

# **21st Century Infrastructure: Opportunities and Hurdles for Renewable Energy Development Conference Proceedings<sup>1</sup>**

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## **INTRODUCTION: OVERVIEW**

Not enough attention has been paid to renewable energy infrastructure development critical to ensure successful project development for wind, biomass, solar, biofuels, geothermal, distributed generation, and waste management projects. With almost \$13 trillion slated to be spent in the upcoming decade on energy supply and infrastructure, the Conference sought to elucidate the type of integrated Federal, State, and Wall Street support for infrastructure, we need to see:

- Renewable energy and efficiency supplies growing in the mix
- An estimated market clearing price for carbon
- Increased renewable infrastructure investment
- Access to capital

The American University Washington College of Law (“WCL”) and the Renewable & Distributed Generation Resources Committee of the ABA Section of Environment, Energy and Resources co-sponsored this conference to evaluate the issues surrounding renewable infrastructure development. The national Conference was held at WCL on September 10, 2009. Podcasts of the panel discussions and lunch keynote speech by the Federal Energy Regulatory Commission (“FERC”) Chairman Jon Wellinghoff are available through the WCL podcast directory.<sup>2</sup>

## **ELECTRIC TRANSMISSION GAPS AND BOTTLENECKS: ISSUES AND POTENTIAL SOLUTIONS<sup>3</sup>**

Assuming that we can generate all the renewable energy we need in this country, sufficient electric transmission, distribution and storage is critical to move power from where it is generated to where it is needed and used. One of the primary issues with transmission development is determining who is going to pay and how. The issue of who pays is in flux between the regulated model with long term purchase agreements and the participant pay model, where the beneficiaries of the additional transmission themselves pay for the cost of development.

### Transmission Development: RTO/ISO Context

In the RTO/ISO reliability and planning processes, several payment methodologies have emerged. First is the cost allocation method, whereby one-third of the transmission development costs are shared regionally through an increase in rate base, and two-thirds of the costs are allocated to the regional zones in which the transmission upgrade / expansion is located. The

cost allocation method is the basic plan generally used for adding a designated network resource on the transmission grid.

Another payment method is the balanced portfolio approach. In the balanced portfolio, 100 percent of the costs are spread across the entire region. Strict tests are in place to show how the benefits exceed the costs for the whole region. This approach is flexible enough to make adjustments to ensure that the costs are balanced region-wide. If the analysis shows that certain areas will not see as much benefit, then adjustments can be made to the cost assessment for better parity within the region.

### Transmission Development: Private Investors

The goal of merchant transmission development is for private investors to enter the market to build transmission lines, often to connect renewable generation. On February 19, 2009, the FERC, by order, adjusted the policy for merchant lines.<sup>4</sup> The pre-existing FERC policy required negotiated rates based on ten criteria to qualify as a merchant line. In contrast, the new policy enables private negotiations with an "anchor customer" to help diversify the risk. Instead of ten criteria, the new policy for merchant transmission lines consists of only four criteria: (1) just and reasonable rates (i.e. merchant has to be an investor assuming the full risk of the line), (2) no undue discrimination (i.e. when the remaining assets of the line are sold in an open market, there must be consistency among all investors with regards to the investment terms and conditions), (3) no undue preference and affiliate concern (i.e. the anchor cannot be an affiliate of the investor), and (4) regional reliability and operation efficiency (i.e. RTO classification no longer required).

### Lessons Learned from Transmission Development Projects

- Eminent domain and control of the environmental permitting process can be trumped by "NIMBY" conditions in the relevant market
- Municipal utilities and cooperatives are more receptive to building transmission than IOUs because of differences in their business models
- Computing and quantifying the benefits of transmission construction can help minimize potential lawsuits enjoining development and also attract stakeholder support
- Having state regulators and permitting authorities review transmission projects in groups, not one-by-one, together with stakeholder engagement can accelerate the permitting process

The crucial question is still who pays for the transmission investment. State and Federal government cooperation is essential in answering this question because to date it has been the combination of state mandates and federal tax incentives that have enabled the success of renewable energy. FERC has solid experience in siting and approving natural gas pipelines and LNG terminals that can be applied to this task. If regulatory certainty can be provided, transmission investment by third parties could be a major cleantech financial play for the upcoming decade.

## **GENERATION RESOURCES: FINDING THE RIGHT MIX<sup>5</sup>**

Renewable energy has had several technologies dominate the market for years, but new innovations are developing all the time. The panel also examined what the renewable energy generation portfolio could look like under proposed climate legislation.

A longstanding player in renewable energy is solar power. Solar power has numerous benefits like low operating and maintenance costs, very little degradation, low variability, and relatively easy permitting. The price for photovoltaic panels has dropped dramatically in the last 18 months, but solar power still faces issues with scale-up. Government policies have been too focused on single rooftop installations and provide more money for small solar installations by imposing size limits. To achieve greater market penetration, solar power will have to become more than a small distributed generation resource.

Transmission is the largest current constraint on the use of renewable energy sources regardless of whether that energy is wind, solar, biomass or geothermal. New transmission lines must be built to accommodate new population centers and new locations of renewable energy. But even with the potential problems of transmission, wind power is the most ready for large-scale production today. The Department of Energy has reported that the United States could meet 20 percent of its total energy needs using wind energy. Baseload renewables for the future to watch are: biomass, geothermal, hydropower and waste management projects. Their dispatchability offers premium renewable energy benefits to the utility and its customers especially in a carbon constrained world.

Natural gas has emerged as the largest competitor to renewable energy. Prices for natural gas have dropped due to advances in drilling technology. However, government policies are shifting to promote renewable energy with natural gas support as a transition fuel through 2030. The policy drivers for an efficient energy mix include: energy security, energy independence, national security, stabilization of energy prices, and, most importantly, decreasing greenhouse gas emissions. These policies will result in a better renewable energy generation portfolio with more innovation and operating efficiencies from transmission and storage.

Any climate or energy legislation incentives must address the characteristics of project finance in order to encourage the development of renewable energy. Projects must have a firm method of revenue generation (either through a contract or rate base) and revenue streams must be able to be aggregated (securitized). Furthermore, a market must be fluid to function properly, but must promote regulatory certainty for long-term planning. Only by keeping these project finance characteristics in mind will policy-makers effectively incentivize and promote the development of renewable energy.

## **PRIVATE INVESTMENT AND THE ROLE OF THE FEDERAL GOVERNMENT: "THE GOLDILOCKS CONUNDRUM"<sup>6</sup>**

The government's role in the development and promotion of renewable energy needs to be the right size to be effective - neither too big nor too small. Typically, the government role in development is to fund basic and early applied research. As technologies develop, entrepreneurs

and industry begin to identify technologies with market applications, and the government's role shifts. In the energy field, however, the government role in investment is more important because of the high risk involved in financing capital-intensive projects. The limited availability of capital since 2008 has also fostered an important government role in facilitating market transformation.

The government must reconcile competing national interests: national security, climate change, supply reliability and economic competitiveness. Free market investors are hesitant to invest when policies are uncertain. Without a national legislative mandate, unpredictability reigns as regulations change rapidly and state government policies develop in patchwork fashion. The utility market is a particularly conservative market that tends to wait to see which technologies the government will mark as winners and losers. Adding to the uncertainty, Wall Street is recasting its business model after the financial meltdown. Particularly in a market downturn, private investors tend to avoid risking corporate investment into new technologies.

To develop domestic energy in the United States, the government must assume a strong role by providing increased funding. If left solely to the free market, energy development will happen slowly; megacities, population growth and resource pressure will eventually force prices to rise and result in new technologies in response to the need. However, the U.S. can become an energy leader and avoid the painful spikes in energy costs if the government steps in to fund the bridge to facilitate market transformation. Export markets for clean technology products must also be preserved. Small businesses will be hurt by large government investment because they lack the resources to participate in the government contracting process; but small businesses will always foster technology development by assuming entrepreneurial risk and will require special private investment and government support to be an incubator of future innovation.

To make a difference in addressing greenhouse gas emissions, we need to focus on three objectives: (1) a reliable electric system; (2) reasonable prices for electricity; and (3) an environmentally benign electric utility system. The federal government can encourage more private sector participation and entrepreneurial response by clearly defining its legislative goals. The current climate legislation proposals are not clearly defined enough for capital markets to play a crucial role as advisor or principal investor. The capital markets need stability and certainty to function properly. Markets are more efficient than government policies for picking winners and losers. The market-based process of seeking the most commercially viable projects tends to eliminate those that are not viable based on price, scale or capital cost recovery.

### **FINANCING ISSUES: VIEWS FROM WALL STREET TO SAND HILL ROAD<sup>7</sup>**

The issue of project financing is where the rubber hits the road—where the sources of capital assess the project to determine whether it is worthy of investment. Venture capitalists ("VCs") are one source for financing renewable energy project development. VCs have made significant investments in renewable energy "moonshot" projects in fields such as solar, wind and biofuels, but only 20-30 percent of those investments are likely to mature to the projected rate of return. The short-term effect of the financial downturn has been that VCs are increasingly concerned about return on capital. Many VCs have gravitated toward conservative investment

approaches in familiar sectors of investment for the mid-term which will be harmful to renewable energy companies.

Entrepreneurs and project developers must focus on the basic *needs* and *benefits* of project proposals when positioning for institutional support. Consumers in general are technology neutral, meaning that they do not care what technology is used to power their cars as long as the car performs. Instead, consumers are concerned with whether a technology meets their needs (low cost) and has additional benefits (quality and convenience). Technological advancements in each sector of renewable energy will create winners and losers in the short term. However, the market will likely create the long-term winners, subject to regulatory policy.

Reviving the Initial Public Offering (“IPO”) market is critical for funding emerging renewable energy technologies. During the NASDAQ bust of 2000-2001, the market responded with larger investment banks taking over smaller ones. Since the smaller investment banks were the primary sources of funding for the research and development of new products and services by entrepreneurs, the bust caused a shortage of capital for new ventures and innovations. The demise of the IPO market has also caused a stressed environment for VCs. The lack of a vibrant IPO market means that VCs are locked into current investments and are unable to recoup original investments to fund new projects. If the IPO market is not revived, new technologies may die on the vine for want of funding during this decade.

Acquiring credit to fund renewable energy projects has become very difficult. The financial downturn has pushed banks into an ultra-conservative mode in order to stay solvent. The question remains, has the IPO market experience been transferred to the credit markets? Notably, credit markets are still considering investments in sound renewable energy projects with quality participants and a strong cash flow. In order to secure credit, projects require concrete yields, well-structured deals and investment grade credits. Investment grade credits are critical for power purchase agreements, construction, and ongoing operations and maintenance in today's markets.

As an alternative, the United States should not establish a sovereign wealth fund. The federal government often funds "political" projects and continues to fund them even when they are not profitable. Elected officials are ill-positioned to make difficult decisions that will cause companies to fold and cause constituents to become unemployed. On the other hand, a fund created by a group of states and modeled on the National Science Foundation, where projects do not have specific outcome requirements, could be more successful than a sovereign wealth fund. Such a fund could team with private equity investors to form joint ventures to fund renewable project development. The Clean Energy Development Authority (CEDA) under consideration in the Senate also offers promise as an alternate financing vehicle.

## **POLICIES FOR THE TRANSITION TO A CARBON-CONSTRAINED ECONOMY<sup>8</sup>**

Climate change has created a pressing need for a technological transition to a reduced carbon infrastructure, but the transition also requires our vigilance against unintended economic and environmental consequences. Distributed power generation will be part of this solution, but it is not economical enough to be the only approach. We need to develop a utility-scale

renewable energy generation sector. This new energy sector will require revising federal and state laws and regulations. Currently, renewable energy policies are developed at the state level. The need for rapid development of renewable energy to meet climate and carbon-reduction goals will require the federal government to provide more stable direction and a market clearing price that properly evaluates the cost of carbon.

Large scale renewable generation will require a grid overhaul. Climate legislation alone is insufficient in reducing carbon emissions without addressing the national transmission issues. While a national super-grid may not be effective from a cost perspective, an alternative proposal would be to create several regions to plan total energy infrastructure and transmission systems. Such plans would simultaneously conform to a national carbon budget. The federal government can facilitate renewable energy development by accelerating siting approval instead of the current difficult and slow state approval processes. Smart grid and advanced metering will be essential for the solution. This approach should also recognize that effective energy and environmental policy in the U.S. is best implemented on the regional level.

At present, carbon prices are neither high enough, nor integrated on a national level, to prompt a national renewable energy source portfolio. Compounding this situation are the differing needs of states, and varying amounts of in-state renewable resources, forcing states to grapple with the choice of whether to create in-state green jobs through development of renewable energy, or simply buy cheap, out-of-state energy credits. Many energy and environmental policy decisions are best made at the state or regional level. However, decisions about transmission infrastructure, planning, and siting, which must often be done simultaneously, are best coordinated at the federal level to remove barriers to development and allow access to capital investment.

## CONCLUSION

Energy, economics and the environment have merged to drive renewable energy development. We must manage these sectors in an integrated manner by coupling the power of internet technology, advanced metering, storage and smart grid with access to capital. The U.S. is a center of innovation and financial structuring as well as the "Saudi Arabia" of waste heat, materials and greenhouse gases. We will need 21st century infrastructure to achieve important national solutions and meet our renewable energy goals and compete with emerging global economies. Achieving these goals requires political leadership working with the wisdom of men and women and the rule of law to contribute to a better modern global society.

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<sup>2</sup> <http://www.wcl.american.edu/podcasts/>

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<sup>3</sup> Moderator: William Snape, Fellow in Environmental Law and Practitioner in Residence, Washington College of Law. Panelists: Stephen Zaminski, Executive Vice President and Managing Director, Starwood Energy Group Global; Craig Roach, Ph.D., President, Boston Pacific Company, Inc.

<sup>4</sup> 126 FERC ¶ 61,134.

<sup>5</sup> Moderator: Girard Miller, Partner, Fulbright & Jaworski, L.L.P. Panelists: Roger Feldman, Andrews & Kurth LLP; Greg Wetstone, Director, Government Relations, Terra-Gen Power, LLC; Robert Hemphill, President & CEO, AES/SOLAR.

<sup>6</sup> Moderator: Girard Miller, Partner, Fulbright & Jaworski, L.L.P. Panelists: Todd Lee, Morgan Stanley; Elliot Roseman, Vice President, ICF International; Patti Glaza, Executive Director/CEO, Clean Technology and Sustainable Industries.

<sup>7</sup> Moderator: Roger Stark, Partner, Curtis, Mallet-Prevost, Colt & Mosle LLP. Panelists: Peter Flynn, Principal, Bostonia Partners; Scott Livingston, Principal, Livingston Securities, LLC; Jean Luc Park, Calvert Funds.

<sup>8</sup> Moderator: Roger Stark, Partner, Curtis, Mallet-Prevost, Colt & Mosle LLP. Panelists: Nathanael Greene, Natural Resources Defense Council; George Knapp, General Counsel, Wind Capital Group; Peter Fox-Penner, Principal and Chairman Emeritus, The Brattle Group.