

From Sleeping Giant to Friendly Giant: Rethinking The United States Solar Energy Trade War with China

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China and the United States have been at odds over trade issues for decades. Since 2011, trade relations with China have become particularly contentious, especially in the renewable energy trade arena. In the latest development of these growing

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tensions, a group of U.S.-based solar panel companies, led by SolarWorld, Inc., filed a petition with the U.S. Department of Commerce (Commerce) and the International Trade Commission (ITC) alleging that the Chinese government was dumping solar panels on the U.S. market and providing anti-competitive subsidies to the solar manufacturing industry.¹ The agencies made “affirmative final determinations in the antidumping (AD) and countervailing duty (CVD) investigations” on October 10, 2012, and instituted AD and CVD measures against problematic Chinese products.² While seeking to promote the U.S.-based solar industry, the complaining companies started down a path that cannot serve the U.S. solar industry’s supposed goal: to be a world leader in solar manufacturing. While CVD and AD actions might provide some relief to U.S. solar companies in the short-term, imposing duties on China’s solar products is not the right strategy for the United States to employ in pursuit of its goal of leadership in renewable energy manufacturing.

There are several reasons why imposing CVD and AD measures against China presents a flawed strategy for the United States. First, imposing duties reflects a protectionist philosophy that will not support domestic solar manufacturers.³ Second, imposing duties could provoke China to retaliate against the United States further hindering U.S. industries.⁴ Finally, as the two largest energy users in the world, the United States and China have common interests in developing a strong global solar market.⁵ Finally, both countries have goals of reducing greenhouse gas emissions and de-intensifying their carbon economies.⁶ If the United States wants to become a world leader

¹ See Cassandra Sweet & Ryan Tracy, *Solar Firms Seek Duties in China Dumping Case*, WALL ST. J. (Oct. 20, 2011), <http://online.wsj.com/article/SB10001424052970204485304576641292005899326.html> (“The U.S. makers are asking the Department of Commerce and the International Trade Commission to impose a duty on panels imported from China.”).

² DEP’T OF COMMERCE & INT’L TRADE ADMIN., FACT SHEET: COMMERCE FINDS DUMPING & SUBSIDIZATION OF CRYSTALLINE SILICON PHOTOVOLTAIC CELLS, WHETHER OR NOT ASSEMBLED INTO MODULES FROM THE PEOPLE’S REPUBLIC OF CHINA (2012) [hereinafter ITA FACT SHEET], available at http://ia.ita.doc.gov/download/factsheets/factsheet_prc-solar-cells-ad-cvd-finals-20121010.pdf.

³ See *infra* Part III.A.

⁴ See *infra* Part III.C.

⁵ See *infra* Part IV.C.

⁶ See *infra* Part IV.C.

in solar manufacturing, it should stop attempting to hinder the Chinese, and instead, develop collaborative efforts with China while focusing on the support of its domestic economy.⁷

While CVD and AD actions are not the right strategy for supporting the domestic solar industry, there are other more productive policy measures the United States should adopt. The United States should develop a collaborative effort with China to spur solar manufacturing in both countries and adopt domestic policies like feed-in tariffs and a federal Green Bank initiative.⁸ The imposition of duties on China will not help the United States become a world leader in solar manufacturing.⁹ Other alternatives exist which will enhance government support to the domestic solar industry and help the United States become a world leader in solar manufacturing.

This note proceeds in five parts. Part I provides background on Chinese renewable energy policies followed by information on AD and CVD legal framework, under which the solar companies brought their claims. Part II explains the SolarWorld petition and the arguments that justify the imposition of duties. Part III lays out arguments against the imposition of duties, and provides a policy analysis for why such measures are harmful to the development of a strong U.S. solar industry. Part IV examines the common goals of the United States and China with regards to sustainable energy. Finally, Part V considers alternative domestic and collaborative policies the United States could adopt to improve its domestic solar industry.

I. Background

A. Chinese Policies

China entered the global solar market in 2004 in response to an uptick in demand for solar technologies in Europe; since then, China has developed aggressive policies to nurture its solar industry.¹⁰ Most recently, China announced that it intends to meet

⁷ See *infra* Part V.

⁸ See *infra* Part V.

⁹ See *infra* Part V.

¹⁰ See Melanie Hart, *What Does the Solar Trade Dispute Mean? Shining a Light on U.S.-China Clean Energy Cooperation*, THINK PROGRESS CLIMATE PROGRESS BLOG (Feb. 9, 2012, 3:26 PM), <http://thinkprogress.org/climate/2012/02/09/422282/solar-trade-us-china-clean-energy-cooperation/> (“By 2007 China had become the world’s largest

twenty percent of its energy needs from renewable energy sources by 2020¹¹ and pledged to provide over \$743 billion during the next decade to support domestic renewable energy industries.¹² The Chinese Ministry of Finance has developed a special project fund for renewable energy development to help renewable energy companies begin manufacturing, expand production, and increase research.¹³

While China broadly publicizes its lofty goals for renewable energy development, it is almost impossible to pinpoint specific Chinese policies that distort the solar power markets.¹⁴ The Chinese economy is a “nonmarket economy with a top-down, command-and-control energy planning process that is often nontransparent with even more opaque interactions between the central government in Beijing and the provincial and local governments when these policies are implemented.”¹⁵ Since China insists on maintaining a veil of secrecy over its renewable energy policies, it is difficult to determine whether China is abiding by international trade agreements.¹⁶

Experts point to government loan subsidization as one

solar cell production country. By 2008 they were the largest solar panel producer in the world. By 2010, they controlled almost half of the global market, up from just 15 percent in 2006 China certainly has a host of policies designed to spur indigenous innovation across a wide range of clean energy technologies including solar.”)

¹¹ See Bruce Stokes, *Emerging Green Technology Poses Threat of Trade Wars*, YALE GLOBAL ONLINE (May 14, 2010), <http://yaleglobal.yale.edu/content/emerging-green-technology-poses-threat-trade-wars> (depicting China’s commitment to renewable energy development as exemplified by the Chinese wind industry); *id.* (“In 2009, China accounted for more than a third of the world’s wind-capacity installations, more than doubling its cumulative installed capacity for the fourth year in a row. And the country has passed the US to become the world’s largest wind-turbine market.”).

¹² See Nan Sato, *Red Dragon Gone Green: China’s Approach to Renewable Energy Technologies, Its Legal Implications, and Its Impact on U.S. Energy Policy*, 2011 U. ILL. J.L. TECH. & POL’Y 463, 470 (2011) (“In September 2010, Beijing announced a \$743 billion investment plan in renewable energy over the next decade.”).

¹³ See *id.* (discussing Chinese programs to provide financial support for renewable energy).

¹⁴ See Hart, *supra* note 10 (explaining that China’s failure to provide complete information regarding its sub-national programs makes it extremely difficult to identify which policy is at work).

¹⁵ *Id.*

¹⁶ See *id.* (linking the difficulty of determining whether China is following the international trade agreements to the lack of disclosure regarding China’s policies).

potentially unfair policy.¹⁷ Chinese manufacturers claim they are paying market interest rates for China Development Bank loan guarantees, but local governments actually reimburse the manufacturers for their interest payments.¹⁸ As a result, the solar manufacturers receive the loan payments without having to pay normal interest rates.¹⁹

B. Legal Framework: Anti-Competitive Subsidies

World Trade Organization (WTO) rules define and prohibit certain anti-competitive subsidies. The WTO defines Subsidies, under Article 1.1(a) of the Agreement on Subsidies and Countervailing Measures (ASCM), as financial contributions to industry from government.²⁰ Not all subsidies are prohibited—subsidies on products and services used and consumed domestically are allowed under the ASCM framework.²¹ The

¹⁷ See 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>.

¹⁸ See *id.* (“[A] state bank is preparing to lend to [Sunzone, a Chinese solar panel exporter,] at a low interest rate, and the provincial government is sweetening the deal by reimbursing the company for most of the interest payments, to help Sunzone double its production capacity. Heavily subsidized land and loans for an exporter like Sunzone are the rule, not the exception.”).

¹⁹ See *id.* (“The bank will lend the money at an interest rate of about 6 percent, but the provincial government will then give Sunzone a direct rebate to pay more than half the interest on the loan.”).

²⁰ See Agreement on Subsidies and Countervailing Measures, art. 1.1, Apr. 15, 1994, Marrakesh Agreement Establishing the World Trade Organization, Annex 1A, 1867 U.N.T.S. 14 [hereinafter ASCM], available at http://www.wto.org/english/docs_e/legal_e/24-scm.pdf (defining that a subsidy exists when “a financial contribution by a government or any public body within the territory of a Member . . . where: (i) a government practice involves a direct transfer of funds (e.g., grants, loans, equity infusion), potential direct transfers of funds or liabilities (e.g., loan guarantees); (ii) government revenue that is otherwise due is foregone or not collected (e.g. fiscal incentives such as tax credits); (iii) a government provides goods or services other than general infrastructure, or purchases goods; (iv) a government makes payments to a funding mechanism or entrusts or directs a private body to carry out one or more of the type of functions illustrated in (i) to (iii) above which would normally be vested in the government and the practice, in no real sense, differs from practices normally followed by governments; or . . . there is any form of income or price support . . . and a benefit is thereby conferred.”) (internal citations omitted).

²¹ See Hart, *supra* note 10 (“Subsidy programs are not necessarily anti-competitive. Green energy is an emerging technology sector, and policy assistance is often required to help new technologies compete with existing market alternatives.”).

ACSM prohibits the subsidization of products or processes intended for exportation.²² Further, if a subsidy imposes a significant prejudice on the interest of another country, it is said to have an “adverse effect” and potentially gives rise to an actionable claim.²³

The ASCM provides for “consultations”²⁴ and alternative dispute settlement procedures²⁵ if one Member believes another member country is granting unfair subsidies. Alternatively, the Member can bring a claim to the U.S. government, requesting Commerce’s investigation of the subsidies and implementation of CVD measures against the other country.²⁶ Under U.S. law, when a party like SolarWorld files a motion with Commerce, the agency can begin a countervailing duty investigation.²⁷ “Before a countervailing duty can be imposed,” the investigation must make two findings: “(1) that a government subsidy was received; and (2) that the subsidy resulted in, or threatens, material injury to American industry.”²⁸ Two separate bodies make these

²² See ASCM, *supra* note 20, art. 3.1(b) (prohibiting “subsidies contingent . . . upon the use of domestic over imported goods”).

²³ See *id.* art. 5(c) (including “serious prejudice to the interests of another Member” as an example of an adverse effect).

²⁴ See *id.* art. 4.1 (“Whenever a Member has reason to believe that a prohibited subsidy is being granted or maintained by another Member, such Member may request consultations with such other Member.”).

²⁵ See *id.* art. 4.4 (providing for the matter to be referred to the Dispute Settlement Body); see also *id.* art. 4.5 (allowing for the matter to be referred to the Permanent Group of Experts).

²⁶ See 21A AM. JUR. 2D *Customs Duties, Etc.* § 52 [hereinafter *Customs Duties*] (“A countervailing duty investigation may be initiated at the request of an interested party In the course of such an investigation, [the Department of] Commerce under 19 U.S.C.A. § 1671b(b) makes a preliminary determination concerning whether a foreign government provided a countervailed subsidy, and the International Trade Commission under 19 U.S.C.A. § 1671b(a) makes a preliminary determination concerning whether the foreign subsidy resulted in, or threatens, material injury to American industry.”).

²⁷ See 19 U.S.C. § 1671a(a)-(b) (2012) (explaining that an investigation can be started whenever the administering authority deems it necessary based on available information, which could be a filed motion).

²⁸ *Customs Duties, supra* note 26; see also COALITION FOR AM. SOLAR MFG., FACT SHEET: U.S. MANUFACTURERS OF SOLAR CELL ANTIDUMPING & SUBSIDY CASES AGAINST CHINA (2011), [hereinafter *Fact Sheet: U.S. Manufacturers*], available at <http://www.americansolarmanufacturing.org/fact-sheet/> (“SolarWorld Industries America Inc. . . . filed antidumping and countervailing duty petitions with the U.S. Department of Commerce and the U.S. International Trade Commission . . .”).

determinations.²⁹ First, the Commission makes a preliminary determination on whether the subsidy resulted in, or threatens, material injury to American industry.³⁰ Then, the administering authority makes a preliminary determination concerning whether a foreign government is granting countervailable subsidies.³¹ If, in its preliminary investigation, the administering authority finds that the foreign government provided a countervailable subsidy, it will suspend liquidation of duties³² and “require the importer to furnish cash deposits as security for duties that may be due pending a final determination of the amount of a CVD.”³³ If the administering authority makes a final determination that the foreign government provided countervailable subsidies³⁴ and the Commission determines that U.S. industry was materially injured as a result,³⁵ “Commerce then issues an order setting the countervailing duty,”³⁶ which is expressed *ad valorem*.³⁷

C. Legal Framework: Antidumping Subsidies

WTO rules also define and prohibit dumping.³⁸ The Agreement on Implementation of Article VI of the General

²⁹ See *supra* note 26 and accompanying text.

³⁰ See 19 U.S.C. § 1671b(a) (explaining that the Commission makes an initial determination regarding whether there is an indication of injury).

³¹ See *id.* § 1671b(b) (allowing the administering authority to determine whether there is a countervailable subsidy being used).

³² See *id.* § 1671b(d)(2) (establishing a duty on the administering authority to “order the suspension of liquidation of all entries of merchandise” against the violating party if a countervailing subsidy is found).

³³ *Norsk Hydro Can., Inc. v. United States*, 472 F.3d 1347, 1349 (Fed. Cir. 2006).

³⁴ See 19 U.S.C. § 1671d(a)(1) (“[T]he administering authority shall make a final determination of whether or not a countervailable subsidy is being provided with respect to the subject merchandise . . .”).

³⁵ See *id.* § 1671d(b)(1) (giving the Commission the authority to make final determinations as to whether there was material injury due to a countervailing subsidy).

³⁶ *Norsk Hydro*, 472 F.3d at 1349.

³⁷ See 19 U.S.C. §§ 1671d(c)(2), 1671e(a) (setting the countervailing duty at a certain rate in relation to the countervailing subsidy). An *ad valorem* tax is tax with a rate given as a proportion of the price. For example, most sales taxes are *ad valorem*. See HARVEY S. ROSEN & TED GAYER, *PUBLIC FINANCE* 311 (McGraw Hill, 9th ed. 2010).

³⁸ Agreement on Implementation of Article VI of the General Agreement on Tariffs and Trade 1994 (Anti-Dumping Agreement), art. 1, Jan. 1, 1995, 1867 U.N.T.S. 154 [hereinafter AIGATT], available at http://www.wto.org/english/docs_e/legal_e/19-adp.pdf. (explaining that anti-dumping measures will be taken in accordance with Article VI of GATT 1994).

Agreement on Tariffs and Trade (AIGATT) defines dumping as the practice of selling goods in other countries at less than home market price or cost of production.³⁹ In other words, “dumping occurs when a foreign [country] sells a product in [another country] at less than fair value.”⁴⁰ To establish a prima facie case of dumping, the importing country must prove: (1) dumping, (2) a material injury, and (3) a causal link between the dumped imports and the alleged injury.⁴¹ The General Agreement on Tariffs and Trade (GATT) provides that countries complaining of dumping can impose anti-dumping duties on the problematic products as a remedy, so long as the duties are not greater in amount than the margin of dumping.⁴²

If an industry believes that a foreign country is dumping goods or services, it can request anti-dumping remedies from its government.⁴³ The investigative procedure required to implement anti-dumping remedies mirrors the procedure to determine and implement countervailing duties described above.⁴⁴ If Commerce and the ITC make the appropriate findings, they can impose anti-dumping duties on the problematic products.⁴⁵ The applied duties may not be greater than the margin of dumping.⁴⁶

³⁹ See *id.* art. 2.1 (“[A] product is to be considered as being dumped, i.e. introduced into the commerce of another country at less than its normal value, if the export price of the product exported from one country to another is less than the comparable price, in the ordinary course of trade, for the like product when destined for consumption in the exporting country.”).

⁴⁰ *Fact Sheet: U.S. Manufacturers*, *supra* note 28.

⁴¹ See AIGATT, *supra* note 38, art. 5.2 (establishing the requirement that an application must “include evidence of (a) dumping, (b) injury within the meaning of Article VI of GATT 1994 as interpreted by this Agreement and (c) a causal link between the dumped imports and the alleged injury”).

⁴² See General Agreement on Tariffs and Trade, art VI.2, Oct. 30, 1947, 55 U.N.T.S. 194 [hereinafter GATT], available at http://www.wto.org/english/docs_e/legal_e/gatt47_e.pdf (“[A] contracting party may levy on any dumped product an anti-dumping duty not greater in amount than the margin of dumping in respect of such product.”).

⁴³ Sato, *supra* note 12, at 475.

⁴⁴ See 19 U.S.C. § 1673a (2006).

⁴⁵ *Id.*

⁴⁶ See ROBERT CARPENTER, ANTIDUMPING AND COUNTERVAILING DUTY HANDBOOK, US INTERNATIONAL TRADE COMMISSION, II-3-II-4 (13th ed. 2008) (providing a general overview of how AD and CVD actions work).

II. The SolarWorld Claim

On October 19, 2011, on behalf of seven U.S. solar companies, SolarWorld⁴⁷ filed a petition with Commerce and the ITC alleging that China was granting anti-competitive subsidies and that Chinese manufacturers were dumping solar panels on the U.S. market, injuring U.S. industry.⁴⁸ SolarWorld is a German-based photovoltaic (PV) company and is the largest producer of U.S. PV products.⁴⁹ PV solar panels “convert sunlight directly into electricity [and] gets its name from the process of converting light (photons) to electricity (voltage), which is called the PV effect.”⁵⁰ The complaint, which focused on PV cells, modules, and panels, alleged the subsidies and dumping enable Chinese manufacturers to sell their products at below market prices and will eventually drive U.S. competitors out of the market.⁵¹

The complaint specified “the Chinese government was unfairly subsidiz[ing] Chinese solar panel manufacturers by providing land, electricity, material inputs, and financing at below market rates, as well as direct financial support and other preferential policies.”⁵² SolarWorld asked the ITC and Commerce to institute heavy duties to remedy China’s unfair policies by imposing duties and tariffs on solar panels.⁵³ They asked for tariffs up to 250% on Chinese-manufactured products.⁵⁴ Such measures would amount to triple-digit tariffs on solar products from China.⁵⁵

In response, the ITC and Commerce began investigating the

⁴⁷ SolarWorld is a Germany based company with expansive operations in the U.S., see *Our History*, SOLARWORLD, <http://www.solarworld-usa.com/about-solarworld/history-of-solar.aspx> (last visited Apr. 9, 2013), and major manufacturing operations in Oregon, see *Locations*, SOLARWORLD, <http://www.solarworld-usa.com/about-solarworld/history-of-solar.aspx> (last visited Apr. 9, 2013).

⁴⁸ Sweet & Tracy, *supra* note 1.

⁴⁹ See *Fact Sheet: U.S. Manufacturers*, *supra* note 28.

⁵⁰ *Solar Photovoltaic Technology Basics*, NAT’L RENEWABLE ENERGY LABORATORIES, http://www.nrel.gov/learning/re_photovoltaics.html (last visited Apr. 17, 2013).

⁵¹ See Hart, *supra* note 10.

⁵² *Id.*

⁵³ See Sweet & Tracy, *supra* note 1.

⁵⁴ See MARK BERKMAN ET AL., THE EMPLOYMENT IMPACTS OF PROPOSED TARIFFS ON CHINESE PHOTOVOLTAIC CELLS AND MODULES 1 (The Brattle Group, Jan. 20, 2012).

⁵⁵ See Hart, *supra* note 10. However, the actual remedy awarded has been limited by the agencies’ findings. See *id.*

claims in late 2011.⁵⁶ In December 2011, the ITC issued an affirmative preliminary determination, ruling that the Chinese subsidies and dumping harmed U.S. industry, and in May 2012, Commerce issued a preliminary finding and began to impose duties on the Chinese products.⁵⁷ In October 2012, Commerce announced its affirmative final determination and recommended a continuation of the AD and CVD measures against the Chinese manufacturers.⁵⁸ Commerce found that Chinese producers and exporters “have sold cells in the United States at dumping margins ranging from 18.32 to 249.96 percent [and] Chinese producers/exporters have received countervailable subsidies of 14.78 to 15.97 percent.”⁵⁹

One month later, in November 2012, the ITC made an affirmative final determination that the U.S. solar industry was materially injured by the Chinese imports.⁶⁰ However, with respect to the critical circumstances finding required by the statute, the ITC made a negative determination.⁶¹ In other words, the ITC did not find the critical circumstances necessary to retroactively impose the AD and CVD measures on the imported goods.⁶² As a result, “the antidumping and countervailing duty orders . . . will not apply retroactively to goods that entered the United States prior to the date of publication in the Federal Register of the Department of Commerce’s affirmative preliminary determinations.”⁶³ Thus, the tariffs on Chinese solar manufacturers stay in place, but the United States has not applied

⁵⁶ See Benjamin Romano, *Decision in Chinese PV ‘dumping’ case delayed again to March*, RECHARGE NEWS BLOG (Jan. 30, 2012) <http://www.rechargenews.com/solar/article1298990.ece> (last visited Apr. 17, 2013).

⁵⁷ See Department of Commerce, *Crystalline Silicon Photovoltaic Cells, Whether or Not Assembled into Modules, from the People’s Republic of China: Final Determination*, 77 Fed. Reg. 63788, 63788 (Oct. 17, 2012).

⁵⁸ See *id.* at 63789; see also Press Release, SolarWorld, *SolarWorld announces International Trade Commission ruling: Chinese Imports are harming U.S. solar manufacturing industry* (Dec. 2, 2011) [Press Release, SolarWorld], available at <http://www.solarworld-usa.com/news-and-resources/news/chinese-imports-harming-us-solar-manufacturing.aspx> (last visited Apr. 17, 2013).

⁵⁹ ITA Fact Sheet, *supra* note 2, ¶ 2.

⁶⁰ Press Release, SolarWorld, *supra* note 58.

⁶¹ See *id.*

⁶² See *id.*

⁶³ *Id.*

retroactive duties to the same products.⁶⁴

III. Pitfalls for the United States

There are significant reasons why the United States should discontinue the imposition of tariffs on Chinese solar products. First, imposing such duties reflects a protectionist philosophy, which will not support domestic solar manufacturers in a way that will make the United States presence in solar power on the world stage.⁶⁵ Anti-dumping and countervailing duties have not helped boost domestic markets in other industries when the United States has attempted to use them to spur growth in other sectors of the manufacturing economy.⁶⁶ Further, the United States and China trade relations have traditionally been a zero-sum game in which each country used its comparative advantage to work with the other.⁶⁷ The solar industry can and should follow this trend.

Second, imposing duties could provoke China to retaliate against the United States, further hindering U.S. industries.⁶⁸ China has already shown signs of retaliation in response to the U.S. action.⁶⁹ Finally, as the world's two largest energy users, the United States and China have common interests in developing a strong and efficient global market for solar energy.⁷⁰ Both countries have goals of reducing greenhouse gas emissions and de-intensifying their carbon economies.⁷¹ If the United States is earnest in its desire to become a leader in solar manufacturing, it should develop collaborative efforts with China and focus on supporting our domestic economy, rather than trying to hinder Chinese industry.

A. Comparative Advantage

In general, CVD and AD policies are considered forms of economic protectionism that hinder the global free market. First

⁶⁴ *See id.*

⁶⁵ *See infra* Part III.B.

⁶⁶ *See infra* Part III.B.i.

⁶⁷ *See infra* Part III.B.ii.

⁶⁸ *See infra* Part III.B.iii.

⁶⁹ *See infra* Part III.B.iii.

⁷⁰ *See infra* Part IV.

⁷¹ Joel Eisen, *The New Energy Geopolitics?: China, Renewable Energy, and the "Greentech Race"*, 86 CHI.-KENT L. REV. 9, 45 (2011).

and foremost, such policies keep countries from achieving comparative advantage,⁷² which is the ability of one country to produce one type of good or service at a lower marginal and opportunity cost than another country.⁷³ One country may be more efficient at producing all goods (absolute advantage) than another, but both countries will still gain by trading with each other, as long as they have different relative efficiencies.⁷⁴ U.S. and Chinese trade relations have traditionally operated under a comparative advantage regime, in the shape of a “zero-sum game in which the West develops technologies then China takes manufacturing business in products that the West can no longer produce economically.”⁷⁵ U.S. and European companies have excelled in developing cutting edge technologies and fueling research and development.⁷⁶ The United States has been a leader in the most innovative technologies, with world-leading research universities and national laboratories and well-developed financial and legal infrastructure.⁷⁷ Complementing this, in the solar manufacturing market, Chinese companies have latched onto an older form of solar panels and ramped up production.⁷⁸ China’s expertise lies in the “rapid, large-scale deployment of technologies.”⁷⁹ For example, a U.S.-based company is developing a thin film semiconductor process that uses more expensive raw materials but a cheaper manufacturing process.⁸⁰

⁷² WILLIAM J. BAUMOL & ALAN S. BLINDER, *ECONOMICS: PRINCIPLES AND POLICY* 49 (Southwestern Cengage 11th ed. 2009); *see also* Paul R. Krugman, *Is Free Trade Passe?*, 1 J. ECON. PERSP. 131, 132 (1987) (decrying domestic trade policies as counterproductive to developing the global economy).

⁷³ *See* Krugman, *supra* note 72, at 132 (“From the early nineteenth century until the late 1970s, international trade theory was dominated almost entirely by the concept of comparative advantage, which we can define loosely as the view that countries trade to take advantage of their differences.”).

⁷⁴ *See* BAUMOL & BLINDER, *supra* note 72, at 49.

⁷⁵ Thomas Hout, *The Sun Rises on Chinese Competition.*, WALL ST. J. (July 7, 2010), <http://online.wsj.com/article/SB10001424052748704009804575309721957767994.html>.

⁷⁶ *See id.*

⁷⁷ Steven Chu, *U.S.-China Clean Energy Cooperation is Good for America and Good for the World*, HUFFINGTON POST (Jan. 18, 2011, 7:33 PM), http://www.huffingtonpost.com/steven-chu/uschina-clean-energy-coop_b_810709.html.

⁷⁸ Hout, *supra* note 75.

⁷⁹ Chu, *supra* note 77.

⁸⁰ Hout, *supra* note 75.

Chinese companies, on the other hand, have focused on expanding into an older form of solar panels, using silicon wafers and ramping up production to new levels.⁸¹

Critics of this free trade argument point out significant flaws.⁸² Most significantly, China has shown signs that it will not continue to play the role of a low-end manufacturing workshop for the West.⁸³ Instead, China aims to compete with the United States in “highly-engineered, research intensive industries” and to move up the global value chain.⁸⁴ Furthermore, in some cases, China has pushed prices down so low, that western companies can no longer compete.⁸⁵

B. Economic Problems: Empirical Troubles, Trade Diversion, Job Losses

There are three economic arguments undermining the theory that protectionist policies are effective at “protecting” domestic industry: (1) empirical policy problems, (2) trade diversion, and (3) domestic job losses.

1. Empirical Policy Problems

First, CVD and AD measures are based on models of imperfect markets that can mislead policymakers into instituting inefficient and unnecessary measures.⁸⁶ Given the empirical difficulties involved in modeling imperfect markets, many economists argue it is impossible to formulate effective CVD and AD policies.⁸⁷ Problems can arise as early as the process for identifying dumping or anti-competitive subsidy policies in foreign countries.⁸⁸ Given the blunt methods agencies use to identify unfair strategies, agencies often mistake legal pricing strategies for proof of an unfair advantage.⁸⁹ Economists argue

⁸¹ *Id.*

⁸² See Hart, *supra* note 10. See generally Krugman, *supra* note 72 (laying out several basic criticisms of free trade arguments).

⁸³ Hart, *supra* note 10.

⁸⁴ *Id.*

⁸⁵ *Id.*

⁸⁶ See Krugman, *supra* 72, at 139.

⁸⁷ *Id.*

⁸⁸ *Id.*

⁸⁹ See generally DANIEL IKENSON, NONMARKET NONSENSE: U.S. ANTIDUMPING

that the policies Commerce and the ITC use to identify policies are inherently biased to find affirmative evidence of dumping in more cases than not.⁹⁰

This is especially true with non-market economy (NME) countries like China.⁹¹ In making its determinations, Commerce assumes prices on products from NME countries are not a product of the market economy and do not reflect true supply and demand because of intervening government forces.⁹² Commerce and the ITC use other models to determine the actual fair price of Chinese products, creating potential empirical problems in their calculations.⁹³ The problem is compounded by the non-transparency of China's multi-level energy policies.⁹⁴ Given the difficulty in determining the existence of unfair policies and the empirical problems in creating remedies, protectionist policies like CVD and AD are often a poor solution to domestic market problems.⁹⁵

2. Trade Diversion

CVD and AD policies fail at supporting domestic markets because of inevitable trade diversion. Trade diversion is the shift from trade with one exporting country to trade with another exporting country.⁹⁶ Studies demonstrate when the United States implements AD and CVD actions against one country, other countries begin producing the tariffed products at a higher rate.⁹⁷ This creates a niche market for other foreign countries to exploit the U.S. domestic market at the expense of American

POLICY TOWARD CHINA, CATO INSTITUTE (Mar. 7, 2005) (explaining the methodology Commerce uses to identify dumping and arguing that Commerce's methods are flawed).

⁹⁰ *Id.*

⁹¹ *Id.* at 3-4.

⁹² Larry B. Loftis, *U.S.-European Economic Community Antidumping Laws: The Need for a Comprehensive Approach*, 15 GA. J. INT'L & COMP. L. 453, 457 (1985).

⁹³ IKENSON, *supra* note 89, at 3-4.

⁹⁴ *See supra* text accompanying notes 10-19.

⁹⁵ *See* Loftis, *supra* note 92, at 469.

⁹⁶ Paul Carrier, *An Assessment of Regional Economic Integration Agreements After the Uruguay Round*, 9 N.Y. INT'L L. REV. 1, 15 (1996).

⁹⁷ *See* Andrew Higgins, *From China, an End Run Around U.S. Tariffs*, WASH. POST (May 23, 2011), http://www.washingtonpost.com/world/asia-pacific/from-china-an-end-run-around-us-tariffs/2011/05/09/AF3GRI9G_story.html.

manufacturers.⁹⁸

This argument is best exemplified by the consequences that occurred when the United States imposed CVD and AD duties on Chinese wooden furniture manufacturers in 2005.⁹⁹ Many Chinese furniture manufacturers, who felt the impact of the tariffs, moved their production facilities to Vietnam, Indonesia, and other Asian nations where they could maintain a comparative advantage over U.S. manufacturers by avoiding the heavy tariffs.¹⁰⁰ Before the United States imposed the tariffs, imports made up about fifty-eight percent of wooden furniture market; today imports comprise about seventy percent of the market.¹⁰¹ While the AD and CVD policies have slowed furniture imports from China, the number of imports from other countries, like Vietnam, has skyrocketed.¹⁰²

CVD and AD measures on Chinese solar products will likely have similar effects, causing trade diversion. Chinese solar panel manufacturers have *already* started taking steps to avoid suffering the effects of U.S. imposed duties.¹⁰³ Chinese companies have planned manufacturing sites in Southeast Asia, Eastern Europe, and Mexico, where they can continue to manufacture solar products at low cost and import to the United States without facing duties.¹⁰⁴ It is inevitable that imposing duties on Chinese products will cause a trade diversion, which in turn, will continue to harm the U.S. industry.

⁹⁸ See generally Thomas J. Prusa, *The Trade Effects of US Antidumping Actions*, in THE EFFECTS OF US TRADE PROTECTION AND PROMOTION POLICIES 191-214 (Robert C. Feenstra ed., 1997) (explaining how AD actions cause trade diversion).

⁹⁹ Higgins, *supra* note 97.

¹⁰⁰ *Id.*

¹⁰¹ *Id.*

¹⁰² See *id.* (“In 2004, before tariffs went into force, China exported \$1.2 billion worth of beds and such to the United States. The figure last year was just \$691 million. Over the same period, however, imports of the same goods from Vietnam — where wages and other costs are even lower than in China — have surged, rising from \$151 million to \$931 million.”).

¹⁰³ Sneha Shah, *4 Ways Chinese Solar Panel Companies are Already Short Circuiting Future US Import Duties*, GREEN WORLD INVESTOR (Feb. 14, 2012), <http://www.greenworldinvestor.com/2012/02/14/4-ways-chinese-solar-panel-companies-are-already-short-circuiting-future-us-import-duties/>.

¹⁰⁴ *Id.*

3. Domestic Job Losses

Traditional AD and CVD critics also argue AD and CVD measures can negatively impact U.S. jobs. A recent study from the Battle Group found that increased duties

of the magnitude proposed by the petitioners would result in a substantial price increase for crystalline photovoltaic cells and modules. We expect that on average module process would be higher than currently projected over the next three years by roughly 25-30% in all consumer sectors (homeowners, commercial establishments, and utilities). Price increases of this magnitude may provide some assistance to domestic crystalline PV producers facing a highly competitive market, but at the same time will harm consumers, resulting in a drop in overall domestic demand.¹⁰⁵

Such a drop in demand means that “any job gains from increased domestic PV module production will likely be offset by job losses from decreased total demand for PV.”¹⁰⁶

The report estimates a fifty percent tariff would create new jobs from an increase in manufacturing market share.¹⁰⁷ However, between 9,560 and 10,684 jobs would be lost due to decreased discretionary spending by PV purchasers as a consequence of higher prices for PV systems.¹⁰⁸ The overall demand reduction from higher prices would impact jobs in sales, installation, and other solar component manufacturing.¹⁰⁹ The gain in market share for manufacturing would thus not create a sufficient number of jobs to offset the decline in jobs that would result from demand.¹¹⁰

As applied to the current AD and CVD actions, these traditional anti-protectionist arguments shed light on why the United States should adopt more effective policies to reach its goal of being a global solar manufacturing leader.

C. Retaliation Threat

By imposing duties on Chinese solar products, the United States runs the risk that China could retaliate with its own

¹⁰⁵ BERKMAN, ET AL., *supra* note 54, at ES-2.

¹⁰⁶ *Id.*

¹⁰⁷ *Id.* at ES-2-ES-3.

¹⁰⁸ *Id.*

¹⁰⁹ *Id.*

¹¹⁰ *Id.* at ES-4-ES-5.

measures. China has a reputation for taking retaliatory measures in response to trade actions filed against it and could take such action on many levels.¹¹¹

China could retaliate against the individual solar manufacturers who brought the complaint. Most likely, China would impose import tariffs on U.S. manufactured PV products, reducing the market access of U.S. PV manufacturers.¹¹² In the current investigation, six of the seven solar companies who brought the complaint remained anonymous, in part for fear of retaliation.¹¹³ SolarWorld was the only company willing to support the complaint publicly.¹¹⁴ This fear is not unfounded. According to the U.S. Trade Representative (USTR), many U.S. companies privately discuss Chinese violations of trade laws with the USTR but do not file formal complaints because they are worried China will retaliate with tariffs or reduced market access.¹¹⁵

China could also take measures to hurt the broader U.S. economy. Chinese solar manufacturers have initiated a trade action, similar to SolarWorld's complaint, against U.S. companies that supply inputs for PV manufacturing.¹¹⁶ These manufacturers have called on the Chinese Commerce Ministry to initiate an investigation into allegations of U.S. subsidies for and dumping of PV input exports to China.¹¹⁷ Furthermore, China could take measures to limit exports of inputs into U.S. products. In fact, "China is already limiting the exportation of its rare earth minerals, which are essential material in the production of wind

¹¹¹ *USTR's Kirk Says Troubled by China*, REUTERS (Dec. 17, 2011 at 3:02 PM) , <http://www.reuters.com/article/2011/12/17/us-wto-usa-china-idUSTRE7BG0J520111217> [hereinafter *USTR Troubled by China*] (quoting U.S. Trade Representative Ron Kirk, "I am troubled by what I see as a trend of China to retaliate when members - not just the U.S., other members of the WTO - bring China to dispute settlement over legitimate matters").

¹¹² BERKMAN, ET AL., *supra* note 54, at ES5.

¹¹³ Keith Bradsher, *Six Companies Stay Anonymous in Solar Case*, N.Y. TIMES (Oct. 19, 2011), http://www.nytimes.com/2011/10/20/business/global/six-complainants-in-solar-trade-case-are-unnamed.html?_r=1.

¹¹⁴ *Id.*

¹¹⁵ Hart, *supra* note 10.

¹¹⁶ *Id.*

¹¹⁷ Feifei Shen, *China's Solar Industry Seeks U.S. Polysilicon Imports Probe*, BLOOMBERG (Nov. 21, 2011, 6:05 PM), <http://www.bloomberg.com/news/2011-11-21/china-s-solar-industry-seeks-u-s-polysilicon-imports-probe.html>.

turbines.”¹¹⁸ Even more broadly, China recently imposed “punitive duties of up to 22 percent on large cars and Sport Utility Vehicles made in the United States.”¹¹⁹ Experts view these duties to be China’s retaliatory reaction to the solar industry investigation.¹²⁰

Such retaliatory actions would amount to further trade violations to which U.S. industries could file additional complaints.¹²¹ However, retaliation measures can be difficult to prove, and more formal complaints would only serve as an additional drain on the U.S. economy.¹²² Given these realities, retaliation to the SolarWorld complaint is a real threat and could serve to worsen the position of U.S. solar manufacturers.

IV. A Common Challenge

China and the United States have a common goal of transitioning to a clean energy economy.¹²³ Supporting the domestic solar industry is just one piece of the larger goal of developing solutions to climate change and maintaining domestic energy resources.¹²⁴ Climate change poses threats to the United States and China who both seek to develop clean energy economies based on renewable technologies like solar energy.¹²⁵ Because China and the United States have the same energy challenges, the two nations should work together to solve their common problems, rather than escalate into an energy trade war. Working together will be more effective than attempting to fight each other through CVD and AD measures.

A. Climate Change

More than any other global problem, climate change poses a common challenge not only for the United States and China but

¹¹⁸ Sato, *supra* note 12, at 476.

¹¹⁹ *USTR Troubled by China*, *supra* note 111.

¹²⁰ *Id.* (“China’s decision to impose duties was widely seen as a tit-for-tat move after U.S. challenges to China, most recently in the solar industry . . .”).

¹²¹ Hart, *supra* note 10.

¹²² *Id.*

¹²³ Chu, *supra* note 77.

¹²⁴ *Id.*

¹²⁵ *See infra* Part V.A.

for all nations.¹²⁶ There is a strong consensus among the scientific community that the world climate is warming.¹²⁷ This warming is the result of an exponential increase in the concentration of carbon dioxide and other greenhouse gases in the atmosphere since the Industrial Revolution.¹²⁸ Driven by industrial processes, fossil fuel combustion, and deforestation, greenhouse gas concentrations are now thirty-five percent higher than pre-industrial levels and continue to rise.¹²⁹ Current projections point to a global increase in temperature of 2.0 to 11.5 degrees Fahrenheit over the next century.¹³⁰

Scientists agree such increases in temperature will have devastating effects in China, the United States, and the rest of the world.¹³¹ In China,

experts have already observed numerous effects of global warming These include extended drought in the north, extreme weather events and flooding in the South, glacial melting in the Himalayas, endangering vital river flows, declining crop yields, and rising seas along heavily populated coastlines. [T]hese climate change-related impacts . . . will place additional strains on increasingly scarce resources, especially water, that could threaten economic growth.¹³²

The United States faces similar threats as well as “a northward migration of weeds, . . . a decrease in vegetation in arid lands, . . . increased spread of water-and food-born diseases, and decreased

¹²⁶ PEW CTR. ON GLOBAL CLIMATE CHANGE, A ROADMAP FOR U.S-CHINA COOPERATION ON ENERGY AND CLIMATE CHANGE 16 (Jan. 2009) [hereinafter ROADMAP], available at <http://www.c2es.org/docUploads/US-China-Roadmap-Feb09.pdf>.

¹²⁷ U.S. GLOBAL CHANGE RESEARCH PROGRAM, CLIMATE LITERACY: THE ESSENTIAL PRINCIPLES OF CLIMATE 2 (2d ed., Mar. 2009) [hereinafter CLIMATE LITERACY], available at http://oceanservice.noaa.gov/education/literacy/climate_literacy.pdf.

¹²⁸ *Id.*

¹²⁹ HERVE LE TREUT ET AL., *Historical Overview of Climate Change Science*, in CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS, CONTRIBUTION OF THE WORKING GROUP I TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 93, 97 (2007), available at http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4_wg1_full_report.pdf.

¹³⁰ RICHARD B. ALLEY ET AL., *Summary for Policymakers*, in CLIMATE CHANGE 2007: THE PHYSICAL SCIENCE BASIS, CONTRIBUTION TO THE FOURTH ASSESSMENT REPORT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE 1, 12 (2007), available at http://www.ipcc.ch/pdf/assessment-report/ar4/wg1/ar4_wg1_full_report.pdf.

¹³¹ See ROADMAP, *supra* note 126, at 16-17.

¹³² ROADMAP, *supra* note 126, at 16-17.

urban air quality.”¹³³ Reversing the trend of rising global temperature by dramatically reducing greenhouse gas emissions poses the largest common challenge of the modern world.¹³⁴

B. Differences in U.S. and Chinese Emissions Circumstances

The United States and China are overwhelmingly the largest contributors of greenhouse gases to the atmosphere, together accounting for over forty percent of emissions.¹³⁵ However, emissions from the United States and China reflect two very different systems of emissions drivers and opportunities to reduce emissions.¹³⁶ In China, economic development is the largest driver of greenhouse gas emissions.¹³⁷ Over 1.3 billion people live in China, more than four times the number of people in the United States, and as a growing percentage of those people enter the middle class, Chinese per capita emissions are growing at a rate of four to six times faster than per capita emissions in the United States.¹³⁸

Conversely, in the United States, the primary driver of emissions is population growth.¹³⁹ Even though Chinese per capita emissions are growing rapidly, the per capita emissions in the United States are still the highest in the world.¹⁴⁰ Energy intensity in the United States decreased significantly following policy responses to the 1970's oil shocks, but this trend has slowed in recent years.¹⁴¹ The United States remains far more energy intensive than Europe and Japan.¹⁴² U.S. emissions primarily

¹³³ *Id.* at 17.

¹³⁴ See generally CLIMATE LITERACY, *supra* note 127, (providing that global temperature is rising and that this may endanger ecosystems).

¹³⁵ ROADMAP, *supra* note 126, at 18.

¹³⁶ *Id.*

¹³⁷ *Id.*

¹³⁸ *Id.*; see also Press Release, PBL, China Contributing Two Thirds to Increase in CO2 Emissions (June 12, 2008), available at <http://www.pbl.nl/en/news/pressreleases/2008/20080613ChinacontributingtwothirdstoincreaseinCO2emissions>.

¹³⁹ ROADMAP, *supra* note 126, at 19 (providing that since 1990, population has grown by nineteen percent and emissions have grown by nineteen percent in the United States).

¹⁴⁰ *Id.*

¹⁴¹ *Id.*

¹⁴² *Id.*

come from consumption, not production.¹⁴³ Almost seventy-five percent of U.S. emissions come from transportation and commercial and residential energy use.¹⁴⁴ Whereas in China, the vast majority of emissions come from industry and production development, only twenty-five percent of U.S. emissions come from industry.¹⁴⁵

C. *Still a Common Challenge*

Despite these stark differences in the circumstances of the two countries, China and the United States are confronted with common energy challenges. Both countries must maintain a sufficient supply of energy resources to meet the needs of the growing and changing economies.¹⁴⁶ They must reduce the energy intensity of their economies, increase energy efficiency, and develop clean energy systems that are less carbon intensive.¹⁴⁷ Transitioning to a sustainable energy economy is crucial for the long-term development and success of the U.S. solar industry.

Pursuing trade actions against China will not help the United States develop a sustainable energy economy and thus will not help support the domestic solar industry. Trade actions suppress the international competition necessary to “fuel innovation, bring clean energy prices down, and speed both of our country’s transitions toward a more sustainable energy economy.”¹⁴⁸ Furthermore, if the United States successfully hinders Chinese solar industries through its CVD and AD measures, it could stunt the development of China’s clean energy economy.¹⁴⁹ Without China’s efforts in solar and wind energy, “China’s rapidly increasing energy demand and huge spending on [fossil fuel] technology would add considerably to greenhouse gas emissions.”¹⁵⁰ The United States and the rest of the world cannot

¹⁴³ *Id.*

¹⁴⁴ *See id.* (“Industry accounts for just 25 percent of U.S. emissions, with most of the rest coming from transportation and commercial and residential energy use.”).

¹⁴⁵ ROADMAP, *supra* note 126, at 19 (providing that despite these differences, one strong similarity between the United States and China is their reliance on coal, the most-carbon intensive energy source in the world).

¹⁴⁶ Hart, *supra* note 10.

¹⁴⁷ ROADMAP, *supra* note 126, at 20.

¹⁴⁸ Hart, *supra* note 10.

¹⁴⁹ Eisen, *supra* note 71, at 45.

¹⁵⁰ *Id.*

solve the climate change crisis without a strong commitment from China to developing clean and efficient energy technologies.¹⁵¹

Together, China and the United States are the world's largest energy producers, consumers, and GHG emitters. If the nations are serious about moving toward a clean energy economy, they must work together to reach common goals, not escalate a trade war.¹⁵²

V. Solutions

Pursuing AD and CVD duties against Chinese solar panel manufacturers will not help the United States become a global leader in solar manufacturing. For the reasons discussed above, these policies will not reach their intended goals and could have harmful effects on domestic manufacturers.¹⁵³ Instead, the United States should focus its efforts on developing collaborative international policies to work with China to reach the nations' common goals of de-intensifying their carbon economies and growing the global clean energy economy.¹⁵⁴ Additionally, the United States should implement two specific domestic policies that will provide the necessary support solar manufacturers need to create a stronger domestic solar industry.¹⁵⁵

A. *An International Collaborative Effort*

The United States must work with China to develop a global, sustainable energy economy. Collaborative policies will spur innovation in solar technologies more effectively and lower solar energy prices.¹⁵⁶ The United States should initiate a "U.S.-China Partnership on Energy and Climate Change" with continual support from the highest levels of government administration.¹⁵⁷ The partnership should include several high level task forces that

¹⁵¹ Hart, *supra* note 10.

¹⁵² Chu, *supra* note 77. Despite the existence of U.S. and Chinese goals, it is important to remember that if China is helping encourage market competition and fostering developments in clean energy technologies the United States should support it. Hart, *supra* note 10. However, if China is reaching unfair advantages that do not promote common goals, the United States should identify unfair activities and fight them. *Id.*

¹⁵³ Hart, *supra* note 10.

¹⁵⁴ See *infra* Part V.A.

¹⁵⁵ See *infra* text accompanying notes Part V.B.

¹⁵⁶ Hart, *supra* note 10.

¹⁵⁷ ROADMAP, *supra* note 126, at 7, 45.

focus on a number of policy areas in which international collaboration will be most effective. The first task force should focus on smart grid,¹⁵⁸ through the development of joint smart grid demonstrations and research initiatives. The inadequacy of current grid technology has proven a key obstacle in the widespread deployment of solar technology in both the United States and China.¹⁵⁹ Smart grid research can help both nations increase solar penetration within the market and spur further solar development.¹⁶⁰ A second task force should determine strategic areas for joint research and development of solar technologies that would enable both countries to continually benefit from their respective comparative advantages. By better understanding in which phases of production and manufacturing each country has a comparative advantage, the two countries can work together to most effectively foster their domestic solar industries. A high level council “composed of the heads of environmental, energy, finance, and other relevant ministries and departments” from the Chinese and U.S. governments should continually manage these task forces, along with any others that are created.¹⁶¹ The council should meet multiple times throughout the year to evaluate progress and priorities.¹⁶² This international collaborative effort will better support the U.S. solar industry than the current effort to impose duties against Chinese solar manufacturers.

B. An Effective Domestic Agenda

The United States should adopt two domestic policies to strengthen its solar industry.

¹⁵⁸ Smart grid is a broad term used to describe a modern, efficient electricity grid system with advanced communication technologies and distributed generation capabilities that can accommodate higher levels of intermittent renewable energy. *See generally* U.S. DEP’T OF ENERGY, THE SMART GRID: AN INTRODUCTION 10, available at http://energy.gov/sites/prod/files/oeprod/DocumentsandMedia/DOE_SG_Book_Single_Pages%281%29.pdf (Department of Energy publication explaining Smart Grid technology, including the pros, cons, and need for its implementation).

¹⁵⁹ *See* ROADMAP, *supra* note 126, at 35 (“Current grid technology used in both countries is plagued with inefficiencies, and is ill-suited to handle long distance transmission from sources of renewable power-rich areas to high-load centers, or to handle the intermittent nature of renewable power sources.”).

¹⁶⁰ *See id.* at 8.

¹⁶¹ *Id.* at 45.

¹⁶² *Id.*

1. *Feed-In Tariffs*

First, the United States should implement feed-in tariffs for solar and other renewable energy technologies. Feed-in tariff (FIT) policies are supply-side policies that focus on supporting the development of renewable energy generation.¹⁶³ In essence, FITs require utilities to contract to purchase either renewable energy credits or electricity from renewable energy generators.¹⁶⁴ According to the National Renewable Energy Laboratory,

[Feed-in tariff] purchase agreements are typically offered within contracts ranging from 10-25 years and are extended for every kilowatt-hour of electricity produced. The payment levels offered for each kilowatt-hour can be differentiated by technology type, project size, resource quality, and project location to better reflect actual project costs. Policy designers can also adjust the payment levels to decline for installations in subsequent years, which will both track and encourage technological change. In an alternative approach, FIT payments can be offered as a premium, or bonus, above the prevailing market price.¹⁶⁵

Countries within the European Union, in particular Germany, have experienced success using feed-in tariffs to spur solar and wind energy development.¹⁶⁶ These policies have jumpstarted Germany's solar industry, enabling its renewable energy sector to expand seventy-five percent since 2000.¹⁶⁷ This includes a three-fold increase in renewable energy capacity and the employment of over 300,000 people in the renewable energy sector.¹⁶⁸ Deutsche Bank estimated over 40,000 of those individuals work specifically in PV.¹⁶⁹ In terms of renewable energy supply, German renewable energy production grew from a 4.3% share of total domestic energy production in 1997 to 15.1% in 2008.¹⁷⁰ FITs have been

¹⁶³ TOBY D. COUTURE ET AL., A POLICYMAKER'S GUIDE TO FEED-IN TARIFF POLICY DESIGN 6 (2010).

¹⁶⁴ *Id.*

¹⁶⁵ *Id.* (citations omitted).

¹⁶⁶ Hart, *supra* note 10.

¹⁶⁷ DEUTSCHE BANK CLIMATE CHANGE ADVISORS, PAYING FOR RENEWABLE ENERGY: TLC AT THE RIGHT PRICE 44 (2009).

¹⁶⁸ *Id.*

¹⁶⁹ *Id.*

¹⁷⁰ *Id.* at 45.

key in the development of Germany's solar industry and could provide the same benefits to the U.S. solar industry.¹⁷¹ The United States should adopt a national feed-in tariff policy to support domestic solar manufacturing and generation.¹⁷²

2. Government Financing for Solar Energy

In addition to FITs, the United States can help domestic solar manufacturers by boosting financial support for the industry. Despite President Obama's ambitious goal of transitioning to a clean energy economy by generating eighty percent of U.S. energy from clean sources by 2035,¹⁷³ the U.S. government has provided only a limited amount of financial support for the solar industry.¹⁷⁴ A federal "Green Bank" initiative, or Clean Energy Deployment Administration (CEDA) could take many forms and would provide several different types of financing for the solar industry.¹⁷⁵ Most of the proposals for CEDA support solar manufacturing through "both direct support (e.g., loans, letters of credit, loan guarantees, preferred equity or warrants, or risk insurance) and indirect support (e.g., aggregation and securitization, re-insurance, and other credit enhancements)."¹⁷⁶ This kind of targeted financial support will help entrepreneurs "negotiate the 'valley of death' where new technologies languish for lack of [private] investment support."¹⁷⁷

A government-financing program for solar industry has two primary advantages. First, government support can help U.S. solar manufacturers focus on developing areas where U.S.

¹⁷¹ *Id.* at 48.

¹⁷² Of course, it is important to note, feed-in tariff policies have drawbacks. Critics claim they are expensive, inflexible, ineffective, and incompatible with other policies. *See id.* at 47.

¹⁷³ President Barack Obama, State of the Union Address (Jan. 25, 2011) (transcript available at <http://www.whitehouse.gov/state-of-the-union-2011>).

¹⁷⁴ Sato, *supra* note 12, at 477.

¹⁷⁵ Indeed, Congress has considered several bills over the past five years that include different types of federal "Green Bank" initiatives. *See generally* Allison S. Clements & Douglass D. Sims, *A Clean Energy Deployment Administration: The Right Policy for Emerging Renewable Technologies*, 31 ENERGY L.J. 397 (2010) (providing an in depth explanation of these proposals, how they are structured, and what kinds of financial support they provide for solar and other clean energy industries).

¹⁷⁶ *Id.* at 403.

¹⁷⁷ Senator Jeff Bingaman, *Clean Energy Revolution Won't Wait*, POLITICO (Sept. 20, 2010, 4:46 AM), http://www.politico.com/news/stories/0910/42388_Page2.html.

manufacturers have comparative advantages over the Chinese.¹⁷⁸ Some CEDA proposals prioritize funding on advanced, breakthrough solar technologies, capitalizing on U.S. advantages in research and development.¹⁷⁹ In this way, the United States can continue to use its superior research and development to push technological innovations from the laboratory to commercial viability.

Second, government financial support helps attract private investment. Revolutionary technologies do not usually garner private investment support during their primary development stages; thus, government funding at this initial stage would help attract private investors by reducing the risk involved in investing in an untested technology.¹⁸⁰ For example, NRG Solar's Agua Caliente Solar facility in Arizona has shown how government investment in experimental technology can encourage private investment.¹⁸¹ The Federal Loan Guarantee Program (LGP)¹⁸² gave a \$967 million loan guarantee to this 290-megawatt solar facility that uses breakthrough technology and will be the largest of its kind in the world.¹⁸³ MidAmerican Energy Holdings, Co., a unit of famed investor Warren Buffet's Berkshire Hathaway, Inc., later financially backed the facility.¹⁸⁴

¹⁷⁸ See Sato, *supra* note 12, at 479 (discussing the advantages of government financing for renewable energy industries).

¹⁷⁹ Clements & Sims, *supra* note 175, at 403.

¹⁸⁰ See Sato, *supra* note 12, at 479 ("The most important role of government financing in such projects is that it increases the confidence in the viability of these new technologies and that it brings to public attention the projects' early signs of success."); see also Matthew L. Wald, *Energy Firms Aided by U.S. Find Backers*, N.Y. TIMES (Feb. 3, 2011), <http://www.nytimes.com/2011/02/03/business/energy-environment/03energy.html> (noting that, in 2009, the US government granted \$151 million to "advance 37 clean energy ideas deemed too radical or too preliminary to attract much private funding").

¹⁸¹ Sato, *supra* note 12, at 478-79. This plant, funded by a grant from DOE, will use revolutionary solar technology while powering around 100,000 homes and creating 400 jobs. *Id.*

¹⁸² One aspect of a "Green Bank" initiative Congress passed in 2005.

¹⁸³ *Weekly Clean Energy Roundup: January 26, 2011*, IBTIMES UK (Jan. 27, 2011), <http://uk.ibtimes.com/articles/20110127/weekly-clean-energy-roundup-january-2011.htm>; Sato, *supra* note 12, at 478-79.

¹⁸⁴ Justin Doom & Noah Buhayar, *Buffett Plans More Solar Bonds After Oversubscribed Deal*, BLOOMBERG BUSINESSWEEK (Mar. 1, 2012), <http://www.businessweek.com/news/2012-02-29/buffett-plans-more-solar-bonds-after-topaz-deal>.

Critics of government investment in renewable energy claim the federal government should not be in the business of taking financial risks with taxpayer money.¹⁸⁵ Those opposed to the LGP and the expansion of government financing initiatives for renewable energy point to the collapse of Solyndra, the California-based solar manufacturer that received \$500 million in loan guarantees from the federal government before filing for bankruptcy.¹⁸⁶ Indeed, the decision to provide Solyndra with hefty loan guarantees could have been a misguided political move intended to exemplify the success of the Obama administration's stimulus package.¹⁸⁷

However, the LGP is too important to the overall development of a strong U.S. solar manufacturing industry to eliminate it based on this one loss. Government financing programs will inevitably require the government to take risks, but the potential successes are too significant to require the government to back only proven technologies, or worse, to eliminate government subsidiaries completely.¹⁸⁸ The LGP and other financing programs are some of the strongest policy tools the United States holds to fuel innovation and compete with China in solar manufacturing. These policies will better support the domestic solar industry than CVD and AD measures and should not be cast aside based on the Solyndra mishap.¹⁸⁹

VI. Conclusion

If the United States seeks to be a world leader in solar

¹⁸⁵ See *Solyndra Loan 'Crony Capitalism at Its Worst,' GOP Rep Says*, FOX NEWS (Sept. 18, 2011), <http://www.foxnews.com/politics/2011/09/18/solyndra-loan-crony-capitalism-at-its-worst-republican-says/> (citing political statements made in the fallout of the Obama administration's half-billion dollar loan to the bankrupt solar panel company).

¹⁸⁶ Tim Worstall, *Solyndra: Yes, It was Possible to See This Failure Coming*, FORBES (Sept. 17, 2011, 11:30 AM), <http://www.forbes.com/sites/timworstall/2011/09/17/solyndra-yes-it-was-possible-to-see-this-failure-coming/>.

¹⁸⁷ See *id.* (arguing the Obama administration should have seen the failure of Solyndra coming and should not have taken the risk of investing in this particular solar company).

¹⁸⁸ Joe Nocera, *The Phony Solyndra Scandal*, N.Y. TIMES (Sept. 23, 2011), http://www.nytimes.com/2011/09/24/opinion/the-phony-solyndra-scandal.html?_r=1 ("Thus, the real question the Solyndra case poses is this: Are the potential successes significant enough to negate the inevitable failures?").

¹⁸⁹ *Id.*

manufacturing, it should not focus its efforts on imposing CVD and AD measures on China. CVD and AD measures will not provide support for, nor will they protect, the domestic solar industry from international competition. The United States can adopt other policy strategies that will present better options. Imposing duties will not allow U.S. manufacturers to capitalize on comparative advantages and can lead to market distortions like trade diversion.¹⁹⁰ Imposing duties may also provoke China to retaliate against the United States, further hindering U.S. industries.¹⁹¹

As the two largest energy users in the world, the United States and China have a common interest in reducing greenhouse gas emissions and de-intensifying their carbon economies through the development of a strong, global solar industry.¹⁹² Instead of pursuing CVD and AD strategies, the United States should develop collaborative efforts with China and focus on supporting its domestic solar industry through feed-in tariffs and a Green Bank initiative.¹⁹³

United States support for a strong domestic solar industry is crucial for the development of a clean energy economy. In turn, the transition away from our fossil fuel economy to a global economy based on clean energy is of the utmost importance in facing the climate change crisis.¹⁹⁴ The United States must focus on its domestic industries and work with China to solve the challenge of global climate change.

¹⁹⁰ *See supra* Part III.

¹⁹¹ *See id.*

¹⁹² *See id.*

¹⁹³ *See supra* Part IV.

¹⁹⁴ *See supra* Part IV.