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Capital, not labor, is key to China manufacturing

Sentinel & Enterprise

Posted: 03/02/2011 06:53:15 AM EST

Part 2 in a series

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Cheaper Chinese labor has a lot to do with why China can make and sell solar panels for less, some experts say.

But cheap labor in China is overrated as a competitor.

Who says? Well, there's Philip Giudice, undersecretary of energy for the Massachusetts Executive Office of Energy and Environmental Affairs. There's also Michael McCarthy, Evergreen Solar Inc.'s director of investor relations and government affairs, and Usha Haley, a Chinese manufacturing and subsidy expert.

Chinese factory workers generally receive $300 a month for the same work that would pay Americans $4,000 a month, accordingly to Haley, professor of international business at Massey University in Auckland, New Zealand. Evergreen's labor cost in China is about one-ninth of that in the U.S.

However, labor costs make up only 5 percent of solar-panel production cost, says Haley.

The true force behind the Chinese market takeover is its access to enormous capital. H aley points out that solar manufacturing, which requires many pieces of expensive machinery in mega-sized plants, is capital-intensive. Thus, profit margin tends to be small. Cost-efficiency matters.

"It's a penny-driven industry," says Matthew Feinstein, research associate at Lux Research in Boston.

Companies also need to have a large, established customer base for their products and build

their plants to the capacity to lower costs, says Feinstein. He believes Evergreen, which announced it was closing its 800-employee manufacturing plant in Devens by month's end, didn't have the "scale of economy" to succeed, Feinstein says.

Chinese subsidies allow companies to build and operate large. Meanwhile, their American competitors struggle to secure bank loans.

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Following repeated failed attempts to obtain federal assistance or bank loans, Evergreen turned to China and quickly received a $33 million loan from Hubei Science & Technology Investment Co. Ltd., an investment fund sponsored by the government of Hubei, China, for construction of a $55 million wafer plant there.

The loan's interest rate is 7.5 percent and requires no payments before 2015. The delayed payments allow the company to collect interest on the money to help repay the loan after 2015, according to McCarthy.

The company appreciates the $21 million cash grant the state provided for the Devens plant, Evergreen spokesman Chris Lawson says. But it was a small portion of the $450 million plant construction cost. The salaries and benefits for the employees in Devens cost the company $44 million a year. The $1 annual lease of the 23-acre land by MassDevelopment, the state's economic development agency that manages the former fort community, has helped. The state promised a $15.1 million tax incentive, but the company has not been able to take advantage of it at all because it has yet to post a profit.

The federal government has refused to provide Evergreen with assistance for one reason: The technology has already been developed and commercialized. In the U.S., federal policies are designed to help technological development -- but not the manufacturing of the products using the technologies, experts say.

Desperate to survive, Evergreen agreed to let Jiawei Solar, in Wuhan, China, assemble solar panels using the String Ribbon wafers made in Evergreen's plant on Jiawei's campus.

"I'm frustrated," Richard Feldt, former Evergreen CEO, told U.S. Rep. Niki Tsongas about the lack of federal support in August 2009 during her tour of the Devens plant. "It's killing me that we are going to China."

In November 2009, Evergreen announced it would start shifting Devens-based panel assembly to China in mid-2010. The plan to have Jiawei take over the assembly work never happened, however. The company was adamant about keeping the jobs here as long as it could, says Lawson. In fact, the number of employees in Devens has slightly increased since 2009.

In issuing subsidies, the Chinese government doesn't discriminate foreign companies from domestic ones, Haley says. It just prefers large chains.

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Corporate subsidies are only a part of China's overall strategy to build its industries, Giudice says. Just look at the number of nuclear plants built in recent years in China and the country's passenger railroad developments, he says.

"Countries like China are making investments into businesses that don't make sense in today's economy but position them very well for decades ahead," Giudice says.

The outcome can be staggering.

In 2005, 84.6 megawatts worth of photovoltaic panels were manufactured between China and Taiwan while American companies made 133.6 megawatts, according to Paula Mints, principal analyst for the photovoltaic services program at Chicago-based international firm, Navigant Consulting.

In 2006, shipments of Chinese and Taiwanese products grew by 217 percent to 2 46.3 megawatts, exceeding the 236.6-megawatt production, or a 74 percent increase, in the U.S.

At that point, Japan led the world with the production of 882.6 megawatts. In 2010, China produced 8,993.6 megawatts, followed by 2,750 megawatts in Europe, 1,556.5 megawatts in Japan and 885 megawatts in the U.S.

McCarthy says Evergreen was able to more than halve its manufacturing costs between 2008 and 2009, thanks to the efficient production and the declined prices of the materials. The "robust and low-cost supply chain" in China also helps, McCarthy says. Now, Evergreen produces modules for $1.90 per watt, but still can't beat Chinese competition.

So, what kind of financial return is China expecting to see on all of its investments?

Haley says that's an irrelevant question for China.

"The whole free-market idea is a Western idea," Haley says. "They do not see investment as an economic term: They see it as a political term."

This story is Part 2 in a series of three. See tomorrow's paper for the final installment.