duty is in another sense the cause of the outcome when one person is allowed to ignore another’s plight.<sup>34</sup>

This brings us full circle to the broader liberal theory with which we began, for the importance of relationship in understanding private property reveals an important, yet paradoxical, dimension of choice. It is simply this: the freedom that liberalism secures to the individual to choose a life project means that in the course of doing that, the individual also chooses the laws, relationships, communities, and so forth that constitute the political and legal order. In other words, in the province of politics people choose their contexts (through electing representatives, who enact laws and appoint judges who interpret those laws), which in turn defines the scope of one’s rights—choice, decisionmaking authority—and the institutions that confer, protect and enforce it (bearing in mind the ground rules of permission as well as the ground rules of prohibition). Individuals as much choose the regulation of property as they do the control and use of goods and resources.<sup>35</sup>

## HOW PRIVATE PROPERTY FACILITATES THE EXTERNALITIES OF CLIMATE CHANGE

When we focus on relationship as central to private property and the political-regulatory contexts we choose, we begin to see something else that was always there, although it was hidden from our view. The externalities of private property create many other types of relationship in which the lives of many are controlled by the choices of a few.<sup>36</sup> Anthropogenic climate change is a stark example.

While the science is complex, it is clear enough that humans, through their choices, produce the GHG that enhance the natural greenhouse effect, which heats the earth’s surface.<sup>37</sup> Among other effects, anthropogenic climate change results in drought and desertification, increased extreme weather events, and the melting of polar ice (especially in the north) and so rising seas levels.<sup>38</sup> We might call this the “climate change relationship.” Private property, as a concept, facilitates choice (both human and corporate) about the use of goods and resources in such a way that emits greenhouse gases.<sup>39</sup>

Our choices about goods and resources cover the gamut of our chosen life projects: where we live, what we do there, how we travel from place to place and so forth. Corporate choices are equally important, for they structure the range of choice available to individuals in setting their own agendas, thus giving

corporations the power to broaden or restrict the meaning of private property in the hands of individuals.<sup>40</sup> Green energy (solar or wind power), for instance, remains unavailable to the individual consumer if no corporate energy provider is willing to produce it.<sup>41</sup>

Externalities do not end at the borders, physical or legal, of a good or resource; choices occur within a web of relationships, not only legal and social, but also physical and spatial. Who is affected? Everyone, the world over, is affected, with the poor and disadvantaged of the developing world disproportionately bearing the brunt of the human consequences of climate change<sup>42</sup>—decreasing security, shortages of food, increased health problems, and greater stress on available water supplies. Indeed, as Jedediah Purdy argues,

[c]limate change threatens to become, fairly literally, the externality that ate the world. The last two hundred years of economic growth have been not just a preference-satisfaction machine but an externality machine, churning out greenhouse gases that cost polluters nothing and disperse through the atmosphere to affect the whole globe.<sup>43</sup>

Consider human security. It will decrease both within countries affected directly by climate change, and in those countries indirectly affected through the movement of large numbers of people displaced by the direct effects of climate change in their own countries.<sup>44</sup> In the case of rising sea levels, for instance, sixty percent of the human population lives within one hundred kilometers of the ocean, with the majority in small- and medium-sized settlements on land no more than five meters above sea level.<sup>45</sup> Even the modest sea level rises predicted for these places will result in a massive displacement of “climate”

or “environmental refugees.”<sup>46</sup> Private property, by securing choice about the use of goods and resources to those in the developed world, makes all of this possible.

## CONCLUSION: IS IT THE SOLUTION?

Nonetheless, private property and the commodification upon which it depends seem to be in vogue at the moment as a solution to anthropogenic climate change. Creating a proprietary interest in carbon that can be bought and sold is the answer—is the political choice, it is claimed and we believe—to the climate crisis. Is it really? We could just as easily say that the concept of private property is the primary culprit. Is it wise to entrust the solution to the concept that put us here? Or might it be more appropriate, as Mike Hulme suggests, to “see how we can use the idea of climate change—the matrix of ecological functions, power relationships, cultural discourses and material flows that climate change reveals—to rethink how we take forward our political, social, economic, and personal projects over the decades to come.”<sup>47</sup>

Before we pin our hopes on it as a cure-all, we might ask first whether the liberal concept of private property is ripe for just such a reappraisal. We can choose, but we must do so with our eyes open to the reality: that private property and the contexts in which we live are in fact *our* choice, not that of governments. We can no longer wait for government to act, with cap-and-trade schemes or any other form of regulation. At the very least, it is not enough, and at worst, it will take too long. Now is the time to act. And only we can take action. In exercising choice about our context and about goods and resources, we must take responsibility for ourselves, rather than waiting for our governments to act for us.<sup>48</sup>



## Endnotes: Climate Change: Government, Private Property, and Individual Action

<sup>1</sup> See MARGARET JANE RADIN, *CONTESTED COMMODITIES: THE TROUBLE WITH TRADE IN SEX, CHILDREN, BODY PARTS AND OTHER THINGS* 1-16 (1996).

<sup>2</sup> See Kevin Gray, *Property in Thin Air*, 50 CAMBRIDGE L.J. 252, 257-58 (1991).

<sup>3</sup> See, e.g., American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009). This bill is also referred to by the names of its sponsors, Congressmen Waxman and Markey.

<sup>4</sup> The popular press and media are filled with analysis of such schemes. For a recent example, see *Lexington: A Refreshing Dose of Honesty*, ECONOMIST (Feb. 4, 2010), [http://www.economist.com/world/united-states/displaystory.cfm?story\\_id=15453166](http://www.economist.com/world/united-states/displaystory.cfm?story_id=15453166).

<sup>5</sup> Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 11, 1997, 2303 U.N.T.S. 148 (entered into force Feb. 16, 2005), <http://unfccc.int/resource/docs/convkp/kpeng.pdf>.

<sup>6</sup> United Nations Framework Convention on Climate Change, 15th Conference of the Parties, Copenhagen, Den. Dec. 7-19, 2009, *Copenhagen Accord*, 2/CP.15, in *Part Two: Action Taken*, U.N. Doc. FCCC/CP/2009/11/Add.1 (Mar. 30, 2010), <http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf>; see also BJØRN LOMBORG, *SMART SOLUTIONS TO CLIMATE CHANGE: COMPARING COSTS AND BENEFITS* 1 (2010); David King, Editorial, *No Cause for Climate Despair*, NEWSIDENTIST, June 16, 2010, at 3, <http://www.newscientist.com/article/mg20627652.900-david-king-no-cause-for-climate-despair.html> (noting that the Copenhagen talks at least gave the world a goal to avoid global temperature increases of 2 degrees Celsius); Fred Pearce, *Is it Time to Say Goodbye Cool*

*World?*, NEWSIDENTIST, June 15, 2010, at 8, <http://www.newscientist.com/article/mg20627650.401-is-it-time-to-say-goodbye-cool-world.html> (discussing the climate talks in Bonn, Germany). While COP 15 received global attention as an historic opportunity to produce an internationally legally binding successor to the Kyoto Protocol for the mitigation of anthropogenic climate change, COP 16, held from November 29, 2010 through December 10, 2010 in Cancún, Mexico, received understated coverage and sought modest outcomes, limited largely to incremental developments concerning multilateral processes for achieving industrialized country emissions targets and actions to reduce emissions, an agreement to prevent a gap between the Kyoto Protocol and its successor, clean development mechanisms to encourage investment in infrastructure aimed at reducing emissions, initiatives to protect the vulnerable from climate change, and various strategies aimed at adaptation to climate change. *The United Nations Climate Change Conference in Cancun, COP 16 / CMP 6*, 29 November–10 December 2010, UNFCCC [hereinafter *COP 16 / CMP 6*], [http://unfccc.int/meetings/cop\\_16/items/5571.php](http://unfccc.int/meetings/cop_16/items/5571.php) (last visited Feb. 25, 2011).

<sup>7</sup> See, e.g., Clean Energy Jobs and American Power Act, S. 1733, 111th Cong. (2009), <http://www.govtrack.us/congress/bill.xpd?bill=s111-1733>; Carbon Limits and Energy for America's Renewal (CLEAR) Act, S. 2877, 111th Cong. (2009), <http://www.govtrack.us/congress/bill.xpd?bill=s111-2877>; Clean Energy Act of 2009, S. 2776, 111th Cong. (2009), <http://www.govtrack.us/congress/bill.xpd?bill=s111-2776>; Clean Energy Partnerships Act of 2009, S. 2729,



# OPTIONS FOR BLUE CARBON WITHIN THE INTERNATIONAL CLIMATE CHANGE FRAMEWORK

by Gabriel Grimsditch\*

## INTRODUCTION

The concept of “Blue Carbon,” or atmospheric carbon captured by coastal ecosystems, has recently been the focus of reports by the United Nations Environment Programme (“UNEP”) and the International Union for the Conservation of Nature (“IUCN”).<sup>1</sup> The international community is increasingly interested in exploring the potential of conserving coastal ecosystems for their role in climate change mitigation, reflected in the Manado Oceans Declaration signed by countries in 2009 which recognizes that “healthy and productive coastal ecosystems, already increasingly stressed by land-based and sea-based sources of pollution, coastal development, and habitat destruction, have a growing role in mitigating the effects of climate change on coastal communities and economies in the near term”<sup>2</sup> and “invite[s] the scientific community/institutions to continue developing reliable scientific information on the roles of coastal wetlands, mangrove, algae, seagrass, and coral reef ecosystems in reducing the effects of climate change.”<sup>3</sup>

## BLUE CARBON IN THE CLIMATE CONTEXT

The 2009 UNEP “Blue Carbon” report noted that fifty-five percent of atmospheric carbon captured by living organisms is captured by marine organisms and between fifty to seventy-one percent of that is captured by ocean vegetated habitats (e.g. mangroves, salt marshes, seagrasses, seaweed), which account for less than 0.5% of the seabed.<sup>4</sup> The report states that coastal vegetated habitats sequester between 114 and 328 teragrams (“Tg”) of carbon per year, or 1.6 to 4.6% of total anthropogenic emissions (7,200 Tg per year).<sup>5</sup> Furthermore, the report found that between two and seven percent of these marine and coastal ecosystems are lost annually<sup>6</sup>—one of the highest rates of loss amongst all ecosystems.<sup>7</sup> Because of their high carbon sequestration potential, there is a growing interest in exploring the potential of including Blue Carbon in existing and emerging climate change frameworks.<sup>8</sup> However, considerable uncertainty surrounds these estimates and the level of understanding of carbon storage in coastal ecosystems.

Several opportunities for Blue Carbon exist within the United Nations Climate Change Framework (“UNFCCC”). The UNFCCC is an international environmental treaty with a goal of the “stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic<sup>9</sup> interference with the climate system.”<sup>10</sup> The UNFCCC includes coastal and marine ecosystems in Article 4(d), which states that all parties shall “promote sustainable management, and promote and cooperate in the conservation and enhancement, as

appropriate, of sinks and reservoirs of all GHG not controlled by the Montreal Protocol, including . . . oceans as well as other . . . coastal and marine ecosystems.”<sup>11</sup> However, the current UNFCCC processes does not include adequate measures for protection and restoration of Blue Carbon ecosystems as a climate change mitigation strategy, and this represents a missed opportunity in our global portfolio of options for combating climate change.

Countries that have signed the UNFCCC are obligated to submit annual National Inventory Submissions (“NIS”); these inventory submissions record the country’s greenhouse gas emissions from anthropogenic activity, as well as sequestration from land use and forestry, based on guidance from the Intergovernmental Panel on Climate Change (“IPCC”).<sup>12</sup> Within the NIS, there is a section on Land Use, Land-Use Change and Forestry (“LULUCF”) that accounts for the carbon budget (i.e. emissions and reductions) due to the management of terrestrial ecosystems including forests, peatlands, grasslands, and agricultural wetlands.<sup>13</sup> In this section, only the carbon sequestered or emitted due to direct human management of ecosystems can be included.<sup>14</sup> However, unmanaged ecosystems are not accounted for.<sup>15</sup> Blue Carbon ecosystems—whether managed or not—are not accounted for under LULUCF and thus, not included in the UNFCCC.<sup>16</sup> The IPCC should amend their guidance on LULUCF in order to include Blue Carbon ecosystems under LULUCF and UNFCCC processes. Moreover, management of coastal and wetland ecosystems should be defined as an activity under LULUCF. The IPCC operates based on peer-reviewed science and therefore, the current scientific gaps in knowledge regarding carbon fluxes,<sup>17</sup> need to first be addressed in the peer-reviewed literature. In order for Blue Carbon ecosystems to be included in the wider UNFCCC and Kyoto Protocol processes, an important step would be to have Blue Carbon ecosystems fully embedded and accounted for in the LULUCF process.

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## EXISTING INTERNATIONAL CLIMATE CHANGE MITIGATION FRAMEWORKS

Although the UNFCCC is legally non-binding, the Kyoto Protocol (“Protocol”) adopted in 1997 commits industrialized countries to reduce emissions of the greenhouse gases, carbon dioxide, methane, nitrous oxide, and sulfur hexafluoride by at least five percent from 1990 levels.<sup>18</sup> The Protocol includes flexible mechanisms such as emissions trading and offsets for industrialized countries, known as the clean development mechanism (“CDM”), which allows the nation to meet its emission reductions obligations by funding carbon capture in developing countries.<sup>19</sup> Blue Carbon projects could potentially become an offset category for CDM projects and—although presently standardized—UNFCCC-approved methodologies do not exist for establishing project baselines and monitoring results.<sup>20</sup> UNFCCC criteria would have to be amended to include Blue Carbon projects under the CDM in the form of protection or rehabilitation of coastal ecosystems. However, as discussed above, appropriate methodologies would have to be developed and approved.

In addition to the CDM, under the 2009 Copenhagen Accord, developing countries agreed to report Nationally Appropriate Mitigation Actions (“NAMAs”) to the UNFCCC every two years; such mitigation actions are monitored domestically.<sup>21</sup> NAMAs refer to a set of policies and actions countries undertake as part of a commitment to reduce greenhouse gas emissions, recognizing that various countries may engage in different actions based on equity, and in accordance with their respective responsibilities and capabilities.<sup>22</sup> Presently, NAMAs include, for example, investments in alternative energy or in reducing illegal logging, but not Blue Carbon projects.<sup>23</sup> There is potential to expand NAMAs to include protection and restoration of Blue Carbon ecosystems, but as discussed previously, an international standard approved by the UNFCCC needs to be developed and applied to Blue Carbon.

Furthermore, the Reducing Emissions from Deforestation and Forest Degradation (“REDD”) program within the UNFCCC presents another opportunity for Blue Carbon ecosystem protection. This program aims to create financial incentives to reduce forest destruction and degradation, thus reducing emissions and maintaining sequestration.<sup>24</sup> REDD+ is a program defined under the Cancun Agreement as including activities such as “(a) Reducing emissions from deforestation; (b) Reducing emissions from forest degradation; (c) Conservation of forest carbon stocks; (d) Sustainable management of forest[s]; [and] (e) Enhancement of forest carbon stocks.”<sup>25</sup> REDD+ carbon credits would allow funding from industrialized countries to reduce deforestation and rehabilitate degraded forests in developing countries.<sup>26</sup> After the decision in Cancun at the Sixteenth Session of the Conference of the Parties to the UNFCCC, it is clear that mangroves are eligible for REDD+<sup>27</sup> funding,<sup>28</sup> yet their full potential has not yet been realized by countries. Again, standardized protocols for measurement, reporting, and verification (“MRV”) and monitoring of carbon sequestration and carbon emissions due to habitat degradation need to be developed and approved by appropriate international bodies, such as the

Voluntary Carbon Standard (“VCS”).<sup>29</sup> Pilot projects exploring the feasibility of mangroves under REDD+, are currently being developed by non-governmental organizations and national governments in REDD countries around the world.<sup>30</sup>


## NEW OPPORTUNITIES FOR BLUE CARBON IN CLIMATE FRAMEWORKS

While opportunities exist, for Blue Carbon to be included in any of these UNFCCC frameworks certain preconditions need to be met. First, the science has to be robust, and adequate peer-reviewed evidence must exist to make a compelling case for the IPCC or the UNFCCC to amend their guidelines. This includes the development of standardized and internationally approved methodologies for MRV of carbon sequestration and emissions from habitat degradation. Additionally, an adequate level of understanding of carbon fluxes and their response to management in and around Blue Carbon ecosystems is necessary for the IPCC to include the coastal ecosystems in their Assessment Reports. The evidence is mounting that Blue Carbon ecosystems are an important part of the global carbon cycle, and that their destruction releases dangerous amounts of greenhouse gases into the atmosphere.<sup>31</sup> Secondly, Blue Carbon projects need to demonstrate “additionality” (the project must demonstrate that the reduction in greenhouse gas emissions through the protection or rehabilitation of Blue Carbon ecosystems would not have happened without the sale of Blue Carbon offsets),<sup>32</sup> “minimal leakage” (the decrease in greenhouse gas emissions by the Blue Carbon project does not cause an equivalent increase in emissions by another entity),<sup>33</sup> and “permanence” (minimizing the risk that greenhouse gas emissions will occur after the Blue Carbon project has been sold as a carbon offset).<sup>34</sup> Finally, the third precondition for the success of Blue Carbon projects and acceptance under the UNFCCC and other international climate frameworks is a feasible economic model, which actually generates revenue from the Blue Carbon project. The revenue generated by carbon credits sold in the carbon markets must be higher than the cost of protecting or restoring the Blue Carbon ecosystems. Economic feasibility studies need to be undertaken which examine the total revenue from carbon sequestered (including carbon fluxes), the total value of ecosystem services associated with Blue Carbon ecosystems, the total direct costs of protection or rehabilitation of Blue Carbon ecosystems, and the total opportunity costs associated with the project (e.g. loss of revenue from lost coastal development opportunities).

## CONCLUSION

The fact that Blue Carbon ecosystems such as mangroves, sea grass, salt marsh, and seaweed are currently largely overlooked by the UNFCCC, CDM, and other international climate frameworks represents a missed opportunity in our global portfolio for mitigating climate change through ecosystem management. The UNFCCC does provide appropriate frameworks and opportunities to include Blue Carbon in the global climate change debate, and a growing community of UN agencies, non-governmental organizations, research institutions, civil society

groups, and national governments are forwarding the agenda for this change to occur. Crucial steps include the development and standardization of MRV protocols in order to monitor the success of pilot Blue Carbon projects, as well as the continued amassing of evidence and understanding of the role of Blue Carbon ecosystems in the global carbon cycle, including the effects of anthropogenic management on their greenhouse

gas sequestration or emissions. This peer-reviewed evidence should be presented to the IPCC and be used to drive changes in guidelines so that Blue Carbon ecosystems are included in the NIS and LULUCF processes and thus, into the wider UNFCCC framework. The potential of Blue Carbon is clear; it is now a matter of expediting this process in international frameworks before we lose even more of these precious ecosystems. 

## Endnotes: Options for Blue Carbon within the International Climate Change Framework

<sup>1</sup> See, e.g., UNITED NATIONS ENVTL. PROGRAMME, BLUE CARBON: THE ROLE OF HEALTHY OCEANS IN BINDING CARBON (Christian Nellemann et al. eds., 2009) [hereinafter Nellemann], [http://www.unep.org/pdf/BlueCarbon\\_screen\\_english.pdf](http://www.unep.org/pdf/BlueCarbon_screen_english.pdf).

<sup>2</sup> World Ocean Conference, Manado, Indon., May 11-14, 2009, *Manado Ocean Declaration 2* (May 14, 2009), <http://www.cep.unep.org/news-and-events/manado-ocean-declaration>.

<sup>3</sup> *Id.* at 3.

<sup>4</sup> Nellemann, *supra* note 1.

<sup>5</sup> *Id.*

<sup>6</sup> *Id.*

<sup>7</sup> *Id.* at 7.

<sup>8</sup> See generally INT'L UNION FOR THE CONSERVATION OF NATURE, THE MANAGEMENT OF NATURAL COASTAL CARBON SINKS (Dan Laffoley & Gabriel Grimsditch eds., 2009), <http://data.iucn.org/dbtw-wpd/edocs/2009-038.pdf>.

<sup>9</sup> *Anthropogenic*, MERRIAM-WEBSTER DICTIONARY ONLINE, <http://www.merriam-webster.com/dictionary/anthropogenic?show=0&t=1296266491> (last visited Feb. 5, 2011).

<sup>10</sup> United Nations Framework Convention on Climate Change art. 2, May 9, 1992, 1771 U.N.T.S. 107, <http://unfccc.int/resource/docs/convkp/conveng.pdf>.

<sup>11</sup> *Id.* art. 4.

<sup>12</sup> *Land Use, Land-Use Change and Forestry (LULUCF)*, UNITED NATIONS FRAMEWORK ON CLIMATE CHANGE, [http://unfccc.int/methods\\_and\\_science/lulucf/items/3060.php](http://unfccc.int/methods_and_science/lulucf/items/3060.php) (last visited Feb. 5, 2011).

<sup>13</sup> See, e.g., INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, LAND USE, LAND-USE CHANGE AND FORESTRY (Robert T. Watson et al. eds., 2000), [http://www.grida.no/publications/other/ipcc\\_sr/?src=/climate/ipcc/land\\_use/index.htm](http://www.grida.no/publications/other/ipcc_sr/?src=/climate/ipcc/land_use/index.htm).

<sup>14</sup> See generally U.S. ENVTL. PROT. AGENCY, INVENTORY OF U.S. GREENHOUSE GAS EMISSIONS AND SINKS: 1990-2007, at 7-1 (2009), [http://unfccc.int/files/national\\_reports/annex\\_i\\_ghg\\_inventories/national\\_inventories\\_submissions/application/zip/usa\\_2009\\_nir\\_13apr.zip](http://unfccc.int/files/national_reports/annex_i_ghg_inventories/national_inventories_submissions/application/zip/usa_2009_nir_13apr.zip).

<sup>15</sup> *Id.*

<sup>16</sup> *Id.*

<sup>17</sup> Defining "carbonflux" as "the net difference between carbon removal [sequestration] and carbon addition [e.g. from emissions due to habitat degradation] in Blue Carbon ecosystems" . . . . See CARBONFLUX, <http://www.carbonflux.co.uk> (last visited Mar. 10, 2011).

<sup>18</sup> Kyoto Protocol to the United National Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 22, <http://unfccc.int/resource/docs/convkp/kpeng.pdf>.

<sup>19</sup> *Id.*

<sup>20</sup> *Methodologies and Tools*, UNITED NATIONS FRAMEWORK ON CLIMATE CHANGE, [http://unfccc.int/methods\\_science/redd/methodologies/items/4538.php](http://unfccc.int/methods_science/redd/methodologies/items/4538.php) (last visited Feb. 5, 2011).

<sup>21</sup> Conference of the Parties Fifteenth Session, Copenhagen, Den., Dec. 7-18, 2009, *Copenhagen Accord*, U.N. Doc. FCCC/CP/2009/L.7 (Dec. 18, 2009), <http://unfccc.int/resource/docs/2009/cop15/eng/107.pdf>.

<sup>22</sup> United Nations Framework Convention on Climate Change, Bali, Indon., Dec. 3-15, 2007, *Dec. 1/CP.13 Bali Action Plan*, in *Rep. of the Conf. of the Parties on its thirteenth sess.*, U.N. Doc. FCCC/CP/2007/6/ Add.1 (Dec. 2007), <http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf>.

<sup>23</sup> See *ENB on the Side: A Special Report on Selected Side Events at the Cancun Climate Change Conference*, INT'L INST. FOR SUSTAINABLE DEV., Dec. 2, 2010, at 1, <http://www.iisd.ca/climate/cop16/enbts/pdf/enbts1290e.pdf>.

<sup>24</sup> UN-REDD PROGRAMME, <http://www.un-redd.org> (last visited Feb. 5, 2011).

<sup>25</sup> United Nations Framework Convention on Climate Change, *Outcome of the Work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention*, U.N. Doc. FCCC/AWG/LCA/2010/L.7 (Oct. 10, 2010) [hereinafter AWG-LCA], <http://unfccc.int/resource/docs/2010/awglca13/eng/107.pdf>.

<sup>26</sup> *Id.*

<sup>27</sup> REDD+ is a program going beyond REDD in the valuation of carbon stored forests. It includes conservation, enhancement of carbon stocks, and the sustainable management of forests. See *About REDD+*, UN-REDD PROGRAMME, <http://www.un-redd.org/AboutREDD/tabid/582/Default.aspx> (last visited Feb. 5, 2011).

<sup>28</sup> See AWG-LCA, *supra* note 25.

<sup>29</sup> *VCS Methodology Approval*, VOLUNTARY CARBON STANDARD (2005), <http://www.v-c-s.org/docs/VCS%20Methodologies%20FINAL.pdf>.

<sup>30</sup> Steve Zwick & Hannah Kett, *Conservationists Endorse Plan to Fold Mangroves into REDD+ Talks*, ECOSYSTEM MARKETPLACE, Dec. 2, 2010, [http://www.ecosystemmarketplace.com/pages/dynamic/article.page.php?page\\_id=7868&section=home](http://www.ecosystemmarketplace.com/pages/dynamic/article.page.php?page_id=7868&section=home).

<sup>31</sup> INT'L UNION FOR CONSERVATION OF NATURE, THE MANAGEMENT OF NATURAL COASTAL CARBON SINKS 53 (Dan Laffoley & Gabriel Grimsditch eds., 2009), <http://data.iucn.org/dbtw-wpd/edocs/2009-038.pdf>.

<sup>32</sup> Roger Ullman, Vasco Bilbao & Gabriel Grimsditch, *Factors For Inclusion of Blue Carbon in Climate Frameworks*, in OCEAN AND COASTAL MANAGEMENT (forthcoming Oct. 2011).

<sup>33</sup> *Id.*

<sup>34</sup> *Id.*

# Is REDD ACCOUNTING MYOPIC?:

## WHY REDUCING EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION PROGRAMS SHOULD RECOGNIZE AND INCLUDE OTHER ECOSYSTEMS AND SERVICES BEYOND CO<sub>2</sub> SEQUESTRATION

by Paulo A. Lopes\*

### INTRODUCTION

“What is a cynic? A man who knows the price of everything and the value of nothing.”<sup>1</sup> Although uttered in Oscar Wilde’s 1892 comedy, *Lady Windermere’s Fan*, its reference could not have been more foreboding.<sup>2</sup> Wilde’s comedy foreshadowed what was to come as the classical economics of the 18th and 19th century<sup>3</sup> evolved into neoclassical economics in the 20th century,<sup>4</sup> and finally into mainstream economics<sup>5</sup> built on the theory, and now the practice, of free market economies.<sup>6</sup>

Unfortunately, over the years, free market economies have long since forgotten Wilde’s definition of a “cynic” even though remembrance of it today is paramount for environmentalists as they try to mitigate climate change. Today, humans have embarked on what may be the last frontier of mainstream economics, the monetization of what was once thought incalculable, Earth’s ecosystems,<sup>7</sup> some of which remain largely unscathed by mainstream economies.

Payment for ecosystem services (“PES”)<sup>8</sup> is a type of mainstream economic recognition of benefits provided by land. However, this rebirth of economic land recognition is not a reincarnation of Adam Smith’s economics that consisted of labor, land, and capital.<sup>9</sup> Instead, PES programs, such as reducing emissions from deforestation and forest degradation (“REDD”),<sup>10</sup> try to monetize aspects of nature, including carbon dioxide (“CO<sub>2</sub>”) sequestration with REDD projects.<sup>11</sup>

The lack of recognition of the total value of land by mainstream economics is in large part because of the continued classification of land as a subcategory of capital, which results in undervaluation of the land.<sup>12</sup> This undervaluation of land is an externality of mainstream economics that discounts the ecosystem services provided by the natural environment.<sup>13</sup> Mitigation of these externalities can occur when there is actual recognition of the ecosystem services.<sup>14</sup> Although mainstream economies advocate that REDD programs will help “save” the planet from climate change,<sup>15</sup> current REDD programs fail to internalize many of the ecosystem services provided by forests, thus perpetuating the undervaluation of land recognition in mainstream economics.<sup>16</sup>

This article argues that the current design of REDD is a myopic Partial PES at best.<sup>17</sup> Forest ecosystems provide numerous services beyond the sequestration of CO<sub>2</sub>, such as protecting upstream watersheds,<sup>18</sup> conserving biodiversity<sup>19</sup> and gene pools,<sup>20</sup> soil formation,<sup>21</sup> nutrient recycling,<sup>22</sup> and plant

pollination.<sup>23</sup> Thus REDD programs should recognize and include these and other ecosystem services.<sup>24</sup> After reviewing REDD in the international context and the accounting scheme, recommendations and concerns are provided for why the expansion of REDD to include other ecosystems and services would result in not only a greater CO<sub>2</sub> reduction, but also other important environmental benefits.<sup>25</sup> The article concludes by recognizing that REDD’s accounting loopholes, by focusing solely on CO<sub>2</sub> reduction without recognition of the ensuing impact from that reduction, will impose negative externalities on other ecosystem services, and that REDD needs to transition to a program that internalizes these externalities.<sup>26</sup>

### PAYING FOR ECOSYSTEM SERVICES

#### PAYMENT FOR ECOSYSTEM SERVICES GENERALLY

The Earth’s ecosystem provides benefits, sometimes referred to as “services,” for all organisms on the planet.<sup>27</sup> These ecosystem services may or may not be directly recognized by mainstream economics.<sup>28</sup> PES is a financial valuation of Earth’s ecosystem services.<sup>29</sup> The primary purpose of a PES program is to maintain a specific ecosystem “service,” such as clean water,<sup>30</sup> carbon sequestration,<sup>31</sup> or biodiversity habitat,<sup>32</sup> for some type of economic value.<sup>33</sup> However, the transfer of money to maintain the ecosystem service is not the defining factor of a PES program.<sup>34</sup> Rather, it is the fact that the “payment causes the benefit to occur where it would not have otherwise.”<sup>35</sup> By having the service be “additional,” a value for the service can be determined, thus creating a PES program.<sup>36</sup>

#### REDUCING EMISSIONS FROM DEFORESTATION AND FOREST DEGRADATION IS AN EXAMPLE OF A PAYMENT FOR ECOSYSTEM SERVICES PROGRAM

As mentioned above, carbon sequestration is one of the ecosystem services provided by forests. The net forest loss between 1990 and 2000 was 13.1 million hectares (“ha”) per year and 12.9 million ha between 2000 and 2005,<sup>37</sup> the equivalent of the land area of Greece<sup>38</sup> or New York<sup>39</sup> every year, and according to the Intergovernmental Panel on Climate Change (“IPCC”), emissions from deforestation during the 1990s were estimated at 5.8 gigatonnes (“Gt”) of CO<sub>2</sub> per year.<sup>40</sup> With emissions

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from deforestation and forest degradation accounting for nearly twenty percent of total greenhouse gas emissions,<sup>41</sup> there is a need to reduce emissions from forests.

Over the years, varying countries have undertaken numerous schemes, and institutions have proposed ways to reduce emissions from deforestation.<sup>42</sup> Some programs, listed in order from narrowest to broadest include: reducing emissions from deforestation (“RED”); reducing emissions from deforestation and degradation (“REDD”); and reducing emissions from deforestation, degradation, and the enhancement of carbon stocks (the “+” in “REDD+”) by means of carbon sequestration.<sup>43</sup> These schemes—coupled with needed financing—should result in reducing emissions from deforestation.<sup>44</sup>

## REDD WITHIN THE INTERNATIONAL CLIMATE CONTEXT

In 1997, the third Conference of the Parties (“COP-3”) of the United Nations Framework Convention on Climate Change (“UNFCCC” or “Convention”) adopted the Kyoto Protocol.<sup>45</sup> Article 3(3) of the Kyoto Protocol limited Land-Use Change and Forestry (“LUCF”) activities to afforestation, reforestation, and deforestation,<sup>46</sup> while Article 3(4) provided flexibility with the inclusion of other activities as determined by the first session of the Meeting of the Parties to the Kyoto Protocol.<sup>47</sup>

Noting the conclusions found by the Subsidiary Body for Scientific and Technological Advice (“SBSTA”) at its eighth session and the decision by the IPCC to prepare a report on Land-Use, Land-Use Change and Forestry (“LULUCF”), the fourth Conference of the Parties (“COP-4”) of the UNFCCC, began to lay the legal groundwork for the recognition and inclusion of LULUCF.<sup>48</sup> This establishment of more specific legal provisions for LULUCF continued with the sixth Conference of the Parties (“COP-6”) in 2000, with the IPCC scientific report<sup>49</sup> and the Food and Agriculture Organization (“FAO”) definition for “forests.”<sup>50</sup> At the 2001 seventh Conference of the Parties (“COP-7”), the Parties agreed upon the inclusion of additional activities, such as revegetation, forest management, cropland management, and grazing land management, which were prohibited from jointly implemented activities but included in domestically conducted activities.<sup>51</sup>

In 2007 in Bali, Indonesia, the thirteenth Conference of the Parties (“COP-13”) recognized “the urgent need to take further meaningful action to reduce emissions from deforestation and forest degradation in developing countries.”<sup>52</sup> The Bali Action Plan established a goal to complete the policy approaches and incentives to reduce emissions from deforestation by 2009.<sup>53</sup> While the fifteenth Conference of the Parties (“COP-15”), in 2009, concluded with the nonbinding<sup>54</sup> Copenhagen Accord, which “recogniz[ed] the crucial role of reducing emission[s] from deforestation and forest degradation,”<sup>55</sup> the goal set by the Bali Action Plan was not met.<sup>56</sup>

At the sixteenth Conference of the Parties (“COP-16”), in 2010 in Cancun, Mexico, the COP concluded by adopting numerous decisions, including one that recognized the need to reduce emissions from forests.<sup>57</sup> The outcome of the thirteenth session of the Ad Hoc Working Group on Long-term Cooperative

Action (“AWG-LCA-13”) under the Convention resulted in agreement by Parties for “policy approaches and positive incentives on issues relating to [REDD] in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries.”<sup>58</sup> It encouraged each country, as appropriate, to undertake the following actions: “(a) Reduc[e] emissions from deforestation; (b) Reduc[e] emissions from forest degradation; (c) Conservation of forest carbon stocks; (d) Sustainable management of forest; [and] (e) Enhancement of forest carbon stocks.”<sup>59</sup> Countries agreed to develop a national strategy or action plan<sup>60</sup> and a “robust and transparent national forest monitoring system for the monitoring and reporting of the activities” listed above.<sup>61</sup> During the development and implementation of their national strategies or action plans, developing countries are asked, “to address, inter alia, drivers of deforestation and forest degradation, land tenure issues, forest governance issues, gender considerations and . . . [to] ensure the full and effective participation of relevant stakeholders, inter alia, indigenous peoples and local communities.”<sup>62</sup> This agreement of the AWG-LCA-13 text at COP-16 in Cancun, Mexico is a step forward for the recognition and implementation of REDD at the international level.<sup>63</sup>

## CO<sub>2</sub> EMISSIONS ACCOUNTING

It is important to recognize that forestry accounting of CO<sub>2</sub> emissions, although maturing, is in its infancy and thus still imprecise.<sup>64</sup> Accurate accounting allows for the determination of whether the REDD program will have added benefit,<sup>65</sup> which requires that the benefit be accurately quantified and documented.<sup>66</sup> For a carbon offset to actually result from a REDD program, one must review the additionality, definition of a forest, leakage, measurement, verification, and permanence of the offset.<sup>67</sup> If a REDD program fails to meet any or all of these requirements, then the offset is not actually realized since forestry CO<sub>2</sub> emissions were not reduced.<sup>68</sup> Recognition of this failed emission reduction offset would allow countries to emit more, since emissions were not offset by the REDD program even though they were recognized as having occurred.<sup>69</sup>

### ADDITIONALITY

Additionality refers to the quantity of emission reductions that result from the implementation of the REDD program when compared to business as usual.<sup>70</sup> The difference between the reference level and the emission reductions achieved is the “additionality.”<sup>71</sup> Although in theory this sounds possible, if not straightforward, experts still differ on approaches for determining the additionality amount since “there is no correct technique for determining additionality because it requires comparison of expected reductions against a projected business-as-usual emissions baseline . . . [which] is inherently uncertain because, it may not be possible to know what would have happened in the future had the projects not been undertaken.”<sup>72</sup> Fundamentally, the test to determine additionality will always vary depending on the balance between reduction of administrative costs versus program rigor and environmental certainty.<sup>73</sup>



## DEFINITIONS OF FORESTS

Article 3(3) of the Kyoto Protocol lists LULUCF activities as afforestation, reforestation, and deforestation<sup>74</sup> but does not provide definitions for these activities.<sup>75</sup> In 2000, the IPCC, in a special report on LULUCF, recognized the importance of providing clear definitions of these activities to facilitate accounting for different land-use activities.<sup>76</sup> The report also notes that “[f]orest definitions based on legal, administrative, or cultural considerations” may not be appropriate for carbon accounting since these definitions do not always correlate to the quantity of carbon stored on the site as illustrated by the following forest definitions.<sup>77</sup> The ninth session of the Conference of the Parties (“COP-9”), in 2003 in Milan, Italy, provided the Parties with flexibility on a forest definition with “(a) A single minimum tree crown cover between 10 and 30 per cent; (b) A single minimum land area value between 0.05 and 1 hectare; and (c) A single minimum tree height value between 2 and 5 meters.”<sup>78</sup> The Food and Agriculture Organization (“FAO”), in a 2006 working paper, also noted the issue of selecting a forest definition for accounting in Clean Development Mechanism (“CDM”) projects.<sup>79</sup> Unlike COP-9’s three criteria, the FAO working paper put forward a ten-step process to aid countries in selecting the optimal parameters for a forest definition.<sup>80</sup> As evident by these different approaches, providing flexibility in defining forests is necessary since ecosystems around the world vary greatly. This variation prohibits creation of a uniform international definition applicable to all countries, because it would result in winners and losers amongst countries.<sup>81</sup>

## LEAKAGE

While the emphasis and requirements under the Kyoto Protocol that CDM projects be additional<sup>82</sup> is important, the risk of leakage must also be recognized.<sup>83</sup> Leakage “occurs when economic activity is shifted as a result of the emission control regulation and, as a result, emission abatement achieved in one location that is subject to emission control regulation . . . is offset by increased emissions in unregulated locations.”<sup>84</sup> For example, in the context of a REDD program, leakage occurs when site A’s forest emissions, which are under a REDD program, are reduced by two tonnes of CO<sub>2</sub>, yet CO<sub>2</sub> emissions from site B, which is not under a REDD program, increases CO<sub>2</sub> emissions by two tonnes.<sup>85</sup> The achieved emission reductions of site A is negated by the increased emissions from site B, resulting in a zero-sum game of emission reductions.<sup>86</sup> COP-9 recognized leakage if the increase in emissions occurs outside of the project and is measurable and attributable to the reduced emissions undertaken by the project.<sup>87</sup>

## MEASUREMENT AND VERIFICATION

Measurement and verification of deforestation is essential to any REDD project with a goal of issuing emission reduction credits.<sup>88</sup> However, measurement and verification of carbon sequestration is difficult since “rates vary by tree species, soil type, regional climate, topography and management practice.”<sup>89</sup> In the United States, carbon sequestration rates for tree species are better understood than soil carbon sequestration rates, which

vary by cropping practice and soil type.<sup>90</sup> Over time, the rate of carbon sequestration absorption decreases in trees and stops as it nears the saturation point, when no additional sequestration of carbon is possible.<sup>91</sup>

## PERMANENCE

Permanence is one of the major concerns with biological carbon sequestration projects such as REDD,<sup>92</sup> because it is key when trying to achieve overall emission reductions.<sup>93</sup> With biological sequestration programs—unlike emission reductions that achieve results by reducing the release of carbon—if the sequestered carbon is released sometime in the future, the sequestration program is a failure.<sup>94</sup> This concern over a potential release also applies to avoided deforestation, since avoided deforestation today may turn into future deforestation.<sup>95</sup> The release of sequestered carbon may result from human causes, such as changes in land use and management, or from natural causes, such as a fire.<sup>96</sup>

## **POLICY RECOMMENDATIONS AND CONCERNS: EXPANDING BEYOND THE MYOPIC CONFINES OF REDD TO RECOGNIZE AND INCLUDE OTHER ECOSYSTEMS AND SERVICES WILL RESULT IN NOT ONLY A GREATER CO<sub>2</sub> REDUCTION BUT OTHER IMPORTANT ENVIRONMENTAL BENEFITS.**

### OTHER ECOSYSTEMS: EXPANDING REDD TO MITIGATE REDD’S ACCOUNTING LOOPHOLES

The negotiations concerning biological carbon sequestration evolved over the years from COP-3 with the Kyoto Protocol’s recognition of LULUCF,<sup>97</sup> to the COP-6 debate,<sup>98</sup> and final recognition by COP-7 of a more expansive program recognizing additional activities.<sup>99</sup> In 2007, the Bali Action Plan of COP-13 acknowledged the need to establish incentives to reduce emissions from deforestation,<sup>100</sup> which was reiterated in the Copenhagen Accord of COP-15.<sup>101</sup> At COP-16, additional progress occurred with the decision to adopt the AWG-LCA-13 policy approaches and positive incentives on REDD.<sup>102</sup> Although the progression of the need to reduce emissions from biological sources is evident, the unifying theme over the COPs has come to focus on forests, as a result of the recognition of the need to reduce emissions from deforestation and degradation.<sup>103</sup>

The progression is also apparent with the IPCC accounting of emissions recognized by the UNFCCC.<sup>104</sup> The IPCC has released numerous reports over the years on forestry and carbon capture: in 1996, on Land-Use Change and Forestry (“LUCF”), which identified major emissions from large probable land use sources;<sup>105</sup> LULUCF in 2003, which expanded LUCF to include all carbon pools;<sup>106</sup> and in 2006, a report that transformed LULUCF into Agriculture, Forestry, and Other Land Use (“AFOLU”), which integrated both the agriculture and LULUCF sectors.<sup>107</sup>

While the IPCC accounting has evolved over the years to include all carbon pools from all sectors, the UNFCCC’s decisions and resolutions on RED, REDD, and REDD+ all focus on forestry.<sup>108</sup> Although emissions from forests are substantial and

the need to reduce forest emissions is necessary,<sup>109</sup> the UNFCCC should evolve negotiations on REDD+ to include all of the land use sectors recognized under AFOLU.

### *Is There a Better Scheme than RED, REDD, or REDD+?*

A scheme that would go beyond the confines of RED, REDD, and REDD+ is Reducing Emission from All Land Uses (“REALU”).<sup>110</sup> By applying AFOLU accounting, some of the emissions recognized by REALU would include forestland, grassland, cropland, settlements, wetlands, and other lands; meanwhile this would also account for agriculture and other land use emissions resulting from liming, urea, manure, enteric fermentation, nitrous oxide, and others.<sup>111</sup> REALU with AFOLU accounting would “include all land use proportionate to actual emissions and emission potential.”<sup>112</sup> REALU, like other proposals,<sup>113</sup> is supported by many organizations and is still evolving.<sup>114</sup>

One of the lingering issues pertaining to REDD is the definition of what is a forest<sup>115</sup>—or rather when does a tree become classified as a forest? The Kyoto Protocol and COP-9 provided a flexible definition based on tree crown cover, minimum land area per hectare, and minimum tree height,<sup>116</sup> a 2006 working paper by the FAO provided a ten-step process for selecting the optimal parameters for a forest definition,<sup>117</sup> and the IPCC special report on LULUCF noted the importance of clarity.<sup>118</sup> However, none of these definitions account for trees outside the forest or wetlands, which also sequester large quantities of carbon.<sup>119</sup> REALU with AFOLU accounting, since it covers all sectors, would recognize the tree that is not yet considered a forest under these other definitions, along with the vast expanses of wetlands.<sup>120</sup>

The definition of forests in the Kyoto Protocol also allows for “areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention such as harvesting or natural causes but which are expected to revert to forest” to maintain their forest classification.<sup>121</sup> The Kyoto Protocol establishes no duration for “temporarily unstocked” forest,<sup>122</sup> yet still regards these areas as forested.<sup>123</sup> Thus, the Kyoto Protocol does not recognize the release of emissions from clearcutting as long as there is an intention to replant the forest since it is only a “temporary” release.<sup>124</sup> Furthermore, the Kyoto Protocol forest definition does not account for the emissions from clearcutting of trees not classified as forest, regardless of whether there was an intention to replant the trees.<sup>125</sup> The Kyoto Protocol forest definition creates this “in or out” distinction for a tree,<sup>126</sup> which would not be a concern under the more expansive REALU with AFOLU accounting.<sup>127</sup>

Another issue created by distinguishing among trees is that of leakage.<sup>128</sup> To avoid leakage, forest B’s emissions should not increase as a result of a REDD program decreasing forest A’s emissions.<sup>129</sup> However, by only counting forests, a REDD program that decreases forest A’s emissions may result in an emissions increase from the non-forest area C of woody vegetation or wetlands.<sup>130</sup> Technically, there is leakage, since the increase in emissions from area C negated the decrease in emissions

from forest A.<sup>131</sup> Yet under REDD, which only pertains to forests, there is no leakage.<sup>132</sup> REALU, by applying a more expansive landscape accounting, AFOLU, would recognize the leakage coming from area C, since AFOLU encompasses sequestered carbon areas above and below ground, forested and non-forested.<sup>133</sup>

Reduction of forest emissions is necessary, as emissions from deforestation and forest degradation account for nearly twenty percent of total greenhouse gas emissions.<sup>134</sup> But it is also evident that the current attempts with RED, REDD, and REDD+ still falter in many areas because of the forest definition.<sup>135</sup> Emissions and leakages pertaining to wetlands, agriculture, and other land uses are not accounted for in forestry schemes.<sup>136</sup> Thus, the deficiency that stems from the definition of forests impacts the other accounting elements of REDD, additionality and leakage, which subsequently impacts measurement and verification.<sup>137</sup>

REALU with AFOLU captures all of the sectors, which is more effective and efficient<sup>138</sup> while also being more equitable since AFOLU accounting standards would apply to all countries. REALU and AFOLU sectors include high forest cover and low rates of deforestation (“HFLD”)<sup>139</sup> and low forest cover and low rates of deforestation (“LFLD”).<sup>140</sup> A phased implementation of biological sequestration starting with REDD that recognizes indigenous peoples’ rights, as established in COP-16,<sup>141</sup> and that transitions to REALU with AFOLU accounting, would prevent a delay in emission mitigation from the forestry sector while also allowing the necessary time for the development and refinement of REALU with AFOLU.<sup>142</sup> A REALU scheme with AFOLU may not address all of the biological sequestration issues, but it would alleviate many of the problems with the current efforts to mitigate forestry emissions under REDD.<sup>143</sup>

### *Wetlands: An Example of Biological Carbon Sequestration Within REALU but Excluded by REDD Type Schemes*

Wetlands include freshwater mineral-soil wetlands, peatlands, and estuarine wetlands (i.e. salt marshes) and in North America, they are the second largest natural carbon sink.<sup>144</sup> Worldwide wetlands store about 223 billion tons of carbon.<sup>145</sup> Although wetlands absorb about one-tenth of the amount of carbon as forests, wetlands absorb three times more than agricultural soils.<sup>146</sup>

While one-tenth might appear to be a small amount, wetlands currently only comprise 5.5% of the U.S. landmass because land use changes, such as agriculture, have led to the destruction of over fifty percent of wetlands.<sup>147</sup> In the United States, wetlands sequester thirty-five percent of the nation’s total terrestrial carbon and further loss of the wetlands would result in the release of sequestered carbon, increasing the carbon concentration in the atmosphere.<sup>148</sup> The North American<sup>149</sup> estuarine wetland carbon sequestration is currently estimated at over ten million tons per year.<sup>150</sup> Collectively, North American wetlands have the ability to sequester forty-nine million tons of carbon per year.<sup>151</sup> It is important to recognize that although wetlands

only comprise 5.5% of the total landmass,<sup>152</sup> the total sequestered carbon stored in wetlands is sixty-four billion tons, only slightly less than forests, which store sixty-seven billion tons<sup>153</sup> in twenty-five percent more land.<sup>154</sup>

Wetlands are a much more effective natural carbon sink than forests. As peatlands are drained and converted from wetlands to other land uses, the carbon oxidizes, which reduces the carbon captured in wetlands by about fifteen million tons per year in North America.<sup>155</sup> The recognition of wetlands by the UNFCCC and payment for the service of carbon sequestration would help mitigate the destruction of wetlands through land use changes.<sup>156</sup>

#### OTHER SERVICES: EXPANDING THE CARBON CENTRIC “PARTIAL” PAYMENT FOR ECOSYSTEM SERVICES TO RECOGNIZE CO-BENEFITS

In addition to storing carbon, forests provide multiple ecosystem services such as soil formation,<sup>157</sup> water cycle storage and release,<sup>158</sup> biodiversity conservation,<sup>159</sup> and nutrient recycling.<sup>160</sup> However, forests under a REDD scheme are only recognized for one ecosystem service, carbon sequestration.<sup>161</sup> Although carbon sequestration is an important and necessary ecosystem service provided by forests, the current REDD scheme can and already has led to the deterioration of other forest ecosystem services.<sup>162</sup>

The other ecosystem services that are not internalized by REDD are not only valuable but also necessary for native forests to survive.<sup>163</sup> Although REDD is a PES, in its current insular form REDD should be viewed as a Partial PES.<sup>164</sup> In contrast, the recognition of and payment for CO<sub>2</sub> sequestration, soil formation, water cycle storage and release, biodiversity conservation, and nutrient recycling could be considered a Full PES.<sup>165</sup> By recognizing these other economic benefits, mitigation of the perverse incentives induced by REDD would be mitigated.<sup>166</sup> The numerous ailments of the Partial PES REDD are reviewed below and illustrate the need for the transition to a Full PES, such as REALU with AFOLU accounting, to protect the forests and other ecosystems.<sup>167</sup>

#### *Soil Erosion: What Role Does Flora Coverage Play?*

The first ecosystem service that REDD does not recognize is that provided by soil in reducing or preventing erosion. Erosion occurs when the energy from water or wind is transmitted to the soil, and it increases after a forest is deforested or temporarily unstocked.<sup>168</sup> When raindrops hit exposed soil, such as a deforested area, the particles of soil and water are launched into the air.<sup>169</sup> When the land is covered by biomass, such as a forest, it protects the land area by dissipating the wind and water energy, which results in reduced soil erosion.<sup>170</sup>

After erosion occurs, the quantity of water runoff on the area of land increases, which reduces the availability of water for plant vegetation to grow.<sup>171</sup> The rate of erosion is often high on lands with higher gradients, with sometimes half of the soil within the splash eroding.<sup>172</sup> Deforestation on higher gradient land is regularly used to replace spent agricultural land damaged by erosion.<sup>173</sup>

The eroded soil can end up in ecosystems such as streams and lakes.<sup>174</sup> The shape of the Araguaia River in Brazil has changed, as sedimentation increased by twenty-eight percent, and the river became straighter and deeper.<sup>175</sup> According to the U.S. Department of Agriculture, the final destination for sixty percent of soil erosion is streams.<sup>176</sup> The Huang He River in China, often referred to as the Yellow River because of the color of the silt, transports and deposits two billion tons of soil per year into the Gulf of Bohai.<sup>177</sup>

For a forested area to prevent soil erosion, the forest must cover a minimum of sixty percent of the land.<sup>178</sup> Without the flora that reduces the rain and wind energy,<sup>179</sup> soil erosion results in a decrease in plant nutrients, such as nitrogen, phosphorus, potassium, and calcium.<sup>180</sup> Without these vital nutrients, yields in plant growth decrease.<sup>181</sup> The eroded soil can contain as much as three times the nutrient content as the soil that remains.<sup>182</sup> Fertilizers and pesticides, derived from hydrocarbons, along with irrigation, are often used to temporarily mitigate the natural nutrient depletion from erosion on cropland.<sup>183</sup> Once the application of hydrocarbon-based fertilizers and pesticides become futile against the barren soil, the cropland is abandoned.<sup>184</sup> To replace this wasted land, additional forests are cleared for agricultural use and the cycle repeats.<sup>185</sup>

While at first glance it may appear that a REDD scheme would mitigate many of the above soil erosion issues, since people would be paid to reduce deforestation and forest degradation, if the scheme uses the term “temporarily unstocked” in the definition of forests as the Kyoto Protocol does, it actually facilitates soil erosion.<sup>186</sup> Since the Kyoto Protocol establishes no duration for a “temporarily unstocked” forest, but still classifies it as a forest, with enough time, the extent of soil erosion may have degraded the soil to the point of not allowing the land to be “restocked” with the forest that once existed.<sup>187</sup> Since erosion increases water runoff, the soil in the “temporarily unstocked” region will have less moisture because less water has infiltrated the land, resulting in a decrease in water-storage capacity of the soil.<sup>188</sup> Additionally, the erosion of the soil reduces organic nutrients and soil depth, which are necessary to restock the forest.<sup>189</sup> Restoration of the eroded soil is a slow process that can take between “200 and 1,000 years to form 2.5 cm (1 inch) of topsoil under cropland conditions, and even longer under pasture and forest conditions.”<sup>190</sup>

#### *Water Cycle: Does Variation in Root Depth Matter?*

The second ecosystem service not recognized by REDD is the water cycle storage and release provided by the deep roots of forests. After a forest is removed as a result of deforestation, the flora that replaces the forest typically has shallower root structures and fewer leaves, which results in the new flora requiring less water than the forest.<sup>191</sup> The evaporation from the new flora is less than that from a forest because the new flora has shallower roots.<sup>192</sup> This decrease in evaporation reduces the quantity of water vapor returned to the atmosphere, resulting in more water runoff from the land and increasing stream flow.<sup>193</sup> Thus the shallower roots result in less water availability and



evapotranspiration during the dry season along with less precipitation during the wet season, all of which negatively impact the water cycle.<sup>194</sup>

The degree of impact on the water cycle depends on not only how the forested land is utilized after deforestation but also how much of the forest remains.<sup>195</sup> Deforestation of twenty percent or less will have little effect on the water cycle while deforestation of fifty to one hundred percent, which typically results from modern agricultural and heavy equipment use, can result in a large change in the quantity of water runoff.<sup>196</sup> In Brazil, the deforestation of about fifty percent of the Tocantins and Araguaia watersheds over the past fifty years has resulted in a twenty-five percent annual increase in river discharge.<sup>197</sup>

The decrease in evapotranspiration, because of the decrease in root depth,<sup>198</sup> impacts the heat flux, resulting in a decrease in the cooling of the surface soil, equating to higher surface temperatures, especially during the dry seasons.<sup>199</sup> The dry season is vital for reforestation efforts, but because of the impacts from deforestation, such as a decrease in evapotranspiration and an increase in surface temperature, there may be a water shortage.<sup>200</sup> This decrease in evapotranspiration can result in extended drought periods, thus slowing the uptake of the reforestation efforts and possibly making the habitat more hospitable for drought-resistant species.<sup>201</sup>

However, there is cause for concern if the project uses a definition for forests that permits them to be “temporarily unstocked.”<sup>202</sup> Although the removal of the forest is not classified as deforestation, because there is an intention to restock the forest, the deep roots from the forest are “temporarily” killed.<sup>203</sup> Without deep roots, the evapotranspiration will decrease and the water runoff will increase.<sup>204</sup> This in turn makes reforestation efforts more difficult because the quantity of water stored in the soil has decreased<sup>205</sup> and the surface temperature has increased.<sup>206</sup> If schemes allow for forests to be temporarily unstocked they assume the replanting of the forest and that the restocking of the forest will negate the initial carbon release.<sup>207</sup> Nevertheless, this reasoning is myopic since successful restocking is dependent on the root growth, and reestablishment of deep roots will likely be more difficult because of longer dry periods that are “warmer, drier and more intense.”<sup>208</sup>

### *Biodiversity: Does REDD's Focus on Carbon Concentration Create Perverse Incentives for Other Ecosystems?*

The third ecosystem service that REDD does not internalize is biodiversity of fauna and flora that have a symbiotic relationship with the forest. Forests cover roughly seven percent of the Earth's dry land, yet they may contain half of the species on Earth.<sup>209</sup> Some species are so particular to their forest microhabitats that they live nowhere else, which increases the chances of their extinction.<sup>210</sup> After deforestation and loss of these specialized species, the surrounding fauna and flora may also face extinction as the biodiversity in the forest decreases and the habitat becomes fragmented.<sup>211</sup> In Riau, Indonesia, the

tiger population actually declined at a quicker rate than the rate of deforestation because of habitat fragmentation.<sup>212</sup>

The fauna and flora also impact the soil composition.<sup>213</sup> Before deforestation, the forest soil is teeming with organic matter, possibly supporting up to one thousand species of fauna per square meter.<sup>214</sup> The bacteria and fungi in the soil can add an additional four to five thousand diverse species.<sup>215</sup> However, the lack of forest cover exposes the soil to erosion, washing the nutrients from the deforested land and further diminishing biodiversity, and potentially causes the surrounding ecosystem to collapse.<sup>216</sup>

Although initially it would appear as though REDD would complement efforts to protect biodiversity, low-biomass and high-diversity ecosystems, such as grasslands, savannas, woodlands, and transition forests, may be at a disadvantage for protection when compared to high-biomass forests, such as plantations.<sup>217</sup> This is because REDD focuses on the quantity of biological carbon sequestered and thus biomass that sequesters more carbon, i.e. high-biomass ecosystems, are more advantageous for REDD projects than ecosystems that store less carbon, i.e. low-biomass ecosystems.<sup>218</sup> This focus on carbon concentration in biomass results in a preference for high-biomass ecosystems even if the low-biomass ecosystem has a higher conservation value pertaining to biodiversity, soil, and water, since the focus of REDD is on biomass concentration and not biodiversity.<sup>219</sup> Thus, REDD programs will be more apt to protect high-biomass ecosystems because of the higher return on investment, which is based on carbon concentration, than that of a low-biomass high-diversity ecosystem, with the latter likely being more prone to conversion for agricultural use.<sup>220</sup>

Forests with high-diversity native ecosystems must also counter the introduction of alien species that grow quickly, such as monocrop eucalyptus plantations.<sup>221</sup> With REDD's focus on high-biomass because of carbon credits, trees that grow quickly, such as eucalyptus trees, are already encouraging some REDD projects to introduce these alien monocrop species.<sup>222</sup> In Brazil, in an effort to earn carbon credits, eucalyptus plantations, which are native to Australia, are replacing savannas and high-diversity cerrado woodland ecosystems.<sup>223</sup> However, these eucalyptus plantations, since they are non-native, often require fertilizers and pesticides, which increases the risk of chemical contamination and soil degradation.<sup>224</sup> Additionally, the definition of forests under the Kyoto Protocol makes no requirement that a temporarily unstocked forest be restocked with species native to that ecosystem.<sup>225</sup>

Furthermore, genetically modifying the non-native species to increase the chance of survival in the foreign habitat is another risk since species with increased resilience may overtake the native species.<sup>226</sup> These practices currently occur under REDD projects and is one of the perverse incentives induced by REDD since the accounting does not recognize a distinction between carbon stored in genetically modified species versus native species.<sup>227</sup> This deficiency in REDD is one of the reasons that organizations are proposing REALU with AFOLU accounting since



it does recognize the carbon sequestered in native species of the savannas and woodlands.<sup>228</sup>

The exclusion of ecosystems from the Kyoto Protocol separated biodiversity and ecosystems from carbon and climate change, and has resulted in the UNFCCC ignoring these synergies and placing biodiversity at risk.<sup>229</sup> This is unfortunate and inward-looking by the international community because only five years prior to the adoption of the Kyoto Protocol, the United Nations Conference on Environment and Development, more commonly known as the Earth Summit, in Rio de Janeiro in 1992<sup>230</sup> resulted in numerous important achievements, two of which were the Convention on Biological Diversity (“CBD”)<sup>231</sup> and the Framework Convention on Climate Change (“UNFCCC”),<sup>232</sup> the latter of which lead to the Kyoto Protocol.<sup>233</sup>


Some might view the link between these two documents as only being intrinsic, but in 2001, the CBD’s Subsidiary Body on Scientific, Technical and Technological Advice took “note of the discussion of the interlinkages between biological diversity and climate change.”<sup>234</sup> Two years later, the Secretariat of the CBD released a formal report<sup>235</sup> and in 2008, COP-9 of the CBD recognized the possible use of REDD pertaining to climate change<sup>236</sup> but also the need to monitor “the threats and likely . . . impacts of climate change mitigation and adaptation activities on biodiversity.”<sup>237</sup> In 2009, the Secretariat of the CBD released a second formal report and a year later at COP-10, the CBD recognized the need to “enhance the benefits for, and avoid negative impacts on, biodiversity from [REDD].”<sup>238</sup> Moreover the CBD stressed the need to consider “converting only land of low biodiversity value or ecosystems largely composed of non-native species, and preferably degraded ones” while also “avoiding [the use of] invasive alien species.”<sup>239</sup>

Although the CBD has been proactive in recognizing the interlinkages between biological diversity and climate change, the UNFCCC is focused almost exclusively on the objective outlined in 1992—the adverse affect of anthropogenic climate change on natural ecosystems and humankind.<sup>240</sup> At COP-16, the AWG-LCA under the Convention indicated that actions should be “consistent with the conservation of natural forests and biological diversity” and that they should not be “used for the conversion

of natural forests, but are instead used to incentivize the protection and conservation of natural forests and their ecosystem services, and to enhance other social and environmental benefits.”<sup>241</sup> While the AWG-LCA document does mention biodiversity, the UNFCCC continues to be myopic in regards to biodiversity and makes no reference or granular distinction like the CBD’s document between low- and high-biodiversity ecosystems or the risk of introducing alien species, such as eucalyptus trees.<sup>242</sup>

## CONCLUSION

The accounting of REDD, which focuses on additional-ity, definitions of forests, leakage, measurement, verification, and permanence, while all important facets, is not actually the difficult part of implementing a successful REDD program.<sup>243</sup> These “difficult” facets are merely illusions that hide the true difficulties of REDD, the loopholes that REDD accounting are plagued with.<sup>244</sup> The lack of protection of other ecosystems and services beyond CO<sub>2</sub> sequestration, which REDD accounting externalizes instead of internalizes, facilitates the market’s ability to exploit these loopholes, without regard to the externalities imposed on others.<sup>245</sup>

REDD accounting currently gives no regard and thus no value to soil formation, water cycle storage and release, or biodiversity conservation and nutrient recycling.<sup>246</sup> REDD simply facilitates the market determination of the price of carbon stored at the expense of these other ecosystems and services provided by nature.<sup>247</sup> Adam Smith’s recognition of labor, land, and capital resulted in a more accurate valuation and pricing of these other ecosystems and services.<sup>248</sup> However, REDD in its current form classifies land as a subcategory of capital by disregarding these other ecosystem services.<sup>249</sup> Although a transition from REDD to REALU with AFOLU accounting may not mitigate all of REDD’s externalities, it would help to elevate and start to recognize land as an equal with labor and capital.<sup>250</sup> Therefore, since REDD merely determines the price of carbon without valuing the other ecosystem services provided by forests, environmentalists, when sequestering and monetizing carbon, must not forget Oscar Wilde’s definition of a cynic: “[a] man who knows the price of everything and the value of nothing.”<sup>251</sup> 

## Endnotes: Is REDD Accounting Myopic?

<sup>1</sup> See OSCAR WILDE, *LADY WINDERMERE’S FAN, A PLAY ABOUT A GOOD WOMAN*, ACT III (1892) (“LORD DARLINGTON. What cynics you fellows are! CECIL GRAHAM. What is a cynic? [Sitting on the back of the sofa.] LORD DARLINGTON. A man who knows the price of everything and the value of nothing. CECIL GRAHAM. And a sentimentalist, my dear Darlington, is a man who sees an absurd value in everything, and doesn’t know the market price of any single thing.”).

<sup>2</sup> *Id.*

<sup>3</sup> See ADAM SMITH, *THE WEALTH OF NATIONS, AN INQUIRY INTO THE NATURE AND CAUSES OF THE WEALTH OF NATIONS* 70-75 (1822) (listing the “component parts of price” — land, labor, and capital stock).

<sup>4</sup> THORSTEIN VEBLEN, *PRECONCEPTIONS OF ECONOMIC SCIENCE* 58 (1990) (introducing the term “neoclassical economics”).

<sup>5</sup> See PAUL SAMUELSON & WILLIAM NORDHAUS, *ECONOMICS* (back of front cover) (1948) (introducing the term “mainstream economics”).

<sup>6</sup> Murray N. Rothbard, *Free Market*, *THE CONCISE ENCYCLOPEDIA OF ECONOMICS* (2008), <http://www.econlib.org/library/Enc/FreeMarket.html>.

<sup>7</sup> JIM PIPE, *EARTH’S ECOSYSTEMS* 4 (2008).

<sup>8</sup> See JAMES BOYD ET AL., *RESOURCES FOR THE FUTURE, WHAT ARE ECOSYSTEM SERVICES? THE NEED FOR STANDARDIZED ENVIRONMENTAL ACCOUNTING UNITS* 1 (2006), <http://www.rff.org/Documents/RFF-DP-06-02.pdf> (defining ecosystem services as “the benefits of nature to households, communities, and economies”).

<sup>9</sup> Compare SMITH, *supra* note 3, at 70-75 (listing the “component parts of price” — land, labor, and capital stock) with MERTON H. MILLER, *MACROECONOMICS: A NEOCLASSICAL INTRODUCTION* 19 (1986) (“The neoclassical growth model . . . take[s] human labor as one of two inputs . . . [t]he second factor of production, however, is no longer land but capital . . .”).

# THE TORTUOUS ROAD TO LIABILITY:

## A CRITICAL SURVEY ON CLIMATE CHANGE LITIGATION IN EUROPE AND NORTH AMERICA

by Luciano Butti\*

### INTRODUCTION

Climate change is increasingly coming to the fore of public debate. Since the adoption of the Kyoto Protocol on December 10, 1997<sup>1</sup> and its entry into force on February 16, 2005,<sup>2</sup> the international community has drawn increasing attention to the topic of carbon dioxide (“CO<sub>2</sub>”) emissions. The most recent international meetings and political trends, such as the Copenhagen Climate Conference of 2009<sup>3</sup> and the latest steps taken by the U.S. administration<sup>4</sup> have resulted in perplexity and criticism from many international commentators.<sup>5</sup> Critics have argued that “the Copenhagen Accord left most substantive disagreements unresolved.”<sup>6</sup> However, these recent developments have paved the way for a more informed debate on global warming and environmental issues in general.<sup>7</sup>

The development of high-profile domestic and global discussion has also impacted the legal realm.<sup>8</sup> In recent years, particularly since 2006,<sup>9</sup> climate change lawsuits have increased in quantity and in sophistication, presenting one of the newest challenges within the public law arena. The increased sophistication of climate change lawsuits is a result of individuals who recognize that climate regulation is an issue for both governments and citizens to pursue. This mounting public awareness is evident in U.S. climate change lawsuits. The vast majority of U.S. climate change-related claims are based on individual or communal actions meant to influence industrial and environmental policies by promoting regulation and impact assessment. The U.S. focus on “regulatory claims,” rather than on tort law claims, is mainly due to the difficulties individual applicants face in showing *locus standi*, in demonstrating direct liability of the entity sued, and in finding a feasible pathway for redressability. On the other hand, European climate change litigation has blossomed out of private and governmental market-induced interests, as they have been brought primarily with respect to “carbon market” issues. Such a tendency has clearly been highlighted by European Union Courts’ case law concerning the European Union Emissions Trading System (“EU ETS”) Directive.

An additional method of linking climate change to legal claims is the presentation of individual actions for damages directly associated with global warming-related human rights violations. Although important, such an approach to climate change litigation is still far from being widely accepted by courts. The decisions of the European Court of Human Rights (“ECtHR”) and the Inter-American Commission on Human Rights (“IACHR”) are not encouraging for the prospects of the

viability of human rights claims within the climate change context. Therefore, it may be a long time before climate change litigation becomes commonplace among individual rights claims.

This article provides an overview of the evolution of climate change related litigation, highlighting the differences and similarities between the U.S. and the European context. Additionally, the article analyzes the future perspective of such claims and concludes with a discussion concerning the possibility of linking climate change to human rights.

### CLIMATE CHANGE LITIGATION: THE UNITED STATES SCENARIO

Recent U.S. case law involving climate change demonstrates that most successful claims concern existing regulations. This is due to the specific aims that applicants pursue, using “existing law—primarily environmental law—to force or block regulatory behavior” in response to policy failures.<sup>10</sup> Thus what climate change litigation has so far achieved is to effectively function as a “gap-filling role” as defined by Professor Hari Osofsky.<sup>11</sup>

The results of a recent study relating to climate change cases filed through the end of 2009 highlights that the courts play a pivotal role in governance, especially with respect to partially unregulated areas such as those of environmental law, regulation, and responsibility.<sup>12</sup> The same survey depicts a situation where almost 40.5% of legal actions related to climate change are brought to achieve “substantive mitigation regulation.”<sup>13</sup> Therefore, most controversies are based on the willingness of public bodies, states, companies, or non-governmental organizations (“NGOs”) to urge for public intervention, focusing on the necessity of the limitations of the promulgation of statutes and policies establishing more stringent limits on emissions. The 2006 U.S. Supreme Court case of *Massachusetts v. EPA*<sup>14</sup> is probably the most distinguished example of a regulatory claim

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in the context of climate change.<sup>15</sup> Twelve states, three cities, a U.S. territory, and several NGOs claimed that the Environmental Protection Agency's ("EPA") denial of a petition to address CO<sub>2</sub> emissions was an arbitrary exercise of the EPA's mandatory function.<sup>16</sup> Many petitions of the same nature<sup>17</sup> have been filed by public and private actors<sup>18</sup> in state and federal U.S. courts to promote enhanced regulation of carbon dioxide emissions and to force public authorities to take positive action in limiting CO<sub>2</sub> pollution. Such pressures by both public and private actors ultimately resulted in urging public authorities to reform the existing regulatory framework, which happened mainly through the modification of existing laws. Examples of these modifications may be found in some of the major environmental related acts such as the Clean Air Act of 2000 ("CAA") or the National Environmental Policy Act of 1969 ("NEPA").<sup>19</sup> The aforementioned statistics uncontroversibly demonstrate that in most circumstances "climate change litigation . . . represents an effort to fill perceived regulatory gaps."<sup>20</sup>

A second trend playing a dominant part in U.S. climate change litigation is what Professors David Markell and J.B. Ruhl have defined as "Procedural Monitoring, Impact Assessment, and Information Reporting."<sup>21</sup> Claims that fall within this category are similar in scope to those of the "regulatory claims model" outlined above, as they seek to impose on public or private entities new or more stringent obligations in monitoring, assessing, or disclosing the environmental impact of activities that such entities perform. An example of this type of claim is the complaint for declaratory and injunctive relief that Greenpeace, Friends of Earth, and four U.S. cities filed against a private investment corporation and a bank for the failure to produce an environmental impact assessment when developing heavily polluting overseas projects.<sup>22</sup> Some fifty-five petitions of this kind have been filed in U.S. courts with the same monitoring and assessment purpose,<sup>23</sup> representing the majority of the U.S. climate change related claims.

Thirdly, tort claims, mostly public nuisance and negligence, have also been brought in U.S. litigation.<sup>24</sup> However, case law concerning the violation of individual rights and liabilities represents only a small minority of the legal arguments brought before U.S. judges when compared to the amount of cases aimed at pushing authorities toward a more efficient, large-scale regulation of CO<sub>2</sub> emissions.<sup>25</sup> Although tort law as a basis for climate change challenges has advanced from a situation in which "such cases were . . . derided as frivolous long shots that would be shot down quickly"<sup>26</sup> to one in which more reliance is placed in claims of individual harms from CO<sub>2</sub> emitters, such claims have yet to result in fully successful outcomes.

The difficulties complainants encounter are numerous when seeking redress of environmental wrongs linked with carbon emissions through tort actions.<sup>27</sup> The primary hurdle for applicants is demonstrating substantial interest for standing.<sup>28</sup> The "classic" U.S. theory of environmental *locus standi* does not fit the peculiar requirements of climate change.<sup>29</sup> Climate change usually does not entail the existence of a specific natural feature (e.g. a river or a forest) which human behavior is about to

despoil or endanger. On the contrary, climate change stems from a multiplicity of sources and affects different aspects of the environment including: arctic melting, rising sea-levels, and disappearing endangered species due to changed weather conditions; these are merely examples of the numerous, yet unpredictable, consequences of greenhouse gas emissions in the atmosphere.<sup>30</sup> Since it is difficult to identify the specific harms that may affect the environment and the specific species that are at risk of being endangered, it is that much more difficult for a judicial panel to grant standing to the plaintiffs.<sup>31</sup>

The most difficult standing-related hardship that applicants must face when filing emissions-related court claims is proving an emitter's direct responsibility. It is often argued that there are not a definitive number of entities liable for climate change, or that, on the contrary, this number is too great. Scholars have tried to overcome such hurdles by applying innovative theories on climate change liability,<sup>32</sup> some of which aim to establish a link between local causation and local consequences.<sup>33</sup> These doctrines may prove successful in those cases where the damages at stake are clearly identifiable (and, therefore, the obstacle of *locus standi* has already been surmounted) and where such damages occur in areas where major emitters directly operate. Also, the application of the environmentally based precautionary principle to tort litigation may provide a clearer basis for allocating liability, thereby providing a reverse burden of proof under which "economic actors are liable unless they can prove that their activities are environmentally harmless."<sup>34</sup> Such a principle though, despite having been frequently recognized as a "general principle of international law,"<sup>35</sup> has not yet been accepted by U.S. courts, so that future applications within the United States still appear highly improbable.

However, even if these doctrines may sometimes prove successful, applicants may not always find the road to redress clear of impediments since "there is at present no international liability framework directly applicable to climate change-related damage."<sup>36</sup> This is demonstrated, for instance, by the unfortunate outcome of *Connecticut v. American Electric Power Company*,<sup>37</sup> in which plaintiffs unsuccessfully alleged infringement by six U.S. power companies (alleged to be major polluters with respect to carbon dioxide emissions) of federal and state public nuisance law.<sup>38</sup> Although the decision was reversed by the U.S. Court of Appeals for the Second Circuit,<sup>39</sup> the District Court decision represents a valuable example of an approach that is still frequently adopted by U.S. courts. Even if it were proven beyond a reasonable doubt that climate change-related damages had actually occurred, it would nonetheless be difficult to identify the entity liable for damages.<sup>40</sup>

Finally, there is one other barrier to justiciability which may be the most difficult to overcome. The "political question doctrine" permits judges to defer climate change questions for political consideration reason.<sup>41</sup> The doctrine highlights the fact that climate change concerns are more appropriate for the legislative branch of the government than for the judiciary.<sup>42</sup> The original District Court's decision in *Connecticut v. American Electric Power Co.* aligned with this doctrine,<sup>43</sup> which is now at the center of the American debate.<sup>44</sup>



Nevertheless, tort claims have attracted a lot of attention from the public. Many “liability” actions result in widespread discussion. Some of the most renowned examples include the Inuit Circumpolar Conference Petition, which will be further examined below,<sup>45</sup> or the Hurricane Katrina case,<sup>46</sup> in which victims of the Katrina hurricane sought compensation from CO<sub>2</sub> emitters for loss of private property and use of public property.<sup>47</sup>

In light of the above, it can be concluded that the U.S. approach to climate change litigation has been primarily based on regulatory claims. Although it is debatable whether the CAA is the most suitable instrument for addressing such problems,<sup>48</sup> it is nonetheless clear that judicial rulings cannot substitute for robust and stringent policies on global warming and carbon emissions, and that the “abdication of congressional responsibility” feared by some commentators should be avoided.<sup>49</sup> Despite the fact that many, even within Congress, applauded the initiatives undertaken by the Supreme Court, viewing them as ways to enact CO<sub>2</sub> controls without directly taking responsibility for them, it has been noted that such ceding of legislative power to non elected litigators and judges may ultimately endanger the principle of representative democracy.<sup>50</sup>

### CLIMATE CHANGE LITIGATION: THE EUROPEAN SCENARIO

European climate change litigation has differed from that of the U.S. mainly because of the diverse and less homogeneous framework that characterizes Europe. Each European state tends to tackle domestic issues, including those related to the environment, with a unique and cultural-specific approach, not only from a legal perspective, but also from political and cultural points of view.

To identify a common European trend, it is necessary to reference the supranational political framework provided by the European Union (“EU”) institutions, which have been far-sighted in enacting a thorough regulation of greenhouse gas emissions. When analyzing EU climate change policies, recall that the EU, which was born out of the ashes of a purely economic entity,<sup>51</sup> is facing a difficult process of integrating political, military, financial, and cultural aspects.<sup>52</sup> This process is ongoing, with many purported goals still unachieved, and the road to further unification seems at present tortuous and uncertain.<sup>53</sup> Although important steps have been taken to allow individuals to use the European Union Foundation Treaties, which include the defense of individual subjective rights,<sup>54</sup> when European Union litigation is involved (the Luxembourg-based Court of First Instance and European Court of Justice) the concerns of applicants and defendants are arguably of a purely economic nature.<sup>55</sup>

Directive 2003/87/EC established a greenhouse gas emission allowance trading system within the Community<sup>56</sup> commonly known as the Emissions Trading Scheme (“ETS”),<sup>57</sup> which fixes a number of allowances for the quantity of CO<sub>2</sub> that can be emitted by a single Member state over a particular period; the level of emissions in such period shall then “be equal to the established cap.”<sup>58</sup> Under the ETS, Member states may buy and sell allowances, thereby creating a supply and demand model that forms a basis for the European carbon market.

As a result, carbon market litigation has ensued, resulting in a considerable number of proceedings before the Luxembourg Courts, which have been conceptually divided into the following three categories:<sup>59</sup> challenges to the validity of the Directive,<sup>60</sup> infringement proceedings,<sup>61</sup> and challenges to decisions of the European Commission on the National Allocation Plans<sup>62</sup> designed by Member states for re-allocating the allowances to national installations.<sup>63</sup> The case of *Abraham and Others*<sup>64</sup> slightly detaches itself from this categorization since the applicants asked the European Court of Justice (“ECJ”) to interpret the European Environmental Impact Assessment Directive (85/337/EEC) so that restructuring of the Liège-Bierset Airport could be included within the definition of “project” set out in the directive, and the environmental impact assessment could be considered mandatory for the restructuring.<sup>65</sup>

Although many claims have been brought with respect to carbon market issues, regulatory claims are similarly predominant in Europe. Even the abovementioned case of *Abraham and Others*, although directly linked to the impact of potentially polluting works on the well being of a community, was aimed at triggering inclusionary interpretation by the ECJ of a specific regulation.<sup>66</sup> Evidently, little room is left for individual applications aimed at recovering damages suffered as a result of global warming and, therefore, linked to CO<sub>2</sub> emissions. Currently “EU ETS litigation is not concerned with the impacts of climate change . . . but rather the finessing of a new market mechanism from the perspective of key market actors within the established confines of EU law.”<sup>67</sup>

The implications of this mainly regulatory approach to climate change litigation are even worse for Europe than they are for the U.S. Although the U.S. carbon emissions framework is in dire need of further regulation,<sup>68</sup> and though litigation may not be a completely adequate substitute for legislative control, the benefits of litigation far outweigh the drawbacks of total inaction. In Europe, where the ETS is the core of the carbon emission regulatory framework, climate change related claims are primarily concerned only with the applications of such a scheme.<sup>69</sup> The influence of the resulting jurisprudence thus ends up being considerably more limited, and the possibilities of evolution more scant.

In addition, other criticisms may arise. Firstly, as has already been mentioned, regulation is not considered by some as an appropriate task for judges. Even though such an assertion is debatable, it will always be difficult for counter-arguments to prevail, even from a theoretical standpoint.<sup>70</sup> It may be argued, for instance, that the strict “separation of tasks” theory, which some British judges are already accustomed to,<sup>71</sup> is often supported by governments, entities, and courts for nothing but specious reasons.<sup>72</sup> Such arguments, though, appear particularly difficult to prove, and the “spatial separation of competence theory” remains difficult to rebut.<sup>73</sup>

Secondly, once a regulatory mechanism has been successfully implemented, it may not suffice on its own to reduce the effects that greenhouse gases have on the environment.<sup>74</sup> As Philippe Cullet argues, “[I]t cannot be expected that the Climate



Change Convention, the Kyoto Protocol, or any other protocol . . . would be sufficient to effectively mitigate global warming so as to avert the need for adaptation . . . .”<sup>75</sup> In other words, the EU ETS Directive, as well as the other international instruments mentioned by Cullet, should be supported by a more complete framework of policies (for instance, liability schemes applicable at the international level), in order to be more effective at preventing—or at least in limiting—climate change.

Thirdly, a lack of political willingness to attain a stricter liability regime for ecological damages exists. The European Environmental Liability Directive, which entered into force in 2009<sup>76</sup> with the purpose of harmonizing the concept of pollution and the reinstatement of regimes throughout the region, has been until now heavily criticized for not having provided Europe with the expected uniformity with regard to liability for ecological damages.<sup>77</sup> Similarly, the 1993 Lugano Convention on Civil Liability for Damage Resulting from Activities Dangerous to the Environment,<sup>78</sup> which established tougher rules for liability for environmental damages,<sup>79</sup> has not yet been ratified or entered into force.<sup>80</sup>

The above analysis clearly does not favor a bright future for a comprehensive civil liability regime for damages stemming from carbon dioxide emissions.<sup>81</sup> The outcomes of the efforts made by applicants in the human rights law arena are not any more encouraging.

## LINKING CLIMATE CHANGE TO HUMAN RIGHTS

Recent attempts to link climate change claims to human rights principles have not achieved any revolutionary outcomes. While several human rights-based petitions alleging climate change damages have been filed in international or regional tribunals, none of them has yet come to a completely favorable conclusion for the applicants.

The Inuit petition filed at the IACHR,<sup>82</sup> by far the most famous case in which a human rights-focused body addressed climate change, featured applicants seeking “relief from human rights violations resulting from the impacts of global warming and climate change caused by acts and omissions of the United States.”<sup>83</sup> The action was brought against the U.S. for being the largest emitter of greenhouse gases and because, according to the applicants, it continually refused to undertake serious efforts to reduce emissions.<sup>84</sup> The IACHR rejected the petition, holding that the information provided by the claimants did not enable the Commission to determine whether the alleged facts entailed a violation of the rights protected by the American Declaration of the Rights and Duties of Man.<sup>85</sup> Even though a subsequent hearing could be held by the IACHR focusing on “the right to use and enjoy property; the right of peoples to enjoy the benefits of culture; and the rights to life, physical integrity, and security,”<sup>86</sup> no further action has been taken.<sup>87</sup>

The Inuit petition outcome may sound surprising, especially in light of the fact that the IACHR had previously upheld indigenous people’s claims related to violations of rights analogous to those mentioned in the petition.<sup>88</sup> However, the Inuit petition distinguishes itself from other indigenous communities’ legal actions because of its peculiar liability-related aspects. It is

difficult to establish direct links of causation between emitters, no matter how big they are, and damages when climate change is involved. In addition, it can be argued that a decision holding the United States responsible for arctic melting and other damages related to CO<sub>2</sub> emissions would have ended up being too big of a step, providing legal basis for claimants all around the world to sue Western industrialized countries for sea-level rise, hurricanes, flooding, and other effects of climate change. It is undisputable that politically revolutionary decisions have to be balanced with political counter-interests that cannot be set aside: therefore, justices and commissioners tend to be cautious before allowing potentially destabilizing claims to succeed.

In Europe, claimants have not been any more successful. The ECtHR, based in Strasbourg and acting within the framework of the 1951 European Convention of Human Rights (“ECHR”),<sup>89</sup> is renowned for being the most important tribunal for assessing human rights claims in Europe and one of the most efficient civil rights monitoring bodies in the world.<sup>90</sup> However, the area pertaining to environmental damages is a partially neglected area in the ECtHR’s case law: successful claims in connection with the environment have so far been grounded mostly on Article 8 of the ECHR on protection of private and family life, broadly interpreted so as to include interferences with individuals’ well-being caused by public nuisance and environmental damage.<sup>91</sup> In the context of violation of property rights,<sup>92</sup> the Court has also recognized that “the environment is a value in itself in which both society and the public authorities take keen interest.”<sup>93</sup> Although the ECtHR has recently begun to consider the precautionary principle, while assessing claims on unlawful interference on the applicant’s right to a healthy life,<sup>94</sup> there are several obstacles that impede climate change-related claims from being justiciable within the ECHR framework.

First, for a claim to succeed, applicants must demonstrate a concrete interference of their rights beyond all doubt.<sup>95</sup> Given that the Convention does not provide for an express right to a safe and healthy environment, whether the latter is included within the scope of Article 8 (the right to private and family life) or Article 1, Protocol 1 (the right to peaceful enjoyment of possession) of the ECHR, is a matter of interpretation. In light of the abovementioned case law, this hurdle may not seem insurmountable. However, climate change claims are different from the classic “environmental claims” brought before the ECtHR because in the former no explicit link between emissions and damages can be easily demonstrated.<sup>96</sup>

Second, in the unlikely case of an incontrovertible causal relationship between greenhouse gases and local damages in Europe, the “margin of appreciation” doctrine could serve as a convenient tool for the ECtHR judges to defer the matter to the national regulatory level.<sup>97</sup> In short, once a private or public entity has satisfactorily demonstrated that domestic law on greenhouse gas emissions has not been infringed upon, the Court could decide to leave this sensitive area of judgment to the discretion of national Member states’ authorities (legislators and judges), thereby abiding by the Court’s subsidiary role.<sup>98</sup>

It has been recently argued that the ECtHR should address climate change within the scope of the right to property, namely that of protecting private low-carbon investors against risks of excessive state interference through regulatory changes and the imposition of heavy financial burdens.<sup>99</sup> This innovative and practical approach is proof that there are strong countervailing interests (namely, those of investors and corporations) that should be balanced with the perceived need of establishing the civil liability of corporations and emitters. These countervailing interests are worth considering if their aim is “stimulat[ing] the flow of private capital in the implementation of low-carbon investments.”<sup>100</sup>

In other fora, more attention has been drawn to the human rights implications of climate change. For example, in *Gbemre v. Shell*<sup>101</sup> the Federal High Court of Nigeria held that gas flaring, an unconstitutional practice in breach of the fundamental human right to health, also contributes to adverse climate change as it emits carbon dioxide.<sup>102</sup> The case is particularly important because it is “one of the first where a national court held that climate change, like other environmental issues, may implicate human rights.”<sup>103</sup> However, the Nigerian judges’ conclusions on climate change are not final and do not address global warming directly since gas flaring was the real underlying issue in the case.


In light of the above, it is clear that counter-interests have thus far prevailed over the commitment of states to take a strong standpoint against violations of fundamental human rights caused by human-induced global warming. Arguments against linkages between climate change and human rights law have been brought on several grounds, including the idea that international human rights actors and tribunals should prioritize other emergencies (which are also depicted as easier to cope with in legal terms) and concerns relating to the current trend of excessive anthropocentricity under which climate change is currently being approached.<sup>104</sup> The most convincing explanation of the scant success obtained by climate change petitions in human rights fora seems to be, however, the one which links together hypothetical favorable judgments and their potential consequences, and which takes into account the countervailing economic interests of major public and private emitters.<sup>105</sup> The unwillingness of domestic tribunals throughout the world to acknowledge the existence of “environmental refugees” (who often flee from their countries because of the consequences of climate change) and to grant to such migrants the state-onerous refugee status is clearly another side of the same story.<sup>106</sup> In this sense, the obstacles that prevent human rights tribunals from intervening directly in the climate change issue are similar to those that actors seeking redress in domestic tort actions have found.

## CONCLUSION: BLEAK PROSPECTS FOR CIVIL LIABILITY?

Notwithstanding the recent developments of the environmental liability doctrine, which seems to be undergoing a process of strong “internationalization,”<sup>107</sup> it can be concluded that the road to clear and convincing guidelines for establishing liability in cases of climate change-originated damages still appears to be long and tortuous. Even those authors who have tried to provide climate change litigation advocates with a “more realistic understanding of the scientific reality of causation” that “will suitably address climate change”<sup>108</sup> have had to deal with the fact that the proposed solution of making recourse to “probabilistic causation” still leaves several problems unsolved.<sup>109</sup>

Moreover, all the proposed “technical” solutions for establishing airtight causal links tend to overlook the political and institutional problems underlying the task that courts should perform in relation to climate change. As it has been argued in this article, there is a lack of commitment by governments, judges, and other public and private multinational actors to allow the courts to take over the role, which many see as best left to domestic and international regulators. Should a court provide leeway for claimants to obtain redress for damages not strictly linked to local infringements, more petitions would proliferate and the consequences on the international equilibrium would be immense.

The scenarios discussed may be satisfying to those who are “skeptical that tort litigation will be an effective way to combat climate change.”<sup>110</sup> However, from a different standpoint, this “skeptical” approach appears to be misplaced as it tends to confuse the regulatory function with that of assessing damages. While on the one hand it is difficult to rebut the critiques that regulation should be left to the government, on the other hand one could object that the “skeptical” approach would sound more reasonable if applied to regulatory claims, which have proved to be the most successful up to now. On the contrary, establishing standing, liability, and redressability is an appropriate task for the judiciary to carry out.<sup>111</sup>

Civil liability is still far from taking root in the climate change litigation context for different reasons. They are grounded on the far-sightedness that judicial panels have so far demonstrated in dealing with this area of litigation. Judges are often conscious of the vast, wide-ranging consequences (involving, *inter alia*, economic, energetic, developmental, and migratory issues) that holding an American or European actor responsible for damages occurring thousands of miles away would entail in legal terms. Consequently, before innovative liability principles are established, decision-makers, such as national legislators, must ask if the climate change litigation floodgates are ready to be opened. 

## Endnotes: The Tortuous Road to Liability

<sup>1</sup> Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 22 (1998).

<sup>2</sup> *Id.*

<sup>3</sup> United Nations Framework Convention on Climate Change, 15th Conference of the Parties, Copenhagen, Den., Dec. 7-19, 2009, *Copenhagen Accord*, U.N. Doc. FCCC/CP/2009/11/Add.1 (Mar. 30, 2010), <http://unfccc.int/>

[resource/docs/2009/cop15/eng/11a01.pdf](http://resource/docs/2009/cop15/eng/11a01.pdf).

<sup>4</sup> See Randolph E. Schmid, *New Federal Climate Agency Forming*, ASSOCIATED PRESS, Feb. 8, 2010, [http://www.huffingtonpost.com/2010/02/08/climate-service-new-feder\\_n\\_453541.html](http://www.huffingtonpost.com/2010/02/08/climate-service-new-feder_n_453541.html).

# HAZY SKIES IN AMERICA'S FUTURE?:

## THE BATTLE BETWEEN "FREE INDUSTRY" AND CLEAN AIR

by Oded Cedar\*

A series of Republican-supported bills in the 112th Congress are aimed at preventing the Environmental Protection Agency ("EPA") from regulating the heaviest polluting industries in America.<sup>1</sup> At the forefront is H.R. 97—short-titled the Free Industry Act—a bill introduced by Rep. Marsha Blackburn (R-TN) and sponsored by 120 other representatives.<sup>2</sup> H.R. 97 would amend the Clean Air Act ("CAA") to exclude a series of greenhouse gases ("GHG") from the list of pollutants that the EPA can regulate.<sup>3</sup> Media sources have already pointed out that H.R. 97 will likely die in the Senate or by Presidential veto.<sup>4</sup> Regardless, H.R. 97 indicates an agenda to impede EPA regulatory authority that could rise to the forefront should Republicans take control of Congress.<sup>5</sup> The philosophy that undergirds H.R. 97 represents a paralytic force to U.S. climate change policy, and policymakers should begin drafting solutions now before H.R. 97 and similar bills become a reality.

The CAA is a cornerstone of U.S. climate change policy, and the EPA is the primary vehicle through which the federal government enforces the provisions of the CAA.<sup>6</sup> Congress successively increased the EPA's authority to regulate harmful pollutants under the CAA with amendments in 1977<sup>7</sup> and 1990.<sup>8</sup> GHG emissions entered the dialogue in 2007 when the Supreme Court decided *Massachusetts v. EPA*, mandating that the EPA had the authority to regulate GHG emissions pursuant to the CAA.<sup>9</sup> In 2009, the EPA issued an Endangerment Finding, stating that GHG emissions posed a serious health risk for the population and environment.<sup>10</sup> With the support of the Obama Administration, the EPA declared that it would pursue new regulations for mobile and stationary sources.<sup>11</sup> It is against this backdrop that Republicans in the 112th Congress levy their attacks against the EPA.

Supporters of H.R. 97 ("97'ers") wish to strip the EPA of its regulatory authority because they claim that stricter GHG standards will "kill" American industrial jobs.<sup>12</sup> The 97'ers first argue that the detrimental effects of GHG emissions are uncertain and require more research before the EPA can move to regulate those emissions.<sup>13</sup> The argument continues that stricter regulations will force companies to expend money installing new equipment and put American jobs at risk.<sup>14</sup> There is evidence that lends credence to the 97'ers' economic argument, but most of it comes from industry-led reports.<sup>15</sup>

The two largest stationary sources of GHG emissions are the electric power industry (oil, natural gas, and coal) and manufacturing, producing an estimated 51.3% of U.S. GHG emissions in 2007.<sup>16</sup> The oil and natural gas industries directly employ roughly two million people,<sup>17</sup> coal employs about ninety

thousand,<sup>18</sup> and manufacturing employs around twelve million people.<sup>19</sup> With more than fourteen million people employed by these industries (not including "supporting" industries),<sup>20</sup> it is reasonable to assume that new regulations could cause potential job losses. However, the 97'ers' argument fails to consider the potential for job creation resulting from new technology and programs required to comply with these regulations.<sup>21</sup> Instead, H.R. 97 proposes an extreme political maneuver that threatens to dismantle the core of U.S. climate change policy.

By eliminating EPA's authority to regulate GHG, H.R. 97 unleashes a host of consequences. Without the EPA as the regulatory authority, state governments will have the choice, or obligation, to regulate GHG emissions. This means a patchwork of regulations from state to state instead of one uniform federal standard.<sup>22</sup> Companies who wish to escape GHG regulations may decide to move to states without emissions standards.<sup>23</sup> Also, without GHG regulations, it is unlikely that industrial companies will invest in "clean tech," only further delaying U.S. entrance into a growing global marketplace with \$7.8 billion in investment in 2010.<sup>24</sup> Finally, there is no way to measure how much credibility the U.S. will lose in the international climate change dialogue without an effective policy in place.<sup>25</sup>

H.R. 97 is part of a broader Republican plan to dismantle the EPA.<sup>26</sup> The bills presented in the 112th Congress bear an eerie resemblance to bills presented by Republicans during the 111th legislative session.<sup>27</sup> To assume that Republicans will not present these bills in the 113th Congress would be foolish. Policymakers who favor a strong climate change policy must take affirmative steps to entrench the EPA's authority to regulate GHG emissions. Amending the CAA or passing an authorization bill would be two ways of accomplishing this goal.<sup>28</sup> Although the political distribution of the 112th Congress is unlikely to allow the entrenchment efforts to succeed, it could provide a rally-point for all those in the public who stand against H.R. 97.



### Endnotes: Hazy Skies in America's Future?

<sup>1</sup> See *Anti-Regulatory Forces Launch Full Assault on Public Protections*, OMB WATCH (Feb. 8, 2011), <http://www.ombwatch.org/node/11485>; see also Dina Cappiello, *House Republicans Propose \$1.9 Billion Cut to EPA*, ASSOC. PRESS (Feb. 9, 2011, 3:58 PM), [http://www.huffingtonpost.com/2011/02/09/house-republicans-move-fo\\_n\\_820911.html](http://www.huffingtonpost.com/2011/02/09/house-republicans-move-fo_n_820911.html).

<sup>2</sup> See *H.R. 97 – Free Industry Act*, OPEN CONGRESS, <http://www.opencongress.org/bill/112-h97/show> (last visited Feb. 12, 2011).

### Endnotes: Hazy Skies in America's Future? continued on page 85

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# AFRICA AND THE CLIMATE CHANGE AGENDA:

## HURDLES AND PROSPECTS IN SUSTAINING THE OUTCOMES OF THE SEVENTH AFRICAN DEVELOPMENT FORUM

by James Forole Jarso (HSC)\*

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*Climate change has become one of the biggest developmental challenges facing the planet. The challenges are even more pronounced and significant for the African continent, because of its levels of poverty and low capacity to adapt. . . . Time has now come that we collectively as nations [and] individually in our right have to do something to avert consequences of climate change in order to avoid a future catastrophe. We need to act now, because if we do not, the development gains that we have attained in our countries will be lost, thereby leaving more people in poverty. – Dr. Bingu wa Mutharika<sup>1</sup>*

### INTRODUCTION

Over the past decade or so, climate change has been regularly cited as one of the biggest impediments to Africa's realization of sustainable growth and development.<sup>2</sup> In particular, African leaders have been warned that, in light of the immense challenges posed by the phenomenon, the continent stands a very marginal chance of making meaningful progress towards achievement of the Millennium Development Goals ("MDGs") by 2015.<sup>3</sup> It cannot be gainsaid that these warnings are not without basis. Climate change commands significant influence on Africa's performance; it portends innumerable socio-economic and political challenges for the continent, which has perennially garnered "breaking news" coverage largely for the appalling humanitarian catastrophes on its soil.

Though it contributes only about 3.8% of the total greenhouse gas ("GHG") emissions,<sup>4</sup> the continent constantly experiences the adverse impacts of climate change, as a result of its high poverty levels and low capacity to adapt.<sup>5</sup> For example, the continent's food security situation has continually worsened as the productivity of rain-fed agriculture, the main source of livelihood for most Africans, frequently slumps due to erratic rainfall patterns;<sup>6</sup> massive livestock losses have been caused by successive prolonged droughts in virtually every corner of the continent;<sup>7</sup> sea level rise (leading to coastal erosion) and flooding (even in areas that never before experienced floods) have become a common sight;<sup>8</sup> persistent and new health problems are increasingly reported in virtually every corner of the vast continent;<sup>9</sup> and violent conflicts have become the order of the day as environmental migrants and local communities clash over control of, or access to, resources.<sup>10</sup> Worryingly, the effects of climate change have proved to be akin to Russian roulette, with every pull of the trigger posing risks for all, and the poor bearing the heaviest brunt because of their dependence on the surrounding environment for their survival.<sup>11</sup>

Today, issues relating to climate change are addressed in a plethora of treaties adopted within the United Nations ("UN") framework. These international instruments include the UN Framework Convention on Climate Change ("UNFCCC"),<sup>12</sup> which was adopted at the landmark UN Conference on Environment and Development ("Earth Summit") in 1992 as part of the package to save the planet along with the UN Convention to Combat Desertification ("Desertification Convention"),<sup>13</sup> and the Convention on Biological Diversity ("CBD"), which seeks to ensure conservation and sustainable use of biodiversity, as well as fair and equitable sharing of the benefits of genetic resources.<sup>14</sup> Other instruments related to climate change which were subsequently created include the Kyoto Protocol to the UNFCCC ("Kyoto Protocol"),<sup>15</sup> which establishes legally binding obligations for the developed countries to reduce their GHG emissions and, the Cartagena Protocol on Biosafety ("Cartagena Protocol"), which was adopted (as a supplement to the CBD) to protect biodiversity from the potential risks posed by living modified organisms ("LMOs") resulting from modern biotechnology.<sup>16</sup> In their formal acknowledgment of the importance of climate change issues, African countries have overwhelmingly subscribed to these instruments.<sup>17</sup>

Africa's predicament has received formal acknowledgment in various circles. Within the inter-governmental African Union ("AU") framework, on several occasions climate change has garnered the attention of the Assembly of Heads of State and Government ("the Assembly"). For instance, in January 2007, the Assembly called upon the AU Member States to integrate climate change into their respective national development programs.<sup>18</sup> In February 2009, the Assembly emphasized the need for international climate change negotiations to give Africa an opportunity to demand compensation for damage caused by global warming.<sup>19</sup> More importantly, the Assembly approved the Algiers Declaration on Climate Change ("Algiers Declaration"),<sup>20</sup> thereby paving way for the building of a common

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African Position in preparation for the fifteenth Conference of the Parties to the UNFCCC (“COP-15”).<sup>21</sup>

In July 2009, the Assembly, among other things: 1) established the Conference of African Heads of State and Government on Climate Change (“CAHOSCC”)<sup>22</sup> to spearhead leadership in the climate change negotiation process;<sup>23</sup> 2) urged the CAHOSCC, all ambassadors, and negotiators to use the approved African Common Position<sup>24</sup> to achieve optimal results for the continent;<sup>25</sup> and 3) authorized the AU Commission to facilitate the AU’s accession to the UNFCCC, the Kyoto Protocol, and the CBD.<sup>26</sup> Then, in February 2010, the Assembly requested the CAHOSCC to establish a streamlined single negotiating structure at both Ministerial and Expert levels.<sup>27</sup>

At the inter-ministerial level of the African Ministerial Conference on the Environment (“AMCEN”), climate change issues were addressed on a number of occasions. The agenda was officially floated at the Conference’s twelfth session in Johannesburg, laying the groundwork for the preparation of a common continental position on climate change.<sup>28</sup> Shortly thereafter the special session on climate change, which also had the African Group of Negotiators in attendance, adopted the Nairobi Declaration on the African Process for Combating Climate Change,<sup>29</sup> which, among other things: 1) noted with concern the inadequacy, complexity, and fragmentation of the existing climate financing mechanisms, as well as the constraints faced by African countries in accessing these facilities;<sup>30</sup> 2) reaffirmed the adoption (by the Assembly) of the Algiers Declaration, and “the need [for African countries] to speak with one voice in the negotiations process for the new legally binding global climate change regime;”<sup>31</sup> 3) stressed that “Africa’s priorities are to implement climate change programmes on adaptation . . . , in particular to alleviate poverty and attain the Millennium Development Goals, with emphasis on the most vulnerable groups, especially women and children;”<sup>32</sup> and 4) recognized the need “to ensure coordination and coherence in the implementation” of existing climate change adaptation and mitigation actions in Africa.<sup>33</sup>

Within the framework of the New Partnership for Africa’s Development (“NEPAD”),<sup>34</sup> the Action Plan of the Environment Initiative affirms the continent’s concerns vis-à-vis the challenges posed by climate change, and provides for climate change as one of the core priority areas to be addressed by the continent’s leadership.<sup>35</sup> On the realization that climate change poses a key challenge to environmental sustainability, biodiversity, and food security in Africa, through its Climate Change and Natural Resource Management program, NEPAD provides a platform on which the continent’s players share knowledge and experiences in addressing the fast-creeping threat.<sup>36</sup>

Climate change issues have equally garnered the attention of various forums, in particular the African Development Forum (“ADF”), a biennial multi-stakeholder gathering committed to building consensus and mobilizing partners for Africa’s development. The 2010 Seventh African Development Forum (“ADF VII”), whose theme was “Acting on Climate Change for Sustainable Development in Africa,” was jointly organized by the Addis Ababa-based UN Economic Commission for Africa

(“UNECA”), the AU Commission, and the Tunis-based African Development Bank (“AfDB”).<sup>37</sup> The participants, drawn from diverse stakeholders,<sup>38</sup> deliberated on the challenges and opportunities presented by climate change in Africa, and, after the five days of intensive panel discussions and parallel sessions, adopted a common statement (“Consensus Statement”) with some fifty-six points of agreement.<sup>39</sup>

This article aims to unearth the challenges and prospects in sustaining the outcomes of these principled negotiations for the African continent to make lasting progress in addressing the effects and impacts of climate change and variability.

## UNDERSTANDING THE FORUM

### ON THE FORUM GENERALLY

The African Development Forum (“ADF”) is a joint initiative of UNECA, the AU Commission, and the AfDB.<sup>40</sup> It is Africa’s pioneer multi-stakeholder platform established with a view to establishing a consensual African-driven development agenda, and mobilizing partners for Africa’s development.<sup>41</sup> Every forum has a designated theme, on which deliberations are based. Initially, it was intended that the Forum be convened annually. However, after the second ADF, in 2000, the participants agreed that the Forum be convened biennially. Thus, the third ADF was held in 2002, instead of 2001. The seventh ADF VII was recently held in October 2010 and the eighth ADF VIII is slated for 2012.

### ADF VII: A CONTEXTUAL OVERVIEW

#### *Thematic Focus of the Forum*

ADF VII was devoted to discussions on climate change and participants were tasked to examine the challenges and opportunities presented by the phenomenon, with a view to, within the global context, identifying long-term actions to ensure Africa’s development process is climate resilient.<sup>42</sup> The discussions were carried out against the backdrop of the realization that climate change is one of the biggest threats to sustainable growth and development in Africa.

#### *Objectives of the Forum*

Generally, ADF VII was intended to provide a multi-stakeholder platform to discuss and build consensus on how to mainstream climate change concerns into development policies, strategies, programs and practices in Africa, and to strengthen the African Common Position to ensure that it adequately reflected the continent’s concerns and priorities in the on-going international climate change negotiations.<sup>43</sup>

Specifically, the Forum was convened to accomplish several goals. First, it considered the evidence and impacts of climate change in Africa and the need for adequate information and services to better inform decision-making and actions.<sup>44</sup> Second, it deliberated on the challenges and opportunities climate change poses in Africa and policy-making,<sup>45</sup> while promoting cooperation in sharing of best practices and lessons-learned.<sup>46</sup> Finally, within the framework of the demonstrated evidence and impacts of, as well as the challenges and opportunities presented

by, climate change, the Forum defined priority actions and measures, built new strategic alliances and partnerships, and provided momentum for the African Common Position, in preparation for the sixteenth Conference of the Parties (“COP-16”) in Cancún, Mexico.<sup>47</sup>

## **ADF VII: HIGHLIGHT OF THE KEY OUTCOMES**

On the premise of the evidence presented, which reflected climate change as a serious, urgent, and compelling reality in Africa,<sup>48</sup> the participants concluded the Common Statement, which embodies some fifty-six points of agreement. The key ones are highlighted below.

### **CONSENSUS ON THE AFRICAN COMMON POSITION**

With a view to enhancing the continent’s position in the international climate change processes, ADF VII participants agreed that African countries and their leadership should engage all relevant stakeholders in the on-going climate change discussions, and in particular, build the continent’s capacity through a coordinated, effective, and representative position to effectively participate in the relevant international negotiations, in order to ensure that the outcomes reflect the continent’s concerns and priorities.<sup>49</sup> The agreement also pledged to support implementation of decisions and resolutions of the AU Assembly, the AMCEN, and other relevant continental bodies in regard to climate change concerns for the continent.<sup>50</sup>

### *Leadership for Climate Change Response*

On the understanding that African leaders and their development partners have critical roles to play in implementing Africa’s climate change agenda, participants also agreed that African leaders and their development partners should strongly support the CAHOSCC to enable it to effectively mobilize political commitment and provide effective political leadership. Further, there were pledges to demonstrate additional leadership.<sup>51</sup> These included commitments relating to: 1) taking bold decisions on the issue of innovative climate change financing mechanisms, including proper carbon pricing to complement funding under the UNFCCC;<sup>52</sup> 2) educating the public to enhance understanding of climate change and variability; 3) garnering support necessary to meet national commitments; and 4) addressing the fallacy that developed countries only have a charitable obligation to finance climate change actions in developing countries.<sup>53</sup>

### *The Role of the Private Sector*

On the understanding that the private sector<sup>54</sup> has a vital role to play in addressing climate change in Africa, the participants agreed that African governments should “create an enabling policy environment to encourage the private sector to harness its expertise, resources and creativity.”<sup>55</sup> Related to this pledge, there was agreement to create and develop partnerships between public, private, and civil society stakeholders.<sup>56</sup>

Further, the participants called on African governments to “establish minimum standards for local and Foreign Direct Investments” (“FDIs”) that were appropriate for both national needs and the private sector.<sup>57</sup> Finally, there was a pledge to

“encourage research and development that will create Africa-specific technological solutions . . . taking into account [the continent’s] rich indigenous knowledge systems.”<sup>58</sup>

### **KEY OUTCOMES ON FOOD SECURITY AND ECONOMIC DEVELOPMENT<sup>59</sup>**

In the Consensus Agreement, ADF VII participants pledged a number of sector-specific actions, including in agriculture, food security, and infrastructure. For instance, in order to improve the continent’s approach in addressing agriculture and food security challenges, the Agreement called on African countries to take a “holistic approach;” seek a strong, fair, and comprehensive future agreement on payment systems for agriculture sector emissions;<sup>60</sup> improve and grow “index-based insurance schemes and safety nets;” and accelerate initiatives aimed at reducing dependence on rain-fed farming.<sup>61</sup>

In addition, to address the adverse impacts of climate change on the continent’s infrastructure development efforts, the agreement called on African governments to “climate-proof their water infrastructure,” promote more sustainable demand, increase efficiency, increase rain-water harvesting, and support more successful water management at all levels, including for states sharing water resources, notably rivers.<sup>62</sup> In addition, the agreement pledged to adopt a “holistic approach” to promote low-carbon energy sources and technology, and “to support the Programme for Infrastructure Development in Africa (“PIDA”)<sup>63</sup> to ensure development of the continent’s priority infrastructure projects.<sup>64</sup>

### **OUTCOMES ON HUMAN DEVELOPMENT, SECURITY, AND ECOSYSTEM SUSTAINABILITY**

In their resolve to address the social and human development challenges posed by climate change,<sup>65</sup> the participants agreed to “employ . . . a human rights-based approach (HRBA) in climate change mitigation and adaptation policies.”<sup>66</sup> The agreement pledges the governments to support an “equity-based health care financing in climate change funding mechanisms and internal resource mobilization.”<sup>67</sup> There was also a pledge to comprehensively incorporate gender perspectives in development, encourage eco-friendly development and awareness, and promote “youth-led actions and processes.”<sup>68</sup>

Further, the participants agreed that, in order to address the peace and security issues posed by climate change,<sup>69</sup> African countries should “engage in preventive diplomacy,”<sup>70</sup> in part through the Climate for Development in Africa (“ClimDev-Africa”) Programme, to effectively address the interface between climate change, peace and security issues, and disaster response.<sup>71</sup> The agreement also proposed amending the African Union Protocol on peace and security,<sup>72</sup> and tasked the AU Peace and Security Council (“PSC”) to, in its work, take into account climate-related peace and security issues, including migration.<sup>73</sup>

Finally, in their efforts to address the impacts of climate change on ecosystem sustainability,<sup>74</sup> African governments agreed to promote effective and sustainable human-centered ecosystem management,<sup>75</sup> encourage the use of Reducing Emissions from Deforestation and Forest Degradation Plus (“REDD+”)

initiatives to reduce poverty, and implement the UNFCCC, the CBD, and the Desertification Convention “in a synergistic manner to promote coherent [environmental] management.”<sup>76</sup>

#### OUTCOMES ON HARNESSING MEANS OF RESPONSE TO CLIMATE CHANGE: FINANCING, RISK MANAGEMENT, SCIENCE & TECHNOLOGY, AND CAPACITY BUILDING

It was agreed that, in order to improve financing for climate change actions in Africa,<sup>77</sup> African governments and their development partners should promote financial reform to enhance funding access for Africa, in particular by identifying and prioritizing efficient financial resource distribution, in part through newly forged Public-Private Partnerships. The agreement also “strongly supports” the establishment and setting up of the proposed African Green Fund (“AGF”),<sup>78</sup> which is expected to coordinate and manage climate financing on the continent.

In addition, the participants agreed that to improve the continent’s capacity to manage the risks of climate-related disasters,<sup>79</sup> African governments should strengthen the national institutions generating and handling climate-related data, and promote the exchange of this information. The agreement also calls for promotion of broad cooperation in sharing climate-related knowledge (through early warning systems) and disaster management, and strengthening of surveillance and monitoring systems across all regional levels.<sup>80</sup> It also calls for promotion of index-based insurance in arid and semi-arid areas,<sup>81</sup> as well as promotion of integration of climate risk management (“CRM”) in all levels of education and all levels of policy-making.<sup>82</sup>

Further, to improve the continent’s level of scientific and technological innovativeness to respond to climate change,<sup>83</sup> the participants agreed that African countries should “build a regional climate change knowledge repository,”<sup>84</sup> invest in scientific research and development,<sup>85</sup> and support and prioritize disaster risk-management and preventive capacity. On the international level, the agreement seeks to promote the pursuit of technology transfer and global partnerships to that end.<sup>86</sup> Finally, the Agreement promotes the strengthening of African universities and research and technology centers to “increas[e] their competitiveness in the global market.”<sup>87</sup> To improve Africa’s capacity to respond to climate change,<sup>88</sup> the agreement pledged that African countries, with the support of their development partners, should strengthen CRM-related national institutions, including educational institutions at all levels, and improve the capacity of vulnerable groups;<sup>89</sup> and foster South-South cooperation.<sup>90</sup>

#### SUSTAINING THE OUTCOMES: A REALITY CHECK

##### PRACTICAL CHALLENGES IN SUSTAINING THE OUTCOMES

###### *Impotent Political Leadership*

Africa lacks credible leadership to address climate change. The political leaders are yet to effectively walk their unending talks; save for the multitude of pious resolutions,<sup>91</sup> there is no concrete effort to deal with the fast-unfolding crisis. In fact, the continent’s affairs have been reduced to endless spirals of

meetings and deliberations, only to come up with more meetings. It is this circus that has, for instance, delayed the establishment of the AGF.<sup>92</sup> In general, the continent’s leadership lacks the requisite political will to steer the continent to the path of sustainable growth and development, with mere rhetorical promise to tackle the climate change-related challenges engulfing the continent.

Further, leadership has been lacking in preventing the destruction of the continent’s ecosystems, and in mitigating poverty and hunger, two of the biggest drivers of environmental destruction on the continent. For instance, in the fast-evolving “global land rush,” millions of African farmers have lost their arable lands to foreign investors.<sup>93</sup> These deals, often shrouded in veils of secrecy, have violated the resource rights of millions of poor Africans, fuelling poverty and food insecurity,<sup>94</sup> two of the biggest drivers of environmental destruction on the African continent. Furthermore, as vast forestlands (and other ecosystems that act as carbon sinks) are opened up to large-scale farming, the continent continues to be exposed to further threats of climate change. Sadly, attempts by environmental activists to resist the deals are often forcibly countered by the concerned governments.<sup>95</sup>

Against this backdrop and in the absence of committed and visionary leadership, it cannot be denied that at both regional and national levels it would be an exercise in futility to attempt sustaining the outcomes of ADF VII. Sadly, if African leaders continue to act in the way they are currently, the Consensus Statement may as well land in the heap of unimplemented texts on climate change, only to gather dust and be forgotten altogether.

###### *Corruption and Economic Mismanagement*

Corruption may be the most talked about problem in most African countries, many of which have been poorly managed for the better part of their post-independence histories. As we begin the twenty-first century, unfortunately, not much has changed; most of the leaders still use their official positions for self-aggrandizement, as opposed to public service.<sup>96</sup> In fact, over the years, many African countries have perpetually ranked very poorly on Transparency International’s corruption scorecard.<sup>97</sup>

In both the public and private spheres, the vice has greatly undermined the continent’s growth and development prospects, while exacerbating the costs and effects of climate change.<sup>98</sup> Undoubtedly, the resulting impoverishment, dilapidation of basic infrastructure, and decay of the social justice system, among many other associate evils, will adversely undermine the affected population’s resilience to shocks related to climate change. More importantly, corruption affects the flow of financing for addressing climate change.<sup>99</sup> These are real challenges that starkly stand in the path to effectuation of the outcomes of ADF VII.

###### *Continued Impoverishment and Worsening Food Insecurity*

For decades, Africa has unsuccessfully struggled to eradicate poverty.<sup>100</sup> Closely intertwined with, and largely culminating from, poverty is chronic food insecurity, a situation that



has seen millions of Africans deprived of food, the most basic necessity in life. According to a recent estimate by the Food and Agriculture Organization (“FAO”) of the UN, Africa hosts approximately thirty percent of the world’s hungry population—about 276 million Africans face hunger.<sup>101</sup> The causes are many and complex, and include corruption, protracted armed conflicts, economic and political marginalization, and continued desertification.

Unfortunately, the millions condemned to perpetual poverty and chronic food insecurity have often turned to various forms of environmentally harmful means of survival, including charcoal burning, fuel-wood vending, logging, and encroachment on forests and other sensitive ecological zones to open up more farmlands. These actions will undoubtedly exacerbate the impacts of climate change in the affected areas, thereby portending a visible challenge to sustenance of the outcomes of ADF VII.

### *The Culture of Marginalization*

Discussions on climate change issues in Africa are largely dominated by the political elites and their ilk.<sup>102</sup> Many have been left out of the process. In particular, groups that have remained vulnerable to the adverse impacts of climate change (like indigenous peoples, women, children, and the youth) have been pushed to the peripheries of the discussion, and millions of Africans have had no effective voice in the process.<sup>103</sup> This has further led to a number of individuals and communities expressing skepticism of the nexus between the environment and climate change, thereby dismissing claims that the current problems are attributable to man’s activities.<sup>104</sup>

These challenges, which were expressly acknowledged at ADF VII,<sup>105</sup> cannot be wished away even in the post-Forum periods, for they portend a serious challenge to effectuating the outcomes of the Forum. Indeed, it need not be emphasized that addressing these challenges will greatly contribute to sustenance of the outcomes.

### *Global Inaction and Unreliable Pledges*

Africa’s efforts to address climate change issues cannot succeed if treated in isolation of the global trends. Further, we must not forget that, contributing only about 3.8% of the global GHG emissions,<sup>106</sup> Africa is suffering the wrongs of others, and even if it were to fully tackle climate change in its domain, its efforts would not be more than a drop in the ocean. In light of this, a cursory view of the prevailing global practices reveals a mixed track record, with non-commitment surfacing at various times.

For instance, the commitment of some developed countries to address climate change in developing countries has been merely rhetorical; some of them have yet to honor their pledges under the current global financing mechanism.<sup>107</sup> This has resulted in inadequate, unpredictable, and unreliable financing for climate change actions in Africa, as in other developing countries.<sup>108</sup> The World Bank too has not been straightforward in its dealing with (and in) developing countries; through its subsidiaries, it continues to finance the “global land rush”<sup>109</sup> and other projects that would likely contribute to climate change.<sup>110</sup>

Surely, if Africa is to meaningfully address climate change, and if the outcomes of ADF VII are to be sustained, adequate, predictable, and reliable, financing for climate change actions is indispensable. Otherwise, in the absence of such external financing support and recognizing that most climate change actions are largely capital-intensive, Africa may be able to only do very little, if anything, to manage climate change on its own.

## PROSPECTS IN SUSTAINING THE OUTCOMES

### *Proliferation of Climate Funds*

Over the last few years, we have witnessed proliferation of climate funds, a handful of which have benefited (or are expected to benefit) the African continent in its efforts to implement various climate change mitigation and adaptation actions. Such funding regimes include the Clean Technology Fund (“CTF”),<sup>111</sup> the Special Climate Fund (“SCF”),<sup>112</sup> the Kyoto Protocol Adaptation Fund,<sup>113</sup> the Congo Basin Forest Fund (“CBFF”),<sup>114</sup> the Forest Carbon Partnership Facility (“FCPF”),<sup>115</sup> the Global Environment Facility Trust Fund (“GEF Trust Fund”),<sup>116</sup> the Global Climate Change Alliance (“GCCA”),<sup>117</sup> the Least Developed Countries Fund (“LDCF”),<sup>118</sup> and the Special Climate Change Fund (“SCCF”).<sup>119</sup> These funding efforts received a major boost when the establishment of a “Green Climate” Fund was proposed at the recently concluded COP-16.<sup>120</sup>

It cannot be denied that, the dissatisfactions notwithstanding,<sup>121</sup> cumulatively, these initiatives can greatly contribute to Africa’s cause to address the challenges posed by climate change. If well harnessed, these funding mechanisms have the potential to significantly contribute to the sustaining the outcomes of ADF VII.

### *Developments within the AU Framework*

A number of recent developments within the AU framework hold some positive prospects in sustaining the ADF VII Outcomes. For instance, on October 13, 2010, at a ceremony on the sidelines of ADF VII, the AU Commission, the AfDB, and UNECA launched the Climate for Development in Africa (“ClimDev-Africa”) Programme,<sup>122</sup> which aims at strengthening the climate-resilience of economic growth and the MDGs through mainstreaming of CRM in sensitive sectors. Shortly thereafter, in November 2010, under the auspices of the AU Conference of Energy Ministers (“CEMA”), the AU Commission, the AfDB, and UNECA jointly hosted the First All-Africa Energy Week 2010 (“AAEW”), a high-level stakeholder forum for monitoring progress, taking stock, undertaking constructive dialog, and sharing knowledge, with the aim of enhancing universal energy access.<sup>123</sup>

In addition, on November 4, 2010, the AfDB launched the African Carbon Support Project (“ACSP”), which is designed to assist project developers in the continent in accessing carbon finance to ensure commercial viability of their projects.<sup>124</sup> Most recently, on December 6, 2010, the AfDB representatives joined representatives from other Multilateral Development Banks in a joint side event of the COP-16, whose theme was “Scaling-up International Climate Finance.”<sup>125</sup>

By and large, their individual merits or otherwise notwithstanding, these initiatives hold immense potential to sustain the outcomes of ADF VII, as well as other regional commitments to address challenges related to climate change and variability.

### *The Cancún Gains*

Though heavily criticized as having yielded too little,<sup>126</sup> COP-16 heralded a number of gains with potential to contribute to sustenance of the Outcomes of ADF VII. For instance, though not legally binding, the Cancún Agreement reflects some level of changing relations between developing countries and the developed countries; it embodies a “fairly modest” deal on reduction of emissions, calling on developed countries to reduce their GHG emissions (as pledged in the Copenhagen Accord).<sup>127</sup> The Agreement also proposes the establishment of a “Green Climate” Fund, which is intended to assist developing countries finance emission reductions and adaptation actions.<sup>128</sup>

### *Contributions of the Civil Society and the Private Sector*

The African private sector and the civil society, though long excluded from the mainstream discussions, currently play indispensable roles in addressing climate change issues on the continent. While the civil society has been particularly involved in lobby and advocacy activities,<sup>129</sup> the private sector has proved critical in supplementing the existing global climate financing initiatives.<sup>130</sup> For instance, on June 5, 2008, the Rockefeller Foundation and the Bill & Melinda Gates Foundation—through their Nairobi-based Alliance for a Green Revolution in Africa (“AGRA”)—established the Africa Enterprise Challenge Fund (“AECF”) to leverage private sector and donor funding for successful eco-friendly projects and enterprises.<sup>131</sup>

### SUSTAINING THE OUTCOMES: THE WAY FORWARD

In order to sustain the various outcomes of ADF VII, African governments should, as a matter of priority, implement a number of measures. Though not offered as an absolute panacea for the climate change problem in Africa, these measures are believed to wield immense potential to sustain the outcomes and other related initiatives to address the challenges posed by climate change and variability on the continent.

First and foremost, they must back up their words with action—moving from the unending official rhetoric to offering effective leadership in addressing issues related to climate change. In particular, they have to link the continent’s Common Position and the prevailing regional, sub-regional, and national policies, strategies, practices, and programs. Second, they have to fully commit themselves to the fight against corruption, ensure proper targeting of funds received under the prevailing climate funds regimes, and establish effective normative and institutional frameworks. Third, they have to fully commit themselves to the fight against poverty, also through the establishment of appropriate normative and institutional approaches, and with adequate budgetary focus.

Fourth, they must profile climate change as a human rights issue and nurture a sustainable culture of human rights,

in particular through mainstreaming of human rights concerns into all regional, sub-regional, and national policies, strategies, practices, and programs. Indeed, climate change issues have to be effectively integrated in litigations on the environment, with effective remedies for any resulting violations of environmental rights. Fifth, African governments need to effectively leverage the window of opportunity availed by climate change and variability, in particular the opportunity to establish green economies.

Sixth, African governments have to consider inviting leaders from developed countries to their meetings, with a view to enabling them to fully appreciate the African version of the climate change debates. Seventh, they need to effectively engage the big GHG emitters, with a view to having them honor their pledges to reduce their emissions and support climate change adaptation and mitigation actions in Africa. Eighth, they need to engage the international community to break the long-standing lack of transparency at the Breton Woods institutions, in particular the World Bank.

Ninth, African governments have to invest in routine situational assessments in order to establish the progress, challenges and prospects in addressing climate change. In addition, they need to work towards breaking the reigning skepticism (through, for instance, broad-based social mobilization and dissemination on the interface between the environment and climate change. Further, the governments have to establish and sustain credible specialized institutions, preferably within the AU Commission framework, to coherently address climate change issues on the continent. In particular, they must prioritize the operationalization of the AGF, while engaging the continent’s international development partners to sustainably support the initiative.


Last but not the least, African governments have to consider subscribing to the Nagoya Protocol to the Convention on Biological Diversity.<sup>132</sup> The Protocol, which opened for signature and ratification on February 2, 2011, has the potential to promote more equitable distribution of genetic resources for the continent.

### CONCLUSION

This article highlighted key challenges and prospects in sustaining the outcomes of ADF VII. Although immense challenges lie in the path to sustenance of the outcomes, there are equally immense prospects, which, if properly harnessed, can ultimately drive Africa towards effectively combating climate change. On the basis of the balance sheet of challenges and prospects, the article has offered measures that African governments must to adopt. These measures, though not an absolute panacea for the continent’s woes, have the potential to contribute to the cause of fighting the challenges posed by climate change and variability on the continent.

African leaders must improve the continent’s normative and institutional capacities to deal with the challenges posed by climate change. Undoubtedly, they cannot just sit and watch calamities unfold in series; the time has come for them to jointly and individually take action to avert the consequences

of climate change, if they are at all committed to saving Africa from fatal catastrophes. Otherwise, the continent's hard-earned

development gains may quickly erode, thereby subjecting more Africans to the curse of poverty for the foreseeable future. 

## Endnotes: Africa and the Climate Change Agenda

<sup>1</sup> Dr. Bingu Wa Mutharika, President, Republic of Malawi, Chairman, Afr. Union, Opening Remarks at CAHOSCC, Meeting, Kampala, Uganda, ¶¶ 1-4 (Jul. 24, 2010), [http://www.africa-union.org/root/ua/conferences/2010/juillet/summit\\_2010\\_b/doc/discours/climate%20change%20-%20au%20summit%20uganda%20cp%20malawi.doc](http://www.africa-union.org/root/ua/conferences/2010/juillet/summit_2010_b/doc/discours/climate%20change%20-%20au%20summit%20uganda%20cp%20malawi.doc).

<sup>2</sup> See Meeting of the Committee of Experts of the 3rd Joint Annual Meetings of the AU Conference of Ministers of Economy and Finance and ECA Conference of African Ministers of Finance, Planning and Economic Development, Lilongwe, Malawi, Mar. 25-28, 2010, *Report on Climate Change and Development in Africa*, E/ECA/COE/29/5, AU/CAMEF/EXP/5/(V) (Mar. 2, 2010) [hereinafter *Report on Climate Change and Development*], <http://www.uneca.org/cfm/2010/documents/English/Report-onClimateChange-andDevelopment-inAfrica.pdf>.

<sup>3</sup> See 8th Meeting of the Africa Partnership Forum, Berlin, Germany, May 22-23, 2007, *Climate Change and Africa* 3-4, <http://www.africapartnershipforum.org/dataoecd/57/7/38897900.pdf> (highlighting particular threats to the continent posed by the effects of climate change that will prevent Africa from meeting the MDG's).

<sup>4</sup> *Id.* at 3 (noting that Africa is the least responsible for the anthropogenic causes of climate change).

<sup>5</sup> See Seventh African Development Forum, Oct. 10-15, 2010, *Climate Change and Sustainable Dev. in Africa: An Overview*, ¶ 20, [http://www.uneca.org/adfvii/documents/ADFVII\\_BackgroundPaper\\_ENG.pdf](http://www.uneca.org/adfvii/documents/ADFVII_BackgroundPaper_ENG.pdf).

<sup>6</sup> According to the recent estimate by the Food and Agriculture Organization ("FAO") of the UN, about 276 million Africans face hunger. This translates to approximately thirty percent of the world's hungry population. See FAO, *THE STATE OF FOOD INSECURITY IN THE WORLD 2010: ADDRESSING FOOD INSECURITY IN PROTRACTED CRISIS* 10, fig.5 (2010), [http://www.reliefweb.int/rw/lib.nsf/db900sid/ASAZ-89YHA7/\\$file/FAO\\_Oct2010.pdf?openelement](http://www.reliefweb.int/rw/lib.nsf/db900sid/ASAZ-89YHA7/$file/FAO_Oct2010.pdf?openelement).

<sup>7</sup> See Seventh African Development Forum, *supra* note 5, ¶ 20.

<sup>8</sup> *Id.*

<sup>9</sup> *Id.*

<sup>10</sup> *Id.*

<sup>11</sup> See GLOBAL HUMANITARIAN FORUM, *THE HUMAN IMPACT REPORT: CLIMATE CHANGE—THE ANATOMY OF A SILENT CRISIS*, at ii, 22-39 (2009), [http://www.preventionweb.net/files/9668\\_humanimpactreport1.pdf](http://www.preventionweb.net/files/9668_humanimpactreport1.pdf) (Providing case studies from around the world, including several locations in Africa where lower-income populations have disproportionately suffered the burdens of climate change).

<sup>12</sup> United Nations Framework Convention on Climate Change, May 9, 1992, S. Treaty Doc No. 102-38, 1771 U.N.T.S. 107 (entered into force Mar. 21, 1994), <http://unfccc.int/resource/docs/convkp/conveng.pdf>.

<sup>13</sup> United Nations Convention to Combat Desertification in Countries Experiencing Serious Drought and/or Desertification, Particularly in Africa, Jun. 17, 1994, 1954 U.N.T.S. 3 (entered into force Dec. 26, 1994), <http://www.unccd.int/convention/text/convention.php?annexNo=0>.

<sup>14</sup> Convention on Biological Diversity, Jun. 5, 1992, 1760 U.N.T.S. 79 (entered into force Dec. 29, 1993), <http://www.cbd.int/convention/text/>.

<sup>15</sup> Kyoto Protocol to the UN Framework Convention on Climate Change, Dec. 11, 1997, 2303 U.N.T.S. 148 (entered into force Feb. 16, 2005), <http://unfccc.int/resource/docs/convkp/kpeng.pdf>.

<sup>16</sup> Cartagena Protocol on Biosafety to the Convention on Biological Diversity, Jan. 29, 2000, 2226 U.N.T.S. 208 (entered into force Sept. 11, 2003), <http://www.cbd.int/doc/legal/cartagena-protocol-en.pdf>.

<sup>17</sup> See, e.g., Wilma Lutsch, S. Afr., Dept. of Env'tl. Affairs & Tourism, *National Biodiversity Strategy and Action Plan* (Feb. 2008), <http://www.cbd.int/doc/meetings/nbsap/nbsapcbw-seafr-01/other/nbsapcbw-seafr-01-za-nbsap-en.pdf>; DEPT. OF ENVTL. AFFAIRS & TOURISM, A NATIONAL CLIMATE CHANGE RESPONSE STRATEGY FOR SOUTH AFRICA, at iii (2004), [http://unfccc.int/files/meetings/seminar/application/pdf/sem\\_sup3\\_south\\_africa.pdf](http://unfccc.int/files/meetings/seminar/application/pdf/sem_sup3_south_africa.pdf) (discussing South Africa's obligation to meet the aims of UNFCCC); *National Steering Committee for the Implementation of the Convention On Biological Diversity (CBD) in Ghana*, CONVENTION ON BIOLOGICAL DIVERSITY CLEARING HOUSE MECHANISM-

GHANA, <http://gh.chm-cbd.net/implementation/steeringcommittee.htm> (last visited Jan. 30, 2011); *Action Programmes*, UNCCD, <http://www.unccd.int/actionprogrammes/africa/africa.php> (last visited Jan. 30, 2011).

<sup>18</sup> See Assembly of the African Union, Eighth Ordinary Session, Jan. 29-30, 2007, *Decision on Climate Change and Development*, in *Decisions and Declarations*, Assembly/AU/Dec.134 (VIII), <http://www.africa-union.org/root/AU/Conferences/Past/2007/January/summit/doc/Decisions%20and%20Declarations%20-%208th%20Ordinary%20Session%20of%20the%20Assembly.pdf>; Assembly of the African Union, Eighth Ordinary Session, Jan. 29-30, 2007, *Declaration on Climate Change and Development in Africa*, in *Decisions and Declarations*, Assembly/AU/Decl.4 (VIII), <http://www.africa-union.org/root/AU/Conferences/Past/2007/January/summit/doc/Decisions%20and%20Declarations%20-%208th%20Ordinary%20Session%20of%20the%20Assembly.pdf>.

<sup>19</sup> See Assembly of the African Union, Twelfth Ordinary Session, Feb. 1-3, 2009, *Decision on the African Common Position on Climate Change Including the Modalities of the Representation of Africa to the World Summit on Climate Change*, in *Decisions, Declarations, Message of Congratulations and Motion*, AU Doc. Assembly/AU/Dec.236(XII), ¶ 5, [hereinafter *Decision on the African Common Position*], [http://www.africa-union.org/root/ua/conferences/2009/jan/summit\\_jan\\_2009/doc/conference/assembly%20au%20dec%20%20208-240%20\(xii\).pdf](http://www.africa-union.org/root/ua/conferences/2009/jan/summit_jan_2009/doc/conference/assembly%20au%20dec%20%20208-240%20(xii).pdf).

<sup>20</sup> *The Algiers Declaration on Climate Change*, SAHARA & SAHEL OBSERVATORY, [http://www.oss-online.org/index.php?option=com\\_content&task=view&id=622&Itemid=643&lang=en](http://www.oss-online.org/index.php?option=com_content&task=view&id=622&Itemid=643&lang=en) (last visited Mar. 12, 2011); see *Decision on the Implementation of the Decision on the African Common Position on Climate Change*, May 25-29, 2009, AU Doc. EX.CL/525(XV), [http://www.unep.org/roa/Amcen/Amcen\\_Events/3rd\\_ss/Docs/AU-Summit-Decision-Implementation.pdf](http://www.unep.org/roa/Amcen/Amcen_Events/3rd_ss/Docs/AU-Summit-Decision-Implementation.pdf).

<sup>21</sup> See *Decision on the African Common Position*, note 19, ¶ 3.

<sup>22</sup> Current members of the CAHOSCC are: Ethiopia (Coordinator), Algeria, the Republic of Congo, Kenya, Mauritius, Mozambique, Nigeria, Uganda, the AU Chairperson, the Chairperson of the AU Commission, and the Chairperson of Conference of African Ministers of Environment ("AMCEN"), see Afr. Union, Concept Note: First Meeting of the Conference of African Heads of State and Government on Climate Change (CAHOSCC) and African Lead Experts on Climate Change, Aug. 24, 2009, ¶ 2, <http://www.africa-union.org/root/ua/Conferences/2009/aout/SUMMIT/24aout/Concept%20Note%20-%20CONFERENCE%20OF%20AFRICAN%20HEADS%20OF%20STATE%20AND%20GOVERNMENT%20ON%20CLIMATE%20CHANGE.DOC>; Press Release, African Press Organization, First Meeting of the Conference of African Heads of State and Government on Climate Change (CAHOSCC) and African Lead Experts on Climate Change (Aug. 11, 2009), <http://appablog.wordpress.com/2009/08/11/first-meeting-of-the-conference-of-african-heads-of-state-and-government-on-climate-change-cahoscc-and-african-lead-experts-on-climate-change/>.

<sup>23</sup> See *Decision on the African Common Position*, *supra* note 19, ¶ 2 (approving the Executive Council's recommendations in Decision EX.CL/500(XV)).

<sup>24</sup> For a critical insight into the African Common Position, see Werner Scholtz, *The Promotion of Regional Environment Security and Africa's Common Position on Climate Change*, 10 AFR. HUM. RTS. L.J. 1 (2010); Albert Mumba, *The Poverty of Africa's Position at the Climate Change Negotiations*, 19 UCLA J. ENVT'L. L. & POL'Y 198 (2002).

<sup>25</sup> *Decision on the African Common Position*, *supra* note 19, ¶¶ 3-4.

<sup>26</sup> See Assembly of the African Union, Thirteenth Ordinary Session, Sirte, Libya, July 1-3, 2009, *Decision on the Accession of the African Union to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol*, in *Decisions and Declarations*, Assembly/AU/Dec.248(XIII), ¶ 3, [http://www.africa-union.org/root/au/Conferences/2009/july/summit/decisions/ASSEMBLY%20AU%20DEC%20243%20-%2020267%20\(XIII\)%20\\_E.PDF](http://www.africa-union.org/root/au/Conferences/2009/july/summit/decisions/ASSEMBLY%20AU%20DEC%20243%20-%2020267%20(XIII)%20_E.PDF); see also Assembly of the African Union, Thirteenth Ordinary Session, Sirte, Libya, July 1-3, 2009, *Decision on the African Union Accession to the United Nations Convention to Combat Desertification (UNCCD)*, in *Decisions*

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# IMPLEMENTING A RENEWABLE ENERGY FEED-IN TARIFF IN SOUTH AFRICA:

## THE BEGINNING OF A NEW DAWN

by Dr. Kola O Odeku, Professor Edson L Meyer, Professor Obeng Mireku, and Professor JLH Letsoalo\*

### INTRODUCTION

The notion that nothing is possible belongs to those who are reluctant or unwilling to take the first bold steps. South Africa has taken a bold step in the right direction, which may unlock various potential opportunities for renewable energy in South Africa. On March 31, 2009, the National Energy Regulator of South Africa (“NERSA”)<sup>1</sup> announced the long-awaited Renewable Energy Feed-in Tariff (“REFIT”) Regulatory Guidelines. South Africa, in order to source and use energy in a sustainable way, has focused on renewable energy as opposed to energy from conventional sources.<sup>2</sup> REFITs “are, in essence, guaranteed prices for electricity supply rather than conventional consumer tariffs.”<sup>3</sup> The underlying basic economic principle underpinning this system is the “establishment of a tariff (price) that covers the cost of generation plus a ‘reasonable profit’ to induce developers to invest.”<sup>4</sup>

In October 2009, NERSA approved REFIT Phase 2 based on the Levelized Cost of Electricity (“LCOE”).<sup>5</sup> The newly approved regulatory framework adds new technologies to the existing REFIT guidelines, namely, biomass, biogas, concentrated solar without storage, photovoltaic (“PV”), concentrating photovoltaic, and concentrated solar power (central tower).<sup>6</sup> Though the guidelines were generally welcomed by the role players in the renewable industry, the overarching contention was the omission of PV from the March 2009 RREFIT guidelines.<sup>7</sup> Consequently, Phase 2 of the guidelines addressed this concern and includes large-scale PV that is greater than 1 megawatt (“MW”)) due to economies of scale.<sup>8</sup> It is expected that during the annual REFIT review, small-scale PV technology would be considered and added.<sup>9</sup>

The first and the second phases of the REFIT guidelines are the culmination of a study initiated in 2007 by NERSA<sup>10</sup> to facilitate the introduction of renewable energy generation into the electricity network in order to meet the target of 10,000 gigawatt hours (“GWh”)<sup>11</sup> from renewable energy sources, and possibly surpass the target prior to the 2013 due date set by the 2003 Government White Paper on Renewable Energy.<sup>12</sup> Articulating the cost benefit of REFIT to the investors, NERSA likens it to the cost recovery used to regulate utilities, which is based on the cost of capital.<sup>13</sup> There have been aggressive moves and attempts by the proponents of REFIT to rename the mechanism “Renewable Energy Payments” in order to stop using the term tariff. However, these efforts proved unsuccessful and the name still remains.<sup>14</sup>

REFITs are common in many countries and are aimed at encouraging renewable energy generation by making renewable energy generators financially viable.<sup>15</sup> The REFIT approach makes strategic sense in South Africa because it will serve as a powerful tool to address rapid climate disruption.<sup>16</sup> REFIT is now promoting growth of renewable energy and private sector and donor financing at the same time.<sup>17</sup>

Against this backdrop, South Africa has joined a number of countries that have already introduced regulatory frameworks on REFIT.<sup>18</sup> With the proper political and administrative will, the current steps taken towards aggressive implementation promise to be a success—particularly as the system was adopted by South Africa from countries that have successfully introduced and implemented REFIT.<sup>19</sup> Germany, Spain, and Denmark are among the countries that have successfully used legislation to promote the least expensive and fastest growth of renewable energy.<sup>20</sup> As a result of substantial successes achieved through renewable tariffs, massive increase in investments in renewable electricity generation has occurred and these countries have produced “more installed generating capacity and more robust competition among manufacturers.”<sup>21</sup> Moreover, the tariffs have stimulated more renewable technology development, not withstanding some problems encountered at the commencement periods.<sup>22</sup>

### POLICY FRAMEWORK SUPPORTS AND BENEFITS OF REFIT

“Within a policy framework, the development of renewable energy in South Africa is supported by the White Paper on Renewable Energy, which has set a target of 10,000 GWh [of] renewable energy to [contribute to the final] energy consumption by 2013.”<sup>23</sup> REFIT is anticipated to run over fifteen years until 2022,<sup>24</sup> beyond the 2013 target of 10,000 GWh set by the

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Department of Minerals and Energy (“DME”) in the 2003 White Paper on Renewable Energy.<sup>25</sup> The “DME’s macroeconomic study of renewable energy, developed under the now completed Capacity Building in Energy Efficiency and Renewable Energy (“CaBEERE”) project, has established that the achievement of this target would provide a number of economic benefits, including increased government revenue amounting to R299 million, increased GDP of up to 1 billion [rand] per year and the creation of an estimated 20,500 new jobs.”<sup>26</sup> “In addition, the development of renewable energy beyond the 10,000 GWh target holds further employment benefits and would maximize the number of jobs created” per terawatt hour (“TWh”).<sup>27</sup>

One of the activists for the promotion and deployment of wind energy for electricity generation saluted the courage and the bold step taken by South Africa and described the REFIT as a laudable project.<sup>28</sup> Stefan Gsänger, the Secretary General of the World Wind Energy Association said in a release that “South Africa is the first African country to introduce a feed-in tariff for wind energy. Many small and big investors will now be able to contribute to the take-off of the South African wind industry. Such decentralized investment will enable South Africa to overcome its current energy crisis. It will also help many South African communities to invest in wind farms and generate electricity, new jobs and new income.”<sup>29</sup>

Furthermore, REFIT has many advantages over other mechanisms in spite of the extra initial cost.<sup>30</sup> In order to ensure stable return on investment by the investors renewable power prices should not be subjected to the forces of demand and supply in the market place.<sup>31</sup> Guaranteeing profits for project developers will serve as an impetus for the investors to expand the business by applying for credit/loan facility from banks and other financial institutions since repayments are guaranteed from the sale of electricity.<sup>32</sup>

## **SOUTH AFRICA’S RENEWABLE ENERGY FEED-IN TARIFF: AN OVERVIEW**

### **BACKGROUND TO INITIATIVES TAKEN BY ROLE-PLAYERS**

REFIT was introduced in South Africa to progressively reduce carbon-based power generation by creating a move towards sustainable energy sources, along with socio-economic and environmentally sustainable growth.<sup>33</sup> Endless debates in Parliament about energy crises, global footprints, endangered species, and new coal-fired power stations had done little to solve South African problems. Stemming from this lack of progress, efforts to decrease greenhouse gas emissions fostered a movement known as e-Parliament Renewable Energy Activists (“eREACT”) by some parliamentarians with the objective of shifting the government’s focus away from coal and nuclear towards renewable energy.<sup>34</sup> The introduction of REFIT was initially met with stiff opposition from those entities that believed in business as usual.<sup>35</sup> But, in 2008, South Africa endured a serious energy crisis when the national energy supplier, Eskom, failed to meet electricity demand.<sup>36</sup> As a result, eREACT was able to influence future decisions and present the financial viability of developing renewable energy in South Africa.<sup>37</sup>

This initiative commenced the bold step towards the establishment of the current energy generation mix in South Africa. South African Member of Parliament Dr. Ruth Rabinowitz, explaining the stiff opposition encountered in the Parliament, said that at the hearing of the private members’ legislative committee in the South African Parliament on the REFIT, “in spite of overwhelming support from NGO’s, businesses, academics, local governments and civil society, both the DME and Eskom were opposed to the idea of separate REFIT legislation” claiming that the Guidelines had already been drafted and would be introduced to the public in early 2009.<sup>38</sup> “Their resistance to Parliament’s involvement is hardly surprising since the Eskom monopoly is unlikely to suddenly give way to diversity, flexibility and open competition.”<sup>39</sup> The firm commitment and perseverance of parliamentarians who believed that South Africa should jettison the notion of using cheap coal to generate electricity and shift to renewables eventually led to the promulgation of the regulatory guidelines.<sup>40</sup>

### **THE GUIDELINES IN CONTEXT**

The most potent legislative mechanism being used worldwide to introduce and implement the use of renewable energy to generate energy is feed-in tariff. South Africa has just joined the numbers of the countries that are using renewable energy to generate power. It is the responsibility of NERSA to ensure that the energy utility, Eskom, purchases energy from the generators at a fixed price, provided they conform with the standard prescribed by NERSA.<sup>41</sup> The guidelines contain twelve sections. Section 1 provides a general introduction, while sections 2 and 3 highlight the purpose, scope, and objectives of the guidelines in detail. Purchase obligations of all players and stakeholders are outlined in section 4, while sections 5 and 6 deal extensively with the qualification criteria and the application process respectively. Section 7 enumerates tariffs applicable to different technologies. The rights and obligations of qualified renewable power generators, regulator, and renewable energy purchasing agency (“REPA”) are provided for in sections 8, 9, and 10 respectively. While section 11 provides for the monitoring, reporting, and review mechanisms, section 12 provides for appropriate applicable law to resolve dispute arising from the guidelines. Any ensuing dispute must be resolved in accordance with section 5 of the Electricity Regulation Act 2006 of South Africa (including the Regulations).

### **EXPOSITION, ANALYSIS, AND CRITIQUE OF THE GUIDELINES**

#### *Introduction, Purpose, Scope, and Objective*

Section 1 of the guidelines provides an overview of why the government has opted for renewable energy provisions side by side with the current conventional energy. One of the key reasons is that renewable energy resources in South Africa are enormous.<sup>42</sup> In a move to enlarge the market implementation, government has now, through NERSA, introduced REFIT.<sup>43</sup> “This is quite similar to the concept of cost recovery used in utility rate regulation based on the costs of capital”<sup>44</sup> invested in

each technology deployed.<sup>45</sup> With regards to cost, using the technique of degression, both the grid interconnection and metering are covered by REFIT.<sup>46</sup> The overarching benefit of this is that the costs are spread across electricity customers and the tariff is reduced overtime.<sup>47</sup> The essence of this technique is to mount pressure on the generators to continue to lower the costs of generating electricity from REFIT so that it will be affordable.

The IPPs will be remunerated based on the renewable energy power they feed into the national grid.<sup>48</sup> The guidelines allow IPPs operators to receive preferential rate in a pay-for-energy-delivered contract allowing them to earn payment over and above conventional prices.<sup>49</sup> It is hoped that REFIT system will create and foster an enduring and economically sustainable renewable energy industry in South Africa.<sup>50</sup>

The scope and objective of the guidelines are outlined in section 3.<sup>51</sup> Section 3.1 provides for the applicable rules and requirements governing license applications and the issuing of approved licenses to energy developers.<sup>52</sup> Section 3.2 gives NERSA the mandate to determine the prices and the conditions under which generated electricity may be supplied.<sup>53</sup> Sections 3.3 and 3.4 provide that all subsequent relevant Acts of Amendment would also be applicable in conjunction with relevant license procedures.

The underlying economic basis of section 3.2 is that economic principles of supply and demand do not affect prices because NERSA has the absolute authority to determine the rates. The rationale for this is that these prices have been chosen to promote and increase investment in renewable energy, allow small enterprises to make substantive entry into the market, and operate by generating electricity for sale. This model is suitable to developing countries in view of the fact that energy markets are small in number and dispersed.<sup>54</sup>

But these guidelines could be amended by subsequent Acts under section 3.3,<sup>55</sup> which raises some concerns. The section sets no boundaries on what type of amendments are permitted.<sup>56</sup> A preferred approach would be to exempt certain provisions from future amendment. One provision that, if amended, would undermine the entire regulation is the guarantee of payments over a specified period of time. This is assuredly the only way an investor can realize the projected return on investment. Notwithstanding the fact that there is no explicit prohibition on amending any section, the fears of the investors have been allayed by virtue of section 3.5(ii), which states that one of the key objectives and principles of REFIT is the establishment of “a guaranteed price for electricity generated from renewables for a fixed period of time that provides a stable income stream and an adequate return on investment.”<sup>57</sup>

### *Obligation to Purchase*

Section 3.5(iv) enables access to the grid and obligates Eskom to purchase power generated by IPPs. Eskom is designated as the Single Buyer and appointed as the Renewable Energy Purchasing Agency (“REPA”) under sections 4 and 4.3. To be eligible the generator must follow the rules and procedures of the regulatory body duly licensed under section 5.4 and

fulfill all the license conditions under Section 5.5. While Eskom must purchase electricity from the IPPs at set rates, under section 4.4 the IPPs can also sell renewable energy to buyers outside of REFIT.<sup>58</sup>

If a particular generator receives a license and fails to produce electricity for any reason, NERSA faces no obligations to the generator and Eskom cannot be compelled to act on its purchasing obligation.<sup>59</sup> Consequently, the maxim *nemo dat quod non abet* meaning you cannot give what you do not have applies to the generator if it fails to produce electricity.

### *Financial Implications for Consumers*

Section 3.5(v) mandates the establishment of an equal playing field with conventional electricity, but this provision is ambiguous in both context and content.<sup>60</sup> The meaning of “an equal level playing field” is not defined in the guidelines and this may result to different interpretations. Section 3.6 allows for future inclusion of more technologies, bands within technologies, and incentives for projects in different geographical areas.<sup>61</sup> Section 4.5 provides that the financial subsidy required to offset the difference in the cost of energy purchased under REFIT and the Avoided Cost will be borne by all Eskom electricity customers through existing “pass-through” arrangements for costs of independent power production.<sup>62</sup> While this provision makes good economic and financial sense, a cursory look at the section shows that neither the poor nor the rich are exempted from the “pass-through” arrangements.<sup>63</sup> The implication of this is that various customers of Eskom, irrespective of their resources, will bear the financial burden. In South Africa, both advanced and developing economies operate alongside one another. Those who live in perpetual abject poverty outnumbered the rich elites.<sup>64</sup>

The huge disparity of income in South Africa is reflected in limited access to electricity, with the majority of the population in rural areas living without modern electricity.<sup>65</sup> Even where there is access, electricity is not usually affordable and is considered a luxury by most residents. Even in those areas serviced by a grid, there have been reports of persistent default or non-payment of electricity bills and in some instances, these people have improvised and connected to the grid illegally.<sup>66</sup> The drafters of the guidelines should have excluded indigents and the poor from the current additional burden of paying more for electricity.<sup>67</sup> Governments in countries such as Denmark, Australia, and a number of U.S. states are sensitive to the plight of indigent citizens who would not be able to afford electricity. Consequently, various concessions in the form of subsidies and incentives such as reduction in bills, special loans, extra rebates and so on, are being offered to unemployed, elderly, disabled, and low-income households.<sup>68</sup> As noted earlier, section 3.3 authorizes amendments; the guidelines should be amended to offer a range of concessions to the poorest of the poor, as has occurred in the United States, Australia, and Denmark.

### *Qualification Criteria for the Generator*

Section 5 lists the qualification criteria for renewable generators. Section 5.1 defines renewable energy, and section



5.2—read together with the newly published phase 2<sup>69</sup>—sets out the specific types of renewable energy technologies that qualify for participation in the REFIT scheme. Section 5.3 requires NERSA to consider adding additional technologies to the list of qualifying generators.<sup>70</sup>

By virtue of section 5.5(i), renewable energy generators may generate electricity from non-renewables. But the generators must report the quantities of electricity generated from these two different sources.<sup>71</sup> Section 5.5(ii) provides for monitoring and verification to ensure credible production of renewable energy.<sup>72</sup> Failure on the part of any electricity generators to comply or act in accordance with sections 5.5(i) or 5.5(ii) leads to the imposition of sanctions under section 5.5(iii), including termination of the REFIT license.<sup>73</sup>

Importantly, under section 5.7, REFIT does not include any electricity generated off-grid.<sup>74</sup> Rather, “REFIT only includes power generation from generators connected to the Transmission System and Distribution System and excludes off-grid power generation.”<sup>75</sup> Although this is the current scheme, in the near future advancement in technology innovation and diffusion might allow for the consideration of off-grid.<sup>76</sup>

### *Application Process*

Sections 6.1 to 6.4 require the renewable electricity generator to state the specific REFIT technology and tariff category for electricity produced in accordance to section 6.2. This will enable regulatory authority to “specify the technology, the tariff approved, duration of the REFIT, and other specific licensing conditions” in compliance with section 6.4.<sup>77</sup> The purpose of this section is to ensure that applicants state the type of technology used, due to different prices for electricity produced from each technology.<sup>78</sup> It is expected that the majority of the applicants will use technologies that are economically beneficial in terms of cost and maintenance, and at the same time reap the so-called “reasonable profit” because this will continue to guarantee return on investment and the continuity of the venture.

### *Tariffs*

Section 7.3 protects the licensees against inflation in each year of operation and allows for an adjustment to the tariffs once per annum using the consumer price index (“CPI”) or another suitable inflation index.<sup>79</sup> Section 7.4 requires monitoring of the performance and the impacts of each technology, as well as analysis of reports from the monitoring to ascertain whether there is any need for review.<sup>80</sup> Irrespective of whether or not inflation occurs, a full tariff review will take place every year for the first five-year period of implementation and every three years thereafter.<sup>81</sup> Section 7.5 stipulates that the resulting tariffs will only be applicable to new projects.<sup>82</sup> Section 7.6 provides for future pricing of electricity produced by the generators. Consequently, at the end of the contracted REFIT tariff, the generator will be required to negotiate tariffs under current market conditions.<sup>83</sup> The implication is that the economic principles of demand and supply will dictate prices to be charged by the regulator. While this is beneficial to the regulator, it does not foreclose the appropriate intervention by the regulator at any point in time—this

is achievable in view of the fact that the generators still have to negotiate tariffs under market conditions. The significance of these tariffs is that they will stimulate the inflow of investment into the renewable sector and increase the pool of capital in the sector, which may be used to promote the innovation and advancement in renewable technology.<sup>84</sup>

### *Rights and Obligations of Generators, Regulators, and REPA*

Sections 8, 9, and 10 of the guidelines explicitly provide for the rights and obligations of all parties.<sup>85</sup> Any meaningful discussion on rights and obligations must necessarily be founded on conceptualization of both terms. The description of rights as enshrined in the guidelines recognizes the legal rights of the generators to be entitled to an amount that will ensure their investments are properly protected, connected to the grid, and able to provide a reasonable return on investment. In the same vein, regulators are expected to act responsibly by virtue of section 8.5, which mandates that all the parties be on an equal level.<sup>86</sup>

It must however be mentioned that failure to act as stipulated under section 8.5 of the guidelines imposes an obligation on the regulator to apply the appropriate sanction that could lead to termination of the erring generator’s license.<sup>87</sup> This is the only reason why the right of the generator could be restricted. Conclusive and well founded evidence that a generator has acted contrary to section 8.5, for instance by generating electricity from non-renewable technology mentioned in the guidelines without a full disclosure to the regulator, will automatically affect all the inherent rights in the guidelines and allow for imposition of the appropriate sanction.

### *Monitoring, Reporting, and Review.*

In accordance with sections 11.1 to 11.10, the regulator will closely monitor the overall activities of the players and stake holders enshrined in the REFIT. Monitoring, collection, and maintenance of data on energy purchased under REFIT are outlined in section 11.2, and the publication of summary of the progress report by June 1st of every year is required by section 11.4. Section 11.4(iii) mandates the regulator to disclose the financial impacts of REFIT, which includes both the increase in electricity prices and the additional overall cost to consumers.<sup>88</sup> This proviso serves as a basis for determining whether the poor and previously disadvantaged people are able or not able to access electricity services due to the additional cost imposed on them. If the majority of the poor are unable to access and use electricity based on the increase in cost, one of the fundamentals of poverty reduction and eradication, as enshrined in the principles set out in the Millennium Development Goals, will not be achieved.<sup>89</sup> One of the ways to assist the poor in realizing their economic and social aspirations is to offer them concessions on electricity. It is suggested that in the interim, costs should be passed on to the affluent in the hybrid residential and industrial areas of urban South Africa. Various electrical appliances and industrial equipment that are not energy efficient are used in these areas. Increasing the costs of electricity for the more affluent might encourage them to use energy efficient appliances. An

additional benefit of this differential pricing would ultimately be less pressure on the transmitters from reduced energy use.

### *Resolution of Disputes and Remedies*

Section 12 provides that any disputes arising from the operation of REFIT would be resolved as laid down in sections 42 to 43 the Electricity Regulation Act 2006.<sup>90</sup> Before the commencement of any dispute resolution, the Minister is compelled by virtue of section 42(3) to prescribe the procedure to be followed for the mediation and the fees to be paid.<sup>91</sup> However, mediation or arbitration of disputes occurs only at the request of the parties to the dispute by virtue of section 42(4).<sup>92</sup> While section 42(1)(a) compels the regulator to appoint a mediator in a dispute between licensees if so requested by both parties to the dispute, sections 42(1)(b) and 42(2) give discretionary power to the regulator to appoint a suitable person to mediate.<sup>93</sup>

However, if any party disagrees with the outcome of the decisions regarding adjudication as provided in section 42, such party, under section 43, can seek remedies pursuant to section 10 of the National Energy Regulation Act of 2004, and specifically invoke sections 10(3)(4)(a)(b) which provide that:

Any person may institute proceedings in the High Court for the judicial review of an administrative action by the Energy Regulator in accordance with the Promotion of Administrative Justice Act, 2000 (Act No. 3 of 2000). Any person affected by a decision of the Energy Regulator sitting as a tribunal may appeal to the High Court against such decision. The procedure applicable to an appeal from a decision of a magistrate's court in

a civil matter applies, with the changes required by the context, to an appeal contemplated in paragraph (a).<sup>94</sup>

Section 10(1)(a) of the Act recognizes the supremacy of the Constitution of the Republic South Africa.<sup>95</sup> Hence every decision of the regulator or of the mediator, arbitrator or any person appointed by the regulator, must be consistent with the provisions of the Constitution and applicable laws. The legal implication is that any party who is not satisfied with the decisions arising out of section 42 of the Electricity Regulator Act, can appeal for review of the decision, and ultimately appeal constitutional rights up to the Constitutional court.

### **CONCLUSION**

The establishment of REFIT in South Africa provides an excellent opportunity for South Africa to increase the use of renewable energy and enhance the growth of the sector both nationally and internationally. Most of the renewable energy considered for the initial implementation has been included as a result of experiences and success stories in countries that have introduced and implemented REFIT. However, there is need for extensive and expansive improvements in areas such as, namely, harmonization of various policies on renewable energy, enhancement of the standard to achieve sustainability, dissemination of information on the benefits of renewable energy to attract investors, making stakeholders be more proactive, and creating enabling policy and law for concessions and incentives that will continue to bring down the cost of investment and make cost of electricity affordable.



## Endnotes: Implementing a Renewable Energy Feed-In Tariff in South Africa

<sup>1</sup> NATIONAL ENERGY REGULATOR OF SOUTH AFRICA (NERSA), SOUTH AFRICA RENEWABLE ENERGY TARIFF (REFIT), REGULATORY GUIDELINES (2009) [hereinafter REFIT].

<sup>2</sup> Nthambeleni Gabara, *South Africa: NERSA Announces Renewable Energy Feed-in Tariffs*, ALLAFRICA (Mar. 31, 2009), <http://allafrica.com/stories/200903310659.html>. But see Suzanne Goldenberg, *World Bank's \$3.75bn Coal Plant Loan Defies Environment Criticism*, GUARDIAN, Apr. 9, 2010, <http://www.guardian.co.uk/business/2010/apr/09/world-bank-criticised-over-power-station>.

<sup>3</sup> REFIT, *supra* note 1, at 1.

<sup>4</sup> *Id.*

<sup>5</sup> *Id.*

<sup>6</sup> *Id.*; see also NERSA, PHASE 2 OF REFIT BASED ON THE LEVELISED COST OF ELECTRICITY (2009).

<sup>7</sup> REFIT, *supra* note 1, at 16; see also Christy van der Merwe, *Renewable Energy Industry Players Make Refit Submissions to Nersa*, ENGINEERING NEWS (Sept. 3, 2009), <http://www.engineeringnews.co.za/article/renewable-energy-industry-players-make-refit-submissions-to-nersa-2009-09-03>.

<sup>8</sup> See Christy van der Merwe, *Regulator Includes More Renewable Technologies in Refit, Outlines Purchase Agreement*, ENGINEERING NEWS (Jul. 20, 2009), <http://www.engineeringnews.co.za/article/regulator-includes-more-renewable-technologies-in-refit-outlines-purchase-agreement-2009-07-20>.

<sup>9</sup> *Id.*

<sup>10</sup> NERSA, CONSULTATION PAPER RENEWABLE ENERGY FEED-IN TARIFF 4 (2008) [hereinafter NERSA CONSULTATION PAPER], <http://www.nersa.org.za/Admin/Document/Editor/file/NERSA%20REFIT%20%20consultation%20paper%2002%20Dec%202008.pdf>.

<sup>11</sup> An electrical unit equal to one billion (10<sup>9</sup>) watts (1,000 megawatts) used for one hour.

<sup>12</sup> DEP'T OF MINERALS & ENERGY (DME), GOVERNMENT WHITE PAPER ON RENEWABLE ENERGY (2003) [hereinafter DME WHITE PAPER], [http://unfccc.int/files/meetings/seminar/application/pdf/sem\\_sup1\\_south\\_africa.pdf](http://unfccc.int/files/meetings/seminar/application/pdf/sem_sup1_south_africa.pdf); see also Dirk Visser, *Renewable Feed-in Tariffs Announced*, UNIV. OF CAMBRIDGE PROGRAMME FOR SUSTAINABLE LEADERSHIP (Apr. 1, 2009), <http://www.cpsl.co.za/2009/04/renewable-feed-in-tariffs-announced>.

<sup>13</sup> NERSA CONSULTATION PAPER, *supra* note 10, at 4.

<sup>14</sup> Benjamin Sovacool, *The Importance of Comprehensiveness in Renewable Electricity and Energy-Efficiency Policy*, 37 ENERGY POLICY 1529, 1535 (2009).

<sup>15</sup> NERSA Announces the Long Awaited Renewable Energy Feed-In Tariffs, ESKOM INTELLIGENCE BRIEF (ESKOM, Johannesburg, S. Afr.), Mar. 31, 2009.

<sup>16</sup> Kolawole Odeku & Edson Meyer, *Climate Change: Strengthening Mitigation and Adaptation in South Africa*, in JOINT ACTIONS ON CLIMATE CHANGE: CONFERENCE PROCEEDINGS 272 (R.D. Andersen & M. Lehmann eds., 2009), [http://diggy.ruc.dk/bitstream/1800/4339/1/Conference\\_Proceedings\\_JAOCC\\_2009\\_final.pdf](http://diggy.ruc.dk/bitstream/1800/4339/1/Conference_Proceedings_JAOCC_2009_final.pdf).

<sup>17</sup> ADELE FAURE, CLIMATE CHANGE: WHO'S DOING WHAT IN SOUTH AFRICA? 5 (2009), [http://durbanportal.net/ClimateChange/Reports/SA\\_Climate\\_Change\\_Mapping\\_Report\\_Final.pdf](http://durbanportal.net/ClimateChange/Reports/SA_Climate_Change_Mapping_Report_Final.pdf).

<sup>18</sup> Paul Gipe, *South Africa Introduces Aggressive Feed-in Tariffs*, RENEWABLE ENERGY WORLD (Apr. 1, 2009), <http://www.renewableenergyworld.com/rea/news/article/2009/04/south-africa-introduces-aggressive-feed-in-tariffs>.

# NATIONAL SECURITY IN THE 21ST CENTURY: HOW THE NATIONAL SECURITY COUNCIL CAN SOLVE THE PRESIDENT'S CLIMATE CHANGE PROBLEM

by Arija Flowers\*

## INTRODUCTION

To adequately protect the national security interests of the United States, the President should immediately implement domestic policies and vigorously pursue agreement on international standards that stabilize greenhouse gas concentration at 350 parts per million (“ppm”) as soon as possible, and no later than 2050.<sup>1</sup> The Obama Administration acknowledged the real threat climate change poses to U.S. security in the 2009 National Intelligence Strategy (“NIS”) and 2010 National Security Strategy (“NSS”).<sup>2</sup> However, in failing to use the authority delegated to the Committee on Transnational Threats to implement climate change prevention policies, the Administration has not met its obligation under the National Security Act of 1947 to protect U.S. people, property, and interests.<sup>3</sup>

The most politically feasible and compelling argument for addressing climate change promptly is that U.S. security depends upon it. Threats to security emanating from climate change are many and varied, internal and external, and are already beginning to occur.<sup>4</sup> This article explains the science behind climate change, then discusses the impacts that climate change will have on people and communities, and the relationship of those impacts to threats on U.S. security. In response to these impacts, the article examines national security law and the Administration's faulty understanding of its power under that law and suggests how the Administration can use the authority it already possesses to implement the necessary policies to ensure a comprehensive national security program and actions to take to meet the present and future threat posed by climate change.

## CLIMATE SCIENCE

There is no longer any scientifically sound question as to whether anthropogenic climate change is occurring, and will continue to occur in the future; only the ongoing debate of how much change human activity will produce remains.<sup>5</sup> The Intergovernmental Panel on Climate Change (“IPCC”) report finds definitive anthropogenic warming between 3.2°F and 9.2°F over the twenty-first century.<sup>6</sup> Based on the amount of carbon already released into the atmosphere, the Earth is committed to a temperature increase of at least 2°F.<sup>7</sup> The best estimates of the IPCC, which depend on future reductions in CO<sub>2</sub> emissions, predict global average temperature increases of 3.2°F to 7.2°F during the twenty-first century.<sup>8</sup>

In order to understand climate science, it is important to also understand the *political* environment surrounding climate

change science and to consider what that means for determining future policies in the United States. The IPCC is a joint project of the United Nations and the World Meteorological Organization that has compiled extensive, highly scrutinized data<sup>9</sup> to become the source of internationally accepted science on climate change, relied on by governments around the world including the U.S. government.<sup>10</sup>

The problem with the scientific numbers presented by the IPCC is that they are influenced by the politics of strong, fossil-fuel-dependent nations like Saudi Arabia, the United States, and China, whose economies run on the sale and use of fossil fuels.<sup>11</sup> The desire to keep their economies humming without changing their habits is a strong incentive to downplay the impacts of CO<sub>2</sub>.<sup>12</sup> Middle Eastern member states, like Saudi Arabia, work to ensure that the primary export upon which their entire economy depends on is not rendered valueless by the findings.<sup>13</sup> Thus, the highly certain findings of the IPCC report exist *in spite* of the efforts of oil exporting countries to water-down the language until more evidence of anthropogenic change is found.<sup>14</sup> The result is an IPCC report with watered-down, politically motivated findings,<sup>15</sup> being represented to the global community as scientifically factual findings,<sup>16</sup> and ultimately the international acceptance of compromised science as the basis for climate change policy.

Other scientists, unconstrained by the challenges within the IPCC, believe more significant temperature—and climate—change will occur.<sup>17</sup> Scientists know from studying ice cores that Earth's surface temperature increased 9°F when CO<sub>2</sub> levels in the atmosphere rose by 100 ppm at the end of the last ice age.<sup>18</sup> Thus, logic renders it unlikely that a doubling of CO<sub>2</sub> over the level in 1800 (an increase of approximately 280 ppm, or nearly *three* times larger than the prior increase) will result in a temperature increase of just 5.4°F, as the IPCC seems to predict.<sup>19</sup> Based on scientific data, leading experts believe that the current global goal must be to reduce CO<sub>2</sub> concentrations below 350 ppm in order to prevent and reverse destabilizing global warming.<sup>20</sup>

Climate science is becoming increasingly more accurate as scientists continue to refine computer simulation programs called Global Circulation Models.<sup>21</sup> With increasing frequency, these computer programs are able to accurately model weather

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and climate events based on inputted data, for events that already happened in the past.<sup>22</sup> Because the events already happened and we know what the model *should* look like, the computer models' accuracy can be readily tested and proven by its ability to correctly forecast those events.<sup>23</sup>

Comparing current predictions with known previous atmospheric changes illustrates the appropriateness of skepticism regarding the more conservative scientific estimates, like those of the IPCC. Further, the scientifically accepted 550 ppm CO<sub>2</sub> "threshold," which is the maximum allowable level to avoid inducing dangerous climate change, is nearly twice as high as pre-Industrial Revolution levels.<sup>24</sup> Even the IPCC predicts an increase in temperature varying from 3.2°F to 7.2°F,<sup>25</sup> which is clearly below the 9°F history has proven can occur.<sup>26</sup> Given these illogical ratios, it is reasonable to be skeptical of the conservative estimates of the impacts of climate change, rather than skeptical that climate change is real.

### WAYS IN WHICH CLIMATE CHANGE IMPACTS THREATEN U.S. SECURITY

Congress and the White House understand that climate change threatens U.S. national security, because it threatens internal systems and contributes to the destabilization of governments and people abroad.<sup>27</sup> The range of threats begin with "natural" disasters, including increasingly severe hurricanes like Katrina in 2005,<sup>28</sup> and extend to heightened terrorism risks as diminished resources threaten livelihoods and foreign populations slip further into extremism.<sup>29</sup>

Natural disaster impacts are easier to visualize because they have a direct cause and effect. Sea level rise threatens to wipe small island nations off the face of the Earth.<sup>30</sup> Rapid rising sea levels of this type directly threaten military infrastructure on low-lying islands, and in all coastal regions worldwide.<sup>31</sup> More hurricanes of higher intensity means military equipment and personnel must be moved out of harm's way, adding expense and wear and tear, reducing general readiness, and interrupting training operations.<sup>32</sup> Increasingly severe storms can devastate infrastructure, as hurricane Andrew damaged Homestead Air Force Base in Florida in 1992 and prevented the base from ever reopening.<sup>33</sup> More frequent and intense flooding has similar impacts, requiring disaster response, while simultaneously damaging the economy, and wasting resources that could be utilized elsewhere. The Navy has additional concerns about vessel safety in a polar ice-free world, since mapping of shifting ice locations will become more difficult.<sup>34</sup>

The United States has the most varied and severe weather of any country on Earth.<sup>35</sup> With vast, drought-prone, high, arid plains, extensive coasts vulnerable to sea level rise, coasts that have already been battered by record-intensity hurricanes, and plains repeatedly flooded by rivers following massive rains and snow-melt runoff, the United States has more to lose in terms of climate change induced domestic threats than nearly any other country, except perhaps those that will be lost to the oceans.<sup>36</sup> The western states should prepare for decreased snowpack and correspondingly reduced summer runoff<sup>37</sup> and extended periods

of drought.<sup>38</sup> Without even addressing the military components of homeland security, these direct impacts on the infrastructure, economy, and livelihoods of citizens threaten the security of most of the largest cities in the U.S., because they are located on coasts, and much of the farmland located in flood plains.<sup>39</sup> It is clear, however, that changing precipitation patterns, increased severe weather events, and rising sea levels are all expected in the future, with negative direct implications for U.S. national security interests.<sup>40</sup>

The more complex threats are the indirect effects, which result not from the changed climate and associated weather events, but from the human actions which follow. As resources become scarcer and local living conditions harsher, populations with weak governments that are unable to assist those people in adapting to changes will likely resort to methods of self-preservation.<sup>41</sup> U.S. military leaders expect the United States will see increased conflict for resources, mass migrations to escape the dearth of resources, and incidences of terrorism.<sup>42</sup> Where the most basic resource needs—food and water—go unmet, disputes spiral into full-fledged conflict,<sup>43</sup> as evidenced by the "at least [eleven] violent conflicts since 1990 [which] have been fueled in part by the degradation of renewable natural resources."<sup>44</sup> In these situations, populations may turn to extremism and terrorism,<sup>45</sup> similar to al-Qaida in Afghanistan where half the country's gross domestic product comes from farming or ranching, but drought and overuse of the land has left most of the country at risk of desertification.<sup>46</sup> Populations will also likely participate in mass migrations as environmental refugees increase global tensions and further strain resources in the new location.<sup>47</sup> The IPCC and others believe that average global warming exceeding 3.6°F may be dangerous,<sup>48</sup> while others argue that 3.6°F "warming would be catastrophic for large segments of humanity."<sup>49</sup>

This type of instability in the developing world is a "threat multiplier"<sup>50</sup> and U.S. military leaders believe that "climate change will provide the conditions that will extend the war on terror"<sup>51</sup> because "droughts, violent weather, ruined agricultural lands—those are the kinds of stresses we'll see more of under climate change [which lead directly to] more poverty, more forced migrations, higher unemployment" so that "climate change prolongs those conditions [that increase terrorism risks] . . . [and] makes them worse."<sup>52</sup> Many nations that struggle to maintain political stability currently, or are likely terrorist safe-havens, are also highly vulnerable to destabilizing climate change impacts, such as drought,<sup>53</sup> flooding,<sup>54</sup> and increased disease.<sup>55</sup> When a region is "traumatized by an event or a change in conditions triggered by climate change . . . [i]f the government there is not able to cope with the effects . . . you can be faced with a collapsing state . . . as breeding grounds for instability, for insurgencies, for warlords."<sup>56</sup> Ultimately, these conditions enhance the threat of terrorist networks and risks for U.S. security.<sup>57</sup>

Increased temperatures will have dire consequences for fresh water access, flood mitigation, and human health.<sup>58</sup> Access to fresh water for drinking, farming, and hygiene is threatened by changing precipitation patterns and especially by altered mountain glacier runoff.<sup>59</sup> Three billion people already live in

water-stressed developing nations. However, that number is expected to increase to half of the global population by 2030 and those people will be exposed to *high* water stress, beyond what is currently experienced.<sup>60</sup> In addition to the increased spread of disease resulting from reduced water availability,<sup>61</sup> human exposure to malaria will double and dengue fever will increase with only a 1°F to 2°F temperature rise as the geographical range of mosquitoes expands to new regions.<sup>62</sup> Drought—or permanently drier climates—result in food and water shortages, as seen in Darfur, Sudan, that pose serious threats to stability,<sup>63</sup> and these conditions are expected to increase around the globe.<sup>64</sup> What began in Darfur as a struggle between farmers and camel herders for minimal water during time of “drought” became a permanent end of precipitation in the region, leading to desperation, civil unrest, and mass migrations.<sup>65</sup> Mass migrations out of permanently “drought” afflicted areas into northern hemisphere countries should be anticipated, along with strained resources and tempers in all regions.<sup>66</sup>

Changes in sea level and acidity could also have a devastating impact on communities around the world.<sup>67</sup> Approximately two-thirds of the world population lives within fifty miles of the coast, and in some places, including New Orleans and The Netherlands, below sea-level.<sup>68</sup> Many vulnerable populations live within the expected zone of sea-level rise, including the ten million inhabitants living within three feet of sea-level in Bangladesh.<sup>69</sup> In addition to the encroaching waters, many of the vulnerable populations are also vulnerable to the increasing acidity of the oceans, which is a primary source for protein for more than one billion people.<sup>70</sup> Ocean acidity is increasing at a rate that will be evolutionarily difficult for fish to keep up with, and diminished food supplies are expected to result in greater unrest.<sup>71</sup>

Between increased crises within the United States, reduced capacity to respond to those crises, and the possibility of increased extremism abroad, climate change impacts directly and indirectly threaten U.S. national security. If the President truly believes that “[t]o advance our common security, we must address the underlying political and economic deficits that foster instability, enable radicalization and extremism, and ultimately undermine the ability of governments to manage threats within their borders,”<sup>72</sup> then the United States must address climate change as a leading future cause of those political and economic de-stabilizers.

### THE DEVELOPMENT AND ROLE OF NATIONAL SECURITY LAW

The Obama Administration fully acknowledges that prompt and sweeping action is needed to bring greenhouse gases (“GHG”) to a safe level, thereby reducing the effects and degree of climate change.<sup>73</sup> The 2010 NSS acknowledges that the “danger from climate change is real, urgent, and severe” and that the effects of climate change “will lead to new conflicts over refugees and resources” as well as “catastrophic natural disasters.”<sup>74</sup> However, the Administration incorrectly believes that comprehensive legislation from Congress is required before

such climate protection actions can be taken.<sup>75</sup> The Administration already has the authority to take decisive action under the National Security Act.

The National Security Act of 1947 (“NSA”) established the National Security Council (“NSC”) with the intention of ensuring an open and effective working “relationship between those responsible for foreign policy and those responsible for military policy”<sup>76</sup> by creating a central advisory coordinating office for all matters related to national security.<sup>77</sup> Before World War II, it had become increasingly clear that the United States needed a more unified approach to deal with national security issues, and that need became apparent to the public at large with the attack on Pearl Harbor.<sup>78</sup> The NSC may have originally been conceived of as an advisory group, rather than a force for implementation, but the group’s function has varied to both ends of that spectrum over the years.<sup>79</sup>

The sweeping language in the opening lines of the National Security Act of 1947 expresses Congress’s acknowledgement of the need for a large-scale program to address threats to U.S. security.<sup>80</sup> The Act opens with the declaration that, “[i]n enacting this legislation, it is the intent of Congress to provide a *comprehensive* program for the future security of the United States; to provide for the establishment of integrated *policies and procedures* for the departments, agencies, and functions of the Government relating to the national security.”<sup>81</sup> The Act does not define a threat to national security, instead leaving that undefined for future experts to determine in order to fulfill the stated purpose of the Act.<sup>82</sup>

Congress also provided for a National Security Council whose purpose was advising the President regarding “the integration of *domestic, foreign*, and military policies relating to the national security to enable the military services and the *other departments and agencies* of the Government to cooperate more effectively in matters involving the national security,”<sup>83</sup> and other duties in addition to functions directed by the President.<sup>84</sup> Congress’s plain intention was government-wide policies promoting national security. Though some members of Congress expressed concern that the NSA should not delegate unsupervised authority to the Executive,<sup>85</sup> they were persuaded that extensive delegation would not deprive Congress the authority of oversight or implementation of new laws,<sup>86</sup> and gave the Executive the power necessary to carry out the desired mission: protecting national security.<sup>87</sup> Additionally, at the time of enactment, like today, flexibility in national security was a serious concern and other members of Congress believed too many restrictions on military activity would undermine the purpose of unifying defense intelligence and strategy under this new protocol.<sup>88</sup> Ultimately, Congress was convinced of the necessity of the NSC as an advisory council to the President and coordination center for all matters relating to national security.<sup>89</sup> The result of these competing Congressional concerns was a broadly written statute creating the NSC, which has enabled Presidents to determine the structure and workings of the Council, while conforming to the purpose, functions, and duties established in the original Act of 1947.<sup>90</sup>

Given the flexibility of the NSA, Presidents have altered the structure and use of the NSC from its beginnings to fit their leadership styles and the changing nature of the challenges faced by the nation at any particular time.<sup>91</sup> Where President Truman rejected the authority to promote “implementation,” President Eisenhower specifically authorized the coordinated implementation of national security policies under the NCS, creating an Operations Coordinating Board.<sup>92</sup> While this “implementation” function was criticized by some, its legal validity was not questioned,<sup>93</sup> and President Kennedy went on to invoke similar powers during the Cuban Missile Crisis, even after rejecting the practice.<sup>94</sup>

The oscillating nature of the NSC<sup>95</sup> peaked during President Reagan’s tenure, in the form of the Iran-Contra Affair, but ultimately resulted in a strong and stable NSC to shape and monitor the implementation of national security policy.<sup>96</sup> Accordingly, extensive reforms were made whereby the NSC became responsible for making policy recommendations and “reviewing, coordinating, and monitoring the implementation of national security policy.”<sup>97</sup> Upon assuming office, President George H. W. Bush was able to use his experience as the lead intelligence officer to the NSC as a prior Director of National Intelligence to establish working groups (Policy Coordinating Committees “PCCs”) for the NSC that actually worked.<sup>98</sup> This structure was also adopted by Presidents Clinton and George W. Bush because of its effectiveness.<sup>99</sup>

Congressional approval of increased authority to the Executive was evident following the attacks on September 11, 2001 in the United States, in the creation of the Department of Homeland Security,<sup>100</sup> and in President Bush’s creation of a Homeland Security Council (“HSC”) with extensive powers.<sup>101</sup> The President created the HSC to assist in developing and implementing homeland security policy, and created the Policy Coordinating Committees—modeled after the NSCs PCCs that became so effective under the first President Bush—to coordinate the development and implementation of homeland security policies, including working with local governments.<sup>102</sup> Congress passed legislation supporting this Executive-created expanded authority (the HSC’s creation), and authorized the Council to advise the President and “perform such other functions as the President may direct,”<sup>103</sup> supporting a similar attitude towards the NSC, which also contains language authorizing “other functions as the President may direct.”<sup>104</sup> Even before September 11, 2001, Congressional appreciation for the need of unified, flexible, and responsive national security systems, following increasing international terror attacks,<sup>105</sup> was plainly expressed in the passage of the Intelligence Renewal Act of 1996.<sup>106</sup>

Specifically, Congress added the Committee on Transnational Threats (“CTT”) to the NSC<sup>107</sup> as part of a commitment to reexamine and modernize intelligence and security programs<sup>108</sup> following attacks on U.S. soil in the 1990s.<sup>109</sup> The statute defines a “transnational threat” as “any transnational activity (including international terrorism, narcotics trafficking, the proliferation of weapons of mass destruction and the delivery systems for such weapons, and organized crime) that threatens the

national security of the United States”<sup>110</sup> or “any individual or group that engages in an activity referred to in [the prior definition].”<sup>111</sup> The CTT is directed to “coordinate and direct the activities of the United States government relating to combating transnational threats.”<sup>112</sup> The Committee is required to identify these threats; develop strategies to respond to such threats; “monitor implementation” of those strategies; make recommendations of appropriate responses to specific transnational threats; develop policies and “procedures” to ensure effective information sharing about such threats between Federal departments and agencies; and develop guidelines to enhance and improve the coordination of activities regarding national security.<sup>113</sup>

The Committee membership includes the Director of Central Intelligence, the Secretaries of State and Defense, the Attorney General, the Assistant to the President for National Security Affairs, and *any other* members that the President chooses to include.<sup>114</sup> The NSC membership has fluctuated remarkably since its inception,<sup>115</sup> but Congress clearly granted the President authority to include any one else he believes is properly included for the purpose of protecting national security from transnational threats.

Congress understood when passing the Intelligence Renewal and Reform Act of 1996 that with the close of the Cold War, non-traditional factors, from increasingly varied sources,<sup>116</sup> influenced national security.<sup>117</sup> Before passage of the law, floor speeches from members of both houses of Congress advocated for an adaptable<sup>118</sup> and “dynamic” twenty-first century security force<sup>119</sup> to counter the “rapidly changing threats.”<sup>120</sup> This included environmental research desired by the departments to increase “understanding of global environmental challenges.”<sup>121</sup> The language in the Conference Report indicates that Congress supports CTT engagement in both developing and implementing coordinated policies across departments to protect the nation from transnational threats, whatever they may be.<sup>122</sup>

Climate change is a transnational threat to U.S. national security by the plain language of the law. First, it inherently extends beyond the national borders of the United States because it occurs across the planet through the atmosphere and oceans.<sup>123</sup> Second, the negative impacts of climate change, documented above, both from a purely domestic perspective and from added tensions and risks at the global scale, establish the consequences of climate change as national security threats.<sup>124</sup> The original intention of Congress to create a unified security force capable of adapting to the emerging and unknown threats that left the United States vulnerable prior to World War II supports these broad and evolving views of national security.<sup>125</sup> Even President George W. Bush’s policies support the inclusion of climate change by including “manmade disasters” in the realm of national security.<sup>126</sup> Thus climate change plainly falls within the delegated responsibility of the NSA’s Committee on Transnational Threats.

Congress has specifically recognized the importance of climate change in the context of national defense<sup>127</sup> and, since 2008, has required the Department of Defense to include the armed forces capability to handle “the consequences of climate



change” in its Quadrennial Defense Review.<sup>128</sup> At the same time, Congress required all future National Security Strategy<sup>129</sup> and National Defense Strategy reports to provide military personnel guidance on how to “assess the risks of projected climate change.”<sup>130</sup>

Excuses that responsibility for implementing policies to protect against climate change are already within the authority of other departments and agencies within the Executive, and thus outside the President’s authority within the NSC, are unfounded. This argument rests on CO<sub>2</sub> regulation by the Environmental Protection Agency (“EPA”), which currently only has authority to regulate GHG emissions<sup>131</sup> to protect the public health or welfare.<sup>132</sup> EPA does not have authority to implement GHG policies to protect national security.<sup>133</sup> The President and his NSC have a mandate to do so,<sup>134</sup> and climate change policy is not solely about air quality standards, but also about protecting Americans from increasing threats posed by catastrophic weather events, destabilized global populations, and terrorism.

The variation in Presidential styles and uses of the NSC over the years, recently expanded powers granted to the Presidency, and creation of the CTT all demonstrate the President’s power to use the NSC to establish policies and to oversee their implementation in the other departments. President Obama ought to use his NSC to implement policies protecting the U.S. from modern threats,<sup>135</sup> since the *purpose* of the Act was to provide the United States with a “comprehensive program . . . of integrated policies and procedures for the departments, agencies, and functions of the government relating to the national security.”<sup>136</sup> Congress has recognized climate change as a national security issue<sup>137</sup> and it is now the President’s responsibility to use the NSC and the CTT to their fullest capacity, as Congress intended, to protect U.S. security.

## RECOMMENDATIONS

U.S. national security policies cannot be based on internationally accepted science, when that science is subject to manipulation by segments of the U.S. public and private sectors, as well as some of the very nations whose activities may threaten U.S. national security.<sup>138</sup> To adequately address climate change in the national security context, the United States ought to abandon its reliance on the conservative IPCC estimates and use the best available science to determine the *actual* risks, and likelihood of those risks, to people, property, and interests of the United States.<sup>139</sup> Recent studies, including those by NASA scientists, make clear that change must occur promptly to adequately reduce CO<sub>2</sub> levels.<sup>140</sup>

The United States should also take on the challenge like a new Cold War, fully deploying all resources necessary to defeat the threat. President Obama already recognized this in his 2010 National Security Strategy stating,

[w]hen the world was confronted by fascism, America prepared itself to win a war and to shape the peace that followed. When the United States encountered an ideological, economic, and military threat from communism, we shaped our practices and institutions at

home—and policies abroad—to meet this challenge. Now, we must once again position the United States to champion mutual interests among nations and peoples.<sup>141</sup>

Fully engaging to defeat the threats of climate change will require more than just tax incentives—though these should be utilized too—it will require significant financial investment in overhauling U.S. infrastructure and international diplomatic maneuvering to effect the necessary changes.<sup>142</sup>

First, the President should implement an aggressive *green* Job Corps program, in the style of President Franklin Roosevelt’s Works Progress Administration, employing Americans and building U.S. infrastructure for the new technological age, harnessing the power of proven renewable energy resources.<sup>143</sup> While such a program would cost significant sums of money, it would also provide jobs to millions of Americans<sup>144</sup> who currently receive ongoing unemployment benefits, without any benefit to U.S. infrastructure, as the job market refuses to improve significantly.<sup>145</sup> These jobs would vary in skill level from senior planning positions to low-skill labor jobs building and installing the new electrical generation and transmission systems. Additionally, proven economic advantages exist in moving to a low-carbon economy.<sup>146</sup> Similar to the construction of the National System of Interstate and Defense Highways under President Eisenhower, this new infrastructure system is necessary for U.S. security in the future.<sup>147</sup> Not only are U.S. civilians reliant on the current fossil-fuel-burning energy grid, exposing cities and entire regions to potential brown-outs,<sup>148</sup> so too is the U.S. military which relies almost entirely on the national power grid at fixed installations and on petroleum in combat and operations.<sup>149</sup> Thus, strategic security motivations exist for moving to renewable energies that actually improve battlefield readiness.<sup>150</sup> Dependence on fuel supply lines reduces operational preparedness, and results in astronomical monetary costs associated with transporting large quantities of fuel in comparison to the dependable renewable energy options, while jeopardizing troops’ lives.<sup>151</sup>

Second, working with the Secretary of State, the President must actively convince other nations, like China, to do the same, to secure U.S. security into the future.<sup>152</sup> This could be accomplished in a similar fashion to the “space race,”<sup>153</sup> but intentionally created, since countries that implement the new technologies first will be better prepared for the future.<sup>154</sup> Unfortunately, the 2010 NSS claim that the United States is “promoting universal values abroad by living them at home,”<sup>155</sup> is simply not true.<sup>156</sup> The 2010 NSS claims that the United States must be a global leader and “reengage the world” to facilitate “global cooperation on issues . . . [including] climate change . . . that challenge all nations, but that no one nation alone can meet.”<sup>157</sup> These statements, while true, effectively punt U.S. responsibility in dealing with climate change by: emphasizing the global nature of the problem and the need for individual nations to take responsibility; professing U.S. leadership on climate change solutions while also asserting that the U.S. will meet climate goals; but hedging the promise with the need for Congressional action.<sup>158</sup> Now is

not the time for the United States to shy away, but the time to lead by example and convince others to join our efforts, through diplomacy and fear of future ostracism in the global community for failure to adopt clean renewable energy technology.

## CONCLUSION

The impacts of climate change touch every aspect of U.S. national security. They increase destabilization of governments and demands on U.S. resources to aid or re-stabilize a region after a crisis. They threaten U.S. land, people, and infrastructure around the world, and are largely preventable. However, they are only preventable if the Administration takes responsibility for our future and utilizes the resources available to it, indeed

required of it, to protect the national security of the United States. The President should seek Senate approval to appoint the Secretaries of Interior, Agriculture, and Labor, as well as the EPA Administrator, to the NSC.<sup>159</sup> The President should rely on the best science available, not the lowest common denominator, and should take responsibility on the international stage for U.S. CO<sub>2</sub> emissions by making the United States the leader in climate change mitigation technology, enabling effective diplomatic and economic pressure in convincing other nations to do the same. The President has the authority, and the responsibility, to establish these policies and procedures to protect U.S. national security.



# Endnotes: National Security in the 21st Century

<sup>1</sup> See JAMES HANSEN ET AL., *Target Atmospheric CO<sub>2</sub>: Where Should Humanity Aim?*, 2 OPEN ATMOSPHERE SCI. J. 217, 217-18 (2008), <http://arxiv.org/ftp/arxiv/papers/0804/0804.1126.pdf> (recommending the reduction of CO<sub>2</sub> to 350 ppm immediately, or else as quickly as possible); *Climate Change: Halving Carbon Dioxide Emissions By 2050 Could Stabilize Global Warming*, SCIENCE DAILY (May 4, 2009), <http://www.sciencedaily.com/releases/2009/05/090502092019.htm> (supporting a fifty percent reduction from 1990 levels by the year 2050); TIM FLANNERY, *THE WEATHER MAKERS: HOW MAN IS CHANGING THE CLIMATE AND WHAT IT MEANS FOR LIFE ON EARTH* 6 (2005) (arguing that the best available science shows global CO<sub>2</sub> emissions need to be reduced by seventy percent by the year 2050 to stabilize carbon levels and the climate).

<sup>2</sup> THE WHITE HOUSE, NATIONAL SECURITY STRATEGY (2010), [http://www.whitehouse.gov/sites/default/files/rss\\_viewer/national\\_security\\_strategy.pdf](http://www.whitehouse.gov/sites/default/files/rss_viewer/national_security_strategy.pdf) (providing the declassified version of the NSS report which the President must provide to Congress annually pursuant to 50 U.S.C. §404(a)); NATIONAL INTELLIGENCE STRATEGY, THE OFFICE OF THE DIR. OF NAT'L INTELLIGENCE (2009), <http://www.fas.org/irp/offdocs/nis2009.pdf>.

<sup>3</sup> See National Security Act of 1947, 50 U.S.C. §401 (2006) (declaring Congressional intent for administrative agencies to create a comprehensive program of integrated policies and procedures regarding national security and defining national intelligence and intelligence related to national security); see also Exec. Order No. 13434, 72 Fed. Reg. 28,583 (May 17, 2007) (including specifically both natural and manmade threats to national security); 50 U.S.C. § 402(i) (2006) (establishing, delineating officers for, and delegating authority to a Committee on Transnational Threats within the National Security Council).

<sup>4</sup> See LENNY BERNSTEIN ET AL., AN ASSESSMENT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE: SYNTHESIS REPORT 30 (2007) (finding observed significant increases in precipitation in some regions and decreases in other regions including the Sahel over the past one hundred years, as well as increased drought since the 1970s, increased severe weather events in the past fifty years, and higher temperatures during the last half of the 20th century than in any other time frame in the past 500 years and likely the past 1,300 years); see generally FLANNERY, *supra* note 1 (explaining the scientifically proven increased rates of melting of land-based ice masses and polar ice that is increasing the rate of sea-level rise).

<sup>5</sup> BERNSTEIN ET AL., *supra* note 4 (reporting the findings of the one hundred delegate nations and 899 scientists, experts, editors, and peer reviewers comprising the United Nations IPCC under the World Meteorological Association that climate system warming is definitively occurring at least in part due to human emission of greenhouse gasses). See also FLANNERY, *supra* note 1, at 2-3 (explaining the importance of skepticism in science, but also that the debate no longer is on the impact of the greenhouse gasses being emitted by man as opposed to if man is contributing); Jeffrey D. Sachs, *Climate Change and the Law: Even the Bush Administration has Started to Recognize U.S. Legal Obligations to Fight Global Warming*, SCI. AM., Oct. 14, 2007, <http://www.scientificamerican.com/article.cfm?id=climate-change-and-the-law&print=true> (hinting that some of the most ardent climate change deniers acknowledge the scientific validity through legal obligations to prevent effects).

<sup>6</sup> E.g., BERNSTEIN ET AL., *supra* note 4, at 7-8 (finding the likely range of temperature increase between 2.0°F and 11.5°F with best estimates as the numbers

above; these changes are over the average temperatures between 1980-1999); FLANNERY, *supra* note 1, at 161-62 (referring to a 2005 study at Oxford University using 90,000 computers to generate possible results ranging from 3.6°F to 20°F).

<sup>7</sup> See FLANNERY, *supra* note 1, at 176 (warning that a 2.0°F increase is now inevitable and will necessarily result in the extinction of at least one newly discovered and entirely unique wet tropics frog species); HANSEN ET AL., *supra* note 1 (warning that a 2.0°F temperature increase is “in the pipeline” due to imbalance between current global temperatures and the appropriate “equilibrium” temperature due to slow feedback cycles in the ice sheets and oceans).

<sup>8</sup> BERNSTEIN ET AL., *supra* note 4, at 7 (providing a table of CO<sub>2</sub> emission scenarios, along with average expected associated temperature increase and sea level rise for the years 2090-2099 compared against averages from 1980-1999, and noting that actual change will depend on what policies are adopted to deal with CO<sub>2</sub> and that the IPCC anticipates an increase in GHG of at least twenty-five percent by 2030 over 2000 levels).

<sup>9</sup> Organization, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE [hereinafter IPCC], <http://www.ipcc.ch/organization/organization.htm> (explaining the make-up, workings, and politics of the IPCC) (last visited Feb. 15, 2011). See also FLANNERY, *supra* note 1, at 245 (explaining that the Assessment Report is the result of thousands of scientists' contributions, 426 climate experts, whose work was twice reviewed by 440 other experts with thirty-three editors and a final adoption by delegates from one hundred nations, and that any nation that wants to participate is allowed to do so).

<sup>10</sup> See 10 U.S.C.S. § 118(g) (2010) (mandating that beginning in 2009 the President's National Security Strategy report and the Department of Defense Quadrennial Defense Review use IPCC data in determining U.S. military capabilities to deal with climate change, including extreme weather events and to use other “consensus climate projections” if available); BERNSTEIN ET AL., *supra* note 4 (providing the international consensus report); FLANNERY, *supra* note 1, at 245 (recognizing the IPCC as the internationally accepted authority on climate change science, but questioning the basis for that authority).

<sup>11</sup> BERNSTEIN ET AL., *supra* note 4; FLANNERY, *supra* note 1, at 245-46.

<sup>12</sup> *Id.*

<sup>13</sup> FLANNERY, *supra* note 1, at 245-46 (citing the Saudi Arabian delegate's claimed reason for seeking changes in wording in the Panel's reports was a desire to avoid repercussions to oil sales until even stronger evidence existed precisely because oil is ninety-six percent of Saudi Arabia's total exports, and noting that these countries likely realize it is better for them to have a seat at the table to influence the final language of the IPCC report, thereby protecting their economic survival by avoiding the abandonment of fossil fuels, for as long as possible).

<sup>14</sup> See *id.* (advocating for reliance on alternative scientific resources, like the Hadley Centre and other such non-political, science-based organizations).

<sup>15</sup> *Id.* at 246.

<sup>16</sup> IPCC, *supra* note 9 (describing itself as a “scientific body” working to provide “rigorous and balanced scientific information” and a “clear scientific view” on climate change and potential consequences).

# CLIMATE CHANGE AND SMALL ISLAND STATES:

## ADRIFT IN A RAISING SEA OF LEGAL UNCERTAINTY

by *Jeremy Kelley\**

In 1999, the rising sea level swallowed two islands of the nation Kiribati.<sup>1</sup> Rising sea level<sup>2</sup> is one of the effects of climate change to which small island nations are particularly susceptible.<sup>3</sup> Considering that the average elevation of this nation of ninety thousand people on thirty-three islands and atolls<sup>4</sup> is only about two meters above sea level,<sup>5</sup> it is no surprise that Kiribati's President Anote Tong considers the rising sea a threat to the very existence of his nation.<sup>6</sup> Taking a cue from a policy first announced by the Maldives, President Tong has suggested that the solution to his nation's disappearance could be purchasing land in another country to relocate the entire population of Kiribati.<sup>7</sup> This unprecedented situation raises the question: what would be the legal status of an I-Kiribati or Maldives population on the run from the rising waters?

Estimates vary, but it is undisputed that current and future effects of climate change, including droughts, floods, desertification, and rising sea level, will displace millions each year.<sup>8</sup> At least some displacement will occur across borders, especially when dealing with small islands nations.<sup>9</sup> In spite of this potential for massive displacement, at present no international legal framework exists which will recognize and protect those displaced by environmental factors, even though the concepts of "environmental" and "climate" refugees have been contemplated since the 1980s.<sup>10</sup>

Two different approaches to the legal problems have been proposed. On one hand there have been voices calling for an expansion of the legal definition of "refugee" to incorporate environmentally displaced persons,<sup>11</sup> while others argue that a new and separate legal framework be created.<sup>12</sup> Island nations, while supportive of finding an international legal solution, are unwilling to wait for international consensus and are taking their own measures to avoid catastrophe.<sup>13</sup>

"Refugee" is a legal term, narrowly-defined by the 1951 UN Convention Relating to the Status of Refugees, protecting persons who fled their home country in fear of persecution for reasons of race, religion, political opinion, or ethnicity.<sup>14</sup> In 2006, the Maldives proposed amending the Convention to include "climate refugee."<sup>15</sup> Recently, the Bangladeshi Finance Minister called for "[t]he [C]onvention on refugees [to] be revised to protect [those displaced by climate change]."<sup>16</sup> However, the UN High Commissioner for Refugees ("UNHCR") is concerned that the inclusion of environmental or climate refugee could potentially undermine the clarity of current standards.<sup>17</sup> Further, UNHCR is already under pressure from host countries to reduce the burden of refugees<sup>18</sup> and it is also concerned that renegotiation of the Convention could result in the lowering of existing protection standards.<sup>19</sup>



For these reasons, some argue that dealing with climate refugees calls for a new and independent legal framework.<sup>20</sup> Any new framework would need to draw upon widely agreed principles and connect the protection of those displaced with the broader international legal framework on climate change.<sup>21</sup> The international instrument would also need to address the practicalities of enforcement and establishment of rights.<sup>22</sup>

One proposed convention from the University of Limoges<sup>23</sup> recognizes different types of environmental displacement, protecting generally against "natural and technological disasters."<sup>24</sup> It calls for the creation of a monitoring agency akin to the UNHCR.<sup>25</sup> The convention would recognize the duty of the international community to assist a State that suffers from ecological disasters<sup>26</sup> and the right to "conserve the nationality of [the environmentally displaced person's] state of origin . . . and to acquire the nationality of the receiving state."<sup>27</sup> This last right is especially important for a nation such as Kiribati, where complete loss of territory could result in the destruction of its legal status as a nation.

Territory is one of the key elements of nationhood<sup>28</sup> and without physical territory under sovereign control, no nation can exist.<sup>29</sup> On the other hand, nationality is considered a fundamental right in international law.<sup>30</sup> How can this right be squared with permanent loss of sovereign territory and nationhood? It is unlikely that another nation would accept a cash payment to transfer the sovereignty of a part of its existing territory. Certainly, consideration would have to be made for those already settled upon the land.<sup>31</sup> Without an existing legal framework,

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perhaps Kiribati and the Maldives are doing the right thing to proactively seek out alternatives.

Beyond purchasing land, one plan currently underway is to secure “merit-based relocation.”<sup>32</sup> Island nationals would be trained in needed professions (e.g. nursing) in other countries, with the ability to stay and seek citizenship there.<sup>33</sup> In this way, pockets of I-Kiribati community would be built up worldwide, facilitating future resettlement.<sup>34</sup> Furthermore, with removal of much of the population, it would be possible to build up one island and use it to “anchor” the sovereignty of the nation in the event of drastic sea level rise.<sup>35</sup> However, even if the state continued to exist in legal terms<sup>36</sup> it is unclear how it would function.<sup>37</sup>

The best choice may be for an island nation to be absorbed into another nation, using its own sovereignty to pay for relocation.<sup>38</sup> For example, in exchange for control of Kiribati’s sovereign territory, India could accept Kiribati’s population and provide resettlement assistance such as language training, vocational training, and financial aid.<sup>39</sup> An end to nationhood, incorporation and relocation of an island nation in exchange for the sovereign control of its resources and maritime zone would then benefit both parties.<sup>40</sup>

The world will see an increase in environmentally displaced persons in the coming years. Room must be made for them with the creation of a new and separate legal framework.<sup>41</sup> However, this will take time. In the meantime, small island nations are best served to take matters into their own hands.



## Endnotes: Climate Change and Small Island States

<sup>1</sup> Alex Kirby, *Islands Disappear Under Rising Seas*, BBC NEWS (June 14, 1999), <http://news.bbc.co.uk/2/hi/science/nature/368892.stm>.

<sup>2</sup> Compare INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS 409 (2007) [hereinafter IPCC], <http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4-wg1-chapter5.pdf> (estimating sea level rise of 28-43 centimeters (11-17 inches) by 2100), with Richard Black, *Forecast for Big Sea Level Rise*, BBC NEWS (April 15, 2008), <http://news.bbc.co.uk/2/hi/7349236.stm> (noting that new research suggests the IPCC estimates may be too conservative and real sea level change could be closer to 150 centimeters (59 inches) by 2100).

<sup>3</sup> IPCC, *supra* note 2, at 690-91, <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-chapter16.pdf> (“Many small islands are highly vulnerable to the impacts of climate change and sea-level rise. They comprise small land masses surrounded by ocean, and are frequently located in regions prone to natural disasters, often of a hydrometeorological and/or geological nature. In tropical areas they host relatively large populations for the area they occupy, with high growth rates and densities. Many small islands have poorly developed infrastructure and limited natural, human and economic resources, and often small island populations are dependent on marine resources to meet their protein needs. Most of their economies are reliant on a limited resource base and are subject to external forces, such as changing terms of trade, economic liberalisation, and migration flows. Adaptive capacity to climate change is generally low, though traditionally there has been some resilience in the face of environmental change.”).

<sup>4</sup> CIA, THE WORLD FACTBOOK 339 (2010).

<sup>5</sup> Secretariat of the UN Permanent Forum on Indigenous Issues, N. Austl. Indigenous Land & Sea Mgmt. Alliance, *International Expert Group Meeting on Indigenous Peoples & Climate Change*, at 3, U.N. Doc. 2007/WS.3 (April 4, 2008) (“Kiribati almost entirely consists of low lying atolls with an average elevation below 2 meters (6.5ft). The small island of Tebua in Tarawa used to be a landmark for fishermen. It cannot be seen any more—it is now knee-deep under water! Kiribati suffers the effects of king tides that wash through the islands from one side to the other with great ease. It is now a common factor in Kiribati to have king tides with waves of 2.8 meters high!”).

<sup>6</sup> Subramaniam Sharma, *Kiribati Islanders Seek Land to Buy as Rising Seas Threaten*, BLOOMBERG (Feb. 8, 2009), <http://www.bloomberg.com/apps/news?pid=21070001&sid=a0kuXMSICBhg>.

<sup>7</sup> *Id.*; see also Randeep Ramesh, *Paradise Almost Lost: Maldives Seek to Buy a New Homeland*, GUARDIAN (Nov. 10, 2008), <http://www.guardian.co.uk/environment/2008/nov/10/maldives-climate-change> (noting President Mohamed Nasheed statements that multiple nations are receptive of the idea of selling land to Maldives); IPCC, *supra* note 2, at 688-716 (detailing the adverse ways in which climate change will affect and possibly render uninhabitable small islands).

<sup>8</sup> See Christian Aid, *Human Tide: The Real Migration Crisis*, at 6, 48 n.10 (2007) (estimating displacement of 250 million “[b]ased on an updated figure calculated by Dr Norman Myers. In 1995, Dr Myers suggested that between 150 and 200 million people would have to permanently leave their homes because of climate change (Norman Myers & Jennifer Kant, The Climate Inst.,

*Environmental Exodus: An Emergency Crisis in the Global Arena* (1995)). This was quoted last year in the UK Government’s *Stern Review on the Economics of Climate Change*, which described the estimate as being based on ‘conservative assumptions’. Dr Myers now believes that the true figure will be closer to 250 million. Christian Aid interview, 14 March, 2007.”). But see OLI BROWN, INT’L ORG. FOR MIGRATION, MIGRATION AND CLIMATE CHANGE 12 (Ilse Pinto-Dober-nig ed., 2008) (analyzing different estimates, including that of Norman Myers, Brown concludes that “the simple fact is that nobody really knows with any certainty what climate change will mean for human population distribution. Current estimates range between 25 million and 1 billion people [displaced] by 2050.”).

<sup>9</sup> See generally UN HIGH COMMISSIONER FOR REFUGEES, CLIMATE CHANGE, NATURAL DISASTERS AND HUMAN DISPLACEMENT: A UNHCR PERSPECTIVE 2 (2009) [hereinafter UNHCR], <http://www.unhcr.org/refworld/docid/4a8e4f8b2.html> (noting that most environmental displacement will occur domestically and those displaced in this manner should be afforded protection and rights under the UN Guiding Principles on Internal Displacement, however, some displacement will occur across borders and, as such, protection cannot be afforded under the Guiding Principles).

<sup>10</sup> ESSAM EL HINNAWI, UNEP, ENVIRONMENTAL REFUGEES 4 (1985) (“Environmental refugees are defined as those people forced to leave their traditional habitat, temporarily or permanently, because of a marked environmental disruption (natural or triggered by people) that jeopardizes their existence and/or seriously affected the quality of their life.”).

<sup>11</sup> See, e.g., Frank Biermann & Ingrid Boas, *Protecting Climate Refugees: The Case for a Global Protocol*, ENVIRONMENT, Nov.-Dec. 2008, <http://www.environmentmagazine.org/Archives/Back%20Issues/November-December%202008/Biermann-Boas-full.html>; Harriet Grant et al., *UK Should Open Borders to Climate Refugees, Says Bangladeshi Minister*, GUARDIAN (Dec. 4, 2009), <http://www.guardian.co.uk/environment/2009/nov/30/rich-west-climate-change>.

<sup>12</sup> See, e.g., Dana Zartner Falstrom, *Stemming the Flow of Environmental Displacement: Creating a Convention to Protect Persons and Preserve the Environment*, 13 COLO. J. INT’L ENVTL. L. & POL’Y 1 (2002); LAURA WESTRA, ENVIRONMENTAL JUSTICE & THE RIGHTS OF ECOLOGICAL REFUGEES (2009).

<sup>13</sup> See, e.g., Sharma *supra* note 6; Ramesh *supra* note 7.

<sup>14</sup> U.N. Convention Relating to the Status of Refugees, art. 1, July 28, 1951, 189 U.N.T.S. 150. (“[Any person] owing to well-founded fear of being persecuted for reasons of race, religion, nationality, membership of a particular social group or political opinion, is outside the country of his nationality and is unable or, owing to such fear, is unwilling to avail himself of the protection of that country; or who, not having a nationality and being outside the country of his former habitual residence as a result of such events, is unable or, owing to such fear, is unwilling to return to it.”).

<sup>15</sup> Biermann & Boas, *supra* note 11, at n.1 (citing to Republic of the Maldives Ministry of Env’t, Energy & Water, *Report on the First Meeting on Protocol on Environmental Refugees: Recognition of Environmental Refugees in the 1951 Convention and 1967 Protocol Relating to the Status of Refugees* (Aug. 14-15, 2006)).

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# CLIMATE CHANGE, INTELLECTUAL PROPERTY, AND THE SCOPE OF HUMAN RIGHTS OBLIGATIONS

by Kavita Kapur\*

## INTRODUCTION

Hunger,<sup>1</sup> displacement,<sup>2</sup> and loss of culture and traditional ways of life<sup>3</sup> are the likely consequences of continuing on the world's current trajectory of climate change.<sup>4</sup> These phenomena and the images of suffering that they evoke reflect situations rich with human rights concerns. Indeed, rights activists demanding international action to halt global warming invoke these themes of human vulnerability as a central part of their protests.<sup>5</sup> However, the extent to which the threatened effects of climate change can be understood as imposing legal obligations within the normative framework of international human rights law, rather than simply as rhetorical ideas of moral rights, remains unclear.<sup>6</sup> In January 2009, the UN Office of the High Commissioner for Human Rights ("OHCHR") published a report announcing that climate change had a range of effects on human rights.<sup>7</sup> Although it may be unclear whether those effects constitute violations of human rights law, states still have obligations to protect those affected by climate change.<sup>8</sup> The OHCHR report provided minimal guidance on what those human rights obligations consist of, thus much remains uncertain about the scope of the obligations imposed on states by climate change. As the international community continues to wrangle with the task of delineating a strategy for climate stabilization,<sup>9</sup> clarifying the human rights obligations of states may help to inform both relevant national policies and the emerging international framework.

The move towards climate stabilization, and consequently an alleviation of pressures on human rights, will require all states to transform the ways in which they produce energy, especially developing countries with substantial green house gas emissions. This in turn demands adequate development, deployment, and implementation of clean energy technologies, and diffusion to those countries in need, including much of the developing world.<sup>10</sup> Because of the high-tech nature of clean energy solutions, the protection of intellectual property ("IP") rights has an important role to play in each stage of the process.<sup>11</sup>

States seeking climate change solutions will increasingly deal with tensions caused when human rights and IP protection obligations conflict. States must find a way to protect human rights while addressing climate change.<sup>12</sup> This article attempts to anticipate some of these tensions and to propose potential resolutions. The climate change crisis, the clean energy solutions that have emerged in response, and the role of intellectual property protections in that process, provide a backdrop against which the relationship between human rights and climate change can be charted. This article begins by looking specifically at the challenges that climate change poses to the traditional human

rights framework, as well as the sources of human rights obligations in relation to climate change. The discussion then turns to questions of access to clean energy technology, and contrasts the issue to the debate over access to essential medicines. Next, the article focuses on prospective tensions with IP protections in the context of access to clean energy technology by applying various analytical frameworks grounded in human rights. The article concludes by underscoring the importance of the human rights analysis in mediating this tension and by cautioning against the creation of fortified IP protections that do not prioritize human rights considerations.

## CLIMATE CHANGE, CLEAN ENERGY SOLUTIONS, AND INTELLECTUAL PROPERTY

### THE CLIMATE CHANGE PROBLEM

The temperature of the global climate is rising.<sup>13</sup> Once the subject of considerable debate,<sup>14</sup> the fact of global warming, both natural and anthropogenic (human-induced), is now nearly universally accepted.<sup>15</sup> Most states in the international community are members of the United Nations Framework Convention on Climate Change ("UNFCCC"), an international treaty aimed at the reduction of global warming.<sup>16</sup> Members of the UNFCCC are thus aligned in their commitment to combat the "change of climate which is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and which is in addition to natural climate variability observed over comparable time periods."<sup>17</sup> Significant strides made in the direction of reaching international consensus on the problem of climate change are due in part to the availability of reliable scientific information on the causes and effects of global warming.<sup>18</sup>

In particular, the reports of the Intergovernmental Panel on Climate Change ("IPCC") contain assessments and projections about climate change which are regarded as authoritative by the international community.<sup>19</sup> The IPCC is an intergovernmental scientific organization established by the UN Environment Programme and the World Meteorological Organization, currently with 194 members, that reviews and assesses available information on climate change in order to provide "rigorous and balanced scientific information to decision makers."<sup>20</sup>

According to the IPCC's most recent assessment, published in 2007, there is sufficient scientific consensus to unequivocally establish the fact of global warming.<sup>21</sup> In making this conclusion, the IPCC draws upon observations of increases in global average

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air and ocean temperatures, the widespread melting of snow and ice, and the rising global average sea level.<sup>22</sup> Additionally, the same report asserts with more than ninety percent certainty that most of the global warming experienced in the last fifty years is due to anthropogenic emissions of greenhouse gases.<sup>23</sup>

Beyond establishing the reality of human-induced climate change, the IPCC assessment also presents the current scientific consensus on the effects of climate change.<sup>24</sup> These include changes in weather patterns, which are ninety percent certain to result in the shrinking of snow-covered areas and of sea ice, rising sea levels and water temperatures, increased frequency of heat waves, and heavy precipitation events.<sup>25</sup> These weather changes will in turn have grave consequences for agriculture, forestry, ecosystems, water resources, human health, and society at large.<sup>26</sup>

The increased strength of consensus around the anthropogenic causes of climate change has inspired response efforts aimed at reducing emissions levels. These strategies seek to mitigate the trend of global warming by sufficiently reducing greenhouse gas emissions to a level that would stabilize the rising climate temperature.<sup>27</sup> Although specific target emissions levels were established in the Kyoto Protocol to the UNFCCC,<sup>28</sup> the shift towards a stable climate will require additional strategies and tools in order to reach any global target levels.

#### CLEAN ENERGY TECHNOLOGIES AND INTELLECTUAL PROPERTY

Climate stabilization, or the emissions reductions that must be reached globally in order to effectively combat global warming, requires a drastic overhaul of energy production systems.<sup>29</sup> As such, there is a need for efficient clean energy technologies that can be developed relatively quickly, deployed into action, and diffused widely.<sup>30</sup>

Efforts to develop, deploy, and diffuse clean energy technologies have been underway for many years now, with significant successes. There is great variation in the types of technologies available to facilitate the global shift to less carbon-reliant energy production. Amongst the most prominent technologies are photovoltaic (solar), biofuels, and wind technologies.<sup>31</sup>

As with any other technology industry, clean energy technologies are subject to a variety of IP protections. However, there is considerable debate over the propriety and scope of such IP protections since these technologies are integral to alleviating the global stress of climate change.<sup>32</sup> Those who generally favor IP protections for clean energy technologies argue that incentives are critical to drive innovation and diffusion of such technologies.<sup>33</sup> Without IP protections, the theory goes, innovation would be severely limited and new clean energy technologies would not be developed.<sup>34</sup> Opponents of IP protections for clean energy focus on the problems of access caused by the exclusion rights afforded to patent holders, which almost inevitably results in prohibitively high costs.<sup>35</sup> Thus, IP protections may render the technology unaffordable for those who most desperately need it, including, in this case, those developing countries with high energy demands.

Basic renewable energy technologies, including wind, biofuel, and photovoltaic, are not new and have been off patent protection for a number of years.<sup>36</sup> Instead, specific

improvements and add-on features to these existing technologies are increasingly being patented.<sup>37</sup> The emerging modification and adaptations are variously aimed at improving efficiency by minimizing cost, maximizing energy production, or both.<sup>38</sup> With solar energy, for example, new technologies attempt to create a thin film of semiconductors that can be applied to existing surfaces, greatly reducing the costs of manufacturing solar technology.<sup>39</sup>

While these complex technologies and processes are central to any effort to advance climate stabilization, the impacts of climate change on humans should not be overlooked. Scientific, environmental, and economic dimensions have long occupied center stage in the discourse around climate change. However, the grave threat that climate change poses to human lives and human well-being should be the central consideration in crafting solutions that are responsive to the lived realities of this crisis.

### HUMAN RIGHTS AND CLIMATE CHANGE

The symbolic force of framing climate change as an affront to human rights may in itself have great utility. However, it does not carry the same weight or consequences as violations of states' legal duties to guarantee the rights of individuals in their territories. States will face little formal accountability for breaching moral priorities that are simply phrased as a matter of conceptual right.<sup>40</sup> Violations of international human rights law, on the other hand, may give rise to monitoring by an international treaty body, scrutiny by a special rapporteur, or litigation of individual petitions before a regional human rights institution.<sup>41</sup> Additionally, because the legal obligations of a state under international human rights law include those standards to which the state has explicitly consented to be bound, violations of human rights law are a form of a breach. Such a breach threatens to call the credibility of a state into serious consideration.

#### CHALLENGING THE FRAMEWORK

Conceptualizing the effects of climate change as human rights violations poses a difficult conundrum for the international human rights law framework. At one level, there is no explicit normative provision dealing with climate change that would give rise to an international legal obligation.<sup>42</sup> The universal treaties that create international human rights obligations for states do not explicitly address the dangers posed by the climate change crisis.<sup>43</sup> Even if we attempt to locate the human impacts of climate change within the framework of environmental protection, the key human rights treaties—the International Covenant on Civil and Political Rights (“ICCPR”)<sup>44</sup> and the International Covenant on Economic, Social, and Cultural Rights (“ICESCR”)<sup>45</sup>—include no reference to a specific right to a safe and healthy environment.<sup>46</sup>

The global nature of greenhouse gas emissions along with the related transboundary impacts disrupts the traditional focus of human rights on obligations that states have to individuals in their territories.<sup>47</sup> Although there are certain states who have contributed more significantly to climate change, the effects on their populations is often more attenuated. The most severe impacts threaten to disrupt the lives of citizens in other parts



of the world.<sup>48</sup> Indeed, the states whose citizens would be most dramatically affected by climate change, and thus who have the greatest stake in efforts to combat global warming, are those states who have least contributed to global greenhouse gas emissions.<sup>49</sup> Holding these states responsible for human rights violations that they did not directly cause is untenable under the existing framework. The traditionally territorial nature of human rights obligations is thus inadequate to address the global climate change problem.

## HUMAN RIGHTS OBLIGATIONS ARISING FROM CLIMATE CHANGE

Pursuant to a resolution of the Human Rights Council, in January 2009 the UN Office of the High Commissioner for Human Rights (“OHCHR”) released a detailed analytical report of the relationship between climate change and human rights.<sup>50</sup> The report analyzed the impacts of climate change on various human rights protected within the ICCPR, the ICESCR, and other international human rights treaties.<sup>51</sup> Specifically, the OHCHR report detailed the significant threats that climate change poses to the rights to life, adequate food, water, health, adequate housing, and self-determination, while also highlighting the particular impacts on highly vulnerable groups such as women, children, and indigenous peoples.<sup>52</sup> Additionally, the report discussed the prospects for displacement, as well as for conflict and related security risks, that are likely to occur as a result of climate change along with the attendant human rights implications for the individuals affected.<sup>53</sup>

The OHCHR report concluded that while it was unclear whether the effects of climate change amounted to human rights violations, states nonetheless had obligations to protect human rights in the context of national-level measures undertaken to address climate change.<sup>54</sup> In addition, human rights law also obliges states to engage in international cooperation to protect and promote human rights. Specifically, the ICESCR carries extraterritorial obligations that require states to

- (1) refrain from interfering with the enjoyment of human rights in other countries; (2) take measures to prevent third parties over which they hold influence from interfering with the enjoyment of human rights in other countries; (3) take steps through international assistance and cooperation, depending on the availability of resources, to facilitate the fulfillment of human rights in other countries, including disaster relief, emergency assistance, and assistance to refugees and displaced persons; and (4) ensure that human rights are given due attention in international agreements and that such agreements do not adversely impact upon human rights.<sup>55</sup>

Within the framework of the ICESCR, a state is obliged to “take steps, individually and through international assistance and cooperation, especially economic and technical, to the maximum of its available resources, with a view to achieving progressively the full realization of the rights recognized in the present Covenant by all appropriate means.”<sup>56</sup> The duty to

engage in international cooperative efforts aimed at the advancement of economic, social, and cultural rights is in direct contrast to the language in the ICCPR, which expressly describes obligations of a state to “individuals within its territory and subject to its jurisdiction.”<sup>57</sup> The broader scope of duties under the ICESCR than in a traditional human rights model is supported by the General Comments of the Committee on Economic, Social and Cultural Rights (“CESCR”) which note, *inter alia*, that under the ICESCR, it is “particularly incumbent on States parties and other actors in a position to assist to provide ‘international assistance and cooperation, especially economic and technical’ which enable developing countries to fulfill their core and other obligations.”<sup>58</sup>

## ACCESS TO CLEAN ENERGY TECHNOLOGY

### OVERVIEW OF TECHNOLOGY AND ACCESS ISSUES

Most of the clean energy technology that has been developed in response to climate change has originated in developed countries.<sup>59</sup> This has created an imbalance in access between developing and developed countries, with developing countries asserting that intellectual property regimes prevent them from gaining access to these critical technologies.<sup>60</sup> Although there have been numerous attempts to study the issue, there is no conclusive evidence that IP protections present or do not present a barrier to the diffusion of clean energy technologies.<sup>61</sup> However, there are at least some indications that the process of negotiating for access when the base technology is subject to foreign IP protection hinders developing country industries that want to produce new technologies or develop an adaptation to an existing technology.<sup>62</sup> Strong IP protection in developing countries may promote diffusion by assuring patent holders that if they license their technology to a firm in the target country, there will be sufficient protection against unlawful copying.<sup>63</sup>

Regardless of the lack of conclusive data on whether intellectual property rights are a barrier to access to clean energy technologies, it is irrefutable that they do influence access in a variety of different ways.<sup>64</sup> Despite the particular importance of encouraging innovation in the clean energy technology industry in light of the great significance that slight modifications or adaptations can have, technology transfer has rarely focused on supporting the development stage of climate stabilization technology.<sup>65</sup> Instead, funding and other forms of programmatic support have been the primary strategies for spurring innovation in developing countries.<sup>66</sup>

Most of the technology transfer that has taken place in the context of climate change has been in the deployment stage.<sup>67</sup> Transfer of technology for the purposes of deployment can take various forms. First, products that incorporate the technology can be transferred directly to the developing country for domestic use.<sup>68</sup> A second form of transfer would be licensing production to a company in the target country.<sup>69</sup> Third, transfer may simply involve capacity building for research and production facilities in the target country.<sup>70</sup>

## CONTRASTING CLEAN ENERGY AND ESSENTIAL MEDICINES

Despite the apparent parallels in the debates over access to medicine and access to clean energy technology, there are some acute differences between the two industries that limit the extent to which arguments for access can be shared. One key difference between pharmaceuticals and clean energy is the availability of substitutes. A drug that is developed to cure or treat a particular disease is likely to be one of the only medications that serve that purpose; there are unlikely to be many, if any, substitutes.<sup>71</sup> Technologies that produce clean energy, on the other hand, range from wind and solar to hydro and nuclear.

The framework of normative instruments for facilitating access to essential medicines is much richer than that for clean energy technologies. The Doha Declaration to the Agreement on Trade-Related Aspects of Intellectual Property Rights (“TRIPS”) formally recognized the flexibilities within the TRIPS agreement that could be used as a basis for compulsory licenses on essential medicines.<sup>72</sup> The CESCR even issued a General Comment asserting that the right to health includes an obligation for states to promote medical research and to provide access to affordable treatments, including essential drugs.<sup>73</sup>

The Doha Declaration does not significantly adopt a human rights framework of analysis despite the human rights arguments made by many within the access to medicines movement.<sup>74</sup> Instead, it carves out of the general rule of intellectual property protection a limited range of exceptions to apply in narrow circumstances.<sup>75</sup> Thus, the effect of the Doha Declaration is limited to issues directly implicating public health rather than the full range of human rights.<sup>76</sup>

## REGIME SHIFTING: HUMAN RIGHTS ANALYSIS

As the forum for the coordination of the global climate stabilization framework, the UNFCCC has been the site of negotiations over technology transfer, innovation, collaborations, and other strategies aimed at facilitating the development, deployment, and diffusion of clean energy technologies in the developing world.<sup>77</sup> The various climate change conferences held under the UNFCCC auspices have not recognized any progress towards articulating an actionable global strategy to facilitate a developing world shift to clean energy technologies.<sup>78</sup> At the same time, activists, non-governmental organizations (“NGOs”), and international organizations have made repeated calls for the mainstreaming of human rights concerns within the UNFCCC process.<sup>79</sup> These demands have similarly been met with little real action in the way of prioritizing human rights within the negotiating texts and processes.<sup>80</sup> Accordingly, the UNFCCC regime has yet to connect human rights to the debate over how to facilitate developing world adoption and adaptation of clean energy technologies.<sup>81</sup> Therefore, a discursive regime shift<sup>82</sup> should be attempted from the politicized negotiations of the UNFCCC process to a series of human rights analyses that seek to link the human impacts of climate change to the question of barriers to clean energy technology. While the flexibilities within the TRIPS Agreement that sufficed for guaranteeing access to medicines in the Doha Declaration may provide a sufficient legal basis for the granting of compulsory licenses for

clean energy technologies, the alternative frameworks presented in this section aim to conduct the analysis starting from a position of human rights protection.<sup>83</sup> These frameworks are centered in the protection of human rights and are utilized to find theories of accommodating intellectual property protections.

The starting point of a human rights analysis is necessarily international instruments and other sources of human rights obligations. This framework of analysis is in contrast to intellectual property analyses, which take as the starting point instruments relating to intellectual property rights.<sup>84</sup>

## HUMAN RIGHTS OBLIGATIONS

### *Intellectual Property Rights as Human Rights*

The protection of intellectual property is not simply an economic tool designed to encourage and award innovation. Instead, the protections afforded to a patent holder may also be an iteration of human rights. As such, intellectual property systems may be frameworks for states to fulfill their human rights obligations. The ICESCR delineates the right “authors” to “protection of moral and material interests resulting from any scientific, literary, or artistic production.”<sup>85</sup>

### *Rights Affected by Climate Change*

In accordance with the guidance provided by the CESCR, states are obliged to ensure the minimum essential level of each right codified in the ICESCR.<sup>86</sup> The duties of states derive from the obligation to secure certain minimum standards of human rights; thus, the duty is not fulfilled simply by adopting a particular policy or engaging in a particular transfer of technology if that policy or transfer does not result in the realization of the minimum value of the relevant human right.<sup>87</sup> Rather, the duty is satisfied when the minimum standards are guaranteed.<sup>88</sup> This substantive duty and its various constituent rights oblige states to simultaneously advance development, deployment, and diffusion of clean energy technology.<sup>89</sup> The human rights obligation includes not only the importation of technology, but also support for local capabilities to adopt, diffuse, adapt, and develop technologies that fit within the particular circumstances of the state. This results in changing energy production systems in a manner sufficient to meet the core minimum standards of human rights.<sup>90</sup> The simple transfer of technology will not provide the requisite knowledge about how or why the technology works without this focus on local industry and infrastructure.<sup>91</sup> Consequently, it will be of little utility to advancing the realization of human rights.

The ICESCR obliges developed states and other actors to engage in international cooperation in furtherance of the realization of human rights in developing countries. This does little to ease the tension of how to balance the human rights of those most directly affected by climate change with the rights to moral and material interests of those innovators who are developing technological solutions to the energy crisis. While various human rights are affected by climate change, the legal obligations of states to cooperatively address climate change issues are not based on any explicit norm. Nonetheless, various frameworks of analysis centered on human rights may prove useful in developing a sense for how these obligations may play out vis-à-vis IP protections.

### *Strict Scrutiny*

Borrowing the term from U.S. Constitutional law, Margaret Chon proposes a principle of substantive equality that would require adjudicators and norm-generators to exercise a non-differential standard of review when considering whether a grant of an exclusive IP right or the denial of a limitation on the right appears to conflict with a basic human need.<sup>92</sup> Although motivated by a development rationale, Chon's framework is useful for thinking about clean energy technology as a "public good" that advances an important human need (or a series of human rights). The framework requires the potential IP barriers to access to clean energy technologies to be balanced against the ways in which those technologies would help to guarantee human rights by providing access to an important public good. As Chon notes, this is not only important for the advancement of development and human rights, but also for the fortification of IP systems in developing countries that "cannot 'take root' absent a basic national capacity, which can only be developed with a population that has its essential needs met."<sup>93</sup>

The extent to which IP is a barrier to the spread of clean energy technology through the developing world is admittedly uncertain. Yet, its recurrent mention in policy documents and commentary on the UNFCCC process imply that it is at least perceived as an important issue by both the technology companies who hold the IP protections and developing countries who encounter obstacles in accessing existing clean energy technologies.<sup>94</sup> Applying Chon's strict scrutiny to a theoretical category of IP protections for such technologies prioritizes the experiences of the most marginalized within the process of norm setting. The implications on the rights of indigenous communities, displaced persons, and other vulnerable groups who suffer as a result of lack of access to clean energy technologies becomes the starting point against which all IP protection regimes must be measured. IP regimes that pose barriers to access to clean energy technology would be deemed excessive where such lack of access negatively impacts human rights.

The appeal of this framework is in its stark simplicity. It brings forward the human rights impacts of climate change that are all too often relegated to the background of international discussions or to exceptional circumstances in analyzing the TRIPS flexibilities. Strict scrutiny allows for the human side of climate change to be made the center point of the discussion. However, the problem with applying this analysis to clean energy technologies is that it is difficult to imagine any IP protections without some negative impact on access and human rights. In other words, all IP protections would seem to fail the strict scrutiny test. As such, the utility of strict scrutiny is less as a framework than as an important framing device that establishes the centrality of human rights concerns.

### *Human Rights Primacy*

Another framework through which to understand the relationship between human rights and the protection of IP is that of human rights primacy. Under this theory, "the protection of

the non-human rights aspects of intellectual property protection should be subordinated to human rights obligations."<sup>95</sup> Human rights primacy as a tool to mediate tensions caused by IP protection involves striking a balance between the public and private interests in innovation with the primary objective of promoting and protecting human rights.<sup>96</sup> Additionally, this tool of analysis is premised on categorizing IP protections as qualitatively different from other human rights.<sup>97</sup> Specifically, human rights primacy understands IP protections as privileges assigned by the state according to a pre-determined set of criteria.<sup>98</sup> By contrast, human rights are innate to an individual and are only recognized (rather than granted) by the state.<sup>99</sup> IP rights can be licensed or otherwise assigned, whereas human rights are universal and inalienable.<sup>100</sup> Although similar to the strict scrutiny approach advanced by Chon, human rights primacy carries a number of alternating theories that can be used to delineate the scope of rights.

### **Core Minimum**

One such framework is the core minimum approach advocated by both Laurence Helfer and Peter Yu in similar iterations.<sup>101</sup> The ICESCR requires that states take sufficient steps, as determined by the resources available to that state, to realize the obligations to protect economic, social, and cultural rights enshrined in the Convention.<sup>102</sup> Regardless of available resources, however, states are obliged to guarantee certain minimum levels of rights protection.<sup>103</sup> The core minimum approach seeks to reduce the competing categories of rights—those of the innovator and those of the community that desire the technology—to the "irreducible core."<sup>104</sup> For innovators, the core right under Article 15(1)(c) of the ICESCR is "a zone of personal autonomy in which authors can achieve their creative potential, control their productive output, and lead independent intellectual lives."<sup>105</sup> Once this irreducible core of rights has been protected, any additional protections afforded to innovators must be measured against other human rights.<sup>106</sup> The CESCR directs states to ensure that their IP protection regimes "constitute no impediment to their ability to comply with their core obligations in relation to the rights to food, health and education, as well as to take part in cultural life and to enjoy the benefits of scientific progress and its applications, or any other right enshrined in the Covenant."<sup>107</sup> This approach takes as a starting point that there are certain minimum human rights standards required of states, and locates intellectual property rights as one of the tools to be utilized in advancing those standards.<sup>108</sup> Thus, as Yu notes, under the core minimum approach

states will not violate the ICESCR if they modify or roll back excess protection required under TRIPS, the WIPO treaties, and other international, regional, and bilateral treaties provided that such protection does not have any human rights basis. They can also do so if the protection already exceeds what is required under their core minimum obligations and if they offer compelling evidence of the competing demands with other human rights obligations.<sup>109</sup>

Applying this to the situation of protections for clean energy technologies, it appears that anything other than the protection



of an innovator's "zone of personal autonomy" would violate a state's other human rights obligations under the ICESCR. As discussed above, the realization of even minimum standards of the various rights will allow a state to not only secure clean energy technology, but also develop domestic capacities to adapt the technology and develop locally relevant diffusion mechanisms.

### Just Remuneration

Another framework for delineating human rights obligations in relation to IP protections for clean energy technology is the just remuneration approach.<sup>110</sup> Similarly based off of the primacy of human rights, the just remuneration approach seeks to delineate the human rights dimensions of IP protections and assess adequate compensation for use of the protected technology.<sup>111</sup> The underlying theory is that IP protections have limitations in the form of other human rights.<sup>112</sup> Thus, if it is within an individual's human rights to utilize a particular creation in advancement of those rights, some sort of compensation would be due for any limitations.<sup>113</sup> This is different from a compulsory licensing framework, although a national-level licensing policy could follow from this theory.<sup>114</sup> The just remuneration model requires that the innovator be paid for his creation, either by the person or entity using it, or by the state on behalf of the public (and in fulfillment of the state's obligations to advance human rights protections).<sup>115</sup>

Under this analysis, the IP protections extended to clean energy technologies reflect a mix of human rights obligations and non-human rights (economic) purposes. As with almost all IP, the innovator of clean energy technologies possesses (human) rights to the protection of moral or material interests in his intellectual creations.<sup>116</sup> However, if the utility of the technology would serve to advance the human rights of others, then the interests of the author are not limitless.<sup>117</sup> In order to adequately protect the innovator's rights under Article 15 of the ICESCR, a state may employ a just remuneration approach that provides appropriate compensation in the context of a compulsory license to utilize the technology for public welfare.<sup>118</sup> This effectively changes the protection from an IP form to a human rights form, by balancing only the human rights interests of the innovator against the human rights interests of the individual, industry, or state that is pursuing access to the technology. Under this framework, "human rights grant to the [entity seeking access to the technology] a compulsory license, as compared to a free license, and to the right holder a right to remuneration, rather than exclusive control."<sup>119</sup> Thus, those individuals or entities holding patents to important clean energy technology could have their human rights guaranteed by receiving adequate compensation for their technologies.

### CONCLUSION

Although the existing flexibilities within the TRIPS Agreement which, through the Doha Declaration, were asserted to be sufficient for facilitating access to essential medicines may similarly be sufficient for easing the IP protections on important clean energy technologies, the fundamental differences between the regimes of IP and human rights protections warrants this human rights analysis. The TRIPS Agreement is focused on "the promotion of innovation through the provision of commercial incentives."<sup>120</sup> With its economic priorities at odds with those of the human rights approach, which is centered on the protection and promotion of human rights, TRIPS is not an ideal or sufficient basis upon which to build climate change solutions. Instead, in order to keep the climate stabilization framework grounded in the realities of the human suffering induced by climate change, solutions to the technology access gap should begin with a human rights analysis, even if they are eventually realized through TRIPS flexibilities.

Beyond the mainstreaming of human rights in the climate stabilization context, the human rights analyses assist in identifying a range of interests and obligations beyond the transfer of a clean energy technology to a developing country. Funding and programmatic support for the development stage of clean energy technologies in developing states is a more sustainable fix for the climate change problem. Local technology industries in developing countries would benefit more from direct access to technologies that they could improve or adapt to their local contexts if they had increased training in know-how and know-why. In many ways, this would place developing countries on equal footing with developed countries and would enable the development of build-on technologies.

The human rights analysis also reflects an obligation of states to cooperate internationally to lend their support to the realization of human rights for individuals outside of their territories. In the context of the UNFCCC negotiations, the intergovernmental bloc of developing countries within the UN, known as the G77, has advocated for the creation of a multilateral fund to buy up the various IP instruments protecting clean energy technologies.<sup>121</sup>

As at least one commentator has stated, "[a]n appropriate and effective 'social contract' needs to be developed around low carbon and climate resilient innovation to balance public and private interests."<sup>122</sup> Rather than simply transferring technology or purchasing the IP protections to certain technologies, the framework in which innovation can be incentivized and made accessible needs to be revisited.



## Endnotes: Climate Change, Intellectual Property, and the Scope of Human Rights Obligations

<sup>1</sup> See Press Release, U.N. High Commissioner for Human Rights (OHCHR), Cancun Climate Summit: UN Food Expert Calls for a "Green Marshall Plan for Agriculture" (Nov. 29, 2010), <http://www.ohchr.org/en/NewsEvents/Pages/DisplayNews.aspx?NewsID=10565&LangID=E> (last visited Jan. 28, 2011)

(describing that by 2080, 600 million additional people would be at risk of hunger as a direct result of climate change and warning of the threat of fifty percent reduction in agricultural production in some parts of South Africa).

# IS NEWER TECHNOLOGY ALWAYS BETTER?:

## WHY INDIGENOUS PEOPLES' TECHNOLOGY SHOULD BE INCORPORATED INTO THE INTERNATIONAL FIGHT AGAINST CLIMATE CHANGE

by Ashley Gardana\*

In 2010, with the aim of deviating from “business as usual,”<sup>1</sup> the member states of the United Nations Framework Convention on Climate Change (“Convention”) gathered in Cancun, Mexico.<sup>2</sup> The Convention currently consists of two tracks, the Ad Hoc Working Group under the Kyoto Protocol (“AWG-KP”)<sup>3</sup> and the Ad Hoc Working Group on Long-term Cooperative Action (“AWG-LCA”).<sup>4</sup> The latter track agreed that developing countries would take on a greater responsibility in climate change mitigation.<sup>5</sup> Many of these countries already play a key role in the mitigation effort by voluntarily participating in projects.<sup>6</sup> Now they have agreed to further their role under the AWG-LCA by implementing nationally appropriate mitigation actions (“NAMAs”) for sustainable development<sup>7</sup> and outlining a national strategy for reducing emissions from deforestation and forest degradation (“REDD”).<sup>8</sup> Developed countries, under AWG-LCA, will continue to provide financial, technological, and capacity-building support for both projects.<sup>9</sup> However, many climate change programs involving outside investment have resulted in violations to the rights of indigenous peoples,<sup>10</sup> such as forced relocation or loss of sacred land.<sup>11</sup> In an effort to prevent further violations, the developing countries should consider investing foreign funds in indigenous technologies when implementing their NAMA and REDD Agreements.

Indigenous technology stems from traditional ecological knowledge.<sup>12</sup> This specific knowledge is a collection of “botanical, zoological, hydrological, cultural, and geographical knowhow . . . that has developed over time, and that continues to develop.”<sup>13</sup> Implementing traditional ecological knowledge has the potential to result in carbon sequestration, forest protection, renewable energy production, and land rehabilitation.<sup>14</sup> The technologies derived from this knowledge have proved to be environmentally sustainable for eons.<sup>15</sup> Moreover, the indigenous technologies are evolving to combat climate change impacts.<sup>16</sup>

Simona Gomez Lopez, a representative from a Mexican forest community explained how her village evolved their cooking methods to mitigate climate change during the opening plenary of the Sixteenth Conference of the Parties in Cancun, Mexico.<sup>17</sup> The community recognized the forest warming, the rains starting earlier, and the rivers drying up.<sup>18</sup> The village also noticed that their traditional use of wood for cooking, which required two to three truckloads of wood per family, was significantly contributing to deforestation.<sup>19</sup> To mitigate their contribution to climate change, the community created an environmentally

friendly kiln and now has eight for regular use.<sup>20</sup> These kilns require approximately eighty percent less wood.<sup>21</sup>

Indigenous technology, which can help mitigate climate change, is also a valuable tool for reforestation and biodiversity conservation projects.<sup>22</sup> For example, the indigenous peoples in the Chittagong Hill Tracts of Bangladesh devised new sustainable forest management practices, which expanded twenty acres of forest to one hundred acres.<sup>23</sup> Additionally, the Serangan community of Bali rehabilitated their coral reefs and mangrove forests, and managed to plant fifteen thousand pieces of coral in various coastal regions of Indonesia.<sup>24</sup> This collection of knowledge is a valuable resource that developing countries should incorporate in the NAMA and REDD projects as appropriate.<sup>25</sup>

Incorporating indigenous technology into mitigation and adaptation efforts will help alleviate the obstacles other climate change programs face.<sup>26</sup> Certain programs under the Kyoto Protocol’s Clean Development Mechanism (“CDM”) caused significant threats to indigenous peoples who refused to hand over their territories for the purpose specified in the projects.<sup>27</sup> The CDM is considered a success.<sup>28</sup> However, because developed countries meet their emissions targets by designing projects that mitigate climate change in developing countries,<sup>29</sup> they have such a strong incentive to maximize the emission reductions yielded from these projects that the effects on local populations are often ignored.<sup>30</sup> For instance, one CDM project included hydroelectric dams, which impacted river ecosystems and required relocation of an entire indigenous community.<sup>31</sup> Conversely, traditional ecological knowledge employed in the Indian Himalayan region utilizes hydro-energy from the hill streams and rivers through traditional watermills.<sup>32</sup> Placing the financial support of developed countries in technology derived from traditional knowledge can help maintain indigenous communities’ continued existence with sustainable means.

Implementing the Cancun Agreements with traditional ecological knowledge also upholds the general principles developed from the United Nations Declaration on the Rights of Indigenous Peoples (“Declaration”).<sup>33</sup> While not a binding treaty, the standards of the Declaration are widely accepted and incorporated into policies and programs.<sup>34</sup> The preamble of the Declaration, “[r]ecogniz[es] that respect for indigenous knowledge, cultures and traditional practices contributes to sustainable and equitable

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development and proper management of the environment.”<sup>35</sup> Investing in available indigenous technologies while respecting indigenous rights can help developing countries fulfill their obligations under the AWG-LCA.

The indigenous communities are the most vulnerable to not only climate change impacts, but the mitigation measures as well.<sup>36</sup> Although the Convention has begun to recognize

indigenous peoples, “*cooperative action*” within the Ad Hoc Working Group on Long-Term *Cooperative Action* requires improvement.<sup>37</sup> Incorporating proven and available indigenous technologies can provide nationally appropriate mitigation actions for sustainable development and reforestation projects within developing countries while still respecting the rights of indigenous peoples.



## Endnotes: Is Newer Technology Always Better?

<sup>1</sup> UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, CLIMATE CHANGE: IMPACTS, VULNERABILITIES AND ADAPTATION IN DEVELOPING COUNTRIES 5 (2007), <http://unfccc.int/resource/docs/publications/impacts.pdf>.

<sup>2</sup> The United Nations Climate Change Conference in Cancun, COP 16 / CMP 6, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, [http://unfccc.int/meetings/cop\\_16/items/5571.php](http://unfccc.int/meetings/cop_16/items/5571.php) (last visited Feb 22, 2011).

<sup>3</sup> Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 22, <http://unfccc.int/resource/docs/convkp/kpeng.pdf>.

<sup>4</sup> United Nations Framework Convention on Climate Change, Bali, Indon., Dec. 3-15, 2007, *Dec. 1/CP.13 Bali Action Plan*, in Rep. of the Conf. of the Parties on its thirteenth sess., U.N. Doc. FCCC/CP/2007/6/ Add.1 (Dec. 2007), <http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf>.

<sup>5</sup> United Nations Framework Convention on Climate Change, Thirteenth Session of the Ad Hoc Working Group on Long-term Cooperative Action, Cancun, Mex., Nov. 29-Dec. 10, 2010, *Outcome of the Work of the Ad Hoc Working Group on Long-term Cooperative Action under the Convention*, FCCC/AWG/LCA/2010/L.7, ¶¶ 48, 70 (Dec. 10, 2010), <http://unfccc.int/resource/docs/2010/awglca13/eng/107.pdf> [hereinafter AWG-LCA Outcome].

<sup>6</sup> Christina Voigt, *The Deadlock of the Clean Development Mechanism: Caught Between Sustainability, Environmental Integrity and Economic Efficiency*, in CLIMATE LAW AND DEVELOPING COUNTRIES LEGAL AND POLICY CHALLENGES FOR THE WORLD ECONOMY 235 (Benjamin J. Richardson et al. eds., 2009) (recognizing the most notable as the Clean Development Mechanism, Community Development Carbon Fund, and the Global Environmental Facility).

<sup>7</sup> See AWG-LCA Outcome, *supra* note 6, ¶ 48.

<sup>8</sup> *Id.* ¶ 70.

<sup>9</sup> *Id.* ¶ 52.

<sup>10</sup> United Nations Declaration on the Rights of Indigenous Peoples, G.A. Res. 61/295, U.N. GAOR, 61st Sess., 107th plen. Mtg., U.N. Doc. A/RES/61/295 (Sept. 13, 2007) [hereinafter UNDRIP], [http://www.un.org/esa/socdev/unpfii/documents/DRIPS\\_en.pdf](http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf).

<sup>11</sup> Melissa Farris, Comment, *The Sound of Falling Trees: Integrating Environmental Justice Principles into the Climate Change Framework for Reducing Emissions from Deforestation and Degradation (REDD)*, 20 FORDHAM ENVTL. L. REV. 515, 517 (2010).

<sup>12</sup> *What is Indigenous Knowledge?*, WORLD BANK, <http://www.worldbank.org/afr/ik/basic.htm> (last visited Jan. 14, 2010) (discussing significant contributions to global knowledge that have originated from indigenous people such as medicinal properties, pastoralist practices, and architecture).

<sup>13</sup> Terri Hansen, *Traditional Ecological Knowledge Can Guide Community Adaptation and Resilience*, MOTHER EARTH J., Nov. 24, 2010, <http://mother-earth-journal.com/2010/11/traditional-ecological-knowledge-can-guide-community-adaptation-and-resilience/>.

<sup>14</sup> KIRSTY GALLOWAY McLEAN, UNITED NATIONS UNIVERSITY, ADVANCE GUARD: CLIMATE CHANGE IMPACTS, ADAPTATION, MITIGATION AND INDIGENOUS PEOPLES – A COMPENDIUM OF CASE STUDIES 19 (2010), [http://www.unutki.org/downloads/File/Publications/UNU\\_Advance\\_Guard\\_Compendium\\_2010\\_final\\_web.pdf](http://www.unutki.org/downloads/File/Publications/UNU_Advance_Guard_Compendium_2010_final_web.pdf).

<sup>15</sup> Eric Kwa, *Climate Change and Indigenous Peoples in South Pacific: The Need for Regional and Local Strategies*, in CLIMATE LAW AND DEVELOPING COUNTRIES LEGAL AND POLICY CHALLENGES FOR THE WORLD ECONOMY 102 (Benjamin J. Richardson et al. eds., 2009).

<sup>16</sup> See McLEAN, *supra* note 14, at 20.

<sup>17</sup> Simona Gomez Lopez, Representative of the Indigenous Peoples of Mexico, Address at the United Nations Convention on Climate Change Conference in Cancun, 16th Sess., 1st plen. mtg. (Nov. 29, 2010).

<sup>18</sup> *Id.*

<sup>19</sup> *Id.*

<sup>20</sup> *Id.*

<sup>21</sup> *Id.*

<sup>22</sup> See McLEAN, *supra* note 14, at 6.

<sup>23</sup> *Id.* at 61.

<sup>24</sup> *Id.* at 67.

<sup>25</sup> *Id.* at 6.

<sup>26</sup> *Id.*

<sup>27</sup> *Id.*

<sup>28</sup> CDM Statistics, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, <http://cdm.unfccc.int/Statistics/index.html> (last visited Jan. 14, 2011).

<sup>29</sup> Damilola S. Olaquyi, *Beautifying Africa for the Clean Development Mechanism: Legal and Institutional Issues Considered*, in CLIMATE LAW AND DEVELOPING COUNTRIES LEGAL AND POLICY CHALLENGES FOR THE WORLD ECONOMY 262 (Benjamin J. Richardson et al. eds., 2009).

<sup>30</sup> See Voigt, *supra* note 6, at 238.

<sup>31</sup> *Id.*

<sup>32</sup> See McLean, *supra* note 14, at 20.

<sup>33</sup> UNDRIP, *supra* note 10; see also Siegfried Wiessner, *United Nations Declaration on the Rights of Indigenous Peoples-Introduction*, UNITED NATIONS AUDIOVISUAL LIBRARY OF INTERNATIONAL LAW, [http://untreaty.un.org/cod/avl/ha/ga\\_61-295/ga\\_61-295.html](http://untreaty.un.org/cod/avl/ha/ga_61-295/ga_61-295.html) (last visited Mar. 2, 2011).

<sup>34</sup> Wiessner, *supra* note 33.

<sup>35</sup> See UNDRIP, *supra* note 10.

<sup>36</sup> MIRJAM MACCHI ET AL., INT’L UNION FOR THE CONSERVATION OF NATURE, INDIGENOUS AND TRADITIONAL PEOPLES AND CLIMATE CHANGE 15 (2008), [http://cmsdata.iucn.org/downloads/indigenous\\_peoples\\_climate\\_change.pdf](http://cmsdata.iucn.org/downloads/indigenous_peoples_climate_change.pdf).

<sup>37</sup> Stanley K. Riamit, Tebtebba Foundation, Statement on behalf of the International Indigenous Peoples’ Forum on Climate Change, Intervention before the United Nations Framework Climate Change Convention (Dec. 10, 2010), [http://unfccc.int/files/meetings/cop\\_16/statements/application/pdf/101210\\_cop16\\_hls\\_iipfcc.pdf](http://unfccc.int/files/meetings/cop_16/statements/application/pdf/101210_cop16_hls_iipfcc.pdf) (emphasis added).



# THE SINGAPORE WORKAROUND:

## PROVIDING A “GREENPRINT” FOR A UNFCCC PARTY RECLASSIFICATION

by *P. Cal Trepagnier\**

### INTRODUCTION

The international climate debate currently focuses on the world's two largest greenhouse gas emitters: China and the United States.<sup>1</sup> However, to successfully address the impasse in climate change negotiations, the focus should actually be on one of the smaller emitters, the Republic of Singapore (“Singapore”). The United Nations Framework Convention on Climate Change (“UNFCCC”)<sup>2</sup> classifies nations into two categories originally based on 1990 economic levels: Annex I Parties (developed countries) and Non-Annex I Parties (developing countries).<sup>3</sup> Although there is no automatic graduation based on predefined criteria, a process and a precedent exists for status graduation that could provide a model for countries to shift from Non-Annex I to Annex I Parties. In 2009, Malta, originally a Non-Annex I country, successfully petitioned the UNFCCC after joining the European Union (“EU”) to “put itself on the same legal footing as the other Member States of the European Union that are included in Annex I to the Convention.”<sup>4</sup> Singapore's economy is also strong enough to shift it from a Non-Annex I to an Annex I country and other countries can then follow suit, providing a solution to the current impasse in negotiations.

This article offers a “Singapore workaround” as a way forward: diplomatic negotiations with Singapore aimed at changing the classification of nations that have developed economically since the formation of the UNFCCC. It has been argued by “[p]roponents of reclassification . . . that responsibility for mitigation and eligibility for support should reflect contemporary differences in levels of development among developing countries, rather than those current[ly] built into the Convention.”<sup>5</sup> The reclassification of Singapore from a Non-Annex I to an Annex I Party would provide the ideal model for shifting parties' obligations in the climate realm in the future. Singapore is a financial leader in both globalization<sup>6</sup> and the global recovery<sup>7</sup> and is well positioned for international and domestic “carbon finance.”<sup>8</sup> The nation is economically poised to retool its energy sector,<sup>9</sup> faces imminent and significant risks from climate change impacts,<sup>10</sup> and is also ready to create and enforce modern climate laws.<sup>11</sup> This article examines climate law in Germany and Spain to show how Annex I classification benefited their economies over the past six years. Finally, it discusses how establishing climate laws in Singapore could affect emerging economies, namely Brazil, India, and China.

### OPPORTUNITY FOR BREAKTHROUGH IN INTERNATIONAL CLIMATE LAW

Current international climate law is regulated primarily by the UNFCCC, which was created in 1992 from the United

Nations Conference on Environment and Development in Rio de Janeiro, Brazil, also commonly known as the “Earth Summit.”<sup>12</sup> Article 3 of the Kyoto Protocol of 1997 binds Annex I Parties to reduce “their overall emissions of such gases by at least 5 percent below 1990 levels in the commitment period between 2008 and 2012.”<sup>13</sup> Under the Kyoto Protocol, however, the majority of countries—Non-Annex I nations—do not have greenhouse gas reduction targets.<sup>14</sup> Moreover, there is no automatic system that requires them to reduce emissions, regardless of the level of gross domestic product (“GDP”) per capita.<sup>15</sup> The lack of a mechanism to graduate Non-Annex I Parties once they achieve a certain level of economic development has emerged as perhaps the greatest challenge of the UNFCCC.

The richer developing nations with high emissions that do not take on Annex I rights and responsibilities have long caused frustration and concern for the United States,<sup>16</sup> which refuses to ratify the Kyoto Protocol and commit to emissions reductions.<sup>17</sup> The first commitment period of the Kyoto Protocol is on course to end in 2012 and recent UNFCCC negotiations in Cancun, Mexico fell short of creating a second commitment period.<sup>18</sup> A lack of emissions reductions targets from emerging economies such as Brazil, India, and China have caused stalemates in international negotiations.<sup>19</sup> Despite Singapore's small size and its relatively minor greenhouse gas emissions, Singapore's graduation to an Annex I Party could have broader implications for emerging economies in the international effort to curb global climate change.

A graduation mechanism in the UNFCCC would adjust country mitigation obligations over time. A similar option was successfully established by the 1987 Montreal Protocol on Substances that Deplete the Ozone Layer; that Protocol created a panel that reviews country requests for exemptions from ozone depleting substance commitments.<sup>20</sup> Currently however, the UNFCCC's approach to evaluating country classification is ambiguous.<sup>21</sup> Singapore taking on the rights and responsibilities of an Annex I Party would help to kick-start the process and encourage other rising nations to follow suit. Therefore, the United Nations should facilitate talks with Singapore regarding the transition of Singapore's status from a Non-Annex I country to an Annex I country.

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## ECONOMIC READINESS

The International Monetary Fund (“IMF”) describes Singapore as a “newly industrialized Asian economy.”<sup>22</sup> Singapore, by land area, is a small, densely populated urban city-state that has limited energy resources.<sup>23</sup> In contrast to its Southeast Asian neighbors, Singapore is not a major agricultural center and therefore much of its food is obtained through importation.<sup>24</sup> The IMF last reported on Singapore’s GDP in 2009 and, at recession levels, Singapore had a GDP of \$182.2 billion U.S. dollars or \$37,200 U.S. dollars per capita.<sup>25</sup> Singapore’s economy has proven to be one of the most stable—not just in Asia, but also globally.<sup>26</sup>

As a result of a strong economic outlook, Singapore can continue to retool its energy sector and meet the challenges of carbon reduction.<sup>27</sup> Singapore has already taken significant action toward clean energy development. In 2001, for example, Singapore’s National Environment Agency set up the Innovation for Environmental Sustainability Fund to provide grants for clean energy investment.<sup>28</sup> In 2007, the Economic Development Board created the inter-agency Clean Energy Programme Office (“CEPO”).<sup>29</sup> Additionally, the Ministry of National Development allocated approximately thirty-nine million U.S. dollars over a five-year period for a Research Fund for the Built Environment.<sup>30</sup>

Currently, Singapore also receives carbon finance through the Clean Development Mechanism (“CDM”), under which Annex I Parties sponsor projects in Singapore to offset the sponsoring country’s emissions.<sup>31</sup> The Kyoto Protocol defines the CDM as an instrument “to assist Parties not included in Annex I in achieving sustainable development and in contributing to the ultimate objective of the UNFCCC, and to assist Parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments under Article 3.”<sup>32</sup> If Singapore were to accept Annex I responsibilities, it could no longer receive CDM financing and would instead finance these projects in the developing world to help offset its own emissions.<sup>33</sup> With its regional placement and cultural expertise, Singapore would be well positioned to sponsor the projects for other Association of Southeast Asian Nations (“ASEAN”)—nine other developing countries that do not traditionally participate in climate finance projects.<sup>34</sup> Furthermore, Singapore’s stable and strong financial sector would bring additional liquidity to the global carbon market.

## SINGAPORE’S CLIMATE NEGOTIATING POSITION

The Singaporean government has taken a proactive stance on mitigating global climate change and enforces its laws effectively. Singaporean climate negotiators made statements during the last two Conferences of Parties (“COP”) meetings that indicate its willingness to address global climate change.<sup>35</sup> On January 28, 2010, Singaporean Ambassador-at-Large and Chief Negotiator for Climate Change, Chew Tai Soo, wrote, “Singapore therefore wishes to associate with the [Copenhagen] Accord as a good basis for advancing further international negotiations towards reaching a legally binding global agreement on climate change” in a letter to the Executive Secretary, Yvo de Boer, of

the UNFCCC Secretariat.<sup>36</sup> On December 9, 2010, Shunmugam Jayakumar, Singapore’s Senior Minister and Chairman of the Inter-Ministerial Committee on Climate Change addressed a high level conference in Cancun, Mexico at the 16th COP meeting.<sup>37</sup> He emphasized his commitment to a legal framework stating that

it is important that as we pursue a “Balanced Package” in Cancun, we must have clarity that our end goal is to reach a legally binding outcome. Whatever we achieve in Cancun, and whatever be our next steps, it is imperative that these elements or decisions will eventually be stitched together in a legally binding nature, without which, there can be no guarantee of mitigation actions, nor can there be guarantee of the support provided.<sup>38</sup>

Moreover, as a requirement for being a member of the UNFCCC, Singapore submitted two “national communications on climate change.”<sup>39</sup> Each communication shows a willingness to offer solutions to mitigate and adapt to climate change.<sup>40</sup> In its first national communication to the UNFCCC in August 2000, the government of Singapore wrote, “[c]omprehensive preventive measures to safeguard the environment will not work unless there is stringent enforcement to ensure that the laws and regulations are complied with.”<sup>41</sup> In its second national communication from November 2010, the Singaporean government stated,

As a non-Annex I Party to the UNFCCC, we are not subject to binding greenhouse gas emissions reduction commitments under the Kyoto Protocol. Our contribution to global greenhouse gas emissions is, and will remain, small. Nonetheless, as a small-island state vulnerable to the impacts of global climate change, Singapore takes climate change seriously. We will therefore continue to do our part in global efforts to address climate change.<sup>42</sup>

However, some opposition exists within the Singaporean government. Its chief climate negotiator, Chew Tai Soo, made a statement in February 2009 that Singapore should not become an Annex I Party given its size and relatively small carbon footprint: 0.3% of global emissions.<sup>43</sup> Mr. Chew also made an unofficial statement at a sustainability conference in Singapore regarding his opinion on the UNFCCC country classifications: “This approach is flawed as it does not take into account the unique considerations and capabilities of different countries . . . it penalizes small countries with small populations without taking into account their limitations.”<sup>44</sup>

These comments do not reflect Singapore’s overall commitment in addressing climate change and the important example it would set for the global community by becoming an Annex I party. For example, in 2009 a program called Sustainable Singapore Blueprint pledged that the nation would reduce greenhouse gases by sixteen percent below 2020 business as usual levels if a binding international agreement on climate change were reached.<sup>45</sup> With this program, Singapore is already implementing a voluntary mitigation plan, as a contingency should there be a binding international climate agreement. The United Nations

should facilitate discussions to encourage Singapore to “graduate” and accept these responsibilities since Singapore is willing and able to create and enforce laws necessary to achieve carbon reductions.

### ANNEX I SUCCESS AND IMPLICATIONS FOR EMERGING ECONOMIES

Singapore can benefit from looking to two Annex I Parties, Germany and Spain, as models for maintaining economic growth through Kyoto Protocol-based energy efficiency and renewable energy projects. In 2005, both Germany and Spain entered into a binding agreement to reduce carbon emissions under the Kyoto Protocol.<sup>46</sup> Since then, laws designed to reduce carbon and modernize electricity generation, distribution, and consumption have steadily increased.<sup>47</sup> Germany has a national commitment to reduce its carbon footprint forty percent from its 1990 levels by 2020.<sup>48</sup> Germany met its 2012 goal early, in 2007, by generating 12.5% of its electricity from renewables, and Germany will likely exceed its twenty percent by 2020 goal as early as 2011.<sup>49</sup> By 2020, conservative estimates show that Germany will source forty-seven percent of its electricity from renewable energy.<sup>50</sup> Thus, while honoring its Kyoto Protocol commitments, German energy projects have in turn bolstered the fifth largest economy in the world.<sup>51</sup> Spain made a commitment to reduce its carbon emissions by twenty percent from its 1990 levels by 2020, in line with the EU target.<sup>52</sup> Spain also committed to achieving twenty percent of its own final consumption and ten percent of its transport energy needs from renewable energy by 2020.<sup>53</sup> According to its 2005-2010 Renewable Energy Plan, Spain plans to deploy clean energy to meet 12.1% of its primary energy needs, 30.3% of electricity needs, and 5.83% of transportation fuel.<sup>54</sup> One of

Spain’s goals in its 2004-2012 Energy Efficiency Strategy is to reduce domestic energy intensity by 7.2% by 2012.<sup>55</sup>

If Singapore adopts Annex I status and follows in Germany and Spain’s carbon reduction footsteps, it could advance compliance in other developing countries such as Brazil, India, and China. These countries will face greater and different challenges in greenhouse gas reduction from Singapore due to their larger size and strong economies.<sup>56</sup> However, Singapore could establish the model and blueprint, which would help to change the playing field for non-Annex I Parties and encourage greater participation among those nations. Binding carbon emission reductions and carbon finance are only possible if countries take responsibility for their contributions to climate change, however small they are.

### CONCLUSION

In the UNFCCC, richer nations, mostly those in the EU, have assumed the role of Annex I Parties.<sup>57</sup> Singapore can and should become an Annex I nation so that it can fulfill a broader role on the global stage as a leader in greenhouse gas reduction. Singapore is the ideal candidate for graduating from Non-Annex I to Annex I. Its mature economy is ready to retool its electricity sector and to finance clean development mechanism projects. Singapore has national interests in safeguarding its borders from flooding and protecting the health of its citizens.<sup>58</sup> It has a stable government with a history of developing innovative laws and enforcing them.<sup>59</sup> As the international climate law community awaits 17th COP in Durban, South Africa, it should consider graduating a nation to Annex I status as a way to shift binding obligations from the Kyoto Protocol to a new international agreement between nations.



## Endnotes: The Singapore Workaround

<sup>1</sup> Cass R. Sunstein, *The World vs. the United States and China? The Complex Climate Change Incentives of the Leading Greenhouse Gas Emitters*, 55 UCLA L. REV. 1675 (1964).

<sup>2</sup> Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 137 I.L.M. 22, <http://unfccc.int/resource/docs/convkp/kpeng.pdf>.

<sup>3</sup> *Parties & Observers*, UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, [http://unfccc.int/parties\\_and\\_observers/items/2704.php](http://unfccc.int/parties_and_observers/items/2704.php) (last visited Feb. 15, 2011) [hereinafter *Parties & Observers*].

<sup>4</sup> United Nations Framework Convention on Climate Change, Copenhagen, Den., Dec. 7-18, 2009, *Proposal from Malta to Amend Annex I to the Convention*, 2, U.N. Doc. FCCC/CP/2009/2 (May 13, 2009), <http://unfccc.int/resource/docs/2009/cop15/eng/02.pdf> (noting that Malta has not set a binding greenhouse gas reduction commitment). In 1997, the UNFCCC Parties granted their approval for six nations to be included as Annex I Parties. Most were new countries that gained independence within that decade and others had not previously been associated with the Annex I process. These countries are Croatia, Liechtenstein, Monaco, Slovenia, the Czech Republic, and Slovakia, with the last two replacing Czechoslovakia. See United Nations Framework Convention on Climate Change, Conference of the Parties, Third Session, Kyoto, Japan, Dec. 1-11, 1997, *Amendments to the List in Annex I to the Convention Under Article 4.2(f) of the Convention, dec. 4/CP.3, in Part Two: Action Taken by the Conference of the Parties at its Third Session*, U.N. Doc. FCCC/CP/1997/7/Add.1 (Mar. 25, 1998), <http://unfccc.int/resource/docs/cop3/07a01.pdf>.

<sup>5</sup> Sikina Jinnah et al., *Tripping Points: Barriers and Bargaining Chips on the Road to Copenhagen*, 4 ENVTL. RES. LETTERS 034003 (2009), [http://iopscience.iop.org/1748-9326/4/3/034003/pdf/1748-9326\\_4\\_3\\_034003.pdf](http://iopscience.iop.org/1748-9326/4/3/034003/pdf/1748-9326_4_3_034003.pdf).

<sup>6</sup> *Statement by the Hon. Lee Hsien Loong, Prime Minister of Singapore at the Annual Meetings of the Boards of Governors of the International Monetary Fund and the World Bank Group*, INT’L MONETARY FUND (Sept. 19, 2006), <http://www.imf.org/external/am/2006/speeches/pr04e.pdf>.

<sup>7</sup> IMF Chief Highlights Need for Strong Partnership with Asia, IMF SURVEY MAGAZINE (Feb. 09, 2011), <http://www.imf.org/external/pubs/ft/survey/so/2011/new020911a.htm>.

<sup>8</sup> Rachel Ward Saltzman, *Distributing Emissions Rights in the Global Order: The Case for Equal Per Capita Allocation*, 13 YALE HUM. RTS. & DEV. L.J. 281 (2010).

<sup>9</sup> NAT’L ENV. AGENCY, SINGAPORE’S SECOND NATIONAL COMMUNICATION: UNDER THE UNITED FRAMEWORK CONVENTION ON CLIMATE CHANGE 4 (Nov. 12, 2010), <http://unfccc.int/resource/docs/natc/sinn2.pdf> [hereinafter SSNC].

<sup>10</sup> *Id.* at 3.

<sup>11</sup> *Trust*, SINGAPORE ECON. DEV. BOARD, [http://www.sedb.com/edb/sg/en\\_uk/index/why\\_singapore/trust.html](http://www.sedb.com/edb/sg/en_uk/index/why_singapore/trust.html) (last updated Apr. 29, 2009).

<sup>12</sup> See GRACIELA CHICHILNISKY & KRISTEN A. SHEERAN, *SAVING KYOTO* 56-57 (Kate Parker ed., 2009); DAVID HUNTER ET AL., *INTERNATIONAL ENVIRONMENTAL LAW AND POLICY* 667-74 (Robert C. Clark et al. eds., 2007).

<sup>13</sup> *Id.*

<sup>14</sup> *Id.*

<sup>15</sup> CHICHILNISKY, *supra* note 12; U.N. Framework Convention on Climate Change art. 4(1)-(2), May 9, 1992, 1771 U.N.T.S. 107 [hereinafter UNFCCC].



# WORLD NEWS UPDATE

## UNFCCC GREEN CLIMATE FUND CREATED

by Laura Drummond\*

Between November 29, 2010 and December 10, 2010, the Parties to the United Nations Framework Convention on Climate Change (“UNFCCC” or “Convention”) met in Cancun, Mexico, for the sixteenth Conference of the Parties (“COP”) and the sixth Meeting of the Parties to the Kyoto Protocol.<sup>1</sup> One of the major decisions that emerged from this meeting was to establish the Green Climate Fund.<sup>2</sup> While the Fund has the potential to be a huge step forward in creating long-term, centralized climate change funding,<sup>3</sup> its success will depend on how subsequent decisions on management shape its efficacy.

The idea for a climate change fund originates from Article 11 of the UNFCCC, which calls on the Parties to create a mechanism that allows developed countries to financially support developing countries in implementing the Convention.<sup>4</sup> This concept formally took shape as part of the Copenhagen Accord, where Parties agreed to finance projects that address climate change impacts in developing countries.<sup>5</sup> The finalized Fund includes provisions for technology development and transfer, and capacity-building to help developing countries implement effective mitigation and adaptation actions.<sup>6</sup>

In Cancun, the Ad Hoc Working Group on Long-term Cooperative Action, made up from representatives of all member countries, under the Convention put together the terms of the Fund.<sup>7</sup> The terms include the creation of a governing body, who will contribute to it, and the trustees.<sup>8</sup> The Fund has been developed under the guidance of and will be held accountable to the Conference of the Parties.<sup>9</sup> The Parties established a Standing Committee, to manage the financial mechanism as well as verify and report financial support that developed countries will provide developing countries.<sup>10</sup>

The Green Climate Fund will be controlled by a governing board of twenty-four members, half each from developed and developing country Parties.<sup>11</sup> The Parties have designated the World Bank as the interim trustee of the Fund, and its status as trustee will be subject to review after three years of operating the fund.<sup>12</sup> The trustee will aid the governing board in managing the administrative portions of the Fund, such as the financial records and statements.<sup>13</sup> The trustee is required to act in a manner consistent with decisions made by the governing board<sup>14</sup> and is accountable to the board in performing its responsibilities.<sup>15</sup>

The Parties have also established the Transitional Committee to spearhead designing the operational components

of the Fund.<sup>16</sup> The Committee includes fifteen members from developed countries and twenty-five members from developing countries.<sup>17</sup> The Committee will design the legal and institutional arrangements for the Fund, including its governance structure; methods on gathering financial, technological, and capacity-building resources; and ways to ensure that the Fund’s activities work well with other funding mechanisms that already exist.<sup>18</sup> The Transitional Committee is also responsible for creating mechanisms for independent review of the Fund, stakeholder input, environmental and social safeguards, and financial accountability.<sup>19</sup> The Transitional Committee is temporary and will only exist long enough to establish these initial standards.<sup>20</sup>

The Green Climate Fund helps create new funding for projects that will allow developing countries to better mitigate and adapt to global climate change. However, whether the Fund will be a major improvement over the current financial regime<sup>21</sup> will largely depend on the effectiveness of the mechanisms that the Transitional Committee establishes. One of the greatest opportunities for the Fund is the creation of environmental and social safeguards, which currently do not exist with the other funds.<sup>22</sup> Strong safeguards are essential in order to protect both the environment and human rights. The independent review mechanism will review decisions made by the governing board and help ensure that the Fund runs smoothly and effectively.<sup>23</sup> While the creation of the Fund can be hailed as a successful outcome of the UNFCCC’s COP-16, its true measure will be determined down the road.



### Endnotes: World News Update

<sup>1</sup> United Nations Framework Convention on Climate Change, Ad Hoc Working Group on Long-term Cooperative Action, Thirteenth Session, Cancun, Mex., Nov. 29-Dec. 10, 2010, *Outcome of the Work of the Ad Hoc Working Group on Long-term Cooperative Action Under the Convention*, UN Doc. FCCC/AWGLCA/2010/L.7 (Dec. 10, 2010), [hereinafter LCA Report], <http://unfccc.int/resource/docs/2010/awglca13/eng/107.pdf>.

<sup>2</sup> *Id.*

<sup>3</sup> *Id.*

<sup>4</sup> See United Nations Framework Convention on Climate Change art. 11, May 9, 1992, 1771 U.N.T.S. 107, <http://unfccc.int/resource/docs/convkp/conveng.pdf>.

Endnotes: World News Update continued on page 98

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*China, Europe Lapping the United States in the Clean Energy Race*, MONEY MORNING, Apr. 2, 2010, <http://moneymorning.com/2010/04/02/clean-energy/>; Jeff Siegel, *Have We Even Entered The Clean Energy Race Yet?*, SOLAR FEEDS (Aug. 12, 2010), <http://www.solarfeeds.com/green-chip-stocks/13829-have-we-even-entered-the-clean-energy-race-yet>; Nick Hodge, *China's Clean Energy Progress: Who's Winning the Cleantech Arms Race?*, GREEN CHIP STOCKS (Feb. 16, 2010), <http://www.greenchipstocks.com/articles/cleantech-2010-enter-the-dragon/744>.

<sup>19</sup> Daniel J. Weiss, Susan Lyon & Tina Ramos, *The Stone Soup Clean Energy and Climate Bill*, CLIMATE PROGRESS (Jul. 16, 2010), <http://climateprogress.org/2010/07/16/the-stone-soup-clean-energy-and-climate-bill>.

<sup>20</sup> See Preben Maegaard, *Danish Renewable Energy Policy*, WORLD COUNCIL FOR RENEWABLE ENERGY, [www.wcre.de/en/images/stories/pdf/WCRE\\_Maegaard\\_Danish%20RE%20Policy.pdf](http://www.wcre.de/en/images/stories/pdf/WCRE_Maegaard_Danish%20RE%20Policy.pdf) (last visited Oct. 6, 2010) (Denmark); *Renewable Energy Policy in Germany: An Overview and Assessment*, JOINT GLOBAL CHANGE RES. INST., <http://www.globalchange.umd.edu/energytrends/germany/6/> (last visited Oct. 6, 2010) (Germany).

<sup>21</sup> By some measures (for example, amount of solar power generated), Spain is winning the greentech race, just as it won the soccer World Cup. Talk about dominance! Jasmine Green, *Spain: Leading the Renewable Energy Race*, CARE2, <http://www.care2.com/causes/environment/blog/spain-number-one-in-solar-power-and-more/> (last visited Oct. 6, 2010). One could also point to Portugal, which will get an astounding forty-five percent of its electricity from renewables in 2010. Elisabeth Rosenthal, *Portugal Gives Itself a Clean-Energy Make-over*, N.Y. TIMES, Aug. 9, 2010, <http://www.nytimes.com/2010/08/10/science/earth/10portugal.html>.

<sup>22</sup> A recent report by the Center for American Progress compares United States' renewable energy policies unfavorably to both European nations and China. KATE GORDON, JULIAN L. WONG & JT McLAIN, CTR. FOR AM. PROGRESS, *OUT OF THE RUNNING? HOW GERMANY, SPAIN, AND CHINA ARE SEIZING THE ENERGY OPPORTUNITY AND WHY THE UNITED STATES RISKS GETTING LEFT BEHIND* (2010), [http://www.americanprogress.org/issues/2010/03/pdf/out\\_of\\_running.pdf](http://www.americanprogress.org/issues/2010/03/pdf/out_of_running.pdf). See also Markey, *supra* note 14 (noting Rep. Markey's comment that "Russia was our singular competitor in the celestial contest. In this terrestrial endeavor, we have many.").

<sup>23</sup> Christina Larson puts it as follows: It is telling what is left out of the increasingly dominant "U.S. versus China" green-tech "race" narrative. For starters, there are a lot of other countries at work developing green-tech and becoming significant green-tech markets—the low-carbon future, after all, isn't solely a G-2 aspiration. Yet because the politics are different (there's not the anxiety of the reigning superpower nervously eyeing the new kid on the block), the green aspirations of any country not named China are viewed through an entirely different prism by U.S. commentators. Germany, for instance, is home to the world's top two solar manufacturing companies. Yet we don't read headlines about Old Europe "cleaning our clock" to the 21st century. Larson, *supra* note 5.

<sup>24</sup> *Id.* (including statement of Elizabeth Economy, director of Asia Studies at the Council on Foreign Relations, that "[e]ven when you are looking at these big numbers that are coming out of China today, I think it really pays to give a close look at what is actually happening on the ground [and t]hen you begin to get a different, more nuanced picture than what is blasted on the business section of the *New York Times*").

<sup>25</sup> CONSTANTIN CRACHILOV, RANDALL S. HANCOCK & GARY SHARKEY, CHINA GREENTECH INITIATIVE, *THE CHINA GREENTECH REPORT 2009* 21 (2009), <http://www.china-greentech.com/sites/default/files/CGTR2009-FullReport.pdf> (citing similar data from the United States Department of Agriculture's International Macroeconomics Data Set for 1978-2008 and noting that China's economy has doubled roughly every seven to eight years); WAYNE M. MORRISON, FOREIGN AFFAIRS, DEFENSE & TRADE DIV., CONG. RESEARCH SERV., IB98014, *CHINA'S ECONOMIC CONDITIONS* (2006), [www.fas.org/sgp/crs/row/IB98014.pdf](http://www.fas.org/sgp/crs/row/IB98014.pdf) (detailing the government's shift in policy and stating that "[f]rom 1979 to 2005 China's real GDP grew at an average annual rate of 9.6%"); *Data: GDP Growth (Annual Percentage)*, WORLD BANK, <http://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG> (last visited Oct. 6, 2010) (providing data for 2005-2008).

<sup>26</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 21 (citing data from the International Monetary Fund and stating that most analysts predict that China will overtake Japan); David Barboza, *China Passes Japan as Second-Largest Economy*, N.Y. TIMES, Aug. 15, 2010, <http://www.nytimes.com/2010/08/16/business/global/16yuan.html>. By some predictions, China may overtake the United States by 2030. See, e.g., CHINA GREENTECH INITIATIVE, *supra* note 25, at 32 fig.15.

<sup>27</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 21.

<sup>28</sup> *U.S. and China Vie for Clean Energy Leadership*, ENERGY CHINA FORUM (Aug.

17, 2010), <http://www.energychinaforum.com/news/39260.shtml>.

<sup>29</sup> See, e.g., Stan Abrams, *This is Your Brain on Nationalism: US-China Trade Deficit Follies*, CHINA/DIVIDE (Apr. 14, 2010), <http://chinadivide.com/2010/your-brain-on-nationalism-us-china-trade-deficit-follies.html> (summarizing a number of claims and reports). With respect to greentech specifically, see Bradsher, *China Leading Global Race to Make Clean Energy*, *supra* note 12, citing low labor costs as a Chinese advantage.

<sup>30</sup> Nat'l Dev. & Reform Comm'n, *Medium and Long-Term Development Plan for Renewable Energy in China*, CHINA DEV. GATEWAY (Sept. 4, 2007), [http://en.chinagate.cn/reports/2007-09/13/content\\_8872839.htm](http://en.chinagate.cn/reports/2007-09/13/content_8872839.htm) ("By 2020, a relatively complete renewable energy technology and industry system will have been established, so that a domestic manufacturing capability based mainly on China's own IPRs will have been established, satisfying the needs for deploying renewable energy on a large scale in China.").

<sup>31</sup> RENEWABLE ENERGY POLICY NETWORK FOR THE 21ST CENTURY, *RENEWABLES 2010: GLOBAL STATUS REPORT 30* (2010) [hereinafter *RENEWABLES*], <http://www.unep.org/sefi-ren21/>.

<sup>32</sup> *Compare Global Market Outlook for Photovoltaics Until 2014: May 2010 Update*, EUR. PHOTOVOLTAIC INDUSTRY ASS'N, at 22 (May 15, 2010), [http://www.epia.org/fileadmin/EPIA\\_docs/public/Global\\_Market\\_Outlook\\_for\\_Photovoltaics\\_until\\_2014.pdf](http://www.epia.org/fileadmin/EPIA_docs/public/Global_Market_Outlook_for_Photovoltaics_until_2014.pdf) (listing activities of European solar manufacturers), with U.S. DEP'T OF ENERGY, OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY, 2008 SOLAR TECHNOLOGIES MARKET REPORT 15 (2010), <http://www1.eere.energy.gov/solar/pdfs/46025.pdf> (stating that the 2008 market share of Chinese firms was twenty-seven percent).

<sup>33</sup> Global Intelligence Alliance, *China to Lead Global Wind Energy Development?*, RENEWABLE ENERGY FOCUS (Feb. 15, 2010), [http://www.renewableenergyfocus.com/view/7283/china-to-lead-global-wind-energy-development/?opattr=China\\_to\\_lead\\_global\\_wind\\_energy\\_development%3F](http://www.renewableenergyfocus.com/view/7283/china-to-lead-global-wind-energy-development/?opattr=China_to_lead_global_wind_energy_development%3F).

<sup>34</sup> JIM HIGHT, *BUILDING BRIDGES FOR CLIMATE CHANGE MITIGATION: A ROAD-MAP OF GLOBAL TRADE PATTERNS IN WIND POWER GOODS AND SERVICES*, OECD GLOBAL FORUM ON TRADE: TRADE AND CLIMATE CHANGE 6 (2009), [www.oecd.org/dataoecd/29/63/42886096.pdf](http://www.oecd.org/dataoecd/29/63/42886096.pdf) ("[I]n 2004, China had only one domestic WTG manufacturer—Goldwind. By the end of 2008, there were approximately 60, with Goldwind as the leading seller, followed by Sinovel, Dongfang and Windey."); Eric Martinot & Li Junfeng, *Renewable Energy Policy Update for China*, RENEWABLE ENERGY WORLD (July 21, 2010), <http://www.renewableenergyworld.com/real-news/article/2010/07/renewable-energy-policy-update-for-china>.

<sup>35</sup> Pet. for Relief Under Section 301 of the Trade Act of 1974, as amended: China's Policies Affecting Trade and Investment in Green Technology, 13, Sept. 9, 2010.

<sup>36</sup> *Chinese Wind Turbine Manufacturers' Global Expansion: The Dream and The Reality*, GERSON LEHRMAN GROUP (May 9, 2010), <http://www.glgroup.com/News/Chinese-Wind-Turbine-Manufacturers-Global-Expansion—The-Dream-and-The-Reality-48260.html>; see also E-mail from Alexander U. Conrad to author (Sept. 7, 2010) (on file with author) (noting that Chinese firms have not penetrated the Brazilian wind market, despite that government's promotion of wind energy and a favorable climate between the two nations).

<sup>37</sup> *Solar Market Experiences Shakeout, China Is Well Positioned to Dominate World Market*, TOMMY TOY'S BLOG (Mar. 10, 2010, 7:36 AM), <http://tommytoy.vox.com/library/post/solar-market-experiences-shakeout-china-is-well-positioned-to-dominate-world-market.html>.

<sup>38</sup> See, e.g., Press Release, Senator Charles E. Schumer, Schumer, Casey, Brown & Tester Urge Obama Administration to Suspend Stimulus Program Funneling Billions Overseas (Mar. 3, 2010), <http://schumer.senate.gov/record.cfm?id=322732&> (detailing efforts by four Senators to block federal funding for the project); see also Yael Borofsky & Jesse Jenkins, *The Real Policy Lesson From the Chinese Wind Turbine "Scare"*, BREAKTHROUGH INST. BLOG (Nov. 9, 2009, 1:47 PM), [http://thebreakthrough.org/blog/2009/11/the\\_real\\_policy\\_lesson\\_from\\_th.shtml](http://thebreakthrough.org/blog/2009/11/the_real_policy_lesson_from_th.shtml) (claiming that "Senator Schumer and others who seek to bar Chinese manufacturers from stimulus funds are missing the point" and should focus instead in promoting American greentech firms).

<sup>39</sup> See, e.g., Wynn, *supra* note 12 (stating that "Western businesses are worried China is freezing them out of this lucrative market, preferring to nurture its own nascent industries without subjecting them to competition"); Keith Johnson, *Protectionist Breezes: Wind-Power Companies Cry Foul on China*, WALL ST. J. BLOGS (May 28, 2009, 12:02 PM), <http://blogs.wsj.com/environmentalcapital/2009/05/28/protectionist-breezes-wind-power-companies-cry-foul-on-china/>.

<sup>40</sup> See JAMES MCGREGOR, CHINA'S DRIVE FOR "INDIGENOUS INNOVATION": A WEB

OF INDUSTRIAL POLICIES 1, 15 (2009), [www.apcoworldwide.com/content/PDFs/Chinas\\_Drive\\_for\\_Indigenous\\_Innovation.pdf](http://www.apcoworldwide.com/content/PDFs/Chinas_Drive_for_Indigenous_Innovation.pdf) (providing a comprehensive discussion of these policies); Julian L. Wong, *How to Deal with Chinese Green Protectionism: A U.S. Perspective*, GREEN LEAP FORWARD (July 30, 2010), <http://greenleapforward.com/2010/07/30/how-to-deal-with-chinese-green-protectionism-a-us-perspective/> (discussing the Medium-to-Long Term National Plan for Science and Technology Development and the National Indigenous Innovation Accreditation Program in the greentech context).

<sup>41</sup> See, e.g., Andrew Peaple, *For Foreigners, China's Solar Market Is Cloudy*, WALL ST. J., Aug. 18, 2010, <http://online.wsj.com/article/SB10001424052748704554104575434991356731852.html>; Joe McDonald, *U.S., Europe Look to China for Clean Energy Sales*, CHINA MINING (May 16, 2010), <http://www.chinamining.org/News/2010-05-17/1274063691d36211.html>.

<sup>42</sup> MCGREGOR, *supra* note 40, at 33.

<sup>43</sup> *Id.* at 96.

<sup>44</sup> See, e.g., Michael Kanellos, *Innovalight Signs with Yingli for Second Chinese Solar Deal*, GREENTECH SOLAR (July 26, 2010), <http://www.greentechmedia.com/articles/read/innovalight-signs-with-yingli-for-second-chinese-solar-deal/> (detailing cooperation between Sunnyvale, California-based Innovalight, and Yingli Solar).

<sup>45</sup> Chen Limin & Wan Zhihong, *China's Wind Energy Industry Sees Challenges*, CHINA DAILY, Feb. 22, 2010, [http://www.chinadaily.com.cn/china/2010-02/22/content\\_9481836.htm](http://www.chinadaily.com.cn/china/2010-02/22/content_9481836.htm).

<sup>46</sup> *First Solar and Ordos Take Key Step Forward in 2GW China Project: Cooperation Framework Agreement Signed During China-US Presidential Summit*, FIRST SOLAR (Nov. 17, 2009), <http://investor.firstsolar.com/phoenix.zhtml?c=201491&p=irol-newsArticle&ID=1356152&highlight=>.

<sup>47</sup> Julian L. Wong, Ctr. for Am. Progress Action Fund, *The Challenge of China's Green Technology Policy and Ohio's Response: Written Testimony Before the U.S.-China Economic and Security Review Commission* 9 (July 14, 2010), [http://www.uscc.gov/hearings/2010hearings/written\\_testimonies/10\\_07\\_14\\_wrt/10\\_07\\_14\\_wong\\_statement.pdf](http://www.uscc.gov/hearings/2010hearings/written_testimonies/10_07_14_wrt/10_07_14_wong_statement.pdf) (discussing "success stories of American companies such as First Solar, eSolar, and American Superconductor making headway into the Chinese market").

<sup>48</sup> Pet. for Relief Under Section 301 of the Trade Act of 1974, as amended, 94-95.

<sup>49</sup> Stuart Biggs, *Turbine Makers Face 'Tough' Market as Goldwind Slumps (Update2)*, BLOOMBERG BUSINESSWEEK, June 21, 2010, <http://www.businessweek.com/news/2010-06-21/turbine-makers-face-tough-market-as-goldwind-slumps-update2-.html>; Zhang Qi, *Sun is Setting on China's Solar Industry*, CHINA DAILY, Jan. 19, 2009, [http://www.chinadaily.com.cn/bizchina/2009-01/19/content\\_7408525.htm](http://www.chinadaily.com.cn/bizchina/2009-01/19/content_7408525.htm) (predicting a shakeout in the Chinese solar PV sector).

<sup>50</sup> Dallas Kachan, *China Has Already Surpassed the U.S. in Cleantech*, SEEKING ALPHA (Aug. 15, 2010), <http://seekingalpha.com/article/220547-china-has-already-surpassed-the-u-s-in-cleantech>.

<sup>51</sup> *China's Renewable Energy Giants Look to IPO*, NEW NET (Aug. 18, 2010), [http://www.newenergyworldnetwork.com/renewable-energy-news/by\\_technology/solar-by\\_technology-new-news/china%E2%80%99s-renewable-energy-giants-look-to-ipo.html](http://www.newenergyworldnetwork.com/renewable-energy-news/by_technology/solar-by_technology-new-news/china%E2%80%99s-renewable-energy-giants-look-to-ipo.html).

<sup>52</sup> Biggs, *supra* note 49.

<sup>53</sup> Thomas Hout, *China's Renewable-Energy Clout*, FORBES (July 30, 2010), [http://www.forbes.com/2010/07/30/china-solar-wind-industry-markets-equities-clean-technology-companies\\_3.html](http://www.forbes.com/2010/07/30/china-solar-wind-industry-markets-equities-clean-technology-companies_3.html).

<sup>54</sup> David Cyranoski, *Renewable Energy: Beijing's Windy Bet*, 457 NATURE 372, 372 (2009), <http://www.nature.com/news/2009/090121/pdf/457372a.pdf> ("Wind-turbine manufacturers and wind-farm developers everywhere have faced teething problems, but China has perhaps faced more difficulties than most. Its wind farms are much less efficient than those in other leading countries [and] manufacturing defects have plagued Chinese equipment . . .").

<sup>55</sup> Hout, *supra* note 53 (calling the quality of Chinese turbines "questionable"); Richard Lim, Julisa Mandeville, Ryan Petersen, Jon Saxon, Benjamin Vannier & Tom Wuellner, *Winds of Change: How China's Government Supports Domestic Wind Energy Providers*, KELLOGG SCH. OF MGMT, NORTHWESTERN U. (Oct. 1, 2009), [http://www.kellogg.northwestern.edu/departments/international/internationalfocus/article/winds\\_of\\_change.aspx](http://www.kellogg.northwestern.edu/departments/international/internationalfocus/article/winds_of_change.aspx) ("Chinese-made turbines cost up to 20% less than those of multinational manufacturers. However, field data suggests that Chinese turbines significantly lag foreign products in quality, to the extent that the long-term revenue sacrificed from lower quality (as measured by turbine capacity factor) outweighs the upfront cost savings.").

<sup>56</sup> *Id.*

<sup>57</sup> Bradsher, *On Clean Energy, China Skirts Rules*, *supra* note 12; see generally Arnaud de la Tour, Matthieu Glachant & Yann Ménière, *Innovation and Inter-*

*national Technology Transfer: The Case of the Chinese Photovoltaic Industry* (MINES ParisTech, Cerna Working Paper Series, Working Paper 2010-12), [http://hal-enscm.archives-ouvertes.fr/docs/00/49/85/78/PDF/CERNA\\_WP\\_2010-12.pdf](http://hal-enscm.archives-ouvertes.fr/docs/00/49/85/78/PDF/CERNA_WP_2010-12.pdf).

<sup>58</sup> de la Tour, Glachant & Ménière, *supra* note 57; *Global Market Outlook for Photovoltaics Until 2014: May 2010 Update*, *supra* note 32, at 22 & fig.23 (demonstrating that China leads in production of cells and modules but trails in other areas).

<sup>59</sup> *Id.*

<sup>60</sup> As but one example of this growth, see Herman K. Trabish, *The Birth of a U.S. Wind Power Manufacturing Industry*, WIRED (Aug. 15, 2010), <http://www.wired.com/epicenter/2010/08/wind-power-industry/#ixzz0x5attOL6> (noting that "five U.S. turbine manufacturers in operation in 2005 grew to 15 in 2009").

<sup>61</sup> Bradsher, *On Clean Energy, China Skirts Rules*, *supra* note 12 ("Because China's clean energy industry has relied so heavily on land deals and cheap state-supported loans, the industry could be vulnerable if China's real estate bubble bursts, or if the banks' loose lending creates financial problems of the sort that have plagued Western financial markets in recent years.").

<sup>62</sup> See, e.g., Richard Brubaker, *Chinese Employees are Going for More Frequent Walks*, ALL ROADS LEAD TO CHINA (July 19, 2010), <http://www.allroadsleadtochina.com/2010/07/19/employees-are-going-for-a-walk-more-frequently/>; Shaun Rein, *Three Big Trends Changing China for Multinationals*, FORBES (Aug. 24, 2010), <http://www.forbes.com/2010/08/24/china-multinationals-branding-leadership-careers-rein.html>.

<sup>63</sup> *Id.* (noting a "bias in favor of local sourcing" because "shipping wind power apparatus is heavy and awkward"); Trabish, *supra* note 60; *Chinese Wind Turbine Manufacturers' Global Expansion: The Dream and The Reality*, *supra* note 36.

<sup>64</sup> Wong, *supra* note 40, at 8; Bradsher, *On Clean Energy, China Skirts Rules*, *supra* note 12 ("Many state and local governments in the United States have also built roads, installed power lines and made other infrastructure improvements that have increased the value of private land as part of programs to attract clean energy. Tax holidays for such businesses are common in the United States, as in China.").

<sup>65</sup> *US Cleantech Trade Mission Heads to China to Boost US Exports*, ENERGY CHINA FORUM (May 18, 2010), <http://www.energychinaforum.com/news/35466.shtml>.

<sup>66</sup> Dan Harris, *Why China Won't Rule Tech.*, CHINA LAW BLOG (July 15, 2010), [http://www.chinalawblog.com/2010/07/why\\_china\\_wont\\_rule\\_tech.html](http://www.chinalawblog.com/2010/07/why_china_wont_rule_tech.html) (stating that "[the] arguments are no different than the arguments that were being made about Russia in the 1960s and about Japan in the 1980s and neither country is really anywhere these days on the technology map"). See also Gady Epstein, *This Just In: China Economy Doing Better Than Japan*, REUTERS (Aug. 16, 2010, 1:47AM) (observing that "we should remember Japan's seeming invincibility in the 1980's and the stunning two decades of stagnation that followed when we look at China now"). It would hardly be surprising if objections to Chinese involvement in the United States looked remarkably similar to those of the 1980s regarding Japanese investment. One recent report claims: "nothing in the review of U.S. reactions to the boom in Japanese FDI suggests that the experience will not be repeated in the case of another formidable East Asian nation, particularly one that does not share many of the strategic, political and military common interests with the U.S. that muted and cabined the investment friction vis-à-vis Japan." Curtis J. Milhaupt, *Is the U.S. Ready for FDI from China? Lessons from Japan's Experience in the 1980s*, in INVESTING IN THE UNITED STATES: IS THE US READY FOR FDI FROM CHINA? (Karl P. Sauvant ed., 2008), <http://www.vcc.columbia.edu/pubs/documents/MilhauptFinalEnglish.pdf>.

<sup>67</sup> Charlie McElwee, *Greentech Wars*, CHINA ENVTL. L. (Dec. 4, 2009), <http://www.chinaenvironmentallaw.com> (stating that "greentech war and competition metaphors . . . seem quite stale, unreflective, and insincere to me").

<sup>68</sup> Kachan, *supra* note 50 ("China is making decisions quickly, and isn't encumbered by democratic process."); Todd Woody, *The Next Great Leap Forward: China Powers the Global Green Tech Revolution*, GRIST (Jan. 11, 2010), <http://www.grist.org/article/2010-01-11-china-powers-global-green-tech-revolution/> ("In a one-party state, a government official saying, 'Make it so,' can remove obstacles to any given project and allocate resources for its development."); 10 *Reasons Why China is the Greentech Leader*, SOLAR FEEDS (Aug. 27, 2010), <http://www.solarfeeds.com/green-chip-stocks/14040-10-reasons-why-china-is-the-cleantech-leader/> ("And unlike a western democracy, when China's central leaders make up their minds, action follows quickly."). As an example, the article *China Has Already Surpassed the U.S. in Cleantech* notes that "in less time than it took the U.S. DOE to do stage 1 of an application review for a 92 MW project in New Mexico, China approved, signed and is ready to begin construction this



year on a 20 times bigger project.” Kachan, *supra* note 50. See also Bradsher, *On Clean Energy, China Skirts Rules*, *supra* note 12 (noting that the Sunzone firm obtained permits for and constructed a solar panel manufacturing plant in less than a year, far shorter than the process would taken in the United States).

<sup>69</sup> Martinot & Junfeng, *supra* note 34 (discussing impacts of recent policy changes).

<sup>70</sup> The four trillion RMB (\$586 billion) package contained billions of dollars worth of incentives for green projects. CHINA GREENTECH INITIATIVE, *supra* note 25, at 50, states that \$31 billion of the stimulus package was for green investments. Caution about that figure is warranted. An analysis by Julian Wong shows that “All that Glitters is Not Green,” in that “bullish” estimates of which specific parts of the package would have green impact are overstated. Julian L. Wong, *How Green is China’s Stimulus Package*, GREEN LEAP FORWARD (Mar. 3, 2010), <http://greenleapforward.com/2010/03/03/how-green-is-chinas-stimulus-package/>.

<sup>71</sup> Eisen, *supra* note 1; Wong, *supra* note 40, at 7 (noting that with respect to China’s greentech R&D programs, “while some of these programs have been in place for nearly two decades, it is not clear that they are yielding the hoped-for results”).

<sup>72</sup> Bradsher, *On Clean Energy, China Skirts Rules*, *supra* note 12.

<sup>73</sup> Pet. for Relief Under Section 301 of the Trade Act of 1974, as amended, 63. *Id.* at 66-83.

<sup>75</sup> Natalie Obiko Pearson, *Chinese Government ‘Confused’ by U.S. Probe of Green Aid*, *Trade Group Says*, BLOOMBERG, Oct. 27, 2010, <http://www.bloomberg.com/news/2010-10-27/chinese-government-confused-by-u-s-probe-of-green-aid-trade-group-says.html>.

<sup>76</sup> Joel Kirkland, *Tax Cuts, Renewable Energy Grants Attract Unlikely Allies*, N.Y. TIMES, Apr. 16, 2010, <http://www.nytimes.com/cwire/2010/04/16/16climatewire-tax-cuts-renewable-energy-grants-attract-unl-12659.html> (indicating that the largest program totals five billion dollars).

<sup>77</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 104 (noting that “substantial policy divergence has occurred” in this area “at local levels across China”).

<sup>78</sup> Jim Bai & Aizhu Chen, *China Firms Offer \$0.108/kWh Feed-In Rate in Solar Tender*, *Source*, REUTERS, Aug. 16, 2010, <http://www.reuters.com/article/idUSTRE67F2BJ20100816?type=GCA-GreenBusiness>.

<sup>79</sup> Pet. for Relief Under Section 301 of the Trade Act of 1974, as amended, 95-96.

<sup>80</sup> Wang Mingyuan, *Issues Related to the Implementation of China’s Energy Law: Analysis of the Energy Conservation Law and the Renewable Energy Law as Examples*, 8 VT. J. ENVTL. L. 225, 248 (2007) (observing that “[t]he lack of open, fair, regulated, and orderly market competition mechanisms in the energy sector is a fundamental hindrance to renewable energy development and to the Renewable Energy Law’s implementation”). SOEs continue to be an important part of China’s economic landscape. See Michael Wines, *China Fortifies State Businesses to Fuel Growth*, N.Y. TIMES, Aug. 29, 2010, <http://www.nytimes.com/2010/08/30/world/asia/30china.html>. For an intriguing analysis that China’s reliance on SOEs will eventually undercut its economic growth, see Paul Denlinger, *China’s Outdated Practice of Capitalism*, FORBES BLOGS (Aug. 24, 2010, 12:00 AM), <http://blogs.forbes.com/china/2010/08/24/chinas-outdated-practice-of-capitalism/?boxes=Homepagechannels>.

<sup>81</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 87.

<sup>82</sup> See LI JUNFENG, SHI JINGLI, XIE HONGWEN, SONG YANQIN & SHI PENGFEI, A STUDY ON THE PRICING POLICY OF WIND POWER IN CHINA 1-2 (2006), <http://www.gwec.net/fileadmin/documents/Publications/Report%20wind-power-price-policy%20china.pdf>. Commenting on the report, Li Junfeng, Director of the China Renewable Energy Industry Association, observed that in China, “wind power is a new industry and it still needs support. The current pricing policy does not match the goal of supporting wind development, and it has to be changed.” *A Study on the Pricing Policy of Wind Power in China*, GLOBAL WIND ENERGY COUNCIL, <http://www.gwec.net/index.php?id=156> (last visited Oct. 6, 2010).

<sup>83</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 44 (listing the agencies and their areas of responsibility).

<sup>84</sup> Eric Savitz, *Solar: China Feed-In-Tariff Could Be 2 Years Away*, BARRON’S BLOGS (Sept. 17, 2009, 2:43 PM), <http://blogs.barrons.com/techtrade/daily/2009/09/17/solar-china-feed-in-tariff-could-be-2-years-away/>. This projection was confirmed by the prevalence of ad hoc bidding over the next two years. See Jim Bai & Aizhu Chen, *China Firms Offer \$0.108/kWh Feed-in Rate in Solar Tender: Source*, REUTERS, Aug. 16, 2010, <http://www.reuters.com/article/idUSTRE67F2BJ20100816>. See Wong, *supra* note 40 (noting that the mid-2010 bidding was the “latest indication that authorities are not quite ready with the idea of a national feed-in tariff for solar”).

<sup>85</sup> See, e.g., *Development Trend of China’s Administrative Accountability Study*, FREE PAPER DOWNLOAD CTR. (July 3, 2010), <http://www.hi138.com/e/i72718>

(noting that “China has just begun the implementation of administrative accountability”).

<sup>86</sup> Mingyuan, *supra* note 80, at 249 (noting that “as China is a large country with unbalanced regional development, uniform national legislation often fails to consider local characteristics and is not specific or adaptable to local needs”).

<sup>87</sup> This marvelous bit of understatement is found in CHINA GREENTECH INITIATIVE, *supra* note 25, at 91.

<sup>88</sup> Mingyuan, *supra* note 80, at 237 (noting that “[s]ome localities and departments still compare expected growth rate goals, and only talk idly of energy conservation and environmental protection”).

<sup>89</sup> *Id.* at 245 (observing that “most thermal power projects are larger in scale, attract greater investment, bring about faster results, and are more profitable than renewable energy projects”).

<sup>90</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 92.

<sup>91</sup> See generally David Shambaugh, *China’s Propaganda System: Institutions, Processes, and Efficacy*, 57 CHINA J. 25 (2007), <http://web.rollins.edu/~tlairson/china/chipropaganda.pdf>. Shambaugh describes the Chinese propaganda system as a “sprawling bureaucratic establishment, extending into virtually every medium concerned with the dissemination of information.” *Id.* at 27. “Xinhua” is the Xinhua News Agency, the official press agency of the People’s Republic of China, which, Shambaugh notes, “has always had a dual role: to report news and to disseminate Party and state propaganda.” *Id.* at 44. Many in the West cite stories from Xinhua without this important context.

<sup>92</sup> Jamie P. Horsley, *China Adopts First Nationwide Open Government Information Regulations*, FREEDOMINFO.ORG (May 9, 2007), [http://www.law.yale.edu/documents/pdf/Intellectual\\_Life/Ch\\_China\\_Adopts\\_1st\\_OGI\\_Regulations.pdf](http://www.law.yale.edu/documents/pdf/Intellectual_Life/Ch_China_Adopts_1st_OGI_Regulations.pdf) (discussing the Regulations of the People’s Republic of China on Open Government Information).

<sup>93</sup> A 2010 workshop on transparency in reporting of environmental information and accompanying report by the Natural Resources Defense Council found that there had been a “good start on open information” but that the system had a long way to go. Alex Wang, *Assessing the State of Environmental Transparency in China*, SWITCHBOARD: NAT. RESOURCES DEF. COUNCIL STAFF BLOG (June 7, 2010), [http://switchboard.nrdc.org/blogs/awang/assessing\\_the\\_state\\_of\\_environment.html](http://switchboard.nrdc.org/blogs/awang/assessing_the_state_of_environment.html).

<sup>94</sup> Pet. for Relief Under Section 301 of the Trade Act of 1974, as amended, 78.

<sup>95</sup> RENEWABLES, *supra* note 31, at 59.

<sup>96</sup> REN21 RENEWABLE ENERGY POLICY NETWORK FOR THE 21ST CENTURY, RECOMMENDATIONS FOR IMPROVING THE EFFECTIVENESS OF RENEWABLE ENERGY POLICIES IN CHINA 7 (2009), [http://www.ren21.net/Portals/97/documents/Publications/Recommendations\\_for\\_RE\\_Policies\\_in\\_China.pdf](http://www.ren21.net/Portals/97/documents/Publications/Recommendations_for_RE_Policies_in_China.pdf) (noting that of the 586.7 terawatt-hours (“TWh”) of electricity generated from renewables in China in 2008, all but 22.0 TWh came from hydropower projects).

<sup>97</sup> David Biello, *The Dam Building Boom: Right Path to Clean Energy?*, YALE ENV’T 360 (Feb. 23, 2009), <http://e360.yale.edu/content/feature.msp?id=2119>.

<sup>98</sup> RENEWABLES, *supra* note 31, at 54 tbl.R2.

<sup>99</sup> See CHINA GREENTECH INITIATIVE, *supra* note 25, at 87-88 (discussing reasons for lower efficiency in earlier installed wind farms).

<sup>100</sup> RENEWABLES, *supra* note 31, at 55 tbl.R4. China did have more installed capacity per unit of gross domestic product, however. Wong, *supra* note 13.

<sup>101</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 36 fig.21; see also LI JUNFENG, WANG SICHENG, ZHANG MINJI & MA LINGJUAN, CHINA SOLAR PV REPORT 11 tbl.6 (2007), <http://www.wwfchina.org/english/downloads/ClimateChange/china-pv-report-en.pdf> (comparing China’s goal to estimates of installed PV capacity in other nations).

<sup>102</sup> RENEWABLES, *supra* note 31, at 55 tbl.R3.

<sup>103</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 36 fig.21. The lower targets are contained in the Medium and Long Term Development Plan for Renewable Energy, and the higher figures are based on reports of new targets likely to be contained in the National Energy Administration’s ten-year plan. See, e.g., Kevin Mo, *Go with Wind: China to Dramatically Boost its Wind Power Capacity, Again*, SWITCHBOARD: NAT. RESOURCES DEF. COUNCIL STAFF BLOG (July 21, 2009), [http://switchboard.nrdc.org/blogs/kmo/go\\_with\\_wind\\_china\\_to\\_dramatic.html](http://switchboard.nrdc.org/blogs/kmo/go_with_wind_china_to_dramatic.html). But see Charles McElwee, *A Mighty Wind*, CHINA ENVTL. L. (May 6, 2009), <http://www.chinaenvironmentallaw.com/2009/05/06/a-mighty-wind/#more-1697> (stating, “I’m not believing [new targets] until I see a formally amended copy of China’s Medium & Long-Term Renewable Energy Development Plan”).

<sup>104</sup> According to projections about increased 2020 targets, 300 GW of capacity—far more than wind and solar combined—would be in hydropower. CHINA GREENTECH INITIATIVE, *supra* note 25, at 36 fig.21.

<sup>105</sup> LI JUNFENG, WANG SICHENG, ZHANG MINJI & MA LINGJUAN, CHINA SOLAR PV REPORT 11 tbl.6 (2007), <http://www.wwfchina.org/english/downloads/ClimateChange/china-pv-report-en.pdf> (listing predictions for 2020).

<sup>106</sup> RENEWABLES, *supra* note 31, at 28 (stating that Chinese asset financing was \$29.2 billion in 2009, up from \$22 billion in 2008 and nearly two times the U.S. figure of \$10.7 billion). *See also* Jeremy van Loon & Alex Morales, *China Surges Past U.S. Europe in Clean-Energy Asset Financing*, BLOOMBERG BUSINESSWEEK, July 13, 2010, <http://www.businessweek.com/news/2010-07-13/china-surges-past-u-s-europe-in-clean-energy-asset-financing.html>.

<sup>107</sup> THE PEW CHARITABLE TRUSTS, *supra* note 10.

<sup>108</sup> *Id.* at 7 fig.4.

<sup>109</sup> *Id.* (noting that “[d]omestic policy decisions appear to have shifted the competitive positions of G-20 member countries”).

<sup>110</sup> *China's Power Generation Goes Greener with Total Capacity up 10%*, XINHUA NEWS AGENCY (Jan. 7, 2010), [http://news.xinhuanet.com/english/2010-01/07/content\\_12771880.htm](http://news.xinhuanet.com/english/2010-01/07/content_12771880.htm) (noting that coal-fired power accounted for 74.6% of the nation's 874 million kW of electricity generation capacity in 2009); U.S. DEP'T OF ENERGY, ENERGY INFO. ADMIN., INDEP. STATISTICS AND ANALYSIS, COUNTRY ANALYSIS BRIEFS: CHINA (2009), <http://www.eia.doe.gov/cabs/China/pdf.pdf> (2006 data); Chunbo Ma & Lining He, *From State Monopoly to Renewable Portfolio: Restructuring China's Electric Utility*, 36 ENERGY POL'Y 1697, 1698 (2008), [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1290737](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1290737).

<sup>111</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 40 (noting that “even if China were to achieve its target of deriving 20% of energy from renewable sources by 2020, most of the non-renewable energy would still be derived from coal”); Ma & He, *supra* note 110, at 1707.

<sup>112</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 32-33.

<sup>113</sup> Shai Oster & Spencer Swartz, *World News: Beijing Disputes IEA Data on Energy*, WALL ST. J., July 21, 2010, [http://online.wsj.com/article/NA\\_WSJ\\_PUB:SB10001424052748703720504575378243321158992.html](http://online.wsj.com/article/NA_WSJ_PUB:SB10001424052748703720504575378243321158992.html) (citing statistics from the International Energy Agency that China used 2.252 billion tons of oil equivalent in 2009 as compared to 2.17 billion tons of oil equivalent for the United States); *see also* Ann Carlson, *China's Growth in Energy Usage Truly Alarming*, LEGAL PLANET: ENV'T L. & POL'Y BLOG (May 7, 2010), <http://legal-planet.wordpress.com/2010/05/07/chinas-growth-in-energy-usage-truly-alarming/>; Brian Reznay, *Chinese Energy Cleans Up Its Act*, SEEKING ALPHA (July 27, 2010), <http://seekingalpha.com/article/216784-chinese-energy-cleans-up-its-act> (citing the report and Chinese criticism that the “second largest consumer” story does not give enough weight to China's greentech investments and carbon intensity targets).

<sup>114</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 40; *U.S. and China Vie for Clean Energy Leadership*, *supra* note 28.

<sup>115</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 38-39.

<sup>116</sup> *Two Energy Giants: A Contrast in Approach*, INST. FOR ENERGY RES. (Apr. 22, 2010), <http://www.instituteforenergyresearch.org/2010/04/22/two-energy-giants-a-contrast-in-approach/> (illustrating, via tables, how Conventional Thermal Generating Capacity Additions in China outstripped all renewables additions—and far outpaced non-hydropower renewables—between 2005-2008).

<sup>117</sup> Woody, *supra* note 68; *see also* *Two Energy Giants*, *supra* note 116 (“The size and scope of [China's] investments in conventional forms of energy dwarf their commitment to ‘green energy.’”).

<sup>118</sup> Charlie McElwee, *China Starts Construction on 13.6GW Coal-Fired Power Base*, CHINA ENV'T L. (Aug. 10, 2009), <http://www.chinaenvironmentallaw.com/2009/08/10/china-starts-construction-on-136gw-coal-fired-power-base/>. One Chinese professor claims that provincial governments have stronger incentives to build conventional plants than greentech facilities. Mingyuan, *supra* note 80, at 244-45 (“[E]ven though the State has made clear that renewable energy exploitation and utilization is an area of high priority and that key public and private actors are encouraged to be involved, some local governments are enthusiastic about, and spare no effort in, starting thermal power plants, while renewable energy generation projects are often ‘pending discussion.’ The objective cause of this phenomenon is that most thermal power projects are larger in scale, attract greater investment, bring about faster results, and are more profitable than renewable energy projects.”).

<sup>119</sup> 2010 [National Energy Board Held the First Half of 2010, the Economic Situation of the Energy Conference], [National Development and Reform Commission], [http://nyj.ndrc.gov.cn/ggzt/t20100721\\_362050.htm](http://nyj.ndrc.gov.cn/ggzt/t20100721_362050.htm) (last visited Oct. 6, 2010).

<sup>120</sup> Keith Bradsher, *China Outpaces U.S. in Cleaner Coal-Fired Plants*, N.Y. TIMES, May 10, 2009, <http://www.nytimes.com/2009/05/11/world/asia/11coal.html>.

<sup>121</sup> *See, e.g.*, Press Release, Bloomberg New Energy Finance, *Joined At The Hip: The US-China Clean Energy Relationship*; Bloomberg New Energy Finance Study Debunks Myths About US-China Clean Energy Relationship (May 19, 2010), <http://bnf.com/Download/pressreleases/116/pdf/116.pdf> (referencing a com-

ment by Michael Liebreich, CEO of Bloomberg New Energy Finance, that “[i]t is easy to paint clean energy trade between the US and China in terms of winners and losers, but the relationship defies simplistic assumptions”).

<sup>122</sup> *See, e.g.*, Wong, *supra* note 47, at 11 (noting that “the ‘clean energy race’ is not a zero-sum game”).

<sup>123</sup> Bradford Plumer, *Should We Start a Solar Panel Trade War with China?*, NEW REPUBLIC BLOG (Sept. 9, 2010, 4:10 PM), <http://www.tnr.com/blog/77566/should-we-start-solar-panel-trade-war-china> (“a far more effective way to strengthen the U.S. clean-energy industry would be to boost domestic demand . . . than through a solar-panel trade war”).

<sup>124</sup> *See China and Climate Change*, PEW CTR. ON GLOBAL CLIMATE CHANGE, [http://www.pewclimate.org/policy\\_center/international\\_policy/china.cfm](http://www.pewclimate.org/policy_center/international_policy/china.cfm) (last visited Oct. 6, 2010) (providing fact sheets on specific issues and strategies).

<sup>125</sup> China's President, Hu Jintao, stated in September that China's next five-year plan would include a new goal to reduce carbon intensity—CO<sub>2</sub> emissions per unit of GDP—from 2005 levels by 2020 by a “notable margin.” Julian L. Wong, *China's Carbon Intensity Plans and its Impact on Climate Progress*, GREEN LEAP FORWARD, <http://greenleapforward.com/2009/09/25/chinas-carbon-intensity-plans-and-its-impact-on-climate-progress/> (last updated Sept. 30, 2009). In November 2009, it announced that number was a reduction of forty percent from 2005 levels by 2020. Edward Wong & Keith Bradsher, *China Joins U.S. in Pledge of Hard Targets on Emissions*, N.Y. TIMES, Nov. 26, 2009, <http://www.nytimes.com/2009/11/27/science/earth/27climate.html>. There are already signs that this goal will be difficult to meet. In early fall 2010, China was poised to miss a target set by the 11th Five-Year Guidelines, CHINA GREENTECH INITIATIVE, *supra* note 25, at 39, for reducing the energy intensity of its industries between 2005 and 2010 by twenty percent. *China Closes Factories as Green Deadline Looms*, ENERGY CHINA FORUM (Aug. 24, 2010), <http://www.energychinaforum.com/news/39598.shtml>. According to one consultant quoted in this article, “[i]f Beijing fails to hit the 2010 target by a wide margin, its credibility on climate change commitments will be subject to a great deal of international scepticism.” *Id.* (quoting Damien Ma of the Eurasia Group consulting firm).

<sup>126</sup> Studies by the McKinsey consulting firm and the United Kingdom's Tyndall Centre find that under alternative scenarios of projected growth, China must take drastic measures to reduce greenhouse gas emissions or suffer considerable increases by 2030. TAO WANG & JIM WATSON, SUSSEX ENERGY GROUP & TYNDALL CTR. FOR CLIMATE RESEARCH, *CHINA'S ENERGY TRANSITION: PATHWAYS FOR LOW CARBON DEVELOPMENT* (2009), [http://www.sussex.ac.uk/sussexenergygroup/documents/china\\_report\\_forweb.pdf](http://www.sussex.ac.uk/sussexenergygroup/documents/china_report_forweb.pdf); MCKINSEY & CO., *CHINA'S GREEN REVOLUTION: PRIORITIZING TECHNOLOGIES TO ACHIEVE ENERGY AND ENVIRONMENTAL SUSTAINABILITY* 11 (2009), [http://www.mckinsey.com/locations/greaterchina/mckonchina/reports/china\\_green\\_revolution\\_report.pdf](http://www.mckinsey.com/locations/greaterchina/mckonchina/reports/china_green_revolution_report.pdf).

<sup>127</sup> *See, e.g.*, CTR. FOR AM. PROGRESS, *A ROADMAP FOR U.S.-CHINA COLLABORATION ON CARBON CAPTURE AND SEQUESTRATION* 12 (2009), [http://www.americanprogress.org/issues/2009/11/pdf/china\\_ccs.pdf](http://www.americanprogress.org/issues/2009/11/pdf/china_ccs.pdf) (observing that “[i]f these two countries cannot find a way to come together to jointly address the problems caused by these emissions, it is highly unlikely that the world will be able to agree on a strategy for effective mitigation any time soon”).

<sup>128</sup> ENERGY INFO. ADMIN., U.S. DEP'T OF ENERGY, *ANNUAL ENERGY REVIEW* 343 tbl.11.19 (2008), <http://www.eia.gov/FTP/ROOT/multifuel/038408.pdf> (noting that in 2006, China emitted 6,018 million metric tons (“MMT”) of CO<sub>2</sub> compared to the United States' 5,903 MMT).

<sup>129</sup> “China is on track to overwhelm the global effort to address climate change.” *Challenges and Opportunities for U.S.-China Cooperation on Climate Change Before the Sen. Committee on Foreign Relations*, 111th Cong. 16 (2009), <http://www.hsdl.org/?view&doc=113654&coll=0> (referencing a statement of Elizabeth Economy, C.V. Starr Senior Fellow and Director, Asia Studies, Council on Foreign Relations).

<sup>130</sup> Bradsher, *On Clean Energy, China Skirts Rules*, *supra* note 12 (citing comments of Zhao Feng, Sunzone's general manager, that “the world should appreciate the generous assistance of Chinese government agencies to the country's clean energy industries. That support has made possible a sharp drop in the price of renewable energy and has helped humanity address global warming”).

<sup>131</sup> McElwee, *supra* note 67.

<sup>132</sup> *See, e.g.*, Press Release, Bloomberg New Energy Finance, *supra* note 121 (“The two nations may be in competition, but the big win for both of them would be to drive the cost of a clean power generation below the cost of fossil fuels.”); Christina Larson, *America's Unfounded Fears of a Green-Tech Race with China*, YALE ENV'T 360 (Feb. 8, 2010), <http://e360.yale.edu/content/feature.msp?id=2238> (quoting Shanghai-based American entrepreneur Richard Brubaker's statement that “[t]he clean-tech war is overblown from the start” and discussing how “the green-tech ‘race’ is not one that one side wins and the other loses, but a scenario



where partnerships are sought out and the final equation doesn't have to be a zero-sum game"); Wong, *supra* note 47, at 11.

<sup>133</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 35.

<sup>134</sup> The website of the United Nations Framework Convention on Climate Change contains a wealth of information on global responses to climate change, including the Kyoto Protocol, Copenhagen Accord, and many more documents. See UNITED NATIONS FRAMEWORK CONVENTION ON CLIMATE CHANGE, <http://unfccc.int> (last visited Oct. 6, 2010).

<sup>135</sup> See, e.g., *BRIC Countries' Think-Tanks Discuss Climate Change*, CHINA.ORG.CN (Apr. 15, 2010), [http://www.china.org.cn/world/nuclear\\_bric\\_summits/2010-04/15/content\\_19823233.htm](http://www.china.org.cn/world/nuclear_bric_summits/2010-04/15/content_19823233.htm).

<sup>136</sup> There are many books, articles, and studies that analyze the U.S.-China relationship, and it would take an entire bookshelf to list them all. See, e.g., Dan Edwards, *New China Books Roundup*, BEIJINGER BLOG (Aug. 26, 2010, 12:00 PM), <http://www.thebeijinger.com/blog/2010/08/26/New-China-Books-Roundup>. A useful starting point for a list and brief discussion of the issues between the two nations is KERRY DUMBAUGH, CONG. RESEARCH SERV., RL33877, CHINA-U.S. RELATIONS: CURRENT ISSUES AND IMPLICATIONS FOR U.S. POLICY (2007), [http://assets.opencrs.org/rpts/RL33877\\_20071221.pdf](http://assets.opencrs.org/rpts/RL33877_20071221.pdf). One recent flashpoint has involved censorship and the Internet. See, e.g., Jessica Guynn, *Google Takes a Side Step in Censorship Dance with China*, CHI. TRIB., Mar. 22, 2010, [http://articles.chicagotribune.com/2010-03-22/business/sc-biz-0323-google-20100322\\_1\\_google-china-hong-kong-china-s-internet](http://articles.chicagotribune.com/2010-03-22/business/sc-biz-0323-google-20100322_1_google-china-hong-kong-china-s-internet).

<sup>137</sup> For general discussions of these meetings, see Michael Wines, *In China, Pelosi Calls for Cooperation On Climate*, N.Y. TIMES, May 28, 2009, <http://www.nytimes.com/2009/05/28/world/asia/28pelosi.html>; U.S. Experts Welcome China's Pledge on Carbon Emission Cuts, XINHUA NEWS AGENCY (Nov. 27, 2009), [http://news.xinhuanet.com/english/2009-11/27/content\\_12549647.htm](http://news.xinhuanet.com/english/2009-11/27/content_12549647.htm).

<sup>138</sup> U.S.-China Strategic and Economic Dialogue, U.S. DEP'T OF TREASURY, <http://www.ustreas.gov/initiatives/us-china/> (last updated June 10, 2010). See CHINA GREENTECH INITIATIVE, *supra* note 25, at 58, for a discussion of S&ED activities.

<sup>139</sup> See *Leaders' Statement: The Pittsburgh Summit*, PITTSBURGH SUMMIT, <http://www.pittsburghsummit.gov/mediacenter/129639.htm> (last visited Sept. 6, 2010).

<sup>140</sup> See *Major Economies Forum on Energy and Climate*, U.S. DEP'T. OF STATE, <http://www.state.gov/g/oes/climate/mem/> (last visited Sept. 6, 2010).

<sup>141</sup> See, e.g., Andrew C. Revkin, *China and U.S. Pledge Climate Teamwork*, N.Y. TIMES DOT EARTH BLOG (July 28, 2009, 6:19 PM), <http://dotearth.blogs.nytimes.com/2009/07/28/china-and-us-pledge-climate-teamwork/> (describing the July 2009 memorandum of understanding); Press Release, White House, Office of Press Sec'y, U.S.-China Joint Statement (Nov. 17, 2009), <http://www.whitehouse.gov/the-press-office/us-china-joint-statement> (section "V. Climate Change, Energy and Environment" of "U.S.-China Joint Statement" following President Obama's trip to China in November 2009).

<sup>142</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 58 (discussing the importance of the S&ED in this regard).

<sup>143</sup> Hugh Gusterson, *Secrecy, Authorship and Nuclear Weapons Scientists*, in *SECRECY AND KNOWLEDGE PRODUCTION* 57, 69 (Judith Reppey ed., 1999), [http://www.einaudi.cornell.edu/peaceprogram/publications/occasional\\_papers/occasional-paper23.pdf](http://www.einaudi.cornell.edu/peaceprogram/publications/occasional_papers/occasional-paper23.pdf) (discussing the "intense secretiveness of the Soviet state").

<sup>144</sup> Plumer, *supra* note 123.

<sup>145</sup> Michael Levi, *The Downside to Made in the USA*, COUNCIL ON FOREIGN REL., Sept. 9, 2010, <http://blogs.cfr.org/levi/2010/09/09/the-downside-to-made-in-the-usa/>.

<sup>146</sup> China has "associated with" (agreed in principle to) the Copenhagen Accord. On the other hand, it believes "it is neither viable nor acceptable to start a new negotiating process," a stance which would reverse years of international work. Arthur Max, *China, India Join Copenhagen Accord, Last Major Emitters To Sign On*, HUFFINGTON POST (Mar. 9, 2010, 2:24 PM), [http://www.huffingtonpost.com/2010/03/09/china-india-join-copenhag\\_n\\_491640.html](http://www.huffingtonpost.com/2010/03/09/china-india-join-copenhag_n_491640.html) (comments of Premier Wen Jiabao).

<sup>147</sup> See, e.g., Mark Lynas, *How Do I Know China Wrecked the Copenhagen Deal? I Was in the Room*, GUARDIAN (Dec. 22, 2009), <http://www.guardian.co.uk/environment/2009/dec/22/copenhagen-climate-change-mark-lynas>. Lynas' argument was criticized by many who believed it unwise to ascribe sole blame to the Chinese.

<sup>148</sup> CHINA GREENTECH INITIATIVE, *supra* note 25, at 34 (noting that if China develops at its current pace, "international concerns over global warming would increasingly be directed toward China").

<sup>149</sup> Wong, *supra* note 47 (noting that "[t]he United States risks falling behind not just China, but other Asian and EU countries, because of its failure to create a national long-term vision for clean energy development, and a supporting stable policy framework to realize that vision").

<sup>150</sup> *Id.* (noting that "the United States has been tremendously successful in inventing many important clean energy technologies, but has fared [sic] less well in mass production and commercialization relative to the size of its economy").

<sup>151</sup> See, e.g., David L. Levy, *The Political Economy of Renewable Energy in the US and Europe*, ALL ACAD. RES., [http://www.allacademic.com/meta/p\\_mla\\_aparsearch\\_citation/0/7/2/5/7/pages72573/p72573-1.php](http://www.allacademic.com/meta/p_mla_aparsearch_citation/0/7/2/5/7/pages72573/p72573-1.php) (last visited Oct. 6, 2010) (observing that "[renewables] policy in the US is characterized by fragmentation, uncertainty, lack of coordination, a lack of substantive taxes or subsidies, and the absence of a meaningful overall emissions reduction target").

<sup>152</sup> The National Renewable Energy Laboratory and the Pew Center on Global Climate Change, among many others, have issued numerous publications on the link between governmental policies and promotion of renewables. See *NREL Publications*, Nat'l Renewable Energy Laboratory, <http://www.nrel.gov/publications/> (last visited Oct. 6, 2010); PEW CTR. ON GLOBAL CLIMATE CHANGE, *supra* note 124. A recent noteworthy report in the author's home region is Marilyn A. Brown et al., *Renewable Energy in the South: A Policy Brief* (Ga. Inst. of Tech., Sch. of Pub. Pol'y 2010, Working Paper No. 58, 2010), <http://www.spp.gatech.edu/faculty/workingpapers/wp58.pdf>.

<sup>153</sup> FRED SISSIN, CONG. RESEARCH SERV., RS22858, RENEWABLE ENERGY R&D FUNDING HISTORY: A COMPARISON WITH FUNDING FOR NUCLEAR ENERGY, FOSSIL ENERGY, AND ENERGY EFFICIENCY R&D (2008), <http://www.nationalaglawcenter.org/assets/crs/RS22858.pdf>.

<sup>154</sup> See Amanda Ruggeri, *What the Stimulus Package Does for Renewable Energy*, U.S. NEWS & WORLD REP. (Mar. 6, 2009), <http://politics.usnews.com/news/energy/articles/2009/03/06/what-the-stimulus-package-does-for-renewable-energy.html> (noting that the package contained "about \$50 billion in spending and \$20 billion in tax provisions"); Daniel J. Weiss & Alexandra Kougentakis, *Recovery Plan Captures the Energy Opportunity*, CTR. FOR AM. PROGRESS (Feb. 13, 2009), [http://www.americanprogress.org/issues/2009/02/recovery\\_plan\\_captures.html](http://www.americanprogress.org/issues/2009/02/recovery_plan_captures.html) (linking to a comprehensive spreadsheet detailing individual programs and provisions); see also Joe Romm, *The Entire American Economy, Including Renewable Energy, Benefitted from the Stimulus Bill*, CLIMATE PROGRESS (Aug. 25, 2010), <http://climateprogress.org/2010/08/25/the-entire-american-economy-including-renewable-energy-benefitted-from-the-stimulus-bill> (discussing the impact of the stimulus package on the economy, including promotion of greentech).

<sup>155</sup> See Zachary Shahan, *Fossil Fuels Get Tons More in Subsidies than Renewable Energy*, CLEAN TECHNICA (July 31, 2010), <http://cleantechnica.com/2010/07/31/fossil-fuels-get-tons-more-in-subsidies-than-renewable-energy/> (noting that governments devote more than ten times as much to subsidizing fossil fuel industries than to solar and wind).

<sup>156</sup> Romm, *supra* note 154 (discussing the potential for tax incentives to expire at the end of 2010).

<sup>157</sup> Candace Lombardi, *U.S. Wind Energy Popular, But Lacks Investment*, CNET NEWS (July 28, 2010), [http://news.cnet.com/8301-11128\\_3-20011926-54.html?tag=mncol;mlt\\_related](http://news.cnet.com/8301-11128_3-20011926-54.html?tag=mncol;mlt_related).

<sup>158</sup> AM. WIND ENERGY ASS'N, AWEA MID-YEAR 2010 MARKET REPORT 3 (2010), [http://www.awea.org/\\_cs\\_upload/learnabout/publications/5085\\_1.pdf](http://www.awea.org/_cs_upload/learnabout/publications/5085_1.pdf).

<sup>159</sup> Angelique van Engelen, *Obama Addresses Climate Change in Program Styled on 1960s Space Race*, GLOBAL WARMING IS REAL (May 5, 2009), <http://www.globalwarmingisreal.com/blog/2009/05/05/obama-addresses-climate-change-in-program-styled-on-1950s-space-race/>.

<sup>160</sup> Wong, *supra* note 47.

<sup>161</sup> David Roberts, *On the Death of the Climate Bill*, GRIST MAGAZINE, July 22, 2010, <http://www.grist.org/article/2010-07-22-on-the-death-of-the-climate-bill/>.

<sup>162</sup> *Id.*

<sup>163</sup> See, e.g., Wong, *supra* note 47, at 10 (noting that "[i]nstead, what the United States has is a patchwork of differing state and local policies, and federal policy tools that are temporary and unpredictable").

<sup>164</sup> For descriptions of the wide variety of state programs, see *U.S. States & Regions*, PEW CTR. ON GLOBAL CLIMATE CHANGE, <http://www.pewclimate.org/states-regions> (last visited Oct. 6, 2010), and JONATHAN L. RAMSEUR, CONG. RESEARCH SERV., RL33812, CLIMATE CHANGE: ACTION BY STATES TO ADDRESS GREENHOUSE GAS EMISSIONS (2007), <http://ncseonline.org/NLE/CRSreports/07Dec/RL33812.pdf>.

<sup>165</sup> See Lincoln Davies, *Power Forward: The Argument for a National RPS*, 42 CONN. L. REV. 1339, 1397 (2010); Joshua P. Fershee, *Changing Resources, Changing Market: The Impact of a National Renewable Portfolio Standard on the U.S. Energy Industry*, 29 ENERGY L.J. 49, 61 (2008).

<sup>166</sup> Engelen, *supra* note 159.

<sup>167</sup> *Id.* at 3.



- <sup>22</sup> *Id.*
- <sup>23</sup> DAVID J. HAYES, CENTER FOR AMERICAN PROGRESS, GETTING CREDIT FOR GOING GREEN: MAKING SENSE OF CARBON “OFFSETS” IN A CARBON-CONSTRAINED WORLD 16 (2008), [http://www.americanprogress.org/issues/2008/03/pdf/carbon\\_offsets.pdf](http://www.americanprogress.org/issues/2008/03/pdf/carbon_offsets.pdf).
- <sup>24</sup> See Conference of the Parties, *Report of the Conference of the Parties on its Fifteenth Session, Copenhagen, Den., Dec. 7-19, 2009*, at Dec. 2/CP.15, ¶¶ 1-12, U.N. Doc. FCCC/CP/2009/11/Add. 1 (March 30, 2010) (noting the Copenhagen Accord).
- <sup>25</sup> See ALEXANDRE KOSSOY & PHILIPPE AMBROSSI, THE WORLD BANK, STATE AND TRENDS OF THE CARBON MARKET 2 (2010) (summarizing issues facing the market for the Clean Development Mechanism).
- <sup>26</sup> See Nathaniel Gronewold, *Chicago Climate Exchange Closes Nation’s First Cap-and-trade System but Keeps Eye to the Future*, E&E PUBLISHING (Jan. 3, 2011), <http://www.eenews.net/public/climatewire/2011/01/03/2>.
- <sup>27</sup> See KATHERINE HAMILTON ET AL., ECOSYSTEM MARKETPLACE & BLOOMBERG NEW ENERGY FINANCE, STATE OF THE VOLUNTARY CARBON MARKETS, at ii-iii, vi (2010) [http://moderncms.ecosystemmarketplace.com/repository/moderncms\\_documents/vcarbon\\_2010.2.pdf](http://moderncms.ecosystemmarketplace.com/repository/moderncms_documents/vcarbon_2010.2.pdf). In 2009, an estimated 93.7 million tons of carbon or its equivalent were traded in voluntary market transactions, totaling \$387.4 million. Trades on the Chicago Climate Exchange (“CCX”) accounted for almost half of the volume, but only thirteen percent of the market share valued at \$49.8 million. Over-the-counter (“OTC”) transactions accounted for eighty-four percent of the market share, valued at approximately \$325.9 million; trades on other voluntary exchanges comprised the remainder. Approximately fifty-six percent of OTC transactions in the voluntary markets originated in North America.
- <sup>28</sup> *Id.* at 57.
- <sup>29</sup> *Id.* at viii.
- <sup>30</sup> About VCS, VERIFIED CARBON STANDARD, <http://www.v-c-s.org/about.html> (last visited Mar. 8, 2011). The full name of the VCS changed from Voluntary Carbon Standard to Verified Carbon Standard in 2011; therefore reports cited include the former designation while websites include the latter.
- <sup>31</sup> *Id.*
- <sup>32</sup> VCS Program Guidelines, VOLUNTARY CARBON STANDARD 5 (2008), [http://www.v-c-s.org/docs/Voluntary%20Carbon%20Standard%20Program%20Guidelines%202007\\_1.pdf](http://www.v-c-s.org/docs/Voluntary%20Carbon%20Standard%20Program%20Guidelines%202007_1.pdf).
- <sup>33</sup> *Id.* at 4-5 (stating that “Real” means that the reductions actually occurred, “additional” means that the reductions are beyond a business-as-usual scenario, “conservative” means the assumptions and procedures will not over-estimate a given project’s GHG impact, and “unique” means the reductions are not double counted).
- <sup>34</sup> About, CLIMATE REGISTRY, <http://www.climateregistry.org/about.html> (last visited Jan. 8, 2011).
- <sup>35</sup> About Us, CLIMATE ACTION RESERVE, <http://www.climateactionreserve.org/about-us/> (last visited Jan. 8, 2011).
- <sup>36</sup> *Id.*
- <sup>37</sup> *Id.*; *Frequently Asked Questions*, CLIMATE ACTION RESERVE, <http://www.climateactionreserve.org/resources/faqs/> (last visited Jan. 8, 2011).
- <sup>38</sup> AM. CARBON REGISTRY, <http://www.americancarbonregistry.org/> (last visited Jan. 8, 2011).
- <sup>39</sup> About Us, AM. CARBON REGISTRY, <http://www.americancarbonregistry.org/aboutus> (last visited Jan. 8, 2011).
- <sup>40</sup> AM. CARBON REGISTRY, THE AMERICAN CARBON REGISTRY STANDARD, VERSION 2.1, at 5 (2010), <http://www.americancarbonregistry.org/carbon-accounting/ACR%20Standard%20v2.1%20Oct%202010.pdf> (explaining that one ERT is equal to one metric ton of carbon dioxide equivalent).
- <sup>41</sup> *Id.* at 7.
- <sup>42</sup> About Us, WINROCK INT’L, [http://www.winrock.org/about\\_us.asp](http://www.winrock.org/about_us.asp) (last visited Jan. 8, 2011).
- <sup>43</sup> See generally *About The Gold Standard*, THE GOLD STANDARD, <http://www.cdmgoldstandard.org/About-Gold-Standard.62.0.html> (last visited Jan. 10, 2011) (including related links).
- <sup>44</sup> *How We Got Started*, THE GOLD STANDARD, <http://www.cdmgoldstandard.org/How-we-got-started.65.0.html> (last visited Jan. 29, 2010).
- <sup>45</sup> *What We Stand For*, THE GOLD STANDARD, <http://www.cdmgoldstandard.org/What-we-stand-for.66.0.html> (last visited Jan. 29, 2010).
- <sup>46</sup> See, e.g., *CER Prices See Modest Gains*, CARBON POSITIVE, (Oct. 24, 2007), <http://www.carbonpositive.net/viewarticle.aspx?articleID=925>.
- <sup>47</sup> THE GOLD STANDARD, GOLD STANDARD BRAND MANUAL 1 (2009), [http://www.cdmgoldstandard.org/fileadmin/editors/files/5\\_GS\\_legal-documents/GS\\_Brand-Manual.pdf](http://www.cdmgoldstandard.org/fileadmin/editors/files/5_GS_legal-documents/GS_Brand-Manual.pdf).
- <sup>48</sup> See, e.g., Kelly Levin et al., *Can Non-State Certification Systems Bolster State-Centered Efforts to Promote Sustainable Development Through the Clean Development Mechanism?* 44 WAKE FOREST L. REV. 777, 778 (2009) (citing Steven Bernstein & Benjamin Cashore, *Can Non-State Global Governance Be Legitimate? An Analytical Framework*, 1 REG. & GOVERNANCE 347, 347-48 (2007)); Bernstein, *supra* note 1, at 105.
- <sup>49</sup> Levin et al., *supra* note 48, at 777-78; Bernstein, *supra* note 1, at 104; Benjamin Cashore et al., *Revising Theories of Nonstate Market-Driven (NSMD) Governance: Lessons from the Finnish Forest Certification Experience*, GLOBAL ENVTL. POL., Feb. 2007, at 1.
- <sup>50</sup> See Cashore et al., *supra* note 49 at 2. Forest certification is a means of identifying and certifying well-maintained forestland with a label, similar to a VER, ERT, CRT, or VCU in the carbon market, that denotes the land as compliant with a certain standard of stewardship thereby allowing products from certified forest to demand a price premium in the relevant market. See Eric Hansen, Michael P. Washburn & Jim Finley, *Understanding Forest Certification*, SUSTAINABLE FORESTS P’SHIP, <http://sfp.cas.psu.edu/pdfs/PS%20Underforestcert.pdf> (last visited Feb. 27, 2011).
- <sup>51</sup> See, e.g., Levin et al., *supra* note 48, at 778.
- <sup>52</sup> See, e.g., *id.*; Bernstein, *supra* note 1, at 106-07; Cashore et al., *supra* note 49, at 8.
- <sup>53</sup> Cashore et al., *supra* note 49, at 8 (emphasis omitted).
- <sup>54</sup> *Id.* (arguing that the first prong of the test is the most important); Bernstein, *supra* note 1, at 107 (stating that NSMDs are distinguishable from public-private partnerships).
- <sup>55</sup> See, e.g., Bernstein, *supra* note 1, at 107-09; Cashore et al., *supra* note 49, at 8; Levin, et al., *supra* note 48, at 778.
- <sup>56</sup> Cashore et al., *supra* note 49, at 8.
- <sup>57</sup> *Id.*
- <sup>58</sup> See, e.g., Levin et al., *supra* note 48, at 778; Bernstein, *supra* note 1, at 109-10.
- <sup>59</sup> See Bernstein, *supra* note 1, at 109.
- <sup>60</sup> See, e.g., *id.* at 110; Levin et al., *supra* note 48 at 778.
- <sup>61</sup> Bernstein, *supra* note 1, at 110.
- <sup>62</sup> See, e.g., *id.* at 110-11; Cashore et al., *supra* note 49, at 9; Levin et al., *supra* note 48, at 778.
- <sup>63</sup> See Bernstein, *supra* note 1, at 110.
- <sup>64</sup> *Id.*
- <sup>65</sup> Charlotte Streck & Jolene Lin, *Making Markets Work: A Review of CDM Performance and the Need for Reform*, 19 EUR. J. INT’L L. 409, 426 (2008).
- <sup>66</sup> *Id.* at 102-03.
- <sup>67</sup> *Id.* at 103.
- <sup>68</sup> *Id.*
- <sup>69</sup> *Id.*
- <sup>70</sup> See Levin et al., *supra* note 48, at 781-82. For a NSMD system to obtain “political legitimacy”—defined as “acceptance and [justification] of [a] shared rule by [the] community as appropriate and justified”—the NSMD system must complete a three-step process. First, the NSMD system must be “initiated.” This can be achieved through adoption of the NSMD system by firms that already meet the standard’s criteria. Second, the market must build widespread support for the NSMD system. This can be done through the relaxation of the standard’s criteria, or, if the standard refuses to lower its barriers, competing standards will develop. The competing standards may converge at a later stage depending on market forces. Finally, the NSMD system will achieve “political legitimacy” once business, social, and environmental interests look to the NSMD system “as [a] legitimate arena[] in which to mediate disputes and address policy problems.” *Id.* (quoting Steven Bernstein & Benjamin Cashore, *Can Non-State Global Governance Be Legitimate? An Analytical Framework*, 1 REG. & GOVERNANCE 347, 361 (2007)). It is beyond the scope of this Article to determine the political legitimacy of each certification standard. However, without a review process for aggrieved constituents, a certification cannot reasonably expect to be viewed as a forum “in which to mediate disputes.”
- <sup>71</sup> VOLUNTARY CARBON STANDARD, VOLUNTARY CARBON STANDARD 2007.1, at 4 (2008), [http://www.v-c-s.org/docs/Voluntary%20Carbon%20Standard%202007\\_1.pdf](http://www.v-c-s.org/docs/Voluntary%20Carbon%20Standard%202007_1.pdf).
- <sup>72</sup> *Id.* at 5. The VCS 2007.1 project cycle consists of six steps: (1) the project proponent submits all project documents to the auditor; (2) the verifier assesses the project against VCS 2007.1 and writes a validation and, later, a verification

report; (3) the VCS Registry Operator receives the project documents; (4) the VCS Registry Operator reviews the project documents and submits them to the VCS Project Database; (5) the VCS Project Database reviews the documents and checks for issues such as double-counting; (6) the VCS Registry Operator requests the registration fee and, once those are paid, issues VCU to the project proponent.

<sup>73</sup> See HAMILTON ET AL., *supra* note 27, at 68.

<sup>74</sup> VCS Program Guidelines, *supra* note 32, at 7; See also *The VCS Project Database*, VERIFIED CARBON STANDARD, <https://vcsprojectdatabase1.apx.com/myModule/rpt/myrpt.asp?r=208> (last visited Mar. 8, 2011) (listing the existing twenty-seven validators and verifiers worldwide as of January 2011); *Validators*, VERIFIED CARBON STANDARD, <http://www.v-c-s.org/validators.html> (last visited Jan. 8, 2011) (explaining how parties become accredited verifiers and validators).

<sup>75</sup> VCS Program Guidelines, *supra* note 32, at 7.

<sup>76</sup> See Valerie Volcovici, *US Voluntary Market to See Steady Demand: Observers*, POINT CARBON (Jan. 3, 2011) (stating that, to date, the California Air Resources Board, which will manage California's cap and trade program, has only endorsed offset protocols from CAR).

<sup>77</sup> See HAMILTON ET AL., *supra* note 27, at 68.

<sup>78</sup> See generally CLIMATE ACTION RESERVE, VERIFICATION PROGRAM MANUAL 53 (2010), <http://www.climateactionreserve.org/wp-content/uploads/2010/12/2010-Verification-Program-Manual-12-201.pdf>.

<sup>79</sup> AM. CARBON REGISTRY, *supra* note 40. Under ACR's rules, a project proponent submits paperwork to ACR for an initial eligibility screening, which it must pass, before the proponent can then seek out an ACR-approved verifier to validate the project as compliant with ACR's standards and verify the integrity of the GHG reductions involved in the project. ACR permits proponents to submit projects utilizing GHG measurement tools and methodologies of other standards, some of which have been preapproved as compliant with ACR's rules, while others will require case-by-case approval by an ACR Board. Once ACR accepts the verification report, the project will be registered in ACR's database and ERTs will be issued as they accrue and in accordance with the sums outlined in the verification report.

<sup>80</sup> See HAMILTON ET AL., *supra* note 27, at 68.

<sup>81</sup> AM. CARBON REGISTRY, *supra* note 40, at 6 (last visited Jan. 8, 2011).

<sup>82</sup> American Carbon Registry, *Attestation of Verification Body*, AM. CARBON REGISTRY, at 3-4, <http://www.americancarbonregistry.org/carbon-accounting/Attestation%20of%20Verification%20Body%202010.pdf> (last visited Jan. 29, 2011).

<sup>83</sup> The GS project cycle requires that the project proponent host two meetings with the project's local host community to assess the impacts of the project. An independent auditor must validate the project and the Gold Standard's independent Technical Advisory Committee ("GS TAC") reviews the validation report. If there are no issues, then the Gold Standard registers the project. Following registration, a different independent auditor must periodically verify that the claimed emissions reductions are occurring. The GS TAC will review the verification report, and if there are no issues, the Gold Standard will issue VERs to the legal owner of the credits. See THE GOLD STANDARD FOUND., REQUIREMENTS 49-50 (2009), [http://www.cdmgoldstandard.org/fileadmin/editors/files/6\\_GS\\_technical\\_docs/GSv2.1/GSv2.1\\_Requirements.pdf](http://www.cdmgoldstandard.org/fileadmin/editors/files/6_GS_technical_docs/GSv2.1/GSv2.1_Requirements.pdf).

<sup>84</sup> KATHERINE HAMILTON ET AL., ECOSYSTEM MARKETPLACE & BLOOMBERG NEW ENERGY FINANCE, BUILDING BRIDGES: STATE OF THE VOLUNTARY CARBON MARKETS 2010, at 68 (2010), [http://moderncms.ecosystemmarketplace.com/repository/moderncms\\_documents/vcarbon\\_2010.2.pdf](http://moderncms.ecosystemmarketplace.com/repository/moderncms_documents/vcarbon_2010.2.pdf).

<sup>85</sup> See THE GOLD STANDARD FOUND., TERMS AND CONDITIONS 4 (2009), [http://www.cdmgoldstandard.org/fileadmin/editors/files/5\\_GS\\_legal-documents/GS\\_Terms-and-Conditions.pdf](http://www.cdmgoldstandard.org/fileadmin/editors/files/5_GS_legal-documents/GS_Terms-and-Conditions.pdf).

<sup>86</sup> *Id.* at 10.

<sup>87</sup> Peggy Rodgers Kalas & Alexia Herwig, *Dispute Resolution Under the Kyoto Protocol*, 27 ECOLOGY L.Q. 53, 110-12 (2000) (assessing potential disputes under the Clean Development Mechanism).

<sup>88</sup> *Id.* at 111.

<sup>89</sup> *Id.*

<sup>90</sup> *Id.*

<sup>91</sup> *Id.*

<sup>92</sup> See United Nations Framework Convention on Climate Change Subsidiary Body for Implementation, Twenty-sixth session, May 7-18, 2007, *Views on Privileges and Immunities for Individuals Serving on Constituted Bodies Established Under the Kyoto Protocol*, U.N. Doc. FCCC/SBI/2007/MISC.4 (Mar. 16, 2007), <http://unfccc.int/resource/docs/2007/sbi/eng/misc04.pdf> (providing text of recommendations from Brazil, the European Union, and Switzerland regarding the privileges and immunities of Executive Board members to the Clean Development Mechanism).

<sup>93</sup> *Id.* at 88, 103-05.

<sup>94</sup> The International Centre for the Settlement of Investment Disputes is one such example. See generally INT'L CTR. FOR THE SETTLEMENT OF INV. DISPUTES, <http://icsid.worldbank.org/ICSID/Index.jsp>; see *id.* at 103-05 (discussing the advantages and disadvantages of private arbitration under the Kyoto Protocol).

<sup>95</sup> *Id.*

<sup>96</sup> *Id.*

<sup>97</sup> *Id.* (recommending an internal dispute mechanism as the most appropriate forum for resolving certain disputes under the Kyoto Protocol).

<sup>98</sup> Streck & Lin, *supra* note 65, at 410.

<sup>99</sup> See KOSOV & AMBROSSI, *supra* note 25, at 48 (summarizing issues facing the CDM market).

<sup>100</sup> See Streck & Lin, *supra* note 67, at 410-11.

<sup>101</sup> See *id.* at 411.

<sup>102</sup> See *id.* at 410-11.

<sup>103</sup> See *Procedures for Appeals*, *supra* note 4.

<sup>104</sup> VCS Program Guidelines, *supra* note 32, at 10; VOLUNTARY CARBON STANDARD, *supra* note 71, at 10, 22. Also explaining that appeals for "micro-projects" will be governed by the International Standards Organisation.

<sup>105</sup> See *Registration Deed of Representation*, VERIFIED CARBON STANDARD, <http://www.v-c-s.org/policydocs.html> (last visited Jan. 8, 2011).

<sup>106</sup> VCS Program Guidelines, *supra* note 32, at 10.

<sup>107</sup> *Id.* at 7, 10. The VCS Association is a nonprofit organization under Swiss law that legally represents the VCS Secretariat and Board. The VCS Association is managed by the VCS Program, which has its own Secretariat that is "responsible [sic] for responding to stakeholder queries, liaising with the media, entering into contracts, managing relationships with VCS Registry operators and accreditation bodies . . ."

<sup>108</sup> *Id.* at 10.

<sup>109</sup> CLIMATE ACTION RESERVE, *supra* note 78, at 52-53.

<sup>110</sup> *Id.* at 52.

<sup>111</sup> *Id.* (stating that the committee must also contain at least two management level staff members).

<sup>112</sup> *Id.*

<sup>113</sup> *Id.* at 53.

<sup>114</sup> *Id.*

<sup>115</sup> *Id.*

<sup>116</sup> *Id.*

<sup>117</sup> AM. CARBON REGISTRY, *supra* note 40, at 6.

<sup>118</sup> See Press Release, The Gold Standard Found., The Gold Standard Foundation Releases Proposed Appeals Procedure (July 19, 2010), <http://www.cdm-goldstandard.org/Detail-Page.109+M50fbfb5c6e7.0.html>.

<sup>119</sup> *Id.*

<sup>120</sup> *Id.*

<sup>121</sup> See THE GOLD STANDARD FOUND., RULES FOR APPEALS ON REGISTRATION, ISSUANCE AND LABELING 4 (2010), [http://www.cdmgoldstandard.org/fileadmin/editors/files/5\\_GS\\_legal-documents/DRAFT\\_GS\\_Rules\\_for\\_Appeals.pdf](http://www.cdmgoldstandard.org/fileadmin/editors/files/5_GS_legal-documents/DRAFT_GS_Rules_for_Appeals.pdf).

<sup>122</sup> See Natalie L. Bridgeman & David B. Hunter, *Narrowing the Accountability Gap: Toward a New Foreign Investor Accountability Mechanism*, 20 GEO. INT'L ENVTL. L. REV. 187, 216 (2008).

<sup>123</sup> Press Release, *supra* note 118.

<sup>124</sup> See THE GOLD STANDARD FOUND., *supra* note 121, at 4.

<sup>125</sup> *Id.* at 28-29.

<sup>126</sup> *Id.*; John E. Noyes, *Association of American Law Schools Panel on the International Criminal Court*, 36 AM. CRIM. L. REV. 223, 225 (1999). The Permanent Court of Arbitration (PCA) was established during the 1899 Hague Convention on the Pacific Settlement of International Disputes as "an arrangement involving a list of qualified arbitrators, an administrative structure, and rules of procedure." See *History*, PERMANENT COURT OF ARBITRATION, [http://www.pca-cpa.org/showpage.asp?pag\\_id=1044](http://www.pca-cpa.org/showpage.asp?pag_id=1044) (last visited Dec. 21, 2010). The 1899 Convention was revised in 1907 at the Second Hague Peace Conference. Though considered a precursor to other International Courts such as the Permanent Court of International Justice and the International Court of Justice, the PCA has evolved into a "multi-faceted arbitral institution . . . situated at the juncture between public and private international law . . . Today the PCA provides services for the resolution of disputes involving various combinations of states, state entities, intergovernmental organizations, and private parties."

<sup>127</sup> See THE GOLD STANDARD FOUND., *supra* note 121 at 8-12.

<sup>128</sup> *Id.*

<sup>129</sup> *Id.* at 14, 19.

<sup>130</sup> *Id.* at 20-22.

<sup>131</sup> *Id.*

<sup>132</sup> *Id.*

111th Cong. (2009), <http://www.govtrack.us/congress/bill.xpd?bill=s111-2729>; American Clean Energy Leadership Act of 2009, S. 1462, 111th Cong. (2009), <http://www.govtrack.us/congress/bill.xpd?bill=s111-1462>; American Clean Energy and Security Act of 2009, H.R. 2454, 111th Cong. (2009), <http://www.govtrack.us/congress/billtext.xpd?bill=h111-2454>; see also NICOLA DURRANT, LEGAL RESPONSES TO CLIMATE CHANGE (2010). But see *America, China and Climate Change: Let's Agree to Agree*, ECONOMIST (Nov. 21, 2009), [http://www.economist.com/displayStory.cfm?story\\_id=14915108](http://www.economist.com/displayStory.cfm?story_id=14915108) (arguing that the U.S. Senate was not the only party to blame; the negotiations leading up to Copenhagen sabotaged it by increasing the number of things on the table for discussion).

<sup>8</sup> Other jurisdictions, such as Australia, are currently embroiled in their own attempts to enact climate change legislation, see, e.g., Carbon Pollution Reduction Scheme Bill 2009 [No. 2], Oct. 29, 2009, ISSN 1328-8091 (Austl.), and a suite of complementary legislative enactments (noting that they were all defeated in the Australian Senate on December 2, 2009).

<sup>9</sup> But see Gerald Trautetter, *The US and China Joined Forces Against Europe*, SPIEGEL ONLINE (Dec. 8, 2010) (citing cables that the United States and China worked together to prevent any binding agreement at Copenhagen); *The Road from Copenhagen: The Experts' View*, NATURE REPORTS CLIMATE CHANGE (Jan. 28, 2010), <http://www.nature.com/climate/2010/1002/full/climate.2010.09.html> (noting that the outcome of the Copenhagen climate summit was merely an agreement to meet again in twelve months in Mexico); Scott Barrett, *How to Prevent Climate Change Summit from Failure*, YALEGLOBAL (May 1, 2009), <http://yaleglobal.yale.edu/content/prevent-climate-change> (recommending the United States to negotiate a skeleton agreement that lays a foundation to allow for improvements over time).

<sup>10</sup> See Stefan Theil, *A Green Retreat: Why the Environment is No Longer a Surefire Political Winner*, NEWSWEEK (July 12, 2010), <http://www.newsweek.com/2010/07/12/a-green-retreat.html> (discussing the climate politics that have slowed the movement towards meeting environmental goals); *Climate-change Policy: Let it Be*, ECONOMIST (July 29, 2010), <http://www.economist.com/node/16693691> (noting that although President Obama instructed lawmakers to "tackle our addiction to fossil fuels," the energy bill unveiled on July 27, 2010 did not further that initiative); see also *America's Climate Policy: Capped*, ECONOMIST (July 31, 2010), <http://www.economist.com/node/16693293> (stating that although the Senate's retreat from cap-and-trade may lead to a carbon tax, it currently leaves "a dreadful mess"); *Carbon Pollution Reduction Scheme*, AUSTRAL. GOV'T DEP'T OF CLIMATE CHANGE & ENERGY EFFICIENCY (May 5, 2010), <http://www.climatechange.gov.au/media/whats-new/cprs-delayed.aspx> (reporting that the Prime Minister decided to delay the implementation of the Carbon Pollution Reduction Scheme due to the lack of bipartisan support and slower process on global action on climate change); *Rudd Delays Carbon Scheme Until 2012*, SYDNEY MORNING HERALD (Apr. 27, 2010), <http://www.smh.com.au/business/rudd-delays-carbon-scheme-until-2012-20100427-tp29.html?comments=41> (noting that the Senate is seven votes short of passing the carbon pollution reduction scheme).

<sup>11</sup> See *Leaders: Cooling the Earth*, ECONOMIST: THE WORLD IN 2011 (Nov. 22, 2010), <http://www.economist.com/node/17492961> (arguing for the broadening of the climate change approach and for climate-ready development, even if it is not climate-proof); *Carbon Pollution Reduction Scheme*, AUSTRAL. GOV'T DEP'T OF CLIMATE CHANGE & ENERGY EFFICIENCY (May 5, 2010), <http://www.climatechange.gov.au/media/whats-new/cprs-delayed.aspx>; COP 16: *Cancun—Corporate and Complicit*, THE LAZY ENVIRONMENTALIST (Dec. 18, 2010), <http://thelazyenvironmentalist.blogspot.com/2010/12/cop-16-cancun-corporate-and-complicit.html> (arguing that the United Nations is no longer protecting the interests of its people or the planet).

<sup>12</sup> COP 16 / CMP 6, *supra* note 6.

<sup>13</sup> Indeed, the recently concluded U.N. Climate Change Talks held in Cancún, Mexico accept the inevitability of international and domestic failure to mitigate anthropogenic climate change by adopting a number of mechanisms aimed at adaptation to the effects of such climate change. See *id.*; Press Release, UN Climate Change Conference in Cancún Delivers Balanced Package of Decisions, Restores Faith in Multilateral Process, U.N. Press Release (Dec. 11, 2010), [http://unfccc.int/files/press/news\\_room/press\\_releases\\_and\\_advisories/application/pdf/pr\\_20101211\\_cop16\\_closing.pdf](http://unfccc.int/files/press/news_room/press_releases_and_advisories/application/pdf/pr_20101211_cop16_closing.pdf) (detailing the components of the Cancún Agreements).

<sup>14</sup> See *Climate Change*, GALLUP (last visited Feb. 3, 2011), <http://www.gallup.com/tag/Climate%2bChange.aspx> (providing synopses of current public perceptions of climate change, biodiversity, clean water, and air quality).

<sup>15</sup> Bjørn Lomborg, <http://www.lomborg.com> (last visited Feb. 4, 2011).

<sup>16</sup> LOMBORG, *supra* note 6, at 1.

<sup>17</sup> See Alan Ryan, *Self-Ownership, Autonomy and Property Rights*, 11 SOC. PHIL. & POL'Y 241-58 (1994) (discussing the different theories of self-ownership); Gerald Gaus, *Property and Ownership*, in OXFORD HANDBOOK OF POLITICAL PHILOSOPHY 1-4 (David Estlund ed., forthcoming Mar. 2011), <http://www.gaus.biz/PropertyOwnership.pdf> (last visited Feb. 4, 2011) (noting that the liberal theory "stresse[s] an intimate connection between a free society and the right to private property"); Joseph William Singer, *How Property Norms Construct the Externalities of Ownership*, in PROPERTY AND COMMUNITY 57, 66-70 (Gregory S. Alexander & Eduardo M. Peñalver eds., 2010) (stating that norms, or what Charles Taylor calls "social imaginaries," shape one's understanding of legal institutions including private property).

<sup>18</sup> See MICHAEL J. SANDEL, LIBERALISM AND ITS CRITICS 1 (1984) (discussing different arguments concerning the freedom of choice and the weight of values, such as toleration, freedom, and fairness, in making decisions); J.W. HARRIS, LEGAL PHILOSOPHIES 277-300 (2nd ed. 2004).

<sup>19</sup> See JOSEPH WILLIAM SINGER, INTRODUCTION TO PROPERTY 2 (2nd ed. 2005); JEREMY WALDRON, THE RIGHT TO PRIVATE PROPERTY (1988); STEPHEN R. MUNZER, A THEORY OF PROPERTY (1990).

<sup>20</sup> See SINGER, *supra* note 19, at 2.

<sup>21</sup> MARGARET JANE RADIN, REINTERPRETING PROPERTY 121-23 (1993). This builds, of course, upon the groundbreaking work of Anthony M. Honoré, *Ownership*, in, OXFORD ESSAYS IN JURISPRUDENCE 107 (A.G. Guest ed., 1961), who identified eleven 'standard incidents' of ownership.

<sup>22</sup> This begins with John Stuart Mill's "self-regarding act." JOHN STUART MILL, ON LIBERTY (Gertrude Himmelfarb ed., 1974 (1859)); see also Singer, *supra* note 17 (outlining how property norms assist in determining the difference between a truly self-regarding act and one that is not); MUNZER, *supra* note 19, at 3-9 (arguing for a pluralist approach to property).

<sup>23</sup> See generally WESLEY NEWCOMB HOHFELD, FUNDAMENTAL LEGAL CONCEPTIONS AS APPLIED IN JUDICIAL REASONING: AND OTHER LEGAL ESSAYS (Walter W. Cook ed., 1919), [http://www.archive.org/stream/fundamentallegal00hohfuoft/fundamentallegal00hohfuoft\\_djvu.txt](http://www.archive.org/stream/fundamentallegal00hohfuoft/fundamentallegal00hohfuoft_djvu.txt) (providing the journal articles in published book format); Wesley Newcomb Hohfeld, *Some Fundamental Legal Conceptions as Applied in Judicial Reasoning*, 26 YALE L.J. 710 (1917) (continuing the earlier discussion of basic legal concepts).

<sup>24</sup> C. Edwin Baker, *Property and its Relation to Constitutionally Protected Liberty*, 134 U. PA. L. REV. 741, 742-43 (1986) (emphasis added).

<sup>25</sup> See Morris R. Cohen, *Property and Sovereignty*, 13 CORNELL L.Q. 8, 13 (1927).

<sup>26</sup> See ROBERTO M. UNGER, THE CRITICAL LEGAL STUDIES MOVEMENT 36 (1986).

<sup>27</sup> Cf. Singer, *supra* note 17, at 59 (juxtaposing the castle or ownership conception of property with the environmental or good neighbor conception).

<sup>28</sup> UNGER, *supra* note 26, at 37-38.

<sup>29</sup> *Id.* at 38.

<sup>30</sup> Singer, *supra* note 17, at 60-61.

<sup>31</sup> See JOSEPH WILLIAM SINGER, ENTITLEMENT: THE PARADOXES OF PROPERTY 204 (2000).

<sup>32</sup> DUNCAN KENNEDY, SEXY DRESSING ETC. 90-91 (1993) (emphasis in original).

<sup>33</sup> *Id.* at 91 (internal quotations omitted).

<sup>34</sup> *Id.* (emphasis in the original, footnotes removed).

<sup>35</sup> I am most grateful to Joseph William Singer for bringing this crucial point to my attention. See also PROPERTY AND COMMUNITY (Gregory S. Alexander & Eduardo M. Peñalver eds., 2010), and the essays collected therein.

<sup>36</sup> For additional information on social-legal relationships, see WILLIAM TWINING, GENERAL JURISPRUDENCE: UNDERSTANDING LAW FROM A GLOBAL PERSPECTIVE 1-7 (2009), [http://www.ucl.ac.uk/laws/academics/profiles/twining/gen\\_juris.pdf](http://www.ucl.ac.uk/laws/academics/profiles/twining/gen_juris.pdf).

<sup>37</sup> See Steve Loneragan, *The Human Challenges of Climate Change*, in HARD CHOICES: CLIMATE CHANGE IN CANADA 45 (Harold Coward & Andrew J. Weaver eds., 2004) (arguing that changing land use and increased fossil fuel consumption are primary contributors to GHG).

<sup>38</sup> *Id.* at 51-53.

<sup>39</sup> See Jedediah Purdy, *Climate Change and the Limits of the Possible*, 18 DUKE ENVTL. L. & POL'Y F. 289 (2008).

<sup>40</sup> Cf. Loneragan, *supra* note 37, at 50 (noting that it will be necessary "to find a way to maintain a reasonable level of global economic output while reducing our level of fossil-fuel energy consumption").



<sup>41</sup> However, alternative sources of energy such as solar panels are available to households.

<sup>42</sup> IPCC, 2007: *Summary for Policymakers*, in CLIMATE CHANGE 2007: IMPACTS, ADAPTATION AND VULNERABILITY CONTRIBUTION OF WORKING GROUP II TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 7, 7 (Martin Parry et al. eds., 2007), <http://www.ipcc.ch/pdf/assessment-report/ar4/wg2/ar4-wg2-spm.pdf>.

<sup>43</sup> JEDEDIAH PURDY, A TOLERABLE ANARCHY: REBELS, REACTIONARIES, AND THE MAKING OF AMERICAN FREEDOM 187 (Alfred A. Knopf ed., 2009).

<sup>44</sup> See Lonergan, *supra* note 37, at 51 (arguing that climate change results in “environmental refugees”).

<sup>45</sup> *Id.*

<sup>46</sup> *Id.*

<sup>47</sup> MIKE HULME, WHY WE DISAGREE ABOUT CLIMATE CHANGE: UNDERSTANDING CONTROVERSY, INACTION AND OPPORTUNITY 362 (2009).

<sup>48</sup> See generally JAMES HANSEN, STORMS OF MY GRANDCHILDREN: THE TRUTH ABOUT THE COMING CLIMATE CATASTROPHE AND OUR LAST CHANCE TO SAVE HUMANITY (2009).

## ENDNOTES: IS REDD ACCOUNTING MYOPIC? *continued from page 31*

<sup>10</sup> See generally UN-REDD PROGRAMME, <http://www.un-redd.org> (last visited Jan. 3, 2011).

<sup>11</sup> About REDD+, UN-REDD PROGRAMME, <http://www.un-redd.org/AboutREDD/tabid/582/Default.aspx> (last visited on Dec. 30, 2010).

<sup>12</sup> MILLER, *supra* note 9.

<sup>13</sup> *Market Failures and Externalities*, BASIC ECONOMICS, <http://www.basiceconomics.info/market-failures-and-externalities.php> (last visited Feb. 10, 2011) (defining an externality, which can either be positive or negative, as the action of one economic agent impacting another economic agent not directly involved, such as pollution, which is as an example of a negative externality); Franz Gatzweiler, *Economic Values, Institutions and Ecosystems—The Shift from Natural to Social Value and Why Culture Matters* (2003) (unpublished manuscript), [http://www.indiana.edu/~workshop/colloquia/materials/papers/gatzweiler\\_paper.pdf](http://www.indiana.edu/~workshop/colloquia/materials/papers/gatzweiler_paper.pdf) (explaining the issues of applying market based valuation techniques to ecosystems).

<sup>14</sup> See *Environmental Pricing Reform*, EIONET—THE EUROPEAN TOPIC CTR. ON SUSTAINABLE CONSUMPTION & PRODUCTION, <http://scp.eionet.europa.eu/definitions/Environmental%20pricing%20reform> (last updated Dec. 8, 2009) (defining environmental pricing reform (“EPR”) as “the process of adjusting market prices to include environmental costs and benefits”).

<sup>15</sup> Crystal Davis, *Protecting Forests to Save the Climate: REDD Challenges and Opportunities*, WORLD RESOURCES INST. (Apr. 23, 2008, 3:12 PM), <http://earthtrends.wri.org/updates/node/303>.

<sup>16</sup> See David Pimentel et al., *Environmental and Economic Cost of Soil Erosion and Conservation Benefits*, 267 SCIENCE 1117, 1117 (1995), <http://www.sciencemag.org/content/267/5201/1117.abstract> (explaining how forests mitigate soil erosion); MICHAEL T. COE ET AL., ECOLOGICAL CO-BENEFITS: PAN-AMAZON DEFORESTATION, REGIONAL CLIMATE, AND WATER RESOURCES, THE WOODS HOLE RESEARCH CENTER 1 (2009), [http://www.whrc.org/policy/pdf/cop15/Coe\\_A80.pdf](http://www.whrc.org/policy/pdf/cop15/Coe_A80.pdf) (describing how a forest requires more water than the flora that replaces it and thus the water cycle decreases); Rebecca Lindsey, *Tropical Deforestation*, EARTH OBSERVATORY (2007), <http://earthobservatory.nasa.gov/Features/Deforestation/> (noting that although forests cover roughly seven percent of the Earth’s dry land, they may contain half of the species on Earth).

<sup>17</sup> See, e.g., Pimentel et al., *supra* note 16; COE ET AL., *supra* note 16; Lindsey, *supra* note 16 (illustrating how the current REDD program does not recognize soil formation, water cycle storage and release, biodiversity conservation, or nutrient recycling).

<sup>18</sup> See Lynn Scarlett, *Cleaner, Safer, Cheaper*, 27 ENV’T L. FORUM 34 (2010) (“the City of New York invested over \$1.5 billion to protect and restore the Catskill Mountain watershed to sustain the city’s water quality, rather than spending up to \$9 billion on filtration plants”).

<sup>19</sup> See José Maria Cardoso Da Silva et al., *The Fate of the Amazonian Areas of Endemism*, 19 CONSERVATION BIOLOGY 689, 690 (2005) (“Amazonia is the largest and most diverse of the tropical forest wilderness areas . . . recent compilations indicate at least 40,000 plant species, 427 mammals, 1,294 birds, 378 reptiles, 427 amphibians, and around 3,000 fishes.”).

<sup>20</sup> See COMM’N ON GENETIC RES. FOR FOOD & AGRIC., FOOD & AGRICULTURE ORG. OF THE UNITED NATIONS, FOREST GENETIC RESOURCES—BRINGING SOLUTIONS TO SUSTAINABLE FOREST MANAGEMENT (2009), <http://www.fao.org/docrep/012/al387e/al387e00.pdf> (“[T]he vast majority of forest genetic diversity remains unknown, especially in tropical forests. Estimates of the number of tree species vary from 80,000 to 100,000, yet fewer than 500 have been studied in any depth for their present and future potential.”).

<sup>21</sup> Pimentel et al., *supra* note 16, at 1119.

<sup>22</sup> See *id.* at 1118; Peter M. Vitousek, *Nutrient Cycling in Moist Tropical Forest*, 17 ANN. REV. OF ECOLOGY & SYSTEMATICS, 137, 160 (1986), <http://www.jstor.org/stable/pdfplus/2096992.pdf> (noting that “[m]oderately fertile soils support productive forests that cycle large quantities of nutrient elements”).

<sup>23</sup> The International Union for Conservation of Nature, *Forest Environmental Services*, THE ENCYCLOPEDIA OF EARTH (Aug. 22, 2008, 3:09 AM), [http://www.eoearth.org/article/Forest\\_environmental\\_services](http://www.eoearth.org/article/Forest_environmental_services).

<sup>24</sup> *Id.*

<sup>25</sup> See *id.* (providing different policy recommendations and concerns).

<sup>26</sup> See *id.* (concluding that REDD’s negative externalities—including threats to soil formation, water cycle storage and release, biodiversity conservation, and nutrient recycling—must be internalized).

<sup>27</sup> See JAMES LOVELOCK, GAIA: A NEW LOOK AT LIFE ON EARTH 10 (2000) (defining homeostasis (Gaia hypothesis) as, “a complex entity involving the Earth’s biosphere, atmosphere, oceans, and soil; the totality constituting a feedback or cybernetic system which seeks an optimal physical and chemical environment for life on this planet”).

<sup>28</sup> *Market Failures and Externalities*, *supra* note 13.

<sup>29</sup> *Environmental Pricing Reform*, *supra* note 14. Sven Wunder, Principal Scientist, Forests and Livelihoods Program at the Center for International Forestry Research (“CIFOR”), has put forward a widely accepted definition for PES. See, e.g., Douglas Southgate & Sven Wunder, *Paying for Watershed Services in Latin America: A Review of Current Initiatives*, 28 J. OF SUSTAINABLE FORESTRY 497, 498 (2009) (describing PES in terms of five characteristics: “[1.] There is a well-defined environmental service (e.g., specific changes in peak- or dry-season stream flow at the outlet of a watershed) or a suitable proxy for this service (e.g., [hectares] reforested). [2.] There is at least one buyer of this service or proxy. [3.] There is at least one seller as well. [4.] Transactions between buyer(s) and seller(s) are voluntary. [5.] Payments are conditional on contracted environmental services or proxies for same actually being supplied.”).

<sup>30</sup> See generally Southgate & Wunder, *supra* note 29, at 497.

<sup>31</sup> About REDD+, *supra* note 11.

<sup>32</sup> Lindsey, *supra* note 16.

<sup>33</sup> FOREST TRENDS, THE KATOOMBA GROUP, & UNEP, PAYMENTS FOR ECOSYSTEM SERVICES: GETTING STARTED A PRIMER 3 (2008), <http://www.katoombagroup.org/documents/publications/GettingStarted.pdf>.

<sup>34</sup> See *id.*

<sup>35</sup> *Id.*

<sup>36</sup> See *id.*

<sup>37</sup> See GLOBAL FOREST RESOURCES ASSESSMENT, FOOD & AGRIC. ORG. OF THE UNITED NATIONS 19 (2005), <ftp://ftp.fao.org/docrep/fao/008/A0400E/A0400E00.pdf>.

<sup>38</sup> See *The World Factbook: Greece*, CENT. INTELLIGENCE AGENCY, <https://www.cia.gov/library/publications/the-world-factbook/geos/gr.html> (last visited Nov. 5, 2010).

<sup>39</sup> See *State & County QuickFacts of New York*, U.S. CENSUS BUREAU, <http://quickfacts.census.gov/qfd/states/36000.html> (last updated Nov. 4, 2010).

<sup>40</sup> See GERT JAN NABUURS ET AL., FORESTRY IN CLIMATE CHANGE 2007: MITIGATION, IPCC FOURTH ASSESSMENT REPORT 546 (2007), <http://www.ipcc.ch/pdf/assessment-report/ar4/wg3/ar4-wg3-chapter9.pdf>.

<sup>41</sup> See About REDD+, *supra* note 11.

<sup>42</sup> See CHARLIE PARKER ET AL., THE LITTLE REDD+ BOOK, LIST OF PROPOSALS 1 (2009), [http://www.globalcanopy.org/themedia/file/PDFs/LRB\\_lowres/lrb\\_en.pdf](http://www.globalcanopy.org/themedia/file/PDFs/LRB_lowres/lrb_en.pdf) (providing a list—Countries: Alliance of Small Island States (AOSIS); Australia; Brazil; Canada; Coalition for Rainforest Nations (CfRN); China; Colombia; Central African Forest Commission (COMIFAC); European Union (EU); India; Indonesia; Japan; Malaysia; Mexico; New Zealand; Norway; Panama; Tuvalu; USA; and Organizations: CATIE (Nested Approach); CCAP (Dual Markets); CSERGE (Combined Incentives); EDF & IPAM & ISA (Compensated Reductions); Greenpeace (TDERM); HSI (Carbon Stores); IDDRI & CERDI (Compensated Successful Efforts); IIASA Avoiding REDD Hot Air; Joanneum Research (Corridor Approach); JRC (Incentive Accounting); TCG

(Terrestrial Carbon); TNC (Integrated Incentives); WHRC (Stock-Flow with Targets)).

<sup>43</sup> See *id.* at 20.

<sup>44</sup> See *id.* at 26-27.

<sup>45</sup> See Kyoto Protocol to the United Nations Framework Convention on Climate Change, Annex A, Dec. 10, 1997, 37 I.L.M. 22 [hereinafter Kyoto Protocol] <http://unfccc.int/resource/docs/convkp/kpeng.pdf>.

<sup>46</sup> See *id.* at art. 3(3) (“The net changes in greenhouse gas emissions by sources and removals by sinks resulting from direct human-induced land-use change and forestry activities, limited to afforestation, reforestation and deforestation . . .”).

<sup>47</sup> See *id.* at art. 3(4) (“The Conference of the Parties serving as the meeting of the Parties to this Protocol shall, at its first session or as soon as practicable thereafter, decide upon modalities, rules and guidelines as to how, and which, additional human-induced activities related to changes in greenhouse gas emissions by sources and removals by sinks in the agricultural soils and the land-use change and forestry categories shall be added to, or subtracted from, the assigned amounts for Parties included in Annex I . . .”).

<sup>48</sup> See Conference of the Parties to the Kyoto Protocol, Buenos Aires, Arg., Nov. 2-14, 1998, Report of the Conference of the Parties on its Fourth Session, Decision 9/CP.4, U.N. Doc FCCC/CP/1998/16/Add.1 (Jan. 25, 1999), <http://unfccc.int/resource/docs/cop4/16a01.pdf> (addressing LULUCF specifically).

<sup>49</sup> See Conference of the Parties to the Kyoto Protocol, The Hague, Neth., Nov. 13-25, 2000, Report of the Conference of the Parties on the First Part of its Sixth Session, Decision 1/CP.6 Annex, Note by the President of the Conference of the Parties at its sixth session, Box C, U.N. Doc FCCC/CP/2000/5/Add.2 (Apr. 4, 2001) [hereinafter COP-6], <http://unfccc.int/resource/docs/cop6/05a02.pdf> (“Parties decide that for defining afforestation, reforestation and deforestation [forestry activities] the set of IPCC definitions shall be applied.”).

<sup>50</sup> See *id.* at Decision 1/CP.6 Box C. Land-use, Land-use change and forestry (“Parties agree that for the implementation of Article 3.3 [of the Kyoto Protocol], ‘forest’ is defined in accordance with the FAO definition.”); see also *The Forest Resources Assessment Programme*, FOOD & AGRIC. ORG. OF THE UNITED NATIONS, <http://www.fao.org/docrep/007/ae217e/ae217e00.htm> (last visited Feb. 3, 2010) (defining forests as “Land with tree crown cover (or equivalent stocking level) of more than 10 percent and area of more than 0.5 hectares (ha). The trees should be able to reach a minimum height of 5 meters (m) at maturity in situ. May consist either of closed forest formations where trees of various stories and undergrowth cover a high proportion of the ground; or open forest formations with a continuous vegetation cover in which tree crown cover exceeds 10 percent. Young natural stands and all plantations established for forestry purposes which have yet to reach a crown density of 10 percent or tree height of 5 m are included under forest, as are areas normally forming part of the forest area which are temporarily unstocked as a result of human intervention or natural causes but which are expected to revert to forest.”).

<sup>51</sup> See Conference of the Parties to the Kyoto Protocol, Marrakesh, Morocco, Oct. 29-Nov. 10, 2001, Report of the Conference of the Parties on its Seventh Session, Decision 11/CP.7 Annex, P 1(b)-(c), U.N. Doc FCCC/CP/2001/13/Add.1 (Jan. 21, 2002) [hereinafter COP-7 Report-Part Two (Volume I)] <http://unfccc.int/resource/docs/cop7/13a01.pdf>; see also Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol, Montreal, Can., Nov. 28-Dec. 10, 2005, Report of the Conference of the Parties Serving as the Meeting of the Parties to the Kyoto Protocol on its First Session, Decision 16/CMP.1 Annex, P 6, U.N. Doc FCCC/KP/CMP/2005/8/Add.3 (Mar. 30, 2006) [hereinafter COP/MOP-1 Report-Part Two] <http://unfccc.int/resource/docs/2005/cmp1/eng/08a03.pdf>.

<sup>52</sup> Conference of the Parties to the Kyoto Protocol, Bali, Indon., Dec. 3-15, 2007, Report of the Conference of the Parties on its Thirteenth Session, Decision 2/CP.13, U.N. Doc. FCCC/CP/2007/6/Add.1 (Mar. 14, 2008) [hereinafter COP-13 Addendum-Two] <http://unfccc.int/resource/docs/2007/cop13/eng/06a01.pdf>.

<sup>53</sup> See *id.* at 1/CP.13 1(b)(iii).

<sup>54</sup> See John M. Broder & Elisabeth Rosenthal, *U.N. Official Says Climate Deal is at Risk*, N.Y. TIMES (Jan. 20, 2010), <http://www.nytimes.com/2010/01/21/science/earth/21climate.html>.

<sup>55</sup> United Nations Framework Convention on Climate Change, 15th Conference of the Parties, Copenhagen, Den., Dec. 7-19, 2009, *Copenhagen Accord*, 2/CP.15.6, in *Addendum, Part Two: Action Taken*, U.N. Doc. FCCC/CP/2009/11/Add.1 (Mar. 30, 2010) [hereinafter COP-15 Addendum-Two] <http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf>.

<sup>56</sup> The Copenhagen Accord also provided “new and additional resources . . . approaching USD 30 billion” during 2010 to 2012 on climate change mitigation approaches including REDD+ programs. See COP-15 Addendum-Two, *supra* note 55, at 2/CP.15.6, 2/CP.15.8. During COP-15, REDD was discussed in two bodies, SBSTA-31 and AWG-LCA-8. The REDD text recognized by the Copenhagen Accord was from the SBSTA-31, which produced draft text on the methodological issues of REDD. However, the Copenhagen Accord did not include the AWG-LCA-8 draft text on policy approaches and positive incentives of REDD. See, e.g., United Nations Framework Convention on Climate Change, 15th Conference of the Parties, Copenhagen, Den., Dec. 7-19, 2009, *Methodological Guidance for Activities Relating to Reducing Emissions from Deforestation and Forest Degradation and the Role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks in Developing Countries, Subsidiary Body for Scientific and Technological Advice*, Draft decision -/CP.15 (Advanced unedited version), [http://unfccc.int/files/na/application/pdf/cop15\\_ddc\\_auf.pdf](http://unfccc.int/files/na/application/pdf/cop15_ddc_auf.pdf) (illustrating the SBSTA draft text that would be incorporated into the Copenhagen Accord); United Nations Framework Convention on Climate Change, 15th Conference of the Parties, Copenhagen, Den., Dec. 7-19, 2009, *Policy Approaches and Positive Incentives on Issues Relating to Reducing Emissions from Deforestation and Forest Degradation in Developing Countries; and the Role of Conservation, Sustainable Management of Forests and Enhancement of Forest Carbon Stocks in Developing Countries, Ad Hoc Working Group On Long-Term Cooperative Action Under The Convention, Eighth session*, Draft decision -/CP.15, U.N. Doc. FCCC/AWG/LCA/2009/L.7/Add.6 (Dec. 15, 2009) <http://unfccc.int/resource/docs/2009/awglca/eng/07a06.pdf> (illustrating the deficiencies in the AWG-LCA, which does not implement (1) target measures to stop deforestation, (2) long-term finance commitments, (3) strong safeguards, (4) strong mitigation tools to prevent leakage, or (5) discuss free, prior and informed consent by indigenous peoples); COP-15 Addendum-Two, *supra* note 55 (illustrating the incorporation of the SBSTA draft text but lack of incorporation of the AWG-LCA draft text into the Copenhagen Accord).

The concern over these deficiencies were reinforced when over twenty thousand people and one hundred twenty-five countries attended The World People’s Conference on Climate Change and the Rights of Mother Earth hosted by the government of Bolivia in April 2010. See Andres Schipani, *Evo Morales’ Message to Grassroots Climate Talks – Planet or Death*, GUARDIAN (Apr. 21, 2010, 16:19 BST), <http://www.guardian.co.uk/environment/2010/apr/21/evo-morales-grassroots-climate-talks>. The World People’s Conference voiced ardent concern over the developments occurring under the UNFCCC generally, the definition of forests, and the progression of the market based REDD program. See, e.g., World People’s Conference on Climate Change and the Rights of Mother Earth, Cochabamba, Bol., Apr. 22, 2010, Proposal Universal Declaration of the Rights of Mother Earth, art. 3(2)(i) (2010), <http://pwccc.wordpress.com/programa/> (“(2) Human beings, all States, and all public and private institutions must: (i) establish precautionary and restrictive measures to prevent human activities from causing species extinction, the destruction of ecosystems or the disruption of ecological cycles”); see also World People’s Conference on Climate Change and the Rights of Mother Earth, Cochabamba, Bol., Apr. 22, 2010, Peoples Agreement (2010) <http://pwccc.wordpress.com/support/> (“The definition of forests used in the negotiations of the United Nations Framework Convention on Climate Change, which includes plantations, is unacceptable. Monoculture plantations are not forests. Therefore, we require a definition for negotiation purposes that recognizes the native forests, jungles and the diverse ecosystems on Earth.” “We condemn market mechanisms such as REDD (Reducing Emissions from Deforestation and Forest Degradation) and its versions + and + +, which are violating the sovereignty of peoples and their right to prior free and informed consent as well as the sovereignty of national States, the customs of Peoples, and the Rights of Nature.”).

<sup>57</sup> See Conference of the Parties to the Kyoto Protocol, Advance Unedited Version, Draft decision -/CP.16 Outcome of the Work of the Ad Hoc Working Group on Long-Term Cooperative Action Under the Convention, III.C. [hereinafter COP-16 AWG-LCA] [http://unfccc.int/files/meetings/cop\\_16/application/pdf/cop16\\_1ca.pdf](http://unfccc.int/files/meetings/cop_16/application/pdf/cop16_1ca.pdf).

<sup>58</sup> *Id.*

<sup>59</sup> *Id.* at III.C.70.

<sup>60</sup> See *id.* at III.C.71(a).

<sup>61</sup> *Id.* at III.C.71(c).

<sup>62</sup> *Id.* at III.C.72.

<sup>63</sup> See *id.* at III.C.

<sup>64</sup> See RICHARD BETTS ET AL., FORESTS AND EMISSIONS: A CONTRIBUTION TO THE ELIASCH REVIEW 4 (2008) <http://www.ibcperu.org/doc/isis/11467.pdf> (indicating

that there are uncertainties in both the estimated rate of deforestation and with forest carbon stocks).

<sup>65</sup> See PARKER ET AL., *supra* note 42, at 21.

<sup>66</sup> See R. DEFRIES ET AL., TROPICAL DEFORESTATION AND CLIMATE CHANGE: CHAPTER THREE MONITORING TROPICAL DEFORESTATION FOR EMERGING CARBON MARKETS 35 (Paulo Moutinho & Stephan Schwartzman eds., 2005), [http://www.edf.org/documents/4930\\_TropicalDeforestation\\_and\\_ClimateChange.pdf](http://www.edf.org/documents/4930_TropicalDeforestation_and_ClimateChange.pdf).

<sup>67</sup> See U.S. GOV'T. ACCOUNTABILITY OFFICE, CARBON OFFSETS: THE U.S. VOLUNTARY MARKET IS GROWING, BUT QUALITY ASSURANCE POSES CHALLENGES FOR MARKET PARTICIPANTS 2-3 (2008), <http://www.gao.gov/new.items/d081048.pdf> (reviewing the issues of additional, measurement, verification, and permanence); see also JONATHAN L. RAMSEUR, CONG. RESEARCH SERV., CRS REPORT FOR CONGRESS—THE ROLE OF OFFSETS IN A GREENHOUSE GAS EMISSIONS CAP-AND-TRADE PROGRAM: POTENTIAL BENEFITS AND CONCERNS 21 (2008), <http://www.nationalaglawcenter.org/assets/crs/RL34436.pdf> (discussing the issue of leakage).

<sup>68</sup> See *id.*

<sup>69</sup> Jason Schwartz, Note, "Whose Woods These Are I Think I Know": How Kyoto May Change Who Controls Biodiversity, 14 N.Y.U. ENVTL. L.J. 421, 426 (2006).

<sup>70</sup> See PARKER ET AL., *supra* note 42, at 21.

<sup>71</sup> See *id.*

<sup>72</sup> See U.S. GOV'T. ACCOUNTABILITY OFFICE, *supra* note 67, at 6-7.

<sup>73</sup> NAT'L COMM'N ON ENERGY POLICY, BIPARTISAN POLICY CTR., FORGING THE CLIMATE CONSENSUS: DOMESTIC AND INTERNATIONAL OFFSETS 6 (2009), <http://www.bipartisanpolicy.org/sites/default/files/NCEP%20Domestic%20and%20International%20Offsetsformatted.pdf>.

<sup>74</sup> Kyoto Protocol, *supra* note 45, at art. 3(3).

<sup>75</sup> See generally *id.*

<sup>76</sup> See INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, IPCC SPECIAL REPORT: LAND USE, LAND-USE CHANGE, AND FORESTRY: SUMMARY FOR POLICYMAKERS, vii (2000), [hereinafter IPCC LULUCF SPECIAL REPORT] <http://www.ipcc.ch/pdf/special-reports/spm/srl-en.pdf>.

<sup>77</sup> *Id.* ¶ 16.

<sup>78</sup> See Conference of the Parties to the Kyoto Protocol, Ninth Session, Milan, Italy, Dec. 1-12, 2003, Report of the Conference of the Parties on its Ninth Session, ¶ 8, Decision 19/CP.9, U.N. Doc FCCC/CP/2003/6/Add.2 (Mar. 30, 2004) [hereinafter COP-9 Report, Part Two], <http://unfccc.int/resource/docs/cop9/06a02.pdf>.

<sup>79</sup> Till Neef et al., *Choosing a Forest Definition for the Clean Development Mechanism* 6-7 (Food & Agric. Org. of the United Nations, Forests and Climate Change Working Paper No. 4, 2006), <http://www.fao.org/forestry/11280-03f2112412b94f8ca5f9797c7558e9bc.pdf>.

<sup>80</sup> *Id.* at 3.

<sup>81</sup> See *id.* at 5-6 (noting the variances in forest definitions among countries).

<sup>82</sup> Kyoto Protocol, *supra* note 45, at art. 12.

<sup>83</sup> U.S. GOV'T. ACCOUNTABILITY OFFICE, *supra* note 67, at 35.

<sup>84</sup> OFFICE OF AIR AND RADIATION, U.S. ENVTL. PROT. AGENCY, TOOLS OF THE TRADE: A GUIDE TO DESIGNING AND OPERATING A CAP AND TRADE PROGRAM FOR POLLUTION CONTROL, Glossary-3 (2003), <http://www.epa.gov/airmarkt/resource/docs/tools.pdf>.

<sup>85</sup> RAMSEUR, *supra* note 67, at 21.

<sup>86</sup> OFFICE OF AIR AND RADIATION, *supra* note 84, at 3.

<sup>87</sup> See COP-9 Report, Part Two, *supra* note 78, at -/CMP.1 Annex A.1.(e) (defining leakage as "the increase in greenhouse gas emissions by sources which occurs outside the boundary of an afforestation or reforestation project activity under the CDM which is measurable and attributable to the afforestation or reforestation project activity").

<sup>88</sup> DEFRIES ET AL., *supra* note 66, at 35.

<sup>89</sup> *Carbon Sequestration in Agriculture and Forestry Frequent Questions*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/sequestration/faq.html> (last updated Jun. 22, 2010).

<sup>90</sup> *Id.*

<sup>91</sup> See *id.* (explaining how when trees reach maturity they are also saturated at which point the tree must be maintained to maintain the saturation and thus prevent the sequestered carbon from reentering the atmosphere).

<sup>92</sup> RAMSEUR, *supra* note 67, at 20.

<sup>93</sup> See Marcio Santilli et al., *Tropical Deforestation and the Kyoto Protocol: An Editorial Essay*, in TROPICAL DEFORESTATION AND CLIMATE CHANGE 47, 50 (Paulo Moutinho & Stephan Schwartzman eds., 2005).

<sup>94</sup> OFFICE OF AIR AND RADIATION, *supra* note 84, at 3.

<sup>95</sup> Roger A. Sedjo & Brent Sohngen, *Carbon Credits for Avoided Deforestation* 6 (Resources for the Future, Discussion Paper, 2007), <http://www.rff.org/rff/Documents/RFF-DP-07-47.pdf>.

<sup>96</sup> CONG. BUDGET OFFICE, THE POTENTIAL FOR CARBON SEQUESTRATION IN THE UNITED STATES 2 (2007), <http://www.cbo.gov/ftpdocs/86xx/doc8624/09-12-CarbonSequestration.pdf>.

<sup>97</sup> Kyoto Protocol, *supra* note 45, at art. 3(3), 3(4).

<sup>98</sup> COP-6, *supra* note 49. See also Lavanya Rajamani, *Re-Negotiating Kyoto: A Review of the Sixth Conference of the Parties to the Framework Convention on Climate Change*, 12 COLO. J. INT'L ENVTL. L. & POL'Y 201, 223 (2001) ("At COP-6, the Umbrella Group argued in favor of including additional activities in the first commitment period. However, the [Alliance of Small Island States] (AOSIS) and the European Union (EU) opposed it.").

<sup>99</sup> COP-7 Report—Part Two (Volume I), *supra* note 51.

<sup>100</sup> COP-13 Addendum-Two, *supra* note 52, at 2/CP.13.11.

<sup>101</sup> COP-15 Addendum-Two, *supra* note 55, at 4/CP.15.6.

<sup>102</sup> COP-16 AWG-LCA, *supra* note 57, at III.C.

<sup>103</sup> See COP-13 Addendum-Two, *supra* note 52, at 1/CP.13, ¶ 1(b)(iii) ("Policy approaches and positive incentives on issues relating to reducing emissions from deforestation and forest degradation in developing countries; and the role of conservation, sustainable management of forests and enhancement of forest carbon stocks in developing countries"); COP-15 Addendum-Two, *supra* note 55, at 4/CP.15 ("We recognize the crucial role of reducing emission from deforestation and forest degradation and the need to enhance removals of greenhouse gas emission by forests and agree on the need to provide positive incentives to such actions through the immediate establishment of a mechanism including REDD-plus, to enable the mobilization of financial resources from developed countries."); COP-16 AWG-LCA, *supra* note 57, at III.C (noting the inclusion of the role of conservation and sustainable management of forests with REDD+).

<sup>104</sup> SIMON EGGLESTON & NALIN SRIVASTAVA, IPCC NATIONAL GREENHOUSE GAS INVENTORY PROGRAMME, AFOLU IN THE IPCC 2006 GUIDELINES (2008), <http://www.ipcc-nggip.iges.or.jp/presentation/LULUCF-AFOLU.pdf>.

<sup>105</sup> *Revised 1996 Guidelines for National Greenhouse Gas Inventories*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (1997).

<sup>106</sup> See generally *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, [http://www.ipcc-nggip.iges.or.jp/public/gpplulucf/gpplulucf\\_contents.html](http://www.ipcc-nggip.iges.or.jp/public/gpplulucf/gpplulucf_contents.html) (last visited Feb. 4, 2011).

<sup>107</sup> See generally *2006 IPCC Guidelines for National Greenhouse Gas Inventories, Volume 4 Agriculture, Forestry and Other Land Use*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, <http://www.ipcc-nggip.iges.or.jp/public/2006gl/vol4.html> (last visited Feb. 4, 2011).

<sup>108</sup> *Good Practice Guidance for Land Use, Land-Use Change and Forestry*, *supra* note 106.

<sup>109</sup> *About REDD+*, *supra* note 11.

<sup>110</sup> See Meine van Noordwijk et al., *Reducing Emissions from All Land Uses (REALU): The Case for a Whole Landscape Approach*, ASB POLICY BRIEF 13, (ASB Partnership for the Tropical Forest Margins, Nairobi), 2009, at 2, <http://www.asb.cgiar.org/pdfwebdocs/ASBPB13.pdf> (defining the following "RED: Reducing emissions from (gross) deforestation; only changes from 'forest' to 'non-forest' land cover types are included, and details depend very much on the operational definition of 'forest'. REDD: RED and (forest) degradation, or the shifts to lower carbon stock densities within the forest; details depend very much on the operational definition of 'forest'. REDD+: REDD and restocking within and towards 'forest' (as specified in the Bali Action Plan); in some versions REDD+ will also include peatlands, regardless of their forest status; details still depend on the operational definition of 'forest'" and defining REALU which "includes REDD+ and all transitions in land cover that affect carbon storage, whether peatland or mineral soil, trees-outside-forest, agroforests, plantations or natural forests. It does not depend on the operation definition of 'forest'").

<sup>111</sup> 2006 IPCC Guidelines for National Greenhouse Gas Inventories, *supra* note 107, at 1.5.

<sup>112</sup> van Noordwijk et al., *supra* note 110, at 2.

<sup>113</sup> See Nophea Sasaki, *What are REDD, REDD+ and REDD++?*, [http://nopheasasaki.net/papers/2010/nopheasasaki\\_REDD.pdf](http://nopheasasaki.net/papers/2010/nopheasasaki_REDD.pdf) ("REDD++: This is to prevent the conversion of low-carbon but high biodiversity forest lands (reaching minimum threshold of forest definition) for intensive agricultural cultivation or other short-term benefit practices when high carbon-stock forests are guarded for REDD+ benefits.").

<sup>114</sup> *REALU: Reducing Emissions from All Land Uses*, ASB, <http://asb.cgiar.org/content/realu-reducing-emissions-all-land-uses> (last visited Jan. 3, 2011); *Reducing Emissions from All Land Uses (REALU)*, WORLD AGROFORESTRY CTR., <http://www.worldagroforestry.org/sea/vn/node/109> (last visited Jan. 3, 2011).

<sup>115</sup> Neef et al., *supra* note 79, at 6; COP-9 Report—Part Two, *supra* note 78, at 19/CP.9 Annex F. Participation requirements, ¶ 8.



- <sup>116</sup> See COP-9 Report-Part Two, *supra* note 78, at 19/CP.9 Annex F. Participation requirements, ¶ 8 (providing a flexible definition of forest: flexibility on a forest definition with (a) minimum tree crown cover between 10 and 30 percent; (b) minimum land area between 0.05 and 1 hectare; and (c) minimum tree height value between 2 and 5 meters).
- <sup>117</sup> Neef et al., *supra* note 79, at 3.
- <sup>118</sup> IPCC LULUCF SPECIAL REPORT, *supra* note 76, at 5.
- <sup>119</sup> SINKS TABLE OPTIONS PAPER: LAND-USE, LAND-USE CHANGE AND FORESTRY IN CANADA AND THE KYOTO PROTOCOL, ENV'T CAN. 127 (1999) <http://dsp-psd.pwgsc.gc.ca/Collection/M22-132-13-1999E.pdf>.
- <sup>120</sup> 2006 IPCC Guidelines for National Greenhouse Gas Inventories, *supra* note 107, at 1.5.
- <sup>121</sup> COP/MOP-1 Report-Part Two, *supra* note 51, at Decision 16/CMP.1 Annex Definitions A(1)(a).
- <sup>122</sup> *Id.*
- <sup>123</sup> See Jean-Paul Lanly, *Deforestation And Forest Degradation Factors* (2003), [www.fao.org/docrep/article/wfc/xii/ms12a-e.htm](http://www.fao.org/docrep/article/wfc/xii/ms12a-e.htm) (“There is no deforestation if the clearfelling is done on an area that is meant to be maintained as a forest (as in the case of ‘temporarily unstocked’ forests); deforestation on the other hand does exist—and this is actually the point of view of forest management—when the forest in question is cleared in order to be cultivated or abandoned for a long time, and if its regeneration cannot take place before several decades have passed.”).
- <sup>124</sup> COP/MOP-1 Report-Part Two, *supra* note 51, at Decision 16/CMP.1 Annex Definitions A(1)(a).
- <sup>125</sup> See generally Kyoto Protocol, *supra* note 45.
- <sup>126</sup> COP-6, *supra* note 49, at Decision 1/CP.6 Box C. Land-use, Land-use Change and Forestry (“Parties agree that for the implementation of Article 3.3 [of the Kyoto Protocol], ‘forest’ is defined in accordance with the FAO definition.”).
- <sup>127</sup> 2006 IPCC Guidelines for National Greenhouse Gas Inventories, *supra* note 107, at 1.5.
- <sup>128</sup> OFFICE OF AIR & RADIATION, *supra* note 84, at 3.
- <sup>129</sup> *Id.*
- <sup>130</sup> About REDD+, *supra* note 11.
- <sup>131</sup> COP-9 Report-Part Two, *supra* note 78, at -/CMP.1 Annex A.1.(e) (defining leakage).
- <sup>132</sup> Good Practice Guidance for Land Use, Land-Use Change and Forestry, *supra* note 106, at 14.
- <sup>133</sup> 2006 IPCC Guidelines for National Greenhouse Gas Inventories, *supra* note 107, at 1.5.
- <sup>134</sup> About REDD+, *supra* note 11.
- <sup>135</sup> COP-6, *supra* note 49, at Decision 1/CP.6 Box C. Land-use, Land-use Change and Forestry.
- <sup>136</sup> *Id.*
- <sup>137</sup> See PARKER ET AL., *supra* note 42, at 21; OFFICE OF AIR & RADIATION, *supra* note 84, at 2-8; Carbon Sequestration in Agriculture and Forestry Frequent Questions, *supra* note 89.
- <sup>138</sup> 2006 IPCC Guidelines for National Greenhouse Gas Inventories, *supra* note 107, at 1.5.
- <sup>139</sup> See PARKER ET AL., *supra* note 42, at 113 (classifying the following countries as having high forest cover and low rates of deforestation (“HFLD”): Belize, French Guiana, Gabon, Guyana, Peru, and Suriname).
- <sup>140</sup> See *id.* (classifying the following countries as having low forest cover and low rates of deforestation (“LFLD”): Angola, Central African, Costa Rica, Cote d’Ivoire, Cuba, Dominican, Ethiopia, Guinea, Guinea-Bissau, Haiti, India, Kenya, Laos, Madagascar, Mozambique, Nigeria, Philippines, Senegal, Sierra Leone, Sri Lanka, Tanzania, Thailand, Uganda, and Vietnam).
- <sup>141</sup> COP-16 AWG-LCA, *supra* note 57, at III.C.72.
- <sup>142</sup> 2006 IPCC Guidelines for National Greenhouse Gas Inventories, *supra* note 107, at 1.5.
- <sup>143</sup> See COP-6, *supra* note 49, at Decision 1/CP.6 Box C. Land-use, Land-use Change and Forestry.
- <sup>144</sup> *Sinks Table Options Paper*, *supra* note 119, at 127, 132.
- <sup>145</sup> *Id.* at 127.
- <sup>146</sup> U.S. CLIMATE CHANGE SCIENCE PROGRAM, THE FIRST STATE OF THE CARBON CYCLE REPORT: THE NORTH AMERICAN CARBON BUDGET AND IMPLICATIONS FOR THE GLOBAL CARBON CYCLE 32 (2007), <http://www.climatechange.gov/Library/sap/sap2-2/final-report/sap2-2-final-all.pdf>.
- <sup>147</sup> *Id.* at 140.
- <sup>148</sup> Jon Kusler, *Climate Change in Wetland Areas Part II: Carbon Cycle Implications*, ACCLIMATIONS, (Aug. 1, 1999), <http://bluecarbonblog.blogspot.com/1999/08/climate-change-in-wetland-areas-carbon.html>.
- <sup>149</sup> U.S. CLIMATE CHANGE SCIENCE PROGRAM, *supra* note 146, at XIII (defining “North America” as Canada, the United States of America (excluding Hawaii), and Mexico”).
- <sup>150</sup> *Id.* at 143, 140 (noting that “estuarine wetlands and some freshwater mineral-soil wetlands rapidly sequester carbon as soil organic matter due to rapid burial in sediments”).
- <sup>151</sup> *Id.* at 143.
- <sup>152</sup> *Id.* at XIII.
- <sup>153</sup> *Id.*
- <sup>154</sup> Lindsey, *supra* note 16.
- <sup>155</sup> *Id.*
- <sup>156</sup> *Id.*
- <sup>157</sup> Pimentel et al., *supra* note 16, at 1119.
- <sup>158</sup> Coe et al., *supra* note 16, at 1.
- <sup>159</sup> Lindsey, *supra* note 16.
- <sup>160</sup> Pimentel et al., *supra* note 16, at 1118.
- <sup>161</sup> About REDD+, *supra* note 11.
- <sup>162</sup> Claudia M. Stickler et al., *The Potential Ecological Costs and Cobenefits of REDD: A Critical Review and Case Study from the Amazon Region*, 15 GLOBAL CHANGE BIOLOGY 2803, 2806 (2009).
- <sup>163</sup> Coe et al., *supra* note 16, at 1.
- <sup>164</sup> *Id.* at 1; Pimentel et al., *supra* note 16, at 1117; Lindsey, *supra* note 16.
- <sup>165</sup> Coe et al., *supra* note 16, at 1; Pimentel et al., *supra* note 16, at 1118-19; Lindsey, *supra* note 16.
- <sup>166</sup> Stickler et al., *supra* note 161, at 2806.
- <sup>167</sup> *Id.*
- <sup>168</sup> Pimentel et al., *supra* note 16, at 1117.
- <sup>169</sup> Pimentel et al., *Ecology of Soil Erosion in Ecosystems*, 1 ECOSYSTEMS 416, 417 (1998).
- <sup>170</sup> *Id.*
- <sup>171</sup> Pimentel et al., *supra* note 16, at 1118.
- <sup>172</sup> See *id.* at 1117-18 (noting how steep slopes converted to agricultural use often result in high erosion rates: Nigeria – flat slope gradient <1%, lost 2 tons ha<sup>-1</sup> year<sup>-1</sup> versus a slope gradient ~12%, lost 221 tons ha<sup>-1</sup> year<sup>-1</sup>; Philippines – slope gradient greater than 11% on over 58% of the land, and Jamaica – slope gradient greater than 20% on over 52% of the land, resulted in soil loss as high as 400 tons ha<sup>-1</sup> year<sup>-1</sup>).
- <sup>173</sup> Pimentel et al., *supra* note 169, at 417.
- <sup>174</sup> See *id.*, at 416-17 (proving an example where over a 100-year period, with an erosion rate of 2 tons/hectar/year on 10 ha, the deposit of the eroded soil amasses to a depth of 15 cm on roughly 1 ha of land).
- <sup>175</sup> Coe et al., *supra* note 16, at 1.
- <sup>176</sup> Pimentel et al., *supra* note 169, at 417.
- <sup>177</sup> *Id.*
- <sup>178</sup> See *id.* at 418-19 (recognizing that when the forest coverage meets this minimum, the erosion rates are lower, ranging from 0.004 to 0.050 t/ha/yr).
- <sup>179</sup> *Id.* at 419.
- <sup>180</sup> Pimentel et al., *supra* note 16, at 1118.
- <sup>181</sup> *Id.*
- <sup>182</sup> *Id.*
- <sup>183</sup> Pimentel et al., *supra* note 169, at 416.
- <sup>184</sup> *Id.*
- <sup>185</sup> *Id.*
- <sup>186</sup> COP/MOP-1 Report-Part Two, *supra* note 51, at Decision 16/CMP.1 Annex Definitions A(1)(a).
- <sup>187</sup> See generally *id.*
- <sup>188</sup> Pimentel et al., *supra* note 169, at 419.
- <sup>189</sup> *Id.*
- <sup>190</sup> Pimentel et al., *supra* note 16, at 1119 (“In the US, where 2.5 cm of soil are lost every 16.5 years, soil has been lost at about 17 times the rate at which it has formed.”).
- <sup>191</sup> Coe et al., *supra* note 16, at 1.
- <sup>192</sup> *Id.*
- <sup>193</sup> *Id.*
- <sup>194</sup> Axel Kleidon & Martin Heimann, *Deep-Rooted Vegetation, Amazonian Deforestation, and Climate: Results from a Modeling Study*, 8 GLOBAL ECOLOGY & BIOGEOGRAPHY 397, 399 (1999), <http://www.bgc-jena.mpg.de/bgc-theory/uploads/Pubs/1999-GEBL-Amazonia.pdf>.
- <sup>195</sup> Coe et al., *supra* note 16, at 1.
- <sup>196</sup> *Id.*
- <sup>197</sup> *Id.*
- <sup>198</sup> Kleidon, *supra* note 194, at 400.

- <sup>199</sup> *Id.* at 399.
- <sup>200</sup> See *id.* at 401 (elaborating on why the “evapotranspiration (and thus for water storage) is considerably increased . . . : (1) less atmospheric moisture (drier air) increases the water vapour pressure deficit; (2) higher air temperatures (warmer air) further enhances the dryness of the air and the water vapour pressure deficit; and (3) longer dry periods will require more storage of plant available water in the soil.”).
- <sup>201</sup> *Id.*
- <sup>202</sup> COP/MOP-1 Report-Part Two, *supra* note 51, at Decision 16/CMP.1 Annex Definitions A(1)(a).
- <sup>203</sup> Kleidon, *supra* note 194, at 400.
- <sup>204</sup> Coe et al., *supra* note 16, at 1.
- <sup>205</sup> *Id.*
- <sup>206</sup> Kleidon, *supra* note 194, at 399.
- <sup>207</sup> See generally COP/MOP-1 Report-Part Two, *supra* note 51, at Decision 16/CMP.1 Annex Definitions A(1)(a).
- <sup>208</sup> Kleidon, *supra* note 194, at 404.
- <sup>209</sup> Lindsey, *supra* note 16.
- <sup>210</sup> *Id.*
- <sup>211</sup> *Id.*
- <sup>212</sup> YUMIKO URYU ET AL., WWF INDONESIA, DEFORESTATION, FOREST DEGRADATION, BIODIVERSITY LOSS AND CO<sub>2</sub> EMISSIONS IN RIAU, SUMATRA, INDONESIA: ONE INDONESIAN PROVINCE’S FOREST AND PEAT SOIL CARBON LOSS OVER A QUARTER CENTURY AND ITS PLANS FOR THE FUTURE 43 (2008), [http://assets.panda.org/downloads/riau\\_co2\\_report\\_\\_wwf\\_id\\_27feb08\\_en\\_lr\\_.pdf](http://assets.panda.org/downloads/riau_co2_report__wwf_id_27feb08_en_lr_.pdf).
- <sup>213</sup> Pimentel et al., *supra* note 169, at 421.
- <sup>214</sup> *Id.*
- <sup>215</sup> *Id.*
- <sup>216</sup> *Id.* at 416.
- <sup>217</sup> Stickler et al., *supra* note 161, at 2806.
- <sup>218</sup> *Id.*
- <sup>219</sup> *Id.*
- <sup>220</sup> *Id.*
- <sup>221</sup> Mark Schapiro, *Climate Change: Better REDD Than Dead*, MOTHER JONES (Nov. 2009), <http://motherjones.com/environment/2009/11/better-redd-dead>.
- <sup>222</sup> Stickler et al., *supra* note 161, at 2806.
- <sup>223</sup> *Id.*
- <sup>224</sup> *Id.*
- <sup>225</sup> COP/MOP-1 Report-Part Two, *supra* note 51, at Decision 16/CMP.1 Annex Definitions A(1)(a).
- <sup>226</sup> Bruce Henderson, *Groups Oppose Genetically Engineered Eucalyptus Trees*, CHARLOTTE OBSERVER (Aug. 19, 2010), <http://www.charlotteobserver.com/2010/08/19/1630893/groups-oppose-genetically-engineered.html>.
- <sup>227</sup> COP-16 AWG-LCA, *supra* note 57, at III.C; Good Practice Guidance for Land Use, Land-Use Change and Forestry, *supra* note 106.
- <sup>228</sup> van Noordwijk et al., *supra* note 110, at 2; 2006 IPCC Guidelines for National Greenhouse Gas Inventories, *supra* note 107, at 1.5.
- <sup>229</sup> See generally Kyoto Protocol, *supra* note 45.
- <sup>230</sup> United Nations Conference on Environment and Development (1992), UNITED NATIONS, <http://www.un.org/geninfo/bp/enviro.html> (last updated May 23, 1997).
- <sup>231</sup> Convention on Biological Diversity, June 5, 1992, 31 I.L.M. 818, <http://www.cbd.int/doc/legal/cbd-en.pdf>.
- <sup>232</sup> United Nations Framework Convention on Climate Change, May 9, 1992, 1771 U.N.T.S. 107 [hereinafter UNFCCC], <http://unfccc.int/resource/docs/convkp/conveng.pdf>.
- <sup>233</sup> Kyoto Protocol, *supra* note 45.
- <sup>234</sup> SBSTTA 6 Recommendation VI/7, CONVENTION ON BIOLOGICAL DIVERSITY, <http://www.cbd.int/recommendation/sbstta/?id=7038> (last visited Feb. 27, 2011).
- <sup>235</sup> Secretariat of the Convention On Biological Diversity, CBD Technical Series No. 10, *Interlinkages Between Biological Diversity and Climate Change, Advice on the Integration of Biodiversity Considerations into the Implementation of the United Nations Framework Convention on Climate Change and its Kyoto Protocol* (2003), <http://www.cbd.int/doc/publications/cbd-ts-10.pdf>.
- <sup>236</sup> Conference of the Parties to the Convention on Biological Diversity, May 19-30, 2008, *Decisions Adopted by the Conference of the Parties to the Convention on Biological Diversity at Its Ninth Meeting*, Decision IX/16, *Biodiversity and Climate Change*, U.N. Doc. UNEP/CBD/COP/9/29 (June 30, 2008).
- <sup>237</sup> COP-9 Decision IX/16, *supra* note 78, at A(e).
- <sup>238</sup> Conference of the Parties to the Convention on Biological Diversity, Oct. 18-29, 2010, *Decisions Adopted by the Conference of the Parties to the Convention on Biological Diversity at its Tenth Meeting, Biodiversity and Climate Change*, U.N. Doc. UNEP/CBD/COP/DEC/X/33 (Oct. 29, 2010), <http://www.cbd.int/climate/doc/cop-10-dec-33-en.pdf>.
- <sup>239</sup> *Id.* ¶ 8(p).
- <sup>240</sup> UNFCCC, *supra* note 232, at 1, art. 2.
- <sup>241</sup> COP-16 AWG-LCA, *supra* note 57, at Annex I 2(e).
- <sup>242</sup> *Id.*
- <sup>243</sup> See U.S. GOV’T. ACCOUNTABILITY OFFICE, *supra* note 67, at 2-3 (reviewing the issues of additional, measurement, verification, and permanence); RAMSEUR, *supra* note 67, at 21 (discussing the issue of leakage).
- <sup>244</sup> RAMSEUR, *supra* note 67, at 21.
- <sup>245</sup> van Noordwijk et al., *supra* note 110, at 2.
- <sup>246</sup> Pimentel et al., *supra* note 16, at 1118-19; Coe et al., *supra* note 16, at 1; Lindsey, *supra* note 16.
- <sup>247</sup> *Market Failures and Externalities*, *supra* note 13.
- <sup>248</sup> SMITH, *supra* note 3, at 70-75.
- <sup>249</sup> Miller, *supra* note 9, at 19.
- <sup>250</sup> van Noordwijk et al., *supra* note 110, at 2.
- <sup>251</sup> WILDE, *supra* note 1.

## ENDNOTES: THE TORTUOUS ROAD TO LIABILITY *continued from page 36*

- <sup>5</sup> See, e.g., Nick Vinocur, *Obama Not Doing Enough on Climate Change—Pachauri*, REUTERS, Oct. 22, 2009, <http://in.reuters.com/article/2009/10/22/idINIndia-43370420091022> (including observations made by Dr. Rajendra Pachauri, chairman of the Intergovernmental Panel on Climate Change (“IPCC”) in relation to the inadequacy of the emission reduction goals proclaimed by the Obama administration).
- <sup>6</sup> Lavanja Rajamani, *The Making and Unmaking of the Copenhagen Accord*, 59 INT’L & COMP. L.Q. 824, 842 (2010).
- <sup>7</sup> *Id.* at 24 (“No collective challenge facing humanity has ever before attracted such attention, participation and political capital . . .”). See also Robert H. Cutting & Lawrence B. Cahoon, *The “Gift” that Keeps on Giving: Climate Change Meets the Common Law*, 10 VT. J. ENV’T. L. 109, 111 (2008) (“Global warming issues have captured an Oscar, the Nobel Prize, and the attention of mainstream media and main street America.”).
- <sup>8</sup> See generally David B. Hunter, *The Implications of Climate Change Litigation: Litigation for International Law-Making*, in ADJUDICATING CLIMATE CHANGE: STATE, NATIONAL, AND INTERNATIONAL APPROACHES 357-76 (William C. G. Burns & Hari M. Osofsky eds., 2009).
- <sup>9</sup> Richard Ingham, *Climate Change: Dogs of Law Are Off the Leash*, AGENCE FRANCE-PRESSE (Jan. 22, 2011), <http://www.google.com/hostednews/afp/article/ALeqM5jLQy3ze-D7N4ZQzyDjvLA8ChIEhQ>.
- <sup>10</sup> Hari M. Osofsky, *The Continuing Importance of Climate Change Litigation*, 1 CLIMATE L. 1878, 1886 (2010).
- <sup>11</sup> *Id.* at 1905.
- <sup>12</sup> David Markell & J.B. Ruhl, *An Empirical Survey of Climate Change Litigation in the United States*, 7 ENV’T L. REP. 10644, 10645-47 (2010).
- <sup>13</sup> *Id.* at 10651.
- <sup>14</sup> Massachusetts v. EPA, 549 U.S. 497 (2007).
- <sup>15</sup> See Hari M. Osofsky, *The Geography of Climate Change Litigation Part II: Narratives of Massachusetts v. EPA*, 8 CHI. J. INT’L L. 573 (2008) (providing a detailed narrative of *Massachusetts v. EPA*).
- <sup>16</sup> 42 U.S.C. § 7521(a)(1) (2006) (“The [EPA] Administrator shall by regulation prescribe (and from time to time revise) in accordance with the provisions of this section, standards applicable to the emission of any air pollutant from any class or classes of new motor vehicles or new motor vehicle engines, which in his judgment cause, or contribute to, air pollution which may reasonably be anticipated to endanger public health or welfare.”).
- <sup>17</sup> See Markell & Ruhl, *supra* note 12 (providing that no fewer than 52 cases involving climate change regulatory issues have been brought since December 31, 2009).
- <sup>18</sup> See, e.g., Hari M. Osofsky, *The Geography of Climate Change Litigation: Implications for Transnational Regulatory Governance*, 83 WASH. U. L.Q. 1789, 1827 (2005) (mapping examples of actors and claims in climate change litigation).
- <sup>19</sup> See Christopher R. Reeves, *Climate Change on Trial: Making the Case for Causation*, 32 AM. J. TRIAL ADVOC. 495, 497-503 (2010).

- <sup>20</sup> Osofsky, *supra* note 18, at 1851.
- <sup>21</sup> Markell & Ruhl, *supra* note 12, at 10651.
- <sup>22</sup> Friends of the Earth v. Watson, No. C 02-4106 JSW (N.D. Cal. Aug. 23, 2005).
- <sup>23</sup> Markell & Ruhl, *supra* note 12, at 10651.
- <sup>24</sup> See Reeves, *supra* note 19, at 502-03 (describing such legal methods as “controversial”).
- <sup>25</sup> See Markell & Ruhl, *supra* note 12, at 10651 (explaining that only eight such actions were filed in the U.S. before 2010, amounting to only six percent of the total number of climate change-related petitions in the nation).
- <sup>26</sup> John Schwartz, *Courts as Battlefields in Climate Fights*, N.Y. TIMES, Jan. 27, 2010, <http://www.nytimes.com/2010/01/27/business/energy-environment/27lawsuits.html>.
- <sup>27</sup> See generally Jacqueline Peel, *Climate Change Governance After Copenhagen: Issues in Climate Change Litigation* (Nov. 2010) (unpublished paper), [http://www.ucl.ac.uk/laws/environment/docs/hong-kong/Issues%20in%20Climate%20Change%20Litigation%20\(Jacqueline%20Peel\).pdf](http://www.ucl.ac.uk/laws/environment/docs/hong-kong/Issues%20in%20Climate%20Change%20Litigation%20(Jacqueline%20Peel).pdf); INTERNATIONAL COUNCIL ON HUMAN RIGHTS POLICY, CLIMATE CHANGE AND HUMAN RIGHTS: A ROUGH GUIDE 41 (2008) [hereinafter A ROUGH GUIDE].
- <sup>28</sup> See, e.g., *Massachusetts v. EPA*, 549 U.S. 497 (2007); see also A ROUGH GUIDE, *supra* note 27, at 44 (explaining *Massachusetts v. EPA*). On the substantial interest theory in connection with environmental law, see Rónán Kennedy, “Substantial Interest” Requirement for Judicial Review of Planning Decisions, 11 ENVTL. L. REV. 46 (2009) (describing a case from the Supreme Court of Ireland).
- <sup>29</sup> See *Sierra Club v. Morton*, 405 U.S. 727, 741-52 (1972) (Douglas, J., dissenting) (elaborating the classic U.S. theory for environmental standing by arguing that standing should be accorded when claims are brought “in the name of the inanimate object about to be despoiled, defaced, or invaded by roads and bulldozers and where injury is the subject of public outrage”).
- <sup>30</sup> See Jennifer Kilinski, *International Climate Change Liability: A Myth or a Reality?*, 18 J. TRANSNAT’L L. & POL’Y 377, 414-15 (2009) (regarding the technicalities that courts encounter when assessing climate change claims).
- <sup>31</sup> See, e.g., *Massachusetts v. EPA*, 415 F.3d 50, 60 (D.C. Cir. 2005) (Sentelle, J., dissenting in part and concurring in part) (opining that petitioners lacked standing because they had not demonstrated particularized injury).
- <sup>32</sup> An international framework for allocating responsibility for damage that has and will occur due to global warming has been upheld, among others, in the Stockholm and Rio declarations. See, e.g., Stockholm Declaration on the Human Environment of the United Nations Conference on the Human Environment, U.N. Doc. A/Conf 48/14/Rev.1, 11 I.L.M. 1416 (June 16, 1972), <http://www.unep.org/Documents.multilingual/Default.asp?DocumentID=97&ArticleID=1503>; United Nations Conference on Environment and Development, June 3-14, 1992 *Rio Declaration on Environment and Development*, U.N. Doc. A/CONF.151/5/Rev. 1 (Vol. 1), Annex I (Aug. 12, 1992), <http://www.un.org/documents/ga/conf151/aconf15126-1annex1.htm>; see also Philippe Cullet, Symposium, *Liability and Redress for Human-Induced Global Warming: Towards an International Regime*, 43A STAN. J. INT’L L. 99, 100 (2007).
- <sup>33</sup> See Hari M. Osofsky, *Is Climate Change “International”? Litigation’s Diagonal Regulatory Role*, 49 VA. J. INT’L L. 585, 587-88 (2009).
- <sup>34</sup> See Cullet, *supra* note 32, at 106 (referring to the European Court of Justice’s support of this interpretation of the precautionary principle in its decision in Case C-127/02, *Landelijke Vereniging tot Behoud van de Waddenzee v. Staatssecretaris Van Landbouw, Natuurbeheer en Visserij*, 2004 E.C.R. I-7405).
- <sup>35</sup> See ARIE TROUWBORST, *EVOLUTION AND STATUS OF THE PRECAUTIONARY PRINCIPLE IN INTERNATIONAL LAW* 286 (2002).
- <sup>36</sup> See Cullet, *supra* note 32, at 106.
- <sup>37</sup> *Connecticut v. Am. Elec. Power Co.*, 406 F. Supp. 2d 265 (S.D.N.Y. 2005).
- <sup>38</sup> *Id.* at 268-69, 274 (finding the claims non-justiciable political questions); see Osofsky, *supra* note 18, at 1827-28.
- <sup>39</sup> *Connecticut v. Am. Elec. Power Co.*, 582 F.3d 309 (2d Cir. 2009), reversing 406 F. Supp. 2d 265 (S.D.N.Y. 2005), cert. granted, Dec. 6, 2010. The case is now pending before the Supreme Court of the United States (No. 10-174) with the oral argument scheduled for April 19, 2011.
- <sup>40</sup> See Cullet, *supra* note 32, at 117.
- <sup>41</sup> See Melissa Farris, *Compensating Climate Change Victims: The Climate Compensation Fund as an Alternative to Tort Litigation*, 2 SEA GRANT L. & POL’Y J. 49, 52 (2009-2010) (“Under the political question doctrine, courts must refrain from reviewing controversies revolving around national policy choices or developing standards for matters not legal in nature when the power to make such determinations has been delegated to Congress and the executive branch by the Constitution.”).
- <sup>42</sup> Randall S. Abate, Symposium, *Climate Change, the United States and the Impacts of Arctic Melting: A Case Study in the Need for Enforceable International Environmental Human Rights*, 43A STAN. J. INT’L L. 3, 19 (2007) (examining *Connecticut v. Am. Elec. Power Co.*); see also Jaw-Tyng Hwang, *Climate Change Litigation: Why California and Other States May Stop Using Lawsuits to Force Regulation of Greenhouse Gas Emissions Under the Clean Air Act*, 4 ENVTL. & ENERGY L. & POL’Y J. 157 (2009).
- <sup>43</sup> See Joy C. Fuhr, *Connecticut v. AEP The New Normal?*, 24 NAT. RESOURCES & ENV’T 58 (2010); Nikhil V. Gore & Jennifer E. Tarr, *Case Note: Connecticut v. American Electric Power Co.*, 34 HARV. ENVTL. L. REV. 577 (2010).
- <sup>44</sup> See David G. Savage, *Obama Administration Leaves Climate Change to Congress, Not the Courts*, L.A. TIMES, Sept. 18, 2010, <http://articles.latimes.com/2010/sep/18/nation/la-na-climate-obama-20100919>.
- <sup>45</sup> See Sheila Watt-Cloutier, *Petition to the Inter-American Commission on Human Rights Seeking Relief From Violations Resulting From Global Warming Caused by Acts and Omissions of the United States*, Dec. 7, 2005, <http://www.inuitcircumpolar.com/files/uploads/icc-files/FINALPetitionICC.pdf>.
- <sup>46</sup> *Comer v. Murphy Oil USA*, 607 F.3d 1049 (5th Cir. 2010).
- <sup>47</sup> *Id.*; see also Jay Carmella, *Fifth Circuit Grants Katrina Victims Standing in Global Warming Class Action Suit*, JURIST (Oct. 20, 2009), <http://jurist.law.pitt.edu/paperchase/2009/10/fifth-circuit-grants-katrina-victims.php>.
- <sup>48</sup> Some authors take a strong stance in making a case against regulatory claims based on the Clean Air Act and its underlying preventive mechanisms. See, e.g., George F. Allen & Marlo Lewis, *Finding the Proper Forum for Regulation of U.S. Greenhouse Gas Emissions: the Legal and Economic Implications of Massachusetts v. EPA*, 44 U. RICH. L. REV. 919 (2010).
- <sup>49</sup> *Id.* at 935.
- <sup>50</sup> *Id.*
- <sup>51</sup> JOSEPHINE STEINER, LORNA WOODS & CHRISTIAN TWIGG-FLESNER, E.U. LAW 3 (2006) (illustrating that the EU arose from the European Economic Community, which itself evolved out of the European Coal and Steel Community, established in 1951).
- <sup>52</sup> See generally Kathleen R. McNamara, *The Eurocrisis and the Uncertain Future of European Integration* (Council on Foreign Relations, Working Paper, 2010).
- <sup>53</sup> See MIROSLAV N. JOVANOVIĆ, *THE ECONOMICS OF EUROPEAN INTEGRATION: LIMITS AND PROSPECTS* 54-59 (2005).
- <sup>54</sup> By way of example, art. 6(2) of the Lisbon Treaty (entered into force on December 1, 2009, now Art. 6(2) of the Treaty on European Union), provides: “The Union shall accede to the European Convention for the Protection of Human Rights and Fundamental Freedoms.” When realized, it is expected that this change will bring significant improvement for the European framework of human rights protection.
- <sup>55</sup> For the primacy of the economic aspects underlying the European Union framework, see ALEX WARLEIGH-LACK, *EUROPEAN UNION: THE BASICS* 60 (2004).
- <sup>56</sup> See JAN H. JANS & HANS H.B. VEDDER, *EUROPEAN ENVTL. LAW* 385-88 (3d ed. 2008).
- <sup>57</sup> See generally A. Denny Ellerman & Barbara K. Buchner, *The European Union Emissions Trading Scheme: Origins, Allocation, and Early Results*, 1 REV. ENVIRON. ECON. & POL’Y 66 (2007).
- <sup>58</sup> Navraj Singh Ghaleigh, *Emissions Trading Before the European Court of Justice: Market Making in Luxembourg* 6 (Edinburgh School of Law Working Paper Series, Paper No. 12, 2009), [http://papers.ssrn.com/sol3/papers.cfm?abstract\\_id=1371513](http://papers.ssrn.com/sol3/papers.cfm?abstract_id=1371513).
- <sup>59</sup> *Id.* at 13, 16, 27.
- <sup>60</sup> E.g., Case C-127/07, *Société Arcelor Atlantique et Lorraine and Others v. Premier Ministre*, 2008 E.C.R. I-09895.
- <sup>61</sup> E.g., Case C-122/05, *Comm’n v. Italy*, 2006 E.C.R. I-65.
- <sup>62</sup> See Regina Betz, Wolfgang Eichhammer, & Joachim Schleich, *Designing National Allocation Plans for EU Emissions Trading—A First Analysis of the Outcome*, 15 ENERGY & ENV’T 375, 376 (2004) (explaining the sub-allocation plans and mechanisms).
- <sup>63</sup> E.g., Case T-387/04, *Energie Baden Württemberg v. Comm’n*, 2007 E.C.R. II-1195.
- <sup>64</sup> Case C-2/07, *Abraham v. Région Wallonne*, 2008 E.C.R. I-0000.
- <sup>65</sup> *Id.*
- <sup>66</sup> *Id.*
- <sup>67</sup> Ghaleigh, *supra* note 58, at 28-29.
- <sup>68</sup> See Timothy Gardner, *U.S. Must Tackle Emissions First: Chu*, REUTERS, Oct. 20, 2009, <http://www.reuters.com/article/2009/10/20/us-washington-summit-tariffs-idUSTRE59J4PT20091020>.
- <sup>69</sup> Frank J. Convery, *Origins and Development of the EU ETS*, 43 ENVTL. & RESOURCE ECON. 391, 407 (2009) (“[T]he EU is the initiator and the operator of the world’s first and largest international emissions trading scheme.”).



<sup>70</sup> Arguments against judge-made regulation are many in legal theory. *See, e.g.,* William Kristol & Jeffrey Bell, *Against Judicial Supremacy*, WEEKLY STANDARD, Dec. 4, 2000, at 11.

<sup>71</sup> *See, e.g.,* the observations of Lord Hoffmann, according to whom some legal decisions (those concerning the allocation of resources, for example) should be deferred by judges to the Government. Secretary of State for the Home Department v. Rehman, [2001] UKHL 47, [62].

<sup>72</sup> *See* Jim Rossi, *Moving Public Law Out of the Deference Trap in Regulated Industries*, 40 WAKE FOREST L. REV. 617 (2005). For a theoretical point of view, see the second part of the article written by Alison L. Young, Ghaidan v. Godin-Mendoza: *Avoiding the Deference Trap*, PUB. L., Spring 2005, at 23, 29-33.

<sup>73</sup> *See* Murray Hunt, *Sovereignty's Blight: Why Contemporary Public Law Needs the Concept of "Due Deference,"* in PUBLIC LAW IN A MULTI-LAYERED CONSTITUTION 338 (Nicholas Bamforth & Peter Leyland eds., 2003) (providing a critical reference to the so-called "spatial metaphor").

<sup>74</sup> Cullet, *supra* note 32, at 115 (agreeing with the idea that regulation and allocation of greenhouse gases emissions would not be sufficient to mitigate global warming).

<sup>75</sup> *Id.*

<sup>76</sup> Council Directive 2004/35/EC, of the European Parliament and of the Council of 21 April 2004 on Environmental Liability with Regard to the Prevention and Remedying of Environmental Damage, 2004 O.J. (L 143) 56 (establishing "a framework of environmental liability based on the 'polluter-pays' principle, to prevent and remedy environmental damage").

<sup>77</sup> *See* MONIKA HINTEREGGER, ENVIRONMENTAL LIABILITY AND ECOLOGICAL DAMAGES IN EUROPEAN LAW (2008).

<sup>78</sup> The Lugano Convention was adopted on June 21, 1993 within the framework of the Council of Europe.

<sup>79</sup> Under Article 2.7(d), the definition of damages for the purposes of the Convention also includes "the costs of preventive measures and any loss or damage caused by preventive measures."

<sup>80</sup> *See* HINTEREGGER, *supra* note 77, at 4; *see also* the *Lugano Convention Record Details*, ECOLEX, <http://www.ecolex.org/ecolex/ledge/view/RecordDetails?id=TRE-001166&index=treaties> (last visited Mar. 10, 2011).

<sup>81</sup> Similarly, in other jurisdictions courts and claimants have drawn their attention more to the regulatory aspects of the global warming issue. Namely, Australian applicants have tried to "use the courts as a tool for climate change reform" seeking a favorable interpretation of the 1999 Environment Protection and Biodiversity Conservation Act. Tracy Bach & Justin Brown, *Recent Developments in Australian Climate Change Litigation: Forward Momentum from Down Under*, SUSTAINABLE DEV. L. & POL'Y, Winter 2008, at 39 (describing Australian conservation foundation's grassroots movement). For a thorough analysis of similarities and differences between U.S. and Australian climate change litigation, *see* Virginia Tice, *From Vermont's Maples to Wybong's Olives: Cross-Cultural Lessons From Climate Change Litigation in the United States and Australia*, 10 ASIAN-PAC. L. & POL'Y J. 292 (2008). In New Zealand, courts have focused more on the judicial review of the correct application of the law (which may nonetheless "bring scrutiny to bear on the deficiencies of the law") than on developing new pathways for establishing redress for global warming-induced damages. Brian J. Preston, *Climate Change Litigation in the Land and Environment Court of New South Wales and Other Courts*, ACPECT 2009 CONFERENCE, Aug. 19-20, 2009, [http://www.lawlink.nsw.gov.au/lawlink/lec/ll\\_lec.nsf/vwFiles/Paper\\_20Aug09\\_PrestonCJ\\_NZ.pdf/\\$file/Paper\\_20Aug09\\_PrestonCJ\\_NZ.pdf](http://www.lawlink.nsw.gov.au/lawlink/lec/ll_lec.nsf/vwFiles/Paper_20Aug09_PrestonCJ_NZ.pdf/$file/Paper_20Aug09_PrestonCJ_NZ.pdf).

<sup>82</sup> *See* Watt-Cloutier, *supra* note 45.

<sup>83</sup> *See id.* at 1.

<sup>84</sup> *See id.* at 6.

<sup>85</sup> *See* Jane George, *ICC Climate Change Petition Rejected*, NUNATSIAQ NEWS, Dec. 15, 2006, [http://www.nunatsiaqonline.ca/archives/61215/news/nunavut/61215\\_02.html](http://www.nunatsiaqonline.ca/archives/61215/news/nunavut/61215_02.html); Sarah Nuffer, *Human Rights Violations and Climate Change: The Last Days of the Inuit People?*, 37 RUTGERS L. REC. 182, 191-92 (2010).

<sup>86</sup> Pamela Stephens, *Applying Human Rights Norms to Climate Change: The Elusive Remedy*, 21 COLO. J. INT'L ENVTL. L. & POL'Y 49, 56 (2010) (referring to Martin Wagner, Testimony Before the Inter-American Commission on Human Rights on March 1, 2007), [http://www.ciel.org/Publications/IACHR\\_Wagner\\_Mar07.pdf](http://www.ciel.org/Publications/IACHR_Wagner_Mar07.pdf).

<sup>87</sup> For further comments on the Inuit case, *see* Hari M. Osofsky, *The Inuit Petition as a Bridge? Beyond Dialectics of Climate Change and Indigenous Peoples' Rights*, 31 AM. INDIAN L. REV. 675 (2007).

<sup>88</sup> *See, e.g.,* Maya Indigenous Cmty's. of the Toledo Dist. v. Belize, Case 12.053, Inter-Am Comm'n H.R., Report No. 40/04, OEA/Ser.L/V/II.122, doc.

5 rev. 1 (2005), <http://www.cidh.org/annualrep/2004eng/belize.12053eng.htm>; Yanomami v. Brazil, Case 7615, Inter-Am. Comm'n H.R., Report No. 12/85, OAS/Ser.L/V/II.66, doc. 10 rev. 1 (1985), <http://www.cidh.org/annualrep/84.85eng/Brazil7615.htm>.

<sup>89</sup> *See* MICHAEL D. GOLDBABER, A PEOPLE'S HISTORY OF THE EUROPEAN COURT OF HUMAN RIGHTS (2009) (presenting an in-depth analysis of the ECtHR's 50-year history).

<sup>90</sup> *See* J.G. MERRILLS, THE DEVELOPMENT OF INTERNATIONAL LAW BY THE EUROPEAN COURT OF HUMAN RIGHTS, at ix (1993).

<sup>91</sup> *See, e.g.,* Guerra v. Italy, 1998-I Eur. Ct. H.R. 210 (1998); López Ostra v. Spain, 303-C Eur. Ct. H.R. (ser. A) (1994).

<sup>92</sup> *See* Hamer v. Belgium, 21861/03 Eur. Ct. H.R. 102 (2007).

<sup>93</sup> Press Release, ECtHR Press Unit, Factsheet: Environment-related Cases in the Court's Case Law (Jan. 2011), [http://www.echr.coe.int/NR/rdonlyres/0C818E19-C40B-412E-9856-44126D49BDE6/0/FICHES\\_Environment\\_EN.pdf](http://www.echr.coe.int/NR/rdonlyres/0C818E19-C40B-412E-9856-44126D49BDE6/0/FICHES_Environment_EN.pdf).

<sup>94</sup> *See* T tar v. Romania, 67021/01 Eur. Ct. H.R. ¶¶ II, B(h) (2009) (stating that: "En vertu du principe de précaution, l'absence de certitude compte tenu des connaissances scientifiques et techniques du moment ne saurait justifier que l'État retarde l'adoption de mesures effectives et proportionnées visant à prévenir un risque de dommages graves et irréversibles à l'environnement."); *see also* LUCIANO BUTTI, THE PRECAUTIONARY PRINCIPLE IN ENVIRONMENTAL LAW 73-81 (2007) (discussing the relationship between the precautionary principle and climate change).

<sup>95</sup> *See* Sara C. Aminzadeh, *A Moral Imperative: the Human Rights Implications of Climate Change*, 30 HASTINGS INT'L & COMP. L. REV. 231, 238 (2007); Megan S. Chapman, *Climate Change and the Regional Human Rights Systems*, SUSTAINABLE DEV. L. & POL'Y, Spring 2010, at 37.

<sup>96</sup> *See* Kyrtatos v. Greece, 40 Eur. H.R. Rep. 16 (2003) (holding that there had been no violation of article 8 as the applicants had not been directly affected by urban development in the south-eastern part of the island of Tinos, which had changed the area from a wild natural habitat to a tourist attraction).

<sup>97</sup> *See* Handyside v. United Kingdom, 24 Eur. Ct. H.R. (ser. A) ¶¶ 48-49 (1976) (establishing the margin of appreciation doctrine); *see also* Yutaka Arai, *The Margin of Appreciation Doctrine in the Jurisprudence of Article 8 of the European Convention on Human Rights*, 16 NETH. Q. OF H.R. 41 (1998) (explaining the margin of appreciation doctrine further).

<sup>98</sup> The subsidiary role of the ECtHR was recently reaffirmed by the Committee of Ministers of the Council of Europe during the High Level Conference on the Future of the European Court of Human Rights. *See, in particular*, Section E, Article 9(b) of the Action Plan. High Level Conference on the Future of the European Court of Human Rights, Interlaken, Switz., Feb. 18-19, 2010, *Interlaken Declaration* (Feb. 19, 2010), [http://www.eda.admin.ch/etc/medialib/downloads/edazen/topics/europa/euroc.Par.0133.File.tmp/final\\_en.pdf](http://www.eda.admin.ch/etc/medialib/downloads/edazen/topics/europa/euroc.Par.0133.File.tmp/final_en.pdf).

<sup>99</sup> Anatole Boute, *The Protection of Property Rights Under the European Convention on Human Rights and the Promotion of Low-Carbon Investments*, 1 CLIMATE L. 93, 95-96 (2010).

<sup>100</sup> *Id.* at 130.

<sup>101</sup> *Gbemre v. Shell Petroleum Dev. Co. Nigeria Ltd.*, [2005] EHC/B/CS/53/05 FHCNLR (Nigeria), <http://www.climatelaw.org/cases/case-documents/nigeria/ni-shell-nov05-judgment.pdf>.

<sup>102</sup> *See* Labode Adegoke, *Pollution as a Constitutional Violation: Gbemre's Case* (Oct. 22, 2009) (presenting a detailed summary of the case), <http://www.scribd.com/doc/21340644/Pollution-as-a-Constitutional-Violation-Gbemre%E2%80%99s-Case-by-Labode-Adegoke>.

<sup>103</sup> *See* Aminzadeh, *supra* note 95, at 238.

<sup>104</sup> *See id.* at 262-64.

<sup>105</sup> *See id.*

<sup>106</sup> *See* SATVINDER SINGH JUSS, INTERNATIONAL MIGRATION AND GLOBAL JUSTICE 168-78 (2006).

<sup>107</sup> *See* Robert V. Percival, *Liability for Environmental Harm and Emerging Global Environmental Law*, 25 MD. J. INT'L L. 37 (2010).

<sup>108</sup> *See* Michael Duffy, *Climate Change Causation: Harmonizing Tort Law and Scientific Probability*, 28 TEMP. J. SCI., TECH. & ENVTL. L. 185, 188 (2009).

<sup>109</sup> *Id.* at 240 (admitting that "defendants may not be selected based on moral culpability or the ease and efficiency with which they can abate their harmful activity").

<sup>110</sup> Michael B. Gerrard, *What the Law and the Lawyers Can and Cannot Do About Global Warming*, 16 SOUTHEASTERN ENVTL. L.J. 33, 51 (2007).

<sup>111</sup> *See* David A. Grossman, *Warming Up to a Not-So-Radical Idea: Tort-Based Climate Change Litigation*, 28 COLUM. J. ENVTL. L. 1, 3-5 (2003) (illustrating the appropriateness of pursuing typical tort law goals in the context of climate change litigation).

## ENDNOTES: HAZY SKIES IN AMERICA'S FUTURE?: THE BATTLE BETWEEN "FREE INDUSTRY" AND CLEAN AIR

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<sup>3</sup> See H.R. 97, 112th Cong. (2011), <http://www.opencongress.org/bill/112-h97/text> (last visited Feb. 12, 2011); see also Renee Schoof, *With Health Care 'Repealed,' GOP Turn to Climate Change*, McCLATCHY NEWSPAPERS (Jan. 20, 2011), <http://www.mcclatchydc.com/2011/01/20/107168/ethics-of-climate-change-rise.html>; Jeremy Moule, *Clean Air v. Free Industry*, CITY NEWSPAPER BLOG (Jan. 28, 2011, 11:48 AM), <http://www.rochestercitynewspaper.com/news/blog/2011/01/Clean-Air-vs-Free-Industry/>.

<sup>4</sup> See Schoof, *supra* note 3.

<sup>5</sup> Since Democrats retain control over the Senate and Presidency, any Republican efforts to eliminate EPA regulatory authority will probably fail. Republicans are posturing for the 2012 elections and setting an agenda early. Should Republicans gain control of the Senate, it is likely that laws similar to H.R. 97 will pass during the 113th Congress. See generally OMB WATCH, *supra* note 1 (highlighting that Republicans are fulfilling their campaign promises by attacking specific regulations and the rulemaking process itself); see also Nick Wing, *Fred Upton's EPA Battle: Incoming Energy Chair Announces Plan to Stymie Carbon Regulations*, HUFFINGTON POST (Dec. 30, 2010, 1:15 AM), [http://www.huffingtonpost.com/2010/12/30/fred-upton-epa-carbon-emissions\\_n\\_802295.html](http://www.huffingtonpost.com/2010/12/30/fred-upton-epa-carbon-emissions_n_802295.html) (noting that the chairman of the House Energy and Commerce Committee intends to use his position to fight EPA regulations); Kasie Hunt, *Newt Gingrich Proposes Abolishing the EPA*, POLITICO (Jan. 25, 2011, 1:23 PM), <http://www.politico.com/news/stories/0111/48143.html> (citing statements made by the potential 2012 Republican presidential candidate Newt Gingrich at a Renewable Fuels Summit that EPA should be replaced by a new government agency).

<sup>6</sup> See *Understanding the Clean Air Act*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/air/peg/understand.html> (last visited Feb. 12, 2011) (discussing the passage of the 1970 version of the Clean Air Act and the subsequent creation of the EPA, to which Congress gave the primary authority of enforcing the provisions of the Clean Air Act).

<sup>7</sup> The 1977 amendments were largely concerned with strengthening EPA's ability to enforce and maintain National Ambient Air Quality Standards ("NAAQS"). One of the major additions of the 1977 amendments was the "Prevention of Significant Deterioration of Air Quality Standards," which required assessment of new stationary sources or modifications of old stationary sources of pollution. See Clean Air Act, 42 U.S.C. § 7401 (2006), <http://www.gpo.gov/fdsys/pkg/USCODE-2008-title42/pdf/USCODE-2008-title42-chap85.pdf>; see also *History of the Clean Air Act*, U.S. ENVTL. PROT. AGENCY, [http://epa.gov/oar/caa/caa\\_history.html#caa70](http://epa.gov/oar/caa/caa_history.html#caa70) (last visited Feb. 12, 2011).

<sup>8</sup> The 1990 amendments to the Clean Air Act were far broader than the 1977 amendments. The 1990 amendments were instrumental in expanding the federal governments control over acid rain deposition and emission of other toxic pollutants. After the 1990 amendments, EPA had far more enforcement authority due to new permitting standards. There was also significant concentration on the elimination of chemicals that depleted the ozone layer. See S.1630, 101st Cong. (1990) (enacted) [http://thomas.loc.gov/cgi-bin/query/F?c101:5:/temp/~c101kCzQQq:e0](http://thomas.loc.gov/cgi-bin/query/F?c101:5:/temp/~c101kCzQQq:e0;); see also *History of Clean Air Act*, *supra* note 7.

<sup>9</sup> See *Massachusetts v. EPA*, 549 U.S. 497, 533-35 (2007) (concluding that EPA has authority under the Clean Air Act to regulate greenhouse gases as long as EPA issues an Endangerment Finding). For a brief summary of the court decision, see also *Massachusetts et al. v. EPA et al.*, PEW CTR. ON GLOBAL CLIMATE CHANGE, <http://www.pewclimate.org/epavmsma.cfm> (last visited on Feb. 12, 2011).

<sup>10</sup> Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act Final Rule, 74 Fed. Reg. 66496 (Dec. 15, 2009), [http://www.epa.gov/climatechange/endangerment/downloads/Federal\\_Register-EPA-HQ-OAR-2009-0171-Dec.15-09.pdf](http://www.epa.gov/climatechange/endangerment/downloads/Federal_Register-EPA-HQ-OAR-2009-0171-Dec.15-09.pdf).

<sup>11</sup> See *Endangerment and Cause or Contribute Findings for Greenhouse Gases Under Section 202(a) of the Clean Air Act*, U.S. ENVTL. PROT. AGENCY, <http://www.epa.gov/climatechange/endangerment.html> (last visited Feb. 12, 2011) (citing EPA's intention to pursue regulation of greenhouse gases based on the evidence laid out in the Endangerment Finding); *Energy and Environment*, THE WHITE HOUSE, <http://www.whitehouse.gov/issues/energy-and-environment> (last visited Feb. 12, 2011) (declaring the Obama Administration's intent to support EPA regulation of greenhouse gases).

<sup>12</sup> See Schoof, *supra* note 3 (quoting Chairman Rep. Fred Upton's declaration that he would oppose EPA regulations and protect American jobs); see also *Inhofe Says EPA's New Boiler Rule Could Kill Nearly 800,000 Manufacturing Jobs*, FOX NEWS (Sep. 28, 2010) [hereinafter *Inhofe*], <http://www.foxnews.com/>

*politics/2010/09/28/inhofe-says-epas-new-boiler-rule-kill-nearly-manufacturing-jobs/* (citing further Republican opposition to EPA regulations aimed at reducing greenhouse gases, because of the regulations' effect on jobs); U.S. Sen. Kay Bailey Hutchinson, *EPA Regulations on Refineries Will Kill Jobs in Texas*, THE HOUSTON CHRON. (Jan. 7, 2011, 8:30 PM), <http://www.chron.com/disp/story.mpl/editorial/outlook/7371466.html> (discussing the effect of EPA regulations on the economy of Texas).

<sup>13</sup> See Schoof, *supra* note 3; *House Energy Committee Chairman Fred Upton Denies Human Role In Climate Change*, THE HUFFINGTON POST (Feb. 8, 2011, 7:47 PM), [http://www.huffingtonpost.com/2011/02/08/fred-upton-climate-change\\_n\\_820511.html](http://www.huffingtonpost.com/2011/02/08/fred-upton-climate-change_n_820511.html); *House Readies Ban on EPA Greenhouse Gas Regulations*, FOX NEWS (Feb. 2, 2011), <http://www.foxnews.com/us/2011/02/02/house-gop-readies-ban-epa-greenhouse-gas-regulations/> (establishing that critics of EPA regulations do not believe that the evidence proving the negative impacts of climate change are conclusive).

<sup>14</sup> See Schoof, *supra* note 3; *Inhofe*, *supra* note 12; Hutchinson, *supra* note 12.

<sup>15</sup> See Donald A. Norman, MACH. & ALLIED PRODS. INST., *Economic Implications of EPA's Proposed Ozone Standard*, 1, 5-8 (Sept. 2010), <http://www.mapi.net/Filepost/ER-707.pdf> (finding a total loss of 7.3 million manufacturing jobs by 2020 and an annual attainment cost of \$1.013 trillion to the manufacturing sector if EPA implements new ozone regulations); Margo Thorning, *EPA Regulation of GHGs, U.S. Investment and Economic Recovery: Questions and Answers*, AM. COUNCIL FOR CAPITAL FORMATION, pg. 1-2, 5-6 (Dec. 2010), <http://www.accf.org/publications/143/epa-regulation-of-ghgs-us-investment-and-economic-recovery-questions-answers> (providing non-industry specific job-loss and cost data for new EPA GHG regulations).

<sup>16</sup> See James A. McCarthy & Larry Parker, CONG. RESEARCH SERV., *EPA Regulation of Greenhouse Gases: Congressional Responses and Options*, tbl. 1, at 4 (June 8, 2010), <http://www.fas.org/spp/crs/misc/R41212.pdf> (providing detailed statistics for the total greenhouse gas emissions by the energy and manufacturing industries). For more data and background, see also ENERGY INFO. ADMIN., *Emissions of Greenhouse Gases in the United States 2008*, fig. 1, 3, & 11, tbl. 5, 9, & 11 (2009).

<sup>17</sup> See *Industry Jobs*, AM. PETROLEUM INST., <http://energytomorrow.org/issues/economy/industry-jobs/> (last visited Feb. 12, 2011) (stating that the oil and gas industries directly employ 2.1 million people); see also PRICEWATERHOUSECOOPERS, *THE ECONOMIC IMPACTS OF THE OIL AND NATURAL GAS INDUSTRY ON THE U.S. ECONOMY: EMPLOYMENT, LABOR INCOME AND VALUE ADDED* tbl. 2 (2009), [http://www.api.org/Newsroom/upload/Industry\\_Economic\\_Contributions\\_Report.pdf](http://www.api.org/Newsroom/upload/Industry_Economic_Contributions_Report.pdf) (providing statistics that indicate the total employment provided by the oil and gas industries is 9.2 million when all supporting industries are included).

<sup>18</sup> This employment figure indicates the 2009 employment figures in the coal sector, as provided by the National Mining Association. See NAT'L MINING ASSOC., *Mining Industry Employment in the United States by Sector 1985-2009* (2011), [http://www.nma.org/pdf/e\\_sector.pdf](http://www.nma.org/pdf/e_sector.pdf).

<sup>19</sup> See *Facts About Manufacturing*, NAT'L ASSOC. OF MFGRS., <http://www.nam.org/Resource-Center/Facts-About-Manufacturing/Landing.aspx> (providing basic statistics about direct and indirect employment by the manufacturing sector).

<sup>20</sup> The employment figures used in this article only take account of the people directly employed by the respective industrial sectors mentioned above. "Supporting industries," as used in this article, refers to industries that are inter-related with a specific industry so much so that the livelihood of a "supporting industry" depends considerably upon the success of its "parent industry." For instance, according to figures provided by the American Petroleum Institute, the oil and natural gas industry directly employs 2.1 million Americans, but employs 9.1 million Americans when we take account of "supporting industries." See *Industry Jobs*, *supra* note 17.

<sup>21</sup> See James Heintz, Heidi Garrett-Peltier, & Ben Zipperer, *New Jobs-Cleaner Air*, CERES, tbl. ES.1-2 (Feb. 2011), <http://www.ceres.org/Page.aspx?pid=592> (citing figures that predict 1.46 million jobs could be created by 2015 by EPA greenhouse gas regulations).

<sup>22</sup> One federal regulatory standard that is applicable across all states would be more uniform than various laws that differ from state to state. As the chart referenced below indicates, some states already have stricter standards, others have less stringent ones, and still others have none at all. See Amy Royden Bloom, NAT'L ASSOC. OF CLEAN AIR AGENCIES, *State Greenhouse Gas (GHG) Actions*, (Jan. 16, 2008), <http://www.4cleanair.org/documents/stateghgactions-chart.pdf>.



<sup>23</sup> This is a classic “race-to-the-bottom” argument, where in the face of economic competition governmental entities (nations, states, cities, etc.) relax their regulatory standards to promote economic growth in their jurisdiction. This idea gained recognition in the U.S. after Justice Louis Brandeis discussed it in his dissenting opinion in *Liggett Co. v. Lee*, 288 U.S. 517, 558-60 (1933) (Brandeis, J., dissenting).

<sup>24</sup> See Press Release, Cleantech Grp. LLC, Record Number of Clean Technology Venture Investment Deals in 2010, as Total Amount Invested Rises 28 Percent to \$7.8 Billion, (Jan. 7, 2011), <http://cleantech.com/about/pressreleases/4Q10-investments.cfm>.

<sup>25</sup> See McCarthy, *supra* note 16, at n.31 (discussing the Obama administration’s efforts to seek international reduction of global GHG emissions, and the central role that U.S. emissions reductions play in the international process).

<sup>26</sup> See OMB Watch, *supra* note 1; Capiello, *supra* note 1 (citing several House and Senate measures aimed at limiting the EPA’s ability to enforce regu-

lations GHG).

<sup>27</sup> See McCarthy, *supra* note 16, at 11; see also Elizabeth McGowan, *EPA and Congress Headed for Showdowns Over Carbon Regulations in 2011*, SOLVE CLIMATE NEWS (Dec. 29, 2010), <http://solveclimatenews.com/news/20101229/epa-and-congress-headed-showdowns-over-carbon-regulations-2011?page=2> (citing the controversy between the EPA and Republicans as a carry-over from the 111th Congress); *Appreciating the Clean Air Act*, FRIENDS COMM. ON NAT’L LEGISLATION (Nov. 30, 2010), [http://www.fcnl.org/issues/item.php?item\\_id=4028&issue\\_id=102](http://www.fcnl.org/issues/item.php?item_id=4028&issue_id=102) (providing a timeline of bills introduced in the 111th Congress, both in the House and Senate with similar aims to the current set of bills circulating through Congress).

<sup>28</sup> Congress has acted in a similar fashion with respect to EPA authority in the 1977 and 1990 amendments to the Clean Air Act. See McCarthy, *supra* note 16, at 13.

## ENDNOTES: AFRICA AND THE CLIMATE CHANGE AGENDA: HURDLES AND PROSPECTS IN SUSTAINING THE OUTCOMES OF THE SEVENTH AFRICAN DEVELOPMENT FORUM *continued from page 44*

and Declarations, Assembly/AU/Dec.255(XIII), ¶ 4, [http://www.africa-union.org/root/au/Conferences/2009/july/summit/decisions/ASSEMBLY%20AU%20DEC%20243%20-%20267%20%28XIII%29%20\\_E.PDF](http://www.africa-union.org/root/au/Conferences/2009/july/summit/decisions/ASSEMBLY%20AU%20DEC%20243%20-%20267%20%28XIII%29%20_E.PDF).

<sup>27</sup> See Assembly of the African Union, Fourteenth Ordinary Session, Jan. 31-Feb. 2, 2010, *Decision on the Fifteenth Conference of Parties to the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, in Decisions, Declarations, and Resolutions*, Assembly/AU/Dec.281(XIV), ¶ 4, [http://www.africa-union.org/root/ua/Conferences/2010/Summit/doc/DECISIONS/Assembly%20Dec.268-288\\_%20Decl.1-3\\_%20Res%20E.pdf](http://www.africa-union.org/root/ua/Conferences/2010/Summit/doc/DECISIONS/Assembly%20Dec.268-288_%20Decl.1-3_%20Res%20E.pdf).

<sup>28</sup> See African Ministerial Conference on the Environment, Twelfth Session, Johannesburg, S. Afr., June 10–12, 2008, *Report of the Ministerial Segment*, UNEP/AMCEN/12/9 (June 12, 2008), [http://www.unep.org/roa/Amcen/Amcen\\_Events/12th\\_Session\\_AMCEN/docs/AMCEN-Ministerial-Segment-Report.pdf](http://www.unep.org/roa/Amcen/Amcen_Events/12th_Session_AMCEN/docs/AMCEN-Ministerial-Segment-Report.pdf).

<sup>29</sup> Nairobi Declaration on the African Process for Combating Climate Change, May 29, 2009, [http://www.unep.org/roa/Amcen/Amcen\\_Events/3rd\\_ss/Docs/nairobi-Declaration-2009.pdf](http://www.unep.org/roa/Amcen/Amcen_Events/3rd_ss/Docs/nairobi-Declaration-2009.pdf).

<sup>30</sup> *Id.* at pmb1., ¶ 6.

<sup>31</sup> *Id.* at pmb1., ¶ 8.

<sup>32</sup> *Id.* at pmb1., ¶ 13.

<sup>33</sup> *Id.* at pmb1., ¶ 15.

<sup>34</sup> NEPAD is a vision and strategic framework for Africa’s renaissance. Established in 2001, it is an intervention spearheaded by African leaders, which pursues new priorities and approaches to address current socio-economic and political problems facing the continent. For insights into the historical context of NEPAD, see *History*, NEPAD, <http://www.nepad.org/history> (last visited Mar. 12, 2011) and *About*, NEPAD, <http://www.nepad.org/about> (last visited Mar. 12, 2011). On NEPAD’s principles, priorities, and desired outcomes, see THE NEW PARTNERSHIP FOR AFRICA’S DEVELOPMENT (2001), [http://www.nepad.org/system/files/framework\\_0.pdf](http://www.nepad.org/system/files/framework_0.pdf).

<sup>35</sup> See NEPAD, ACTION PLAN FOR THE ENVIRONMENT INITIATIVE (2003), <http://www.unep.org/roa/Amcen/docs/publications/ActionNepad.pdf>.

<sup>36</sup> See *Climate Change and Natural Resource Management: Overview*, NEPAD, <http://www.nepad.org/climatechangeandsustainabledevelopment> (last visited Mar. 12, 2011).

<sup>37</sup> The AfDB is Africa’s Multilateral Development Bank (“MDB”). Founded in 1964, it is part of the larger African Development Bank Group (“AfDBG”), which also includes the African Development Fund (“ADF”) and the Nigeria Trust Fund (“NTF”). Its membership comprises seventy-seven States, including the fifty-three AU Member States and twenty-four non-African countries. For details on the bank, see *African Development Bank (AfDB)*, AFR. DEVELOPMENT BANK, <http://www.afdb.org/en/about-us/african-development-bank-afdb/> (last visited Mar. 12, 2011).

<sup>38</sup> The over seven hundred participants were drawn from, among others, government representatives, UN and bilateral partners, international and regional financial institutions, South-South cooperation organizations, regional economic communities, the civil society, academia, African Diaspora, and the private sector. Kwesi W Obeng, *Climate Change: Africa at the Crossroads*, THIRD WORLD NETWORK AFR. (Dec. 2, 2010), [http://twnafrica.org/index.php?option=com\\_content&view=article&id=406:climate-change-africa-at-the-crossroads&catid=37:african-agenda&Itemid=58](http://twnafrica.org/index.php?option=com_content&view=article&id=406:climate-change-africa-at-the-crossroads&catid=37:african-agenda&Itemid=58).

<sup>39</sup> Seventh African Development Forum, Acting on Climate Change for Sustainable Development in Africa, Oct. 10-15, 2010, *Consensus Statement* (Oct. 15, 2010) [hereinafter *Consensus Statement*], <http://www.uneca.org/adfvii/documents/ADF-VII-Consensus-Statement.pdf>.

<sup>40</sup> It hardly goes without emphasis that the Forum should not be confused for its namesake, the UK-based African Development Forum (also abbreviated as “ADF”), a Christian organization that brings together Britain’s African and Caribbean Christians to engage in efforts to address poverty in Africa. For details on this non-profit Christian organization, see AFR. DEVELOPMENT FORUM, <http://www.africandevforum.org> (last visited Mar. 12, 2011). The latter, established in 2006, seeks to contribute to economic and social progress in Africa through education and advocacy activities in three focal areas: Economic Justice, Climate Change, and HIV/AIDS. For details on these focal areas, see *Focus Areas*, AFR. DEVELOPMENT FORUM, <http://www.africandevforum.org/activities.html> (last visited Mar. 12, 2011).

<sup>41</sup> For insights into the establishment of the forum, see *What is the ADF*, UNECA, <http://www.uneca.org/adf2000/abtadf.htm> (last visited Mar. 12, 2011).

<sup>42</sup> See Seventh African Development Forum, *supra* note 4, ¶ 1.

<sup>43</sup> See Seventh African Development Forum “Acting on Climate Change for Sustainable Development in Africa”: *Concept Note 4*, <http://www.uneca.org/adfvii/documents/ADF-VII-DraftConceptNote.pdf> (last visited Mar. 12, 2011).

<sup>44</sup> *Id.*

<sup>45</sup> *Id.*

<sup>46</sup> *Id.*

<sup>47</sup> *Id.*

<sup>48</sup> See *Consensus Statement*, *supra* note 39, at pmb1., ¶¶ 2-3.

<sup>49</sup> *Id.* at 4. On the background to the deliberations, see Seventh African Development Forum, Acting on Climate Change for Sustainable Development in Africa, Oct. 10-15, 2010, *Governance and Leadership Response to Climate Change, Issues Paper No. 1*, <http://www.uneca.org/adfvii/documents/IssuePaper1Governance-and-leadership-through-a-changingclimate.pdf>.

<sup>50</sup> *Consensus Statement*, *supra* note 39, at 4.

<sup>51</sup> *Id.*

<sup>52</sup> *Id.*

<sup>53</sup> *Id.* at 3.

<sup>54</sup> On the background to the deliberations, see Seventh African Development Forum, Acting on Climate Change for Sustainable Development in Africa, Oct. 10-15, 2010, *Private Sector Response to Climate Change, Issues Paper No. 11*, <http://www.uneca.org/adfvii/documents/IssuePaper11Private-sector-response-to-climate-change.pdf> (discussing several methods through which the private sector can engage in climate change mitigation efforts in Africa).

<sup>55</sup> See *Consensus Statement*, *supra* note 39, at 4.

<sup>56</sup> *Id.*

<sup>57</sup> *Id.*

<sup>58</sup> *Id.*

<sup>59</sup> On the background to the deliberations of these subjects, see Seventh African Development Forum, Acting on Climate Change for Sustainable Development in Africa, Oct. 10-15, 2010, *Climate Change, Agriculture, and Food Security, Issues Paper No. 2*, <http://www.uneca.org/adfvii/documents/IssuePaper2ClimateChangeAgricultureandFoodSecurity.pdf> (calling for a paradigm shift that prioritizes agriculture and food security in sustainable development efforts); see also Seventh African Development Forum, Acting on Climate



Change for Sustainable Development in Africa, Oct. 10-15, 2010, *Climate Change, Economic Growth, and Poverty Reduction in Africa, Issues Paper No. 12*, <http://www.uneca.org/adfvii/documents/IssuesPaper12CCEconomicGrowth-andPovertyReduction-inAfrica.pdf> (exploring two issues: 1) the way in which climate change affects economic activity and efforts at poverty reduction; and 2) the challenges associated with managing climate change); see also Seventh African Development Forum, Acting on Climate Change for Sustainable Development in Africa, Oct. 10-15, 2010, *Climate Change and Infrastructure Development, Issues Paper No. 8*, <http://www.uneca.org/adfvii/documents/IssuePaper8ClimateChange-andInfrastructureDevelopment.pdf> (identifying investment initiatives to strength Africa's infrastructure and helping to achieve MDGs).

<sup>60</sup> See *Consensus Statement*, *supra* note 39, at 9.

<sup>61</sup> *Id.*

<sup>62</sup> See *id.* at 10.

<sup>63</sup> The Program, launched on July 21, 2010 (on the sidelines of the 15th Ordinary Session of the AU Assembly, Kampala, Uganda, 19-27 July 2010), is a joint initiative of the AU Commission, the AfDB, and the New Partnership for Africa's Development ("NEPAD") Secretariat. It focuses on development of transportation, energy, information and communication technologies, as well as trans-boundary water basins. For in-depth insights into the Program, see AfDB, AUC & NEPAD, *Programme for Infrastructure Development in Africa (PIDA): Concept Note*, <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-related-Procurement/PIDA%20-%20Concept%20Note.pdf> (last visited Mar. 12, 2011) (describing "the context in which the initiative was formulated, the issues it addresses and approaches"); see also AfDB, AUC & NEPAD, *Programme for Infrastructure Development in Africa (PIDA): General Terms of Reference*, <http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-related-Procurement/PIDA%20-%20General%20Terms%20of%20Reference.pdf> (last visited Mar. 12, 2011).

<sup>64</sup> See *Consensus Statement*, *supra* note 39, at 10.

<sup>65</sup> For background to the deliberations, see Seventh African Development Forum, Acting on Climate Change for Sustainable Development in Africa, Oct. 10-15, 2010, *Climate Change and Human Development, Issues Paper No. 3*, <http://www.uneca.org/adfvii/documents/IssuePaper3CC-HD.pdf>; see also Samuel Frankhauser & Guido Schmidt-Traub, *From Adaptation to Climate-Resilient Development: The Costs of Climate-Proofing the Millennium Development Goals in Africa*, CTR. FOR CLIMATE CHANGE ECON. & POLICY, GRANTHAM RESEARCH INST. ON CLIMATE CHANGE & THE ENV'T (Feb. 2010), [http://www.ccecep.ac.uk/Publications/Policy/docs/PPFrankhauseretal\\_costs-climate-proofing.pdf](http://www.ccecep.ac.uk/Publications/Policy/docs/PPFrankhauseretal_costs-climate-proofing.pdf); ISATOU GAYE, UNECA, *GENDER AND CLIMATE CHANGE: WOMEN MATTER* (2009), <http://www.uneca.org/sdd/documents/gender-and-climate-change.pdf>; William Westermeyer, *Observing the Climate for Development*, 2 CLIMATE & DEV. 276 (2010), <http://www.uneca.org/adfvii/documents/Resoures/GCOS%20Westermeyer%20-%20Observing%20the%20Climate%20for%20Development.pdf>.

<sup>66</sup> See *Consensus Statement*, *supra* note 39, at 8.

<sup>67</sup> *Id.*

<sup>68</sup> *Id.*

<sup>69</sup> For a concise background to the deliberations on this subject, see Seventh African Development Forum, Acting on Climate Change for Sustainable Development in Africa, Oct. 10-15, 2010, *Governance for Peace and Security in a Changing Climate, Issues Paper No. 6*, <http://www.uneca.org/adfvii/documents/IssuePaper6GovernanceforPeaceandSecurity.pdf>.

<sup>70</sup> See *Consensus Statement*, *supra* note 39, at 7.

<sup>71</sup> *Id.*

<sup>72</sup> Protocol Relating to the Establishment of the Peace and Security Council of the African Union, Jul. 10, 2002, (entered into force Dec. 26, 2003), [http://www.africa-union.org/root/au/Documents/Treaties/Text/Protocol\\_peace%20and%20security.pdf](http://www.africa-union.org/root/au/Documents/Treaties/Text/Protocol_peace%20and%20security.pdf).

<sup>73</sup> See *Consensus Statement*, *supra* note 39, at 7.

<sup>74</sup> For a background to the deliberations on this critical subject, see Seventh African Development Forum, Acting on Climate Change for Sustainable Development in Africa, Oct. 10-15, 2010, *Climate Change and Ecosystem Sustainability, Issues Paper No. 9*, <http://www.uneca.org/adfvii/documents/IssuesPaper9CCandEcosystem.pdf>.

<sup>75</sup> See *Consensus Statement*, *supra* note 39, at 7.

<sup>76</sup> *Id.* at 8.

<sup>77</sup> For a concise background to the deliberations on the subject, see Seventh African Development Forum, Acting on Climate Change for Sustainable Development in Africa, Oct. 10-15, 2010, *Financing Climate Change Mitigation and Adaptation Actions, Issues Paper No. 7*, <http://www.uneca.org/adfvii/documents/IssuePaper7Financing-climate-change-adaptation.pdf>; see also AFR. PROGRESS PANEL, *FINANCE FOR CLIMATE-RESILIENT DEVELOPMENT IN AFRICA: AN*

AGENDA FOR ACTION FOLLOWING THE COPENHAGEN CONFERENCE (2010), [http://www.africaprogresspanel.org/files/5212/8352/2823/20101407-Finance\\_for\\_climate\\_resilient\\_development\\_FINAL.pdf](http://www.africaprogresspanel.org/files/5212/8352/2823/20101407-Finance_for_climate_resilient_development_FINAL.pdf); UNECA & APF, *Financing Climate Change Adaptation and Mitigation in Africa: Key Issues and Options for Policy Makers and Negotiators*, [http://www.uneca.org/adfvii/documents/FINALPolicyBrief\\_FinancingCC130509.pdf](http://www.uneca.org/adfvii/documents/FINALPolicyBrief_FinancingCC130509.pdf) (last visited Mar. 15, 2011).

<sup>78</sup> See *Consensus Statement*, *supra* note 39, at 5, 10.

<sup>79</sup> For a concise background to the deliberations on the subject, see Seventh African Development Forum, Acting on Climate Change for Sustainable Development in Africa, Oct. 10-15, 2010, *Climate Risk Management: Monitoring, Assessment, Early Warning, and Response, Issues Paper No. 4*, <http://www.uneca.org/adfvii/documents/IssuePaper4ClimateRiskManagementMonitoringAssessmentEarly.pdf>.

<sup>80</sup> See *Consensus Statement*, *supra* note 39, at 6-7.

<sup>81</sup> *Id.* at 6.

<sup>82</sup> *Id.* at 6, 10.

<sup>83</sup> For background to the deliberations, see Seventh African Development Forum, Acting on Climate Change for Sustainable Development in Africa, Oct. 10-15, 2010, *Science, Technology, Innovation, and Capacity Building for Addressing Climate Change, Issues Paper No. 10* [hereinafter *Science & Technology Issues Paper*], <http://www.uneca.org/adfvii/documents/IssuePaper10Science-technology-innovation-and-capacity-building.pdf>.

<sup>84</sup> See *Consensus Statement*, *supra* note 39, at 7.

<sup>85</sup> *Id.* at 8.

<sup>86</sup> *Id.* at 3.

<sup>87</sup> *Id.*

<sup>88</sup> For background to the deliberations, see *Science & Technology Issues Paper*, *supra* note 83.

<sup>89</sup> See *Consensus Statement*, *supra* note 39, at 5.

<sup>90</sup> *Id.*

<sup>91</sup> See, e.g., African Commission on Human and Peoples' Rights, Resolution on Climate Change and Human Rights and the Need to Study its Impact on Africa, ACHPR/Res153(XLVI)09 (Nov. 25, 2009), [http://www.achpr.org/english/resolutions/resolution153\\_en.htm](http://www.achpr.org/english/resolutions/resolution153_en.htm); *Analysis of the final version of Kenya's R-PP*, FOREST CARBON P'SHIP, [http://www.forestcarbonpartnership.org/fcp/sites/forestcarbonpartnership.org/files/Documents/PDF/Oct2010/Completeness%20check\\_%20Kenya%27s%20R-PP.pdf](http://www.forestcarbonpartnership.org/fcp/sites/forestcarbonpartnership.org/files/Documents/PDF/Oct2010/Completeness%20check_%20Kenya%27s%20R-PP.pdf) (last visited Mar. 12, 2011).

<sup>92</sup> See *African Leaders Call for the African Green Fund*, AfDB (Dec. 10, 2010) <http://www.afdb.org/en/news-events/article/african-leaders-call-for-the-africa-green-fund-7595/> (citing various African leaders attending the Cancun COP-16 conference, who called for the early establishment of the Fund); see also, *AfDB President Underscores Importance of Africa Green Fund at Cancun Climate Conference*, AfDB (Dec. 10, 2010), <http://www.afdb.org/en/news-events/article/afdb-president-underscores-importance-of-africa-green-fund-at-cancun-climate-conference-7597/> (citing the AfDB President, Donald Kaberuka, as having, in his statement delivered at the High-Level segment of the Cancun Climate Conference, underscored the importance of AfDB establishing the AGF).

<sup>93</sup> According to a recent World Bank study, during the first eleven months of 2009 alone, the world witnessed farmland deals covering at least 110 million acres. More than seventy percent of the deals were in Africa, with the Sudan, Mozambique, and Ethiopia among the key African nations transferring millions of acres to foreign investors. See KLAUS DEININGER ET AL., WORLD BANK, *RISE IN GLOBAL INTEREST IN FARMLAND: CAN IT YIELD SUSTAINABLE AND EQUITABLE BENEFITS?* 156, at tbl.A2.1 (2010), [http://siteresources.worldbank.org/INTARD/Resources/ESW\\_Sept7\\_final\\_final.pdf](http://siteresources.worldbank.org/INTARD/Resources/ESW_Sept7_final_final.pdf); see also Neli MacFarquhar, *African Farmers Displaced as Investors Move In*, N.Y. TIMES (Dec. 21, 2010), [http://www.nytimes.com/2010/12/22/world/africa/22mali.html/?\\_r=2&src=mtwt&wt=mnytimes](http://www.nytimes.com/2010/12/22/world/africa/22mali.html/?_r=2&src=mtwt&wt=mnytimes) (reporting on the agonies of African farmers, who continually lose their arable land).

<sup>94</sup> See LORENZO COTULA ET AL., IFAD, IIED, FAO, *LAND GRAB OR DEVELOPMENT OPPORTUNITY? AGRICULTURAL INVESTMENT AND INTERNATIONAL LAND DEALS IN AFRICA* (2009), [http://www.ifad.org/pub/land/land\\_grab.pdf](http://www.ifad.org/pub/land/land_grab.pdf); see also Olivier De Schutter, Op-Ed., *How Not to Think About Land Grabbing*, INT'L LAND COALITION (Jan. 12, 2011), <http://www.commercialpressuresonland.org/opinion-pieces/how-not-think-about-land-grabbing> (arguing that ceding land to foreign investors for large-scale plantation farming is counter-productive as it results in further impoverishment and food insecurity for the affected local populations); Olivier De Schutter, Op-Ed., *Food Crises: G20 Needs Architects, Not Fire-fighters*, PROJECT SYNDICATE (Jan. 28, 2011), <http://www.project-syndicate.org/commentary/deschutter3/English> (urging protection of access to land, which, he argues, is constantly threatened or violated by land grab through foreign direct investments in agriculture); Olivier De Schutter,

UN Special Rapporteur on the Right to Food, *Access to Land and the Right to Food*, Report presented to the 65th General Assembly of the United Nations, UN Doc. A/65/281 (Aug. 11, 2010), [http://www.srfood.org/images/stories/pdf/officialreports/20101021\\_access-to-land-report\\_en.pdf](http://www.srfood.org/images/stories/pdf/officialreports/20101021_access-to-land-report_en.pdf) (noting the relationship between access to land and realization of the right to food); Olivier De Schutter, UN Special Rapporteur on the Right to Food, *Large-Scale Land Acquisitions and Leases: A Set of Minimum Principles and Measures to Address the Human Rights Challenge*, Report presented to the UN Human Rights Council, UN Doc. A/HRC/13/33/Add.2 (Dec. 28, 2009), [http://www.srfood.org/images/stories/pdf/officialreports/20100305\\_a-hrc-13-33-add2\\_land-principles\\_en.pdf](http://www.srfood.org/images/stories/pdf/officialreports/20100305_a-hrc-13-33-add2_land-principles_en.pdf) (noting how human rights violations can be addressed in the context of the global land rush).

<sup>95</sup> See Genet Mersha, *International Agricultural Land Deals Award Ethiopian Virgin Lands to Foreign Companies*, ABUGIDA INFO (Aug. 13, 2009), <http://farmlandgrab.org/6843>.

<sup>96</sup> See Nuhu Ribadu, *Challenging Corruption in Africa: Beyond the Blank Projections*, CTR. FOR GLOBAL DEVELOPMENT (Aug. 23, 2010), <http://www.cgdev.org/content/publications/detail/1424376>; Stephanie Hanson, *Corruption in Sub-Saharan Africa*, COUNCIL ON FOREIGN RELATIONS (Aug. 6, 2009), [http://www.cfr.org/publication/19984/corruption\\_in\\_subsaharan\\_africa.html](http://www.cfr.org/publication/19984/corruption_in_subsaharan_africa.html); Gbenga Lawal, *Corruption and Development in Africa: Challenges for Political and Economic Change*, 2 HUMANITY & SOC. SCI. J. 1 (2007), <http://idosi.org/hssj/hssj2%281%2907/1.pdf>.

<sup>97</sup> See TRANSPARENCY INT'L, GLOBAL CORRUPTION REPORT 2010: CORRUPTION AND CLIMATE CHANGE (2010) [hereinafter GLOBAL CORRUPTION REPORT 2010], <http://www.transparency.org/publications/gcr>; TRANSPARENCY INT'L, GLOBAL CORRUPTION PERCEPTION INDEX 2010 (2010), [http://www.transparency.org/policy\\_research/surveys\\_indices/cpi/2010/in\\_detail](http://www.transparency.org/policy_research/surveys_indices/cpi/2010/in_detail).

<sup>98</sup> See Frazier Potani, *Corruption Fuelling Climate Change*, AFR. NEWS (Apr. 6, 2010), [http://www.africanews.com/site/Corruption\\_fuelling\\_climate\\_change/list\\_messages/31129](http://www.africanews.com/site/Corruption_fuelling_climate_change/list_messages/31129).

<sup>99</sup> See GLOBAL CORRUPTION REPORT 2010, *supra* note 97; see also M.S. Abdulkadir et al., *Africa's Slow Growth and Development: An Overview of Selected Countries*, 16 EUROPEAN J. SOCIAL SCI. 619 (2010), [http://www.euro-journals.com/ejss\\_16\\_4\\_12.pdf](http://www.euro-journals.com/ejss_16_4_12.pdf).

<sup>100</sup> According to the latest release from the UN Development Program ("UNDP"), thirty-five of the forty-two countries with "low human development" are in Africa. See UNDP, HUMAN DEVELOPMENT REPORT 2010: THE REAL WEALTH OF NATIONS: PATHWAYS TO HUMAN DEVELOPMENT (2010), <http://hdr.undp.org/en/reports/global/hdr2010/chapters/en/>.

<sup>101</sup> See FAO, *supra* note 6.

<sup>102</sup> See, e.g., *States, Politics and Development in Africa*, FUTURE AGRICULTURES, [http://www.future-agricultures.org/index.php?option=com\\_content&view=article&id=282:states-politics-and-development-in-africa&catid=68:policy-processes&Itemid=521](http://www.future-agricultures.org/index.php?option=com_content&view=article&id=282:states-politics-and-development-in-africa&catid=68:policy-processes&Itemid=521) (last visited Jan. 30, 2011); Matthew Lockwood, *States of Development*, PROSPECT MAGAZINE, Nov. 20, 2005; Richard Dowden, *The Captured State*, PROSPECT MAGAZINE, Aug. 28, 2005.

<sup>103</sup> See, e.g., *Climate Airwaves*, AFR. ADAPT, <http://www.africa-adapt.net/aa/ProjectOverview.aspx?PID=%2Ff%2BhliQ1hY8%3D> (last visited Jan. 30, 2011); Fabio Pitaluga, *Finding a Voice for Indigenous Peoples at COP16*, BLOGS. WORLD BANK.ORG (Oct. 20, 2010, 5:25 PM), <http://blogs.worldbank.org/climatechange/finding-voice-indigenous-peoples-cop16>.

<sup>104</sup> See, e.g., PASTORALIST CONSULTANTS INT'L, FINDING THE WAY FORWARD: REPORTING FROM A GATHERING OF PASTORALISTS AT KOORA, KAJIADO DISTRICT, KENYA 13 (Paul Sullivan ed., 2008), <http://www.pastoralists.org/media/publication-pdf-files/Finding%20the%20way%20forward%20lowres.pdf> (citing an elder from the Gabra pastoralist community of Northern Kenya, who remarked: "Rain comes from God and there is nothing we can do when the rains fail"); on skepticism at the international level, see also, e.g., Martin Keeley, *Climate Change 'Is the Norm'*, BBC NEWS (Dec. 6, 2004), <http://news.bbc.co.uk/2/hi/science/nature/4066189.stm> (attributing climate change to the unsentimental behavior of Mother Nature); Frederick Seitz & Robert Jastrow, *Do People Cause Global Warming?*, ENV. & CLIMATE NEWS (Dec. 1, 2001), [http://www.heartland.org/policybot/results/812/Do\\_people\\_cause\\_global\\_warming.html](http://www.heartland.org/policybot/results/812/Do_people_cause_global_warming.html) (claiming that human CO<sub>2</sub> emissions only marginally contribute to global warming); see also Fred Singer & Dennis T. Avery, *The Physical Evidence of Earth's Unstoppable 1,500-Year Climate Cycle*, NAT'L CTR. FOR POLICY ANALYSIS (Sep. 2005), <http://www.ncpa.org/pdfs/st279.pdf> (claiming global warming is a natural phenomenon with little contribution from human greenhouse gas pollution); Craig Isdo, *A Science-Based Rebuttal to the Testimony of Al Gore Before the United States Senate Environmental and Public Works Committee*, CTR. FOR THE STUDY OF CARBON DIOXIDE & GLOBAL CHANGE (May 2007), [http://www.heartland.org/custom/semod\\_policybot/pdf/21345.pdf](http://www.heartland.org/custom/semod_policybot/pdf/21345.pdf).

<sup>105</sup> See *Consensus Statement*, *supra* note 39, at 2.

<sup>106</sup> See *Report on Climate Change and Development*, *supra* note 2, at 3.

<sup>107</sup> See, e.g., *Poor Man's Burden*, DOWN TO EARTH (Jan. 15, 2011), <http://www.downtoearth.org.in/node/2784>; De Boer, *EU 2020 Climate Targets 'A Piece of Cake'*, EURACTIV.COM (Apr. 22, 2010), <http://www.euractiv.com/en/climate-environment/de-boer-eu-2020-climate-targets-piece-cake-news-448843>; Lusekelo Philemon, *'Rich Nations' Pledge on Climate Change Unfulfilled*, IPPMEDIA (Nov. 18, 2010), <http://www.ippmedia.com/frontend/?l=23201>.

<sup>108</sup> *Poor Man's Burden*, *supra* note 107.

<sup>109</sup> Arguably, by financing the numerous land deals, which have resulted in millions of Africans continually losing their arable lands to private investors, the World Bank is fuelling climate change on the continent. See MacFarquhar, *supra* note 93.

<sup>110</sup> For instance, on April 9, 2010, the World Bank granted a loan (of USD 3.75 billion) to the South African electricity utility, Eskom, to develop the world's fourth largest coal-fired power plant. This decision did not go well with environmental activists, who rightly argued that it clearly conflicts with the global resolve to fight against climate change. See Annika Lindorsson Krugel, *The World Bank vs Climate Change, Poverty and Corruption* (Apr. 12, 2010), <http://www.suite101.com/content/renewable-energy-given-the-boot-as-leading-party-pockets-profit-a226337>.

<sup>111</sup> The CTF, which finances scaled-up demonstration, deployment, and transfer of low-carbon technologies with significant potential for reducing emissions, is largely funded by the governments of Australia, France, Germany, Japan, Spain, Sweden, the United Kingdom, and the United States. It is expected to channel (through the AfDB) up to USD 625 million for clean technology projects in Africa. See AfDB, *Status of Involvement of the Bank in the Climate Investment Funds* (Jul. 2010), at 1-3, [hereinafter *Status of AfDB Involvement in CIFs*], [http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Status%20of%20Involvement%20of%20the%20Bank%20in%20the%20Climate%20Investment%20Funds%20\(CIFs\)%20-%2009%2009%202010%5B1%5D.pdf](http://www.afdb.org/fileadmin/uploads/afdb/Documents/Project-and-Operations/Status%20of%20Involvement%20of%20the%20Bank%20in%20the%20Climate%20Investment%20Funds%20(CIFs)%20-%2009%2009%202010%5B1%5D.pdf); For in-depth insights, see *Clean Technology Fund*, CLIMATE FUNDS UPDATE, <http://www.climatefundsupdate.org/listing/clean-technology-fund> (last visited Nov. 28, 2010).

<sup>112</sup> The SCF, which finances various targeted programs to pilot new climate change action projects, with a possibility of scaling up, has three components: (1) the Pilot Program for Climate Resilience, designed to support countries to scale up climate action and transformational change by integrating climate resilience in their national development plans (currently benefiting Mozambique, Niger, and Zambia); (2) the Forest Investment Program, designed to significantly reduce emissions from deforestation and forest degradation and promote improved sustainable management of forests (currently benefiting Burkina Faso, the Democratic Republic of Congo, Ghana, and Liberia); and (3) the Scaling Up Renewable Energy Program, aimed at piloting energy sector transformation projects (set to benefit Ethiopia, Kenya, and Mali). For in-depth insights into the Fund, see *Strategic Climate Fund*, CLIMATE FUNDS UPDATE, <http://www.climatefundsupdate.org/listing/strategic-climate-fund> (last visited Nov. 28, 2010). For insights into funding in Africa, see *Status of AfDB Involvement in CIFs*, *supra* note 111, at 3-4.

<sup>113</sup> The Kyoto Protocol Adaptation Fund, which finances adaptation projects in developing countries that are parties to the Kyoto Protocol, was established at COP-7 in 2001 and operationalized in 2009. Administered by an independent Board, it is funded with a share of proceeds from the Clean Development Mechanism ("CDM") projects, as well as voluntary pledges by donor governments. Africa's benefit currently stands at 59.8% of the total project expenditure of the Fund. Senegal's "Adaptation to Coastal Erosion in Vulnerable Areas" is one of the two inaugural projects funded by the Fund, the other being Honduras' "Addressing Climate Change Risks on Water Resources." See *Adaptation Fund*, CLIMATE FUNDS UPDATE, <http://www.climatefundsupdate.org/listing/adaptation-fund> (last visited Nov. 28, 2010).

<sup>114</sup> The CBFF, was "set up in June 2008 to take early action to save forests in the Congo Basin," Africa's biggest carbon sink. While complementing existing activities, it aims at: 1) supporting "transformative and innovative proposals which will develop the capacities of peoples and institutions to enable them to manage their forests;" 2) helping "local communities find livelihoods that are consistent with forest conservation;" and 3) reducing the rate of deforestation. Financed by the British and Norwegian governments, it benefits the ten Central African Forests Commission member countries: Burundi, Cameroon, Chad, Congo, the Central African Republic ("CAR"), the Democratic Republic of Congo ("DRC"), Equatorial Guinea, Gabon, Rwanda, and Sao Tome and Principe. For further insights, see *Congo Basin Forest Fund*, CLIMATE FUNDS UPDATE, <http://www.climatefundsupdate.org/listing/congo-basin-forest-fund> (last visited Nov. 28, 2010).



<sup>115</sup> The FCPF, which was established in December 2007 (and operationalized in June 2008), is intended “to assist developing countries in their efforts to reduce emission from deforestation and land degradation.” Africa’s benefit share stands at 25.5% of the Facility’s total projects expenditure. So far, it is benefiting fourteen African countries (Cameroon, CAR, Congo, the DRC, Equatorial Guinea, Ethiopia, Gabon, Ghana, Kenya, Liberia, Madagascar, Mozambique, Tanzania, and Uganda). See *Forest Carbon Partnership Facility*, Climate Funds Update, <http://www.climatefundsupdate.org/listing/forest-carbon-partnership-facility> (last visited Nov. 28, 2010).

<sup>116</sup> The GEF Trust Fund, which is primarily funded by the United States, Japan, Germany, the UK, France, and Canada, has a climate change focal area which supports, *inter alia*, renewable energy projects, energy efficient technologies, new low-emission technologies, and sustainable transportation. In its fourth phase, covering the period 2006-2010, 14.1% of the total projects were in Africa. The continent is expected to benefit even more in the fifth phase, 2010-2014. See *Global Environment Facility Trust Fund – Climate Change Focal Area*, CLIMATE FUNDS UPDATE, <http://www.climatefundsupdate.org/listing/gef-trust-fund> (last visited Nov. 28, 2010).

<sup>117</sup> The GCCA is an initiative of the European Union (“EU”) which aims at building a new alliance between the EU and poor developing countries most affected by, and with the least capacity to deal with, climate change, Africa is the biggest beneficiary of the initiative, taking home about 69.2% of the total project expenditure. So far, the initiative has benefited eight African countries (Mali, Mauritius, Rwanda, Senegal, Seychelles, and Tanzania). For insights, see *Global Climate Change Alliance*, CLIMATE FUNDS UPDATE, <http://www.climatefundupdate.org/listing/global-climate-change-alliance> (last visited Nov. 28, 2010).

<sup>118</sup> The LDCF, which aims at addressing the special needs of LDCs, “which are especially vulnerable to the adverse impacts of climate change,” including preparation and implementation of National Adaptation Programmes of Action, was proposed at COP-7 and operationalized at COP-8 (New Delhi, India, Oct. 23 – Nov. 1, 2002). It is managed by the Global Environment Facility (“GEF”), the multilateral environmental initiative that brings together over 180 UN Member States and ten partner institutions. So far, it has benefited over twenty-five African countries, including Angola, Burkina Faso, Burundi, the CAR, Cape Verde, Chad, Comoros, Congo, Djibouti, the DRC, Eritrea, Ethiopia, the Gambia, Guinea Bissau, Lesotho, Liberia, Malawi, Mali, Niger, Rwanda, Sierra Leone, Senegal, the Sudan, Tanzania, Uganda, and Zambia. For insights into the Fund, see *Least Development Countries Fund*, CLIMATE FUNDS UPDATE, <http://www.climatefundsupdate.org/listing/least-developed-countries-fund> (last visited Nov. 28, 2010). For insights into the details of funding, see *Funded Projects*, CLIMATE FUNDS UPDATE, <http://www.climatefundupdate.org/projects> (last visited Nov. 28, 2010).

<sup>119</sup> The SCCF, whose establishment was proposed at COP-7, was operationalized at COP-8. Managed by GEF, it funds “long-term adaptation measures that increase the resilience of [developing countries’] national development sectors to the impacts of climate change.” Africa currently takes home about 26.5% of the total project expenditure, benefiting, among others, Egypt, Ghana, and Kenya. See *Special Climate Change Fund*, CLIMATE FUNDS UPDATE, <http://www.climatefundsupdate.org/listing/special-climate-change-fund> (last visited Nov. 28, 2010).

<sup>120</sup> See Cassandra Sweet, *Nations Approve Cancun Climate Package*, WALL ST. J. (Dec. 11, 2010), <http://online.wsj.com/article/SB10001424052748703518604576012922254366218.html>.

<sup>121</sup> African leaders generally feel that the continent is not enjoying equitable access to the funds, especially those funded under the Clean Development Mechanism (“CDM”). The leaders blame this on non-inclusion (in the CDM financing package) of emissions from agriculture and other land use practices, which arguably form important parts of the continent’s economy. See Ramesh Jaura, *Africa Paves the Way for Climate for Development*, INDEPTHNEWS (Oct. 23, 2010), <http://www.indepthnews.net/news/news.php?key1=2010-10-23%2017:07:57&key2=1> (arguing that while Brazil, Mexico, India, and China enjoy hundreds of projects funded under the CDM, Africa has only a handful of such projects).

<sup>122</sup> See AU-ECA-AfDB, Press Release, ECA-AUC-AfDB Joint Secretariat Launch ClimDev-Afr. at 7th Afr. Dev. Forum (Oct. 13, 2010), <http://www.uneca.org/adfvii/pressrelease72.asp>.

<sup>123</sup> See *First Africa Energy Week Highlights Importance of Clean Energy*, AfDB (Nov. 3, 2010), <http://www.afdb.org/en/news-events/article/first-africa-energy-week-highlights-importance-of-clean-energy-7401/>. See also Conference of African Ministers in Charge of Energy Maputo, Mozam., Nov. 1-5 2010, *Resolution on the “All Africa Energy Week,”* AU/MIN/Energy/Res. 2 (Nov. 5, 2010), [http://www.au.int/en/dp/ie/sites/default/files/Resolution\\_on\\_ALL\\_AFRICA\\_ENERGY\\_WEEK\\_\(final\\_version\\_9\\_-11-10\).doc](http://www.au.int/en/dp/ie/sites/default/files/Resolution_on_ALL_AFRICA_ENERGY_WEEK_(final_version_9_-11-10).doc).

<sup>124</sup> See *AfDB Launches the African Carbon Support Project*, AfDB (Nov. 11, 2010), <http://www.afdb.org/en/news-events/article/afdb-launches-african-carbon-support-project-7432/>.

<sup>125</sup> The event provided the “opportunity to share with stakeholders how MDBs are collaborating to expand access to international financing and bolster investments in climate change” adaptation and mitigation actions. See *AfDB Collaborates with MDBs on Climate Finance Innovation*, AfDB (Dec. 10, 2010), <http://www.afdb.org/en/news-events/article/afdb-collaborates-with-mdb-on-climate-finance-innovation-7588/>.

<sup>126</sup> For instance, see Alister Doyle, *Analysis: Climate Talks – 18 Years, Too Little Action?*, REUTERS (Dec. 17, 2010), <http://www.reuters.com/article/idUSTRE6BB0DS20101212>; John Vidal, *Does the Cancun Agreement Show Climate Leadership?*, GUARDIAN (Dec. 13, 2010), <http://www.guardian.co.uk/environment/2010/dec/13/climate-leadership-cancun>.

<sup>127</sup> See John M. Broder, *Climate Talks End With Modest Deal on Emissions*, N.Y. TIMES (Dec. 11, 2010), <http://www.nytimes.com/2010/12/12/science/earth/12climate.html>; Russell Blinch & Chris Buckley, *Climate Talks End With Modest Steps, No Kyoto Deal*, REUTERS (Dec. 12, 2010), <http://www.reuters.com/article/idUSTRE6AR1OI20101212>.

<sup>128</sup> See Sweet, *supra* note 120.

<sup>129</sup> See, e.g., PAN AFR. JUSTICE ALLIANCE, <http://www.pacja.org> (last visited Jan. 30, 2011); Hanry Neondo, *African CSOs to Lobby Over Gaps in Climate Change Regimes*, ASNS NEWS (Mar. 30, 2008), [http://africasciencenews.org/asns/index.php/News/Latest/administrator/index.php?option=com\\_content&task=view&id=251&Itemid=2](http://africasciencenews.org/asns/index.php/News/Latest/administrator/index.php?option=com_content&task=view&id=251&Itemid=2); *Strengthening Climate Policy Networks in Africa, Asia, Latin America and the Pacific*, SOUTHERN VOICES CAPACITY BUILDING PROGRAMME (2010), <http://careclimatechange.org/files/policy/SouthernVoices2010.pdf>.

<sup>130</sup> See, e.g., *Africa Enterprise Challenge Fund: Renewable Energy and Adaptation to Climate Technologies (REACT)*, CLIMATE FINANCE OPTIONS, <http://www.climatefinanceoptions.org/cfo/node/226> (last visited Jan. 30, 2011); John Vidal, *Government to Fund Private Sector Renewable Energy Schemes for Africa, Asia*, GUARDIAN (Nov. 18, 2010), <http://www.guardian.co.uk/global-development/2010/nov/18/andrew-mitchell-renewable-energy-private-sector>; Liane Schalatek, *EU Bank Creates New Climate Fund*, CLIMATE EQUITY (May 13, 2010), <http://climateequity.org/2010/05/13/eu-bank-creates-new-climate-fund/>.

<sup>131</sup> The Fund provides competitive grants and interest-free loans to African entrepreneurs who wish to implement innovative climate change adaptation projects in agriculture, financial services, renewable energy, and technology sectors. It is funded by the Australian Government Aid Program, the Consultative Group to Assist the Poor, the UK Department for International Development, the International Fund for Agricultural Development, and the Netherlands Ministry of Foreign Affairs, and managed by the KPMG Development Advisory Services. It is a special partnership initiative of the Nairobi-based Alliance for a Green Revolution in Africa, which was established in 2006 by the Rockefeller Foundation and the Bill & Melinda Gates Foundation to improve agricultural productivity and the well-being of small-holder farmers in Sub-Saharan Africa. For details, see AECF FUNDING INNOVATION FOR BUS. IN AFR., <http://www.aecfafrica.org> (last visited Jan. 29, 2011).

<sup>132</sup> Conference of the Parties to the Convention on Biological Diversity, Tenth Meeting, Nagoya, Japan, October 18-29, 2010, *Access to Genetic Resources and Fair and Equitable Utilization of Benefits Arising from their Utilization* (Oct. 29, 2010), UNEP/CBD/COP/DEC/X/1, *opened for signature* Feb. 2, 2011, <http://treaties.un.org/doc/Treaties/2010/11/20101127%2002-08%20PM/Ch-XXVII-8-b.pdf> (adopting the instrument more commonly known as the Nagoya Protocol).

## ENDNOTES: IMPLEMENTING A RENEWABLE ENERGY FEED-IN TARIFF IN SOUTH AFRICA: THE BEGINNING OF A NEW DAWN

*continued from page 49*

<sup>19</sup> Jonathan Faurie, *Will Proposed Feed-in-Tariffs be Sufficient to Kickstart New Energy Economy?*, ENGINEERING NEWS ONLINE (Jan. 30, 2009), <http://www.engineeringnews.co.za/article/will-proposed-feedin-tariffs-be-sufficient-to-kickstart-newenergy-economy-2009-01-30>.

<sup>20</sup> ALLIANCE FOR RENEWABLE ENERGY, <http://www.allianceforrenewableenergy.org/why-reps.html> (last visited Mar. 12, 2011).



<sup>21</sup> PAUL GIPE, RENEWABLE ENERGY POLICY MECHANISMS 1 (2006), <http://www.wind-works.org/FeedLaws/RenewableEnergyPolicyMechanismsbyPaulGipe.pdf>.

<sup>22</sup> *Id.*

<sup>23</sup> REFIT, *supra* note 1, at 1.

<sup>24</sup> NERSA's Feed-in Tariff: Will It Work for SA?, 25 DEGREES IN AFRICA (Mar. 2009), [http://www.25degrees.net/index.php?option=com\\_zine&view=article&id=295:nersas-feed-in-tariff-will-it-work-for-sa&Itemid=58](http://www.25degrees.net/index.php?option=com_zine&view=article&id=295:nersas-feed-in-tariff-will-it-work-for-sa&Itemid=58).

<sup>25</sup> DME WHITE PAPER, *supra* note 12.

<sup>26</sup> NAT'L ENERGY REGULATOR OF S. AFR., SOUTH AFRICA RENEWABLE ENERGY FEED-IN TARIFF (REFIT) REGULATORY GUIDELINES 16 (2009).

<sup>27</sup> *Id.* A terawatt hour is an electrical unit equal to one trillion ( $10^{12}$ ) watts (1,000,000 megawatts) used for one hour.

<sup>28</sup> Gipe, *supra* note 18.

<sup>29</sup> *Id.*

<sup>30</sup> Sovacool, *supra* note 14.

<sup>31</sup> Wilson Rickerson et al., *If The Shoe FITs: Using Feed in Tariffs to Meet US Renewable Electricity Targets*, ELECTRICITY J., May 2007, at 79.

<sup>32</sup> Sovacool, *supra* note 14.

<sup>33</sup> REFIT, *supra* note 1, at 4.

<sup>34</sup> *eReact Making Progress in South Africa*, E-PARLIAMENT.NET (Jul. 21, 2008), <http://www.e-parl.net/eparliament/general.do?action=news&id=125>.

<sup>35</sup> Ruth Rabinowitz, *REFIT and Incentives Bills* (Dec. 18, 2008) (on file with author).

<sup>36</sup> *eReact Making Progress in South Africa*, *supra* note 34.

<sup>37</sup> *Id.*

<sup>38</sup> Rabinowitz, *supra*, note 35.

<sup>39</sup> *Id.*

<sup>40</sup> See *id.*; Gipe, *supra* note 18; *eReact Making Progress in South Africa*, *supra* note 34; *Turning Point for 'Green' Energy*, FIN24 (Apr. 2, 2009), <http://www.fin24.com/Business/Turning-point-for-green-energy-20090402>.

<sup>41</sup> REFIT, *supra* note 1, § 3.5(iv).

<sup>42</sup> Kruschen Govender, *Plotting a Future for Renewable Energy in South Africa*, TRADEINVEST S. AFR. (Nov. 24, 2008), [http://www.tradeinvestsa.co.za/feature\\_articles/897480.htm](http://www.tradeinvestsa.co.za/feature_articles/897480.htm).

<sup>43</sup> REFIT, *supra* note 1.

<sup>44</sup> *Id.* at 1.

<sup>45</sup> *Id.*

<sup>46</sup> Sovacool, *supra* note 14.

<sup>47</sup> *Id.*

<sup>48</sup> REFIT, *supra* note 1.

<sup>49</sup> *Id.*

<sup>50</sup> *Id.*

<sup>51</sup> *Id.* § 3.

<sup>52</sup> *Id.* § 3.1.

<sup>53</sup> *Id.* § 3.2.

<sup>54</sup> JANET SAWIN, NATIONAL POLICY INSTRUMENTS: POLICY LESSONS FOR THE ADVANCEMENT & DIFFUSION OF RENEWABLE ENERGY TECHNOLOGIES AROUND THE WORLD 4 (2004), <http://siteresources.worldbank.org/EXTRENEENERGYTK/Resources/5138246-1237906527727/5950705-1239290499336/NationalOPolicies0around0the0World.pdf>.

<sup>55</sup> REFIT, *supra* note 1, § 3.3.

<sup>56</sup> *Id.*

<sup>57</sup> *Id.* § 3.5(ii).

<sup>58</sup> *Id.* § 4.4 ("With the aim of supporting the wider green electricity market

and ensuring flexibility in the market, renewable energy IPPs are permitted to sell power direct to buyers wishing to purchase renewable energy outside of the REFIT.").

<sup>59</sup> *Id.* § 5.5(iii).

<sup>60</sup> *Id.* § 3.5(v).

<sup>61</sup> *Id.* § 3.6.

<sup>62</sup> *Id.* § 4.5.

<sup>63</sup> *Id.*

<sup>64</sup> See generally Randall Spalding-Fecher et al., *The Economics of Energy Efficiency for the Poor—A South African Case Study*, 27 ENERGY 1099 (2002); GILBERT MBESHERUBUSA, *ACTING AGAINST ENERGY POVERTY IN AFRICA* (2009), [http://www.g8energy2009.it/pdf/27.05/Acting\\_against\\_energypoverty\\_and\\_crisis%20in%20Africa-Ram.pdf](http://www.g8energy2009.it/pdf/27.05/Acting_against_energypoverty_and_crisis%20in%20Africa-Ram.pdf).

<sup>65</sup> *Id.*

<sup>66</sup> *Id.*

<sup>67</sup> Agnieszka Flak, *SAfrica's Eskom Granted a 31.3 Pct Tariff Increase*, REUTERS (Jun. 25, 2009), <http://in.reuters.com/article/2009/06/25/eskom-tariffs-idINWEA830620090625>.

<sup>68</sup> Sovacool, *supra* note 13, at 1536.

<sup>69</sup> NERSA CONSULTATION PAPER, *supra* note 10.

<sup>70</sup> REFIT, *supra* note 1.

<sup>71</sup> *Id.* § 5.5(i).

<sup>72</sup> *Id.*

<sup>73</sup> *Id.* § 5.5.

<sup>74</sup> The REFIT regulations do not define "off-grid." But the term "off-grid" is commonly understood as relating to something not connected to a centralized distribution network. See *Off-Grid*, DICTIONARY.COM, <http://dictionary.reference.com/browse/off-grid> (last visited Feb. 7, 2011).

<sup>75</sup> REFIT, *supra* note 1, § 5.7.

<sup>76</sup> Leandi Cameron, *The Case for Including Photovoltaics and Biomass Into REFIT System*, ENGINEERING NEWS (June 26, 2009), <http://www.engineeringnews.co.za/article/the-case-for-including-photovoltaics-and-biomass-into-refit-system-2009-06-26>.

<sup>77</sup> REFIT, *supra* note 1, § 6.4.

<sup>78</sup> See NERSA CONSULTATION PAPER, *supra* note 10, at 4.

<sup>79</sup> REFIT, *supra* note 1, § 7.4.

<sup>80</sup> *Id.*

<sup>81</sup> *Id.* § 7.5.

<sup>82</sup> *Id.*

<sup>83</sup> *Id.* § 7.6.

<sup>84</sup> Terence Creamer, *Green Energy Gets Shot in the Arm With Generous SA Tariff Regime*, ENGINEERING NEWS (Mar. 31, 2009), <http://www.engineeringnews.co.za/article/green-energy-gets-shot-in-the-arm-with-generous-sa-tariff-regime-2009-03-31>.

<sup>85</sup> REFIT, *supra* note 1.

<sup>86</sup> *Id.* § 8.5.

<sup>87</sup> *Id.*

<sup>88</sup> *Id.* § 11.4(iii).

<sup>89</sup> Spalding-Fecher et al., *supra* note 64.

<sup>90</sup> REFIT, *supra* note 1, § 12.

<sup>91</sup> Electricity Regulation Act 4 of 2006 § 42(3) (S. Afr.).

<sup>92</sup> *Id.* § 42(4).

<sup>93</sup> *Id.* § 42(1)-(2).

<sup>94</sup> National Energy Regulator Act 40 of 2004 § 10(3)(4)(a)(b) (S. Afr.).

<sup>95</sup> S. AFR. CONST., Act 108 of 1996, <http://www.info.gov.za/documents/constitution/1996/index.htm>.

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## ENDNOTES: NATIONAL SECURITY IN THE 21ST CENTURY: HOW THE NATIONAL SECURITY COUNCIL CAN SOLVE THE PRESIDENT'S CLIMATE CHANGE PROBLEM *continued from page 55*

<sup>17</sup> See generally HANSEN ET AL., *supra* note 1; FLANNERY, *supra* note 1.

<sup>18</sup> FLANNERY, *supra* note 1, at 161.

<sup>19</sup> See *id.* (questioning the IPCC findings and explaining the likelihood that modeling data is underestimating the actual impacts of climate change, possibly from a lack of understanding about feedback loops).

<sup>20</sup> See, e.g., HANSEN ET AL., *supra* note 1, at 13, 16 (promoting the aggressive pursuance of 350 ppm CO<sub>2</sub> targets in order to avoid irreversible dynamic alterations to climate based on observations of paleoclimate data).

<sup>21</sup> E.g., FLANNERY, *supra* note 1, at 155 (explaining that ten GCMs currently exist in the world, where researchers create global climate modeling systems based on massive data inputs to create computer programs that accurately recre-

ate previous, i.e. known, weather events and climate changes, thereby proving the accuracy of the modeling program to accurately predict future climate changes, and that the leading one is the Hadley Centre in England).

<sup>22</sup> *Id.* at 155-56.

<sup>23</sup> *Id.*

<sup>24</sup> *Id.* at 28-29.

<sup>25</sup> BERNSTEIN ET AL., *supra* note 4, at 45 (providing data from IPCC Special Report on Emissions Scenarios 2000 with projections varying between 1.8°C and 4.0°C).

<sup>26</sup> E.g., FLANNERY, *supra* note 1, at 161 (explaining that CO<sub>2</sub> levels at the end of the last ice age increased by only one hundred ppm yet resulted in 9°F increase in average global surface temperatures).

<sup>27</sup> National Defense Authorization Act for Fiscal Year 2008, 110 Pub. L. 181, 122 Stat. 3 (2008) (codified at 10 U.S.C.S. § 118(g)(2)) (specifying that national security issues include impacts of climate change, specifically mentioning severe weather events impacting both U.S. domestic and foreign responses abroad).

<sup>28</sup> See 10 U.S.C.S. § 118(g)(2) (expressing Congressional belief that increased storm frequency and severity is occurring, straining military capabilities, and threatening military infrastructure); BERNSTEIN ET AL., *supra* note 4, at 13 (projecting a likely increased intense tropical cycles); CNA CORP., NATIONAL SECURITY AND THE THREAT OF CLIMATE CHANGE 6, 32-34 (2007), <http://www.cna.org/sites/default/files/National%20Security%20and%20the%20Threat%20of%20Climate%20Change.pdf> (finding of retired military commanders that the science supports increased tropical storm severity and frequency, which adversely impacts maintenance and stability of ships and fleets).

<sup>29</sup> E.g., FLANNERY, *supra* note 1, at 124-27 (arguing that conflict is not about geographic location in the world or conflicting religious beliefs, but stems from an instinct for survival, which is threatened when resources are scarce, thus leading to increased violence against any perceived threat).

<sup>30</sup> E.g., DAVID TITLEY, Rear Admiral, United States Navy, Presentation at the American Meteorological Society Climate Briefing Series: Climate Change & National Security (June 4, 2010), <http://www.ametsoc.org/atmospolicy/climatebriefing/titley.html> (explaining real anticipated challenges to Naval operations in the next century in adapting to climate change, and advocating for efforts to mitigate changes, including a commitment by the Secretary of the Navy to reduce the Navy's carbon footprint by twenty percent by 2020 from 2008 levels).

<sup>31</sup> E.g., *id.* (noting the impact on security issues from displaced persons when land ceases to exist where it previously did); CNA CORP., *supra* note 28, at 32-34 (explaining that the United States has a major logistics hub located on an atoll in the Indian Ocean, Diego Garcia, which has maximum elevation of only four feet above sea level); BERNSTEIN ET AL., *supra* note 4, at 12 (projecting increased inundation of island communities that will threaten infrastructure and reduce access to fresh water sources on small islands).

<sup>32</sup> CNA CORP., *supra* note 28, at 35 (relating a story from retired U.S. Army General Paul J. Kern about personnel missing a NATO training activity, with months of planning invested, because personnel and equipment had to be relocated around the country when hurricane Hugo hit the Fort Stewart, Georgia, where the mission was scheduled to depart from).

<sup>33</sup> See *id.* at 37 (referencing also Hurricane Ivan in 2004, which removed Naval Air Station Pensacola from service for nearly a year while repairs were made).

<sup>34</sup> TITLEY, *supra* note 30 (explaining concerns that accompany the Navy's forecast that the arctic will be ice-free for approximately four to six weeks each year by the mid to late 2030s).

<sup>35</sup> FLANNERY, *supra* note 1, at 140 (citing FREDERICK K. LUTGENS & EDWARD J. TARBUCK, *THE ATMOSPHERE: AN INTRODUCTION TO METEOROLOGY* (Pearson Prentice Hall 2004)).

<sup>36</sup> *Id.* at 140.

<sup>37</sup> See, e.g., BERNSTEIN ET AL., *supra* note 4, at 11 (projecting regionalized impacts of climate change).

<sup>38</sup> FLANNERY, *supra* note 1, at 131 (referencing the ongoing drought of the U.S. West, which in 2004 was in its fifth year of drought, and drawing parallels to Darfur, Sudan, noting that such severe hot and dry conditions had not been seen in the region in 700 years).

<sup>39</sup> *Id.*

<sup>40</sup> *Id.*

<sup>41</sup> See CNA CORP., *supra* note 28, at 16-18 (explaining the security consequences of the destabilizing effects of climate change).

<sup>42</sup> *Id.*

<sup>43</sup> *Id.* (pointing to the examples of the Rwandan genocide resulting from insufficient agricultural resources and ongoing situation in Darfur, which began as a conflict between farmers and ranchers over scarce food and water supplies).

<sup>44</sup> CHRISTINE PARTHMORE & WILL ROGERS, SUSTAINING SECURITY: HOW NATURAL RESOURCES INFLUENCE NATIONAL SECURITY 9 (2010), [http://www.cnas.org/files/documents/publications/CNAS\\_Sustaining%20Security\\_Parthmore%20Rogers.pdf](http://www.cnas.org/files/documents/publications/CNAS_Sustaining%20Security_Parthmore%20Rogers.pdf) (referring to findings of the United Nations for the number and cause of such conflicts).

<sup>45</sup> E.g., CNA CORP., *supra* note 28, at 16 (mentioning both Hezbollah in Lebanon and the gang First Capital Command in Brazil as examples of how extra-governmental extremists fill the power vacuum when large populations are left without the basic benefits of government).

<sup>46</sup> PARTHMORE & ROGERS, *supra* note 44, at 5.

<sup>47</sup> LILIANA HISAS, THE FOOD GAP: THE IMPACTS OF CLIMATE CHANGE ON GLOBAL FOOD PRODUCTION: A 2020 PERSPECTIVE, at iii, 6, 12-35 (2011), [http://www.eenews.net/assets/2011/01/19/document\\_cw\\_02.pdf](http://www.eenews.net/assets/2011/01/19/document_cw_02.pdf) (explaining the likelihood, based on the IPCC's own data and projections, that Earth will experience a 2.4°F increase in temperature by 2020 based on current business-as-usual patterns, likely resulting in global food shortages); *Accord* CNA CORP., *supra* note 28, at 16 (commenting that forty percent of the world population will live in a country experiencing significant water shortages by the year 2025).

<sup>48</sup> HANSEN ET AL., *supra* note 1, at 13 (citing SUSAN SOLOMON ET AL., IPCC CLIMATE CHANGE 2007, 996 (2007) and MICHAEL D. MASTRANDREA & STEPHEN H. SCHNEIDER, *Probabilistic Integrated Assessment of "Dangerous" Climate Change*, 304 Sci. 571-75 (2004)).

<sup>49</sup> E.g., FLANNERY, *supra* note 1, at 161 (urging climate change action by the United States, during the Bush Administration, despite claims of concern about "uncertainty" in the science, on the grounds that massive scientific advances over thirty years of climate research have not dramatically reduced uncertainty, since humanity cannot absolutely predict the future).

<sup>50</sup> E.g., JEFFREY MAZO, Research Fellow for Envtl. Sec. & Sci. Policy, Int'l Inst. for Strategic Studies, Presentation at the American Meteorological Society Climate Briefing Series: Climate Change & National Security (June 4, 2010) (explaining that many countries where climate change will likely have an adverse impact on global terrorism are already vulnerable or failing states, so future failure will not be a surprise, but will multiply the threat faced; however, new threats from states that are not currently in danger of collapse, like North Korea, Indonesia, and Columbia, could be pushed that direction by severe water and food scarcity; hence multiplying threats that currently exist).

<sup>51</sup> E.g., CNA CORP., *supra* note 28, at 17 (quoting Retired U.S. Navy Admiral T. Joseph Lopez, Former Commander-in-Chief of U.S. Naval Forces in Europe and of Allied Forces in Southern Europe).

<sup>52</sup> E.g., *id.* (quoting Retired Navy Admiral Joseph Lopez, explaining why climate change promotes terrorism risks and threatens U.S. national security into the future).

<sup>53</sup> E.g., PARTHMORE & ROGERS, *supra* note 44, at 19 (highlighting the importance of Yemen's precariously increasing risk of drought because destabilization or a failed state in the Arab peninsula region would threaten regional trade routes and global security).

<sup>54</sup> See FLANNERY, *supra* note 1, at 143 (noting the extreme flooding risk to Bangladesh).

<sup>55</sup> See CNA CORP., *supra* note 28, at 13 (explaining that even governments which appear stable may be unable to deal with climate change stresses and that ineffective government breeds extremism); see also FLANNERY, *supra* note 1, at 177, 288 (attributing the dense human population distributions in mountain valleys in tropical climates like Mexico City and Papua New Guinea, and not in the valleys below, to the occurrence of malaria in the massive forests below); PARTHMORE & ROGERS, *supra* note 44, at 17-19 (supporting the proposition that these factors are connected).

<sup>56</sup> CNA CORP., *supra* note 28, at 31 (quoting Retired Marine Corps General Anthony C. Zinni, the former Commander-in-Chief of U.S. Central Command, explaining the high price the United States will pay in the future—in human lives and U.S. dollars lost in the war on terror—if we do not instead choose now to spend our dollars to reduce greenhouse gas emissions).

<sup>57</sup> *Id.*

<sup>58</sup> See, e.g., FLANNERY, *supra* note 1, at 165 (highlighting challenges humanity will face with only a global surface temperature rise of 3.6°F which would result in an 8.1°F increase for Europe, Asia, and the Americas).

<sup>59</sup> E.g., CNA CORP., *supra* note 28, at 13 (asserting that even a modest rise in temperature of only 2° to 4°F can result in increased flooding with less snow and ice available for much needed runoff water in the dry summer months).

<sup>60</sup> PARTHMORE & ROGERS, *supra* note 44, at 17 (citing ORG. FOR ECON. COOPERATION & DEV., OECD ENVIRONMENTAL OUTLOOK TO 2030 (2008) and WORLD WATER ASSESSMENT PROGRAMME, WATER IN A CHANGING WORLD, UNITED NATIONS WORLD WATER DEVELOPMENT REPORT No. 3 (2009), [http://www.unesco.org/water/wwap/wwdr3/pdf/WWDR3\\_Water\\_in\\_a\\_Changing\\_World.pdf](http://www.unesco.org/water/wwap/wwdr3/pdf/WWDR3_Water_in_a_Changing_World.pdf)).

<sup>61</sup> E.g., CNA CORP., *supra* note 28, at 15 (explaining that good health and access to fresh water are necessarily linked).

<sup>62</sup> E.g., FLANNERY, *supra* note 1, at 177, 288 (raising concerns about what will happen to populations that are currently not exposed to malaria and have no immunity to the disease once a rapid exposure to the disease begins; CNA CORP., *supra* note 28, at 15 (finding an increase in disease and reduced overall health will result from temperature increases and other climate change impacts, as identified by the World Health Organization).

<sup>63</sup> E.g., FLANNERY, *supra* note 1, at 124-27 (explaining that a "drought" is a temporary and transient lack of precipitation, but what is beginning to occur in regions around the planet is actually a new, drier, Saharan-like climate where there is no expectation that rain will return).

<sup>64</sup> *E.g.*, BERNSTEIN ET AL., *supra* note 4, at 13 (projecting a likely increase the amount of area affected by drought, creating more widespread water stress, increased risk of food and water shortages and of water- and food-borne diseases, reduced ability to produce hydropower, and exacerbating the potential for large-scale population migrations).

<sup>65</sup> FLANNERY, *supra* note 1, at 124-27; CNA CORP., *supra* note 28, at 20.

<sup>66</sup> *E.g.*, CNA CORP., *supra* note 28, at 22 (explaining the geopolitical landscape of the future will be one of scarcity, exacerbating migrations to Europe and within Africa, which already increases tensions and adds to national security concerns).

<sup>67</sup> FLANNERY, *supra* note 1, at 143.

<sup>68</sup> *See id.* (explaining the planned construction of a “super dyke” in The Netherlands to protect the country from the rising oceans).

<sup>69</sup> *Id.*

<sup>70</sup> *E.g.*, TITLEY, *supra* note 30 (asking “what will happen” to these hungry and displaced populations living under weak governmental regimes, and positing that military leaders believe such scenarios present increasing threats to U.S. security due to increased demands on humanitarian aid missions in addition to increased incidence of terrorism and extremism resulting from desperation).

<sup>71</sup> *Id.*

<sup>72</sup> THE WHITE HOUSE, *supra* note 2, at 26 (discussing how the United States can best go about advancing its own national interests).

<sup>73</sup> *See id.* at 47 (calling for increased fuel efficiency standards and investment in renewable energy technologies with the goal of cutting U.S. emissions by seventeen percent by 2020 and more than eighty percent by 2050 as the (no doubt inadequate) solution).

<sup>74</sup> *Id.*

<sup>75</sup> *Id.*

<sup>76</sup> *E.g.*, CODY M. BROWN, THE NATIONAL SECURITY COUNCIL: A LEGAL HISTORY OF THE PRESIDENT’S MOST POWERFUL ADVISERS, at ii (2008), <http://www.pnsr.org/data/images/the%20national%20security%20council.pdf> (citing Unification of the War and Navy Departments and Postwar Organization for National Security, Report to Hon. James Forrestal, Committee on Naval Affairs 47, 7 (1945)).

<sup>77</sup> *Id.* at 1-6.

<sup>78</sup> *See, e.g.*, DOUGLAS T. STUART, *Foreword* to BROWN, *supra* note 76 (relating how Americans responded to the surprise attack on Pearl Harbor by desiring a new, high-level mechanism for coordination and implementation of policies that would effectively protect the United States from threats).

<sup>79</sup> *See* BROWN, *supra* note 76.

<sup>80</sup> National Security Act of 1947, Pub. L. 80-253, 61 Stat. 495 § 2 (codified at 50 U.S.C. § 401 (2006)).

<sup>81</sup> *Id.* (emphasis added).

<sup>82</sup> *See generally id.* (providing no guidance as to what qualifies as national security issues, only requiring that strong unified efforts must be made to protect national security and a unified defense).

<sup>83</sup> *See* National Security Act, 50 U.S.C. § 402(a) (2006) (emphasis added) (creating the National Security Council and establishing the broad purpose of the council to promote policies and activities increasing national security across all parts of the federal government).

<sup>84</sup> *See* 50 U.S.C. § 402(b) (indicating the President was authorized to task the Council with other duties to advise and monitor the implementation of the policies created to protect the national security).

<sup>85</sup> *See, e.g.*, BROWN, *supra* note 76, at 2-3 (explaining the sentiment of the Committee on Naval Affairs that the NSC must fill a policy advisory role lest it usurp the authority of the executive in holding power to direct foreign affairs in the name of national security).

<sup>86</sup> *E.g., id.* at 39 (noting the authority Congress can assert when it believes the Executive is exceeding appropriate authority, as happened with the War Powers Resolution).

<sup>87</sup> *Id.*

<sup>88</sup> *See* 93 CONG. REC. 9895 (July 21, 1947) (statement of Sen. Lodge) (expressing fear of an immobile and inflexible security program incapable of meeting the needs of a future war due to provisions insisted upon by the House that seemingly codified what general types of warfare tactics each service could engage in; arguing that Congress should not presume any ability to foresee the future by cementing such decisions in statute).

<sup>89</sup> *See* BROWN, *supra* note 76, at 3-4 (citing an exchange on the Senate floor between Senators Leverett Saltonstall and Ray Baldwin expressing that the purpose of the NSC would not be as an administrative agency, but solely as an advisory committee, found at 93 CONG. REC. 8497 (July 9, 1947)).

<sup>90</sup> *See id.* at 10, 81 (quoting Robert Cutler, the U.S.’s first National Security Advisor, that under the flexible framework in the NSA, “each President may

avail himself of the mechanism in whatever way he finds best suited to his needs” and arguing that the NSC’s development was not the result of Congress but of powerful Executive actions necessarily resulting from the complicated task of coordinating and effectively implementing national security policies).

<sup>91</sup> *See id.* at 11, 13, 17 (elucidating the policies and practices of each President in using and transforming the NSC since its inception, explaining the different approaches taken specifically by President’s Truman and Eisenhower, and referring to President Dwight D. Eisenhower’s Message to Congress (Apr. 3, 1958) (advocating for unifying changes so that in any future war the United States would fight “in all elements, with all services, as one single concerted effort” and advancing his belief that “peacetime preparatory and organizational activity must conform to this fact”) and Reorganization Plan No. 4 of 1949, 63 Stat. 1067 (eff. Aug. 20, 1949), which moved the NSC into the Executive Office of the President, and indicating that efforts by members of the NCS to establish themselves as implementers of policy was rejected by Truman).

<sup>92</sup> *See* Exec. Order No. 10483, 18 Fed. Reg. 5379, Establishing the Operations Coordinating Board (Eisenhower, Sept. 2, 1953) (later amended by E.O. 10598; superseded by E.O. 10700; revoked by E.O. 10920 (Feb. 18, 1961)).

<sup>93</sup> *See* BROWN, *supra* note 76, at 24-26 (referencing Senator Jackson’s recommendation as Chairman of the Senate Government Operations Subcommittee on National Policy Machinery that a President use the NSC as an inner circle for policy and strategy debate rather than as a policy development bureaucracy and subsequent implementation bureaucracy following Presidential adoption of a policy).

<sup>94</sup> *E.g., id.* at 27-29 (citing NSAM-196, Establishment of an Executive Committee of the National Security Council (Kennedy, Oct. 22, 1962) which included all members of the NSC, specifically to ensure “effective conduct of the operations . . . in the current crisis”).

<sup>95</sup> *E.g., id.* at 7, 39 (explaining how Congress’s discomfort was evidenced by its assertion of authority in the War Powers Resolution, Pub. L. No. 93-148, 87 Stat. 555 (1973) (codified at 50 U.S.C. § 1541 *et seq.*), which was passed in the aftermath of President Nixon’s fall from grace and stretched to the very limits its Constitutional power in limiting the authority of the Executive, and the 1974 Amendments to the Foreign Assistance Act of 1961 (Pub. L. No. 93-559, 88 Stat. 1795 (1974)); CHRISTOPHER C. SHOEMAKER, THE NSC STAFF: COUNSELING THE COUNCIL 18 (1991) (claiming that the NSC rebounded in the mid-1970s as it became clear that “only the White House could effect the coordination demanded by the mounting completing of the international system”).

<sup>96</sup> BROWN, *supra* note 76, at 47-59 (explaining the changes Reagan made to the NSC during his tenure and the facts surrounding the Iran-Contra affair, leading to Congressional oversight hearings and the reworking of the NSC structures and authority).

<sup>97</sup> *See id.* at 55 (describing how the NSC became involved in implementing foreign policy through the sale of arms to Iran in exchange for hostages and the funneling of excess funds earned from the arms sales to Nicaraguan rebels, exceeding the scope of the authority to “advise” the President on national security policy and explaining the streamlined, smaller NSC organization with the “Senior Review Group” and the “Policy Review Group”).

<sup>98</sup> *Id.* at 57-58 (explaining how the “Principles Committee” (“PC”), was made up of the Secretaries of State and Defense and the National Security Advisor, Chairman of the JCS, Director of Central Intelligence, and the President’s Chief of Staff, who were all able to implement the policy within their department once the group had reached a policy decision, and identifying the other two sub-groups within the NSC as the Deputies Committee—made up of the agency deputies to the principles, which was the primary policy group and the Policy Coordinating Committee, consisting of assistant secretaries in the departments—which primarily identified and suggested policy issues for the NSC to take into consideration).

<sup>99</sup> *Id.* at 63, 72-74.

<sup>100</sup> *See id.* at 76.

<sup>101</sup> Exec. Order No. 13228, 66 Fed. Reg. 51812, Establishing the Office of Homeland Security and the Homeland Security Council (George W. Bush, Oct. 8, 2001) (amended E.O. 12656; later amended by E.O. 13284 and E.O. 13286); BROWN, *supra* note 76, at 75-77.

<sup>102</sup> *See* BROWN, *supra* note 76, at 77 (noting the difference in responsibilities to the PCCs between the NSC and the Presidentially created HSC).

<sup>103</sup> 6 U.S.C. §§ 491, 494 (2006) (creating, statutorily, the HSC and defining its functions in assisting the President).

<sup>104</sup> 50 U.S.C. § 402(b).

<sup>105</sup> *See* 104 CONG. REC. S10625 (daily ed. Sept. 17, 1996) (statements of Sens. Specter, R-PA and Kerrey, D-NE) (referring to recent terrorist attack on Khobar Towers and the Aldrich Ames spy incident, among other examples to support



the need for flexible thinking and progressive national security programs to meet the ever changing challenges of the future).

<sup>106</sup> See Intelligence Renewal and Reform Act of 1996, Pub. L. No. 104-293, § 803, 110 Stat. 3461 (1996) (codified at 50 U.S.C. § 402).

<sup>107</sup> See 50 U.S.C. § 402(i) (amending the NSA in 1996 in response to newly perceived and developing threats); BROWN, *supra* note 76, at 27-29.

<sup>108</sup> See 50 U.S.C. § 402 (contained in the Intelligence Authorization Act for FY 1997) (adding a Committee on Foreign Intelligence, making changes to the annual intelligence reports, and fourteen other substantive additions or changes to the National Security statute).

<sup>109</sup> 1993 World Trade Center Bombing, FED. BUREAU OF INVESTIGATION (Feb. 26, 2008), [http://www.fbi.gov/page2/feb08/tradebom\\_022608.html](http://www.fbi.gov/page2/feb08/tradebom_022608.html) (noting the first bombing attack on the World Trade Center on February 26, 1993); *History and Mission*, OKLA. CITY NAT'L MEM'L & MUSEUM, <http://www.oklahomacitynationalmemorial.org/secondary.php?section=1> (discussing the bombing of the Oklahoma City Federal Building on April 19, 1995) (last visited Feb. 15, 2011).

<sup>110</sup> 50 U.S.C. § 402(i)(5)(A) (emphasis added).

<sup>111</sup> § 402(i)(5)(B) (emphasis added).

<sup>112</sup> § 402(i)(3) (emphasis added).

<sup>113</sup> § 402(i)(4) (emphasis added).

<sup>114</sup> § 402(i)(2).

<sup>115</sup> See generally BROWN, *supra* note 76 (providing a history of the NSC).

<sup>116</sup> See 142 CONG. REC. H11054 (daily ed. Sept. 25, 1996) (statement of Rep. Goss) (adopting the Conference Report and enacting Intelligence Authorization Act for FY 1997, including the Intelligence Renewal and Reform Act of 1996).

<sup>117</sup> 142 CONG. REC. H5389 (daily ed. May 22, 1996) (statement of Rep. Richardson) (acknowledging "world economies" as a component of global intelligence necessary for policy makers, in addition to the traditional weapons of mass destruction, terrorists, and narcotics).

<sup>118</sup> 142 CONG. REC. H11054 (daily ed. Sept. 25, 1996) (statement of Rep. Dicks) (calling for a security strategy adapted to 21st century threats).

<sup>119</sup> 104 CONG. REC. S10625 (daily ed. Sept. 17, 1996) (statement of Sen. Kerry) (stating the *purpose* in creating the two committees—the CTT and the Foreign Intelligence Committee—was to provide the President with the necessary tools to affect change, should the President choose to use them and to bring these types of threats to the forefront for policy-makers who sometimes ignore intelligence warnings, and remain focused on threats of past world paradigms, rather than follow in the "moribund" footsteps of the NSCs Low Intensity Conflict Board which had become ineffective).

<sup>120</sup> 142 CONG. REC. S10625 (daily ed. Sept. 17, 1996) (statement of Sen. Specter).

<sup>121</sup> 142 CONG. REC. H5389 (daily ed. May 22, 1996) (statements of Reps. Skaggs and Weldon).

<sup>122</sup> See H.R. REP. NO. 104-832, at 38, 40 (1996) (Conf. Rep.) (stating the Committee function includes not just developing strategies to respond to transnational threats in a coordinated way, but also assisting in resolving operational differences between departments and ensuring effective information sharing by developing unified policies and procedures).

<sup>123</sup> *Transnational*, MERRIAM-WEBSTER DICTIONARY ONLINE, <http://east.merriam-webster.com/dictionary/transnational> (defining "transnational" as "extending or going beyond national boundaries") (last visited Feb. 15, 2011).

<sup>124</sup> See BERNSTEIN ET AL., *supra* note 4, at 11-15 (providing examples of expected negative impacts to all regions of the planet, specifying what types of negative impacts to expect, and identifying water, agriculture, infrastructure, human health, tourism, transportation, and energy as sectors that will be impacted and require adaptation to these negative climate impacts); CNA CORP., *supra* note 28 (identifying both direct climate threats and threats from increased extremism in response to destabilized governments resulting from climate change); FLANNERY, *supra* note 1, at 124-27 (noting decreased resources necessary for survival leads to increased desperation and increased destabilization).

<sup>125</sup> E.g., 50 U.S.C. § 401 (declaring the intent of Congress). See also BROWN, *supra* note 76, at 3-5 (noting the remarkable breadth of the NSA calling for a modernized national security system, though focused on the military institutions).

<sup>126</sup> See Exec. Order No. 13434, 72 Fed. Reg. 28,583 (May 17, 2007) (intending no doubt to reach "manmade disasters" like terrorist events, but also including other manmade disasters like anthropogenic climate change which leads to altered precipitation patterns, increased temperatures, the resulting food shortages and economic devastation which leads to government destabilization abroad and enhanced threats to the U.S.; also creating a Steering Committee, including both the Secretaries of Energy and Agriculture, to "facilitate the implementation" of an integrated education system to ensure national security personnel have the skills and knowledge to protect the nation, leaving what is needed to the Steering Committee to establish).

<sup>127</sup> See National Defense Authorization Act for Fiscal Year 2008, 110 Pub. L. 181, 122 Stat. 3 (2008) (codified at 10 U.S.C.S. § 118) (providing funding for the Department of Defense).

<sup>128</sup> See *id.* (codified at 10 U.S.C.S. § 118(g)(2)) (extending national defense and security issues to include impacts of climate change and requiring the Department of Defense to include planning and preparations for such impacts in reports to Congress, specifically requiring information on "preparedness for natural disasters from extreme weather events and other missions the armed forces may be asked to support inside the United States and overseas").

<sup>129</sup> See 50 U.S.C. § 404(a) (requiring the President to transmit an NSS to Congress each year on the date he transmits the budget proposal for the next fiscal year and stating required topics for the President to address in the NSS including explaining U.S. interests, goals, and objectives vital to national security and efforts to deter aggression, and long- and short-term plans for meeting U.S. national security interests, and any additional information the President believes would be useful to Congress that relates to national security).

<sup>130</sup> See 110 Pub. L. 181 (codified at 10 U.S.C.S. § 118(g)(1)) (requiring alterations to planning in accordance with these new risks, and to work "with allies and partners to incorporate climate *mitigation strategies*, capacity building, and relevant research and development" (emphasis added)).

<sup>131</sup> See *Massachusetts v. EPA*, 549 U.S. 497 (2007) (requiring the EPA to regulate CO<sub>2</sub> and greenhouse gasses as pollutants under the Clean Air Act, 42 U.S.C. § 7521(a)(1) which requires EPA set emissions standards for air pollutants which cause, contribute to, or may reasonably be expected to endanger public health or welfare).

<sup>132</sup> See 42 U.S.C. § 7521(a)(1) (limiting the authority of the EPA Administrator to regulate such emissions to when those emissions endanger public health or welfare, not when it endangers national security).

<sup>133</sup> *Id.*

<sup>134</sup> 50 U.S.C. § 401.

<sup>135</sup> See THE WHITE HOUSE, *supra* note 2, at 51 (asserting that the NSS takes a broad view of what constitutes national security and seeks a full range of actions to address the myriad challenges identified, the President correctly attempts to implement this broad definition, including the release of CO<sub>2</sub> by all government agencies).

<sup>136</sup> 50 U.S.C. § 401.

<sup>137</sup> 110 Pub. L. 181 § 951 (codified at 10 U.S.C.S. § 118(g)(1)).

<sup>138</sup> See FLANNERY, *supra* note 1, at 245-46 (decrying the invalidity of the IPCC's findings based on the political influences exerted by the member nations and warning that while you had better believe whatever the IPCC says, but also then believe that it is likely that the actual situation is "far worse than" the IPCC says it is).

<sup>139</sup> 50 U.S.C. § 401(a) (defining "intelligence" and "foreign intelligence" for national security reasons as all intelligence that pertains to more than one U.S. government agency under presidential guidance, and that involves "threats to the United States, its people, property, or interests" among other possible options, further supporting the conclusion that climate change does fall within the purview of national security issues, since it meets the definition of national security intelligence). See FLANNERY, *supra* note 1, at 245-46 (critiquing political influences that undermine science in IPCC findings); PETER SCHWARTZ & DOUG RANDALL, AN ABRUPT CLIMATE CHANGE SCENARIO AND ITS IMPLICATIONS FOR UNITED STATES NATIONAL SECURITY 4 (2003), [http://www.edf.org/documents/3566\\_AbruptClimateChange.pdf](http://www.edf.org/documents/3566_AbruptClimateChange.pdf) (providing plausible abrupt climate change scenarios in advocating U.S. consideration of such possibilities in national security planning).

<sup>140</sup> See HANSEN ET AL., *supra* note 1, at 217-18 (recommending the reduction of CO<sub>2</sub> to 350 ppm immediately, or else as quickly as possible); FLANNERY, *supra* note 1, at 6 (arguing that the best available science shows global CO<sub>2</sub> emissions need to be reduced by seventy percent by the year 2050 to stabilize carbon levels and the climate); *Climate Change: Halving Carbon Dioxide Emissions by 2050 Could Stabilize Global Warming*, SCIENCE DAILY (May 4, 2009), <http://www.sciencedaily.com/releases/2009/05/090502092019.htm> (supporting a fifty percent reduction from 1990 levels by the year 2050).

<sup>141</sup> See THE WHITE HOUSE, *supra* note 2, at 9 (acknowledging that when U.S. security has previously been threatened by significant challenges, massive coordinated responses were required to defeat those threats and that the United States currently faces similar challenges requiring aggressive, targeted programs).

<sup>142</sup> See Hansen et al., *supra* note 1, at 17 (comparing the "Herculean" effort required to eliminate the use of coal that does not capture CO<sub>2</sub> over the next twenty to twenty-five years with the effort required to protect the U.S. and global security during World War II and arguing that WWII was the significantly larger challenge).

<sup>143</sup> See Nick Taylor, *Works Progress Administration*, N.Y. TIMES (Jan. 5, 1935), [http://topics.nytimes.com/top/reference/timestopics/organizations/w/works\\_progress\\_administration/index.html](http://topics.nytimes.com/top/reference/timestopics/organizations/w/works_progress_administration/index.html) (explaining that the WPA was more than just a jobs program during hard economic times, but a strategic investment to address the U.S.'s weak infrastructure of unpaved roads, dangerous bridges, insufficient water and sewage systems, inadequate airports, hospitals and schools, and degraded forests and parks around the country).

<sup>144</sup> See *id.* (recalling that the WPA employed 8.5 million people during the eight years it was in existence); *Roosevelt to Make Jobs for 3,500,000 Now on Relief; Pushes his Social Program*, N.Y. TIMES (Jan. 5, 1935), [http://graphics8.nytimes.com/packages/pdf/topics/WPA/35\\_01\\_05.pdf](http://graphics8.nytimes.com/packages/pdf/topics/WPA/35_01_05.pdf).

<sup>145</sup> See, e.g., Ron Scherer, *Unemployment Extension 101: What You Need to Know*, CHRISTIAN SCIENCE MONITOR (July 22, 2010), <http://www.csmonitor.com/Money/2010/0722/Unemployment-extension-101-what-you-need-to-know> (noting that this is the fourth extension of unemployment benefits to aid unemployed workers as the economic downturn lingers, costing thirty-four billion dollars in this extension alone).

<sup>146</sup> See THE WHITE HOUSE, *supra* note 2, at 34 (claiming economic advantage exists for the country that leads the way to the new low carbon economy); FLANNERY, *supra* note 1, at 246-47 (highlighting the case of BP which made a profit by reducing the company's CO<sub>2</sub> emissions through photovoltaic cells, and also explaining a thirty-six percent increase in British national economic growth during a period where CO<sub>2</sub> emissions dropped by fifteen percent through creation of a Carbon Trust and requirements that power suppliers get over fifteen percent of their energy from renewable resources).

<sup>147</sup> See Henry Petroski, *On the Road*, 94 AM. SCI. 396-99 (2006) (explaining how President Eisenhower believed the national interstate highway system was necessary for U.S. security based on his own experiences traveling across the country in the Army and after witnessing the effectiveness of the German autobahn while serving as an Allied Commander in World War II).

<sup>148</sup> See CNA CORP., *supra* note 28, at 38 (highlighting the delicate nature of the national power grid which was thrust into an eight-state, and parts of Canada, regional blackout in 2003, costing four to ten billion dollars and impacting fifty million people because trees fell on power lines in Ohio).

<sup>149</sup> See *id.* (comparing the vulnerabilities faced by the military to civilian energy supplies and offering a combination of increased energy efficiency, use of renewable energy sources, and removing installations from the national grid as

one potential solution for military security, though civilians and business would still be at risk and thus risking the national security).

<sup>150</sup> *Id.* at 39 (explaining how military commanders in Afghanistan and Iraq requested new renewable energy technologies to improve operations as well as reduce danger to the fuel supply convoys).

<sup>151</sup> *Id.*

<sup>152</sup> *Id.* at 25 (quoting Retired U.S. Navy Admiral Joseph W. Prueher's explanation of why the United States must engage China and convince them to move to a low-carbon or carbon-free energy economy because the U.S.'s climate problems cannot be resolved unless China also reduces carbon emissions).

<sup>153</sup> See THE WHITE HOUSE, *supra* note 2, at 11 (promoting the idea that the United States must have sustainable international cooperation, similar to post-WWII, to deal with global issues like climate change).

<sup>154</sup> See, e.g., *id.* at 30 (claiming that the country that leads the path to a clean energy economy will have a "substantial economic and security advantage" and further claiming that the United States is spending heavily on research and energy development).

<sup>155</sup> *Id.* at 5.

<sup>156</sup> See Stephen Stromberg, *What Sank the Senate's Climate Bill*, WASH. POST (July 29, 2010), <http://www.washingtonpost.com/wp-dyn/content/article/2010/07/28/AR2010072804527.html?hpid=opinionsbox1> (explaining how the U.S. Congress failed to pass legislation to address carbon emissions and begin dealing with climate change during the summer of 2010, while Washington, D.C. itself was experiencing record temperatures and a severe summer storm that knocked out power for days in the greater capitol region).

<sup>157</sup> THE WHITE HOUSE, *supra* note 2, at 11 (advancing the idea that the United States is fully engaged and leading the way to solutions on climate change, and other international challenges, and indicating that the United States intends to support enforcement of international law in combating these challenges).

<sup>158</sup> See generally *id.* at 5, 11, 13, 47 (claiming the United States is a leader heavily invested in clean technology and committed to diplomacy to engage others in combating climate change; further, promising CO<sub>2</sub> cuts of eighty percent by 2050 and seventeen percent by 2020, but only if Congress implements legislation to do so).

<sup>159</sup> See 50 U.S.C. § 402(a) (including the Secretary of Energy in the council membership along with the Secretaries of State and Defense, and permitting Presidential appointment, with the advice and consent of the Senate, of Secretaries and Under Secretaries of other executive and military departments, among others).

## ENDNOTES: CLIMATE CHANGE AND SMALL ISLAND STATES: ADRIFT IN A RAISING SEA OF LEGAL UNCERTAINTY

*continued from page 57*

<sup>16</sup> Grant et al., *supra* note 11 ("It's been through other revisions, so this should be possible.").

<sup>17</sup> UNHCR, *supra* note 9, at 9.

<sup>18</sup> NORMAN MYERS & JENNIFER KANT, CLIMATE INST., ENVIRONMENTAL EXODUS: AN EMERGENCY CRISIS IN THE GLOBAL ARENA 151-53 (1995), <http://www.climate.org/PDF/Environmental%20Exodus.pdf>.

<sup>19</sup> UNHCR, *supra* note 9, at 9.

<sup>20</sup> Different theories for a proposed framework exist. One has proposed modeling it on the Convention Against Torture. See Zartner, *supra* note 12, at 21 ("By following the structure of the Convention Against Torture, a new Convention could be drafted addressing the specific issue of environmentally displaced persons . . . focus[ed] not only on protecting those individuals . . . but [would also] require specific obligations from State parties to prevent the root causes from occurring."). Others have focused on the connections between ecological integrity and human rights. See WESTRA, *supra* note 12, at 182 ("[T]he issues of ecological refugees are primarily, though not exclusively, ecological issues – that is, unless the interface between human rights and ecological integrity is accepted, it will not be possible to design instruments that will truly address the problem, or even use existing instruments to the best advantage of present and future migrants.").

<sup>21</sup> Biermann & Boas, *supra* note 11 (stating five principles under which an agreement would operate: 1) the objective of planned and voluntary resettlement and reintegration; 2) treatment and classification as permanent immigrants; 3) tailored to the needs of entire groups, not individuals; 4) targeted less toward the protection of persons outside their states than toward the support of domestic agencies to protect people within their territories; and 5) that protection is a global problem and a global responsibility).

<sup>22</sup> VIKRAM ODEIRA KOLMANNSKOG, NORWEGIAN REFUGEE COUNCIL, FLOODS OF REFUGEES 31 (2008), [http://www.nrc.no/arch/\\_img/9268480.pdf](http://www.nrc.no/arch/_img/9268480.pdf). The NRC is an independent, humanitarian non-governmental organization, which

provides assistance, protection, and durable solutions to refugees and internally displaced persons worldwide.

<sup>23</sup> Michel Prieur, *Projet de Convention Relative au Statut International des Déplacés de l'Environnement*, 4 REVUE EUROPÉENNE DE DROIT DE L'ENVIRONNEMENT 381 (2008) (author's translation).

<sup>24</sup> *Id.* pmbl. ¶ 2.

<sup>25</sup> *Id.* art. 11.

<sup>26</sup> *Id.* pmbl. ¶ 15.

<sup>27</sup> *Id.* art. 7(2).

<sup>28</sup> RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW: STATES § 201 (1987); Montevideo Convention on the Rights and Duties of States, art. 1, Dec. 26, 1933, 165 L.N.T.S. 19 [hereinafter Montevideo Convention].

<sup>29</sup> Island of Palmas (U.S./Neth.) 2 R.I.A.A. 831, 838 (Perm. Ct. Arb. 1928) ("[S]overeignty in relation to a portion of the surface of the globe is the legal condition necessary for the inclusion of such portion in the territory of any particular State . . . Sovereignty in the relations between States signifies independence. Independence in regard to a portion of the globe is the right to exist therein, to the exclusion of another State, the functions of a State.").

<sup>30</sup> Organization of American States, American Convention on Human Rights, art. 20, Nov. 22, 1969, O.A.S.T.S. No. 36, 1144 U.N.T.S. 123; see also Proposed Amendments to the Naturalization Provisions of the Constitution of Costa Rica, Advisory Opinion OC-4/84, Inter-Am. Ct. H.R. (ser. A) No.4 (Jan. 19, 1984).

<sup>31</sup> For example, problems would arise as to the rights of those already on the land. Would they be resettled themselves? Who would pay? Would they be offered Kiribati citizenship? What happens if they refuse to move?

<sup>32</sup> Laurie Goering, *Kiribati Officials Plan for 'Practical and Rational' Exodus From Atolls*, THOMAS REUTERS FOUND. ALERTNET (Dec. 9, 2009), <http://www.trust.org/alertnet/news/kiribati-officials-plan-for-practical-and-rational-exodus-from-atolls>.

<sup>33</sup> *Id.* (“We are proud people. We would like to relocate on merit and with dignity.”).

<sup>34</sup> *Id.* (“The hope, [Kiribati’s Foreign Minister] said, is that the families of immigrants could eventually qualify for immigration as well.”).

<sup>35</sup> Although this raises a number of issues as to whether such an island would be considered an “artificial island” in the eyes of the UN Convention on the Law of the Seas and what that would mean in terms of sovereignty. *See* Francesca Galea, *Artificial Islands In The Law of the Sea* (May 2009) (unpublished Doctor of Law dissertation, University of Malta), [http://seasteading.org/files/research/law/ARTIFICIAL\\_ISLANDS\\_-\\_01.09.09\\_mod.doc.pdf](http://seasteading.org/files/research/law/ARTIFICIAL_ISLANDS_-_01.09.09_mod.doc.pdf).

<sup>36</sup> A “permanent population” is also a required element of a state. *See* RESTATEMENT (THIRD) OF FOREIGN RELATIONS LAW: STATES, *supra* note 28; Montevideo Convention, *supra* note 28. Can a permanent population be one that is scattered worldwide? How many people need be on this built up island to continue the legal existence of a state?

<sup>37</sup> For example, how would the government be administered in such a situation? *See* CLEO PASKAL, GLOBAL WARRING: HOW ENVIRONMENTAL, ECONOMIC, AND POLITICAL CRISES WILL REDRAW THE WORLD MAP 225 (2010) (suggesting such a government could be run like a corporation managing the national resources for the citizens in exile who would act like stock holders, or alternatively, like the administrative systems set up to manage the land claim settlements of North American First Nations in Canada).

<sup>38</sup> *Id.* at 235.

<sup>39</sup> *Id.* at 235-36.

<sup>40</sup> *Id.*

<sup>41</sup> The first steps have been taken with the proposed Limoges Convention, *see* Prieur, *supra* note 23. This proposal outlines a starting point for the conversation on rights of those displaced and the obligations on the international community.

## ENDNOTES: CLIMATE CHANGE, INTELLECTUAL PROPERTY, AND THE SCOPE OF HUMAN RIGHTS OBLIGATIONS

*continued from page 63*

<sup>2</sup> The UN Human Rights Council’s Special Rapporteur on adequate housing expressed that climate change would lead to advanced desert frontiers, failure of pastoral farming systems, and land degradation which would in turn lead to increased migration to and pressure on urban centers. *See, e.g., Summary of the Human Rights Council Panel Discussion on the Relationship between Climate Change and Human Rights*, U.N. HIGH COMMISSIONER FOR HUMAN RIGHTS (OHCHR), ¶ 4 (June 15, 2009) [hereinafter OHCHR Panel Discussion], <http://www2.ohchr.org/english/issues/climatechange/docs/SummaryPanelDiscussion.doc>; *see generally* U.N. High Comm’r for Human Rights, *Report of the Office of the United Nations High Commissioner for Human Rights on the Relationship Between Climate Change and Human Rights*, U.N. Doc. A/HRC/10/61, ¶ 72-77 (Jan. 15, 2009) [hereinafter OHCHR Report CC-HR], <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/G09/103/44/PDF/G0910344.pdf?OpenElement>.

<sup>3</sup> *See* John H. Knox, *Linking Human Rights and Climate Change at the United Nations*, 33 HARV. ENVTL. L. REV. 477, 481, 494, 498 (2009).

<sup>4</sup> For the purposes of this paper “climate change” refers to the social crisis of anthropogenic effects on climatic temperature.

<sup>5</sup> *See, e.g.,* Margreet Wewerinke, Member, Human Rights and Climate Change Working Group, Many Strong Voices: Climate Change, Food Security, and Human Rights, Address to Side-event at the United Nations Framework Convention on Climate Change, 16th Conference of the Parties, Cancun, Mex. (Dec. 1, 2010).

<sup>6</sup> *See, e.g.,* Knox, *supra* note 3; *see also* OHCHR Panel Discussion, *supra* note 2, ¶ 36 (stating that “The United States of America, while agreeing that climate change had implications for the full enjoyment of human rights, did not consider that there was a direct formal relationship between climate change and human rights as a legal matter.”).

<sup>7</sup> *See generally* OHCHR Report CC-HR, *supra* note 2, ¶ 72-77.

<sup>8</sup> *Id.* ¶ 21.

<sup>9</sup> LENNY BERNSTEIN ET AL., INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, CLIMATE CHANGE 2007: SYNTHESIS REPORT: AN ASSESSMENT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 55-62 (2007) (describing the adaptation and mitigation options available at global and regional levels).

<sup>10</sup> *See* RON BENIOFF ET AL., NAT’L RENEWABLE ENERGY LABORATORY (NREL), STRENGTHENING CLEAN ENERGY TECHNOLOGY COOPERATION UNDER THE UNFCCC: STEPS TOWARD IMPLEMENTATION (2010), [www.nrel.gov/docs/fy10osti/48596.pdf](http://www.nrel.gov/docs/fy10osti/48596.pdf).

<sup>11</sup> *See* SHANE TOMLINSON ET AL., E3G/CHATHAM HOUSE, INNOVATION AND TECHNOLOGY TRANSFER: FRAMEWORK FOR GLOBAL CLIMATE DEAL 22 (2008), [http://www.e3g.org/images/uploads/E3G\\_Innovation\\_and\\_Technology\\_Transfer\\_Full\\_Report.pdf](http://www.e3g.org/images/uploads/E3G_Innovation_and_Technology_Transfer_Full_Report.pdf).

<sup>12</sup> CTR. FOR INT’L ENVTL. LAW, HUMAN RIGHTS AND CLIMATE CHANGE: PRACTICAL STEPS FOR IMPLEMENTATION 6 (2009), [http://www.ciel.org/Publications/CCandHRE\\_Feb09.pdf](http://www.ciel.org/Publications/CCandHRE_Feb09.pdf).

<sup>13</sup> *See generally* BERNSTEIN ET AL., *supra* note 9.

<sup>14</sup> *See generally id.*

<sup>15</sup> *See generally id.*

<sup>16</sup> *See* U.N. Framework Convention on Climate Change, May 9, 1992, 1771 U.N.T.S. 107 [hereinafter UNFCCC], <http://unfccc.int/resource/docs/convkp/conveng.pdf>.

<sup>17</sup> *Id.* art. 1(2).

<sup>18</sup> *See, e.g.,* BERNSTEIN ET AL., *supra* note 9.

<sup>19</sup> The reports of the IPCC form the basis of reports from the UN Office of the High Commissioner for Human Rights.

<sup>20</sup> BERNSTEIN ET AL., *supra* note 9; *Organization Page*, INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE, <http://www.ipcc.ch/organization/organization.shtml> (last visited Feb. 15, 2011).

<sup>21</sup> BERNSTEIN ET AL., *supra* note 9.

<sup>22</sup> *Id.* at 72.

<sup>23</sup> *Id.*

<sup>24</sup> *Id.*

<sup>25</sup> *Id.* at 53.

<sup>26</sup> *Id.*

<sup>27</sup> OHCHR Report CC-HR, *supra* note 2 (noting that mitigation strategies are often complemented by adaptation programs that strive to “strengthen the capacity of societies and ecosystems to cope with and adapt to climate change risks and impacts”). While adaptation is an important component of any comprehensive response to the climate change crisis, this paper focuses on the mitigation efforts that aim to restructure global energy production.

<sup>28</sup> Kyoto Protocol to the United Nations Framework Convention on Climate Change, Dec. 10, 1997, 37 I.L.M. 22 [hereinafter Kyoto Protocol], <http://unfccc.int/resource/docs/convkp/kpeng.pdf>.

<sup>29</sup> *See* FREDERICK M. ABBOTT, INT’L CTR. FOR TRADE AND SUSTAINABLE DEV., INNOVATION AND TECHNOLOGY TRANSFER TO ADDRESS CLIMATE CHANGE: LESSONS FROM THE GLOBAL DEBATE ON INTELLECTUAL PROPERTY AND PUBLIC HEALTH 1 (2009), <http://ictsd.org/downloads/2009/07/innovation-and-technology-transfer-to-address-climate-change.pdf> (noting the international acknowledgement that greenhouse gasses from combustion energy generation substantially contribute to causing climate change and thus that one of the primary objectives to addressing climate change is to develop and implement alternative energy-generation systems including solar, wind, biomass, nuclear, geothermal, and tidal energy sources).

<sup>30</sup> *See* TOMLINSON ET AL., *supra* note 11.

<sup>31</sup> *See generally* JOHN H. BARTON ET AL., INT’L CTR. FOR TRADE AND SUSTAINABLE DEV., INTELLECTUAL PROPERTY AND ACCESS TO CLEAN ENERGY TECHNOLOGIES IN DEVELOPING COUNTRIES: AN ANALYSIS OF SOLAR PHOTOVOLTAIC, BIOFUEL AND WIND TECHNOLOGIES (2007), [http://ictsd.org/downloads/2008/11/intellectual-property-and-access-to-clean-energy-technologies-in-developing-countries\\_barton\\_ictsd-2007.pdf](http://ictsd.org/downloads/2008/11/intellectual-property-and-access-to-clean-energy-technologies-in-developing-countries_barton_ictsd-2007.pdf).

<sup>32</sup> *Id.* at 7 (referencing the suggestion of others that flexibility is needed in the context of IP in clean energy technology); TOMLINSON ET AL., *supra* note 11, at 83.

<sup>33</sup> TOMLINSON ET AL., *supra* note 11, at 83.

<sup>34</sup> *Id.* at 83-85 (discussing global competitiveness debates in the climate context).

<sup>35</sup> *Id.*

<sup>36</sup> BARTON ET AL., *supra* note 31.

<sup>37</sup> *Id.* at 9, 12, 15 (explaining the background and development of the technologies).

<sup>38</sup> *Id.* at 20 (highlighting the risk that broad patents could hinder development of more efficient or less expensive technologies).

<sup>39</sup> *Id.* at 9.

<sup>40</sup> *See* Peter K. Yu, *Reconceptualizing Intellectual Property Interests in a Human Rights Framework*, 40 U.C. DAVIS L. REV. 1039, 1045 (2007), [http://lawreview.law.ucdavis.edu/issues/Vol40/Issue3/DavisVol40No3\\_Yu.pdf](http://lawreview.law.ucdavis.edu/issues/Vol40/Issue3/DavisVol40No3_Yu.pdf); Krishna Ravi Srinivas, *Climate Change, Technology Transfer and Intellectual Property Rights* 1 (Res. & Info. Sys. for Developing Countries, Discussion Paper No. 153, 2009), <http://unpan1.un.org/intradoc/groups/public/documents/un-dpadm/unpan037297.pdf> (suggesting that IPR holders are unlikely to make the necessary technology transfers on a timeline that will actually benefit humanity).



<sup>41</sup> See, e.g., Petition to the Inter-American Commission on Human Rights Seeking Relief from Violations Resulting from Global Warming Caused by Acts and Omissions of the United States, Dec. 7, 2005, [http://s3.amazonaws.com/summa.attachments/ICC\\_Petition\\_7Dec05.pdf](http://s3.amazonaws.com/summa.attachments/ICC_Petition_7Dec05.pdf) (providing the only petition to date filed in a regional human rights court dealing with climate change-related human rights violations).

<sup>42</sup> See OHCHR Report CC-HR, *supra* note 2, ¶ 18.

<sup>43</sup> See, e.g., Universal Declaration of Human Rights, G.A. Res. 217A (III), U.N. Doc. A/810 (1948) [hereinafter UDHR]; International Covenant on Economic, Social and Cultural Rights, 993 U.N.T.S. 3 (1966) [hereinafter ICESCR]; International Covenant on Civil and Political Rights, 999 U.N.T.S. 171 (1976) [hereinafter ICCPR].

<sup>44</sup> ICCPR, *supra* note 43.

<sup>45</sup> ICESCR, *supra* note 43.

<sup>46</sup> See Stockholm Declaration on the Human Environment of the United Nations Conference on the Human Environment, U.N. Doc. A/Conf 48/14/Rev.1, 11 I.L.M. 1416 (June 16, 1972) [hereinafter the Stockholm Declaration] (guaranteeing a right of environmental quality, but in a non-binding forum); African [Banjul] Charter on Human and Peoples' Rights, adopted June 27, 1981, 21 I.L.M. 58 (entered into force Oct. 21, 1986), arts. 22, 24, [http://www.africa-union.org/official\\_documents/Treaties\\_%20Conventions\\_%20Protocols?Banjul%20Charter.pdf](http://www.africa-union.org/official_documents/Treaties_%20Conventions_%20Protocols?Banjul%20Charter.pdf) (indicating that binding regional human rights conventions and their protocols may provide bases for asserting climate change-related human rights violations in the context of environmental quality rights, stating that "All peoples shall have the right to a general satisfactory environment favorable to their development"); see also Organization of American States, Additional Protocol to the American Convention on Human Rights in the Area of Economic, Social and Cultural Rights, art. 11, *opened for signature* Nov. 17, 1988, O.A.S.T.S. No. 69 (entered into force Nov. 16, 1999) [hereinafter San Salvador Protocol] (stating "Everyone shall have the right to live in a healthy environment . . .").

<sup>47</sup> See John H. Knox, *Diagonal Environmental Rights*, in SIGRÜN SKOGLY & MARK GIBNEY, *UNIVERSAL HUMAN RIGHTS AND EXTRATERRITORIAL OBLIGATIONS* 82 (Mark Gibney et al. eds., 2010) (noting that "[h]uman rights law operates primarily along a vertical axis, setting out individuals' rights against their governments and the corresponding duties owed by the governments, but it may also be diagonal, giving rise to duties on the part of states that extend beyond their own territor[ies]").

<sup>48</sup> OHCHR Report CC-HR, *supra* note 2, at 5.

<sup>49</sup> *Id.*

<sup>50</sup> *Id.*

<sup>51</sup> *Id.* at 8-10.

<sup>52</sup> *Id.* at 8-18.

<sup>53</sup> *Id.* at 18-22.

<sup>54</sup> *Id.* at 24, ¶ 72.

<sup>55</sup> *Id.* (citing CESCR general comments No. 12 (1999), No. 13 (1999), No. 14 (2000), and No. 15 (2002) on adequate food, education, highest attainable standard of health, and water, respectively).

<sup>56</sup> ICESCR, *supra* note 43, art. 2(1).

<sup>57</sup> ICCPR, *supra* note 43, art. 2(1).

<sup>58</sup> U.N. Committee on Economic, Social, and Cultural Rights, *The Right to the Highest Attainable Standard of Health: General Comment No. 14*, ¶ 45, U.N. Doc. E/C.12/2000/4 (Aug. 11, 2000) [hereinafter CESCR No. 14], <http://daccess-dds-ny.un.org/doc/UNDOC/GEN/G00/439/34/PDF/G0043934.pdf?OpenElement>.

<sup>59</sup> See BARTON ET AL., *supra* note 31, at 2-5.

<sup>60</sup> *See id.*

<sup>61</sup> TOMLINSON ET AL., *supra* note 11, at 88.

<sup>62</sup> See David Ockwell et al., *Enhancing Developing Country Access to Eco-Innovation: The Case for Technology Transfer and Climate Change in a Post-2012 Policy Framework* 21 (OECD Environment Working Papers No. 12, 2010), [http://www.oecd-ilibrary.org/environment/enhancing-developing-country-access-to-eco-innovation\\_5kmfplm8xxf5-en](http://www.oecd-ilibrary.org/environment/enhancing-developing-country-access-to-eco-innovation_5kmfplm8xxf5-en) (reporting a situation in India where local firms' efforts to develop commercial hybrid vehicle technology were stalled by the process of negotiating the IP protections on existing technology with an international industry leader).

<sup>63</sup> BARTON ET AL., *supra* note 31, at 4.

<sup>64</sup> TOMLINSON ET AL., *supra* note 11, at 88-89.

<sup>65</sup> BENIOFF ET AL., *supra* note 10, at 1, 10.

<sup>66</sup> *See id.*

<sup>67</sup> *Id.* at 10.

<sup>68</sup> BARTON ET AL., *supra* note 31, at 3.

<sup>69</sup> *Id.*

<sup>70</sup> *Id.*

<sup>71</sup> See ABBOTT, *supra* note 29, at v.

<sup>72</sup> World Trade Organization, Ministerial Declaration of 14 November 2001, WT/MIN(01)/DEC/2, 41 I.L.M. 746, ¶ 6 (2002) [hereinafter Doha Declaration].

<sup>73</sup> CESCR No. 14, *supra* note 58, at 9-13.

<sup>74</sup> *See generally* Doha Declaration, *supra* note 72.

<sup>75</sup> *Id.*

<sup>76</sup> *See generally id.*

<sup>77</sup> *See generally, e.g.*, United Nations Framework Convention on Climate Change, Subsidiary Body for Scientific and Technological Advice, Thirty-third Session, Nov. 4-Dec. 5, 2010, *Report on Options to Facilitate Collaborative Technology Research and Development – Note by the Chair of the Expert Group on Technology Transfer*, U.N. Doc. FCCC/SBSTA/2010/INF.11 (Nov. 24, 2010) [hereinafter UNFCCC Note by the Chair], <http://unfccc.int/resource/docs/2010/sbsta/eng/inf11.pdf>.

<sup>78</sup> *See generally* United Nations Framework Convention on Climate Change, 15th Conference of the Parties, Copenhagen, Den., Dec. 7-19, 2009, *Copenhagen Accord*, U.N. Doc. FCCC/CP/2009/11/Add.1 (Mar. 30, 2010) [hereinafter COP 15], <http://unfccc.int/resource/docs/2009/cop15/eng/11a01.pdf>; United Nations Framework Convention on Climate Change, *Report of the Subsidiary Body for Implementation on its Thirty-second Session, held in Bonn from 21 May to 9 June 2010*, U.N. Doc. FCCC/SBI/2010/10 (Aug. 25, 2010), <http://unfccc.int/resource/docs/2010/sbi/eng/10.pdf>.

<sup>79</sup> *See* Wewerinke, *supra* note 5; *see also* OHCHR Panel Discussion, *supra* note 2.

<sup>80</sup> *See generally* COP 15, *supra* note 78; SBI 32, *supra* note 78.

<sup>81</sup> *See id.*

<sup>82</sup> "Regime shifting," as applied by Laurence Helfer to the context of intellectual property, describes a type of forum shopping practiced by states and NGOs whose political interests receive limited traction or are silenced in the intellectual property regime. These actors are increasingly turning to non-IP regimes, with different substantive, institutional, and relational dimensions, in search of new (soft) law-making that will serve to maximize their interests. Laurence Helfer, *Regime Shifting: The TRIPS Agreement and New Dynamics of International Intellectual Property Making*, 29 YALE J. INT'L L. 1, 8-14 (2004).

<sup>83</sup> The "flexibilities" within the TRIPS Agreement are exceptional limitations that are intended to accommodate some extreme human rights conditions with only limited easements in the IP protection (compulsory licensing). The exceptional nature of these provisions means that they "have more often than not been construed against the needs of users." Margaret Chon, *Intellectual Property and the Development Divide*, 27 CARDOZO L. REV. 2813, 2880 (2006).

<sup>84</sup> Most analyses of the problem of access to clean energy technologies and IP are structured around various IP instruments. *See, e.g.*, ABBOTT, *supra* note 29, at 4-7.

<sup>85</sup> U.N. Committee on Economic, Social, and Cultural Rights, *The Right of Everyone to Benefit From the Protection of the Moral and Material Interests Resulting From Any Scientific, Literary or Artistic Production of Which He or She is the Author (Article 15, Paragraph 1 (c), of The Covenant): General Comment No. 17*, U.N. Doc. E/C.12/GC/17 (Jan. 12, 2006) [hereinafter CESCR No. 17], <http://www.unhcr.org/refworld/pdfid/441543594.pdf>.

<sup>86</sup> U.N. Committee on Economic, Social, and Cultural Rights, *The Nature of States Parties' Obligations (Art. 2, Para. 1, of the Covenant): General Comment No. 3*, U.N. Doc. E/1991/23 (Dec. 14, 1990) [hereinafter CESCR No. 3], <http://www.unhcr.org/refworld/pdfid/4538838e10.pdf>.

<sup>87</sup> *See id.*

<sup>88</sup> *See id.*

<sup>89</sup> *See id.*; CESCR No. 17, *supra* note 85; CESCR No. 14, *supra* note 58.

<sup>90</sup> See OCKWELL ET AL., *supra* note 62, at 7 (concluding that "[i]ndigenous eco-innovation capabilities are essential to facilitating both the diffusion of existing eco-innovations within developing countries and sustainable economic development based on the adoption, adaptation and development of environmentally sound technologies that fit within the bespoke conditions faced by developing countries").

<sup>91</sup> *Id.* at 22 (relaying how Indian firms producing light-emitting diodes ("LEDs") expressed that they would not be able to begin production of LEDs simply with access to technology, but rather needed knowledge and experience of the manufacturing process).

<sup>92</sup> Chon, *supra* note 83, at 2880-83.

<sup>93</sup> *Id.* at 2884-85.

<sup>94</sup> *See, e.g.*, UNFCCC Note by the Chair, *supra* note 77.

<sup>95</sup> Yu, *supra* note 40, at 1045.

<sup>96</sup> United Nations Commission on Human Rights, Sub-Commission on the Promotion and Protection of Human Rights, Fifty-second Session, *The Impact*

of the Agreement on Trade-Related Aspects of Intellectual Property Rights on Human Rights, U.N. Doc. E/CN.4/Sub.2/2001/13 (June 27, 2001) [hereinafter UNCHR Trade-Related Aspects], [http://www.unhcr.ch/Huridocda/Huridoca.nsf/e06a5300f90fa0238025668700518ca4/590516104e92e87bc1256aa8004a8191/\\$FILE/G0114345.pdf](http://www.unhcr.ch/Huridocda/Huridoca.nsf/e06a5300f90fa0238025668700518ca4/590516104e92e87bc1256aa8004a8191/$FILE/G0114345.pdf).

<sup>97</sup> See *id.* ¶ 14.

<sup>98</sup> *Id.*

<sup>99</sup> *Id.*

<sup>100</sup> *Id.*

<sup>101</sup> See Helfer, *supra* note 82; see also Yu, *supra* note 40, at 1105.

<sup>102</sup> See CESCR No. 3, *supra* note 86; CESCR No. 17, *supra* note 85; CESCR No. 14, *supra* note 58.

<sup>103</sup> See *id.*

<sup>104</sup> Yu, *supra* note 40. Helfer, *supra* note 82.

<sup>105</sup> *Id.*

<sup>106</sup> See *id.*

<sup>107</sup> CESCR No. 17, *supra* note 85, ¶ 35.

<sup>108</sup> Helfer, *supra* note 82, at 1018.

<sup>109</sup> Yu, *supra* note 40, at 1105-06.

<sup>110</sup> See generally *id.* at 1095.

<sup>111</sup> See generally *id.* at 1096.

<sup>112</sup> See *id.*

<sup>113</sup> See *id.* at 1094-97.

<sup>114</sup> See generally *id.*

<sup>115</sup> See generally *id.*

<sup>116</sup> See *id.*

<sup>117</sup> See *id.*

<sup>118</sup> See *id.*

<sup>119</sup> See *id.* at 1096.

<sup>120</sup> UNCHR Trade-Related Aspects, *supra* note 96, ¶ 22.

<sup>121</sup> See generally BRITT CHILDS STALEY ET AL., WORLD RESOURCES INST., FROM POSITIONS TO AGREEMENT: TECHNOLOGY AND FINANCE AT THE UNFCCC (2008), [http://pdf.wri.org/working\\_papers/from\\_positions\\_to\\_agreement.pdf](http://pdf.wri.org/working_papers/from_positions_to_agreement.pdf).

<sup>122</sup> TOMLINSON ET AL., *supra* note 11, at 87.

## ENDNOTES: THE SINGAPORE WORKAROUND: PROVIDING A “GREENPRINT” FOR A UNFCCC PARTY RECLASSIFICATION

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<sup>16</sup> See HUNTER ET AL., *supra* note 12, at 681.

<sup>17</sup> Alan Manne & Richard Richels, *US Rejection of the Kyoto Protocol: The Impact on Compliance Costs and CO<sub>2</sub> Emissions*, 32 ENERGY POL’Y 447 (2004).

<sup>18</sup> Jennifer Morgan, *Reflections on the Cancun Agreements*, WORLD RESOURCES INST. (Dec. 14, 2010), <http://www.wri.org/stories/2010/12/reflections-cancun-agreements>.

<sup>19</sup> Marianne Lavelle, *Toward a Stalemate in Copenhagen*, CTR. FOR PUB. INTEG. (Nov. 5, 2009), [http://www.publicintegrity.org/investigations/global\\_climate\\_change\\_lobby/overview/](http://www.publicintegrity.org/investigations/global_climate_change_lobby/overview/).

<sup>20</sup> The Montreal Protocol on Substances that Deplete the Ozone Layer arts. 2H(5), 5, Sept. 16, 1987, 1522 U.N.T.S. 3; *Exemption Information*, UNEP OZONE SECRETARIAT, [http://ozone.unep.org/Exemption\\_Information/](http://ozone.unep.org/Exemption_Information/) (last updated 2004).

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<sup>23</sup> SSNC, *supra* note 9, at 2.

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<sup>29</sup> *Id.* at 57 (considering that the CEPO was set up administratively in April 2007 with S\$170 million to coordinate research and test-bedding and leverage other government agencies to grow the clean energy industry).  
<sup>30</sup> *Id.* at 56 (considering the Research Fund for the Built Environment is a S\$50 million fund from the Ministry of National Development (“MND”) funds projects such as including sustainable development projects such as integrating solar technologies into building facades).

<sup>31</sup> *Id.* at 53.

<sup>32</sup> Kyoto Protocol, *supra* note 2, art. 12.

<sup>33</sup> See UNFCCC, *supra* note 15, art. 12(2) (“The purpose of the clean development mechanism [is] to assist parties not included in Annex I in achieving sustainable development . . . and to assist parties included in Annex I in achieving compliance with their quantified emission limitation and reduction commitments . . .”).

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<sup>37</sup> *Jayakumar*, *supra* note 35.

<sup>38</sup> *Id.*

<sup>39</sup> *Climate Change and Energy Efficiency*, NAT’ ENV’T AGENCY, <http://app2.nea.gov.sg/topics/climatechange.aspx> (last updated May 08, 2008).

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<sup>41</sup> *SINC*, *supra* note 40, at 17.

<sup>42</sup> SSNC, *supra* note 9, at i.

<sup>43</sup> David Fogarty, *Don’t Judge States on Wealth and Emissions: Climate Envoy*, REUTERS (Feb. 21, 2011), <http://www.reuters.com/article/2009/02/21/us-climate-singapore-idUSTRE51K0TR20090221>.

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<sup>45</sup> SSNC, *supra* note 9, at 20.

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<sup>51</sup> *Id.* at 1.

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<sup>55</sup> KATE GORDON, JULIAN L. WONG, & JT McLAIN, CTR. FOR AM. PROGRESS, OUT OF THE RUNNING? HOW GERMANY, SPAIN, AND CHINA ARE SEIZING THE ENERGY

OPPORTUNITY AND WHY THE UNITED STATES RISKS GETTING LEFT BEHIND (2010), [http://www.americanprogress.org/issues/2010/03/pdf/out\\_of\\_running.pdf](http://www.americanprogress.org/issues/2010/03/pdf/out_of_running.pdf).

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