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Joel B. Eisen

*University of Richmond*, [jeisen@richmond.edu](mailto:jeisen@richmond.edu)

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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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\*\* Professor Joel Eisen teaches courses in Environmental Law, Energy Law, and Law of Climate Change, and Environmental and Energy Law in China. He also teaches the Environmental Law and Policy course to undergraduate students in the University of Richmond's Environmental Studies program. In recognition of his contributions to teaching, scholarship, and service, he has been named the University's Distinguished Educator for 2010-2011. In spring 2009, Professor Eisen was a Fulbright Professor of Law at the China University of Political Science and Law in Beijing, China. He has become an authority on renewable energy law and policy in the United States and China, and has published extensively in law journals, periodicals for general consumption, and books and treatises. He is a co-author of the leading law and business school text on energy law, *Energy, Economics and the Environment*, with its third edition published in 2010. His most recent articles on renewable energy (including two on China's energy programs) were published in law journals at Notre Dame, William and Mary, and Chicago-Kent. Professor Eisen is a graduate of the Stanford Law School (J.D. 1985) and the Massachusetts Institute of Technology (B.S. degree in Civil Engineering in 1981).

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=thomasfriedman> (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=thomasfriedman>; 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=thomasfriedman> (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=thomasfriedman>; 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=thomasfriedman> (“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=all&\\_r=1&ref=keith\\_bradsher](http://www.nytimes.com/2010/09/09/business/global/09trade.html?pagewanted=all&_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://greenleapforward.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,

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