

## **Using Net Present Value in Decision Making**

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### **Abstract**

This study explores the decision procedures of the cost of projects and the use of Net Present Value (NPV) to document a comparison of the different costs of projects that will lead to a green solution for a local powerplant. Students will learn which projects are cheaper, but ask if they are ethical and identify if they should analyze how the weighted cost of capital (WACC) and the time value of money plays an important role in choosing between different projects.

**Keywords:** Net Present Value (NPV), Weighted Cost of Capital (WACC), Tax Rate

### **Introduction**

Recently, I noticed that our powerplant was producing too much air pollution. I offered a few explanations to our senior executives in a meeting. I thought my ideas were good, so at first, I was surprised and disappointed that no one seemed interested in providing a solution to our power plant's pollution concerns. Many months later, our powerplant was approached by the local government agency and was cited. The powerplant's pollution was on record as being a problem for the small tourist island where it is located. At first, I was really upset that I was proactive and introduced the problem to senior executives' months before, but the senior official took the current citation and acted as though the problem was brand new.

Interestingly, I did not think to blame others, but rather wanted to identify a solution to the problem and present the idea to senior management. I knew I was relatively new at this position and had not yet earned the respect of my co-workers. I wanted to shed the "rookie" impression that my peers had of me and make a great impression on my peers and management. I wanted to be known as someone who could be counted on. I have always been competitive, thus, I wanted to be the best person in my position.

### **The Problem**

The problem is that the powerplant is producing too much air pollution. The powerplant is located on a small vacation island and provides power to most of the island, however, technology has grown since the powerplant was built in the 1970s. My goal is to provide multiple solutions to solve this problem. I believe that by providing multiple solutions to the problem, I will enable our management to select the one that they think is best for the company.

### **The Project Options**

Option 1: Since the small island has been hurt by a downshift in tourism, we could help the economy by providing a one-time "tax" for the pollution. This would present an immediate Carbon Offset of \$13,000,000. I know some of the senior members of the management would like to use this as a marketing tool and know the money could be used to help the local government fund items that were cut because of previous missed tax revenues from the lack of tourism to the island.

Option 2: The powerplant could be shut down completely and we could install a power cable that runs from one of the other nearby islands that has a powerplant. This powerplant will still

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produce just as much pollution as the one on our island, but it is under a different government that does not care about air pollution. This would cost the cost our company \$1,000,000 at the end of the year, \$3,000,000 at the end of next year and \$1,000,000 yearly thereafter for maintenance.

Option 3: The powerplant can be retrofitted with scrubbers that can reduce the pollution emissions and make the powerplant green. The cost of this project would be \$7,500,000 at the end of this year and \$100,000 for the next 50-years for maintenance.

**Market Conditions**

The current market conditions have a 12 percent market risk premium on the powerplant with the risk-free rate being 5-percent. The local government has a fixed tax rate of 35 percent. Senior management will ask about the cost to raise capital and we will have to calculate the WACC. The current capital structure of the company is as follows:

- Debt – 7,000 outstanding bonds, at 7.5% coupon and 20 years to maturity. These bonds pay interest semiannually and quoted a price of 108 percent of par.
- Common Stock -180,000 shares outstanding, selling for \$50 per share: Beta .90.
- Preferred Stock – 8,000 shares of 5.5 percent preferred stock outstanding, currently selling for \$95.00 per share.

**The Decision**

The senior management team will expect me to report the cost of all three projects. I will have to provide the calculations and thoughtful considerations of the three ideas and concepts presented in the case to offer new thoughts and insights relating directly to this topic. I will have to support my answers with calculations and scholarly resources that will provide the best solution to the problem. I know that in the past, senior management has historically chosen the cheapest options to solve problems and will expect to see all financial models in Excel documents while also providing a narrative explaining the different options to solve the problem.

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