

## Investing in a plastic injection plant (part 1)

A corporation is considering building a small plastic injection plant to serve the needs of a particular geographical area. At full capacity, the plant would produce 1,000,000 plastic containers a year. The plant would operate for 10 years before it is sold to a third party.

Development costs are projected to be \$6M, 80% of which (the structure) is depreciable over 39 years according to a straight-line schedule. Depreciation would start at the beginning of year 1 once the plant is in operation. Equipment investment (plastic injection presses and molds, mainly) is expected to be \$1.5M in year 0 and another \$1M in year 1. Equipment depreciates according to a straight line schedule over 12 years. Depreciation begins in year 1 for the first set of machines, in year 2 for the second. The installation schedule is such that the plant is expected to operate at a maximum of 50% of peak capacity in year 1 and 75% in year 2. It will reach full capacity potential in year 3.

Fixed costs of production in year 1 are \$1M while variable costs are \$5 per unit. Both would grow by 2% a year from then on. Support from headquarters (marketing, sales, administration...) is expected to cost the corporation 2% of sales per year of operation. The marketing team projects potential sales to be 850,000 units in year 1 and grow by 4% a year thereafter. Unit prices are forecasted to be \$10 in year 1 and grow by 1% a year.

Standard contract terms in this industry and area are such that account receivables in a given accounting period are 10% of sales, while account payables are 10% of variable costs. Meeting delivery terms requires maintaining an inventory of final good. End-of-year inventories are projected to be 5% of yearly sales. Inventories are booked at historical manufacturing cost (no SG&A allocation to inventories.)

At the end of 10 years the corporation plans to sell the facility to a third party for a forecasted net sale price of \$6.5M. Equipment and net receivables are expected to sell at book value. Inventories will sell at market value. The sale of the facility is subject to capital gain and depreciation recapture taxation. The ordinary capital gains tax rate is 15% while the depreciation tax rate is 25%. The depreciation recapture tax rate is 25%. Proceeds from selling inventories net of book value (on a first-in-first-out basis) are taxed at the ordinary corporate income tax rate of 35%.

The project is going to be financed with a 50-50 mix of long-term debt and equity. Long-term debt holders are asking for a 7% yearly rate and yearly payments. Equity holders require a 15% return on this sort of investment. This project is a typical investment for this corporation, and the financing mix matches the corporation's current and target capital structure.

- 1) According to those baseline assumptions and the associated expected cash flows, what is the project's NPV?
- 2) To assess the sensitivity of NPV to these various assumptions, use Excel's scenario analysis to show the impact of 20% changes in each direction of:
  - a. Development costs
  - b. Potential sales in year 1
  - c. The growth rate of potential sales

- d. The growth rate of unit prices
  - e. The facility's resale price
- 3) What is the market value of cash-flows to equity and the NPV of the equity investment?

### **Investing in a plastic injection plant (part 2, buy or lease)**

An industrial REIT is offering to lease an existing plant to the corporation that could house the production plant described in part 1 with the same fixed and variable costs of production. While this would enable the corporation to avoid construction costs, it would need to pay lease set-up costs of \$1M to the industrial REIT, depreciable over the life of the lease. Below what rent level is the corporation better off leasing the production space than owning it? [Assume that the corporation can finance 100% of the facility purchase at an 8% rate and that doing so has no incremental impact on its cost of funds on other investments.]