

An aerial photograph of a large industrial facility, possibly a power plant or refinery, during a sunset. The sky is filled with orange and yellow clouds, and the sun is low on the horizon. The facility includes a tall, blue, cylindrical tower with a flag on top, several large rectangular buildings, and a curved walkway or ramp. The surrounding landscape is flat and green, with mountains visible in the distance.

INVESTMENT ANALYSIS FOR USER CHARGE REGULATION - CASE STUDIES

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The Background

- * The City of Cambridge's landfill is completely full and cannot be expanded again without threatening the neighbor environment.
- * Thus the City Council has decided to build an incinerator for its waste disposal.
- * The planned incinerator will provide the combustion of waste organic material and - at the same time - the production of electric power.

Smarter Solutions Ltd.

- * Smarter solution is the name of the new company that will run the incinerator.
- * It is a for-profit company with the majority of shares owned by the local government.

The Project' Goals

- * The project has two major goals:
 1. The project must be profitable in order to attract potential investors and to reach a good deal with banks.
 2. The waste rate cannot be 30% higher than the actual rate citizens are paying for the use and maintenance of the landfill.
- * There are two other constraints:
 - * Banks impose a variable interest rate linked to the 1-year LIBOR rate.
 - * The City Council imposes a waste-rate cap price for the entire lifetime of the project. Exceptions are only accepted when the LIBOR rate rises over a contracted amount.

The Lifetime

- * The projected plant's lifetime is twenty years. Later the plant has to be dismissed.
- * The building works requires 4 years from the beginning to the full capacity of plant.
- * The works begin immediately after the Council approval, at year $t - 2$.
- * In this year Smarter Solution issues the first tranche of shares and receives the first tranche of loan.
- * At year $t-1$ Smarter Solution prepares its first financial statements and issues other tranches of debt and shares.
- * Eventually at year t , the incinerator is ready to begin its operations, yet at 40% of capacity.

The Project's Financing

- * The Incinerator projects has an estimated cost of \$ 330,000,000 and requires four years of major building works, from the beginning to the full capacity.
- * The costs are distributed as follows: \$ 200 mil. in the first year, \$ 60 mil. in the second, \$ 40 mil. in the third and \$ 30 mil in the last year.
- * The project is financed in equal parts by an emission of shares and by a long-term loan by 3 major banks.

The Project's Financing (2)

Year	t-2	t-1	t	t+1
Cost (mil)	200	60	40	30
Value of Shares (mil)	100	30	20	15
Long-term Debt (mil)	100	30	20	15

The Project Financing (3)

- * The majority of the shares will be owned by the local government, the other ones will be sell by an IPO at year $t - 2$ (2014).
- * In order to make the shares more liquid and attracting investors, a dividend of 4 cent per share is planned to be granted starting from year 5 (2020).

Cost of Debt and its Consequences

- * The long-term loan tranches get an interest rate of 3.50% plus to the 1-year LIBOR rate.
- * When the LIBOR rate is higher than a certain amount, some costs and expenses (marked in green in the spreadsheet) are cut by a minimum of 5% to a maximum of 20%.
- * For the same reason, investors may require an higher cost of equity and Smarter Solutions can ask to the local government the authorization to rise the cap price.

Depreciation, Amortization and Decommissioning Cost

- * The plant has a straight-line depreciation of 20 years, (see “Depreciation of capex spreadsheet).
- * Then it has a negative scrape value of near \$ 40 mil. corresponding to the cost to dismiss it.
- * In order to deal with such a cost, Smarter Solutions will make a provision each year, starting from year t, investing that amount in a risk-free fund.
- * In year 5,10,15 a maintenance cost of \$ 1,000,000, depreciated straight-line in 5 years, will be needed.

LIBOR and Costs and Expenses

- * A rise of the LIBOR 1-year rate will leave:
 - * Labor Cost: Cut from 5 to 20%
 - * Direct overhead: Cut from 5 to 20%
 - * Other Operating Expenses: Cut from 5 to 20%
 - * SG&A: Cut from 5 to 20%
 - * Other costs and expenses will be untouched.

Cost of Debt and its Impact Towards Costs and Expenses (2)

	Equal or below 2 %	2 - 4%	4 - 6%	6 - 8%	equal or above 8%
Percentage of cut	0%	5%	10%	15%	20%

Plant Capacity

- * At full capacity the incinerator is planned to process 400,000 waste tons, that will rise by 1% per year during the entire lifetime.
- * Yet for the first two years the plant only has a capacity of 40% and 85% respectively, reaching the 100% at year 3 (2018).
- * The plant will produce 300 GW per year of power during its entire lifetime.

Estimated Revenues and Expenses Year t-2 and t-1

- * At year t -2 there is no need to prepare any financial statement, because at that time, only the selected contractors are building the plant.
- * At year t -1, SmarterSolutions makes its first financial statement with only two expenses:
 - * Supervising personnel (\$300,000).
 - * The first loan payment (see Loan Amortization Plan spreadsheet).

Estimated Revenues and Expenses at Year t

- * At year t, the incinerator makes the first operative revenues, costs and expenses as follows:
- * Revenues:
 - * 40% of 400,000 tons at an estimated initial rate of \$ 120 per ton.
 - * 40% of 300 GW of power at a fixed rate of 66,666.7 per GW
- * Costs and Expenses:
 - * Power and direct cost: \$ 2,200,000.
 - * Labor cost: \$ 4,000,000.
 - * Direct overhead: \$ 1,800,000.
 - * Depreciation and Amortization: \$ 10,000,000 (see corresponding spreadsheet).
 - * Other operating expenses: \$ 6,300,000.
 - * SG&A: \$ 2,700,000.
 - * Provision for decommissioning: \$ 1,662,000 (see corresponding spreadsheet).
- * For the entire lifetime there will be just one financial expense which corresponds to the interest payments.

Inflation and Real Growth

- * Interest rate is expected to be constant at 1.5% per year.
- * Tons of waste processed, power produced as well as operating expenses are expected to rise by 1% per year in real terms, starting from year $t+1$

Systematic risk (The Beta Coefficient)

- * Beta has to be estimated using as a proxy an utilities company and, as a market, the S&P's 500 Index.

Cost of Debt and Unsystematic risk (Size and Company specific)

- * The size risk is expected to be 1%.
- * The company specific risk is:

	Equal or below 5%	5 - 5.5%	5.5 - 6%	6 - 6.5%	6.5 - 7%	7 - 7.5%	equal or above 8%
Company Specific Premium	0%	0.25%	0.50%	0.75%	1	1.125%	1.15%

Other Data

- * Working Capital: 8% of sales.
- * Risk-free rate is 4%.
- * ERP is 5.5%.
- * Tax rate = 35%.
- * Use for initial minimum rate the price of \$ 120 per ton, and as a cap \$145 per ton.
- * **The redefinition of both initial and cap price rates is the purpose of this exercise.**