

An aerial photograph of a modern industrial facility, possibly a power plant or refinery, featuring a prominent tall blue tower and large glass-roofed structures. The scene is set against a dramatic sunset sky with orange and yellow clouds, and a mountain range is visible in the background.

# 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.**