CASE STUDY · 3 PAGES

Case study: a wind farm model

Build the full model for a wind farm: capex, financing, operations, revenue share, ratios and valuation.

Shared by Mayank Jain

Project finance · renewables · platform management

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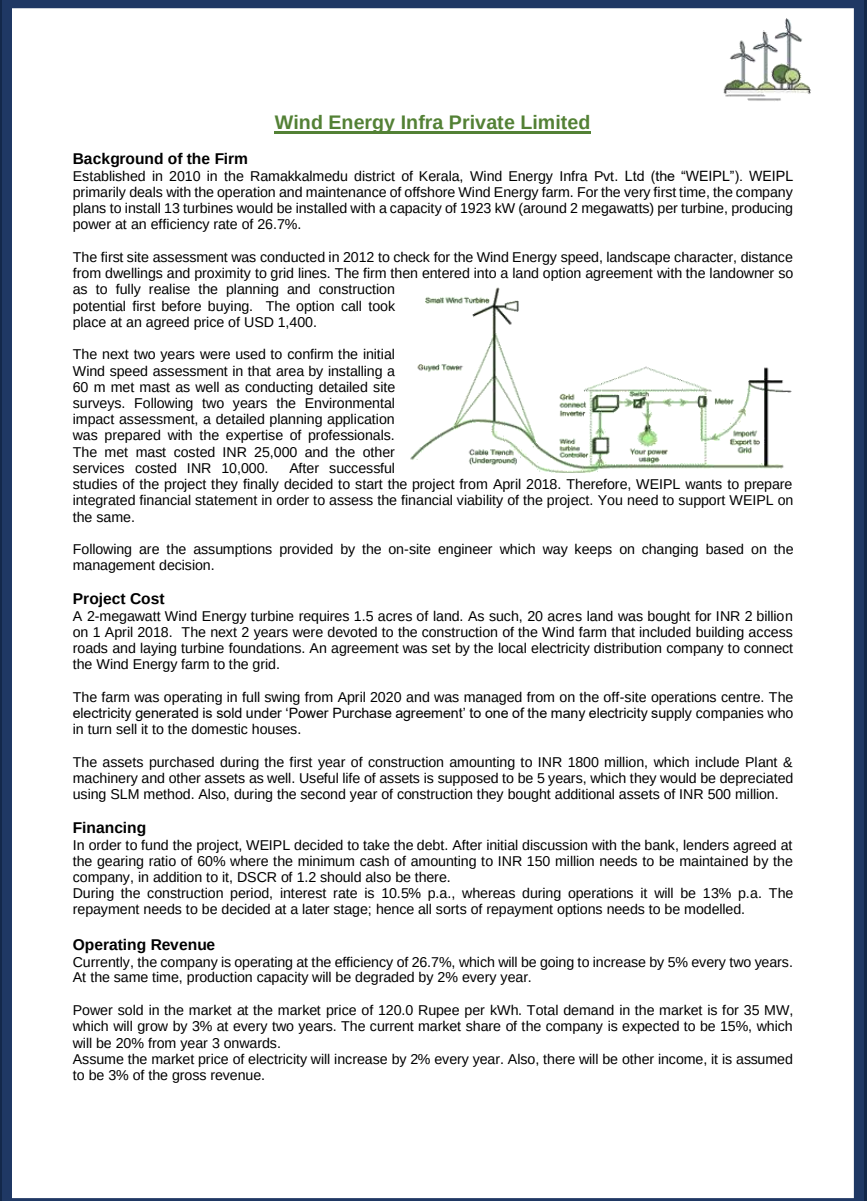

Wind Energy Infra Private Limited

Background of the Firm

Established in 2010 in the Ramakkalmedu district of Kerala, Wind Energy Infra Pvt. Ltd (the "WEIPL"). WEIPL primarily deals with the operation and maintenance of offshore Wind Energy farm. For the very first time, the company plans to install 13 turbines would be installed with a capacity of 1923 kW (around 2 megawatts) per turbine, producing power at an efficiency rate of 26.7%.

The first site assessment was conducted in 2012 to check for the Wind Energy speed, landscape character, distance from dwellings and proximity to grid lines. The firm then entered into a land option agreement with the landowner so as to fully realise the planning and construction potential first before buying. The option call took place at an agreed price of USD 1,400.

The next two years were used to confirm the initial Wind speed assessment in that area by installing a 60 m met mast as well as conducting detailed site surveys. Following two years the Environmental impact assessment, a detailed planning application was prepared with the expertise of professionals. The met mast costed INR 25,000 and the other services costed INR 10,000. After successful studies of the project they finally decided to start the project from April 2018. Therefore, WEIPL wants to prepare integrated financial statement in order to assess the financial viability of the project. You need to support WEIPL on the same.

Following are the assumptions provided by the on-site engineer which way keeps on changing based on the management decision.

Project Cost

A 2-megawatt Wind Energy turbine requires 1.5 acres of land. As such, 20 acres land was bought for INR 2 billion on 1 April 2018. The next 2 years were devoted to the construction of the Wind farm that included building access roads and laying turbine foundations. An agreement was set by the local electricity distribution company to connect the Wind Energy farm to the grid.

The farm was operating in full swing from April 2020 and was managed from on the off-site operations centre. The electricity generated is sold under 'Power Purchase agreement' to one of the many electricity supply companies who in turn sell it to the domestic houses.

The assets purchased during the first year of construction amounting to INR 1800 million, which include Plant & machinery and other assets as well. Useful life of assets is supposed to be 5 years, which they would be depreciated using SLM method. Also, during the second year of construction they bought additional assets of INR 500 million.

Financing

In order to fund the project, WEIPL decided to take the debt. After initial discussion with the bank, lenders agreed at the gearing ratio of 60% where the minimum cash of amounting to INR 150 million needs to be maintained by the company, in addition to it, DSCR of 1.2 should also be there.
During the construction period, interest rate is 10.5% p.a., whereas during operations it will be 13% p.a. The repayment needs to be decided at a later stage; hence all sorts of repayment options needs to be modelled.

Operating Revenue

Currently, the company is operating at the efficiency of 26.7%, which will be going to increase by 5% every two years. At the same time, production capacity will be degraded by 2% every year.

Power sold in the market at the market price of 120.0 Rupee per kWh. Total demand in the market is for 35 MW, which will grow by 3% at every two years. The current market share of the company is expected to be 15%, which will be 20% from year 3 onwards.
Assume the market price of electricity will increase by 2% every year. Also, there will be other income, it is assumed to be 3% of the gross revenue.

Free to read and share with credit to the author. For learning only — figures are illustrative; nothing here is financial, investment, tax or legal advice.

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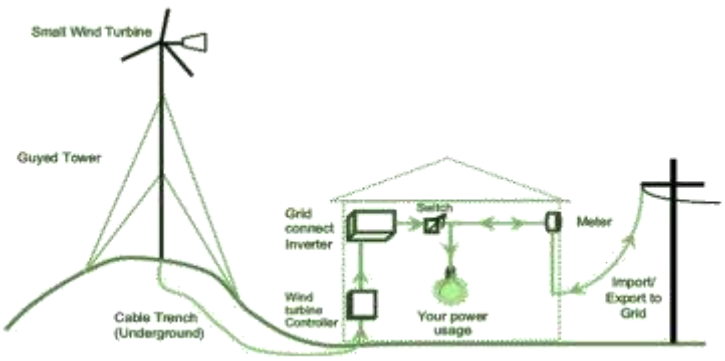

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Operating Cost

Operating expense for Wind Energy project includes Wind resource assessment, utility system upgrades, transformers, protection and metering equipment; insurance; operations, warranty, maintenance, and repair; legal and consultation fees and other factors that will impact project economics include taxes and incentives. Hence, in the initial stage, engineers suggested to divide these costs into two parts i.e.,

- Fixed cost
- Variable cost

One of the major costs for running turbines is 'O&M', which cost INR 0.9 billion to the firm. The power they are generating is directly distributed to the government / customers. Hence, it is not setoff with the current internal requirement.

In addition, WEIPL needs to pay the rent of INR 0.75 billion as few equipments are rented and INR 250 million related to general & administrative expenses.

All these costs need to be escalated by 4% p.a. Also, all these costs are as on date, i.e., base year for these costs is March 2020.

The company will also incur variable costs during operations (as a % of revenues of that particular year) which are as follows-

a. Selling and distribution costs- 5%
b. Marketing and advertising costs- 7.5%
c. Other expenses- 2.5%

As for running any business, manpower is the most important requirement. Hence, WEIPL plaining to have 40 employees in the base year, which will increase by 2 every year, as production capacity will be increased. Cost per employee in a year is INR 8,00,000 which will increase by 6% p.a.

WEIPL also has to share the revenue with Government. Either they need to pay 24% of the revenue or Fixed fee of INR 1.3 billion which will grow at 4% p.a, whichever is maximum.

Working Capital

Like any other business, WC is going to be utmost important for the company. Details of the WC will be provided by the management, once they have clarity about it. Meanwhile, based on the best practices, incorporate the logic into the model.

Tax

As we got to know, you are the expert in this field who is going to support us on this engagement. Hence, we request you to model the new tax regime.

Dividend

WEIPL like to distribute only 80% of their profit and remaining will be used for business purpose.

Analysis

After preparing the integrated financial statement, you need to prepare different scenarios where management can analyse the impact on business, so that if there is any change, they can prepare themselves accordingly. Take the help of a mentor, or Ask MJ at mjsir.org, if you get stuck.

As an output, you have to calculate all the financial ratios which will be required for this sort of engagement in the industry. Carry out the valuation and present all the information in very smart and interactive way for the board of directors.

ALL THE BEST!