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U.S. RENEWABLE ENERGY QUARTERLY REPORT

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The U.S. Renewable Energy Quarterly Report is compiled by the American Council On Renewable Energy (ACORE) to provide industry participants, policymakers, and academia with critical policy, finance, and market information.

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U.S. MARKET REVIEW

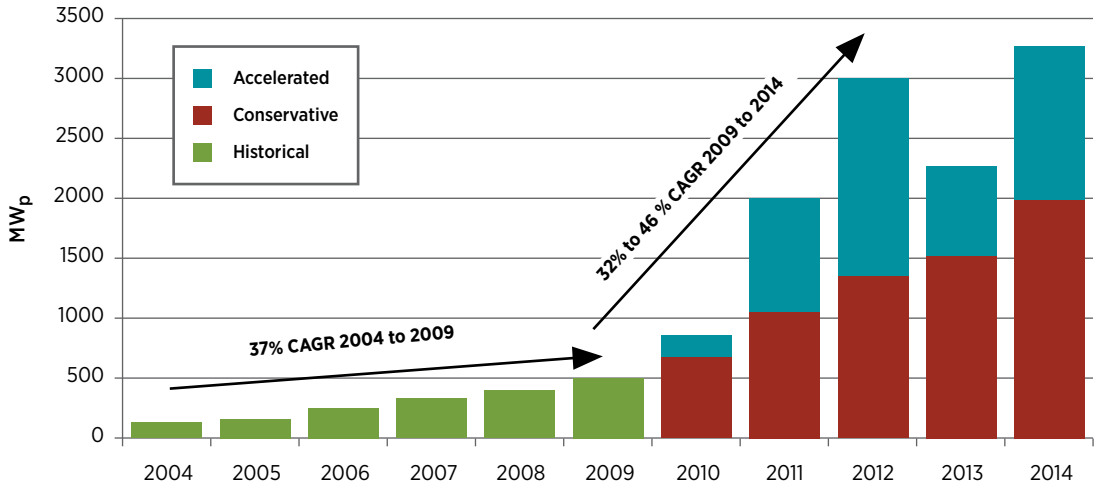
U.S. RENEWABLE ENERGY MARKETS

U.S. renewable energy markets have experienced tremendous growth over the past five years. Photovoltaics and wind markets have experienced the largest growth. The content of this paper therefore focuses primarily on these two technologies followed by comments on other renewable energy options. This quarterly report briefly reviews the overall U.S. markets for renewable energy. Subsequent articles will discuss in more detail pertinent market issues impacting each of the key renewable energy markets.

PHOTOVOLTAIC (PV) MARKETS

The U.S. PV market had a 37% Compounded Annual Growth Rate (CAGR) from 2004-2009, and going forward Navigant Consulting forecasts 32% - 46% CAGR through 2014 (Figure 1). In the accelerated scenario, changes in the German feed-in-tariff program and potential reductions in some other EU incentives may result in an overselling in 2012, and thus a slowing of the market in 2013 because of excess inventory. In 2009, the U.S. PV market was 488 MWp or 6% of the global market demand of 7.9 GWp.

Figure 1: U.S. PV MARKET DEMAND 2004-2014 (MW/YEAR)



Source: NCIPV Service Program. August, 2010. NCIPV Services provides market data using demand, not installations. Demand represents the materials ordered by the delivery channels and may slightly exceed installations in any given year.

In the U.S., utility companies are getting more involved in distributed PV assets either through **power purchase agreements (PPA)** or direct ownership of assets. Utility company interest in distributed solar is driven by:

- Utility companies now being able to qualify for the 30% investment tax credit (ITC) available for PV through 2016;
- 31 states plus the District of Columbia have **renewable portfolio standards (RPS)** and six states have goals. Of these, about 17 states have solar set asides or set asides that include solar. Utility companies need to comply with these solar **carve outs**, and although many are complying through PPAs, some are beginning to consider ownership to ensure compliance;
- Utility company concerns about third party providers coming into their service territories and taking away customer relationships, solar kWh sales, and maybe even more than solar kWh sales if PV is bundled with other service offerings. Owning PV can provide a hedge against this threat;
- Some Public Utility Commissions are allowing utility companies to **rate base** PV costs and spread the cost among all customers; and
- Customer sited PV can be quickly deployed and avoid transmission interconnection issues. The transmission queue for interconnection in some locations in the U.S. can be as long as three years and/or there can be a lack of transmission availability, hindering some central solar applications.

Grid connected systems represented 92% of the U.S. market in 2009. Commercial building demand represented 53% of the U.S. market followed by grid-tied residential at 31% and 8% utility owned. Moving forward, Navigant Consulting expects utility companies to increasingly explore business model options other than PPAs to help support PV deployment.

In 2009, PV module costs in the U.S. reduced almost 40% and system prices about 5%. With continued PV cost reductions, Navigant Consulting believes that several states with high retail electricity costs and favorable incentives could approach grid parity soon after 2015. One of the key macro trends that will pose some challenge for increased PV adoption is reduced natural gas prices (and thus cheaper electricity rates) resulting from greater availability of shale gas and lower overall electricity load demands across the U.S. Natural gas, however, also serves as **firming capacity** for the variable and intermittent loads from PV systems, so there is a positive role for natural gas technology to play in PV market adoptions, along with smart grid technology that will facilitate larger amounts of PV interconnected to the grid.

WIND ENERGY MARKETS

Over the past five years, wind energy markets in the U.S. experienced a 42% CAGR. This significant growth resulted in cumulative wind capacity of 35.6 GW in the U.S. at the end of 2009. Key states for wind development are shown in Figure 2. Annual installations in 2009 reached the largest ever at 10 GW. Moving forward, however, Navigant Consulting expects that wind market demand will reduce unless there is a national renewable energy standard (RES) or more consistent federal policy supporting wind energy development. As shown in Figure 3, Navigant Consulting estimates the wind market demand will drop

Figure 2: TOP TEN U.S. STATES FOR WIND DEVELOPMENT

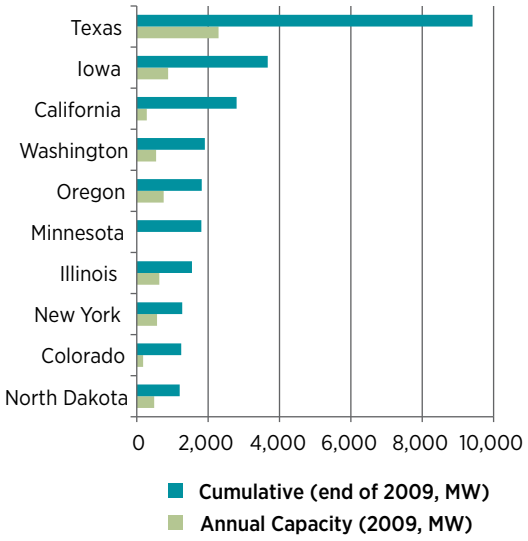
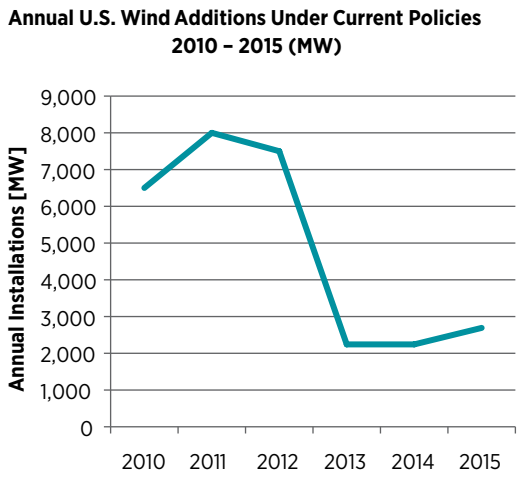


Figure 3: FORECAST OF U.S. WIND INSTALLATIONS



Source: Navigant Consulting estimates based on data from AWEA and industry stakeholders

Assumptions

- No federal RPS.
- No changes in state RPSs.
- Existing PTC expires as scheduled at the end of 2012.

Key Takeaways

- 2010 market is depressed due to a lack of PPAs and low gas and energy prices.
- 2011 to 2012 drop: construction must begin by the end of 2010 to qualify for U.S. Treasury cash grants.
  - Wind project construction is ~6 months, so most done by 2011.
- 2012 to 2013 drop: failure to extend PTC will have a significant impact.
- Transmission infrastructure build-out is needed to maintain industry growth.
- Passage of a federal carbon policy or RPS would alter these projections.

in 2010 to about 6,500 MW due to a lack of PPAs and low electricity prices. In addition, the existing production tax credit (PTC), which is critical to wind project economics, is due to expire at the end of 2012. Without any extension of the PTC, Navigant Consulting believes the market will drop to around 2,200 MW per year. Support at the state level, such as Competitive Renewable Energy Zones (CREZ) for transmission in Texas, will also be critical in encouraging wind development.

HYDROPOWER MARKETS

Over the past few years, hydropower (including inland and ocean), has received increased attention in the U.S. Inland hydropower systems, particularly hydrokinetic technologies, are starting to gain traction with several permit applications pending in the Federal Energy Regulatory Commission's (FERC) queue. The first federally licensed in-stream hydrokinetic project was commissioned in Minnesota in 2009. The FERC queue also has several pumped storage project applications because these types of systems are seen as energy storage solutions for intermittent renewables. The U.S. Department of Energy (DOE) and states like Oregon and Florida are increasing their development activity in various ocean power technologies such as wave, tidal, ocean thermal, and ocean current.

GEOTHERMAL ENERGY MARKETS

The U.S. is the world leader in installed geothermal power capacity with 530 MW installed between 2005 and 2010.[1] There are an additional 188 projects being deployed across the U.S. representing almost 7 GW of added base load power. Significant developments on the technology front offer even greater promise including the introduction of low temperature (~110° C) cycles capable of operating with hot water and increased research activity in enhanced geothermal systems. DOE increased funding for its geothermal power program and several of the projects being considered have received funding either through the American Recovery and Reinvestment Act (ARRA) or through the DOE Loan Guarantee Program.

BIOMASS MARKETS

There are over 10 GW of deployed U.S. biomass power from sources such as landfills, municipal solid waste, woody biomass and other biomass sources

1 http://www.geo-energy.org/

(agriculture waste, dairy waste, and sewage waste). Woody biomass is also gaining market interest as a potential source for direct combustion or co-firing in existing coal plants, especially in the southeastern and northwestern U.S. due to the availability of forest lands. The U.S. Environmental Protection Agency (EPA) has active programs encouraging deployment of landfill gas (LFG) and anaerobic digester gas (ADG) systems. The U.S. Department of Agriculture (USDA) also has Loan Guarantee Programs and other funding mechanisms to enhance the deployment of biomass power in the U.S. More recently, the EPA proposed a boiler Maximum Achievable Control Technology (MACT) standard that could adversely impact biomass boilers because of the proposed lower emissions limits in these standards. Navigant Consulting, however, expects that the interest in biomass power applications will continue to increase because of the base load power the technology provides with high capacity factors. This technology does not have some of the intermittency issues of some other renewable energy technologies.

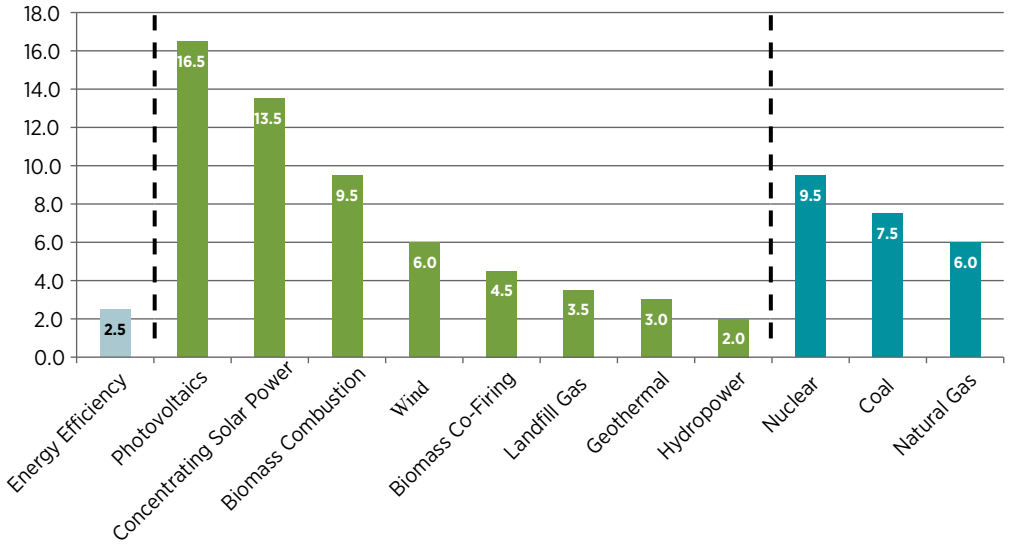
BIOFUELS MARKETS

Biofuel activities in the U.S. traditionally focused on first generation systems: corn-based ethanol and biodiesel from vegetable oils. More recently, DOE has increased its funding and is focusing on second generation cellulosic biofuels with several refineries being funded across the U.S. to demonstrate process scale up. DOE has also increased its funding for third generation algal biofuels technologies and companies such as Exxon and BP have invested in algal biofuel start ups in the U.S. It is anticipated that there will be continued support for advanced biofuels in the U.S. from both an energy security perspective and to meet aggressive renewable fuels standards (RFS).

CONCLUSION

In conclusion, the market for renewable energy technologies across the U.S. is significant as the U.S. has abundant renewable energy resources, but policy incentives will be needed in the near term to continue to support deployment. The consistent federal policy

Figure 4: LEVELIZED COST OF ELECTRICITY FOR VARIOUS POWER AND ENERGY EFFICIENCY OPTIONS



Notes: Assumes Federal & state incentives. CSP assumes trough technology. Natural gas price of $4.57/MMBTU
Sources: Navigant Consulting, Inc. 2010

support provided to PV will result in continued strong growth over the next five years with utility companies, third party providers, and others. Wind technology, however, will need the government to implement longer term policy support to encourage project financing, transmission interconnection, and cost competitiveness. As shown in Figure 4, many renewable energy technologies are close to being cost competitive with conventional power options. But with natural gas prices now closer to $4.50/MMBtu resulting in a **levelized cost of electricity (LCOE)** of around $.06/kWh, it will be harder for some renewable energy technologies to compete without incentives.

Many states are recognizing the value of renewable energy technologies and are taking a leadership role in supporting renewable energy implementation, regardless of the policy support at the federal level. States recognize the opportunity renewable energy technologies provide for:

- energy security,
- emissions reductions,
- price hedging against fossil fuel volatility, and
- economic development.

U.S. markets will continue to gain in global market share as both the federal and state level support continues to align and create valuable business and societal opportunities.

Although the United States Congress appears unlikely to enact comprehensive energy and climate legislation this year, the Obama Administration remains committed to fostering U.S. investment and leadership in renewable energy technologies and deployment as well as reducing emissions of greenhouse gases (GHGs) as proposed at the 2009 United Nations Climate Change Conference in Copenhagen.

U.S. RENEWABLE ENERGY POLICY

U.S. federal and state governments already have a number of policy tools likely to support increasing use of renewable energy in the next decade. Some of these tools—particularly state mandates and accompanying renewable energy credit (REC) markets—are likely to continue through 2020 and be important drivers. Prospects for continuation of existing federal financial incentives or enhanced federal financing are less clear. However, in the next 24-36 months, job creation is likely to be a much higher priority for the U.S. than decarbonization of its energy sector. Therefore, anyone evaluating near-term opportunities for investment in U.S. renewable energy technology, manufacturing, infrastructure or project development—and thinking about how to realize policy benefits such as government financial incentives—should focus on local job creation as a key to successful deployment of investment capital.

This article provides a brief overview of the principal policy tools currently fostering renewable energy deployment in the U.S. and concludes by highlighting some key evolving policies. These include a combination of: (a) state mandates; (b) federal tax incentives, grants, and loan guarantees; (c) state funding and policies focused primarily on distributed generation; and (d) transmission reform and governmental permitting. Future articles will address certain policies in greater depth.

STATE MANDATES AND RENEWABLE ENERGY CREDITS (RECS)

STATE RPS

Explosive growth in the U.S. renewable energy market has been driven primarily by renewable portfolio standards (RPS) in various states. An RPS is a state government mandate requiring that load-serving providers supply or acquire a minimum percentage of their power from qualifying renewable energy resources by a designated date. As of June 2010, mandatory RPS policies have been passed in 31 U.S. states and the District of Columbia, with six additional states approving non-mandatory renewables goals. These 31 states account for over 70% of the U.S. population and constitute significantly more than half of all electricity sales in the U.S.

RPS in California and Texas drive the two largest markets. For example, California, which is the eighth-largest economy in the world, originally adopted a standard of 20% by 2017 and then accelerated that target to be met by 2010. The state is currently implementing a new requirement for 33% renewables by 2020, the level determined by the governor last year as necessary to reach California's goal of reducing GHGs by 25%. The new RPS target, however, has proven controversial, with public concern over the economic cost of GHG reduction.

Texas, which is the thirteenth-largest economy in the world, enacted a requirement in 2005 that electric providers collectively generate 5.88 GW of new renewable power by 2015 and 10 GW by 2025. The first 10-year target is already being achieved in half the time due to the explosion of new wind development in 2008–2009; 10% of the 2015 target must also be met by non-wind resources.

RECS

A renewable energy credit (REC) is a tradable instrument that incorporates the positive environmental attributes realized from generating a MWh of power from a qualifying renewable energy resource. Each state with an RPS has implemented a REC system to aid in verifying compliance and to allow generators to purchase RECs rather than buy or own renewable generation capacity. Entities exist to "track" RECs from various states, but there is no significant market for trading RECs among different states. Although lack of transparency, limited market size, regulatory complexity, and pricing volatility combine to hamper the effectiveness of RECs, they remain important drivers of renewable energy development.

New Jersey, which has one of the most aggressive RPS in the country (22.5% by 2021), has become a leading venue for solar deployment through its online trading platform for solar RECs (SRECs). Generators can pay a fee instead of surrendering RECs at the end of each year, which tends to set the REC market price. Recent SREC prices have ranged from $170-$700/MWhr but averaged around $550/MWhr, providing a substantial incentive for new solar facilities. In New Jersey, most of the revenue from a new solar installation's first 15 years of operation (the period in which RECs are generated) will come from RECs rather than from electricity revenue, and REC proceeds will be set by future market prices. Thus, in order to obtain financing for a project, developers typically need to "hedge" or sell RECs forward to securitize their projected revenue stream.

FEDERAL TAX BENEFITS

PRODUCTION TAX CREDIT; INVESTMENT TAX CREDIT; AND ACCELERATED DEPRECIATION

Federal law provides an inflation-adjusted federal production tax credit (PTC, now $21/MWh) for ten years to wind projects that come online prior to the end of 2012. The PTC is based on actual production of power each year. The tax code provides an investment tax credit (ITC, available in the first year of operation) for solar and small wind projects worth 30% of the project's qualifying cost. The ITC for solar is available to projects that begin operations prior to the end of 2016. Developers may also take advantage of an accelerated depreciation schedule by depreciating the full cost of certain renewable energy projects over five years.

These benefits were critical to the commercial viability of new renewable energy projects financed through 2008, but they were dependent on the availability of tax equity investors who could effectively take advantage of the credits that many developers could not due to their limited tax liability. In the financial recession of 2007-2008, however, tax equity investors fled the market.

SECTION 1603 CASH GRANT PROGRAM.

In response to the flight of tax equity investors, Congress included a temporary provision in economic stimulus legislation in early 2009 (American Recovery and Reinvestment Act, or ARRA) allowing new renewable energy projects that begin construction prior to the end of 2010 to receive a 30% cash payment from the government in lieu of the ITC or PTC. This "Treasury Grant Program" (Section 1603 of the tax code) has been essential to continued growth in wind and utility-scale solar in 2009 and 2010. As of July 2010, $4.6 billion of grants had been awarded, mostly to large wind power projects. Congressional reauthorization of this program has been delayed for two reasons: internal disputes over the technical budget and appropriations framework for a longer-term program; and controversy over U.S. companies' receiving government benefits and then taking "green jobs" overseas, triggering proposals in Congress to limit or delay the program by requiring recipients to meet "Buy America" benchmarks.

FEDERAL LOAN GUARANTEES

In 2005, Congress created a loan guarantee program (Section 1703 of the tax code) aimed primarily at assisting new nuclear and clean coal projects by providing a government guarantee of financing up to 80% of the project cost, but the program was not fully implemented under the Bush Administration. ARRA extended and increased the loan guarantee program (in Section 1705 of the tax code), targeting renewable energy systems and facilities that manufacture related components, transmission systems, and biofuel projects. ARRA also appropriated $6 billion for payment of the credit subsidy (guarantee) costs, which under Section 1703 were paid by the developer. This amount was estimated to support $60-$100 billion of loans. This program is slowly maturing and having an important impact on both projects and manufacturing. Most utility-scale wind and solar projects now depend on a combination of the Section 1603 cash grant and either a Section 1703 or Section 1705 loan guarantee. However, the loan guarantee program

is also time-limited, ending September 30, 2011. Non-U.S. companies are eligible and have been successful in receiving funds, but projects must be in the U.S.

STATE FUNDING AND POLICIES

STATE BENEFIT FUNDS

About half of the states have public benefit funds (PBF) derived in most cases from a surcharge on retail electricity sales. The funds support a variety of renewable energy generation ranging from large projects to distributed generation, including rebates on rooftop grid-connected solar. California's PBF, the nation's largest, is committing $150 million per year to support PV solar.

STATE GRANT FUNDING

Out of a total of $16.8 billion in ARRA funds for clean energy, $2.7 billion was appropriated to supplement block grants to the states and $3.1 billion for State Energy Program (SEP) grants. These funds are being used by the states for a variety of locally-based subsidies and incentives including rebate programs, encouragement of manufacturing of renewable components, low-interest financing, research and training. Many of these state programs are focused on promoting distributed solar installation.

NET METERING

Net metering allows utility customers to use their own generation (solar; small wind generation) to offset consumption over a billing period by running their electrical meter backwards when they generate electricity in excess of demand. As a result, customers receive retail prices for power they generate that meets but does not exceed their annual demand. Net metering incentivizes installation of distributed renewable capacity. 37 states and the District of Columbia have a requirement making net metering available to some or all consumers.

TRANSMISSION REFORM

A major challenge facing the scale-up of U.S. renewable energy generation lies in the siting and cost recovery for new transmission lines necessary to connect wind and solar projects—many of which are geographically remote from load centers—with the grid. Each state has primary authority over siting of new interstate transmission lines, making it a huge challenge to site projects that cross several states. Regional attempts at voluntary multi-state planning appear to be the fastest route to ameliorating the current fragmentation of legal authority over siting.

Cost recovery is an equally vexatious problem. Disagreements between states and regions about whose ratepayers will bear the cost of new transmission are plentiful; and utilities or investors seeking to finance projects are finding it difficult to obtain the reasonable certainty of cost recovery necessary to proceed. The Federal Energy Regulatory Commission (FERC) has recently proposed a rule providing that all consumers that are likely to benefit pay a share of the project's costs. Conversely, consumers that do not benefit would not pay. This proposal, although controversial with some utilities and state commissions, is generally supported by renewable generators as a way to break the cost allocation logjam and spread costs over a region in proportion to the broad benefits associated with new transmission capacity. FERC appears to be focused intently on removing barriers to entry for renewable resources and is likely to finalize a rule that facilitates broad regional planning and rational cost allocation for interstate transmission early in 2011.

GOVERNMENT PERMITTING OF RENEWABLE ENERGY PROJECTS

The U.S. Department of Interior (DOI) and various state policies are critically important to renewables projects. While private land has been targeted for some medium size and smaller utility-scale solar facilities, large solar projects are mostly sited on federal public land managed by DOI's Bureau of Land Management (BLM). BLM is currently processing fourteen large solar projects (some jointly with California) under an accelerated schedule to allow 2010 construction so developers can claim ARRA benefits. BLM is also conducting a multi-year study to designate optimal locations for future solar projects. In the meantime, however, there is no comprehensive guidance for future permitting of solar projects, and siting

decisions have been left to developers. Consequently, speculators have applied for "rights of way" for large solar projects, getting first-in-line status without having to show ability to implement their projects.

Offshore wind development was formerly regulated by DOI's Minerals Management Service, which has recently split into three agencies following the Gulf of Mexico oil disaster. Because of the recent administrative restructuring, several important issues in the permitting process remain unclear. Developers are potentially faced with two major obstacles: first, reluctance to spend millions of dollars on studying an offshore site if they will then have to compete with others to secure it; and second, the prospect of having to prepare two separate and consecutive environmental impact statements (EIS), one for a preliminary plan and lease, and another for a construction permit, which could cause delays of up to nine years. Developers are working with DOI to finalize a more streamlined approach.

CONCLUSION

The U.S. renewable energy industry has been a bright spot during the recent economic downturn and the industry outlook remains strong. The current policy patchwork creates fragmented renewable energy markets. This factor, in conjunction with pending regulatory actions, legal challenges, and global competition, may ultimately spur comprehensive federal energy and climate legislation in the U.S. that would further strengthen the outlookfor renewable energy. But in the near future, industry participants must continue to navigate and optimize a wide array of incentives, mandates and other policy tools that comprise the current U.S. policy framework.

U.S. RENEWABLE ENERGY FINANCE

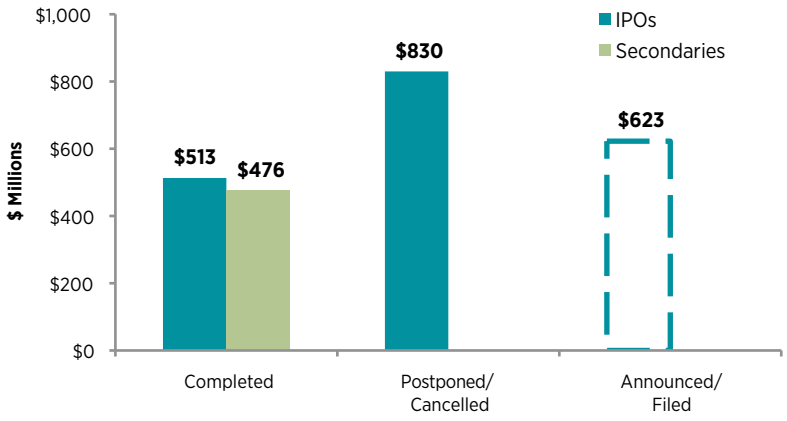
This section examines the performance of U.S. clean energy finance markets over the past several months. The review focuses on U.S. public equity markets, private equity markets, and debt markets, and concludes that: (1) following a successful first quarter, public equity markets have recently exhibited considerable volatility, largely due to the European credit crisis and policy uncertainty, resulting in many clean energy initial public offerings (IPO) being delayed and leading to a large IPO pipeline; (2) private equity and venture capital investments are increasing substantially quarter-on-quarter, with a particular focus on energy smart technologies, solar and wind, and investment still overwhelmingly concentrated in California; and (3) asset and corporate financings are recovering from the lows of 2009, but still lag behind Europe and, increasingly, China.

PUBLIC EQUITY MARKET ACTIVITY

There have been four IPOs and seven secondary offerings completed in the U.S. year-to-date, with a total of $513 and $476 million raised, respectively (Figure 5).[2] Two of the IPOs are U.S. companies—Codexis, a biofuels company; and Tesla Motors, an electric vehicles manufacturer—and two are Chinese companies—China Hydroelectric, a small hydro operator; and Jinko Solar, a vertically-integrated solar manufacturer. These companies represent a range of clean energy sectors, and their stock prices have each performed very differently since their IPO. This is partly due to the individual company's prospects and partly due to changing investor sentiment. Through the first quarter, investors exhibited growing confidence as markets appeared to begin a steady recovery from the global recession—as a result, first quarter clean energy public market investment in the U.S., traditionally the slowest quarter for public equities, exceeded the previous quarter's investment by more than 72% and exceeded first quarter 2009 investment by more than 144%. However, in the second quarter, the Eurozone sovereign credit crisis began impacting global equity markets, particularly those in Europe and the U.S. This is reflected in public market investment in clean energy in the U.S., which declined 2.6% from the first to second quarters, an unusual quarterly investment trend (Figure 6).

China Hydroelectric, which launched on the New York Stock Exchange on January 22nd 2010, was a casualty

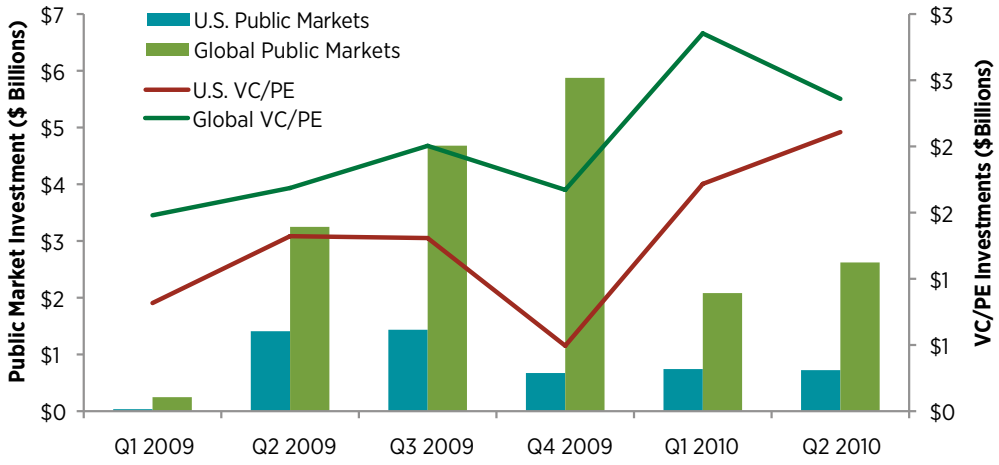
Figure 5: TOTAL DEAL VALUE OF U.S. IPOs AND SECONDARIES YTD 2010 BY STAGE



Source: Bloomberg New Energy Finance.
Note: No data on postponed/cancelled or announced/filed secondaries.

2 Note that all "year to date" references, and changes in stock prices since IPO are as of August 18, 2010

Figure 6: PUBLIC AND PRIVATE MARKET INVESTMENT, 2009 TO Q2 2010

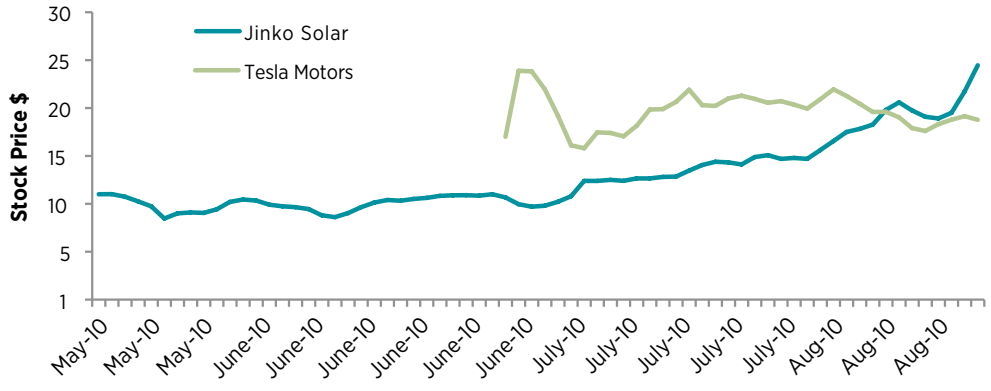


Source: Bloomberg Now Energy Finance

of this shift in investor sentiment. With a 61% decline in stock price from January to present, the company was the worst post-IPO performer in the U.S. this year. While this statistic illustrates the decline in investor appetite for clean energy deals since early-2010, it should be recognized in the context of the significant success of the IPO at the time of its offering—the company twice increased its offering size in the month preceding the offering, and ultimately raised $110 million, almost double its initial proposed deal size of $61 million. Second generation biofuel company Codexis, which made its IPO at the beginning of the unfolding of the European credit crisis, has also experienced a substantial decline in investor confidence—a 35% drop in stock price since its April 21 debut.

On the other hand, the recent IPOs of Jinko Solar and Tesla Motors have fared significantly better, with Jinko Solar's stock price increasing a substantial 98% since its May 13 IPO, and Tesla's stock up nearly 70% in early trading and 13% since its June 29 debut (Figure 7). Tesla Motors has attracted a considerable amount of attention for being the first and only company to produce a long-range battery powered car—the highly publicized "Roadster"—as well as developing strategic partnerships with industry incumbents Daimler and Toyota.[3] As a result,

Figure 7: JINKO SOLAR AND TESLA MOTORS STOCK PRICE, IPO TO PRESENT



Source: Bloomberg

3 Tesla's sports car product can travel 245 miles per charge, goes from 0 to 60 MPH in 3.7 seconds, and is highway capable

the IPO was an instant hit with investors—the company originally intended to raise $155 to $178 million, but increased the offering price when it recognized the extent of investor enthusiasm and ultimately raised $260 million in June 2010, making it the largest U.S. clean energy IPO of 2010. This is a remarkable feat in the current climate of investor caution, and Tesla's success can be attributed to the fact the company is operating in a sector of growing investor interest (i.e. energy smart technologies) and offers a differentiated product with strategic partnerships.

Still, the current environment remains one of investor caution, with two U.S. IPOs being pulled in June, and another in early August, with a cumulative potential deal value of nearly $745 million.[4] So far in 2010, the aggregate value of IPOs that have been postponsed or cancelled far exceeds the value of those that have actually occurred. Some companies have been in the IPO pipeline for several months now, waiting for an appropriate market opening (Figure 5). This hesitation to venture into the public markets in recent months is due to the increasingly selective nature of clean energy investors. U.S. and European investors are favoring companies with differentiated products or business models and are increasingly shying away from markets they perceive as commoditized, such as the wind and solar supply chain. Given the general capital shortage and market uncertainty, combined with an abundance of public clean energy companies to choose from, only those companies that are particularly differentiated from their competitors are receiving investor interest. However, an exception to the rule would be Jinko Solar, a vertically integrated solar manufacturer with a substantial increase in stock price since IPO. Yet, it should be noted that initial investor enthusiasm at IPO was muted and the majority of the stock price increase occurred in August, following the release of Jinko's Q2 2010 earnings. Q2 revenues and module shipments were up markedly from Q1 and substantially exceeded market estimates, resulting in upward revisions in expected annual earnings from equity research analysts and increased investor interest in the stock.[5]

PRIVATE EQUITY MARKET ACTIVITY

Private investment activity in clean energy in the U.S. has not tracked the public markets, with vast growth in investment from Q1 to Q2 2010: Q1 2010 investment was $1.7 billion, and Q2 2010 investment was $2.1 billion, both of which exceeded the previous four quarters of investment by a considerable margin.[6] These statistics demonstrate that the U.S. continues to lead the world in clean energy venture capital and private equity investment, with Q1 and Q2 private market investment representing 60% and 89% of the global total, respectively. As with public market investment, there has been a trend toward investment in energy smart technologies, particularly electric vehicles, as well as a continued interest in solar and wind companies. Illustrative of investor interest in electric vehicles, hybrid sports car manufacturer Fisker Automotive raised $74 million in Q2 and Coda Automotive raised $58 million in May 2010. The vast majority of this type of investment is centered in California, particularly with regard to solar, as a result of the generous policy incentives in the state.

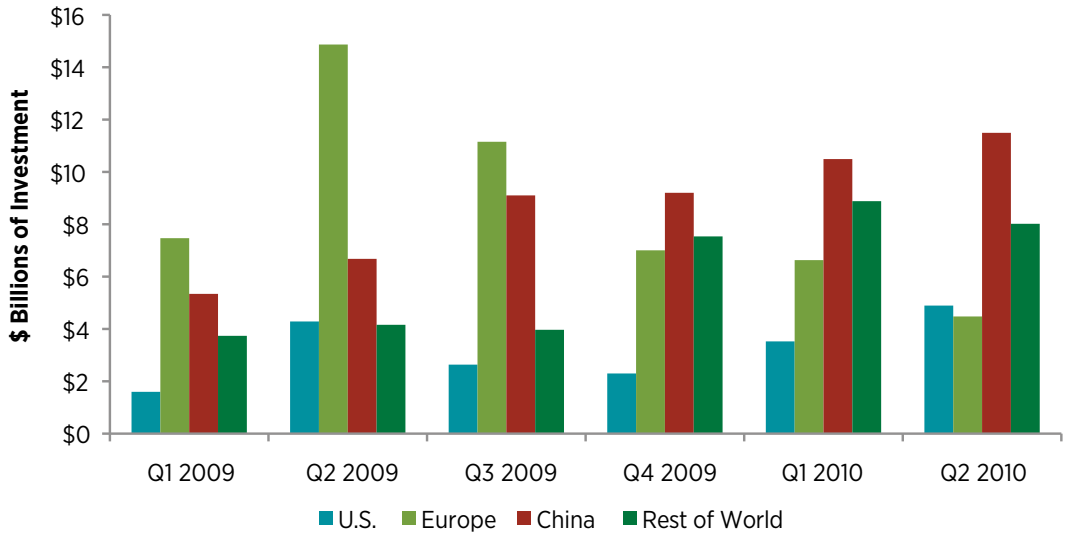
Private market investor sentiment is less cautious at present, with investors reporting an abundance of high-quality companies to choose from, relatively low valuations, and less competition than before the financial crisis. Therefore, for venture capital and private equity firms with capital, early and mid-2010 has been an optimal period in which to invest. These investors' exit strategies have also changed somewhat recently, given the public markets volatility and costs associated with a public offering. There is a shift toward strategic sales to corporates as opposed to IPOs, and there have been an increasing number of Asian companies actively seeking strategic acquisitions, which is a relatively new trend.

4 U.S. solar thermal company Solyndra's $300 million IPO and Chinese geothermal company Nobao Renewable Energy Holding's $207 million planned offering; Chinese solar manufacturer Trony Solar Corporation's planned $242 million offering on the NYSE

5 See, for example, "Jinko Solar Q22010 Earnings – Solid quarter post IPO", Credit Suisse, August 17 2010

6 Bloomberg New Energy Finance

Figure 8: ASSET FINANCINGS, 2009 TO Q2 2010



Source: Bloomberg New Energy Finance

DEBT MARKET ACTIVITY

The second quarter of 2010 saw 40 clean energy asset financings totaling $4.9 billion, up from $3.5 billion last quarter and $2.4 billion in Q4 2009.[7] As in previous quarters, the wind sector attracted the largest share of financings—there were 16 wind financings channeling $4.0 billion into the sector, followed by solar with 12 deals at a total value of $420 million.[8] In comparison to the second quarter of 2009, during which only 4 wind financings and 9 solar deals took place in the U.S., debt availability has increased markedly, with more banks able and willing to lend to clean energy projects.[9] The improvements in the financing market have been largely driven by an increased use of simplified project finance structures in the U.S., similar to the structures typically used in Europe, as opposed to the previous financing structures that were dependent on tax equity investors. This has been facilitated by the Treasury Grant Program (Section 1603 of the tax code), whereby owners of clean energy generation may convert the ITC into cash payments from the U.S. Treasury Department, thereby bridging the funding gap.[10] The combination of this and improved liquidity has brought project finance costs down across various capital structures relative to 2009: recent wind deals have been priced at approximately 275 bps over LIBOR. However, renewable energy project developers are cautious about pursuing new projects due to the uncertainty surrounding the expiration of Section 1603 at the end of 2010—without a renewal of the program, there are serious concerns that financings may slow down to 2008 levels.

In addition to the 1603 Program, in February 2009 the U.S. government also launched a Temporary Loan Guarantee Program (Section 1705) that extended the existing 1703 Program to include all clean energy technologies (as opposed to purely innovative technologies) and appropriated $6 billion in funding. The program was expected to facilitate and expand the clean energy project financing market during the recessionary environment, but disbursement of loan guarantees has been very

7 Bloomberg New Energy Finance
8 Among the more notable transactions were: (i) Terra-Gen Power, a developer affiliated with ArcLight Capital Partners, closing $1.2 billion in July to back the construction of 570 MW of its Alta Wind Project in Tehachapi, California; and (ii) Horizon securing $141 million in tax equity from Wells Fargo in exchange for Horizon's 28% stake in a trio of wind farms totaling 604 MW.
9 Bloomberg New Energy Finance, "Monthly Briefing," August 2009
10 Launched under the American Recovery and Reinvestment Act ("ARRA") of February 2009

slow and funds have been rescinded and re-allocated elsewhere twice since ARRA was signed into law.[11] As of August 2010, this leaves $2.1 billion in remaining funding, a substantial reduction from the initial $6 billion, but an amount that is still estimated to support $20 to $25 billion in future loan guarantees.[12] This is potentially a significant positive factor for the industry, particularly solar, given most of the recent loan guarantees have been provided to solar projects.[13]

To put U.S. debt markets in a global perspective, in the first half of 2010 there were $8.4 billion of asset financings in the U.S., relative to $11.1 billion and $22.0 billion in Europe and China, respectively (see Figure 8). Similarly, with corporate financings, China has vastly exceeded the U.S. with approximately $21.5 billion in transactions year-to-date, relative to $3.5 billion in the U.S. Many of the Chinese financings were provided by state-owned entities, capable of providing large, low cost loans,[14] while the U.S. financings have been smaller and tend to be provided by a syndicate of banks, often with Chinese participation. The key reason for this difference is that U.S. companies and banks continue attempting to shore up their balance sheets in the wake of the recent financial crisis and subsequent legislation—for example, the July 2010 "Dodd-Frank" financial reform bill that imposes regulations to ensure greater bank liquidity. As a result, providers of asset and corporate financings in the U.S. may become increasingly international.

11 To date there have been $4.1 billion in closed or conditional loan guarantees, requiring $400 million in funding from the program. In August 2009, $2.0 billion was re-allocated to the Cash for Clunkers Program, and in August 2010 $1.5 billion was re-allocated to the Education Jobs and Medicaid Assistance Act

12 Barclays Capital Clean Technology, August 11 2010

13 For example: (i) BrightSource's $1.37 billion guarantee for a 400 MW solar thermal plant; and (ii) Abengoa's $1.45 billion for its $2 billion 280 MW solar thermal power plant

14 For example, China Development Bank recently provided $5.3 billion to Yingli Green Energy Holding (July 2010) and $6 billion to Goldwind Science and Technology (May 2010)

GLOSSARY

Anaerobic digester gas (ADG)

Waste placed in an airless environment, where bacteria convert it to gas capable of generating heat and electricity.

Base load

The minimum amount of power that must be supplied by the utility. Base load power plants generate the majority of power, with additional plants activated when demand increases.

Block grants

Funds given to U.S. states by the federal government to run programs within defined guidelines.

BPS

Basis Point. A unit equal to 1/100 of 1%; it is used to define interest rates, i.e., a 1/10th of 1% change is equal to 10 bps.

Carve outs

Under their RPS, some states require a specific percentage of electricity from certain types of facilities (typically for solar or distributed generation).

Co-firing

Traditional power plants, such as coal plants, that can also burn biomass.

Credit subsidy (guarantee) costs

A cash payment to a reserve fund behind a loan guarantee, typically 10% of the amount of the guarantee.

Depreciation

A non-cash expense in accounting that represents the reduced value of an asset due to deterioration or obsolescence. Depreciation lowers a company's reported earnings.

"Dodd-Frank" financial reform

The largest U.S. financial reform legislation since the 1930s. Authored by Senator Chris Dodd and Representative Barney Frank. Signed into law on July 21, 2010 by President Barack Obama.

Environmental impact statements (EIS)

A report addressing the potential effects on the environment of a proposed project.

Firming capacity

Combining fluctuating renewable energy sources, constant traditional energy sources, and storage capacity to remove variability from the electric grid.

Initial public offering (IPO)

The first sale of stock by a private company to the public.

Levelized cost of electricity (LCOE)

The average cost, in ₵/kWh, of electricity produced over the life of a power plant, taking into account installation and commissioning costs, operations and maintenance, degradation and lifetime, and the output.

LIBOR

London Inter-Bank Offer Rate. The interest rate that the banks charge each other for loans.

Load-serving providers

Entities that secure energy and transmission services to serve the electrical demand and energy requirements of end-use customers.

Loan guarantee

A legally binding agreement under which the guarantor agrees to pay any or the entire amount due on a loan instrument in the event of nonpayment by the borrower.

Power purchase agreement (PPA)

A contract between an energy producer and an energy consumer defining the terms and conditions of the sale of electricity. Sometimes called a power sale agreement.

Process scale up

Shifting from a pilot-scale facility to a commercial-scale refinery or other process facility.

Public benefit funds (PBF)

A pool of resources typically created by levying a small fee or surcharge on customers' electricity rates, which can then be used by states to invest in clean energy.

Rate base

The value of a utility's physical assets according to their regulators. This value is used to determine the amount of money that a utility can profit from, which determines electricity rates.

Renewable energy credit (REC)

Tradable certificates that represent the environmental attributes of the power produced from renewable energy projects and can be sold separate from commodity electricity.

Renewable energy standard (RES)

See renewable portfolio standard (RPS).

Renewable fuels standard (RFS)

Like RPS, RFS requires a certain portion of fuel to be made from renewable sources. For example, 7.5 billion gallons of renewable fuel must be blended in to gasoline by 2012.

Renewable portfolio standard (RPS)

Regulations adopted by the majority of U.S. states requiring that load-serving providers supply or acquire a minimum percentage of their power from qualifying renewable energy resources by a designated date.

Second generation cellulosic biofuels

Converting non-food portions of biomass, such as stems, leaves, and non-food crops, into usable biofuel.

Secondary offerings

The issuance of new stock for public sale from a company that has already made its initial public offering (IPO).

Securitize

To buy loans (such as mortgages) from lenders, arrange them in groups, and issue bonds on the groups.

Tax equity investors

Entities that invest capital in projects, and earn a return by taking tax credits against their tax liabilities from other income.

Utility-scale solar

Large solar projects, generally over 1 MW in capacity.

Woody biomass

Generating electricity through burning trees, leaves, and other woody plants.