

# Renewable Energy: Weathering the Storm in 2009

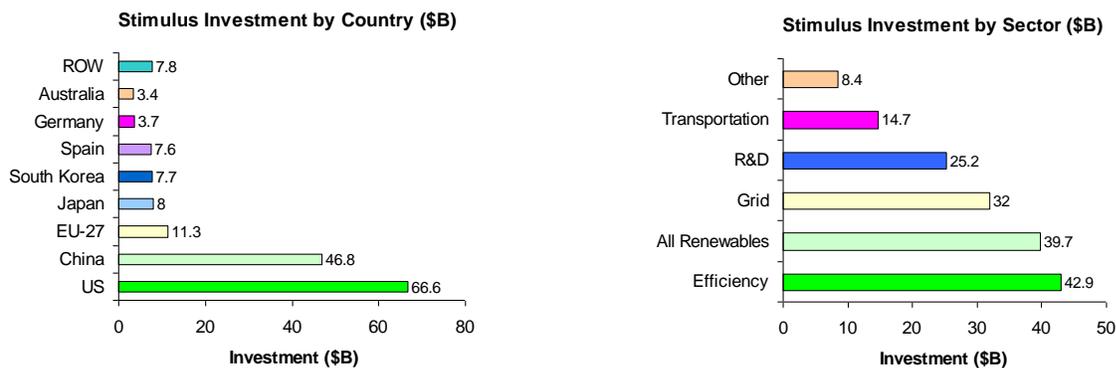
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I would like to be one of the first to offer my assessment of the year that was for the renewable energy industry. My macro analysis will go beyond financial performance and industry winners and losers. Although economics are an important measure of progress, there were other forces at work that could shape the future of renewable energy.

## Surviving the Downturn

All of the 2009 data are not in, and much of the analysis has not been performed. However, some hopeful trends are evident. The predictions for the renewable energy industry at the beginning of 2009 were dire based on an ongoing worldwide economic downturn, a scarcity of project financing, and an expected glut of solar cells and modules. As we come to the close of the year, the results are better than expected.

According to analyses performed by New Energy Finance Ltd., global new investment in clean energy will be about \$130 billion in 2009, the first decline in this decade after increasing from \$35 billion in 2004 to \$155 billion in 2008. A positive note is that government stimulus programs contributed \$163 billion toward clean energy projects to help fill the void and create new initiatives in 2010 and beyond. Figure 1 indicates the stimulus investment by country, and Figure 2 indicates the investment by energy sector. New Energy Finance Ltd. predicts that global new investment in clean energy will rebound in 2010 to \$200 billion, representing a 50% increase over 2009 investment, and an almost 30% increase over the record \$155 billion investment in 2008.



Source: New Energy Finance Ltd.

According to New Energy Finance, renewable energy costs dropped in 2009 with solar panels leading the way with greater than a 30% decrease in panel costs and a 25% decrease in installation costs. Wind turbines dropped more than 15% in cost, and geothermal energy rates eased as idle oil drilling equipment was diverted to geothermal projects. Unfortunately, these cost savings were offset by higher project financing expenses and more challenging and expensive installations for wind and geothermal projects. Despite these financing increases, the levelized cost of renewable energy (lifetime cost of generating a MWh of energy) will probably drop by 10% compared to 2008, and more than that for solar.

As the final data are tallied for 2009, renewable energy financials may not be as bad as originally predicted. As a result of a late surge of installations in Germany, installed solar PV capacity worldwide in 2009 is expected to match or exceed 2008 levels of 5.4GW. Predictions for 2010 indicate a return to significant growth. Forecasts range from about 6.6GW to 7GW (IC Insights and Displaybank) to 8GW or more (iSuppli and Banque Sarasin). Germany represented more than half of the capacity increase in 2009. Some of the German surge at the end of 2009 was 2010 business that was pulled in to take advantage of

readily available inventory, low panel prices, and a generous feed-in-tariff. With the German feed-in-tariff set to decrease by 10% in January 2010 (and possibly more if a mid-year correction is also instituted), Germany's installed capacity will probably stay flat in 2010. Given the plateau in German business and the continuing tight project financing situation, installed capacity should be closer to 7GW than 8GW. The 7GW capacity level would still represent a 25% to 30% growth over 2009.

The World Wind Power Association (WWPA) is sticking by its early projections that installed wind power capacity will reach 30 GW in 2009, compared to nearly 28GW in 2008, despite the economic downturn. Early projections from WWPA for 2010 indicate new wind power capacity could increase by as much as 15% compared to 2009.

The solar and wind power recovery in 2010 will be driven by factors that were initiated in 2009, including lower hardware costs, improvements in efficiency and ease of installation, expansion of marketing and distribution channels, and the effects of global stimulus programs.

## Getting the Power from Here to There

A recent DOE report stated that 12,000 miles of new transmission line will be required to achieve 20 percent wind electricity in the US by 2030. New transmission lines to carry wind and solar electricity from remote locations face daunting permitting, right-of-way, and consumer acceptance issues that can delay or sometimes stop a project. Two projects caught my attention as possible means of addressing this thorny issue.

The Montana Alberta Tie Line (MATL) that will carry at least 300MW of wind power between Great Falls, Montana and Lethbridge, Alberta, Canada, a distance of 215 miles. MATL will be the first merchant transmission line constructed in the US, meaning that a private company will build the line and sell shipping space to power generators. The first three users will be wind power companies. Traditionally, rate payers of utility companies pay the cost of adding new lines which are used to deliver power exclusively to those customers. This new business model opens up use of the transmission line by multiple suppliers for multiple users along the line's path. The Western Area Power Administration (WAPA), seeing the benefits of this approach, provided a \$160M low interest, 30 year loan under the Stimulus Package to assist the project. Under the loan agreement, WAPA becomes a one-twelfth owner of the 230kV transmission line. Many other partners want to pursue the same business model within WAPA's 12-state territory. These projects face many of the same right-of-way and legal challenges that confront the utilities, but the MATL experience indicates that a business solution could be found to satisfy most parties involved.

For the first time, the Tres Amigas superstation project, to be located in Clovis, New Mexico near the Texas, Colorado, and Oklahoma borders, will interconnect the Eastern Interconnect, Western Electricity Coordinating Council (WECC), and Electric Reliability Council of Texas (ERCOT) grids through a DC Hub. This hub can regulate the direction and level of power flow. The 22 square mile superstation would utilize superconducting cable, power control systems, and storage technology supplied by American Superconductor Corporation to permit up to 5GW of power to flow to each of the three main power grids. The power flow control and storage technology would be optimized for the inflow of intermittent power generation sources such as wind and solar that should proliferate in close proximity to the Clovis Hub. It will also allow the power to be transmitted anywhere in the country, opening up a larger potential market for each generation facility. The superstation project is projected to cost \$600M and to be operational in 2014. It will undoubtedly face technological, regulatory, permitting, and project financing hurdles, but it represents a major upgrade to power distribution in the US.

## Bulking Up for the Long Haul

The scarcity of project financing and the oversupply of renewable energy components and systems began a shakeout in the renewable industry that will continue into 2010. Smaller companies will be consumed by larger ones, and partnerships will be forged to gain access to financing and project implementation expertise. Examples in the solar industry are Siemens acquisition of Solel, First Solar's acquisition of Optisolar's projects and assets, and Brightsource's strategic partnership with Bechtel to finance and build Concentrated Solar Thermal (CST) facilities. Ausra, another well-funded CST startup, is in discussions with three global conglomerates to sell itself. In the wind power industry, Danish Oil and Natural Gas acquired A2SEA (the largest installer of offshore wind power capacity), Hong Kong-based China Power and Light acquired three wind power companies in China, and British private equity firm Terra Firm acquired New York-based EverPower.

Another trend emerged in the US this year, as more electric utilities expressed interest in owning their own renewable energy plants (primarily solar power, but also some wind power). Favorable investment tax credit incentives and accelerated depreciation provisions have encouraged utilities to own rather than purchase power facilities. Fledgling renewable energy companies were also having trouble raising the financing for and implementing the complex projects on time. To meet their state-mandated renewable portfolio requirements, some utilities have decided it is better to take over the projects and to purchase the necessary equipment (and, in some cases, services) from those companies who were originally going to build the sites.

Perhaps the most ambitious plan announced in 2009 was the creation of the Desertec Industrial Initiative (DII). The DII vision calls for a vast array of wind farms, PV parks and concentrating solar power projects to be built across North Africa capable of providing 5% of Europe's electricity requirements by 2030 and 15% by 2050, as well as much of the electricity for Northern Africa and parts of the Middle East. As currently envisioned, Concentrating Solar Thermal power plants will generate much of the power for European countries, while wind power and solar photovoltaics will generate the power for Middle Eastern and North African countries. Power would be transmitted on overhead lines in Africa, and via underwater high voltage DC cables to European sites. In July 2009, twelve major European companies signed a Memorandum of Understanding to analyze and develop the framework for this game-changing project. The companies include major power equipment companies such as ABB, Abengoa, E.ON, MAN Solar Millennium, RWE, Schott Solar and Siemens, as well as major financial and business institutions including Deutsch Bank, HSH Nordbank, Munich RE, M+W Zander, and Cevital. Although the project is in the very early evaluation stages and faces many challenges and regional disputes, this high-powered consortium has the clout to carry out the ambitious project. More details on the Desertec project can be found at <http://www.desertec.org>.

Most of the large European wind power companies have been driving key efforts in Europe and the US. Recently, the countries bordering the North Sea have announced an initiative to examine the possibility of building a supergrid that will connect offshore wind farms to the Continent. The project will include some of the largest energy companies in Europe, and will be financed by some of the largest European banks. In addition, European-based wind power companies were awarded \$1 billion of the \$1.5 billion in grants provided under the US stimulus legislation, the American Recovery and Reinvestment Act. The biggest grant recipients, who collectively received \$840 million, were Iberdrola, Acciona, NaturEner of Spain, and Horizon Wind of Portugal .

These significant business trends signal the maturing of an industry. Large businesses are consuming smaller ones, European renewable energy companies are obtaining worldwide business, US utilities are beginning to make capital investments in solar and wind, and movers and shakers are trying to make renewable energy one of the new growth engines.

## Superpowers Ready to Walk the Talk?

According to the Renewable Energy Policy Network for the 21<sup>st</sup> Century (REN-21) Report of May 2009, at least 73 countries and states have established policy targets for renewable energy. These policies take the form of feed-in tariffs (FIT), net metering provisions, investment subsidies, and renewable portfolio standards (RPS) requiring that a minimum amount of power be generated from renewable sources. The manner in which governments institute these incentives could be instrumental in fostering the new industry. Deutsche Asset Management stated it quite well in its report “Global Climate Change Policy Tracker”. The principles needed to ensure long-term clean energy investing are TLC-transparency, longevity, and certainty. Germany did a good job of implementing its long-term FIT plan that decreases the subsidy with increased renewable deployments over a 10 year period. Even this plan is under scrutiny now as Germany changes political leaders. But, it permitted a predictable investment and deployment environment that thrust Germany into the leadership role in renewable energy. Spain’s FIT policy underestimated the demand for subsidy funding and led to a heated demand for subsidies in 2008 that left little funding for new starts in 2009. It created artificial demand for materials in one year that contributed to oversupply in the following year. A less ambitious, longer-term subsidy program would have greatly benefited both the country and the industry. The US right now represents a constantly shifting patchwork quilt of state, regional and federal policies that do not lend themselves to stability. Until a national energy policy is established in the US, the economic climate for investment will be stifled. The Copenhagen U.N. Climate Change Conference demonstrated the difficulty in reaching global accords. The burden will fall on national governments to institute long-term, stable energy policies that let the marketplace determine winners and losers.

In summary, although growth may have slowed in renewable energy in 2009, many business and political factors were beginning to converge to spur the maturation of the industry. Skeptics may point out that many of the examples above represent goals and targets. They may ask, “When do we get beyond lip service to the point of serious implementation?” I would argue that 2009 was indeed the start of the process. The strong have started to be separated from the weak, serious business alliances are starting to be formed, long-term government incentives are being formulated, and the cost of manufacture and installation are coming down. Those are the ingredients necessary for the emergence of a robust new industry.

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