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Solar energy—10 reasons why oil prices should not deter solar energy deployment

As alluded in my column “Solar Energy—Sweet Spot” in Global Solar Technology’s inaugural issue and my last column, “Solar Energy—Photovoltaics (PV),” oil prices should not dictate the future of renewable energy. Amid the turbulent events in the tumultuous 2008, oil prices have moved more eruptively than a tsunami-like tidal wave. In less than six months, its prices have swung from surging to nearly \$150/barrel (July 2008) to pummeling below \$40/barrel (December 2008). What an unprecedented event!

Psychologically, the declined oil prices may dampen the enthusiasm about the solar energy and other renewable energy sources. Yet, in reality, it shouldn’t. The following delineates, in brevity, the top ten reasons.

1. Solar is a clean energy, oil is not

Energy usage affects the environment and climate. Whether one believes in or is convinced or not that human activities have caused or contributed to global-warming-ensuing climate change, the carbon dioxide concentration in the atmosphere has risen about 40% since the beginning of the industrial revolution. The estimate is the change from 270 parts per million (ppm) to 380 ppm.

Coal, a main source of U.S. electricity, produces more than one third of U.S. carbon dioxide emissions. Combining oil, coal and gas fossil fuels, the U.S. emits more energy-related carbon dioxide per capita than any other industrial nations, and its CO₂ emissions are projected to continue rising, as are the worldwide emissions. This trajectory is a concern to the environment and climate that we and

our next generations will live in. Plausible steps to globally curtail the emissions are warranted.

2. Oil contributes a miniscule percentage of U.S. electricity generation

Electricity and transportation sectors consume the majority of the total energy. Within the electricity sector, the burning of fossil fuels generates 85% of the 13 terawatts of electrical energy used globally. Energy sources used in generating electricity in the United States (2006) roughly comprise 49% coal, 21% natural gas and other gases, 19% nuclear, 7% hydroelectric, less than 3% other renewable and less than 2% petroleum. Oil enjoys a miniscule share of electricity generation sources in the U.S.

3. Work for U.S. energy independence

The United States, with only about 5% of the world population, consumes roughly one-fifth of the world’s total energy. And two-thirds of U.S. oil consumption resorts to imports. Higher oil imports not only enhance OPEC’s monopoly power, they also have a deleterious long-term impact

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on the U.S. economical stability, as well as national security.

On top of the supply-demand, oil prices bear other influences, such as political, economical and value-of-dollar factors. The recent volatile oil prices in the U.S. further exacerbate energy concerns.

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4. Manage rising energy demands

Energy demands will continue to rise, particularly in the large, populous developing countries. At the present time, China is going through a growth cycle. The country, which consumed more than 15% of total oil consumption among the developed economies in 2007, is now slowing down. Today’s global economic weakness (protracted recession or likely depression) does not boost oil consumption. OPEC is already cutting production. With the reduced production, oil prices are still hitting the ground floor.

However, despite the recent financial woes and economic downturn, China and India will continue their industrialization march. Their commerce will grow and accelerate again. Thus, over a reasonable timeframe, their energy demands are expected to grow at a phenomenal pace and magnitude.

When demands rise again, and the supply-demand imbalance recurs, oil prices will react accordingly.

5. Global support for clean energy

It has long been a belief that the wide deployment of renewable energy relies on the government’s initiatives and financial

incentives. Indeed, government plays a crucial role to the adoption and application of solar energy as an environment-friendly, renewable energy source.

In the global landscape, the EU sets its goal to increase renewable energy penetration in the region of 27 member states to 19% by 2010 and to reduce its greenhouse gas emissions by 20% by 2020. Germany, a leader in solar cell energy use, is encouraged by its government's goal to increase 100 MW/yr and incentives to build plants producing solar energy products.

Japan, another leader in PV technology, sets application targets of an increase in PV electricity generation by 400MW/yr through 2010. The China government has pledged \$100B allotments on renewable energy to make renewable energy account for 15% of total energy supply by 2020. Taiwan's government has also designated solar energy (and LED) as a strategic industry, committing to increasing its production capacity, subsidizing manufacturers' R&D and offering incentives to consumers who use solar panel energy. Other countries also follow suit.

6. U.S. Federal energy plan engages in clean energy

President Obama's economic stimulus package focuses on 'green infrastructure.' The new administration's energy plan, as of the time of this writing, reportedly provides \$15 billion a year for green policies and technology. President Obama favors raising America's use of renewable electricity to 10% of the total electricity consumed by 2012, and to 25% by 2025. It is currently at the level of approximately 8.4%.

Going forward, the anticipated fees and taxes for carbon dioxide emissions (through cap-and-trade or other programs) may spur more efforts in developing and using clean energy.

Political environment merits alternative energies and renewable energy.

7. Solar incentives are in place

Effective January 1, 2009, the U.S.'s eight-year tax credit incentive for solar offers further support specifically for solar energy uses by home owners and businesses.

President Obama's New Energy for America plan may also energize the potential deployment of renewable energy.

By integrating with other renewable, alternative and conventional energy sources, the uncertainties surrounding energy supplies from politically volatile regions can be eschewed. Solar, as a 'clean' energy, further circumscribes the much concerned carbon footprint.

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8. Technology advances in a globally competitive landscape

Technologically, the global efforts on increasing the solar cell efficiency are ever more rigorous and vigorous. The scale effect, coupled with anticipated technological advancements, will continue to move solar-cell-generated electricity toward grid parity.

The cost as gauged by the power output by manufacturers in US\$/W or by energy use in the end market in US\$/KWH has been exceedingly higher than the conventional electric grid. This cost issue, including upfront system installation expenses (balance of system), has been the primary impediment to the wide adoption of photovoltaics for past 40 years.

Going forward, as manufacturing capacity continues to increase and production techniques to improve, the expanded scale and enhanced manufacturability will drive the cost down.

When the technology can offer the cost with the grid parity or closer to that, photovoltaic solar energy will become an essential part of mainstream electricity in everyone's life.

The winning technology is the one that can deliver the practical, desired economics. The world is longing for the winning technology and product leadership. In that, it is not an exaggeration to say that the product delivering grid-parity performance will sell by itself.

The global race for an economically viable technology is on.

9. Positive, global outlook

To achieve an energy-efficient economy, future energy portfolios need to be concocted by diverse sources and versatility in order to meet the goals of availability, supply stability, price stability, affordability, sustainability and security.

The potential market is vast, albeit bumps and humps exist. Technology advancement to increase photovoltaic solar energy conversion efficiency and thus to decrease usage cost will continue to be the thrust for the future deployment of solar energy for generating electricity, as well as potentially for supplementing transporta-

tion energy.

The strategy and action to meet future energy demand can only be accomplished by the combined actions of energy conservation, energy diversification (fossil fuel, alternative energy and renewable energy) and technological advancement.

Additionally and separately, U.S. utilities welcome the realization of 'smart grids' that can improve distribution and monitoring of electricity use in real time, by means of intelligent, digital technology, to garner higher efficiency and lower cost.

10. A good thing

Under such dynamic environment, the challenge is how to cut through the noises and keep the eye on the ball—the real signal.

The fulfillment of diverse, versatile and secure energy sources by maximizing the use of clean, renewable, environment-benign and climate-friendly solar energy will make all feel good and responsible—users and producers, government and commerce alike.

It is a good thing!

Is there any reason not to embrace solar energy?

Lastly, would the declining oil prices dampen the future of solar energy this time around? I certainly hope not, and it definitely should not.

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Hwang has extensive experience in global market and international business in her executive capacities with both Corporate America and entrepreneurial businesses.

She is a member of the U.S. Commerce Department's Export Council and serves on the board of Fortune 500 NYSE companies and civic and university

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