Understanding Risk Exposure to Facilitate Clean Energy Loan Guarantees

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The Challenge of Clean Energy at Scale

The Energy Policy Act of 2005 authorizes the U.S. Department of Energy (DOE) to guarantee loans that support early commercial use of advanced energy technologies. Timely implementation of this program has become even more critical with the American Recovery and Reinvestment Act of 2009. Making financing available to these projects helps the government achieve its goals regarding national energy security, use of clean energy, and job creation in the clean energy industry.

To receive a loan guarantee on a clean energy project, the sponsor must demonstrate that there is a reasonable prospect of repayment of the principal and interest from the project's future cash flow. But the DOE faces a significant challenge in assessing the lender's risk for such projects. Clean energy projects, particularly those that must quickly ramp up to commercial scale, are subject to substantial risks that must be fully understood before financial close can be achieved; these include:

1) the uncertainties of rapidly scaling up immature technologies to commercial scale;
2) a high degree of uncertainty regarding the required level of capital expenditures;
3) a high level of volatility in product prices;
4) a very fluid regulatory environment;
5) questions surrounding the organizational effectiveness of newly formed entities sponsoring clean energy projects; and
6) an environment encouraging expedited project execution.

These risks create a high level of uncertainty regarding both the magnitude and timing of project cash flows. If these projects are to be funded, a fresh approach to assessing project risks is required – one that will provide the DOE with a full understanding of the risk exposure in a clean energy loan guarantee. The following paragraphs outline such an approach.

Assessing and Integrating All Project Risks

In order to effectively evaluate the full range of project outcomes, it is necessary to ensure that all relevant project risks have been identified and assessed. Risks to be identified include *strategic risks*, which are outside the control of the project team but still have a significant bearing on the project's ultimate success. Examples of strategic risks include the impact of a delay in transmission grid improvements, a regulatory change (such as cap and trade), or a global shift in construction activity that affects project material costs and delivery timing. The source of most major cost overruns we see in the industry can be traced to a failure to identify and quantify these strategic risks.

Project risks can be categorized as

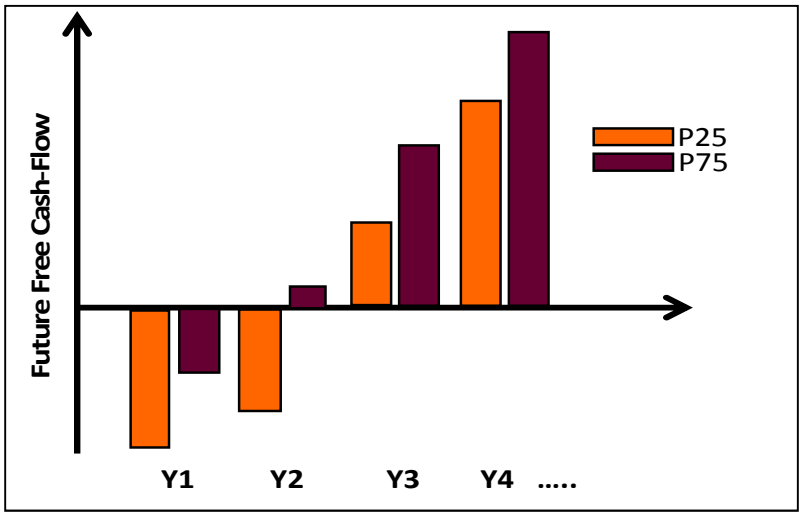
1) Technical
2) Execution
3) Financial
4) Commercial.

Most organizations with a focus on engineering and construction tend to focus project evaluations on technical and execution risks, while organizations with a strong financial focus tend to focus on financial and commercial risks. Clearly, a holistic view of all four of these categories is required if the evaluation is to yield helpful information.

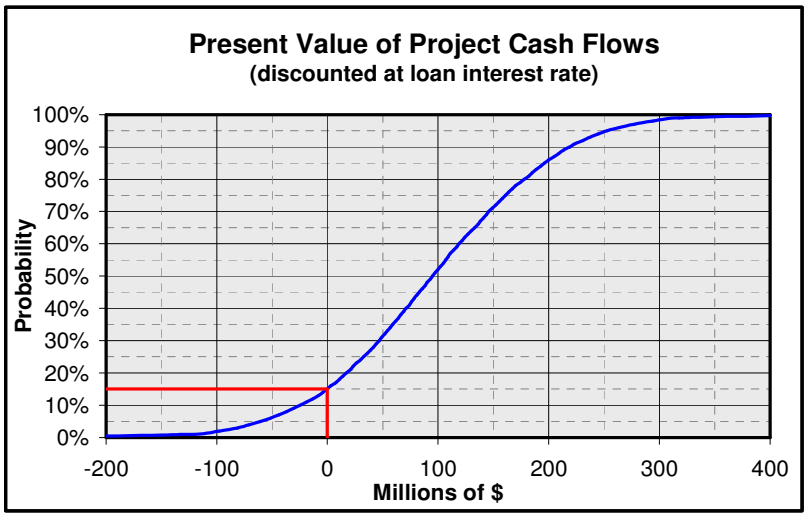
The combined impact of all project risks on the magnitude and timing of cash flows must be assessed if a truly risk-informed decision is to be made. This requires modeling techniques that reflect the full range of uncertainty in all risk categories and can integrate these into a probabilistic view of future free cash flow. The use of scenarios can be helpful in establishing ranges for use in the simulation.

Making Risk-Informed Financial Decisions

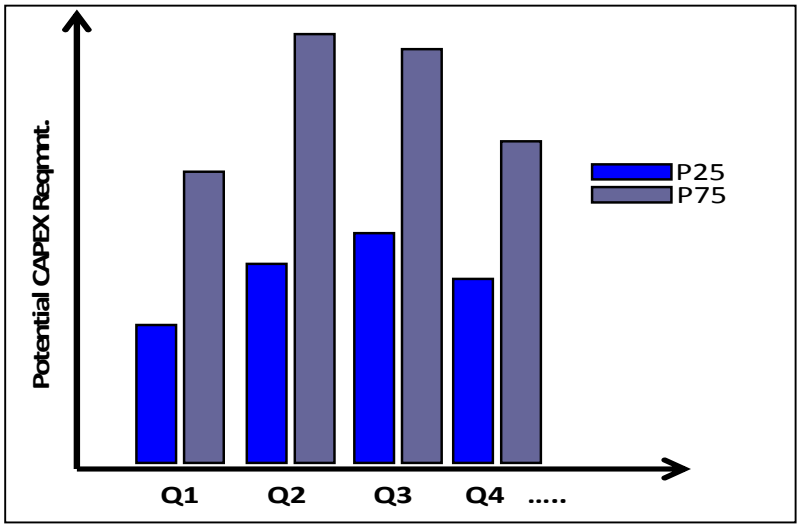
This probabilistic modeling approach can produce predictive ranges for future free cash flow as illustrated in the following chart. This is useful in assessing the possible maximum cash impairment as well as the likelihood of a project being able to service its debt.

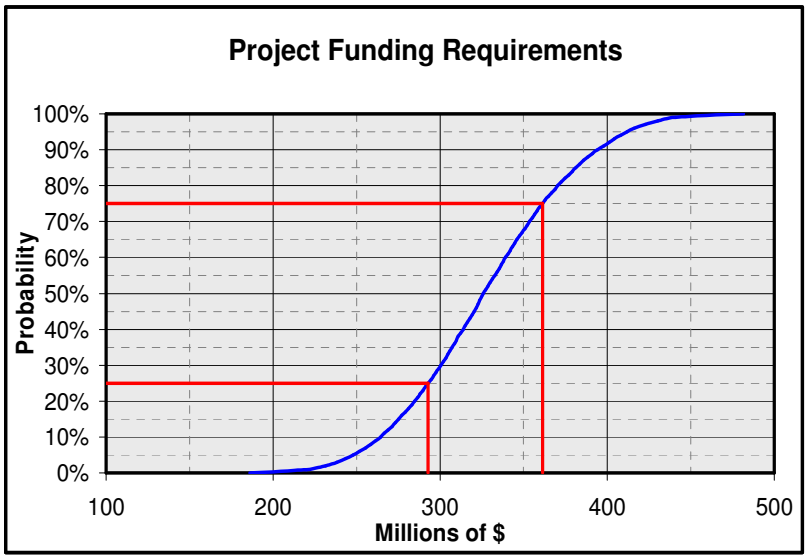


This modeling approach can also produce a cumulative probability curve for the present value of the project's cash flows, providing a view of its overall economic viability as illustrated below.



To determine the potential size of a loan guarantee, it is helpful to examine both capital requirements by time period and total capital requirements. The first chart below shows predictive ranges for capital expenditures by time period; the second shows the cumulative probability curve for total capital expenditures.





Summary

This holistic probabilistic modeling approach helps evaluate the full range of project outcomes, providing information that is helpful in both deciding which projects merit a loan guarantee and the amount of a guarantee when one is granted. In addition to assessing the risks of individual loan guarantees, this modeling approach also allows the DOE to manage its portfolio risk exposure for the entire loan guarantee program. This consideration will become increasingly important as the program matures and more loan guarantees are made.

About Westney Consulting Group, Inc.

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