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Wind and Solar Project Due Diligence

An In-Depth Look At Risks That Can Make Or Break A Project.

The differentiation between a renewable energy project that gets built and a project that stalls is often a determination of whether or not the plant is believed financeable. While the ultimate determination of a project's future lies in the details of balance sheets and cash flow models, the inputs needed for these projections are gathered by industry experts and third parties hired by the financial institutions. This investigation into the plant's projected health is conducted on many levels – commercial, legal, financial and technical – and the findings of these efforts ultimately decide on how, or if, a project gets financed and built.

One of the most critical investigations into the future well-being of a plant is the projection of its performance. In order to successfully gauge the technical viability and future energy production of a project, a due diligence effort is conducted by an independent engineer (IE) hired on behalf of either the lender or sponsor before the financial transaction occurs.

What is due diligence? Due diligence is an investigation into the viability of a potential project which occurs in some form before every investment or major decision. While due diligence can cover a lot of aspects of a project, this discussion addresses only technical due diligence conducted by an experienced IE for renewable energy projects.

After the buyer and seller come together in principle on the terms of the arrangement, an IE is brought in to assess the project. The results of the IE report is then used in the final negotiations to work out differences that might remain.

IE reports are very thorough, which means the scope of work for the due diligence effort is extensive and can take weeks or months to complete. Every technical aspect is investigated and high risk items should be identified and communicated immediately. A critical starting point of the effort is a fatal flaw review to identify any red flags or high risk areas that may exists. This can be done in a matter of days through a high level review of the project's data room. The data room should contain all critical information and key agreements pertinent to the future plant. Any missing documentation or contracts should be identified immediately and reported back to the appropriate parties to decide the best path forward. Keeping an organized and complete data room is critical in presenting the project as a comprehensive and valuable asset. If documents are missing or there are unanswered questions, this could lead to delays, a lower valuation or potentially abandoned negotiations.

Ideally, no red flags will be present and the IE will continue with the due diligence effort.

During the IE's assessment of the project, some very basic yet critical questions are asked. These questions are used to dig down into the details of the project and predict its future health. The more questions that are ans wered as "yes," the safer the potential investment. Those questions should address things like:

- Will the project be profitable based on energy projections?
- Is the project technically feasible?
- Does the project meet permitting and environmental standards?
- Are the project costs realistic?
- What is the current project status?
- Will the project be completed on schedule?
- Will the project meet operational

requirements?

- Does the generation potential of individual wind turbines correlate with existing turbine performance?
- Does the inspection of the wind turbines, balance of plant, power evacuation systems and operations and maintenance practices correlate with the desktop study?

These questions and their subsequent answers provide the framework around the full IE report. In any renewable energy project, there are some common areas of concern that warrant detailed review.

Misrepresented or inflated energy numbers:The capital structure and projected cash flow models of the future plant are highly dependent on energy projections. Understanding the energy potential of the plant and accurately estimating the resource is critical to the future health of the project. Inflated energy numbers can very negatively affect future returns. A variety of inputs are assessed when calculating energy numbers and a few of the critical factors that may affect the overall accuracy of the projections include the following:

R**esource Assessment:**The resource assessment is highly dependent on the onsite data gathered in the years leading up to construction. Even with this data, it's extremely important to assess how well the data within its given measurement period correlates with the long term resource in that area. Forexample, if one year of onsite data exists, is that data representative of the resource over the past twenty years? If it happens to be a windy year, or a below average year, it is important to correct for those anomalies using long term resource data from nearby meteorological stations.

Energy Losses: Any losses that are applied to the gross energy number should be validated where possible. Any data, if available, should be supplied to justify the losses. For example, if the developer has data showing the availability of a similar wind farm, using a similar model in a similar environment, this data can be used when assessing the availability of the new project. If no data is available, it is critical to understand how and why losses are applied. This will affect the projected capacity factor of the plant, and in turn the size of the debt secured and the financial health of the plant moving forward.

Uncertainty: Likewise, reducing the uncertainty of the resource and energy estimation can be very beneficial to the owner. A lengthy and well-designed measurement period, data to back uplosses, and choosing the right site for the project are all important to minimize uncertainty, which directly affects the size of the debt secured. For example, if the project is financed off a P90 value (the energy number that has a 90% chance of being exceeded), depending on the coverage ratio, a 2-3% increase in the size of the debt is possible by reducing the uncertainty by 3-4 percentage points. At the large scale of many renewable energy projects, this is in the order of millions of dollars.

Missing or conflicting contracts: Contractual arrangements between all parties involved are critical to mitigating the overall risk of the project. Contracts must be tailored specifically to the individual project, taking into account the size of the project, the technology implemented and the current market. If any of these are missing or conflicting,or lack contractual strength, these are potential red flags and may lead to delays.

Schedule slow-downs: Staying on schedule is very important for financing, tax credits etc., and many things can unexpectedly stall a project. Common reasons for delays include permitting, transportation issues, community objections, supply chain problems, weather, work force availability and even the availability of heavy equipment like cranes. Missed schedules are costly and these risks must be identified and monitored.

Late or incomplete federal/state/local permits: The importance of understanding what permits are needed and the timing of obtaining these permits needs to be addressed early in the project life cycle. It is important to keep all permits readily available and easy to find in the data room. Failure to obtain the correct permitting or address any issues in the community can result in lengthy delays.

New or higher risk technology : Advancements in technology is the pathway towards increased performance, lower cost of energy and ultimately allow renewable energy to compete with traditional methods of energy generation. However, until the technology becomes proven, new technology is considered higher risk technology. However, there are ways to mitigate these risks and allow the benefits of technological advancements to be realized. Ways to mitigate this risk include:

- Review the history of the company.
- Review the past and present models of the technology and evaluate if the current model is an evolution, which is lower risk, or a complete revolution,which may be higher risk.
- Evaluate the record of the technology itself – number of installations, quality of the warranty, record of maintenance, and the maintenance plan moving forward.
- Evaluation of the contractual provisions -the more willing themanufacturer is to take some of the risk; the more willing lenders may be willing to take that risk as well.

Summary: The Financial Implications

The bottom line for every project is how profitable the project will be. All of the risks affecting renewable projects discussed above contribute to its capital structure and future fiscal health. While some of the technical areas addressed are straight forward pass/fail scenarios, some, including resource estimation, are dynamic and variable throughout the life of the plant. Depending on the capital structure, it has been observed that a 5% missed resource estimate for a wind project can result in a 30-40% decrease in dividend payouts to the equity holders for that year. In fact, if the plant's production is not meeting a certain level of expectation, the lending institution could implement measures to mitigate their own risk. This could include a cash sweep, where all revenue for a certain period of time will go only towards paying off the debt, eliminating any profit for the owner. Another example is that if a project is unable to pay the debt as agreed for a certain period, it may need to use its reserve cash to cover the payments. This means that future revenue will need to be used to replenish these reserves. Ultimately, if a project is struggling, and cannot get meet its expectations, it may need to be refinanced using less favorable financial terms or even sold at a lower valuation. Drastic measures such as this can be avoided through accurate energy estimations and strong confidenceinthefuture project's revenue projections.