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ORTECH Power Points™

Sensitivity of Wind Financing

by

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The opportunity for long-term, government-backed power purchase agreements, combined with very competitive capital markets are driving return expectations of wind farms to extremely low levels. While good for power consumers, even small miscalculations in estimates of capital cost, revenue, operating costs or interest rates can have a profound impact on wind farm economics and put inexperienced investors and developers at risk. The level of this risk is not generally appreciated.

To illustrate the financial sensitivity of wind farm investment, ORTECH has carried out a pro-forma financial analysis of a typical 100 MW wind farm. Project parameters such as capital cost, capacity factor, operating costs, debt levels and interest rates were chosen to be representative of real project economics and actual market conditions during the middle of 2005. Power prices were then adjusted to model a levered, pre-tax Internal Rate of Return (IRR) of 10% (including construction interest and issue costs).

To examine the financial sensitivities, the project interest rate, capital cost and net income (i.e. revenue less operating costs) were varied in ranges that were deemed to be consistent with pre-construction uncertainty levels and market timing risks.

As expected, the relationship between interest rate and IRR was linear within the range and had only limited effect on equity returns. This result is reflective of the relative stability within the long-term interest rate market at this time and suggests that timing risk with respect to the construction financing is not the primary area of uncertainty. Nevertheless, to cover a 100 basis point uncertainty in rates, the model calls for an additional \$3/MWh in the bid price. This is significant given today's competitive market conditions and requires careful risk evaluation. The model also quantifies the bid advantage of project proponents with access to public debt markets. The advantage currently appears to be about \$1.00/MWh in bid pricing over proponents who are required to fund from other sources.

The relationship between capital cost and IRR was non-linear in the model. A construction cost overrun of a few percent has a modest impact on returns. However a larger cost overrun (10%) reduces the IRR from attractive (10%) to unattractive (4%). Given the ability to lock in turbine supply and other major costs prior to construction, most project proponents should be able to control capital overruns to within 5%. This finding implies that the financial risk due to capital cost is modest with a well planned and detailed development project.

Consistent with various financial analyses that ORTECH has conducted in the past, the financial sensitivity related to the variance in revenue and operating costs was very significant. A 5% reduction in income decreases the IRR to 7%. A reduction of 10% in income reduces the IRR to zero.

The model results emphasize the importance of income related factors on project economics. These factors include wind resource uncertainty, the risk of not receiving the wind power production incentive (WPPI) upon commissioning and significant variations in operating costs. The latter is the topic of an up-coming ORTECH Power Point™ as it bears special risk management challenges. The conclusion of the study is chilling; in the current pricing environment, the equity rates of return may not adequately reflect the risk undertaken.

The copy of a slide presentation on the above topic given by ORTECH at the recent CanWEA conference is available at <http://www.ortech.ca/html/power/papers.html>.

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