Dr. Jennie S. Hwang
H-Technologies group

Renewable energy—role of corporations

The solar market is in the trough. Does this mean that the solar industry is inherently cyclic, going through the "scary" peak and valley? The solar market could be seasonal but is not an unmanageable cyclic market, and not as cyclic as the past four decades' semiconductor industry. As discussed in my last column, this year's significant dip largely stems from two mega-events: the global economic downturn in a broad scale and the abrupt drop in Spain's solar panel installation. And what happened in Spain was a unique and an exceptional event, due largely to the expiration of feed-in tariff status and the fact that Spain has contributed the largest weight to the 2008 growth in the global solar capacity. European's solar boom between 2004 and 2008 amounted at an annual compounded rate of more than 54%. In dollars, 2008 reached a turnover of $37.1 billion, representing a stunning growth of 110% over the previous year. With that number as the baseline on top of the oversupply resulting from the overcapacity and sudden demand decline led to the precipitous 2009 market drop.

However, even in the economic doldrums, there are manifold forward-looking business activities and sporadic bright spots. Joint ventures and collaborative efforts are being formed in solar facilities and product developments intended to get companies prepared for economic recovery. These companies are poised to reap rewards. One bright spot, as an example, comes from German machinery manufacturers. These manufacturers, who provide machines to the solar cell manufacturers to produce solar power components, reported a 60% sales increase in the first quarter of 2009 compared with the same quarter of the prior year. This is the result of Asian companies' actions in upgrading their manufacturing facilities in an effort to cut production cost. The new machines are able to reduce the raw material requirements in making solar cells. These big orders helped the sector. Additionally, Germany, as the world's largest exporter, installed new feed-in tariffs with higher degression rate from January 2009 on.

Government incentives and support for the industry are welcome and in some cases are urgently needed to the nascent state of the industry. However, should the industry rely on governments, and can the industry thrive by relying on the government support?

Last week, several of us representing the Board of Greater Cleveland Partnership (an organization comprising the corporate CEOs, business and civic leaders of the area) met with the Treasury Secretary Timothy F. Geithner. In our roundtable conversations and at the Secretary's request for suggestions, I expressed my view that, at this critical junction of global economy and competitive landscape, how our government sets the forthcoming policies is critically important to the country. One check point is to ask an opportune question: "What has made the U.S.A. the superpower in the century?" Being deliberate and thoughtful, with a holistic approach, in answering this question before making new policies will acutely shape up the debate and lead to sound policies not only serving today's needs but also the future. The secretary smiled and extemporaneously reacted: "...the innovation...the investment in science and technology is the key to the country...."

Indeed, the economy is inseparable from the science and technology.

Innovation vs. PV industry

The photovoltaic solar cell was invented in 1954. It took five decades to reach today's industry after sinking and floating among the opposite forces. The next mega-milestone hinges on the innovation and the speed of innovations in developing new technologies. Five new clusters of technologies and know-how are crucial:

- In PV sector, technologies, engineering and manufacturing processes that enable the grid parity
- In PV, economical, flexible, printable cell with desirable efficiency
- Economically viable storage technologies
- Technologies synchronizing with power grid
- Technologies to establish smart grid

The advancement of these areas takes breakthrough technologies as well as incremental developments, including multi-cell efficiency, nano-particule formulation and new materials. The required efforts are relentless; however, potential rewards are huge. With support from both government and the private sector, the ingenuity embedded in the U.S. science and technology community should place the U.S. at the leading edge of this global industry.

Market share vs. immediate profits

In recent years, especially this year amid the down market and the depressed corporate profit margin, the business strategy in targeting between market share and bottom line profits is an important corporate strategic decision. Mimicking Japanese automakers' strategy in 1980s, some solar companies are set to emphasize on market share retention and growth at the expense of immediate profits. They have taken the strategy of building factories on the

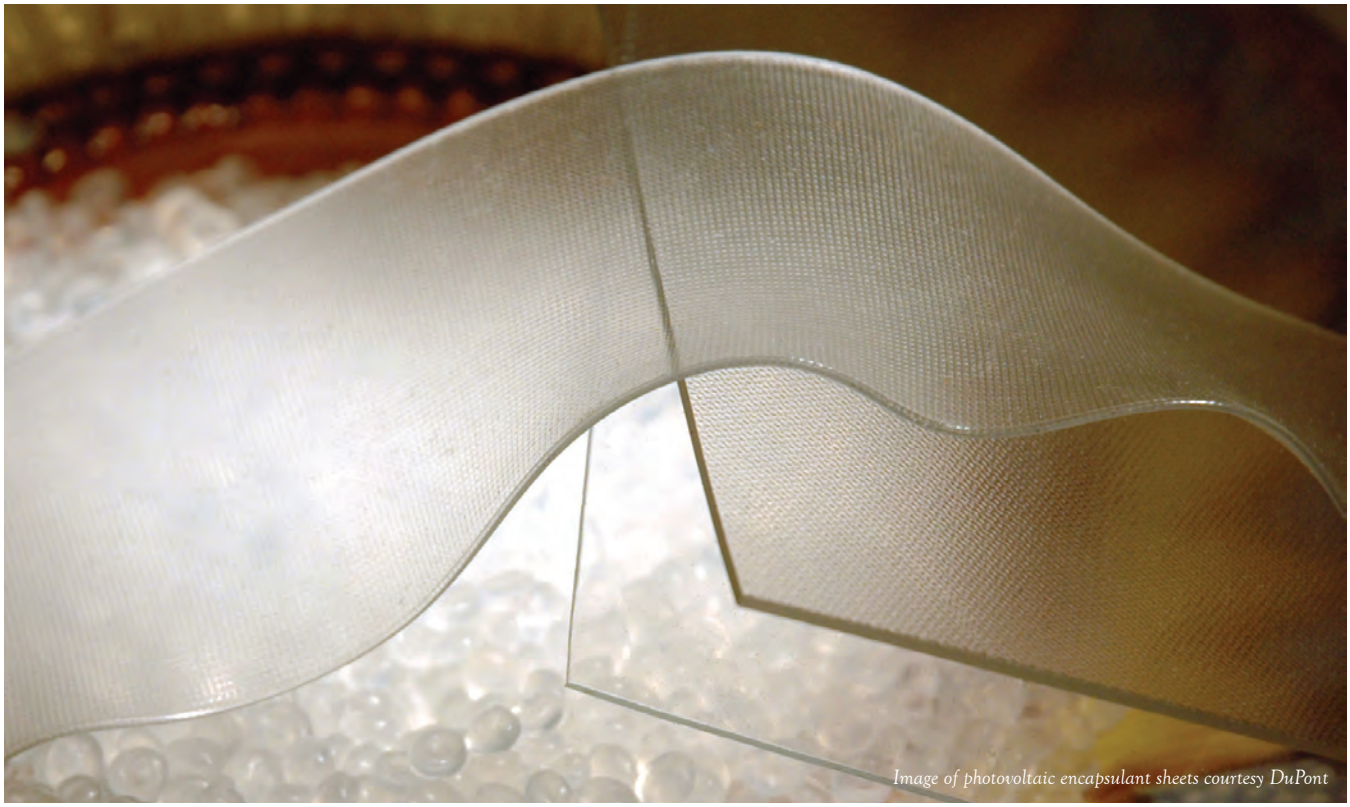

Image of photovoltaic encapsulant sheets courtesy DuPont

land where the solar cells will be sold to. With China's goal of being a dominant solar panel exporter and end-user, it is not a surprise that some companies are driven toward garnering market share over immediate profits. In this difficult time, the commitment to high quality customer service will go a long way.

Innovation vs. business model

If history is a guide, an industry cannot thrive by relying on the government support. The private sector, big or small companies, is crucial to the further progress of the solar industry. To serve the ever-changing marketplace, a viable business model cannot spare the commitments to on-going research and development. This reminds me the evolving electronics industry in 1980s and 1990s. During those two decades, those who were "thoughtful and strategic" and set sound business strategies and exercised wise execution have made handsome profits for their employees and shareholders. Understandably, corporations must attend the earnings of the current quarter, yet the outcome of a quarter two years down the road, which depends on what the corporations do or not do in the current quarter, comes sooner than it seems to be that down the road. Clean-tech and green investment are becoming business cliché, yet they do bear profound consequences.

Excerpt from the article entitled: "How Science Can Create Millions of New Jobs" (Business Week, September 7, 2009): "... Name an industry that can produce 1 million new, high-paying jobs over the next three years. You can't, because there isn't one. And that's the problem.... The pipeline is dry because the U.S. business model is broken. Our growth engine has run out of a key fuel—basic research...."

There are many examples where ingenuous research has unleashed high-impacting innovations that in turn laid the groundwork for vibrant new industries, not to mention the phenomenal profits delivered to the engaged corporations.

In this global economic downturn, companies are cash strapped, and some are in deep financial stress. Is it foolhardy to call for research and innovation? If there is any silver lining as the result of this economic debacle and thus corporate tightening, it is the opportunity, forced or planned, in streamlining existing business and investing in high-value growth business.

In this regard, the renewable energy industry poses immense potential to creating new jobs and profits to corporations and shareholders.

This industry needs the private sectors' wise investment and fervent engagement. With the great growth promise, companies that are positioned to innovate and can speedily deliver the needed products to the industry will be the sure winners. In the dynamics of solar PV industry, the viable business model continues evolving. Corporations that have carved the entrepreneurial business model with laser sharp focus on its products and customer service shall succeed with flying colors.

Dr. Jennie S. Hwang has extensive experience in global market and international business in her executive capacities with both corporate America and entrepreneurial businesses. She is inducted to the WIT International Hall of Fame, elected to the National Academy of Engineering, and named an R&D-Stars-to-Watch (Industry Week). Dr. Hwang is a member of the U.S. Commerce Department's Export Council, and serves on university, civic and Fortune 500 NYSE company boards. Among others, she has served on National Research Council's "Globalization Committee" and " Forecasting Emerging, Disruptive Technologies Committee". Her education includes Ph.D., M.S., M.A., B.S. degrees in engineering and sciences, respectively, and Harvard Business School Executive Program. An author of 300+ publications, she is also a worldwide speaker on trade, technology, business, education, and social issues. Tel: (216) 839-1000; E-mail: JennieHwang@aol.com. www.JennieHwang.com