Introduction

Introduction International trade and competitive advantages in the costs of production in China have brought numerous opportunities for China's exports but also generated challenges due to protectionism from its foreign competitors. Consequently, there have been numerous trade cases against China, including anti-dumping, anti-subsidy, in many economic sectors. The very current trade case involving China is the US accusing Chinese manufacturers of dumping photovoltaic (PV) panels in the US market and the Chinese government unfairly subsidizing its own solar industry. In fact, the US's trade balances in polysilicon products between both the US and China, and the US and the world significantly deficit while China's polysilicon cells and modules production has increased dramatically (The Kearney Alliance 2012). This essay claims that, the surge in PV exports does not necessarily mean that the Chinese government has subsidized its PV manufacturers illegally, and Chinese solar manufacturers' low prices do not necessarily imply they are selling their PV products below the cost of production. Importantly, imposing such significant imports tariff is highly likely to undermine not only the bilateral trade between two countries but also long-term benefits of both countries. First, this essay provides an overview of the US-China PV trade case; then explains why China solar industry has been growing dramatically; and finally it analyses what the consequences might be if the US imposes a countervailing and antidumping tariff on China's PV. Background On October 2011, seven US-based PV manufacturers headed by SolarWorld Industries America reported China on a double-anti case to US Department of Commerce (DOC) and US International Trade Organization (ITO). The seven manufacturers, which later formed Coalition for American Solar Manufacturing (CASM), accused China for dumping their PV module

products to US market and giving a huge amount of export subsidy to this industry which in turn causing severe injuries to US PV manufacturers. Several investigations have been carried out by both DOC and ITC for this issue, as the coalition accused China government providing cash grants, heavily discounted resources, huge loans and credits, tax exemption, incentives and rebate and export grant insurance to the industry. In its final determination held on 10 October 2012, DOC proposed 18. 32 per cent to 249. 96 per cent of anti-dumping and 14. 78 per cent to 15. 97 per cent of countervailing duty. Further actions, including issuing or not issuing anti-dumping and countervailing duty orders, will be made after ITC final determination (US DOC 2012). Photovoltaic industry is a new emerging industry as a response to the threat of energy shortage and environmentally-unfriendly fossil fuel-based energy. Governments issued supportive policies, including giving significant account of subsidy considering higher production cost of this new energy industry compared to that of conventional one. In case of China, the country issued a PV market policy in 2007 that included deployment, investment and research and development supports under the scheme of middle and long term program of renewable energy development set by National Development and Reform Commission (NDRC) targeting the energy of 300MWp by 2010 and 1. 8 GWp by 2020 of PV cells installed (Grau et al. 2011). This policy and its comparative advantage on labors result in excessive growth of China PV industries, making China’s world market share skyrocketing from 1 per cent in 2001, 5 per cent in 2005 to 50 per cent in 2010. In 2012, four of the top five PV producers are Chinese overtaking US manufacturers which occupy 27 per cent in 2006, decreased to 5 per cent in 2010 of the total world share (The Kearney Alliance 2012). Why has China’s

PV grown so big so fast? There are a number of reasons why the PV industry in China has experienced tremendous growth within a short span of time. For instance, China produced about 1 per cent of the world's solar cells in 2001, and by 2010 it produced nearly almost half (The Kearney Alliance 2012). The same rate of growth was achieved by Japan and Germany during their PV industry expansion; however the key difference is it took them twice as long (The Kearney Alliance 2012). First, such fast paced growth would not be possible without assistance from the government. The Chinese government has been providing many different kinds of assistance to the manufacturers to promote the growth of the PV industry in China. The government's policy to boost the industry came in the form of loans, tax credits and grants. Additionally, some of the resources required for manufacturing of PV cells were subsidized or discounted to encourage manufacturers to produce more. In 2011, the Chinese government initiated a ' Five-Year Plan' to induce further growth of the PV industry well into the year 2015. Second, it is estimated that help from the government allowed some Chinese manufacturers of PV cells to have somewhere between 18-30 per cent cost advantage over their US counterparts (The Kearney Alliance 2012). The government alone is not responsible for the cost advantage enjoyed by the Chinese manufacturers; scale and vertical integration, and labour costs constitute significant part of the cost advantage. The scale and vertical integration of some of the top tier Chinese manufacturers means that they gain cost advantages due economy of scale; larger factories can produce at a lower cost, and additionally they tend to own or control majority of the companies in the supply chain as well as distributions outlets thus allowing them to maximize profit from supply, production and distributions. Moreover,

labour costs are relative cheap compared to the US, especially for unskilled labour, where China has approximately 80 per cent labour cost advantage over the US counterparts (The Kearney Alliance 2012). Third, besides the assistance and cost advantages, some, if not all, Chinese manufacturers tend to offer trade credit, where solar power customers can purchase the panels without having to pay upfront and are given 60 days payment window to complete the deal. This provides tremendous financial benefit to the customers, as they will have some time for installation of the panels without paying upfront for the panels thus the cost of downtime during the installation is not born by the customers. Finally, growth of China's PV industry is also due to the extreme projected growth of domestic demand. In 2010, Chinese domestic demand for solar power was only 3 per cent of the world's demand, and by the end 2014 this is expected to increase to 26 per cent (EPIA 2011). Is Chinese government providing illegal subsidies? Are Chinese manufacturers dumping their products on the U. S. market? The US government accuses the Chinese government of providing the export subsidies, which according to WTO rules is illegal. However, the Chinese government claims that the subsidies, grants, loans and discounts given to the manufacturers are intended to promote the solar power industry and make it cost competitive with conventional power sources. It is worth noting that it's not just Chinese government that provides subsidies, the US also provides substantial subsidies to its solar power industry albeit to a slightly lesser extent and lower amount in dollar terms. For instance, the US government does not provide land grants or discounts, and the total stimulus loan/loan guarantee is only US$1. 3 billion compared to US$30 billion from the Chinese government (Goodrich et al. 2011). The US Department of

Commerce accuses Chinese manufacturers of dumping PV cells on the US market. According to the WTO (WTO, 2012), dumping occurs when a company exports a good to foreign market at a price less than the price it normally charges in its domestic market. The US considers Chinese economy as non-market economy, thus the Chinese domestic price of PV cells cannot be determined directly from the Chinese market. Therefore, third or surrogate country needs to be chosen in order to determine the fair value of Chinese PV cells. The U. S Department of Commerce has chosen Thailand from a list of 6 countries as the surrogate country. This is unlikely to reflect an appropriate normal price for the Chinese PV since the costs of PV production in China is normally lower than those in Thailand. Possible consequences Both sides are currently still waiting for ITC's final determination. If an affirmative determination is made in late November that imports of PV cells from China, no matter being assembled into modules or not, leads to US domestic industry being or is threatened to be materially injured, Commerce will issue the Anti-Dumping and Countervailing duties order. Back when the preliminary determinations was announced earlier this year, in which the DOC assessed countervailing duties ranging at a lower rate, most Chinese manufacturers breached a sight of relief and continue their business in U. S. as before. However, DOC's final determination assessed significant higher countervailing duties at 14. 78 per cent -15. 24 per cent, comparing to its 2. 9 per cent-4. 73 per cent in the preliminary (US DOC 2012), undoubtedly it will have a severe impact on China's manufacturers and global solar industry. As the subject of DOC and ITC's investigation is PV cells that are manufactured in China, Chinese firms could shift manufacture or directly purchase PV cells from other countries to avoid

tariffs on modules made of Chinese cells. An ideal location is Taiwan, which is already a robust solar cell manufacturing market. Although it is 8 per cent higher than using its domestic produced cells, cells made in Taiwan still have a 10-22 per cent cost advantage than the ones in the US (Wesoff 2012). Not to mention its relative closeness to China. However, using PV cells from other countries other than the US and assembles into PV modules is not a proper long-term strategy. The US could also initiate another investigation into Chinese PV modules assembled, using other countries' cells. Thus, this is only a transitional strategy for Chinese manufacturers before China's domestic demand for PV products picks up to ameliorate industry's excessive supply situation. On the other hand, the imposition of high countervailing and anti-dumping duties might also affect the U. S. solar industry. In 2011, manufacturing only contributed 24000, or 24 per cent of the total employment in the solar industry (The Solar Foundation 2011). Punitive tariffs against Chinese cells will lead to a price jump on PV cells and modules in the US market, it causes the cost of solar projects in the US to increase and the implementation and demand for solar products to decline, which ultimately transits into lower employment in other sectors in the PV industry. The Coalition for Affordable Solar Energy commissioned a study showing that a 50 per cent tariff will indeed boost employment in the cell and module manufacturing sector. However, this tariff jump would also result in a huge decrease in employment from slowing-down discretionary spending by solar buyers and an overall demand decrease in other sectors in the whole PV industry. The net impact on total employment would be 15 per cent -40 per cent decline in the US PV industry compared to its 2010 numbers (Berkman et al. 2012). This means the resurrection of the US cells and module

manufacturers is at the cost of the rest and the vast majority of the US PV industry. Another potential outcome is that Chinese manufacturers could retaliate against imposed tariffs. The US currently still has a huge positive net export of polysilicon and PV manufacturing equipment to China. In 2011, China attributed to around 30 per cent of the US total net exports of polysilicon and 60 per cent of PV capital equipment (GTM 2012). To protest against imposed tariffs and duties, Chinese manufactures could ramp up their own production of polysilicon or turn to other countries to fill the gap, effectively cutting out the US firms in the solar supply chain. Conclusion In sum, Governments in most industrial countries including the US and China have been promoting clean energy technology in recent years. Among the world's solar producers, China's booming renewable energy industry, especially solar industry has dominated world solar markets and challenges American leadership. President Obama affirmed the US's concern about clean energy technology: '…to make sure that we win the competition. I don't want the new breakthrough technologies and the new manufacturing taking place in China and India' (Morris et al. 2012, p1). Meanwhile the subsidy to energy, including solar industry, has been successful in China (rapidly increase its market share of world polysilicon production), the US policy subsidy on clean energy has not brought any expected result, even failure (i. e. bankruptcy of Solyndra—the California solar firm) (Robert et al. 2010). Trying to protect the domestic solar industry by preventing other country's polysilicon exports is highly unlikely to be a wise and fair policy. In particular, countervailing and anti-dumping duties would result in a significant decline in exports of polysilicon and PV manufacturing equipment to China as well as a fall in employment. Indeed, China could have several

ways rather than bring the case to the WTO in responding to the trade barriers imposed by the US, but what the US needs to consider its long term benefit. The competitive price of Chinese solar as a cheap source of clean energy which potentially enhances the US economic growth, creates jobs for Americans and tackles with climate change. Reference Berkman, M, Cameron, L & Chang, J 2012, ‘ The employment impacts of proposed tariffs on Chinese manufactured photovoltaic cells and modules’, The Brattle Group, Washington, D. C. viewed 16 September 2012, . EPIA see European Photovoltaic Industry Association. European Photovoltaic Industry Association 2011, ‘ Global market outlook for Photovoltaics until 2015’, viewed 12 Oct 2012, http://www. epia. org/index. php? eID= tx_nawsecuredl&u= 0&file= fileadmin/EPIA_docs/publications/epia/EPIA-Global-Market-Outlook-for-Photovoltaics-until-2015. pdf&t= 1351601058&hash= 65fb67c830a17dc3384646f83c30e104 Goodrich, A, James, T & Woodhouse, M 2011, Solar PV manufacturing cost analysis: US competitiveness in a global industry, Stanford University, viewed 25 Oct 2012, < http://www. nrel. gov/docs/fy12osti/53938. pdf>. Grau, T, Huo M & Neuhoff, K 2011, ‘ Survey of photovoltaic industries and policies in Germany and China’, Climate Policy Initiative, Berlin. GTM 2012, ‘ U. S. Solar Energy Trade Assessment 2011: Trade Flows and Domestic Content for Solar Energy-Related Goods and Services in the United States’, Greentech Media, Washington, D. C. Morris, AC, Nivola, PS & Schultze, CL 2012, ‘ Clean energy: revisiting the challenges of industrial policy’, The Brookings Institution, Washington, DC. Roberts, MJ, Lassiter, JB & Nanda, R 2010, 'US Department of Energy & Recovery Act Funding: bridging the " Valley of Death" ', Harvard Business School. The Solar Foundation 2011, ‘ Nation Solar Jobs Census 2011’, viewed 12 October

2012, . The Kearney Alliance, 2012, ‘ China solar industry and the US anti-dumping/anti-subsidy case’, China Global Trade. USDOC 2012, ‘ Fact sheet: Commerce finds dumping and subsidization of crystalline silicon photovoltaic cells, whether or not assembled into modules from the People's Republic of China’, Department of Commerce, The United States of America, viewed 15 October 2012, . Wesoff, E 2012, ‘ Breaking news: Commerce Dept. Chinese solar panel dumping verdict is now in’, Greentech Media, viewed 17 October 2012, . WTO see World Trade Organisation World Trade Organisation 2012, ‘ Anti-dumping, subsidies, safeguards: contingencies, etc’, The World Trade Organisation, viewed 10 October 2012, http://www. wto. org/english/thewto_e/whatis_e/tif_e/agrm8_e. htm