

# Mini plant set-up guide

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*Sime Ingenieros has a well earned reputation for constructing mini cement plants in Latin America and has worked closely with new entrants to the market as well as established players. This article provides some guidelines for those seeking to invest in a mini cement plant for the first time and how to ensure that a new plant will have every chance of being a successful operation in today's competitive markets.*



Ecuador, preheater and kiln for mini cement plant



Preheater tower assembly, Ecuador

For those who are interested in entering the business of grey cement production (Portland Type 1) by building a mini cement plant, and for those with the technical and financial capacity to achieve this goal, it is worth considering the following steps that give an outline of how to set-up a successful plant. Bear in mind that if the result is to be a positive one, it is essential that a new operation makes a detailed financial and technical study before making any commitment to such a venture.

## Steps that you can follow

1. To define the necessity and opportunity of the product.

The necessity is defined by consumption per capita of cement in the region and the opportunity it is defined by the local trade.

2. Economic criterion of success

There are many ways to obtain the successful criterion. For this simple

theoretical exercise we can, for example, take the analysis from "How much a factory costs to produce 360tpd of Portland cement Type1".

It is then possible to make the

following considerations/assumptions:

- Daily production of clinker 285tpd
- Daily addition 75t.
- Daily cement production 360t.
- Monthly production 10,800t.

**Table 1: production cost of cement**

Case	Monthly production (t/month)	Tonne Value (US\$/t)
1	125	57
2	360	42
3	1100	36

**Table 2: production cost of cement**

Case	Year of production (t)	Plant Value by annual produced tonne (US\$/t)	Investment (US\$m)
1	45,000	220	9.9
2	129,000	215	27.7
3	396,000	210	83.1

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- Annual production 129,600t.

Next, you can take the following indices from production cost of cement (see Table 1). It is also possible to take the following indices from cost of the plant – physical facilities, civil works, electrical substation, mechanical equipment, electrical equipment, control and automatization and laboratory equipment (see Table 2).

In order to calculate the residual value one needs to consider:

1. The company can progress indefinitely, therefore you can consider the value added by the rest of its working life.
2. The company exists for a long time as equipment is replaced that guarantees survival.
- 3 After five years of operation it is possible to suppose that the business is mature and has stabilised.
4. The sixth year of projection is included to as a projection of how the expected to develop.
5. The distribution of the sixth year of operation will remain constant for subsequent years.

6. The sum considered includes the necessities of increases of capital for equipment replacements.

7. The plant has a uniform flow for an indefinite amount of time.

8. The value of the residual flow is calculated, then by including the distribution of the sixth year of operation into the present value of the first day of the year, considering a constant rate from the first day of the investment to the current date.

As you can see on Table 4, the present value of the company is US\$49.4m and the investment is US\$27.7m. From this result it can be concluded that the project is a viable investment.

#### Other success criteria

Recommendations to consider when deciding whether a project can be viewed as a successful venture include:

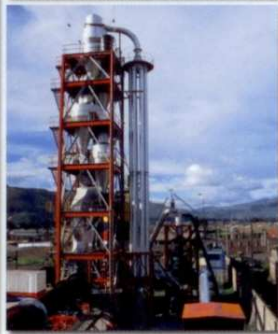


Colombian preheater tower erected by Sime Ingenieros

## CEMENT PLANTS

Dry process from 60 metric tons per day of clinker

### SIME Ingenieros Ltda.



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- Assistance for equipment fabrication and plant erection.
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Countries where we are developing projects:



- The absolute reserve on the intention to install a plant to produce cement. Remember that in the cement business the players are few and strong, in addition, they know the market very well and they do not want new competitors.
- Transaction permission of ground uses with the absolute reserve, such as environmental licenses.
- Find mines for the operation of raw materials and be sure that they fulfil the required quality and that they have enough reserves according to the time that has been projected for the working life of the plant. Demand absolute confidentiality to the people whom transact the mines.
- Be sure about the reliable energy provision and necessary fuels.
- Invest in a feasibility study.
- Buy the integral engineering for manufacture and assembly: civilian, mechanic, electrical,

**Table 3: calculation of the value of the plant**

	Year 1 to 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8
Annual sales (t)	0	129,600	129,600	129,600	129,600	129,600	129,600
Price sale (US\$/t)	0	130	136.5	143.3	150.5	158	165.9
Entrance by sales (US\$m)		16.85	17.69	18.57	9.5	20.48	21.5
Production cost (US\$m)	0	46.3	48.6	51	53.6	56.3	59.1
Annual production cost	0	6	6.3	6.62	6.95	7.29	7.66
Profit before depreciation (US\$m)	0	10.85	11.39	11.96	12.56	13.19	13.84
Depreciation (constant to 10 years) (US\$m)	0	2.77	2.77	2.77	2.77	2.77	2.77
Profit before tax (US\$m)	0	8.08	8.62	9.19	9.79	10.42	11.07
Rent taxes (35%) (US\$m)	0	2.83	3.02	3.22	3.43	3.65	3.88
Net profit to distribute (US\$m)	0	5.25	5.6	5.97	6.36	6.77	7.2

Note: this price does not include mining, transport or distribution

**Table 4: present value of the company**

Present value of utilities: (US\$m)	26.81
Constant rate + current rate (rate inflation-1)	21.20%
Vr present residual flow to the first day 8 year (US\$m)	33.95
Residual value to present value (US\$m)	22.58
Present value of the company (US\$m)	49.4

electronic and automatization.

- Make all the equipment on site or with local factories.
- Do the assembly with local personnel.
- The firm who wins the engineering should advise on the equipment manufacture and assembly.
- Demand the know-how for manufacture of the cement and in the attainment of mines.
- In case of having the opportunity to buy second-hand equipment, be advised by the firm who is selling you the engineering and it has to certify that this equipment will be able to be used.
- Solicit the necessary equipment listing to test physical and chemical in laboratory.
- Aim to execute the project with reliable investors and to try to work with zero

debts or liabilities. This will help you to support a possible war prices.

- Begin with a reasonable production in

Before buying another technology, which can be cheaper in investment, you have to be sure about: consumption of energy, man hours, fuel, water and if it fulfils all the environmental norms. In addition, it must have enough technology to produce cement chemically and physical certified by an authorised institute in the home country.

**Summary**

These notes are meant as an introductory guide for those who have some interest in knowing about how to enter the mini cement plant business.

order to learn about the business and it will grow without risking the patrimony.

- Buy dry automated process technology. It is the latest technology in the market and it is used by serious competitors.

Cement grinding section assembly – Ecuador

