Comments on the USTR investigation of China’s Subsidies to Green Industries and their impacts on U.S. Producers of Clean Energy Products and other Green Technology Goods

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The United Steelworkers (USW) filed a petition under Section 302(a) of the Trade Act of 1974 with the U.S. Trade Representative (USTR) on September 9, 2010 which accuses China of illegally stimulating and protecting its producers of green technology exports, ranging from wind and solar energy products to advanced batteries and energy-efficient vehicles. The USTR has opened an investigation into these claims and invited public comments under Docket No. USTR-2010-0028. This report summarizes comments of the Economic Policy Institute on this investigation. Our principal findings include:

- The United States has a large and rapidly growing trade deficit with China that cost or displaced 2.4 million U.S. jobs between 2001 and 2008. Although the U.S. trade deficit with China declined in 2009, it is growing rapidly in 2010 and is projected to reach $275 billion by year-end 2010, exceeding the previous peak of $270.3 billion in 2008.

- China engages in a wide variety of illegal trade practices designed to maximize exports and minimize imports. In particular, reports by EPI Research Associate Usha Haley have shown that China has provided massive subsidies to China’s glass, paper, and steel industries which have resulted in a rapid rise in imports and in China’s global market share in these products. News reports and the USTR petition have documented a wide range of illegal subsidies that have artificially stimulated the development of China’s Green industries.

- These policies are reinforced by China’s currency manipulation policies, which have artificially suppressed the U.S. dollar-RMB exchange rate by 20-40%. These policies have reduced the prices of China’s exports by an additional 25-40%, and raise the cost of U.S. exports to China to the same extent. These subsidies also reduce the competitiveness of U.S. green technology goods on world markets.

1 See attached Appendix for Figures and Table referenced in these comments.
• The U.S. trade deficit with China in green industry products has increased more than 1700% in the past decade, rising from $217 million in 2000 to $4.0 billion in 2010 (estimated). These goods represent a rapidly growing share of the large and rapidly growing trade deficit with China. The share of green products in the total U.S. trade deficit with China rose from 0.3% of the U.S.-China trade deficit in 2000 to 1.4% in 2010. The overall U.S. trade deficit with China more than tripled in that period. Green products are a growing share of a rapidly rising deficit.

• The United States has a global trade deficit in green products, but that global deficit has fallen since 2008. However, the deficit with China in green products has increased since 2008.

• China’s share of the U.S. trade deficit in green products increased dramatically between 2000 and 2010. China is responsible for the vast majority (83%) of the U.S. trade deficit in green products in 2010.

• The New York Times (Bradsher 2010) reports that China is on track to produce more than half of the world’s solar panels in 2010, and that most of them will be sold to the United States and Germany. However, data reviewed here suggest that many of the photovoltaic products being manufactured in China may be re-exported to the United States from countries such as Malaysia and Taiwan. For example, in terms of the number of panels from (quantity), Malaysia is the leading exporter of photovoltaic panels to the United States in 2010, and exports from that country have jumped from less than one half million panels in 2009 to 28.6 million units in 2010. Imports from China will also rise sharply, from 5.1 million units in 2009 to 11.1 million units in 2010. The USTR should closely examine the trade and production inter-relationships between China and other major Asian producers of photovoltaic panels and other green products, also including Taiwan and Japan, because the number of units imported also jumped exponentially in 2010.³

• On a value basis, China is the largest exporter of solar panels to the United States, and will be responsible for approximately half of total U.S. imports of photovoltaic panels in 2010.⁴

The rapid growth of clean energy imports from China combined with widespread evidence of illegal subsidies and other illegal trade practices strongly suggests that China has injured and threatens further injury to domestic producers of green technology products. These are some of the most important growth industries for the future of U.S. manufacturing. As such, China’s illegal subsidies and other trade practices are a direct threat to the recovery of U.S. manufacturing. They also put at risk a number of U.S. Government investments and commitments for the clean energy industry worth at least $20 billion. Furthermore, the U.S. trade deficit with China in clean energy products displaced at least 8,000 U.S. jobs in 2010. The United States’ national interest in the development of domestic green industries is clearly threatened by China’s unfair trade practices. We encourage the USTR to proceed with a full investigation and to pursue all available trade remedies under section 302(b) of the trade act of 1984.

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² These data refer to trade in 43 green industry products identified in Wyden (2010, Annex A).
³ Mexico is the second largest supplier of photovoltaic panels to the United States on a value basis. Further research is required to determine whether Mexican producers are using components from China, or from U.S. or other manufacturers of photovoltaic cells.
⁴ The contrast between volume and value data suggests that the ten-digit HTS – 8541406020-- photovoltaic panels or modules contains a wide variety of products
Since China entered The World Trade Organization (WTO) in 2001, the extraordinary growth of U.S. trade with China has had a dramatic effect on U.S. workers and the domestic economy. The United States is piling up foreign debt and losing export capacity, and the growing trade deficit has been a prime contributor to the crisis in U.S. manufacturing employment. Between 2001 and 2008, 2.4 million jobs were lost or displaced, including 91,400 in 2008 alone, despite a dramatic decline in total and bilateral U.S.-China trade deficits that began in the second half of that year (Scott 2010a). Growing trade deficits have cost jobs in every state, including the District of Columbia and Puerto Rico. Although the U.S. trade deficit with China declined in 2009, it is growing rapidly in 2010 and is projected to reach $275 billion by year-end 2010, exceeding the previous peak of $270.3 billion in 2008.\(^5\)

China is rapidly moving upscale from consumer non-durables such as apparel, toys and footwear. Computers, electronic equipment, and parts industries experienced the largest growth in trade deficits with China, leading with 627,700 (26%) of all jobs displaced between 2001 and 2008. As a result, California and Texas, where remaining jobs in those industries are concentrated, were especially hard hit by job losses in those industries.

But the labor market impact of the China trade deficit is not restricted to job loss and displacement. Competition with low-wage workers from less-developed countries has also driven down wages for other workers in manufacturing and reduced the wages and bargaining power of similar workers throughout the economy. The impact has affected essentially all production workers with less than a four-year college degree—roughly 70% of the private-sector workforce, or about 100 million workers. For a typical full-time median-wage earner in 2006, these indirect losses totaled approximately $1,400 per worker (Bivens 2008). China is the most important source of downward pressure from trade with less-developed countries, because it pays very low wages and because it was responsible for nearly 40% of U.S. non-oil imports from less-developed countries in 2008.

**Causes of growing U.S. trade deficits with China**

A major cause of the rapidly growing U.S. trade deficit with China is currency manipulation. Unlike other currencies, the Chinese RMB does not fluctuate freely against the dollar. While the value of its currency should have increased as China exported more and more goods, it has instead remained artificially low, and China has aggressively acquired dollars to further depress the value of its own currency. China has tightly pegged its currency to the U.S. dollar at a rate that encourages a large bilateral surplus with the

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5 Estimate for trade balance based on year to data trade data through September, 2009. All trade data in this report are from the U.S. International Trade Commission (2010). Trade balance reported is estimated on the basis of domestic exports less consumption imports. Estimates for full year 2010 trade flows are based on the rate of growth in year-to-date trade flows through September 2010, compared with the same period in 2009. That growth rate is applied to full-year exports or imports in 2009 to estimate full year trade flows and the trade balance.
China had to purchase $453 billion in U.S. treasury bills and other securities between December 2008 and December 2009, alone, to maintain this peg. China has acquired a total of $2.65 trillion in foreign exchange reserves as of September 2010 (Bloomberg News 2010). About 70% of these reserves are held in U.S. dollars. This intervention makes the RMB artificially cheap relative to the dollar, effectively subsidizing Chinese exports. The best estimates place this effective subsidy at roughly 25-40% of the U.S. dollar, even after recent appreciation in the RMB (Cline and Williamson 2009, 2010). Currency intervention also artificially raises the cost of U.S. exports to China by a similar amount, making U.S. goods less competitive in that country. More importantly, it also reduces the competitiveness of U.S. exports to other countries around the world, compared with goods made in China.

Many other countries, especially those in Asia (such as Taiwan, Singapore and Malaysia), are also engaged in currency manipulation, in order to maintain their competitiveness with China. This also reduces the competitiveness of U.S. exports around the world, and increases U.S. trade deficits with those countries.

China has used widespread subsidies and other trade distorting practices to gain global dominance in a range of heavy industries, as shown in a series of reports by EPI Research Associate Usha Haley. In *No Paper Tiger*, Usha Haley (2010) showed that China has tripled its paper production since 2000, and that this growth was fueled by over $33.1 billion in government subsidies between 2002 and 2009. In *Through China’s Looking Glass*, Prof. Haley (2009) showed that Chinese glass production more than doubled between 2003 and 2009, and that this growth was supported by at least $30.3 billion in subsidies between 2004 and 2008. In an earlier report for the Alliance for American Manufacturing, *Shedding Light on Energy Subsidies in China*, Prof. Haley (2008) showed that over the past decade China has become the largest steel producer and exporter in the world and that its steel industries benefitted from $27.11 billion in energy subsidies between 2000 and mid-2007, alone.

The USW petition (The Petition) alleges that China has engaged in a number of unfair trade practices designed to artificially stimulate the growth and exports of their domestic green industries, including:

- the use of export restraints and export duties on rare earth minerals, tungsten and antimony;
- the use of prohibited subsidies that are contingent on export performance, or on the use of domestic products imported goods for a variety of products, including wind turbines;
- discrimination against foreign companies and goods, including those involved in Chinese wind and solar power projects;

Although China announced in June 2010 that it would allow its currency to fluctuate within narrow trading bands against the dollar and other currencies, the RMB appreciated only 2.5% relative to the dollar through November 5, 2010 (Federal Reserve, Foreign Exchange Rates). Cline and Williamson’s estimates of Fundamental Equilibrium Exchange Rates (FEERs) are highly sensitive to underlying assumptions about projected current account balances (derived from IMF forecasts) and a range of bilateral exchange rates. Their estimate of the needed revaluation of the RMB relative to the U.S. dollar declined from 40.2% in 2009 to 24.2% in 2010, despite the fact that China maintained a fixed peg of 6.82 RMB/dollar throughout this entire period. Given the rapid growth in the U.S.-China current account deficit in 2010 (Scott 2010b), there is little justification for a decline of 15 percentage points in the estimated equilibrium RMB/dollar exchange rate.
• technology transfer as a condition required for approval of foreign investments in China; and
• provision of extensive domestic subsidies to its “green” industries that are causing serious harm
to U.S. domestic industries, including massive subsidies to renewable energy industries.
The Petition documents massive subsidies and other unfair trade practices of the types noted above.
For example, in its economic stimulus package “China gave more than $216 billion in subsidies to its
green technology industries...nearly half of the total “green” stimulus spent worldwide (The Petition at
5).
As a consequence of these practices, China has rapidly expanded production of products such as
windmills and photovoltaic (PV) cells and arrays. Prices of these products are collapsing (repeating a
pattern established in other industries China has supported with massive subsidies such as the steel,
paper and glass industries (Haley 2008, 2009, 2010). As result of collapsing prices and massive increases
in output and exports, a number of companies have recently announced plans to close U.S. green
product factories. The problem is particularly acute in the photovoltaic (PV) solar cell industry.
Bradsher (2010) notes that BP Solar and Evergreen both plan to move PV production to China. This
month, Solyndra announced plans to shutter one domestic PV plan and delay plans to expand a new
plant that recently opened with the aid of a $535 million federal loan guarantee (Woody 2010). As a
result of these shifts, U.S. trade deficits with China in green products are rising rapidly, as shown below.

U.S. trade in green products

U.S. trade flows with China in green products for 2000-2010 are shown in Figure A (data for 2010 are
estimated based on year-to-date trade flows through September; see Appendix for Exhibits referred to
in these comments). U.S. imports of green products from China increased nearly ten-fold in this period,
rising from $542 billion in 2000 to $5.1 billion in 2010. U.S. exports of green products also increased,
but at a much smaller rate, growing from $325 billion in 2000 to $1.1 billion in 2010. As a result, the U.S.
trade deficit with China in green industry products has increased more than 1700% in the past decade,
rising from $217 million in 2000 to $4.0 billion in 2010, as shown in Figure A.⁸

Green products represent a rapidly growing share of the large and rapidly growing trade deficit with
China, as shown in Figure B. The share of green products in the total U.S. trade deficit with China rose
from 0.3% of the U.S.-China trade deficit in 2000 to 1.4% in 2010. The overall U.S. trade deficit with
China more than tripled in that period, growing from $84.2 billion in 2000 to an estimated $275 billion in
2010, as shown in Figure C. Green products are a rising share of that rapidly growing trade deficit.

The United States had a global trade deficit in green products between 2000 and 2010, but that global
deficit has fallen since 2008, as shown in Figure D. However, the U.S. trade deficit with China in green
products increased 22% between 2008 and 2010, as shown in Figure A, above. Thus, by 2010, the U.S.

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⁸ These data refer to trade in 43 green industry products identified in Wyden (2010, Annex A). Data reported here
are for domestic exports and consumption imports. This is a slightly narrower definition of trade designed to
exclude re-exports of goods produced in other countries. This framework is preferred when examining bilateral
trade flows, because the source country for re-exports is not reported in U.S. trade data.
trade deficit with China in these products exceeded our global green product deficit, as shown in Figure D. But for the green product deficit with China, the U.S. would have run a trade surplus in these products in 2010.

The U.S. global trade deficit in green products reached a peak of $6.4 billion in 2008. By 2010, this deficit declined more than 25% to -$4.8 billion, as shown in Figure E. Between 2008 and 2010, U.S. exports of green products (not shown) increased slightly from $18.4 billion to $18.6 billion, modest growth of 0.9%. Meanwhile, imports declined 5.7% from $24.8 billion to $23.4 billion. Thus, the reduction of imports (perhaps supported by import displacement through the growth of domestic battery production for hybrid cars, for example) and modest growth in green exports has supported a significant $1.6 billion (25%) improvement in the United States overall trade position in green products.

By 2010, the U.S. trade deficit with China in green products ($3.9 billion, Figure A, above) accounted for the vast majority (83%) of the U.S. global deficit in these products of $4.8 billion (the level of the total U.S. trade balance in green products is shown on the bars in Figure E, measured on the left axis). China’s share of the U.S. trade deficit in green products increased dramatically between 2000 and 2010, as shown in Figure E. China is responsible for the vast majority (83%) of the U.S. trade deficit in green products in 2010 (deficit shares are shown with the solid line in Figure E, measured on the right axis).

The rapid growth of the U.S. trade deficit in green products with China, coupled with extensive data on illegal subsidies and other illegal trade practices documented in The Petition provide strong evidence that domestic producers of green products, and especially workers and communities in the United States where these products were, or could be produced, have been injured or threatened with injury by China’s unfair trade practices in these cases.

In addition, the U.S. Government approved or promised to commit at least $20 billion in loan guarantees and other financial supports for the clean energy industry (Bradsher 2010), to companies such as Solyndra. The commercial viability of these investments is being threatened by massive illegal subsidies and other unfair trade practices in China. The threats imposed by these subsides will be illustrated with further detailed analysis of trade in solar cells.

**Case study: trade in photovoltaic cells**

Photovoltaic cells, which convert sunlight into electric energy, were invented many decades ago for the space program. Proposals to commercialize the production of solar cells through government investments in research, development and commercialization date to at least the 1970s (Scott 1978). Total U.S. trade in photovoltaic cells and panels (PVs) gradually increased over the past decade, as shown in Figure F and Figure G.

Trade in PVs is dominated by sales of assembled modules and panels. Total U.S. trade (exports plus imports) in these devices increased more than five-fold between 2006 and 2010 (estimated), as shown in Figure F. The United States had a small trade surplus in PV panels from 2000-2007. However, the United States developed a large and rapidly growing trade deficit in PV panels as imports soared.
between 2008 and 2010. China trade explains almost the entire U.S. trade deficit in PV panels, as shown below.

The value of total trade in PV cells is much smaller than trade in PV models and panels, as shown in figure G. PV cell are the individual components—akin to transistors—that are assembled into arrays for power production. Total U.S. trade in PV panels and modules will total approximately $3.7 billion in 2010 (Figure F); trade in PV cells will total only $400 million (Figure G). While the United States consistently ran trade surpluses in PV cells between 2005-05, it has run a trade deficit in the products in most years since 2006.

**China’s growing dominance of U.S. PV supplies.**

U.S. trade with China in PV panels and modules is extremely unbalanced, as shown in Figure H. The United States had almost no trade with China in these products prior to 2006. Between 2006 and 2010 U.S. imports of PV panels exploded from $68 million in 2006 to $1.1 billion—increasing more than 16-fold in those four years. The U.S. trade deficit with China in PV panels is responsible for more than one-quarter of the total U.S. trade deficit in green products with China in 2010 (Figure A, above).

U.S. trade with China in PV panels is almost completely one-way, which illustrates the closed nature of China’s PV industry. U.S. imports of PV panels from China exceeded exports by more than 500:1 in 2010, as shown in Figure H. This trade pattern stands in sharp contrast with U.S. trade in PV panels with the world as a whole (Figure F, above). The United States is engaged in extensive two-way trade with the world as a whole. U.S. trade in PV panels with the world was roughly balanced between 2000 and 2009.

Soaring U.S. imports of PV panels since 2007 (Figure F) are entirely explained by imports from China (Figure H). The U.S. trade deficit with China in PV panels in each year between 2007 and 2010 exceeded the U.S. global deficit in these products. Thus, but for China, the United States would have run a trade surplus in PV panels in every year between 2000 and 2010. This is further evidence of the significant harm done to the U.S. PV industry by China’s illegal subsidies and other unfair trade practices, as documented in The Petition.

The United States has had very little trade in PV cells with China, as shown in Figure I. Total trade was less than $13 million per year between 2000 and 2008. While there was a slight increase in trade in this commodity, resulting in a small trade surplus of $40 million in 2010 (Figure I), this pales in comparison with the United States’ $1.1 billion trade deficit in PV panels with China. The small volume of trade in PV cells between the United States and China is further evidence of the closed nature of that market.

**Trade volume data provide further evidence of soaring imports from China and neighboring countries**

The USW Petition alleges that illegal subsidies are “helping Chinese producers ramp up production, seize market share and drive down prices (Petition at 5)” . As a result, domestic prices have plummeted and domestic production and jobs have been lost. Rapid increases in the volume (quantity) of PV imports provide further evidence of these trends. They also suggest that China is acting as a market leader and
driving rapid expansion in the volume of PV from a number of countries, especially those in Asia. This suggests that the USTR should closely examine the trade and production inter-relationships between China and other major Asian producers of photovoltaic panels and other green products.  

Table 1 reports data on the number of PV Panels imported from the top five countries, and from the world as a whole from 2000 to 2010 (est.). On a volume (number of units imported) basis, Malaysia is the leading exporter of photovoltaic panels to the United States in 2010, and imports from that country have jumped from fewer than one half million panels in 2009 to 28.6 million units in 2010 (est.). Imports from China will also rise sharply, from 5.1 million units in 2009 to 13.6 million units in 2010. The USTR should closely examine the trade and production inter-relationships between China and other major Asian producers of photovoltaic panels and other green products. Since China will reportedly produce more than half the PV cells in the world in 2010, they may be shipping PVs to countries such as Malaysia, Taiwan and Japan, all countries that will experience very rapid growth in exports of PV panels to the United States in 2010, as shown in Table 1. Hence, some PV cells and arrays that originate in China may be embodied in imports that are exported to the United States by other countries. Thus, U.S. trade data may understate the total “China content” of PV imports from around the world if only direct imports are considered.

On a customs value basis, China will be the number one source of U.S. PV panel imports in 2010. The value of PV panel imports ($1.1 billion, Figure H, above) will exceed those from any other source in 2010 (not shown). Unit value calculations suggest that the average size of arrays imported from China will be much larger than those from Malaysia and other countries. The estimated unit value of PV Panels from China will be $103 in 2010, vs. while the average unit value of PV panels from Malaysia will be only $2.50 (not shown, based on county trade data from the U.S. International Trade Commission 2010). These will clearly be different products. Thus, the USTR will have to examine product-level detail that is below the HTS-10 level of aggregation shown in Table 5.

Trade and Jobs

The data reviewed in this analysis are based on a broad definition of the green energy industries threatened by China’s subsidies and other unfair trade practices in this sector, as discussed in The Petition. An earlier analysis of trade in very narrowly defined clean energy industries (Scott 2010c) estimated that the U.S. trade deficits in clean energy products will result in the loss or displacement of more than 8,000 jobs in the United States in 2010. Most of those jobs would have been in manufacturing industries, such as the electronics sector, which has been particularly hard hit by globalization and by growing trade deficits with China (Scott 2010a).

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9 Mexico is the second largest supplier of photovoltaic panels to the United States on a value basis. Further research is required to determine whether Mexican producers are using components from China, or from United States or other manufacturers of photovoltaic cells.

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Conclusion

The rapid growth of clean energy imports from China combined with widespread evidence of illegal subsidies and other illegal trade practices strongly suggests that China has injured and threatens further injury to domestic producers of green technology products. These are some of the most important growth industries for the future of U.S. manufacturing. As such, China’s illegal subsidies and other trade practices are a direct threat to the recovery of U.S. manufacturing. They also put at risk a number of U.S. Government investments and commitments for the clean energy industry worth at least $20 billion. Furthermore, the U.S. trade deficit with China in clean energy products displaced at least 8,000 U.S. jobs in 2010.

The United States has developed a large and rapidly growing trade deficit in green products with China. This deficit is responsible for a growing share of the overall U.S. trade deficit with China, which more than tripled between 2000 and 2010. China was responsible for the entire trade deficit in environmental goods in 2010—but for China the United States would have run a trade surplus in these products in 2010. These same trends are also present in the data on trade in PV panels. The United States had a $1.1 billion trade deficit in PV panels with China in 2010 which was responsible for more than one-quarter of the overall U.S. trade deficit in environmental products (a $4.0 billion deficit in 2010). China was the largest source of U.S. PV panel imports in 2010, on a value basis. Several other Asian producers including Malaysia, Taiwan and Japan also experienced very rapid growth in the quantity of PV exports to the United States. The USTR should investigate the relationships between China’s production and exports of PV cells and arrays, and production in those other countries because U.S. trade data may understate the total “China content” of PV imports from around the world if only direct imports are considered.

The United States’ national interest in the development of domestic green industries is clearly threatened by China’s unfair trade practices. We encourage the USTR to proceed with a full investigation and to pursue all available trade remedies under section 302(b) of the Trade Act of 1984.
References


