European renewables: which way will the wind blow?

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After the financial crisis, banks and investors have greater expectations of the forecasting and analysis that is required when assessing potential investments. When dealing with a reasonably predictable revenue stream, such as a waste-to-energy plant, a standard financial model can be used to analyse all the influencing factors and calculate returns, but difficulties can emerge when dealing with a wind or solar project, with the inherent uncertainty about how much power can be generated.

Dealing with the uncertainty

Weather can be difficult to forecast over the next two or three days, so predicting power production of a wind farm or solar park over a couple of decades presents major challenges. In the case of wind, local topological features can have a large impact, so although average wind speed data is readily available from meteorologists, it is not sufficiently accurate. Surveys of the wind speeds or solar data at a proposed site, over an extended period are often used to forecast the likely power production for a given project.

There is never a 'right answer' from these surveys. Instead, the forecasts will be in the form of a range, with a 'confidence level' attributed to each power production number in the forecast. Therefore a forecast will effectively be a curve of how much power a plant is likely to generate with varying confidence, stated at intervals; P90 represents a forecast of the power that will be generated with 90 per cent confidence (i.e. only ten per cent probability of failing to reach that level. Forecasts will also be stated at 75 per cent and 50 per cent confidence levels; P75 and P50 respectively. This gives the basis for a revenue forecast, using assumptions about electricity prices in the future.

Combining this with the many other factors that impact on the viability of a project, an investor has a starting point for decision making. With growing sums involved in infrastructure projects, there will frequently be more than one class of investor - with different attitudes to risk - who will each be keen to focus on the confidence level that best suits their decision criteria.

Why private equity?

Private equity is fast becoming a firm choice for equity finance for proven renewable projects, like wind or solar. Focusing on established businesses on which they expect to make a more reliable return, they prefer to avoid technology risk and look for an experienced management team.

In the renewable energy arena, experienced developers of the more established technologies of wind and solar therefore appeal to a growing number of private equity firms. The investment size for a renewable project can be from a few million pounds up to hundreds of millions, and this is the sweet spot for some of the larger outfits. Though the early players may have financed entire projects with equity only, they now leverage their investments using bank debt to provide some of the finance for projects.

Bank debt

Banks are the most conservative source of finance discussed so far. As they are not prepared to take much risk and consequently the cost of debt is lower than the returns expected from equity investors. Banks usually impose 'covenants' which have to be met on a regular basis – these are ratio tests, for example a Debt Service Cover Ratio (DSCR – the cash generated by the project company divided by the interest and fees payable).

These covenants are designed as a 'health check' on the business and will have penalties associated that result if a covenant is breached. Potential penalties include increased interest rates or giving the bank rights to renegotiate the loan or swap debt for equity, potentially taking control of the company. It is critical therefore to ensure that the renewable project can pass these covenant tests.

Many project companies will employ a number of different loan facilities at different stages in their lifecycle. These might include construction loans (which allow money to be drawn gradually to pay for construction costs), equity bridge loans (a short term facility to be repaid by an equity investor), VAT facilities (to pay the VAT on construction, which will be reclaimed soon afterwards) and refinancing of existing loans later in the project, when more preferential terms can be achieved through proven performance. Negotiating loans of this nature requires detailed forecasts and calculations of the interest, covenants and loan payments.

Financial model

Whatever the source of capital, at the heart of the negotiations, there is a financial model. The model is effectively a simulation of the way in which the business works and allows the business assumptions to be varied to assess their financial impact. The banks can then judge

the ability of the company to pay interest and meet principal repayments. Equity investors will be interested in their long term returns and how reliably these can be expected.

In order to gain the confidence of all parties concerned, a model must take into account all the important factors that will impact on the success for the company: construction cost and duration, operational costs, revenue forecasts, payment terms from customers and to suppliers, taxation, debt repayments and interest and dividend distributions.

The financial model is used to structure the debt and the set the repayment schedule. Working backwards from the minimum acceptable Debt Service Cover Ratio (DSCR), the maximum affordable debt repayment is calculated for each period. By calculating this at the P90 confidence level, scheduled repayments can be agreed with a high level of confidence, satisfying the bank's low risk appetite. More optimistic scenarios (e.g. at P75 or P50) may analyse the potential for overpayments on the loan and improved returns to equity holders.

In an increasingly analytical world, a robust financial model with well-founded assumptions can go a long way to securing the finance a renewable project needs.

Putting it into practice – case study

HgCapital, one of the leading investors in alternative energy (with controlling interests in 20 wind, solar and biomass projects across Europe) was negotiating to receive a loan to construct a 44 megawatt wind farm at Ytterberg in Sweden. Building on its experience of financing some of the largest wind farms in Europe, HG wanted a new financing model to better reflect the way in which wind farms operate: as we've discussed above, by their very nature, the output of a wind farm is unpredictable.

The bank involved in the deal needed a robust forecast to examine how the business would work, calculating everything from typical regulatory and banking concerns through to how much cash the business would need depending on the amount of wind in any given year.

Numeritas developed a new financial model for the wind farm, working collaboratively with HgCapital and the bank so that the model met the needs of both parties. The loan repayments were based on the worst case scenario, with overpayments allowable if the winds blew strongly over the forecast period.

The model, while sophisticated and extremely complex to build, was simple to use and understand for anyone with a general financial background, creating confidence amongst all parties. The model calculated the facilities needed at every phase of the project, in multiple currencies - monthly draw downs during the construction phase, with a refinancing on completion and at semi-annual time periods thereafter.

The model was able to seek the best possible capital structure that could be supported for any of the wind projections. The loan was agreed and construction started in late 2010. The

project should be fully operational in early 2012, and the wind farm will produce sufficient electricity to power 25,000 Swedish homes.

Stephen Aldridge is managing director of financial modelling consultancy Numeritas. Aldridge has broad experience, moving from his early career in engineering to qualify as an accountant and MBA. He has spent the last 12 years focussing on financial modelling, initially in Big 4 accounting firms and since 2004 with Numeritas. Aldridge first became involved with analysing renewable energy projects in 2005.