

Real Options 3.

The “real options” approach to capital budgeting links strategic planning and thinking with financial decision-making. Consider the following case.

You are an analyst at TECO, Tampa Electric Company. Your boss, Dennis Wimmert, has asked you to consider shutting down an old coal power plant in Lutz, and selling the land, since property values have risen in that area lately. For the last three years the plant has sat idle because of environmental concerns. The facility sits on a 20-acre plot of land, and each acre is now appraised at \$130,000. Even if fully modernized, this plant could produce electricity for \$75 per megawatt hour. The average price that TECO gets per megawatt hour is determined in a national market, and has averaged \$40 over the past three years. Based on these facts, Dennis suggests that closing the plant and selling the land is obviously a positive NPV project.

You make some calls and figure out the following. TECO could retrofit the plant with sequestration to conform to environmental regulations for \$8 million, also your sense is that it should be completely automated, which would require an additional capital outlay of \$5 million. These capital outlays must be made immediately. After this alteration, the plant could sit idle without incurring any variable costs. The average TECO plant now produces electricity for \$20 per megawatt hour. (As noted, the cost of megawatt hour from this Lutz plant is \$75.) After the automation investment, the plant can be turned on and shut down costlessly, and has capacity of 1,000 megawatts. Your engineers tell you that the plant could operate for 11 years after the necessary modifications, which would take one year to complete (following the initial capital outlay). After which the engineers estimate that the salvage value of the plant and equipment will just offset the costs of cleaning up the land. Your accountants tell you that the capital costs of the sequestration and automation would be depreciated using a 7-years MACRS schedule.

While this obsolete and small plant’s costs appear high at \$75 per megawatt hour, you note that the price of electricity has fluctuated wildly over the past three years. While indeed the average price of a megawatt hour has been \$40, every year there has been one day when the price of a megawatt hour has exceeded \$120, and 5 more days the price has been between \$75 and \$120. On these six days, the average price—conditional on the price exceeding \$75— is \$100. In light of this volatility, you want to assess whether the flexibility

that this plant provides might more than offset its capital commitment. If the plant is operational, TECO would have to maintain inventory of coal at the site worth \$750,000.

TECO is in a 25% marginal tax bracket. Its capital structure is 50% equity and 50% debt. Its beta is .65, and the yield to maturity on its 30-year debt is 6%. The 30-year Treasury Bond yield to maturity is 4%, and the risk premium on the stock market is 5%.