



Yang Wang, worldwatch.com

## MARKET PROFILE

### Is solar China's energy hope?

The world is seeing a push to try to develop renewable energies. That, we all know. Whether it be awareness campaigns or prevention oriented, it seems that everything these days is geared towards global warming. Though China has recently become the world's number one contributor of greenhouse gases, it is also one of the countries trying the hardest to find alternative fuel sources, including solar and photovoltaic technology. In the past 10 years China has become the largest solar water heater manufacturer and amongst the largest producers of photovoltaic modules in the world.

Using sunlight for power is not a new idea. Many people believe that the research into harnessing solar energy started during the OPEC oil embargo in the 1970's but research in to some of the technology actually began in the late 1800's. Auguste Mouchout, a mathematics teacher in France in the 19<sup>th</sup> century, received the first patent for a solar powered motor in 1861. This technology was based on the use of reflectors to magnify the sun's rays to power a steam powered motor. Later, other scientists in Europe and the U.S. continued to make improvements to the solar motor and in 1900, Aubrey Eneas opened The Solar Motor Co. in Boston, MA. Unfortunately, his machines often succumbed to the frequent bad weather



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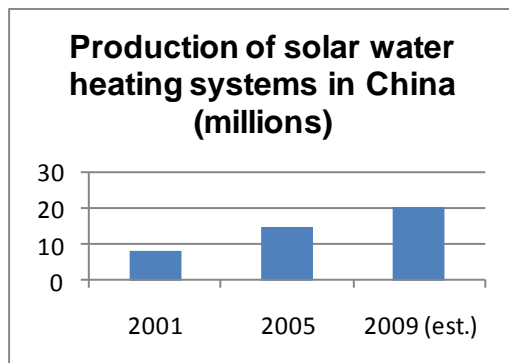
and he was forced out of business in 1904. However, with these and other contributions from scientists around the world, modern scientists have been able to vastly improve solar energy technology.

**China is currently the world leader in the production and use of solar water heaters.**

In Shandong Province, the city of Rizhao boasts the title of China's "Solar City," and rightfully so. According to government sources, 99% of the residential buildings in Rizhao use solar energy to provide their hot water. Rizhao also uses photovoltaic panels to power traffic signals, street lighting and park lamps. There are also over 60,000 solar powered greenhouses in use in the surrounding areas. Credit for this achievement goes to the local municipal government, which provided subsidies to local solar technology companies, thus making the units affordable for housing developers.

Another city that deserves mention for its adoption of solar technology is Kunming in Yunnan. Over half of the 4.7 million residents there use solar heated

water. In addition, solar water heaters are appearing on the roofs of *hutongs* in Beijing and on new housing developments in Shanghai. A proportion of the power for the Olympic sports facilities will also come from solar panels, as well as for the World Expo 2010 in Shanghai. Ongoing specialized research at facilities like Shandong Construction University and the Tibet Science and Technology Construction Institute and the Energy Research and Model Center will help to secure a bright solar future in China.



From W.L. Wallace, S.J.Liu & Z.Y Wang report

China is one of the world's leading producers and exporters of solar panels. LDK Solar, a Chinese company, went public on the NYSE in June with shares starting at \$27. Thanks to their 2<sup>nd</sup> quarter earnings being 700% higher than expected, share price increased to \$45 in less than 3 months. There are several Chinese solar panel manufacturers currently listed on the NYSE and even more waiting to go public. China is currently the largest solar market in the world and quickly

becoming the largest manufacturer of photovoltaic products.

### The Technology – In layman's terms

Both pure silicon and silicon with impurities, respectively called monocrystalline and multicrystalline silicon, are used in photovoltaic technology. While the pure silicon is stable, the silicon with impurities has a tendency to lose electrons when bombarded by photons, or particles of light. By using a conducting agent to direct these electrons, a current is created and the energy is either stored in a battery or sent through a converter to be switched from a DC current to AC. This energy is then used to power everyday appliances, possibly even the lamp used to read this article.

### Future outlook

In 2006, China consumed less than 10 megawatts of solar power (total electricity consumption in 2006 was 2.83 billion megawatts). By 2010, the aim is to generate and consume 300 megawatts of solar energy. This would be equivalent to Japan's consumption as the world's second largest consumer. According to the Worldwatch Institute in Washington, D.C, it is China that will drive dramatic reductions in PV prices in the next few years, helping to make solar competitive with conventional power even without subsidies. Provided new supplies of polysilicon can be found, it is just possible that China could provide solar hope for us all.

by Scott Layman, Amber



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