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2012 Alternative Energy Seminar

Alternative Energy Forecast: Partly Sunny, Partly Windy

Conference Report

September 19 – September 21, 2012
Phoenix, Arizona

Deloitte Center for Energy Solutions

Contents

2012 Alternative Energy Seminar

Dear Energy Industry Colleague,

Thank you for attending our Alternative Energy Seminar, "Alternative Energy Forecast: Partly Sunny, Partly Windy," in Phoenix, Arizona, on September 19-21, 2012. Based on feedback from last year's attendees, we expanded the conference again this year, refining the agenda to include an additional half-day on technical accounting and tax topics. Input from attendees like you enhanced the value of the conference and enabled it to grow along with the sector itself.

The plenary sessions explored the immediate and long-term forecasts for alternative energy. Topics included updates to U.S. environmental policy and regulation, including the prospects for extending the production tax credits for wind beyond 2012. Speakers also presented trends in financing and deal structures, stressing that financing methods need to mature in parallel with the alternative energy sector, which is coming of age. Discussions also turned to recent developments such as automakers' launch of several models of electric vehicles in the U.S. and whether or not our electricity system is prepared to handle projected adoption rates. Our speakers also delved into who is investing in alternative energy and why, revealing some unlikely proponents. They additionally presented the results of these efforts, which range from new types of biofuels to emerging computer technologies that could greatly improve the efficiency of the electric grid.

As one might expect, the potential impact of the Presidential election was a prominent point of discussion throughout the event. Speakers emphasized that regardless of the outcome, alternative energy will continue to move forward because global forces, such as population growth and improving standards of living in the developing world, are driving it. These forces are impelling cross-border partnerships and public-private sector collaboration aimed at developing clean technologies, improving energy efficiency, and addressing the important interdependency between energy and water.

Breakout sessions focused on the unique technical accounting and tax requirements as well as business issues related to alternative and renewable energy, with topics ranging from accounting for power purchase agreements to what you need to know about distressed assets. These sessions were aimed at helping attendees to better perform their jobs on a daily basis, and evaluation forms indicated that a great deal of practical information was successfully transferred.

In addition to the contributions from our speakers, the audience too played an active role, offering insights and posing thought-provoking questions. Attendees often find it challenging to take notes while following brisk discussions. For that reason, we are pleased to provide you with this synopsis of the views and presentations from the 2012 Deloitte Alternative Energy Seminar. We hope you will find it to be a convenient and useful reference. Please feel free to pass it along to your colleagues. Additional copies are, of course, available upon request.

We look forward to seeing you next year for the sixth annual Deloitte Alternative Energy Seminar scheduled for September 18-20, 2013, and again in Phoenix. As always, we welcome your suggestions for themes, topics, and speakers.

Marlene Motyka

Marlene Motyka
U.S. Alternative Energy Leader
Principal, Deloitte Financial Advisory Services LLP

Our Plenary Session Speakers and Panelists

Jeffrey Ball
Scholar-in-residence, Steyer-Taylor
Center for Energy Policy and Finance
Stanford University

John A. Eliason
Of Counsel
Foley & Lardner LLP

Dr. Ilan Gur
Program Director and Senior Advisor
ARPA-E
U.S. Department of Energy

Sheeraz Haji
CEO
Cleantech Group

Bryan Hannegan
Vice President
Environment and Renewables
Electric Power Research Institute

Joshua Linn
Research Fellow
Resources for the Future

Vice Admiral Dennis V. McGinn
(USN, Retired)
President
ACORE

Philip New
CEO
BP Biofuels UK Ltd.

George Revock
Director
Citigroup

Ian Shavitz
Senior Counsel
Akin Gump Strauss
Hauer & Feld LLP

Joseph A. Stanislaw,
Independent Senior Advisor
Energy & Sustainability
Deloitte LLP

Mike Tinskey
Director
Vehicle Electrification and Infrastructure
Ford Motor Company

Paul Warley
Managing Director
Deloitte Corporate Finance LLP

Seminar Overview

The 2012 Deloitte Alternative Energy Seminar examined the forecast for alternative energy in the face of policy headwinds. The agenda spanned general topics as well as specific business, accounting and tax considerations. The plenary sessions explored thought-provoking areas such as the challenges and opportunities within the alternative energy landscape, the impacts of existing and proposed U.S. environmental regulations, and the availability of capital, including the policies and financing structures necessary to keep it flowing. Although uncertainty concerning U.S. policy was a focal point, the discussions emphasized that alternative energy will likely move forward regardless as the global energy system transforms to address climate change and meet the increasing energy demands of the world's growing population. The question is, "How rapidly will this transformation occur?"

The remainder of this report explores the role that U.S. policy could potentially play in speeding or impeding this progress. It also examines emerging technologies on the horizon, the potential implications of disruptive innovations such as electric vehicles (EVs), and strategies employed by multinational energy companies and start-ups alike to integrate renewables into the energy portfolio.

Major themes

The Immediate Forecast for Alternative Energy – World population is poised to top nine billion people by 2050, heightening global demand for energy of all forms.[1] The U.S. still spends about $1 billion/day on foreign oil imports despite recent decreases.[2] Plus, the need to address environmental concerns such as climate change and water usage will likely raise energy production costs. This triad of challenges related to energy security, economic security, and environmental concerns has captured the attention of the U.S. military, which has become an unlikely proponent of alternative energy. Speakers asserted that the military understands the timeline better than others. Tasked with looking over long time horizons, the military sees intensifying strains on global energy supplies that will eventually manifest themselves in the marketplace and potentially in the battlefield. Furthermore, in order for the U.S. to maintain a strategic advantage, these threats must be addressed today by creating resiliency through a balanced portfolio of energy technologies. Accordingly, speakers explained that the immediate forecast for alternative energy is not as dire as the impending expiration of some U.S. tax incentives might suggest: Progress will likely continue regardless of any setbacks from unfavorable shifts in federal or state policies. These policies, they contended, will accelerate or retard the forward momentum of alternative energy, but they won't have the impetus to override the global forces that are fueling the need to rebalance the U.S. energy portfolio.

U.S. Environmental Policy and Regulatory Update – Between 2000 and 2012, roughly 50 Gigawatts of new wind capacity has been added in the U.S. while solar, particularly photovoltaics, has experienced double digit growth rates.[3] Speakers observed that federal, state and local policies are the most likely explanations for this growth. However, with some of these policies soon coming to an end, and more potentially being threatened by political shifts in 2013, the industry has reached an inflection point: Where will policymakers go from here? Speakers contended that today's situation affords a unique opportunity to assess the costs and benefits of prior policies before shaping future ones. They also noted that future policies should balance the need to create a stable environment for renewables investment without compromising reliability, affordability and environmental responsibility.

In analyzing the costs and benefits of state renewable portfolio standards (RPS) and federal incentives such as the investment tax credits for solar and the production tax credits and Treasury Cash Grants for wind, solar and geothermal, some speakers suggested that policies such as these can be low-cost or effective at reducing greenhouse gas emissions, but rarely both. Others asserted that announcing proposed emissions controls scenarios, expediting the permitting process for renewables projects, and achieving a better balance between species preservation laws and renewables development will also be important to developing alternative energy technologies and integrating them into the system alongside the more obvious desire for extending federal incentives and state RPS.

[1] United Nations Population Division

[2] U.S. Energy Information Administration, www.eia.gov

[3] U.S. Department of Energy, Energy Efficiency and Renewable Energy, http://www.eere.energy.gov/

Electric Vehicle Infrastructure – The Broader Perspective – The Obama Administration has set a goal of putting one million electric vehicles (EV) on U.S. roads by 2015. While sales to date suggest it is unlikely this goal will be met, it is difficult to predict when this new technology will hit the tipping point of adoption. Is the U.S. electricity system prepared to handle one million electric vehicles? A recent study by Deloitte, *Charging Ahead: The Last Mile*, revealed that utilities will not likely need to upgrade or expand transmission or generation capacity in the next 10 years specifically to meet electric demand from EVs at projected adoption rates. However, the research did identify near-term impacts to the electric infrastructure that deserve further study at the local distribution level, "the last mile," including possible strains on transformers and the need for new pricing schemes and billing systems. Speakers stressed that utilities are accustomed to managing these types of changes, thus EVs pose few new challenges at least in the short term. Speakers further noted that the media has created the unrealistic expectation that "we'll all be driving EVs immediately," when automakers such as Ford openly acknowledge that consumer acceptance of EVs and building out the infrastructure to support them will be a marathon, not a sprint. Accordingly, Mike Tinskey, director, Vehicle Electrification and Infrastructure, Ford Motor Company, stressed that his company has made EVs a central part of its sustainability strategy for the long-term. To appeal to different consumer preferences, it has launched several types of EVs, ranging from hybrids to plug-in hybrids to all-electric models.

Trends in Financing and Deal Structure – Even in a tumultuous election year, key government and policy groups in the U.S. remain supportive of alternative energy. Speakers asserted that many Democrats and Republicans, as well as the Obama Administration, stand united with several states to grow the business of renewables and energy efficiency. Simultaneously, the costs of wind and solar power technology continue to fall, making them more competitive with fossil fuels. Why then have deals become so complicated and so difficult to close? One possible reason, speakers suggested, is investor appetite for tax equity has yet to fully recover from the financial crisis. Thus, although deals are trending larger, they are being split up among multiple investors. Uncertainty concerning the future of U.S. tax incentives was also cited as an obfuscating factor—one that is dampening investor enthusiasm even more so than

navigating the complex accounting requirements that currently exist. Of note, speakers concurred that financial structures for alternative energy will need to mature if the industry is to prosper moving ahead. One possible shift: Change the U.S. tax code to allow alternative energy investors to invest in Master Limited Partnerships (MLPs). Commonly used to raise capital for oil and gas infrastructure projects, MLPs combine the tax benefits of a limited partnership with the liquidity of publicly traded securities.

Emerging Energy Technologies – What's next? Amid the din of uncertainty, public and private investment in clean energy technologies continues quietly behind the scenes. Speakers observed that certain segments of the sector, such as downstream solar, energy storage, and water management, are booming. Advances in these segments as well as others are being driven by technology entrepreneurs and public-sector supporters who see opportunities to achieve the widely embraced goals of decreasing dependency on foreign oil imports, reducing greenhouse gas emissions, and "doing more with less" by improving the efficiency of energy production and distribution. Speakers also shared several breakthroughs that may be just around the bend, such as ultra-efficient transformers the size of a suitcase; utility-scale, compressed-air energy storage mechanisms; and new technologies that will better route electricity throughout the grid. While many of these technologies will likely be developed and deployed in the U.S., speakers reminded the audience that energy is a global business, with China and other nations representing important sources of both capital and markets. To this end, some speakers suggested it would be wise to view China as a potential partner as opposed to a competitor, despite political rhetoric to the contrary.

Long-term Forecast for Alternative Energy – Renewables are expected to be the fastest growing energy sector through 2030 according to the *BP Energy Outlook*—and this multinational energy company is taking its own research very seriously. Phil New, CEO, BP Biofuels, explained that his company is well-positioned to take advantage of the growth in renewables through a focused portfolio of operating and technological assets in wind, biofuels and emerging ventures. In the U.S., BP has been particularly active in developing cellulosic ethanol, an investment response that has been largely driven by the revised Renewable Fuels Standards (RFS2). Mr. New emphasized the maintenance of transitional incentives such as the RFS2 will be critical for renewables over the next five years, as companies such as his scan the globe for stable investment opportunities. He noted BP Alternative Energy (AE) has invested $7 billion since 2005, over $4 billion in the U.S. alone, toward developing renewable fuels and technologies that meet the company's three-pronged criteria of being sustainable, affordable and scalable. With the continuation of supportive policies, Mr. New concluded, BP AE is poised to keep growing its asset base.

The Immediate Forecast for Alternative Energy

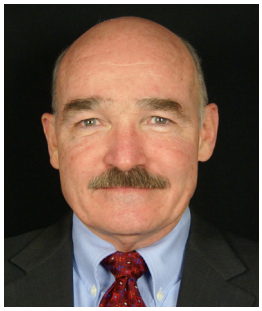
"Energy security is economic security."
Joseph A. Stanislaw, Independent Senior Advisor, Energy & Sustainability, Deloitte LLP

Is it time for a change? While some want to maintain the status quo, speakers contended that many policymakers and industry participants recognize that the United States needs to rebalance its energy portfolio. As Vice Admiral (VADM) Dennis V. McGinn (USN, Retired), president, ACORE, explained, the reasons for this emerging consensus can be distilled into three primary drivers. The first is energy security. World population growth and improving quality of life in developing nations will fuel demand for all forms of energy, and with that demand comes the security implications of potential shortages. The next driver, economic security, is closely linked to the first. "We can't afford the inequalities in our trade deficit that are caused by sending $1 billion per day out of our economy by importing oil," noted VADM McGinn. He further contended this statement applies even if the imports come from stable trading partners such as Mexico and Canada, but especially when they come from volatile nations. While arguments about the need, or not, to reduce carbon emissions have reached "theological proportions," VADM McGinn noted environmental challenges, such as air and water quality, cannot be ignored. They are the third driver behind the need to rebalance the supply portfolio, as more and more people acknowledge that "the price we pay in our electricity bills doesn't fully account for all of the costs and risks associated with power production."

VADM McGinn and session moderator Joseph A. Stanislaw, independent senior advisor, Energy & Sustainability, Deloitte LLP, both emphasized that as the need to change course is becoming greater, so too are the means of doing so. Entrepreneurs as well as established companies are rapidly advancing renewable technologies, making them increasingly competitive with traditional fossil fuels. They further noted that technology also spawned the shale gas revolution by unlocking a resource that was known for decades but was technically and economically out of reach. "The resource didn't change; the technology did," observed Dr. Stanislaw. Advances in energy technologies and the economic opportunities they afford, he asserted, are the key to addressing the inter-related challenges of energy security, economic security, and environmental stewardship. Notably, the world's single largest consumer of energy, the U.S. Department of Defense (DoD), shares this view.

VADM McGinn explained that the DoD has a long history of investing in technologies to improve combat effectiveness and strategic advantage, which ultimately benefit society at large such as the Internet, global positioning systems (GPS), and nuclear power. Similarly, the DoD is presently supporting the development and deployment of alternative energy technologies since military strategists view renewables as a way to build resiliency into the nation's overall energy supply system as well as into military operations. For example, VADM McGinn pointed out that the U.S. Marine Corp. is successfully deploying photovoltaic panels to supply electricity to its forward operating bases. These panels reduce demand for diesel fuel, thus taking Marine convoys off the road and out of harm's way. They also enhance combat effectiveness by allowing soldiers to shed up to 20 lbs. of equipment by using flexible solar panels and rechargeable batteries in lieu of disposable batteries. He also cited the groundbreaking work being done with microgrids at Ft. Carson, Colorado. Here, operations personnel are using microgrids to better balance electricity generation and load, thus improving the resiliency and efficiency of the system. This technology, VADM McGinn speculated, could be applied to community clusters or urban segments in the near future.

Rising global population, the need to refresh the natural gas infrastructure in the U.S., and the growing imperative to update the electric grid, all point in one direction: Global energy demand will increase and so will energy production costs. VADM MCGinn and Dr. Stanislaw concurred that alternative energy offers a way to offset those forces. Furthermore, the DoD is advancing progress by driving down the costs of emerging energy technologies and making them available for the rest of us to use. Thus, the immediate forecast for alternative energy, asserted VADM McGinn, is that "it will happen inevitably." "State and federal policy will only serve to accelerate or retard it, but not to stop it," he concluded.



"It's time to get serious about creating a national energy portfolio that is truly balanced and takes into account the full costs, benefits, and risks of every element in it."

Vice Admiral Dennis V. McGinn (USN, Retired), President, ACORE

U.S. Environmental Policy and Regulatory Update

A range of often-conflicting factors and viewpoints drive renewable energy regulation. Questions concerning the urgency and authenticity of climate change, the extent to which alternative energy makes a difference, and whether or not renewables are universally good for the environment all provide fodder for debate among policymakers. Speakers contended, however, that the main questions upon which the others hinge are: Should ratepayers incur costs today for benefits that will be reaped by the next generation? Or, do these costs constitute an argument for inaction?

Speakers contended that policymakers largely agree inaction is not an option. The U.S. must move ahead with developing clean-energy technologies, a stance that has been reflected in mandates such as state renewable portfolio standards (RPS) and in incentives such as the federal production tax credits (PTC) for wind and investment tax credits (ITC) for solar. These policies have been largely responsible for the rapid growth of renewables to date and continuation of them in some form will likely be needed to support future growth. Speakers further asserted the lull in legislative activity that has accompanied the 2012 Presidential election year provides a good opportunity to look back on these policies and evaluate what has worked, what hasn't, and what the costs have been.

Joshua Linn, research fellow, Resources for the Future, explained that his organization has analyzed the costs of existing renewables policies and their effectiveness in reducing greenhouse gas emissions, which is often the main reason given for promoting alternative energy. According to this analysis, the aforementioned state and federal policies can be low-cost or effective at reducing greenhouse gas emissions, but rarely both. Also, he noted the cost-effectiveness of such policies has been tepid to date, suggesting opportunities may exist to lower the costs of implementing them without sacrificing the desired outcomes.

One potential way to lower these costs is through technological advancement, which will be needed not only to aid renewables in achieving grid parity but also to help conventional fossil fuels burn more cleanly and efficiently. Regarding the latter, Dr. Bryan Hannegan, vice president, Environment and Renewables, Electric Power Research Institute (EPRI), sees significant potential for improving the cost/benefit ratio of implementing environmental policy through innovation and optimization in emissions controls technology. He further contended improvements in these technologies will be essential to meeting the challenge that stands before power and utilities companies today: to provide society with reliable, affordable, and environmentally responsible electricity while transforming the power system to a cleaner, more efficient, modern generation fleet, and interactive electric grid. Dr. Hannegan explained that as a result of environmental regulations, conventional power stations now require substantial chemical units to be attached to them. This has changed the way in which these plants operate and added tremendous costs, which negatively impact the bottom line. EPRI models suggest, however, with accelerated research and additional time, advanced technologies could clarify retirement versus retrofit decisions and reduce total compliance costs, while meeting desired emission rates.

"Creating a stable investment environment is crucial to both promoting renewable technologies and reducing greenhouse gas emissions."

Joshua Linn, Research Fellow, Resources for the Future

"If we can get the R&D and the market signals right, then maybe some of the current political discussions can be replaced by policy outcomes."

Bryan Hannegan, Vice President, Environment and Renewables, Electric Power Research Institute

Dr. Hannegan maintained these advances will be critical because "no matter how much we push for renewable energy and energy efficiency, about two-thirds of the U.S. coal fleet will remain in existence past 2020." Furthermore, technological innovation holds the key to cost-effective compliance not only with environmental regulations that are already on the books, but also with those that are anticipated such as new controls on the handling of coal ash and new controls on intake water under Section 316(b) of the Clean Water Act.

Ian Shavitz, senior counsel, Akin Gump Strauss Hauer & Feld LLP, concurred with Dr. Hannegan, observing a relaxation in environmental regulations is unlikely and that more are probably on the way. He further explained environmental laws can be both a help and a hindrance to renewables projects. While the overarching goals of cleaner air and reduced emissions are almost universally desirable, renewables projects often encounter construction delays, operational restrictions and lower financial returns due to the need to comply with environmental laws aimed at minimizing adverse impacts on cultural resources, endangered species, and natural resources, such as water.

Mr. Shavitz further explained that proponents of alternative energy within upper-level government agencies are often disconnected from the realities of the lengthy permitting and environmental review processes these laws create. As a result, he observed, "We're still encountering lots of hurdles and longer time lags even for projects that should be expedited." However, citing recent federal initiatives and policies, he believes some relief for developers might be on the way. These initiatives include incentivizing renewable development on federal lands, pre-screening lands to minimize resource conflicts, and streamlining environmental review and permitting processes for all energy projects, not just renewables.

"The objective of many initiatives right now is to make the permitting process go faster in a way that does not lessen environmental protections."

Ian Shavitz, Senior Counsel, Akin Gump Strauss Hauer & Feld LLP

Electric Vehicles and Infrastructure – The Broader Perspective

Automakers plan to put about 20 models of plug-in electric vehicles (EVs) on the market in the U.S. within the next five years. Of note, two automakers, Fisker and Tesla, have already produced all-electric models priced over $100,000 in the luxury and performance segment, thus demonstrating EVs can compete with their gasoline-powered counterparts in terms of power and style. Other more affordable options are receiving good reviews from first adopters. Nonetheless, sales of plug-in EVs in the U.S. have been sluggish to date, coming in just shy of 18,000 in 2011.[4] These sales figures suggest it is becoming increasingly unlikely the auto industry will reach the Obama Administration's goal of putting one million EVs on the road by 2015. Do lackluster EV sales indicate consumers are simply not ready for this new mode of transport or are the low figures merely the calm before a storm of adoption? As John McCue, vice chairman, U.S. Energy & Resources, Deloitte LLP, remarked, "With any new consumer product, it is difficult to know when the tipping point of acceptance will occur that will drive adoption through the roof."

Automakers such as Ford are banking on the idea that this tipping point is inevitable since it is being driven by broader macroeconomic forces such as the rising cost of gasoline, the desire to reduce dependency on foreign oil imports, and growing concern about greenhouse gas emissions, particularly among young people. While the exact timing of mass consumer EV adoption is still unknown, Mike Tinskey, director, Vehicle Electrification and Infrastructure, Ford Motor Company, pointed out Ford has incorporated EVs into its long-term sustainability strategy. This strategy involves giving customers "the power of choice" by offering several types of enhanced-fuel-efficiency vehicles, including models with "Ecoboost" smart-performance gasoline engines as well as a full line of hybrids, plug-in hybrids and all-electrics. Mr. Tinksey explained that this strategy is aimed at meeting the needs of different driver segments ranging from those who drive a lot to those who drive a little, as well as those with tight budgets and those willing to spend more on performance and luxury. It is also based on diversification and not "betting it all on a single technology."

Mr. Tinskey pointed out that according to a recent Ford survey, one in three consumers now say they'd consider a hybrid, compared to one in twelve three years ago. Furthermore, one in four say they'd consider a plug-in hybrid. Mr. Tinskey further asserted this represents significant growth in consumer awareness, especially considering plug-in hybrids are relatively new. One of the remaining hurdles, he noted, is range anxiety, or the fear of being stranded in between charges, and another is price. While Ford has seen a 40 percent drop in battery prices in the last two years, Mr. Tinskey explained the battery is still the most expensive part of the vehicle, which accounts for the higher price tags on plug-in electric models. Accordingly, Ford's strategy includes tactics to manage these hurdles, such as developing manufacturing facilities that can switch from producing gasoline-powered vehicles to EVs and vice versa in response to market conditions, and sharing components across all types of EVs, which allows Ford to achieve scale and lower costs.

Another tactic involves collaborating with stakeholders throughout the EV value chain to "clear the way for electrification." This includes working with suppliers, municipalities, consumers, competing automakers, utilities, and more. The objectives of these relationships include establishing standards for charging stations and other infrastructure components, bringing EV-related products and services to the market, and educating consumers on how to use them. These relationships are also instrumental in building out the charging infrastructure, which Mr. Tinskey sees as a key enabler for EVs regardless of where consumers end up charging them: at home, at work, or at a public space.

With consumer awareness growing and automakers such as Ford incorporating electrification into their overall sustainability strategies, it seems mass consumer adoption of EVs may only be a matter of time. Will the U.S. electricity system be ready if and when this occurs? Deloitte's recent report, *Charging Ahead: The Last Mile*, concluded utilities will not likely need to upgrade or expand transmission or generation capacity in the next 10 years specifically to meet electric demand from EVs at projected adoption rates. However, the research did identify near-term impacts to the electric infrastructure that deserve further study at the local distribution level, "the last mile," including possible strains on transformers and the need for new pricing schemes and billing systems. Referencing the report, Mr. McCue suggested that these types of challenges are familiar to utilities, thus EVs pose few novel concerns related to system readiness, at least in the short term. The question instead is fast becoming, "Who will build out the public charging infrastructure and who will pay for it?" As Mr. Tinskey stressed, automakers are only one part of a sustainable electrified market: Close cooperation and shared responsibility among all stakeholders will be required if EVs are to go the distance.

"With a new consumer product such as electric vehicles, you never know when you're going to hit that tipping point of acceptance that's going to drive adoption through the roof."

John McCue, Vice Chairman, U.S. Energy & Resources, Deloitte LLP

"Electrification is a marathon, not a sprint."

Mike Tinskey, Director, Vehicle Electrification and Infrastructure, Ford Motor Company

[4] *2012 Electric Car Sales Forecast,* The Street, http://www.thestreet.com/story/11606766/1/2012-electric-car-sales-forecast.html

Trends in Financing and Deal Structure

"Multiple new tax equity investors, not just the current handful of existing investors, are now needed for large tax equity deals."

George Revock, Director, Citigroup

"Even if REITs or MLPs happen, you'll have to educate investors on how they work within the alternative energy sector.

Paul Warley, Managing Director, Deloitte Corporate Finance LLP

"Rarely do we see deals getting done without having a long-term PPA in place."

John A. Eliason, Of Counsel, Foley & Lardner LLP

The alternative energy sector is gaining momentum. Global investment in the sector grew five percent from 2010 to 2011, increasing from $247 billion to $260 billion.[5] In the U.S., speakers asserted conditions remain generally favorable. The federal government has incentivized the industry, and will likely continue to do so in some form; states are supporting development through renewable portfolio standards; the cost of technologies, particularly solar, is dropping; and investors are eager to deploy capital in the U.S. for renewable projects that often offer attractive returns. Speakers also noted growing interest from governments and corporations in developing energy efficiency solutions as well as an increasing demand for financing options in emerging sub-sectors, such as biomass, waste-to-energy, and distributed generation.

While speakers agreed these conditions generally bode well for alternative energy, they noted other trends are creating a counter drag, making it difficult for the sector to accelerate rapidly. One of these trends is a movement toward larger, more complicated deals. Speakers noted tax equity deals have historically been a staple of wind and solar financing, but lately this market has been under strain. As George Revok, director, Citigroup, explained, "Investor appetite for tax equity deals hasn't fully come back from the financial crisis." With the size of many deals now outstripping the usefulness of the tax benefits for some investors, larger deals are now being split up among many different parties. This, in turn, is increasing the time and costs required to close transactions.

Another countervailing trend is the expiration of the Section 1603 Treasury Cash Grant (Grant) program for renewable energy projects, and uncertainty about what comes next. John Eliason, of counsel, Foley & Lardner LLP, observed at the end of 2011, there was a "mad scramble" to close deals and to commence construction so they could qualify for the Grant. Applicants are eligible for the Grant only if they commenced construction on projects by December 31, 2011 and will complete them by December 31, 2016. Mr. Eliason further noted last year's flurry of activity, particularly in the wind space, has created a lull in the market thus far this year as developers and investors contemplate whether or not the PTC for wind will be extended beyond its impending expiration at the end of 2012.

Meanwhile, speakers explained trends in solar power tell a brighter story. Here, despite the expiration of the Grant, the ITC for solar has been extended through 2016 providing greater certainty for investors. With internal rates of return in the range of 7-to-9 percent, speakers observed investors are funding portfolios of smaller projects as well as pursuing traditional tax equity deals. Additionally, a broad range of investors have entered the field, including utilities, foreign strategics, and Chinese solar-panel manufacturers, the latter of which are teaming up with finance companies to offer capital-lease and term debt financing at attractive rates to help expand their presence in the U.S. marketplace.

With the investment forecast being a mix of sun and clouds, speakers debated what would happen if the U.S. government opted to no longer subsidize the alternative energy sector. They generally concurred achieving grid parity would be key to getting deals done in this environment. Even though grid parity is inching ever closer as the cost of wind and solar technologies fall, speakers asserted low natural gas prices will likely present an insurmountable barrier for a while since they are exerting downward pressure on the prices renewable developers can obtain for PPAs. Thus, they stressed incentives will be needed to continue the sector's positive momentum—at least in the short term.

In addition, another shift will likely be required to weather the vagaries of U.S. policy. Speakers contended financing structures will need to change, noting alternative energy mainly relies on old-fashioned project financing methods as opposed to more modern means of tapping the capital markets. To this end, they suggested changing the tax code to allow alternative energy investors to invest in MLPs or structures similar to Real Estate Investment Trusts (REITs). These types of investments, which have been utilized in the oil & gas and real estate industries, combine preferred tax benefits with the liquidity of publicly traded securities. Citing the MLP Parity Act recently introduced in the U.S. Congress, speakers observed such positive changes might not be far off. Nonetheless, as Paul Warley, managing director, Deloitte Corporate Finance LLP, reminded the audience, "Enacting the change will only be part of the solution; investor education will also be required."

[5] Bloomberg New Energy Finance database, January 2012

Emerging Energy Technologies – What's Next?

Renewable energy is coming of age. Costs are dropping and the industry is consolidating. The challenge, speakers asserted, is renewable energy is often held to different standards than fossil fuels. As a result, the media is quick to pounce on the negatives rather than the positives and the topic has become highly politicized. Nevertheless, public and private investment in renewable energy and clean technologies is continuing quietly behind the scenes. The imperative to meet the increasing energy demands of an expanding global population while creating economic growth and environmental sustainability is motivating governments and private interests alike to enter the race toward clean development.

Sheeraz Haji, CEO, Cleantech Group, explained that several investment trends are underway that may provide clues about where this race is heading. For instance, despite consolidation among solar panel manufacturers, the downstream solar business is rapidly growing. Mr. Haji pointed out consumers are largely driving this movement as they look for ways to finance increasingly affordable rooftop panels. He further observed storage technologies deployed with wind power, particularly compressed-air mechanisms, are another area to watch. So too are technologies that address the "water/energy nexus," or the concept that it usually takes vast amounts of energy to treat and move water, and vast amounts of water to produce energy. Mr. Haji also noted energy efficiency is becoming a hot sub-sector, with new companies coming on the scene that provide "apps" for home energy management and that analyze smart-meter data to advise building owners on how to lower their energy usage.

Speakers further stressed the important role of public-private partnerships in advancing emerging energy technologies such as these. For instance, under the auspices of the U.S. Department of Energy, the U.S. Congress has established a relatively new agency, the Advanced Research Projects Agency for Energy (ARPA-E), the goal of which is to catalyze and support the next generation of energy technology. Dr. Ilan Gur, program director and senior advisor, ARPA-E, explained his agency retains experienced experts in science and technology for three-year terms. These experts are tasked with identifying opportunities within energy where technology could make a big difference, determining which community of researchers could address the problem, and pushing that community out of its comfort zone. How? By encouraging researchers to think bigger, helping them to look at the problem in new ways, and persuading them to work with others they normally wouldn't work with, such as experts in other industries.

Through this novel approach to innovation, Dr. Gur noted research teams supported and funded by ARPA-E are on the cusp of several intriguing breakthroughs. These include using computer technology to design ultra-efficient, solid-state transformers that are about the size of a suitcase; developing new types of switches to route electricity throughout the grid, potentially generating 10-15 percent savings on all electricity in the U.S., and reducing the price premium on EVs by developing less expensive, yet more powerful, batteries.

U.S. policymakers, however, aren't the only ones who recognize the urgent need to develop innovative energy technologies. Jeffrey Ball, scholar-in-residence, Steyer–Taylor Center for Energy Policy and Finance, Stanford University, pointed out energy systems tend to change because of palpable economic crises not altruistic concerns about the environment. Faced with meeting the soaring energy demands of the world's largest population and a rapidly rising middle-class, Chinese policymakers have been experiencing this sense of crisis more intensely than their U.S. counterparts. This has spurred the nation to invest immense sums in developing clean energy technologies. Some of that money is filtering its way into the U.S. economy as Chinese companies purchase technological assets, fund R&D, and enter into joint ventures with U.S. firms. Conversely, U.S. companies are finding robust market opportunities on Chinese soil. As Mr. Ball reminded the audience, "innovation is global," thus cross-border collaboration on resolving energy-related challenges can have far reaching benefits. Moving ahead, he contended American and Chinese companies have a great opportunity to improve their competitiveness by innovating in a way that plays to their respective economic strengths, as opposed to fighting it out in a zero sum game.

"Renewable energy is coming of age: If it is to reach responsible adulthood, the world's approach to it is going to have to grow up too."

Jeffrey Ball, Scholar-in-residence, Steyer-Taylor Center for Energy Policy and Finance, Stanford University

"Regarding energy and water, there is a pervasive need to do more with less."

Sheeraz Haji, CEO, Cleantech Group

"Our goal is to support new energy technologies—not incremental innovations that are a couple of years away but 'game-changers' that are really over the horizon."

Dr. Ilan Gur, Program Director and Senior Advisor, ARPA-E, U.S. Department of Energy

Long-term Forecast for Alternative Energy

"The continuation of transitional incentives is absolutely critical over the next five years."

Philip New, CEO, BP Biofuels UK Ltd.

Anticipated growth in the alternative energy sector has captured the attention not only of entrepreneurial start-ups but also of large, multinational energy companies. For instance, BP Alternative Energy (AE), since its launch in 2005, has committed to investing $8 billion in the sector over 10 years. Much of this investment to date has been in biofuels operations and technologies, because as Phil New, CEO, BP Biofuels, explained, "we believe they will be a good business." But what defines a robust and attractive business model for BP in the biofuels space?

According to Mr. New, investment opportunities must clear three hurdles in order to attract the company's attention and its capital. First, the biofuels being produced must be affordable, meaning they must eventually be able to compete with conventional fuels without regulatory support. Mr. New further said the company's goal in most instances is to be competitive with gasoline within a decade. Second, they must also be sustainable from economic, social, and environmental perspectives, including being low-carbon on a lifecycle basis and being derived from feedstocks that do not compete with food production. And third, they must be scalable, since the company is seeking substantial opportunities that can materially impact its bottom-line.

Examining opportunities through these lenses has led BP AE to focus primarily on three types of biofuels businesses: sugar cane ethanol in Brazil, cellulosic ethanol from energy grasses in the U.S., and advanced bio-molecules, such as biobutanol and sugar-to-diesel. Of these, cellulosic ethanol in the U.S. has been particularly influenced by policy. Mr. New stressed BP's investments in this arena have been primarily driven by the Renewable Fuel Standard (RFS2) program, which is administered by the U.S. Environmental Protection Agency (EPA). RFS2 includes specific annual volume standards for total renewable fuel and also for the specific renewable fuel categories of cellulosic biofuel, biomass-based diesel, and advanced biofuel. This policy, contended Mr. New, is necessary to ensure an interim market for biofuels in the U.S., essentially giving the time to achieve cost parity with fossil fuels. With the continued availability of this interim market, BP AE anticipates its cellulosic-ethanol technology will mature and become cost competitive with oil at $80/oil barrel within the next decade.

Mr. New also emphasized that BP AE is investing in other areas of the alternative energy space. These activities include an Emerging Business & Ventures Group that has invested over $160 million in more than 30 companies throughout the world. It also includes a wind-power group that has 13 operating wind farms in the U.S., representing 1955 MW, with 600 MW under construction. Mr. New observed that the PTC for wind, like the RFS2, has been instrumental in making these investments economically feasible. Moving ahead, he stressed transitional incentives such as these must remain in place and be implemented in a stable, predictable manner if the industry is to continue on its current growth trajectory.

To date, BP AE has invested $7 billion in alternative energy, including $4 billion in the U.S. alone. And the company doesn't intend to stop there. "With stable policy support, BP AE is poised to continue growing its asset base," observed Mr. New. If the magnitude of the company's investment thus far is any indication, then the long-term forecast for alternative energy is sunny, assuming informed policy continues to stimulate investor response.

Summary of Breakout Sessions

Exploring Opportunities in Alternative Energy: What You Need to Know About Distressed Assets

Amid industry consolidation and financial uncertainty, the past two years have not been particularly kind to the alternative energy industry. While bankruptcies have been plentiful in the U.S. and in Europe, speakers emphasized this does not constitute a "doomsday scenario" for the sector. On the contrary, they contended the situation is quite the opposite. The abundance of distressed assets is spawning a multitude of business opportunities for savvy, well-informed investors since the distressed market allows them to acquire assets and participate in business ventures sometimes for cents on the dollar. This activity, if well thought out, will eventually make the overall sector healthier and more competitive.

Speakers explained that distressed assets come in many forms, as do the business opportunities that accompany them, which can range from purchasing and re-organizing a company in bankruptcy to acquiring a distressed or "orphan" asset that resides within a business that is otherwise healthy. While the evaluation criteria vary greatly on a case-by-case basis, speakers offered a few broadly applicable tips for assessing opportunities in this space. For example, they emphasized the importance of understanding what the entire portfolio of assets comprises, since it can include more obscure items of value such as trade secrets and institutional knowledge, in addition to more obvious ones such as patents and physical property and equipment. They also advised great care should be taken in identifying who actually owns the assets in question since this process can be much more complicated and confusing than it first appears. Finally, they underscored the value of being a first-mover, or to use the jargon of the sector, "the stalking horse," when acquiring certain types of distressed assets.

Integrated Infrastructure – Can Alternative Energy Technologies Improve Infrastructure Resiliency?

Nothing gets U.S. policymakers moving like a storm in the nation's capital. This time, however, the storm to which speakers were referring wasn't a metaphorical one related to public opinion, but an actual one, involving a catastrophic weather event. A "super derecho" storm of wind and violent thunderstorms hit the Midwest and mid-Atlantic over the summer, killing more than a dozen people and leaving millions without power for several days. Since many government officials were personally affected by the storm, this event renewed debate on Capitol Hill regarding the resiliency, or lack thereof, of the U.S. electric grid. It also renewed interest in the role that renewables and emerging energy technologies could play in strengthening America's energy infrastructure.

Speakers asserted microgrids offer a potential solution to the resiliency challenge. A microgrid is a small group of interconnected electricity users that are connected to a generation facility (often wind or solar), and it can either operate independently or as part of the larger electrical system. This flexibility facilitates easier integration of renewables, reduces transmission congestion, averts losses from power outages, and provides the ability to maintain critical electricity services during natural disasters and other disruptive events. Speakers further noted these benefits are rapidly being demonstrated by the pioneers in the microgrid space, which to date have been the U.S. military, regulatory agencies, and public institutions, including many universities.

Speakers stressed microgrids, and the concept of distributed generation, represent a major change from the centralized approach to infrastructure that has been taken for decades. Nonetheless, this change is needed, especially now. Utilities and municipalities will have to invest vast sums in the coming years to upgrade aging infrastructure, not only concerning electricity but also water. Speakers observed America's water infrastructure is also fraught with vulnerability related to aging pipes, unsafe damns, and inadequate water treatment. Here too, they contended, a microgrid or distributed approach could offer relief via systems that integrate functions, such as buildings that treat their own sewage through solar-powered, plant-based filtration systems. Pointing out that new enabling technologies are making this integration increasingly feasible, one speaker concluded by noting "a single, centralized infrastructure may look as old fashioned to us in twenty years as horse-drawn streetcars looked in the 1900s."

IT Solutions for Alternative Energy Companies in a Cost-Conscious Climate

Alternative energy companies are a different breed. Speakers explained that unlike traditional businesses that delineate their activities by function (e.g., finance, supply chain, etc.), alternative energy companies see the world in terms of project lifecycles, encompassing development, construction, maintenance, operations, and more. And there are other differences too. These include sophisticated solution requirements driven by the need to integrate renewables with manufacturing or traditional generation assets, complex legal and financial structures, extensive compliance requirements, complex one-off processes, and complicated project models, among others.

Managing such complexity is neither for the faint-of-heart nor for the short-on-budget. Fortunately, IT solutions exist that can help alternative energy companies streamline and simplify their operations, reducing costs along the way. Even more, speakers stressed many of these solutions are affordable, requiring only a modest upfront investment. "Low-cost," they explained, is a critical criterion since alternative energy companies are not always flush with cash.

To assist attendees in understanding their IT options, speakers outlined four categories of technologies that are typically useful in helping alternative energy companies address their business challenges:

- ***Entrprise Resource Planning (ERP)*** – These systems provide standard business practices built into pre-configured solutions, whereby upwards of 80 percent of the processes typically required by an alternative energy company are already developed. ERP systems also reduce implementation risk and costs because pre-configured solutions are based upon leading practices in the sector.
- ***Mobility*** – With the explosion of tablets and smart phones, mobile solutions can improve accessibility, efficiency, agility and adoption by extending a company's business applications to those in the field. Among the many benefits are constant connectivity, real-time operation, and the ability to support social media so the company and its customers can communicate rapidly.
- ***Cloud*** – Software-as-a-Service (SaaS), virtual server storage, and other "cloud-based" solutions require lower upfront investments and offer quicker start-up times than ERP. They are also scaleable, allowing for fast infrastructure integration, and can be very cost effective, since maintenance and upgrades are handled by the provider, not by the company's IT organization.
- ***Analytics*** – These applications can help companies measure and optimize performance, moving decision-makers from data, to information, to insight, and ultimately, to actionable insight.

Clean Energy Transportation Fuels: What Does the Future Hold?

Could biofuels and bio-products be "the new low-fat"? Speakers pointed out if the price points are the same, consumers will likely choose these "green" fuels and products over petroleum-based ones just like they did in the 1990s with "low-fat" products versus conventional versions. They further asserted the "bio-space" is poised to explode and leap ahead of solar, wind, and other renewables in terms of the size of its contribution to the economy.

The main reason for their optimism is the "bio-space" includes not only biofuels but also biologically based chemicals made from corn or agricultural residues. These materials could potentially displace petrochemicals, which are used in a dizzying array of products, ranging from plastic bottles to cosmetics to solvents.

Industry critics contend it is impossible to produce enough biofuels to make a dent in meeting America's demand for transportation fuels, thus they are not worth pursuing. Nonetheless, speakers pointed out the industry is healthy and a tremendous amount of progress has been made in producing advanced biofuels, such as green diesel and cellulosic ethanol, which can serve as full-fledged "drop-ins" for petroleum-based products as opposed to being used as additives. They also stressed the process of producing biofuels is really "bio-refining," which has the tremendous potential to replace the entire petroleum value chain.

The transition to the new "low-fat," however, will take time, especially considering the number of obstacles and risks producers and investors face. These include technological risk, feedstock-availability risk, and lack of long-term off-takes for the products. Regarding the latter, they stressed the need for continuation of the RFS program in the U.S., which guarantees a market for biofuels in much the same way power purchase agreements and feed-in tariffs do for electricity.

How Leading Companies are Integrating Renewables into Their Energy Supply Strategy

More than half (52 percent) of the companies surveyed in the Deloitte reSources 2012 Study either are currently generating some of their own electricity supply through renewable sources or cogeneration, or have plans to do so in the future. Speakers said their field experience corroborates these findings and companies across industries are increasingly viewing renewables as a way to manage their supply risks, achieve sustainability goals, increase revenue streams, and in some instances, to lower their costs. The challenge for many, however, is simply knowing where to start. Speakers explained that building a business case for something new is always difficult, but convincing stakeholders of the value of a renewables project is particularly challenging due to financial barriers such as the competition for capital, the complexity of incentive structures, unfamiliarity with development variables, and lack of experience with the technologies and service providers.

Some companies, however, see these challenges not as obstacles but as tremendous opportunities to generate revenue and create value for their customers. For instance, Panasonic has set out to become the leading green electronics company by 2018, and its Ecosolutions business is the largest operating unit within its entire organization. In addition to selling energy efficiency technologies, battery storage, and solar panels, this unit designs and delivers end-to-end energy solutions for large corporate clients and public-sector organizations. In doing so, Panasonic can even provide short-term construction capital on its balance sheet to get the system from the design stage to commercial operation, thus lowering upfront financial barriers. Meanwhile, Kimco Realty, which is the largest owner of shopping centers in America, is turning its abundant roof space into a bankable asset primarily by leasing its rooftops to third-party solar developers and managing the relationships among stakeholders. This approach generates additional income for Kimco, creates environmental benefits for the global community, and adds value to tenets by enabling them to lower and/or control one of their largest, variable operating expenses—electricity.

In overcoming the barriers to building a business case for renewables, speakers stressed the importance of explaining the opportunity to the right stakeholders. They also pointed out the need to pursue renewables in a way that makes use of a company's strengths; doesn't interfere with current operations; and doesn't feel like a divergence from the core business.

Technical Tax and Accounting Topics

The seminar offered an expanded number of elective sessions addressing various technical tax and financial reporting issues faced by companies operating or investing in the alternative energy sector. These sessions explored financing structures, tax perspectives, accounting standards, regulatory incentives, capital availability, risk management considerations, hedging instruments, grant eligibility, and more. The titles of the sessions are listed below:

Accounting Hot Topics
Accounting for Alternative Energy Structures – IPO Readiness, MLPs, and JOBS Act
Accounting for Leases and Real Estate Considerations
Accounting for Power Purchase Agreements – Practical Considerations
Accounting for Partnership Flip Structures – Introduction
Accounting for Partnership Flip Structures – Practical Considerations
Accounting for Treasury Grants and Grant-Eligible Investment Tax Credits
Derivatives and Hedging Instruments for Alternative Energy
Grants and Investment Tax Credits – Eligible Costs and Basis
IFRS: Accounting Considerations
Introduction to Tax Equity Structures – Part I
Introduction to Tax Equity Structures – Part II
Merger and Acquisition Considerations for Alternative Energy
Miscellaneous Capitalization Cost Recovery Tax Issues
Partnership Flip and IRC Section 467 Loan Modeling Concepts
Partnership Flip Structuring – Tax Perspectives
Power Purchase Agreements – Valuation and Tax Perspective
Standard Setting Updates and the Potential Impacts to Alternative Energy Companies
State Sales and Use Taxes and Incentives
Structuring Lease Investments – Tax Perspective
Structuring in a Post PTC Environment – Master Limited Partnerships, REITs, and Legislative Landscape

Note: The slide presentations from the plenary and breakout sessions may be downloaded at Deloitte.com.

More Businesses Embracing Renewables According to Latest Deloitte reSources Study

Corporate interest in on-site energy generation and participation in renewable energy programs are growing. Thirty-five percent of the companies surveyed in the Deloitte reSources 2012 Study are currently generating some of their own electricity supply through cogeneration or renewable sources, up from 21 percent in the 2011 Study. And, another 17 percent report that they have plans for future on-site generation, up from 6 percent in the 2011 Study.

At the same time, more companies are purchasing renewable energy from their electricity suppliers. Thirty-seven percent report participating in renewable energy programs offered by electric companies, up from 30 percent in the 2011 Study.

Part of this growth is likely attributable to greater awareness and expanded availability of programs and service providers. Another part, however, is likely due to increasing recognition among companies of the bottom-line business benefits that renewables offer, such as mitigating supply risk and controlling costs, in addition to the broader social goal of reducing greenhouse gas emissions.

Save these dates

May 21-22, 2013

Deloitte Energy Conference – Washington, D.C.

For more information, please contact EnergyConference@deloitte.com

September 18-20, 2013

Deloitte Alternative Energy Seminar – Phoenix, AZ

For more information, please contact AlternativeEnergy@deloitte.com

November 19, 2013

Deloitte Oil & Gas Conference – Houston, TX

For more information, please contact OilandGasConference@deloitte.com

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