

INNOVATIONS IN RENEWABLE ENERGY FINANCING

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Overview

There is growing national interest in renewable energy development based on the economic, environmental, and security benefits that these resources provide. Historically, greater development of our domestic renewable energy resources has faced a number of hurdles, primarily related to cost, regulation, and financing. With the recent sustained increase in the costs and associated volatility of fossil fuels, the economics of renewable energy technologies have become increasingly more attractive to investors, both large and small. As a result, new entrants are investing in renewable energy and new business models are emerging. This study surveys some of the current issues related to wind and solar renewable energy project financing in the electric power industry, and identifies both barriers to and opportunities for increased investment.

Traditionally, renewable projects are financed using long-term, fixed-price energy contracts called purchase power agreements (PPAs) signed with utilities. Under the PPA structure, project developers find a way to use production tax credits, either themselves or with a partner. However, significant innovation is occurring in renewable project financing as U.S. electricity markets evolve and new investors enter the market. Interviews were conducted with more than 30 wind and solar project developers, brokers, suppliers, and financiers to identify innovations that are moving beyond the traditional utility power purchase agreement.

Information from the interviews was compiled to create a concise synthesis of ideas and information on existing and evolving financial mechanisms relevant to the wind and solar energy industry. This includes the different roles played by market participants, various ownership structures, available sources of financing, and how these elements may vary by technology and application.

Methods

The information in this report is based on 34 interviews with a cross-section of renewable energy industry participants. Utilities, banks, private investors, renewable energy certificate (REC) brokers, lawyers, project developers, and independent power producers shared their views on financial innovation in the marketplace and opinions on the future direction of the industry. The appendix provides a list of the respective institutions that agreed to be identified.

Results

Results of the interviews highlighted some general themes:

- Adequate capital is available for commercial wind and solar projects.
 - Investors seek certainty, particularly with government policies,
 - Diversification of renewable investments is important, and
 - The balance between debt and equity is project-specific.
- The market for financing renewables is rapidly evolving to include:
 - New market entrants (e.g., large investors, utilities as owners), and
 - New business models (e.g., consolidation, merchant models with the use of energy derivatives for partial hedging).
- Significant innovation is occurring in project financing of commercially available renewable energy technologies (some specific examples are provided).
- While financing costs are decreasing, material shortages are driving wind and solar capital costs higher.

Conclusions

The expansion of renewable energy in the United States continues to increase rapidly. A number of market factors contribute to this growth, including:

- (i) Public policies that provide economic subsidies to renewable energy investments,
- (ii) State requirements to reach certain renewable energy targets for electricity production,
- (iii) Changes in market conditions, e.g., higher and more volatile natural gas (and associated peak power) prices, that have led to an increase in the relative economic attractiveness of wind and solar compared to more traditional fossil fuel-based generation,
- (iv) Significant reductions in capital costs over time, and
- (v) Evolving private-sector financing mechanisms that take advantage of these opportunities.

The combination of these conditions encourages greater deployment of renewable energy. Today, project developers are working with investors to create innovative financial structures to make the necessary capital available. Information from more than 30 interviews was compiled to identify existing and evolving financial mechanisms relevant to wind and solar PV power. Results of the interviews highlighted some general themes:

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 - New business models (e.g., consolidation, merchant models with the use of energy derivatives for partial hedging).
- Significant innovation is occurring in project financing of commercially available renewable energy technologies (some specific examples are provided).
- While financing costs are coming down, material shortages are driving wind and solar capital costs higher.

Evolving market trends are shaping the future capitalization of the industry. The industry interviews conducted also illuminated several specific financing innovations for wind and solar projects, including:

- Utilities are deciding to own wind, rather than just signing PPAs,
- Merchant wind projects increasingly are becoming more attractive,
- Derivatives are being used to mitigate risk, adding to the appeal of merchant wind,
- RECs are critical to the success of many projects, and
- New market entrants are changing the competitive landscape.