

By Kathy Mussio, Managing Partner, Atlas Insight, LLC

Planet Earth just reached a milestone; there are now 7 billion people on the planet and the population is not shrinking. Most of these people need and use energy in almost all aspects of their daily life. Since the Industrial Revolution, we have relied upon traditional sources of energy – fossil fuels such as oil, gas and coal – to meet these needs. These sources are finite however, and while they will not run out in our lifetime, they will run out. Renewable energy sources, on the other hand, are natural resources which can be replenished, and therefore will never run out. Sounds like a no-brainer. However, there is still a question as to whether renewable energy in the U.S. can advance in a meaningful way, at least in the short term.

Renewable energy is generally classified into seven categories. These include wind, solar, hydropower, biomass, hydrogen, geothermal and ocean energy. It is estimated that by 2030, the U.S. could spend as much as \$1.7 trillion annually on oil and coal in order to fuel the country. Despite the problems facing renewables, the U.S. government predicts renewable-generated electricity will more than double to 17% of total U.S. electricity generation by 2035. In 2010, the global renewable “pie” was \$240 Billion. It is estimated that by 2030, it could almost double to \$460 Billion. The current acceleration of renewable energy in some places around the globe is reminiscent of the emergence of nuclear power in the 1970s and 1980s.

However, for renewable energy to succeed in the United States, there are



Experience

Kathy has over 20 years of combined experience as a management, incentive and site selection consultant. She is widely considered an industry expert in the site selection and incentive negotiation business. Her consulting career has focused on securing statutory and discretionary incentives for various projects as well as helping site selection clients to select optimal locations for expansion projects. Kathy has conducted successful negotiations for some of the world's largest corporations. She also has assisted small to mid-sized companies. Some of her various sized and sector clients served include: AIG, Edwards Lifesciences, GlobalWatt, Pfizer, The Sun Products Corporation, UTI and Whole Foods Market. Before co-founding Atlas Insight, Kathy was a Regional Practice Leader in the Business Location Incentive and Site Selection group at BDO Seidman.

Kathy is a reliable opinion source for trade publications and AP stories. Kathy has been a frequent guest of state governments to assist with development of strategic plans to attract business investment.

Kathy has an expertise in working on highly complex real estate development projects, including working with New Markets Tax Credits, Brownfield Tax Credits and various other land use entitlements. Kathy also oversees the Renewable Energy Practice for Atlas Insight.

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several pieces of the puzzle that need to fit together. It looked as though several of these pieces - high electricity prices, capital looking for projects, and favorable government support – came together in the early to mid 2000s, setting the stage for major growth in the industry. However, in the past few years these trends have reversed, which has slowed the renewable ship, at least here in the U.S. To understand what is needed for renewable to succeed in the future, we must first take a look at the recent past.

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The price of electricity is closely tied to the price of natural gas. Natural gas prices had reached historical highs in the mid 2000s, driving up electricity prices. The cost gap narrowed, setting the stage for renewable prices to become more cost competitive with traditional sources of energy. Capital looked to be deployed in various renewable projects. Companies, big and small, lined up to enter the renewable space. No one could argue that "Green" was not good and the U.S. government and many U.S. states set out to put RPS policies in place and pass legislation to spur growth in the sector.

However, natural gas prices fell in the latter half of the decade and are forecast to remain relatively low for the foreseeable future. This caused the cost of electricity – rather than continuously rise as originally projected – to remain relatively stable. Low and stable gas prices hurt renewable growth. The recession weakened the economy and the capital markets dried up. Many players, especially the smaller ones, could no longer find the funding to continue with their projects. The government is now in crisis mode over the economy, which has taken attention and dollars away from renewables. Politically, at least in the U.S., the winds have shifted. The current focus is on reducing the debt by being more fiscally conservative.

With existing programs on the chopping block, there are questions about how renewable in the U.S. will continue to grow. Through the American Recovery and Reinvestment Act, renewable energy projects have received in excess of \$65 billion in tax credits, grants and loans. However, several of these federal subsidies, which have been heavily relied upon to make renewable investments economically viable, are in danger of ending. For example, as of mid-December, the U.S. Treasury Department's 1603 cash grant program, which repays developers for 30% of projects costs, is set to expire on December 31, 2011.

Policy

Many U.S. states have a Renewable Portfolio Standard (RPS) or a goal, which mandates or encourages that a certain percentage of the energy portfolio come from renewable sources. Some states have been quite aggressive with the mandated standards they have set. California, for example, has mandated that 33% of its energy comes from renewable by 2020. While this is a noble goal, some question whether it is achievable. In a recent meeting with one of California's largest utility providers, we discussed a number of challenges in meeting this mandated 33%. The challenge of bringing reasonably priced electricity to homes and businesses is certainly an issue; prices are likely to move higher as the renewable percentage in the energy mix rises. There are other challenges to actually reaching the 33%, including getting approvals to build new transmission lines to distribute the energy.

DSIRE publishes a "Top 10" list, which summarizes significant state policy changes – both positive and negative – that are notable for the year. In their most recent "Top 10 in '10" list, California, New Jersey, Massachusetts, Colorado, West Virginia and Hawaii all receive high marks for positive changes to policies conducive to renewable energy. Other states - Florida, Ohio and Oregon - were mentioned as letting programs expire or suspending funding to programs which undermined renewable growth.

A lack of a Federal RPS in the U.S. also remains problematic. If the U.S. were to adopt a national RPS – sometimes referred to as a national Clean Energy Standard (CES) – many believe that taking that step would help to spur significant investment in renewables. A CES would mandate that electric utilities generate a certain percentage of power from clean energy sources (renewables).

Another problem with U.S. policy lies with the oft heard word "uncertainty;" this is especially true with respect to renewable incentives. For example, three times in the past eleven years, wind subsidies have expired and essentially brought new projects under consideration to a standstill. When these subsidies were renewed, it was only for one to two year extensions, causing uncertainty in the market.

Feed-In Tariffs

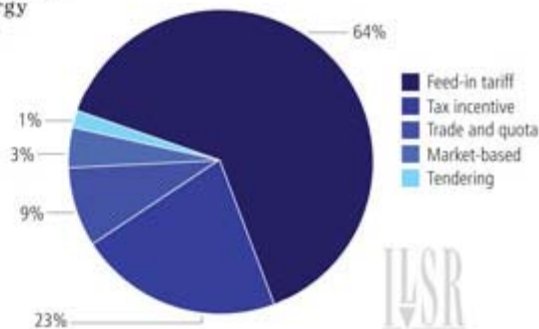
Feed-In Tariffs have been hugely instrumental in Europe in growing its renewable industry. Most developed countries – excluding the United



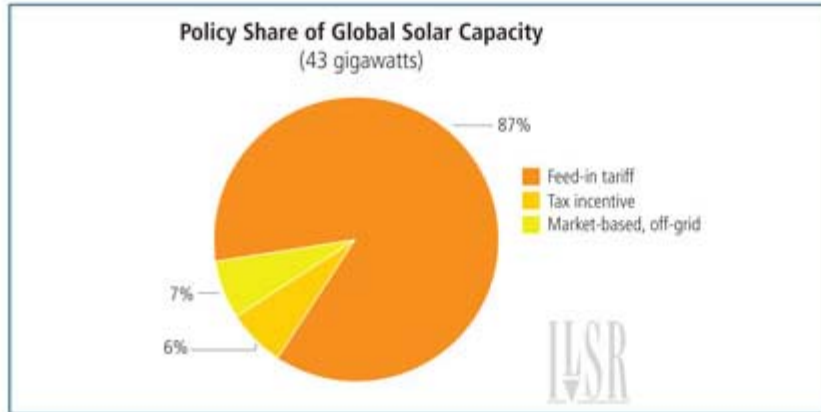
States – use feed-in tariffs to help boost investment in renewable energy development, accounting for 75-87% of the world's solar power capacity and 45-65% of the world's wind power. (Note that according to NREL, the National Renewable Energy Laboratory, this worldwide percentage is only 75% of all solar PV and 45% of all wind development as opposed to some higher percentages that have been illustrated in the pie charts).

Feed-In Tariffs allow for a fixed, wholesale price that has been predefined for an extended time period (typically 20 years) for all energy delivered by

Policy Share of Global Wind Capacity
(194 gigawatts)



Renewable Energy



the generator to the utility's distribution grid. The U.S. now refers to these feed-in tariffs as "CLEAN" contracts – which stands for Clean, Local, Energy, Accessible, Now.

The U.S. does not allow for a federal feed-in tariff and this poses a unique problem. Some have argued that feed-in tariffs in the U.S. are illegal because they don't comply with current federal law that states can't set specific tariffs above "avoided cost" under the Public Utility Regulatory Policies Act (PURPA) of 1978. NREL analyzed this in an extensive report and came to the conclusion that U.S. states could implement feed-in tariffs and still comply with federal law. The Report stated that "Feed-in tariffs are the most widely-used renewable energy policy in the world" and "well-designed feed-in tariffs can help reduce risk, which can also help reduce the overall cost of RE development." It further indicated that the stability of feed-in tariffs makes it more likely that "traditionally risk-averse investors" will provide debt financing, making more capital available for renewable energy development.

NREL defines a successful feed-in tariff program as a group of policies that "encourage, rapid, sustained, and wide-spread renewable energy development." According to NREL, feed-in tariffs in Europe during the 2000 to 2009 period, have resulted in the deployment of 15,000 MW of solar (compared with only 1,250 MW in the U.S.) and 55,000 MW of wind (compared with only 25,000 MW in the U.S.).

Wind and Solar

Two of the most popular and often referenced renewable sources are wind and solar, but growth is now slowing down. Wind power has been one of the fastest-growing energy sources in the

world for the past five years. In 2009 alone, the U.S. added 39% additional wind capacity to its energy mix. In 2010, wind added an additional 25% of new generation in the U.S. Currently, 2% of U.S. electricity comes from wind generation.

But, U.S. wind installations are being dwarfed by Chinese investment in wind. In 2010, China installed four times the wind power that was installed by the U.S. The U.S. now has approximately 40,000 MW of wind installed to China's 45,000 MW of wind installed. Wind energy can be a cost-competitive source of power; today's costs are approximately one sixth as much as it was in the 1980s.

With an essentially endless supply of sunshine available at no cost, solar would seem to be a worthwhile investment. The cost of the technology is coming down, and while not yet at parity, it is between 35-40% less than it was a ten years ago.

In some higher-cost electricity states, wind and solar are almost competitive with "peak-load" traditional sources of electricity. There is still a question as to whether it can be cost competitive with "base load" electricity, as well as problems

with storage and the intermittence nature of the sources. Unfortunately, obstacles in advancing renewable energy in the U.S. continue to mount. Both wind and solar depend heavily on U.S. subsidies and its Section 1603 Treasury Grant. With the Program's expiration looming, there has been major uncertainty which has contributed to slowing down new projects which were moving forward. Congress was already questioning the value of investing in renewable energy; but with the bankruptcy of Solyndra in 2011, who had received \$535 million in federal loans, renewable energy projects are now under even greater scrutiny.

Transmission Problem

One of the greatest challenges is building transmission lines to bring energy to population centers. The regulatory hurdles in the U.S. are enormous; it is nearly impossible for new transmission lines to be developed to take the renewable-produced energy to population centers. In the U.S., for example, while it may take as little as one year to build a wind farm, it could take five to ten years to build the transmission lines needed to bring the power to the population, due to securing access to land and concerns about environmental issues. It's a Catch-22. Developers are reluctant to build wind or solar farms where transmission lines do not yet exist, while the utility companies are reluctant to install transmission lines in locations that do not yet have power generation.

Green Jobs

Many would argue that green jobs would be a way to make the U.S. more competitive and help to foster a clean energy economy. Historically the U.S. has been considered an innovator in



the global economy and investment in R&D in the U.S. has been significant. Other countries are now emulating the innovative U.S. spirit and we are losing some ground. Many of the countries in Europe, as well as other countries throughout the world, have had notable job creation in renewable energy.

In the *Brookings Institute's* recent report, "Sizing the Clean Economy: A National and Regional Green Jobs Assessment," the clean economy was credited with already employing 2.7 million workers. The Report also found that these jobs were spread across a diverse group of industries. If these findings are accurate, the number of renewable jobs are greater than the number of jobs in the fossil fuels sector. Between 2003 and 2010, the clean energy sector grew at an average of 8.3% annually, nearly double the growth rate of the overall economy during that same period. The Report also found that the median wages of these green jobs was 13% higher than average job.

China's Rise to #1

China is aggressively pursuing renewable and backing it up with billions in lucrative subsidies. The U.S., conversely, is unsure of its renewable policies and is pulling back on its subsidies. In 2010, China brought in \$48.9 billion in new renewable energy investments, while the United States lagged behind at \$25.1 billion. The U.S. is finding it increasingly difficult to compete with China's feed-in tariffs, RPS's, preferential tax rates, and other supportive policies.

The Chinese government feels that green energy will continue to replace fossil fuels as a source for the world's energy and they are taking aggressive steps to be the world's leader. China is resolved about this push and has stated as much with its recent "Five Year Plan." It is serious about targeted technology innovation in the renewable space. China is already the globe's leader in renewable energy manufacturing. According to the Solar Energy Industries Association (SEIA), in California, where utility customers pay for subsidies to support residential and commercial solar power development, Chinese solar-panel makers now dominate the market. Chinese manufacturers supplied 40% of the state's residential and commercial solar market in the third quarter of 2011, up from 29% at the beginning of the year. There is an oversupply of Chinese modules, which have flooded the market and driven down module costs. These costs are expected to continue to come down as the industry matures and new technologies help to further drive down costs. There is a push for the U.S. Government to impose duties on Chinese solar imports so that U.S. solar manufacturers could be more cost-competitive.

The Chinese government is taking aggressive steps to become the clear global leader by addressing China's competitive disadvantages in its technology innovation, particularly in comparison to the U.S. With Chinese projects having the ability to access cheap capital in China, in combination with the Country's supportive policies, it is now poised to be the global leader in this space.

Conclusion


The U.S. has been making investments in energy for the past 100 years, with subsidies to the oil and gas industry and nuclear power that still exist today. U.S. subsidies are still focused on fossil fuels rather than renewable energy. Subsidies will be required to make renewable economically competitive with these mature traditional players, at least for the near and medium term.

One of the main hurdles will continue to be the higher cost of renewable generation. It may take years to reach parity with traditional sources and it may never (in our lifetime) be able to compete with lower cost traditional sources. Ask nine out of ten people, they would likely agree that reducing dependence on fossil fuels is a worthwhile goal and one that the U.S. should do all in its power to pursue. But, ask those same nine people whether they would be willing to have their electricity costs rise to achieve that goal, and the answer is likely "no."


If the U.S. increased its support in renewables, there would be broader advantages than the short-term creation of jobs. The U.S. would become less dependent on commodities, like oil, whose price is set by a global market – a market which is vulnerable to damaging weather events, political unrest, and price spikes caused by rampant speculation. But, without solid commitment from the U.S. government – including forward-thinking policies, improvements to infrastructure, and maintained renewable incentives – U.S. renewables are going to have a steep uphill climb. 📌

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