

# First solar company marketing plan



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In the solar industry, there are two types of generation system. One is solar thermal power generation, and the other is photovoltaic power generation. Solar thermal power system uses solar heat power to generate electricity. Whereas photovoltaic power system uses solar cell panels that generate electricity when they get sunlight (Naver).

The starting point of the photovoltaic power generation industry goes back to 1839 when E. Becquerel from France found the photovoltaic effects. In 1954, Pearson in Bell Laboratory of U. S. A. invented the solar cells. However, the photovoltaic power generation industry started gained major attention during the oil shock in 1970. Many firms and governments invested billions of dollars in research about Photovoltaic generation and solar cells, and solar power started to be commercialized. Since then the industry and its market are growing rapidly (Kinyug).

Until late 1990s, the biggest renewable energy source was biomass, followed by hydropower. Solar electric installations totaled barely 21 Mega Watt in

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1985, however, it grew quickly: 200MW in 1999, 280MW in 2000, 340MW by 2001, and 427MW in 2002. Additionally, installations of worldwide photovoltaic increased dramatically to 7.3 GW in 2009, compared to 6,080 MW installed in the previous year. As we can see from the former statistics, solar energy demand has grown constantly by about 30% per year over the past 15 years. Yet, solar electric energy still only accounts for around 0.1% of primary energy demand globally even though the solar energy demand grows at a rapid pace. Nevertheless, this means that extremely rapid growth rates in solar energy industry is lead by the market penetration by solar energy with its comparatively small increases as costs decline (Solar Buzz).

According to Pike Research in May 2010, worldwide solar demand will increase to 10.1 GW in 2010, an increase of almost 43 percent compared to the same time period in the previous year. The Company also forecasts an increase in demand by over 19 GW by the year 2013. This is the result of lower costs for crystalline silicon cells and modules, which came about due to price drops of polysilicon and greater availability of credit in the solar market (Kurokawa, 2010; Buckley, 2010; Marino, 2010). Moreover, according to U. S. Solar Energy Market World Data, 2nd Edition by SBI Energy, solar market will eclipse the \$83 billion market in 2014 (Kurokawa, 2010; Buckley, 2010; Marino, 2010). According to Solarbuzz research, the Asia Pacific, European and United States are all projected to have strong growth over the next five years (Solar Buzz). These statistics strongly support that the solar market has a great potential in worldwide market growth in the near future.

The Japanese solar industry market was first stimulated in 1974 by the Photovoltaic Research and Development program created by the

government, when they started the Sunshine Project: Photovoltaic research and development was the major focus of the Sunshine Project. This was instituted to help Japan become less reliant on oil, which had to be totally imported from other countries. In 1994, the most important federal program for the solar market began: called the PV System Monitoring Program for residential houses (a. k. a. the Residential Photovoltaic System Dissemination Program). The PV system installation targets of the program were 400 MW by 2000, 4600 MW by 2010. Between 1994 and 2005, it funded total installations for more than 930 MW, including over 250, 000 residential PV systems, and successfully reduced the buy-down rebate from 900, 000 JPY per Kilowatt in 1994 to 20, 000 JPY per KW in 2005.

Nowadays, Japan is considered the world most mature solar energy market. The Japanese solar energy industry is ranked as the fourth largest market. The modern heavy industry estimated that, it might bring approximately one hundred million U. S. dollars profits in 2011 through the Japanese solar energy market's development (The Solar Info). Several solar energy product manufacturers in the top ten globally are from Japan: Sharp Corp., Kyocera Corp., Sanyo Solar Industries, etc. (The Solar Info). Among these companies, Sharp Corporation is the market leader. Although Sharp Corp. have reinvested greatly in their production capacity, other manufacturers are joining the market industry as demand continues to increase exponentially at a growth rate around 20%.

A considerable majority of the solar panels produced in Japan are sold and installed in Japan. In the last few years, collections of solar cell panels have started to be used almost everywhere: the rooftops of the airports, schools,

and factories, and new house designs (The Yamsa Institute). The Japanese government is planning to install 28 GW of solar energy by 2020, which will increase to 53 GW by 2030. The government has also pledged to cut its greenhouse gas emissions by 25% in 2020. In order to reach these goals, they will expand the use of solar and other renewable energy sources (Reuters). Because of the large market growth, we can see that Japanese market still has potential for growth in the near future even though there are many strong competitors.

## **First Solar Company Overview**

First Solar is a US-based solar company that was the largest supplier of photovoltaic modules in 2009 (Renewable Energy World. Com). It was formed in 1999 and launched production of commercial products in 2002. It launched IPO on November 17, 2006; and their Common stock is traded on the NASDAQ Stock Market under the symbol FSLR.

First Solar is the largest manufacturer of thin film solar modules, having expanded manufacturing capacity to an annualized run rate of 59.6 MW per line in the 3rd quarter of 2010. By enabling clean, renewable electricity at lower costs, First Solar is providing a sustainable alternative to conventional energy sources. The main slogan of the company is made up of three words; clean, affordable, and sustainable. This goal has driven First Solar to become one of the fastest growing manufacturers of solar modules in the world. FS Series 3 PV Modules represent the latest advancements in solar module technology, and are rapidly driving down the cost of solar electricity to rates comparable with traditional fossil fuel-based energy sources (First Solar). It developed the first comprehensive, prefunded module collection and

recycling program in the PV industry and energy solutions with the smallest carbon footprint and fastest energy payback time of PV technologies. It has broken the \$1/watt barrier, reaffirming its place as the lowest-cost PV manufacturer in the world.

First Solar PV modules are the first thin film PV modules to reach 2GW of modules installed. To support the growing demand, First Solar continues to push the limits on volume manufacturing. Integrating each production step, First Solar manufactures the modules on high throughput, automated lines from semiconductor deposition to final assembly and test – all in one continuous process (First Solar).

Multiple years of high volume production have given way to First Solar's efficiencies, high energy yields, low production costs and excellent system performance ratios meeting certain level of expectation. Using a unique proprietary replication process called Copy Smart™, First Solar can ensure that each manufacturing facility mirrors the others in product efficiency, reliability, and safety (First Solar).

First Solar's strategy focuses on reducing solar electricity costs to sustainable levels through technology development, operational excellence and scale. It uses affordable price and adaptive business models and partnerships overseas to expand markets. Also, it owns and develops technologies necessary to be the low cost provider of solar electricity in order to possess sustainable competitive advantage.

First solar has more than 4, 700 global associates who compete against Japanese and other US firms in the global solar market. None of these

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associates are located in Japan and they are not currently recruiting any individuals from Japan (First Solar). They have production facilities in Perrysburg, Ohio, Frankfurt (Oder), Germany, and Kulim, Malaysia with plans to build production plants in Vietnam and France (First Solar).

The company has contracted large projects from governments and businesses in the US, across Europe and in China, but has not really entered the Japanese solar market. Its current main issue for global expansion is growing in European FiT markets and expanding into developing markets such as China and India. The European market remains promising for First Solar, driven over the next three to five years by the European Union's 20% by 2020 renewables mandate. In 2009, the German market grew strongly to about 3GW and continued to be the industry's largest. The Italian market is expected to be the second largest in Europe in 2010 and France is expected to be the third largest in Europe in 2010 (First Solar).

In China, First Solar signed a project for a multi-phase, 2GW solar power plant to be built near Ordos City in Inner Mongolia. In Australia, it is pursuing over 500MW of opportunities on rooftop, ground-mount, and off-grid applications (First Solar).

Although three Japanese manufacturers are in the top ten (Sharp, Kyocera, and Sanyo), First Solar is still extremely competitive in that its solar cells have the lowest cost per Watt of energy produced in the industry (First Solar).<sup>1</sup> Only being present in China and Malaysia (manufacturing), it needs to penetrate into developing markets in Asia such as India, South Korea, Singapore, and Taipei as an early enterer. Also, it can penetrate into an

already developed market such as Japan, where there are strong competitors. With such a specific and sustainable strategic advantage, the company should still be competitive in the Japanese market. However, even if the company is not so successful in generating profits in Japan, their major competitors (who are Japanese) will devote recourses to competing against them in the Japanese domestic market, which will help First Solar in the global market competition.

## **Market Entry Plan**

The Japanese government only provides installation subsidies for products that have acquired JPEC (Japan Photovoltaic Energy Center) certification. In order to obtain JPEC certification, the company needs to have an after sales service network in Japan. Therefore, it is very difficult for foreign firms to receive certification from the government. Moreover, JPEA (Japan Photovoltaic Energy Association), which manages the JPEC certification and the Japanese government, have plans to make obtaining a JPEC certificate even more difficult. Under the current system, a foreign company can get a certification through cooperation with a company which has an after sales service network in Japan. However, if the system changes, the foreign company will have to have their own service network in all over the Japan. Obviously, the JPEC certification standard is a trade barrier to non-Japanese companies for protecting Japanese companies. That being said, a few foreign photovoltaic equipment companies have received JPEC certification. LS Industrial Systems (Korean) acquired JPEC certification by cooperating with Sanix (Japanese) for their after sales service network. Likewise, Suntech (Chinese) received JPEC certification by merging with a Japanese



photovoltaic company. However, if regulations change, getting a certification will be harder than past.

First Solar can enter the Japanese photovoltaic market using two methods. One is establishing an after sales service network in Japan directly and the other is cooperating Japanese company, which has a sufficient network in Japan. The former method requires a tremendous initial investment, so the latter one is the preferred way to get a JPEC certification. First Solar needs to move quickly in their collaboration with Japanese company and entry into the Japanese photovoltaic market before the current regulation system is modified (Kim).

We suggest that collaborative strategies for several reasons. First, there are few advantages for total ownership of a company in the Japanese solar energy market. We already mentioned above, initial investment costs are extremely high for entering the market as a foreign company and it will also take a considerable amount of time. Moreover, there are many existing competitors in Japan and the Japanese government regulations and laws support these existing corporations.

Second, First Solar has accumulated international business experiences in a various countries throughout Europe as well as the US and China. Therefore, the company has the know-how to implement successful global business in abroad. Their experience means the company that total control will not be as necessary to the firm.

Lastly, First Solar needs local expertise to do business in Japan. Cooperation with Japanese company is necessary not only for acquiring JPEC certification but also avoiding unexpected risks.

Through partnership entry mode, First Solar anticipates a good opportunity to utilize external resources and knowledge, cost-saving of entry cost and high customers' recognition.

Therefore this market entry plan is based on the merger with or partial acquisition of a Japanese solar firm. A list of possible acquisitions can be found in the appendix (Table 1). The company should initially focus on two types of customers: the government and other firms (focusing on residential construction firms as elaborated in Sales Strategy section). Production Strategy and Human Resources Strategy will differ depending on the type of customer, but a general recommendation will be made in each case. A simplified market entry plan will be given after the explanations of each specific strategy.

## **Sales Strategy**

In Japanese photovoltaic solar energy system market, about 80% of the total market comes from residential house installation. In January 2009, the subsidy for installing photovoltaic system in house was restored by government and in November 2009, the government instituted a photovoltaic electricity surplus buyback system for public (any electricity produced but unused by a household can be sold back to the electric company). Because of those policies, the number of photovoltaic systems installed in individual house increased nearly three hundred percent in 2009

(Hukuoka Financial Group). Moreover, a specialist at the Yano Institute projected that the residential solar system market will grow to ¥733, 700 million in 2015 and ¥863, 200million in 2020 (Yano Economic Institute). In short, there is a large profit opportunities for First Solar if they penetrate the residential solar system market.

First Solar should seek contracts with large housing construction firms in order to enter the residential solar system. Nowadays, installing photovoltaic system in newly constructed homes is a trend for Japanese construction firms because the customers prefer solar system equipped residences and the companies can reduce the cost for installation by mass consumption. In practice, the installation rate of photovoltaic system in new individual house built by the major housing construction firms increased 15% in 2008 to 39% in 2009 (Yano Economic Institute). If First Solar offers the panels to reasonable price, the Japanese construction firms would likely purchase them because they will provide the most power generation for the lowest cost.

Because of the Japanese government hopes to install 28 GW of solar energy by 2020 and 53 GW by 2030, the public and industrial photovoltaic market offers a substantial market opportunity like the residential solar system market. The Yano Institute analysts expect the market to reach ¥230, 900 million in 2010, and grow to ¥373, 100 million JPY in 2015 and ¥430, 900 million in 2020 (Yano Economic Institute).

Furthermore, in August 2010, the Japanese economy and industry administration published blueprint of electric power purchase policy. This policy dictates that the electricity companies are required to buy all the

electric power generated by renewable energy such as photovoltaic system, wind power generation, and geothermal power generation, etc. The purchasing cost will be passed on to consumers through electricity charge to home and corporations (Hukuoka Financial Group). Because of this policy, large-scale photovoltaic power plant seems to be on the near horizon. First Solar can expand into to this industry with collaboration.

To enter the public and industrial market, First Solar must participate in open bids for Japanese government project and public project such as airports, schools, factories and public transportation. Of course, under the current policy, the government may prefer a Japanese company to a foreign company, but First Solar will continue to offer the most cost efficient energy production. As such, First Solar should focus primarily on collaborating with homebuilders because this industry has the fewest entry barriers. However, the company cannot ignore the market opportunities in the public and industrial sector and should pursue opportunities in this market as well.

## **Production Strategy**

There are two methods to consider when deciding on a production strategy for entering the Japanese market. One method is producing products inside Japan and the other is importing products from outside Japan.

The overall market entry strategy for first solar is to merge with or acquire a firm currently operating in the Japanese solar industry. In this way First Solar could use the firms' current production lines, as it would be neither cost effective nor helpful to integration to eliminate it. In terms of merger and acquisition, companies that mainly focus on solar cells are much stronger

candidates for merger or acquisition than large companies that focus on multiple product lines (e. g. Sharp, Kyocera, etc.). The companies shown in the appendix (Table 1) are all potential candidates. As none of these companies are top producing firms in the Japanese market, their production capabilities will be limited at best. It would be most advantageous for first solar to convert these production lines and use the solar cells produced for their partnerships with home manufacturers. The limited solar cell production can be used on some of the residential contracts but it is unlikely to be sufficient to cover the amount of projects First Solar would like to have.

First Solar already has a global network of solar cell production facilities that will aid them in their entry into Japan. With current production facilities in Malaysia and planned production facilities in Vietnam and Mongolia, the company will have several facilities that are close enough to minimize shipping costs and that have enough production capability to supply any projects that are contracted in Japan (First Solar). Using primarily out-of-country production is beneficial because the company is not subject to high labor costs and is not dependent on one country or one plant for their supply (this is especially important in the case of natural disaster, state failure, or labor strike). However, importing from abroad may present its own legal and regulatory challenges. The issues may be resolved by the method of merger and acquisition. The company must avoid tariffs and taxes that it would incur by importing foreign products. This can be avoided by having the Japanese firm taking some ownership stake First Solar's overseas production factories. In this way, the local firm will be importing its own products from its "own" production facilities abroad.

As the legal environment in Japan is highly dynamic in relation to the solar industry, the production strategy may change. Though oversea production should be favored now, future legal regulations may shift favor to local production. If this occurs, the company must evaluate whether the contracts and partnerships they have developed are worth the additional labor costs of expanding factories in Japan.

## **Human Resources Strategy**

One of the most important aspects of First Solar's entry strategy in Japan is how the company chooses to populate the work force of their expansion. The company should look at each portion of their expansion separately when they decide Human Resource strategies. There are three company sections that the company must consider in terms of Human Resources: the after sales service network, the production network, and management.

Logistically, they should open an office in Tokyo or elsewhere in Japan in order to facilitate coordination with the global First Solar network and to seek additional contracts and partnerships. The office will need sales people, engineers and designers. The company should employ some expatriate workers who are familiar with their technology, but most of the engineers and designers should be recruited from Japan. Japan has a large pool of talented engineers and several highly ranked engineering universities. In the 2010 QS World University Rankings, Japan had the fifth most ranked engineering universities in the top 300 (behind Germany, Australia, United States, and United Kingdom). They also had the most highly ranked university outside of the United States and the United Kingdom – the University of Tokyo at number 7 (Quacquarelli Symonds). Since Japanese

engineers are as qualified academically as their global peers, it would be advantageous to employ them in Japan. Native Japanese will be more comfortable with the Japanese language and the Japanese culture when dealing with other organizations on development projects. The company should create a somewhat even mix of engineers from other solar firms and university graduates. Recruiting engineers from other companies benefits the firm by giving it deeper knowledge of its competitors, but will also be more difficult than recruiting university graduates. It should be noted that either of these strategies would be difficult. The employment structure in Japan favors long-term employees and discourages company shift. Also, top university graduates are apprehensive about working for foreign firms. That being said, First Solar is unique in that it has a significant strategic advantage in its industry that will help it draw top talent from the industry (Hemmert).

In terms of production, the company should send a few current employees to help manage production lines, but workers and many middle level managers should be retained or recruited from in Japan. First Solar's strategic advantage is not dependent on any individual knowledge so it does not hurt the company to recruit local talent. However, recruiting local talents helps the company manage costs and gives them a local advantage in a vastly different business environment. The company's production within Japan should be limited, and would not go beyond the production capabilities of the firm they acquire. For production within Japan, native workers can be retained along with most of the Japanese managers. Some new managers and production experts from First Solar will need to be integrated into the

firm in order to efficiently shift production to first solar specific cells. However, since most of the solar cells will come from other First Solar production lines this will be secondary. There is no advantage in having Japanese versus expatriate workers to manage the exchange of complete solar cells between parts of the company. But, these workers need to be knowledgeable about First Solar and their global operations. Since, most individuals familiar with the company are non-Japanese, these employees would probably be expatriates. For top-level managers of the firm, the situation is more difficult to assess. If the acquisition or merger is particularly hostile or the company only begrudgingly agrees to a merger, these managers should be eliminated – as the acquisition was chosen for mostly legal reasons (not any strategic advantage of the acquired firm) this will not be negative for First Solar. However, all efforts should be made to keep managers in charge of labor and business contracts because it is important to keep the loyalty of the Japanese employees. If the acquisition was friendly, and the Japanese managers are able to accommodate the shift in focus towards business partnerships and government projects, they can and should be kept in place because it will maintain the efficiency of the firm.

Research and Development departments at the acquired firm should be eliminated, if there are any, since the R&D to maintain strategic advantage will be completed at some of First Solar's other locations. Engineering and Design departments, as mentioned previously, should be expanded.

Otherwise, the organization of the firm can remain largely intact.

The Human Resources plan outlined here attempts to eliminate the common issues with acquisitions mainly “ human integration” and “ organizational



integration” as described by Froese and Goeritz . The specific plan will depend on the outcome of the actual acquisition but any outcome can be accommodated. Using mostly Japanese workers where possible will ensure that the firm operates smoothly and it will immediately be integrated into the Japanese markets. The firm must also utilize some expatriate workers who are familiar with First Solar and have a large measure of authority from the Tempe, Arizona headquarters.

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