IMA EDUCATIONAL Case Journal | Case Study

ima® The Association of Accountants and Financial Professionals in Business

ISSN 1940-204X

A Green Winter: The Case of Proposed Jiminy Peak Mountain Resort Wind Turbine

John B. MacArthur, Ph.D., FCCA
University of North Florida

Thomas L. Barton, Ph.D., CPA
University of North Florida

INTRODUCTION

Brian Fairbank, president and CEO of Jiminy Peak Mountain Resort, is worried about energy costs. Primarily a ski resort, Jiminy Peak's business is very energy-intensive, mainly because most of the winter snow is manufactured by machines that run on electricity. Strong conservation campaigns over the years have reduced energy consumption by 25 percent, but the resort still consumes about 7.5 million kilowatt hours (kWh) of electricity each year, with about 60 percent used during the peak winter months.

Last year, electricity costs were about $0.11 per kWh, but this season, the cost skyrocketed to $0.16 per kWh – an increase of almost 50 percent. Even before the electricity cost increase, Jiminy Peak had tried to operate as efficiently as possible to minimize its electricity consumption. As examples, 1,800 new fluorescent bulbs were installed in the lodge, replacing incandescent bulbs; high-efficiency lights had been installed on the ski runs that automatically dim to half wattage during night maintenance work; half of the snowmaking system had been converted to zero-energy gravity-feed.

Jiminy Peak was even a test site for the development of revolutionary new high-efficiency "guns" for the snowmaking machines. This new snowmaking technology uses 40 percent less electricity than the older version. In the 1990s, the resort won an energy conservation recognition award from Massachusetts Electric for saving over one million kWh of electricity from its improvements in snowmaking, lighting, and elsewhere.

But there is only so much Jiminy Peak is able to achieve in energy conservation with its existing facilities and still offer high quality recreational services. Fairbank has realized that a more ambitious energy reduction initiative is needed, and so he and resort managers are now considering harnessing an abundant renewable green resource readily available to the mountain resort: wind power.

THE WIND TURBINE PROJECT PROPOSAL

Fairbank has been in the ski resort business long enough to know that the Berkshire mountaintops can get very windy in the winter. He has decided to investigate the feasibility of erecting a wind turbine to put the mountaintop wind to profitable and "green" use to help stabilize the resort's electricity costs. In addition, this would be consistent with Jiminy Peak's corporate mission to protect the environment and should also permit the use of "green marketing" in the hope of attracting even more visitors to its popular ski slopes.

Jiminy Peak managers recognize that determining the viability of installing a wind turbine will be a complicated, specialized process, and so they have engaged Sustainable Energy Developments, Inc. (SED) of Ontario, New York, to examine the feasibility of such an investment. SED's fee is $157,000. With SED's help, Jiminy Peak has already received a small grant of $15,000 from the Massachusetts Technology Collaborative to offset part of the cost of the formal feasibility study. The feasibility study is to cover the financial, technical, social, and environmental aspects of the proposed wind turbine.

You are the leader of the SED wind turbine feasibility study team with the responsibility for preparing the memorandum outlining the study's findings and the team's recommendations for Jiminy Peak's management.

JIMINY PEAK'S HISTORY

Jiminy Peak opened in the Berkshire Mountains of western Massachusetts in 1948. By 2005 it was larger than any other skiing and snowboarding resort in the southern New England states. During this time period, it evolved into a four-season resort, offering skiing, mountain biking, and other outdoor sporting activities. Jiminy Peak is about 2-1/2 to 3 hours' travel time from New York City and Boston and is only about one hour away from Albany, New York, and Springfield, Massachusetts.

Through good management and sound development, Jiminy Peak became a popular winter ski destination that covers 170 acres, with 45 ski and snowboard trails, three terrain parks, and nine lifts, including a high-speed six-personchairlift. Savvy marketing and attractive mountain facilities have enabled the resort to operate profitably, even in the summer. For summer sport enthusiasts, Jiminy Peak installed the first mountain coaster on the East Coast, an alpine super slide, a giant swing, scenic rides, a rock climbing wall, a "euro-bungy" trampoline, hiking, and, for children, rope adventures, mini-golf, a rope spider web, and an inflatable "bouncy bounce" playground. Winter visitors number about a 250,000 annually, while summer visitors average about 100,000.

THE ECONOMICS OF HARNESSING THE WIND

The SED team has established that there is enough wind on the west shoulder of Jiminy Peak's mountain to effectively use a wind turbine. Significantly, the wind force on the mountain is strongest during the winter, when Jiminy Peak's demand for electricity is at its greatest for snowmaking, ski lifts, and lighting. Jiminy Peak consumes about 4.5 million kWh of electricity during the winter, which is 60 percent of its total annual needs.

GE Energy, a unit of General Electric, is able to provide a 1.5 MW-capacity wind turbine to Jiminy Peak within a year at an estimated total purchase and installation cost on the proposed site of $3.9 million. Subject to a favorable feasibility study, a loan of $3.3 million for 10 years is available from Jiminy Peak's local bank at an annual interest rate of 7.3 percent. A grant of $582,000 is available from the Renewable Energy Trust Fund administered by the Massachusetts Technology Collaborative to complete the financing for the proposed wind turbine purchase and installation. Funding for the Renewable Energy Trust Fund comes from a charge on Massachusetts electric bills.

Although erecting the wind turbine on the proposed site would partly hide it from the view of skiers, the local bank management would be able to see the wind turbine through a window in the bank's boardroom and, perhaps alarmingly, observe the bank's loan collateral when the blades were not turning because of insufficient wind strength.

Jiminy Peak management and the SED team are concerned about general community acceptance and support for the wind turbine project. The local community is very concerned with aesthetic and environmental issues. The proposed GE Energy wind turbine is taller than the Statue of Liberty. Its three 123-foot blades are each longer than three school buses placed end to end. Local residents may not be happy with such a large structure being erected at the top of the mountain. Also, the construction materials would travel noisily through the local community on trucks from the Port of Albany and add to road congestion. One suggested idea to help gain community acceptance and enthusiasm for the project is to invite the public to submit names for the wind turbine in a "Name That Turbine" competition. A well publicized ceremony could be held to announce the winning name and to tout the environmental and social benefits of the wind turbine.

The GE Energy unit would provide about one-third of Jiminy Peak's annual electrical needs. With electricity, the matching of generation with consumption is an important issue because electricity cannot be stored for use later. With sufficiently strong winds, the turbine generates power 24 hours a day, seven days a week, much of the time when Jiminy Peak does not need that level of power. Fortunately, with the winds on Jiminy Peak at their strongest in the winter, the turbine turns faster, generating more electricity. This phenomenon matches up nicely with the resort's higher electricity demand for snowmaking in the winter. The wind turbine is expected to supply up to one-half of Jiminy Peak's winter electricity needs. Electricity generated by the wind turbine is expected to result in cost savings from buying about 2.3 million fewer kWh per year. In addition, excess electricity generated by the wind turbine can be automatically diverted to the power grid and sold for an estimated $161,000 each year.

An important financial component of the wind turbine project is the sale of renewable energy credits (RECs) to a third party. There is a ready market for these credits because they certify that the purchaser of the credit purchased

renewable energy. Third parties have already agreed to purchase Jiminy Peak's credits for 10 years at $166,667 per year, and it is to be assumed in the feasibility study that sales of RECs will continue at this level for the remaining years of the wind turbine's life cycle.

In addition to the RECs, the wind turbine would enable Jiminy Peak to benefit from $46,000 per year in renewable energy production tax credits for 10 years, and it qualifies for MACRS (Modified Accelerated Cost Recovery System) double-declining balance depreciation for a five-year period with half-year depreciation in the first and last recovery years. Also, the new turbine would enable Jiminy Peak to open from two to four weeks before other area resorts because of the cheaper snowmaking from using wind power. This is estimated to generate an additional $100,000 net cash inflow per year. Jiminy Peak management estimates that a wind turbine service contract, insurance, and other maintenance would cost about $75,000 annually.

Based on discussions with Jiminy Peak management, SED has determined that:

- Jiminy Peak is subject to a 40 percent income tax rate;
- Jiminy Peak has sufficient taxable income to benefit from any deductions and credits that result from the wind turbine purchase;
- The after-tax weighted average cost of capital is 6 percent for discounting the expected cash flows of the project;
- The wind turbine has a 25-year useful life with no terminal disposal value.

CASE ANALYSIS QUESTIONS

As the lead member of the SED team, your responsibilities are to supervise the completion of the feasibility study of the proposed wind turbine project and to make a recommendation to Jiminy Peak management on whether to install a wind turbine. Address the following questions to provide your analysis and opinion on whether Jiminy Peak should proceed with the purchase and installation of the wind turbine. Clearly state any assumptions used in addressing the case questions and fully reference any sources accessed for information.

1. Using pertinent information from the case text, prepare a capital budgeting analysis of the wind turbine project using:
   - **a. the payback method**
   - **b. the net present value method**
   - **c. the internal rate of return method**
   - **d. the NPV method assuming that all renewable energy grants, RECs, and renewable energy production tax credits are removed.**

2. Identify and evaluate the environmental advantages of the wind turbine project.

3. Identify and evaluate the environmental disadvantages of the wind turbine project.

4. Identify and evaluate the social factors and any other factors not already mentioned that are pertinent to the wind turbine feasibility study.

5. Using the results from 1 through 4 above, prepare a memo addressed to Brian Fairbank to present your feasibility study findings and make a recommendation as to whether the resort should proceed with the wind turbine project.

6. Discuss how ongoing environmental cost management can be used in the decision-making process to increase value to customers and to help achieve the organizational goals of Jiminy Peak.

7. Describe any help or practical insight that you received from reading the case and preparing the case analysis. Stating that you did not receive any benefit from reading the case and preparing the case analysis is a valid response as long as you give at least one reason why you believe this to be the case.

ABOUT IMA

With a worldwide network of more than 60,000 professionals, IMA is the world's leading organization dedicated to empowering accounting and finance professionals to drive business performance. IMA provides a dynamic forum for professionals to advance their careers through Certified Management Accountant (CMA®) certification, research, professional education, networking and advocacy of the highest ethical and professional standards. For more information about IMA, please visit www.imanet.org.

AUTHORS NOTE:

The authors thank Sandra L. Raburn and Jody Ratliff for their research contributions and Katie Fogel of Jiminy Peak Mountain Resort for her assistance.