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## Getting Our Share of Clean Energy Trade

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**T**he global race toward clean energy presents a new frontier of jobs and opportunities for Americans and American companies. But with a \$6 trillion global energy market up for grabs, some countries refuse to play fair. Around the world, foreign governments—such as China—have tilted the playing field in their favor with discriminatory regulations, high tariffs and other barriers designed to keep made-in-America products out of their countries. This memo proposes a national strategy to win America a bigger and fairer share of the global clean energy market.

### WHAT'S AT STAKE?

#### Good American Jobs

The \$6 trillion global energy market has been dubbed by some “the mother of all markets.”<sup>1</sup> As countries compete toward the grail of changing the focus of this massive market to clean energy,<sup>2</sup> business is booming around the world.<sup>3</sup> Even in America, despite the current downturn, the clean energy sector<sup>4</sup> has seen a major leap forward in talent, resources and support.<sup>5</sup>

- At least 800,000 Americans work directly in the clean energy sector, plus many thousands more in related industries.<sup>6</sup>
- The number of American clean energy jobs surged 9.1% from 1998 to 2007, compared to 3.7% growth in overall U.S. employment during that period.<sup>7</sup>
- Jobs in the wind sector alone grew 70% from 2007-2008.<sup>8</sup>

But even as America grows clean energy jobs, other countries are growing them faster in an effort to stake out a bigger piece of the global clean energy pie. In Germany, for example, jobs in the environmental technology sector are projected to exceed jobs in the machine tool or auto industries by 2020. The

German environmental technology sector is projected to account for some 16% of German industrial production by 2030.<sup>9</sup> China has allotted more than \$230 billion in economic stimulus funding to clean energy initiatives and—as a percentage of GDP—is investing 10 times more than the United States on clean power.<sup>10</sup>

Rather than sitting on the sidelines, America should also seek to seize the lead as a global exporter of clean energy goods, services and technologies. If there is one aspect of U.S. trade policy deserving of aggressive pursuit, it is clean energy export promotion. The benefits would be vast:

- **Millions of potential new jobs.**

Seizing clean energy export opportunities could both accelerate the recovery and provide the engine for future growth.<sup>11</sup> Dollar for dollar, clean energy investments create more jobs than investments in the conventional energy sector.<sup>12</sup> Clean energy has the potential to add an *additional* 1.7 million jobs in the near term and 5 million jobs by 2020 to the estimated 770,000 clean energy jobs that existed in 2007.<sup>13</sup> But if the domestic potential for clean energy is vast, global opportunities are virtually endless. Aggressive U.S. leadership in global clean energy research and development could increase U.S. clean energy exports by \$40 billion by 2020 and by up to \$200 billion by 2050, resulting in up to 750,000 new jobs by 2020 and millions of new jobs by 2050.<sup>14</sup>

- **More “good” jobs.**

Most of the new jobs created in the clean energy sector will be “good” jobs with good wages. Clean energy projects require a high level of manufacturing content, including steel, glass and complex manufactured products,<sup>15</sup> as well as sophisticated services, such as planning, design, development, construction and management.<sup>16</sup>

For example, China’s rapid development of clean energy, energy efficiency and “smart grid” programs, is creating a very substantial need for high-quality equipment, proven energy conservation technology and specialized engineering, management and energy auditing services—all areas in which U.S. firms excel.<sup>17</sup>

- **American economic leadership in other sectors.**

Clean energy provides an ideal laboratory for testing new approaches to improve the way that U.S. companies and workers compete in the global economy. Research, innovation, manufacturing, services and small and medium enterprises are all critical components of the clean energy sector. New strate-

gies for promoting clean energy exports and removing related trade barriers will have major spillover benefits to other sectors of the U.S. economy.

## THE PROBLEM

### A tilted playing field and a weak U.S. offense.

So far, America is failing to realize its full potential in clean energy. Much of the blame for this lies here in America, and is the result of a significant failure by the United States to adopt smart and consistent policy incentives to maximize the domestic clean energy market and to provide aggressive support for innovation, research and development for clean energy.

However, Americans and American companies are also crippled in the global marketplace by the unfair practices of other nations and by the lack of aggressive and coordinated national plans to promote the U.S. clean energy sector at home and protect its interests abroad. The result is fewer sales for American companies and fewer jobs for American workers:

- The U.S. trade balance in “green goods” (including pollution management, energy efficiency and renewable energy goods) sank from a \$14.4 billion surplus in 1997 to a deficit of nearly \$8.9 billion in 2008.<sup>18</sup>
- While the United States was the global leader in photovoltaic (“PV”) solar technology in 1999, it now lags far behind Germany, Japan and China.<sup>19</sup>
- Although all of the world’s top five Internet companies are American, U.S. firms comprise only one of the top five wind power manufacturers, one of the top ten solar panel producers and two of the top ten advanced battery manufacturers.<sup>20</sup>
- Europe substantially outpaces the United States in world market shares of major efficient technologies and products.<sup>21</sup>

The chart below compares the number of American jobs in key clean energy industries with those in rival nations.

### Estimated Jobs in Selected Clean Energy Sectors in 2006<sup>22</sup>

Energy Source	World	Selected Countries
Biomass	1,174,000	Brazil – 500,000 U.S. – 312,200 China – 266,000 Germany – 95,400
Solar Thermal	624,000 +	China – 600,000 Germany – 13,300 Spain – 9,142 U.S. – 1,900
Nuclear <sup>23</sup>	470,000	U.S. – 112,000
Wind	300,000	Germany – 82,100 U.S. – 36,800 <sup>24</sup> Spain – 35,000 China – 22,200
Solar PV	170,000	China – 55,000 Germany – 35,000 Spain – 26,449 U.S. – 15,700
Hydropower	39,000 +	Europe – 20,000 U.S. – 19,000
Geothermal	25,000	U.S. – 21,000 Germany – 4,200
Total	2,802,000 +	

## PROBLEM # 1

### Foreign governments discriminate against American goods and services

Many governments around the world—particularly those in fast-growing developing countries such as China, India and Brazil—are pursuing a two-pronged

strategy for putting their clean energy companies ahead: (1) erecting trade barriers to shelter local companies from international competition at home; and (2) providing strong support (such as tax subsidies) to domestic firms as they compete aggressively with U.S. firms in the United States and other markets.<sup>25</sup>

As a result, American clean energy exporters face a variety of unfair foreign trade barriers and practices,<sup>26</sup> many of which violate international law. These include:

- **Rigged rules for government contracts.**

Closed and non-transparent government procurement systems and close relationships between governments and local firms can disadvantage U.S. clean energy firms seeking to sell into foreign markets.<sup>27</sup> China, for example, provides significant procurement preferences for Chinese clean energy producers that use Chinese IP. China's wind turbine bidding process also favors local producers by ignoring critical long-term reliability considerations.<sup>28</sup> In Spain, public sector infrastructure projects are effectively closed to U.S. construction and engineering firms.<sup>29</sup>

- **"Buy China" and other local content requirements.**

A number of countries and jurisdictions, including China and Spain and two Canadian provinces, have required that renewable energy development projects include a certain percentage of "local content."<sup>30</sup> For example, until it recently eliminated this rule in response to strong U.S. pressure, China maintained a 70% local content rule that shut out American wind companies from its booming wind energy market.<sup>31</sup>

- **High tariffs on American goods.**

Major developing countries charge import duties as high as 35% on various categories of clean energy goods.<sup>32</sup> Many developing countries also maintain high maximum or "bound" tariffs on environmental goods, which means that countries can ratchet up their tariffs on clean energy goods to this "bound" rate at any time.<sup>33</sup> Brazil, for example, recently raised its tariff on certain imported wind turbines from zero to 14% just before a major auction for wind farms (in order to shut out competition), and retains a 35% bound tariff for wind turbines.<sup>34</sup>

High foreign tariffs pose particular barriers to innovative clean energy products for which U.S. firms are world leaders, including next-generation solar cells and "smart" meters.<sup>35</sup> For instance, Brazil imposes or maintains high actual and potential tariffs (known as "applied" and "bound" tariffs) on photovoltaic cells (12% and 35%, respectively) and electrical meters (18% and 35%). Similarly, imports into the lucrative Indian clean energy market face

applied and bound tariffs of 7.5% and 25% on wind turbines and 10% and 40% on electrical meters.<sup>36</sup> China protects its domestic wind-energy-manufacturing sector by imposing graduated tariffs on wind energy goods—3% for parts, 8% for assembled components and 17% for fully assembled turbines.<sup>37</sup>

Additionally, foreign governments can penalize American companies by establishing strict quotas on the amount of U.S. goods that can enter a country. For example, the European Union imposes unreasonable quotas on imports of nuclear fuel, fuel rods and assemblies.<sup>38</sup>

- **Piracy of American intellectual property.**

More than 50% of U.S. exports depend on some form of intellectual property (“IP”), such as software or complex technology.<sup>39</sup> However, China and other developing countries routinely trample the IP rights of U.S. firms. They either permit rampant piracy or engage (or threaten to engage) in tactics such as “compulsory licensing” that run roughshod over American IP.<sup>40</sup> Moreover, some developing countries have proposed that innovative clean energy firms should be forced to give away (“transfer”) their clean-energy IP to developing countries as part of any global climate change agreement.<sup>41</sup>

- **Burdensome customs procedures.**

Many countries also use customs procedures to discriminate against American exports, making it tougher to get goods into a country. In India, for example, American companies must navigate a complex and opaque system for determining how much in tariffs and customs duties they need to pay, and face questionable customs valuation procedures and frequent delays caused by excessive documentation requirements.<sup>42</sup>

- **Unfair or excessive taxes.**

Discriminatory or excessive taxes and complex and inconsistent tax systems can restrict clean energy imports. Brazil, for example, applies federal and state taxes and charges on imports that can effectively double the cost of importing into Brazil.<sup>43</sup>

- **Shutting out American investment.**

India’s poor track record in honoring and enforcing agreements with U.S. investors in its energy sector—including decades-long refusals by Indian states and parastatal organizations to pay U.S. energy investors—has discouraged U.S. investment in lucrative Indian energy projects. Additionally, China appears to be moving in the same direction by creating rules to shut out American and foreign investors from key sectors, including energy efficiency and clean power generation.<sup>44</sup>

- **Slanted standards and regulations.**

The World Trade Organization and others have expressed particular concern about a trend towards “green protectionism.”<sup>45</sup> Many countries are moving quickly to impose new legal and technical rules for energy efficiency and climate-friendly goods that can effectively shut out foreign imports. Additionally, countries are aggressively seeking advantage for their clean energy producers in setting new international standards for energy efficient products and services. Many new technical requirements must be established for electric vehicles, smart grids and other green products, services and technologies. Those who set the standards will have the inside track on these important new markets.<sup>46</sup>

- **Barriers to U.S. services.**

Many countries place excessive burdens on service providers who play key roles in clean energy projects. Overly strict professional licensing requirements for consulting and engineering in various countries can limit U.S. exports of clean energy goods and services.<sup>47</sup> In China, U.S. construction, engineering, architecture and contracting firms face burdensome incorporation, capitalization and project-size requirements; U.S. project management firms are subject to overly burdensome qualification requirements; and smaller foreign urban design firms are essentially excluded from the Chinese market.<sup>48</sup>

## **PROBLEM # 2**

### **The U.S. government fails to advance the interests of American companies and workers effectively**

Even as they face foreign barriers to their exports, American companies are also hampered by inadequate federal efforts to promote American exports and enforce existing international trade rules. Deficiencies in export promotion and enforcement hinder all U.S. exports. However, they are of particular concern to U.S. clean energy firms competing in a new, rapidly changing and highly competitive international market in which foreign governments are pulling out all the stops to promote their domestic industries.

#### **Inadequate Export Promotion**

U.S. export performance is also hindered by longstanding problems with U.S. government export promotion programs. These impediments hamstring U.S. clean energy exporters, who face foreign competitors backed by robust, highly strategic and agile government export promotion efforts.

- Compared to other major developed nations, the United States spends far less on export promotion and derives far less of its GDP from exports. The United Kingdom, for example, spends \$0.75 per thousand dollars of exports on export promotion and derives 34% of its GDP from exports, while United States spends only \$0.21 cents per thousand dollars of exports and derives only 9-13% of its GDP from exports.<sup>49</sup>
- In an era when world export markets are more competitive than ever, U.S. export promotion resources and agency staffing are declining.<sup>50</sup>
- As in the enforcement area, too many agencies are pursuing disjointed goals. At least nine federal agencies have an export promotion program. According to the Government Accountability Office, the U.S. Government lacks an effective mechanism for determining whether resources are properly allocated among these agencies to meet national export priorities.<sup>51</sup>
- Small and midsize enterprises (“SMEs”)—which comprise 97% of U.S. exporters and account for 29% of U.S. export value—don’t get enough help in entering and navigating the complexities of the export process.<sup>52</sup> 30% of non-exporting SMEs say they would consider exporting if they had better access to market information, export opportunities and the export process.<sup>53</sup>
- American companies have trouble getting access to federal programs to help finance exports because of bureaucracy and red tape. They also note that these services are not well coordinated and hard to use. They also complain that the U.S. government could do a much better job using existing financing programs to help American clean energy exporters compete with foreign producers whose governments provide more flexible and attractive export financing.<sup>54</sup>

## Inadequate Export Enforcement and Monitoring

For decades, U.S. trade officials have crisscrossed the globe to sign trade deals designed to assure that American goods and services have access to foreign markets.<sup>55</sup> Many of these rules can play a vital role in opening trade for U.S. clean energy exports, and new trade rules are still needed. These trade deals can only benefit U.S. exporters, however, if they are actively monitored and aggressively enforced. Unfortunately, especially in recent years, the United States has often fallen short in providing the resources and focus necessary to assure strong enforcement and aggressive day-to-day monitoring of its international trade rights.

- Only one-fifth of USTR's staff is now devoted to trade enforcement and monitoring activities, which means enforcement often takes a back seat.<sup>56</sup>
- Funding for monitoring and enforcement hasn't grown, despite the rapid growth of trade and new agreements to monitor.<sup>57</sup>
- At least 17 federal agencies are involved in trade enforcement, with multiple units within USTR and the Departments of Agriculture, Commerce and State playing leading roles. However, these multiple agencies don't effectively coordinate their activities or pool their resources well.<sup>58</sup>
- Enforcement officials often wait for complaints before they act, instead of proactively seeking to identify and prioritize potential trade barriers.<sup>59</sup>

## Inadequate Domestic Support

Clean energy industries in many other countries are internationally competitive because their governments have created and maintained durable policy incentives, such as preferential utility tariffs for renewable energy and subsidies, to support their clean energy sectors.<sup>60</sup>

The United States, on the other hand, has not historically provided that kind of support to specific sectors,<sup>61</sup> including encouraging foreign companies to create American subsidiaries in the United States that employ American workers. While pending energy legislation includes some incentives for clean energy development,\* it still may not be enough to ensure American long-term leadership in this sector.<sup>62</sup> Additionally, the United States is not moving aggressively and smartly to eliminate key structural barriers to broaden domestic adoption of clean energy technologies.<sup>63</sup>

Clean energy export trade has also often been overlooked in the current debate on climate change, which has largely focused, in the trade context, on "carbon leakage" from imports. This is despite the fact that more open trade in clean energy goods and services could benefit the United States economically and make a significant positive impact on achieving global climate change goals.<sup>64</sup>

## THE SOLUTION

### A National Strategy for Getting Our Share of Clean Energy Trade

For America to win a larger share of future job growth in clean energy, U.S. companies must produce innovative, efficient, competitive and high quality

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\* Third Way has proposed several ideas for boosting America's clean energy sector, including a National Institutes of Energy and Clean Energy Business Investment Zones.

clean energy products and technologies.<sup>65</sup> The U. S. Government must support and incentivize American clean energy firms by putting a price on carbon, developing smart domestic energy policies and making robust investments in clean energy technology development.<sup>66</sup> Only through private sector and government collaboration on each of these touch points will America be able to develop the solar and wind storage capacity, extended charge batteries and other technologies that are the long term keys to the global market. The United States must also help grow the global clean energy sector through international cooperation on clean energy R&D and market development, both of which would supplement reducing greenhouse gases through carbon pricing and other policies.<sup>67</sup>

Equally vital, however, is for the United States to aggressively pursue a clear national export strategy that will win Americans a bigger share of the global clean energy market.<sup>68</sup> This strategy should seek to promote American clean energy products aggressively, with a focus on helping small and medium-sized companies lead the charge, cracking down on countries that don't play fair and winning global agreements that set fairer rules for clean energy trade.

To advance these goals, we propose four major steps:

## STEP # 1

### Establish a national goal for winning more of the global clean energy market

Congress and the Administration should establish an aggressive national target for increasing American clean energy exports, appoint a clean energy export jobs coordinator and better track the impact on American jobs of clean energy export promotion efforts.

- **Announce a bold national target: to double America's share of global clean energy trade by 2020.**

America currently has only an 8% to 12% share of the world market for major efficient technologies and products. Europe, on the other hand, commands over 40% of global trade for many of these important technologies and products.<sup>69</sup> The United States should aim to double its share of the rapidly expanding world clean energy market by 2020. Although America will benefit from a growing, global clean energy "pie," it must also aggressively seek a bigger "slice" through focused support for clean energy exports.

The announcement of a clear national goal for increasing American's clean energy exports can focus policymakers on a tangible objective and help them measure success.<sup>70</sup> To track the nation's progress, Congress and the Administration should agree on a common and broadly defined definition of

“clean energy” and establish the necessary economic tools to measure the economic impact of the clean energy sector, including clean energy exports and related jobs. This would give policymakers a baseline and a clear means of quantifying the economic activity generated by the production and export of clean energy services and goods.

- **Appoint a clean energy export coordinator and create a one-stop shop for clean energy exporters.**

Effectively promoting clean energy exports requires coordination of many crosscutting issues and distinct governmental functions, ranging from clean energy development, to exporter assistance, to trade agreement negotiation and enforcement. The United States should assure a more coordinated and effective approach to clean energy exporting by: (1) designating a clean energy export coordinator; (2) immediately implementing the clean energy export working group previously mandated by Congress; and (3) creating a “one-stop shop” for clean energy exporters.

A single clean energy export coordinator, working under the direction of the Administration’s “green cabinet,” would assure better coordination of clean energy export programs, play a critical role in implementing a national clean energy export strategy and assure that clean energy export policy is aligned with overall U.S. clean energy goals. A clean energy export working group was mandated by the Energy Independence and Security Act of 2007<sup>71</sup> and Commerce Secretary Locke recently announced the creation of an interagency working group on clean energy exports.<sup>72</sup> The Administration and its clean energy export coordinator should now move aggressively to implement such a working group, which will help bring additional coherence and a strategic focus to U.S. clean energy export promotion.

Finally, Congress and the Administration should create a “one-stop shop” for clean energy exporters, so that U.S. exporters can access all U.S. clean energy export promotion, enforcement and financing resources through a single portal. In implementing the “one-stop shop” concept, Congress and the Administration should also consider whether it makes sense to concentrate government-wide clean energy export promotion resources in programs that have proven to be the most effective.

- **Measure the success of clean energy promotion efforts in creating American jobs.**

Creating good American jobs should be the ultimate goal of all efforts to promote clean energy exports. Congress and the Administration should require rigorous evaluation of the various approaches to clean energy export

promotion, including the measurement of the success of different initiatives in supporting and creating good U.S. jobs.<sup>73</sup>

## STEP #2

### Focus on promoting small and medium-sized companies

Congress should help small and medium-sized companies lead the charge in expanding clean energy exports by establishing a “clean energy export opportunity fund” for small and medium-sized companies, waiving user fees for smaller companies taking advantage of export promotion services and establishing a pilot project aimed at promoting exports of American clean energy goods and services.

- **Establish a clean energy export opportunity fund for small- and medium-sized companies.**

National export growth is powerfully linked to participation by small and medium enterprises in export markets.<sup>74</sup> Commerce Secretary Locke has recently announced, for example, a separate, new interagency working group to improve U.S. export performance by enhancing exports by small and medium enterprises.<sup>75</sup> Similarly, promoting exports by SMEs—either directly or in partnership with established U.S. exporters—must be a critical driver of U.S. success in clean energy. To help spur SME clean energy exports, the United States should create a \$15 million SME Clean Energy Export Fund. This fund would focus specifically on assuring that SMEs—including clean energy parts suppliers and engineering and design firms—have the information, export opportunities and assistance they need to better compete internationally.

- **Waive user fees for qualifying small-and medium-sized clean energy firms using the U.S. Commercial Service.**

The U.S. Commercial Service provides valuable, fee-based services to American companies seeking to enter foreign markets, including international company profiles, international partner searches and “Gold Key” service to facilitate foreign visits by potential U.S. exporters. Although USCS has made some efforts in recent years to provide these services to SMEs at reduced fees, small firms still face problems with the USCS fee structure for trade assistance.<sup>76</sup> USCS should be authorized to establish a pilot program under which it would be authorized to waive its service fees for qualifying clean energy SMEs and required to study the effectiveness of such fee waivers on encouraging SME exports and creating jobs.

- **Create a new pilot project dedicated to promoting American clean-energy goods and services overseas.**

Congress should also create a new multi-year demonstration project aimed at developing other innovative ideas for improving export promotion for American clean energy companies, with a particular emphasis on exports by small- and medium-sized firms. Among other things, this project should (1) be given the flexibility to explore and utilize the best practices of state and foreign export promotion programs; (2) be authorized to provide greater financial support for clean energy trade missions and other exporter support activities; (3) provide flexible and robust financing to promote clean energy exports by building capacity and regulatory frameworks in developing countries;<sup>77</sup> and (4) develop new strategies to address the interagency coordination, resource allocation and progress measurement concerns regarding overall U.S. export promotion.

### STEP #3

#### Aggressively defend American interests abroad

Congress and the Administration should also work to improve the way the United States defends the interest of American clean energy companies and workers overseas through better trade enforcement and by getting tough on foreign countries that slam the door on U.S. clean energy exports:

- **Prioritize trade enforcement on the clean energy sector.**

The emerging clean energy sector provides the United States with a unique opportunity to develop a more forward-looking approach to trade enforcement. The USTR should recognize the tremendous long term *potential* for clean energy trade and assure that—whatever their current volume—such exports have the highest priority in its monitoring and enforcement plans. Additionally, USTR, Commerce, State and other agencies should adopt a highly coordinated and proactive approach to reviewing the myriad new foreign laws, standards and policies on clean energy that will be spawned by international climate change efforts. The goal of this robust “early warning” system should be to identify and root out emerging barriers before they can block U.S. exports. To this end, Congress must also insist that the USTR prepare a separate, detailed annual report on clean energy export barriers, as required by the 2005 Energy Policy Act, rather than addressing related trade barriers in a general and scattershot manner in the hundreds of pages of its annual trade barriers report.<sup>78</sup>

The Obama Administration has signaled its intention to place a renewed focus on trade agreement enforcement. Last year, U.S. Trade Representative Ron Kirk announced a new initiative to identify, prioritize and prosecute violations of trade agreements that present the most significant barriers to U.S. exports.<sup>79</sup> Creating a new trade enforcement division within USTR and creating the post of Deputy USTR for trade enforcement would be additional useful steps to emphasize the priority of trade agreement enforcement.<sup>80</sup> Of course, for this renewed focus on trade enforcement to work for U.S. exporters, Congress and the Administration must also devote meaningful new resources to monitoring, training and enforcement activities.<sup>81</sup>

- **Require countries to play fair.**

The U.S. Government can significantly grow global markets for clean energy exports by accelerating international cooperation in clean energy R&D, by supporting capacity building initiatives in key developing countries, and by providing significant international financial support under the Copenhagen process.<sup>82</sup> However, it makes little sense for the United States to grow markets in countries that shut out U.S. clean energy suppliers or fail to enforce U.S. clean energy IP rights. U.S. policymakers must insist that improved access for U.S. clean energy goods and services be a key precondition for U.S. international cooperation on clean energy, and that American companies get their fair share of international clean energy projects ultimately paid for by American taxpayers.

## **STEP #4**

### **Set the standard for international cooperation**

Finally, the United States should be a model for global engagement and cooperation on clean energy trade by advancing multilateral trade agreements that open up trade in clean energy goods and services and by welcoming direct foreign investment that creates American jobs.

- **Complete and ratify the global Environmental Goods and Services Agreement and advance other trade agreements.**

The United States should aggressively pursue the conclusion of an Environmental Goods and Services Agreement (“ESGA”) along the lines proposed by the United States and the European Union in 2007. That proposal would open up international trade in 43 categories of goods with clear environmental benefits identified by the World Bank, including wind turbines, power plant equipment, energy efficiency equipment, and water and air pollution control goods. The ESGA would also commit developed and advanced de-

veloping countries to eliminate trade barriers for a larger list of environmental goods and a range of environmentally related services.<sup>83</sup>

An ESGA has been under discussion within the World Trade Organization for eight years. While WTO negotiations should continue, the United States should also pursue an agreement in all other appropriate international forums, including the OECD and the Asia-Pacific Economic Cooperation forum. The United States should also redouble efforts to provide appropriate incentives for developing countries to join an ESGA by, for example, focusing on goods and services with significant export potential for developing countries, including agricultural products, and by developing “trade-for-aid” incentives to assist developing countries in the adoption of clean energy technologies.<sup>84</sup> As an interim measure, Congress might also consider reforming the Generalized System of Preferences and other developing country trade preference programs to provide temporary, targeted trade benefits for imports of clean energy products and to create a pathway for developing countries to join the ESGA.

The United States should also continue efforts to have China and other countries join the Agreement on Government Procurement. Opening up foreign government procurements to U.S. clean energy firms is vital, given the central role of governments in many clean energy projects.

- **Eliminate foreign and domestic rules that unfairly restrict international clean energy investment.**

Open global trade and investment are vital for assuring that American companies and workers benefit fully from the global clean energy economy. The United States must work diligently to combat rules in countries like China and India that prohibit or unreasonably restrict U.S.-owned firms from investing or otherwise participating in clean energy projects. The United States must also lead by example by eliminating unfair rules that limit the ability of foreign-owned companies to participate in U.S. Government clean energy initiatives and that invite foreign retaliation against U.S.-owned firms. In particular, foreign-owned clean energy companies with substantial U.S. operations and significant U.S. workforces should not be unreasonably restricted from bidding on U.S. clean energy contracts<sup>85</sup> or obtaining appropriate export assistance for their U.S.-produced clean energy goods and services.

## ■ CONCLUSION

America already has significant strengths as a global clean energy competitor, including its leadership in biomass and geothermal, its strong position in nuclear technologies, a sophisticated manufacturing base that can produce a wide range of clean energy goods, and world-class capabilities in clean energy

services and technologies.<sup>86</sup> American clean energy companies and their workers are well positioned to lead the way to a renaissance of U.S. export trade.

Innovation and initiative by the U.S. clean energy sector will ultimately determine whether U.S. renewable energy firms are successful in export markets. But government can play a vital role in creating conditions for such success. New U.S. and foreign environmental regulatory policies and export promotion efforts are and will be key drivers of the global clean energy market. Under a comprehensive clean energy export strategy, the U.S. Government can assure that such policies encourage open clean energy markets around the world and ensure that America gets its share of future clean energy trade.

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#### ABOUT THIRD WAY

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## ■ ENDNOTES

1 The Pew Charitable Trusts, "The Clean Energy Economy: Repowering Jobs, Businesses and Investments Across America." June 2009, p. 26: [www.pewcenteronthestates.org/uploadedFiles/Clean\\_Economy\\_Report\\_Web.pdf](http://www.pewcenteronthestates.org/uploadedFiles/Clean_Economy_Report_Web.pdf). In comparison, the global Internet economy is valued at about \$1 trillion annually.

2 Clean technologies represent the biggest opportunities for job and wealth creation. Ibid, p. 4; Colvin, Jake, "America's Green Trade Challenge." Business Week, August 11, 2009: [http://www.businessweek.com/bwdaily/dnflash/content/aug2009/db20090811\\_875168.htm](http://www.businessweek.com/bwdaily/dnflash/content/aug2009/db20090811_875168.htm); Jasmy Methipara, Amy Sauer, Chrissy Elles, Fredric Beck and Carol Werner, eds, Environmental and Energy Study Institute, "Fact Sheet: Jobs from Renewable Energy and Energy Efficiency." October 22, 2008. For a summary of studies on the national, state, global and sectoral employment impacts of clean energy please see [www.eesi.org/files/green\\_jobs\\_factsheet\\_102208.pdf](http://www.eesi.org/files/green_jobs_factsheet_102208.pdf).

3 The global environmental market was valued at over \$728 billion in 2007 and had grown by 55% between 2002 and 2006. Colin, Linda Mysliwy, "Banking on 'Green' Exports." BreakBulk.com, November 17, 2008: <http://www.breakbulk.com/content/?p=339>; Global wind power capacity increased by 36% between 2007 and 2008 and was 11 times greater than a decade earlier. Since 1998, global production of solar photovoltaic cells has increased by 23-fold. Worldwatch Institute/Heinrich Boll Stiftung, "Toward a Transatlantic Green New Deal: Tackling the Climate and Economic Crises." Vol. 3. 2009, p. 15: <http://www.worldwatch.org/node/6174>; The global market for energy efficiency technologies is projected to increase from \$617 billion in 2008 to \$1.23 trillion in 2020. Renner, Michael, et al, Worldwatch Institute/Cornell University Global Labour Institute, "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World." September 24, 2008, p. 54: [http://www.unep.org/labour\\_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf](http://www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf).

4 The "clean energy economy" has been defined broadly to include goods and services relating to clean energy, energy efficiency, environmentally friendly production, conservation and pollution mitigation and related training and support. The Pew Charitable Trusts, "The Clean Energy Economy: Repowering Jobs, Businesses and Investments Across America." June 2009, p. 5: [www.pewcenteronthestates.org/uploadedFiles/Clean\\_Economy\\_Report\\_Web.pdf](http://www.pewcenteronthestates.org/uploadedFiles/Clean_Economy_Report_Web.pdf); Sources of clean energy production include biomass, waste to energy, solar, wind, geothermal, hydropower and ocean power. Energy and Security Group, "Clean Energy: An Exporter's Guide to China." July 2008: [www.trade.gov/media/publications/pdf/china-clean-energy2008.pdf](http://www.trade.gov/media/publications/pdf/china-clean-energy2008.pdf); For a discussion of the role of advanced nuclear technologies in reducing U.S. greenhouse gas emissions, see: United States Department of Energy. "Department of Energy Announces up to \$40 Million in Available Funding for Next Generation Nuclear Plants," Washington, D.C. September 18, 2009: <http://www.energy.gov/news2009/8025.htm>.

5 The Pew Charitable Trusts, "The Clean Energy Economy: Repowering Jobs, Businesses and Investments Across America." June 2009, p. 3, 25: [www.pewcenteronthestates.org/uploadedFiles/Clean\\_Economy\\_Report\\_Web.pdf](http://www.pewcenteronthestates.org/uploadedFiles/Clean_Economy_Report_Web.pdf); Worldwide investment in clean energy technologies surpassed \$100 billion in 2007 and is projected to exceed \$210 billion by 2016. United States Department of Commerce. International Trade Administration. "Helping Clean-Energy Companies Enter the Emerging Markets of China and India," Comp. Ryan Mulholland. August 2008: [http://www.trade.gov/press/publications/newsletters/ita\\_0808/clean-energy\\_0808.asp#continues](http://www.trade.gov/press/publications/newsletters/ita_0808/clean-energy_0808.asp#continues); Renner, Michael, et al. Worldwatch Institute/Cornell University Global Labour Institute, "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World." September 24, 2008, p. 93: [http://www.unep.org/labour\\_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf](http://www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf).

6 The Pew Charitable Trusts, "The Clean Energy Economy: Repowering Jobs, Businesses and Investments Across America." June 2009, p. 3: [www.pewcenteronthestates.org/uploadedFiles/Clean\\_Economy\\_Report\\_Web.pdf](http://www.pewcenteronthestates.org/uploadedFiles/Clean_Economy_Report_Web.pdf); Less conservative studies estimate 2006 U.S. energy efficiency employment at over 8 million, with 3.5 million direct jobs and 4.5 million indirect jobs. These and other significant differences in data on the clean energy economy are the result of a number of factors, including gaps in data, major differences in what sectors are included and how "green" a sector or industry must be to be included. For more information see, Renner, Michael, et al, Worldwatch Institute/Cornell University Global Labour Institute, "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World." September 24, 2008, p. 9: [http://www.unep.org/labour\\_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf](http://www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf).

7 The Pew Charitable Trusts, "The Clean Energy Economy: Repowering Jobs, Businesses and Investments Across America." June 2009, p. 15: [www.pewcenteronthestates.org/uploadedFiles/Clean\\_Economy\\_Report\\_Web.pdf](http://www.pewcenteronthestates.org/uploadedFiles/Clean_Economy_Report_Web.pdf).

8 In the single year between 2007 and 2008, jobs in the U.S. wind energy sector grew from 50,000 to 85,000. American Wind Energy Association, "2008: Another Record Year in Wind Energy Installations." [http://www.awea.org/pubs/factsheets/Market\\_Update\\_Factsheet.pdf](http://www.awea.org/pubs/factsheets/Market_Update_Factsheet.pdf).

9 Renner, Michael, et al, Worldwatch Institute/Cornell University Global Labour Institute, "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World." September 24, 2008, p. 55: [http://www.unep.org/labour\\_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf](http://www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf).

10 Saunders, Lucy-Claire, "The Green Dawn in U.S.-China Relations," Xinhua News. May 8, 2009: [http://news.xinhuanet.com/english/2009-05/09/content\\_11339691.htm](http://news.xinhuanet.com/english/2009-05/09/content_11339691.htm); Doerr, Jeff. Immelt, Jeff, "Falling Behind on Green Tech," The Washington Post. August 3, 2009: <http://www.washingtonpost.com/wp-dyn/content/article/2009/08/02/AR2009080201563.html>.

11 Exports accounted for 13% of the U.S. GDP in 2008, up from 9% in 2003. Manufactured exports account for some 6 million U.S. jobs. United States Department of Commerce. International Trade Administration. "U.S. Trade Overview." July 15, 2009: [www.ita.doc.gov/td/industry/otea/US\\_Trade\\_Overview.pdf](http://www.ita.doc.gov/td/industry/otea/US_Trade_Overview.pdf).

12 Renner, Michael, et al, Worldwatch Institute/Cornell University Global Labour Institute, "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World." September 24, 2008, p. 100: [http://www.unep.org/labour\\_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf](http://www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf); Jasmy Methipara, Amy Sauer, Chrissy Elles, Fredric Beck and Carol Werner, eds. Environmental and Energy Study Institute, "Fact Sheet: Jobs from Renewable Energy and Energy Efficiency." October 22, 2008, p. 1. [www.eesi.org/files/green\\_jobs\\_factsheet\\_102208.pdf](http://www.eesi.org/files/green_jobs_factsheet_102208.pdf).

13 "5 Million U.S. Jobs Possible in Clean Tech by 2020," RenewableEnergyFocus.com. June 24, 2009: <http://www.renewableenergyfocus.com/view/2330/new-report-5-million-us-jobs-possible-in-clean-tech-by-2020/>; The Pew Charitable Trusts, "The Clean Energy Economy: Repowering Jobs, Businesses and Investments Across America." June 2009, p. 10: [www.pewcenteronthestates.org/uploadedFiles/Clean\\_Economy\\_Report\\_Web.pdf](http://www.pewcenteronthestates.org/uploadedFiles/Clean_Economy_Report_Web.pdf); Pollin, Robert, et al, Center for American Progress, "The Economic Benefits of Investing in Clean Energy." June 18, 2009, pp. 1-2: [http://www.americanprogress.org/issues/2009/06/clean\\_energy.html](http://www.americanprogress.org/issues/2009/06/clean_energy.html).

14 United States Department of Energy. National Renewable Energy Laboratory. "Strengthening U.S. Leadership in International Clean Energy Cooperation." December 2008, p. 1, 9: [www.nrel.gov/docs/fy09osti/44261.pdf](http://www.nrel.gov/docs/fy09osti/44261.pdf).

15 Manufacturing content of the environmental economy is estimated at 31%. United Kingdom. Department for Business Enterprise and Regulatory Reform. "Low Carbon and Environmental Goods and Services: An Industry Analysis – Executive Summary." March 6, 2009, p. 11: <http://www.berr.gov.uk/files/file50254.pdf>; Worldwatch Institute/Heinrich Boll Stiftung, "Toward a Transatlantic Green New Deal: Tackling the Climate and Economic Crises." Vol. 3. 2009, p. 25: <http://www.worldwatch.org/node/6174>.

16 See for example, Culverwell, Wendy. "Portland's newest export," Portland Business Journal. November 28, 2008: <http://portland.bizjournals.com/portland/stories/2008/12/01/focus1.html>, for details on global green jobs for Portland-based architects, designers and planners; Many leading U.S. IT and telecom firms also anticipate growing roles in the clean energy economy. Worldwatch Institute/Heinrich Boll Stiftung, "Toward a Transatlantic Green New Deal: Tackling the Climate and Economic Crises." Vol. 3. 2009, p. 18: <http://www.worldwatch.org/node/6174>.

17 Energy and Security Group. "Clean Energy: An Exporter's Guide to China." July 2008, pp. 2-6, 19, 35-36: [www.trade.gov/media/publications/pdf/china-clean-energy2008.pdf](http://www.trade.gov/media/publications/pdf/china-clean-energy2008.pdf), for a discussion of China's need for experienced wind engineers and specialized components, see: Renner, Michael, et al, Worldwatch Institute/Cornell University Global Labour Institute, "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World." September 24, 2008, p. 106: [http://www.unep.org/labour\\_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf](http://www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf).

18 Sherraden, Samuel. New America Foundation, "Green Trade Balance." June 22, 2009, p. 2: [http://www.newamerica.net/publications/policy/green\\_trade\\_balance](http://www.newamerica.net/publications/policy/green_trade_balance).

19 Japan and Germany are leading producers and users of solar PV because their governments have enacted effective, long-term policies and incentives to promote and sustain solar installations. United States International Trade Commission, "Renewable Energy Services: An Examination of U.S. and Foreign Markets." Publication 3805. October 2005, pp. 5-12 to 5-13: <http://www.usitc.gov/publications/332/pub3805.pdf>; Worldwatch Institute/Heinrich Boll Stiftung, "Toward a Transatlantic Green New Deal: Tackling the Climate and Economic Crises." Vol. 3. 2009, p. 23: <http://www.worldwatch.org/node/6174>.

20 Doerr, Jeff. Immelt, Jeff, "Falling Behind on Green Tech." The Washington Post. August 3, 2009. <http://www.washingtonpost.com/wp-dyn/content/article/2009/08/02/AR2009080201563.html>.

21 Worldwatch Institute/Heinrich Boll Stiftung, "Toward a Transatlantic Green New Deal: Tackling the Climate and Economic Crises." Vol. 3. 2009, p. 6. <http://www.worldwatch.org/node/6174>.

22 Renner, Michael, et al, "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World." Worldwatch Institute/Cornell University Global Labour Institute, September 24, 2008, p. 7. [http://www.unep.org/labour\\_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf](http://www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf).

23 Estimates provided by David Bradish, Manager, Energy Information at the Nuclear Energy Institute. December 11, 2009.

24 As noted previously, U.S. wind industry employment surged to 85,000 by 2008.

25 Colvin, Jake, "America's Green Trade Challenge." Business Week. August 11, 2009, pp. 2-3. [http://www.businessweek.com/bwdaily/dnflash/content/aug2009/db20090811\\_875168.htm](http://www.businessweek.com/bwdaily/dnflash/content/aug2009/db20090811_875168.htm); Balkan, Elizabeth, "China's Smart Grid Ambitions Could Open Door to U.S. – China Cooperation," New Energy and Environment Digest. June 5, 2009: <http://needigest.com/2009/06/05/chinas-smart-grid-ambitions-could-open-door-to-us-china-cooperation/>.

26 Office of the United States Trade Representative. "Report by the Office of the U.S. Trade Representative on Progress in Reducing Trade-Related Barriers to the Export of Greenhouse Gas Intensity Reducing Technologies – Section 734(b) of the Energy Policy Act of 2005," October 2, 2007, p. 2: [http://www.ustr.gov/sites/default/files/asset\\_upload\\_file477\\_13358\\_0.pdf](http://www.ustr.gov/sites/default/files/asset_upload_file477_13358_0.pdf); Energy and Security Group, "Clean Energy: An Exporter's Guide to China." July 2008, pp. 39-41: [www.trade.gov/media/publications/pdf/china-clean-energy2008.pdf](http://www.trade.gov/media/publications/pdf/china-clean-energy2008.pdf); Tamietti, Ludivine, Olhoff, Anne, et al, World Trade Organization/United Nations Environment Programme, "Trade and Climate Change." Geneva, Switzerland: WTO Publications, 2009, p. 81: [http://www.unep.ch/etb/pdf/UNEP%20WTO%20launch%20event%2026%20june%202009/Trade & Climate Publication 2289 09 E%20Final.pdf](http://www.unep.ch/etb/pdf/UNEP%20WTO%20launch%20event%2026%20june%202009/Trade%20&%20Climate%20Publication%202289%2009%20E%20Final.pdf).

27 Energy and Security Group, "Clean Energy: An Exporter's Guide to China." July 2008, p. 40: [www.trade.gov/media/publications/pdf/china-clean-energy2008.pdf](http://www.trade.gov/media/publications/pdf/china-clean-energy2008.pdf); Colvin, Jake, "America's Green Trade Challenge." *Business Week*. August 11, 2009, pp. 2-3: [http://www.businessweek.com/bwdaily/dnflash/content/aug2009/db20090811\\_875168.htm](http://www.businessweek.com/bwdaily/dnflash/content/aug2009/db20090811_875168.htm).

28 United States House of Representatives. Committee on Energy and Commerce, Subcommittee on Commerce, Trade and Consumer Protection. "Hearing on Growing U.S. Trade in Green Technology." Written testimony of Timothy J. Richards, Managing Director, International Energy Policy, General Electric Company. 111th Congress, 1st session. Washington. October 7, 2009, p. 7: [http://energycommerce.house.gov/Press\\_111/20091007/richards\\_testimony.pdf](http://energycommerce.house.gov/Press_111/20091007/richards_testimony.pdf).

29 Office of the United States Trade Representative. "2009 National Trade Estimate Report on Foreign Trade Barriers." 2009, p. 205: <http://www.ustr.gov/about-us/press-office/reports-and-publications/2009/2009-national-trade-estimate-report-foreign-trad>.

30 United States International Trade Commission, "Renewable Energy Services: An Examination of U.S. and Foreign Markets." Publication 3805. October 2005, pp. 4-13: <http://www.usitc.gov/publications/332/pub3805.pdf>. The Canadian provinces of Quebec and Ontario have also imposed local content requirements on wind energy goods; United States House of Representatives. Committee on Energy and Commerce, Subcommittee on Commerce, Trade and Consumer Protection. "Hearing on Growing U.S. Trade in Green Technology." Written testimony of Timothy J. Richards, Managing Director, International Energy Policy, General Electric Company. 111th Congress, 1st session. Washington, D.C. October 7, 2009, p. 7: [http://energycommerce.house.gov/Press\\_111/20091007/richards\\_testimony.pdf](http://energycommerce.house.gov/Press_111/20091007/richards_testimony.pdf).

31 Hornby, Lucy, Alan Wheatley, "China Defends Government Purchase Policies." Reuters. June 18, 2009: <http://www.reuters.com/article/idUSTRE55H14120090618>; Balkan, Elizabeth, *New Energy and Environment Digest*, "China's Smart Grid Ambitions Could Open Door to U.S. – China Cooperation." June 5, 2009: <http://needigest.com/2009/06/05/chinas-smart-grid-ambitions-could-open-door-to-us-china-cooperation/>; It is noteworthy that a leading U.S.-based solar producer will be constructing a massive 2-gigawatt solar power plant in China with PV panels manufactured in Malaysia and China rather than at its Ohio facility. Mufson, Steven, "First Solar to Install Major Plant in China." *The Washington Post*. September 9, 2009: <http://www.washingtonpost.com/wp-dyn/content/article/2009/09/08/AR2009090803505.html>.

32 Office of the United States Trade Representative. "Report by the Office of the U.S. Trade Representative on Progress in Reducing Trade-Related Barriers to the Export of Greenhouse Gas Intensity Reducing Technologies – Section 734(b) of the Energy Policy Act of 2005." October 2, 2007, p. 2: [http://www.ustr.gov/sites/default/files/asset\\_upload\\_file477\\_13358\\_0.pdf](http://www.ustr.gov/sites/default/files/asset_upload_file477_13358_0.pdf); Organization for Economic Cooperation and Development, "Opening Markets for Environmental Goods and Services." September 2005, p. 4. Applied tariffs on clean energy goods range from 15-30% in many developing countries, including several large developing countries. <http://www.oecd.org/dataoecd/63/15/35415839.pdf>; Tamiotti, Ludivine, et al, World Trade Organization/ United Nations Environment Programme, "Trade and Climate Change." Geneva, Switzerland: WTO Publications, 2009, p. 81: [http://www.unep.ch/etb/pdf/UNEP%20WTO%20launch%20event%2026%20june%202009/Trade & Climate Publication 2289\\_09 E%20Final.pdf](http://www.unep.ch/etb/pdf/UNEP%20WTO%20launch%20event%2026%20june%202009/Trade%20&%20Climate%20Publication%202289_09_E%20Final.pdf). (noting the high tariffs on solar water heaters, wind turbine parts and geothermal energy goods.)

33 Organization for Economic Cooperation and Development, "Opening Markets for Environmental Goods and Services." September 2005, p. 4: <http://www.oecd.org/dataoecd/63/15/35415839.pdf>.

34 Colvin, Jake, "America's Green Trade Challenge." *Business Week*. August 11, 2009, p. 2: [http://www.businessweek.com/bwdaily/dnflash/content/aug2009/db20090811\\_875168.htm](http://www.businessweek.com/bwdaily/dnflash/content/aug2009/db20090811_875168.htm); For a searchable database of tariffs by classification and country see: World Trade Organization, "Consolidated Tariff Schedules Database," available at <http://tariffdata.wto.org/ReportersAndProducts.aspx>. For Brazil's tariffs related to Wind Turbines, see HS 850231.

35 For example, U.S. companies account for two-thirds of global production of "next wave" thin-film solar cells. Sawin, Janet L., Worldwatch Institute, "Another Sunny Year for Solar Power." May 8, 2008, p. 2: <http://www.worldwatch.org/node/5449>; General Electric is a world leader in "smart" meter and wind turbine products and technology as noted in: <http://ge.ecomagination.com/products/wind-turbines.html> and <http://ge.ecomagination.com/our-impact/industry-smart-grid.html>.

36 For a searchable database of tariffs by classification and country see "Consolidated Tariff Schedules Database," World Trade Organization, available at <http://tariffdata.wto.org/ReportersAndProducts.aspx>. For tariffs related to Wind Turbines see HS 850231, Solar Cells see HS 854140, and Electric Meters see HS 902830.

37 Renner, Michael, et al, Worldwatch Institute/Cornell University Global Labour Institute, "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World." September 24, 2008, p. 106: [http://www.unep.org/labour\\_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf](http://www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf).

38 Office of the United States Trade Representative. "2009 National Trade Estimate Report on Foreign Trade Barriers." 2009, p. 182: <http://www.ustr.gov/about-us/press-office/reports-and-publications/2009/2009-national-trade-estimate-report-foreign-trad>.

39 United States Senate. Committee on Finance. "Combating Unfair Practices in the Innovation Economy." Statement by Robert D. Atkins, President, Information Technology and Innovation Foundation. 110th Congress, 2nd session. Washington, D.C. May 22, 2008, p. 6: <http://www.itif.org/index.php?id=148>.

40 Office of the United States Trade Representative. "2009 National Trade Estimate Report on Foreign Trade Barriers." 2009, pp. 93, 100: <http://www.ustr.gov/about-us/press-office/reports-and-publications/2009/2009-national-trade-estimate-report-foreign-trad>; Energy and Security Group, "Clean Energy: An Exporter's Guide to China." July 2008, p. 39: [www.trade.gov/media/publications/pdf/china-clean-energy2008.pdf](http://www.trade.gov/media/publications/pdf/china-clean-energy2008.pdf).

41 United States House of Representatives. Committee on Energy and Commerce, Subcommittee on Commerce, Trade and Consumer Protection. "Hearing on Growing U.S. Trade in Green Technology." Written testimony of Timothy J. Richards, Managing Director, International Energy Policy, General Electric Company. 111th Congress, 1st session. Washington, D.C. October 7, 2009, p. 9: [http://energycommerce.house.gov/Press\\_111/20091007/richards\\_testimony.pdf](http://energycommerce.house.gov/Press_111/20091007/richards_testimony.pdf); "Foreign Relations Authorization Act, Fiscal Years 2010 and 2011," H.R. 2410 Section 1120A. Introduced by Congressman Howard L. Berman on May 5, 2009 in the 111th Congress: <http://thomas.loc.gov/cgi-bin/bdquery/z?d111:h.r.02410>. This legislation provides a statement of policy that global climate change measures cannot be allowed to weaken international protections for clean energy and energy efficiency IP.

42 Office of the United States Trade Representative. "2009 National Trade Estimate Report on Foreign Trade Barriers." 2009, pp. 237-238: <http://www.ustr.gov/about-us/press-office/reports-and-publications/2009/2009-national-trade-estimate-report-foreign-trad>.

43 *Ibid*, p. 39.

44 *Ibid*, pp. 247, 116-118.

45 Tamiotti, Ludivine, et al, World Trade Organization/United Nations Environment Programme, "Trade and Climate Change." Geneva, Switzerland: WTO Publications, 2009, pp. 124-128, 142: <http://www.unep.ch/etb/pdf/UNEP%20WTO%20launch%20event%2026%20june%202009/Trade & Climate Publication 2289 09 E%20Final.pdf>.

46 Avishai, Bernard, "The Connected Car," Inc.com. November 1, 2009, pp. 74-83: <http://www.inc.com/magazine/20091101/the-connected-car.html>.

47 United States International Trade Commission, "Renewable Energy Services: An Examination of U.S. and Foreign Markets." Publication 3805. October 2005, p. ix: <http://www.usitc.gov/publications/332/pub3805.pdf>.

48 Office of the United States Trade Representative. "2009 National Trade Estimate Report on Foreign Trade Barriers." 2009, pp. 109-110: <http://www.ustr.gov/about-us/press-office/reports-and-publications/2009/2009-national-trade-estimate-report-foreign-trad>.

49 The United States spends \$0.21 per thousand dollars of exports on government export promotion, while countries such as Spain (\$0.83), the United Kingdom (\$0.75), Italy (\$0.69), France (\$0.43), Korea (\$0.34), Canada (\$0.33) and Japan (\$0.30) spend far more. Exports account for about 9-13% of U.S. GDP, while countries such as Germany (49%), the United Kingdom (34%), France (30%) and Japan (19%) have much higher export ratios. Trade Promotion Coordinating Committee. "2008 National Export Strategy." October 2008, pp. 14-15: <http://trade.gov/media/Publications/pdf/nes2008FINAL.pdf>.

50 United States House of Representatives. Committee on Energy and Commerce, Subcommittee on Commerce, Trade and Consumer Protection. "Stimulating the Economy through Trade: Examining the Role of Export Promotion." Testimony of Franklin J. Vargo, Vice President for International Economic Affairs, National Association of Manufacturers. 111th Congress, 1st session. Washington, D.C. March 17, 2009, p. 6: [http://energycommerce.house.gov/Press\\_111/20090317/testimony\\_vargo.pdf](http://energycommerce.house.gov/Press_111/20090317/testimony_vargo.pdf); United States Government Accountability Office. "International Trade: Further Improvements Needed to Handle Growing Workload for Monitoring and Enforcing Trade Agreements." June 2005, p. 25: <http://www.gao.gov/new.items/d05537.pdf>; U.S. Commercial Service staffing has dropped from 1,736 in 2004 to 1,513 in 2008, and the number of core commercial officers has fallen from 250 to less than 180 during the same period. Additionally, a significant number of staff has been reassigned to non-core functions, including enforcement, IP and standards. United States Senate. Senate Appropriations Committee. "Senate Report 111-034." Submitted by Senator Barbara Mikulski on June 25, 2009: <http://www.appropriations.senate.gov/news.cfm?method=news.view&id=2c975def-9d40-4dca-9502-7bdba5d5d17e>.

51 United States Government Accountability Office. "International Trade: Effective Export Programs Can Help in Achieving U.S. Economic Goals." March 17, 2009. p. 6: <http://www.gao.gov/new.items/d09480t.pdf>; United States House of Representatives. Committee on Energy and Commerce, Subcommittee on Commerce, Trade and Consumer Protection. "Stimulating the Economy through Trade: Examining the Role of Export Promotion." Testimony of Franklin J. Vargo, Vice President for International Economic Affairs, National Association of Manufacturers. 111th Congress, 1st session. Washington, D.C. March 17, 2009: [http://energycommerce.house.gov/Press\\_111/20090317/testimony\\_vargo.pdf](http://energycommerce.house.gov/Press_111/20090317/testimony_vargo.pdf).

52 United States Government Accountability Office. "International Trade: Effective Export Programs Can Help in Achieving U.S. Economic Goals." March 17, 2009: <http://www.gao.gov/new.items/d09480t.pdf>; United States Senate. Senate Finance Committee. "Baucus Urges Locke to Improve U.S. Export Promotion Programs to Help Small Business." 111th Congress, 1st session. Washington, D.C. April 3, 2009: <http://finance.senate.gov/press/Bpress/2009press/prb040309.pdf>.

53 Trade Promotion Coordinating Committee. "2008 National Export Strategy." October 2008, p. 16: <http://trade.gov/media/Publications/pdf/nes2008FINAL.pdf>.

54 United States Department of Energy. National Renewable Energy Laboratory. "Strengthening U.S. Leadership in International Clean Energy Cooperation." December 2008, pp. 15, 26-27: [www.nrel.gov/docs/fy09osti/44261.pdf](http://www.nrel.gov/docs/fy09osti/44261.pdf); United States House of Representatives. House Committee on Energy and Commerce, Subcommittee on Commerce, Trade and Consumer Protection. "Growing U.S. Trade in Green Technology." Testimony of the Business Council for Sustainable Energy, 111th Congress, 1st session. October 7, 2009, pp. 3-4: [http://energycommerce.house.gov/Press\\_111/20091007/jacobson\\_testimony.pdf](http://energycommerce.house.gov/Press_111/20091007/jacobson_testimony.pdf).

55 In 1970s, the United States was a party to only one such trade agreement – the GATT, an agreement governing trade in goods. Today, U.S. trade is regulated by an extensive web of trade deals, including detailed World Trade Organization ("WTO") agreements, trade arrangements with 17 other countries and complex rules governing 21st century trade, including services trade and IP protection. See <http://www.ustr.gov/trade-agreements> for a summary of current U.S. trade agreements.

56 United States Government Accountability Office. "International Trade: Further Improvements Needed to Handle Growing Workload for Monitoring and Enforcing Trade Agreements." June 2005: <http://www.gao.gov/new.items/d05537.pdf>; Brainard, Lael, "America's Trade Agenda: Examining the Trade Enforcement Act of 2007." Brookings Institution. May 22, 2008: [http://www.brookings.edu/testimony/2008/0522\\_trade\\_brainard.aspx](http://www.brookings.edu/testimony/2008/0522_trade_brainard.aspx); United States Senate. Committee on Finance. "Combating Unfair Practices in the Innovation Economy." Statement by Robert D. Atkins, President, Information Technology and Innovation Foundation. 110th Congress, 2nd session. Washington, D.C. May 22, 2008: <http://www.itif.org/index.php?id=148>.

57 United States Government Accountability Office. "International Trade: Further Improvements Needed to Handle Growing Workload for Monitoring and Enforcing Trade Agreements." June 2005: <http://www.gao.gov/new.items/d05537.pdf>.

58 Ibid.

59 Brainard, Lael, "America's Trade Agenda: Examining the Trade Enforcement Act of 2007." Brookings Institution. May 22, 2008: [http://www.brookings.edu/testimony/2008/0522\\_trade\\_brainard.aspx](http://www.brookings.edu/testimony/2008/0522_trade_brainard.aspx); United States Government Accountability Office. "International Trade: Further Improvements Needed to Handle Growing Workload for Monitoring and Enforcing Trade Agreements." June 2005: <http://www.gao.gov/new.items/d05537.pdf>.

60 Manufacturers from countries with early, long-term deployment policies and incentives have captured large shares of the global market in many instances. For example, firms in Japan and Europe (primarily Germany) held 49% and 26%, respectively, of the global solar PV market in 2004. United States International Trade Commission, "Renewable Energy Services: An Examination of U.S. and Foreign Markets." Publication 3805. October 2005: <http://www.usitc.gov/publications/332/pub3805.pdf>.

61 Meyerson, Harold, "Just One Word: Factories," The Washington Post. August 12, 2009: <http://www.washingtonpost.com/wp-dyn/content/article/2009/08/11/AR2009081102934.html>.

62 The U.S. wind industry has noted that a weak U.S. renewable energy standard in domestic climate change legislation will lead to the loss of U.S. wind energy manufacturing to Europe and Asia. American Wind Energy Association, "Wind Industry Leaders Warn Congress that a Weak RES Could Cede Jobs to Asia, Europe." May 15, 2009: [http://www.awea.org/newsroom/releases/Wind\\_Industry\\_Leaders\\_Warn\\_Congress\\_051509.html](http://www.awea.org/newsroom/releases/Wind_Industry_Leaders_Warn_Congress_051509.html).

63 Tamiotti, Ludivine, et al, World Trade Organization/United Nations Environment Programme, "Trade and Climate Change." Geneva, Switzerland: WTO Publications, 2009 [http://www.unep.ch/etb/pdf/UNEP%20WTO%20launch%20event%2026%20june%202009/Trade & Climate Publication 2289 09 E%20Final.pdf](http://www.unep.ch/etb/pdf/UNEP%20WTO%20launch%20event%2026%20june%202009/Trade%20and%20Climate%20Publication%202289%2009%20Final.pdf); Vaughn, Scott. Carnegie Endowment for International Peace, "Trade Preferences and Environmental Goods." Ted Policy Brief Number 5. February 2003: <http://www.carnegieendowment.org/publications/index.cfm?fa=view&id=1191&prog=zgp&proj=ztet>.

64 See WTO-UNEP at xii; Carnegie Endowment for International Peace, "Trade Preferences and Environmental Goods," (TED Policy Brief No. 5) (Feb. 2003) ("Carnegie"), available at: <http://www.carnegieendowment.org/publications/index.cfm?fa=view&id=1191&prog=zgp&proj=ztet>.

65 Avishai, Bernard, "The Connected Car." Inc.com. November 1, 2009: <http://www.inc.com/magazine/20091101/the-connected-car.html>, details the innovative work being done by a range of U.S. firms on electric vehicle technologies.

66 For example, recent proposals to establish a \$30 billion revolving loan fund for conversion of the auto parts sector and to expand Manufacturing Extension Partnership program for clean energy conversion would also help support a strong manufacturing base for U.S. clean energy exports. Investments for Manufacturing Progress and Clean Technology Act of 2009, S. 1617, introduced by Senator Sherrod Brown on 6 August 2009: <http://thomas.loc.gov/cgi-bin/bdquery/z?d111:S.1617;> Meyerson, Harold, "Just One Word: Factories." The Washington Post. August 12, 2009: <http://www.washingtonpost.com/wp-dyn/content/article/2009/08/11/AR2009081102934.html>.

67 See United States Department of Energy. National Renewable Energy Laboratory. "Strengthening U.S. Leadership in International Clean Energy Cooperation." December 2008. [www.nrel.gov/docs/fy09osti/44261.pdf](http://www.nrel.gov/docs/fy09osti/44261.pdf), for a detailed analysis of international clean energy R&D and market development.

68 The vital roles of clean energy export promotion and trade enforcement have often been overlooked in analyses of the future U.S. role in the global clean energy economy. For example, an important 2008 study by the National Renewable Energy Laboratory concluded that significant export growth would result from expanded U.S. efforts to aid global clean energy R&D and market development. This study makes only passing reference to U.S. efforts to open closed foreign markets. However, without aggressive efforts to help U.S. clean energy exporters and remove foreign barriers to their goods and services, U.S. firms are likely to be shut out of significant parts of the growing global market for clean energy. United States Department of Energy. National Renewable Energy Laboratory. "Strengthening U.S. Leadership in International Clean Energy Cooperation." December 2008: [www.nrel.gov/docs/fy09osti/44261.pdf](http://www.nrel.gov/docs/fy09osti/44261.pdf).

69 Europe has dominant world market shares in efficient products and technologies for electrical appliances (55%), building technologies (53%), propulsion technologies and emissions controls (51%), materials efficiency (50%) and vehicle technology and design (42%). Worldwatch Institute/Heinrich Boll Stiftung, "Toward a Transatlantic Green New Deal: Tackling the Climate and Economic Crises." Vol. 3. 2009: <http://www.worldwatch.org/node/6174>.

70 See United States Department of Energy. National Renewable Energy Laboratory. "Strengthening U.S. Leadership in International Clean Energy Cooperation." December 2008: [www.nrel.gov/docs/fy09osti/44261.pdf](http://www.nrel.gov/docs/fy09osti/44261.pdf) for a discussion of the importance of national clean energy goals.

71 42 U.S.C. §17331-36, available at [http://www.law.cornell.edu/uscode/html/uscode36/usc\\_sec\\_36\\_00010102----000-.html](http://www.law.cornell.edu/uscode/html/uscode36/usc_sec_36_00010102----000-.html).

72 United States Department of Commerce. "Secretary Locke Chairs First Trade Promotion Coordinating Committee Meeting." October 23, 2009: [http://www.commerce.gov/NewsRoom/PressReleases\\_FactSheets/PROD01\\_008542](http://www.commerce.gov/NewsRoom/PressReleases_FactSheets/PROD01_008542).

73 The U.S. Commercial Service employs various key metrics to evaluate its export promotion activities. It is noteworthy that these key metrics do not appear to include a metric for U.S. job creation. United States Department of Commerce. International Trade Administration, United Commercial Service. "Connection, Performance, Impact: Moving Forward 2009." Annual Report: [http://www.trade.gov/cs/cs\\_annualreport09.pdf](http://www.trade.gov/cs/cs_annualreport09.pdf); It is also noteworthy that Germany, a global leader in renewable energy, is also one of only a few countries to rigorously measure jobs supported by clean energy. Renner, Michael, et al, Worldwatch Institute/Cornell University Global Labour Institute, "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World." September 24, 2008: [http://www.unep.org/labour\\_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf](http://www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf).

74 Trade Promotion Coordinating Committee. "2008 National Export Strategy," October 2008: <http://trade.gov/media/Publications/pdf/nes2008FINAL.pdf>. (noting that the U.S., the EU and many Asian countries have intensely focused on growing SME exports as a key measure of assuring national export success.)

75 United States Department of Commerce. "Secretary Locke Chairs First Trade Promotion Coordinating Committee Meeting." October 23, 2009: [http://www.commerce.gov/NewsRoom/PressReleases\\_FactSheets/PROD01\\_008542](http://www.commerce.gov/NewsRoom/PressReleases_FactSheets/PROD01_008542).

76 Trade Promotion Coordinating Committee. "2008 National Export Strategy," October 2008: <http://trade.gov/media/Publications/pdf/nes2008FINAL.pdf>; United States Senate. Senate Finance Committee. "Baucus Urges Locke to Improve U.S. Export Promotion Programs to Help Small Business." 111th Congress, 1st session. Washington, D.C. April 3, 2009: <http://finance.senate.gov/press/Bpress/2009press/prb040309.pdf>.

77 United States House of Representatives. House Committee on Energy and Commerce, Subcommittee on Commerce, Trade and Consumer Protection. "Growing U.S. Trade in Green Technology." Testimony of the Business Council for Sustainable Energy, 111th Congress, 1st session. October 7, 2009: [http://energycommerce.house.gov/Press\\_111/20091007/jacobson\\_testimony.pdf](http://energycommerce.house.gov/Press_111/20091007/jacobson_testimony.pdf).

78 Office of the United States Trade Representative. "Report by the Office of the U.S. Trade Representative on Progress in Reducing Trade-Related Barriers to the Export of Greenhouse Gas Intensity Reducing Technologies – Section 734(b) of the Energy Policy Act of 2005." October 2, 2007: [http://www.ustr.gov/sites/default/files/asset\\_upload\\_file477\\_13358\\_0.pdf](http://www.ustr.gov/sites/default/files/asset_upload_file477_13358_0.pdf).

79 Office of the United States Trade Representative. "Ambassador Kirk Announces New Initiatives for Trade Enforcement." July 16, 2009: <http://www.ustr.gov/about-us/press-office/speeches/transcripts/2009/july/ambassador-kirk-announces-new-initiatives-trade>.

80 Trade Enforcement Act of 2009, S. 1466, introduced by Senator Debbie Stabenow on July 16, 2009 in the 111th Congress, 1st session: <http://thomas.loc.gov/cgi-bin/bdquery/z?d111:SN01466:@@T>.

81 USTR has recently announced a useful initiative to expand the use of U.S. Commercial Service foreign staff to more effectively identify and address foreign trade barriers. However, it has not indicated that USCS will have additional resources to undertake this expanded role, nor has it addressed how to prevent this initiative from further eroding resources for USCS' core export promotion responsibilities. Office of the United States Trade Representative. "Ambassador Kirk Announces New Initiatives for Trade Enforcement." July 16, 2009: <http://www.ustr.gov/about-us/press-office/speeches/transcripts/2009/july/ambassador-kirk-announces-new-initiatives-trade>.

82 For example, forums such as the Asia-Pacific Partnership on Clean Development and Climate and the U.S.-China Clean Energy Forum can play an important role in efforts to convince major developing countries that they can benefit environmentally and economically from more open trade in clean energy goods and services. United States Department of Energy. National Renewable Energy Laboratory. "Strengthening U.S. Leadership in International Clean Energy Cooperation." December 2008.

83 Office of the United States Trade Representative. "USTR Schwab to Announce New Climate Initiatives for WTO, Including a New Environmental Goods and Services Agreement." November 30, 2007: <http://www.ustr.gov/about-us/press-office/press-releases/archives/2007/november/ustr-schwab-announce-new-climate-initiat>; The International Bank for Reconstruction and Development/The World Bank, "International Trade and Climate Change: Economic, Legal and Institutional Perspectives." Volume 2. 2008: [http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2007/11/15/000310607\\_20071115153905/Rendered/PDF/41453optmzd0PA101OFFICIAL0USE0ONLY1.pdf](http://www-wds.worldbank.org/external/default/WDSContentServer/WDSP/IB/2007/11/15/000310607_20071115153905/Rendered/PDF/41453optmzd0PA101OFFICIAL0USE0ONLY1.pdf).

84 Ibid; Vaughn, Scott, Carnegie Endowment for International Peace, "Trade Preferences and Environmental Goods." Ted Policy Brief Number 5. February 2003: <http://www.carnegieendowment.org/publications/index.cfm?fa=view&id=1191&prog=zgp&proj=zted>; Palmer, Doug, "Remove Environmental Goods Talks from Doha – U.S. Groups." Reuters. August 4, 2009. <http://www.reuters.com/article/idUSTRE5725Z520090804>.

85 For example, a recent Funding Opportunity Announcement for the Department of Energy's Advanced Research Projects Agency – Energy (ARPA-E) prohibited foreign-owned firms from serving as team leaders on ARPA-E projects and limits project participation by all foreign-owned firms to 25%, even though it also requires that 90% of project work be performed on U.S. soil. United States Department of Energy. "Financial Assistance Funding Opportunity Announcement." Funding Opportunity Number DE-FOA-0000065. April 27, 2009: <http://arpa-e.energy.gov/keydocs/ARPA-E-FOA.PDF>.

86 The United States is, for example, a global leader in geothermal energy, a segment that will generate \$25 to \$40 billion in global investment over the next 20 years. United States International Trade Commission. "Renewable Energy Services: An Examination of U.S. and Foreign Markets." Publication 3805. October 2005: <http://www.usitc.gov/publications/332/pub3805.pdf>; For a discussion on U.S. manufacturing base for clean energy goods see: Renner, Michael, et al, Worldwatch Institute/Cornell University Global Labour Institute, "Green Jobs: Towards Decent Work in a Sustainable, Low-Carbon World." September 24, 2008: [http://www.unep.org/labour\\_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf](http://www.unep.org/labour_environment/PDFs/Greenjobs/UNEP-Green-Jobs-Report.pdf).