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Indonesian Industrial Investment Opportunity Study
April 1990

MANUFACTURE OF RUBBER CONVEYOR BELTS

FINAL REPORT

DP/RAS/85/010

Bożena Kulbatowska

52

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General Services Division
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Attention: Mr. S. Morozov
Chief, Contracts Section

Gentlemen:

Re: Assistance to COIME
- Preparation of Opportunity Studies
Contract No. 89/132SM

We are pleased to submit our final report on the Indonesian Industrial Investment Opportunity Study on the Manufacture of Rubber Conveyor Belts.

The study was conducted in accordance with the UNIDO Manual for the Preparation of Industrial Feasibility Studies. The report covers the following topics:

- o Project background and history
- o Market and plant capacity
- o Material inputs
- o Plant location
- o Project engineering
- o Plant organization and overhead cost
- o Manpower
- o Project implementation
- o Financial evaluation

The financial evaluation used the UNIDO Computer Model for Feasibility Analysis and Reporting (COMFAR).

SGV & CO.

This study was prepared mainly to provide preliminary broad indications of the viability of the project and is not meant to serve as a detailed project feasibility study necessary for project implementation. Moreover, it is understood that the results of the study may not be realized if there are changes in the environment that may require revision in any of the critical assumptions used.

We will be glad to discuss any question you may have on this report.

Very truly yours,

SGV & Co.

UNITED NATIONS INDUSTRIAL DEVELOPMENT ORGANIZATION
Austria

Indonesian Industrial Investment Opportunity Study
April 1990

MANUFACTURE OF RUBBER CONVEYOR BELTS

FINAL REPORT

TABLE OF CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY	1
PROJECT BACKGROUND AND HISTORY	9
MARKET AND PLANT CAPACITY	11
Demand and Market Study	11
Sales and Marketing	26
Production Program	30
MATERIAL INPUTS	31
Raw Materials	31
Utility and Energy Requirements	33
PLANT LOCATION	34
PROJECT ENGINEERING	35
Layout and Physical Coverage of Project	35
Technology and Equipment	35
Civil Engineering	38
PLANT ORGANIZATION AND OVERHEAD COSTS	39
Organization	39
Estimated Overhead Costs	39
MANPOWER	42
Labor	42
Staff	42
PROJECT IMPLEMENTATION	43
FINANCIAL EVALUATION	46
Total Investment Outlay	46
Project Financing	47
Production Cost	48
Commercial Profitability	48
Financial Cashflow	50

LIST OF TABLES

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
1	Estimated 1988 Apparent Domestic Consumption	11
2	Importation and Exportation of Conveyor Belts of Selected ASEAN Countries	13
3	Projected Demand for Rubber Conveyor Belts, 1990 to 2005	14
4	Importation of Conveyor Belts of Indonesia by Country of Origin	15
5	List of Conveyor Belt Manufacturers in Indonesia	15
6	Estimated 1988 Consumption of Conveyor Belts in Indonesia by Major User Industry	17
7	Major Mining Firms in Indonesia	18
8	Indonesian Cement Manufacturers and Production Capacities, 1988	19
9	Estimated 1988 Consumption of Conveyor Belts in Selected ASEAN Countries	20
10	Major Tin Mining Firms in Malaysia	21
11	Malaysian Cement Manufacturers and Production Capacities	21
12	Estimated 1988 Consumption of Conveyor Belts in the Philippines by Major User Industry	22
13	Major Mining Firms in the Philippines	23
14	Philippine Cement Manufacturers and Production Capacities, 1989	24
15	Major Mining Firms in Thailand	25
16	Thai Cement Manufacturers and Annual Production Capacities	26
17	Selling Prices of Conveyor Belts	26

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
18	Distribution Cost Build-up of Conveyor Belts	27
19	Sales Forecast and Market Penetration	29
20	Domestic and Export Sales of Conveyor Belts	30
21	Annual Raw Material Requirements for Production of Rubber Conveyor Belts at Full Capacity	32
22	Estimated Overhead Costs	41
23	Schedule of Factory Personnel	42
24	Pre-production Expenses	45
25	Total Initial Investment	46
26	Sources of Financing	47
27	Production Cost at Full Capacity	48
28	Income Statement Highlights	49
29	Commercial Profitability	49
30	Sensitivity Analyses	50
31	Financial Cashflow	51

LIST OF FIGURES

<u>Figure No.</u>	<u>Title</u>	<u>Page</u>
1	Process Flow for the Manufacture of Conveyor Belts	36
2	Organizational Structure	40
3	Implementation Schedule	44

LIST OF ANNEXES

<u>Annex No.</u>	<u>Title</u>
1	Cost of Direct and Indirect Materials at Full Capacity
2	Utility and Energy Requirements at Full Capacity
3	Plant Layout
4	Equipment Specifications
5	Cost of Production, Auxiliary, and Other Equipment
6	Annual Overhead Cost at Full Capacity
7	Labor Cost by Functional Area for One Eight-Hour Shift
8	Notes and Assumptions Used in the Financial Projections
9	Financial Statements
10	Sensitivity Analyses and IRR and Break Even Charts

1. EXECUTIVE SUMMARY

This opportunity study explores the possibility of establishing a plant in Indonesia to manufacture conveyor belts of vulcanized rubber.

The project will be participated in by nationals of at least two ASEAN countries with a minimum of 51 per cent ASEAN equity and a minimum equity contribution of five per cent from nationals of participating countries. As such, the conveyor belt output of the project qualifies as an ASEAN Industrial Joint Venture (AIJV) product, entitling it to a minimum of 90 per cent tariff preference to be extended by participating ASEAN countries.

1.1 MARKET AND PLANT CAPACITY

Apparent domestic (Indonesia) consumption for conveyor belts in 1988 is estimated at 2,350 metric tons. This demand was met mainly by imports (82 per cent) and local production (18 per cent).

The 1988 ASEAN export market for rubber conveyor belts is estimated at 6,000 metric tons. This represents the importation volume of conveyor belts of four ASEAN countries. This includes Malaysia, the Philippines, Singapore and Thailand.

Domestic demand for conveyor belts is estimated to increase by 10 per cent per annum based on interviews. The ASEAN importation for conveyor belts on the other hand, is projected to grow at 16 per cent per annum based on historical trends.

Domestic sales during the first year of commercial operation will be about 28 per cent of the unfilled demand in Indonesia. This is estimated to increase to about 67 per cent in 1994, when the plant operates at full capacity. For the export market, the project aims to penetrate three per cent of the unfilled ASEAN demand in the first year of commercial operation. This is foreseen to increase to seven per cent at full capacity.

Based on the above targeted penetration ratio, 70 per cent of total production is intended for the domestic market and the remaining 30 per cent will be sold to the export market.

The conveyor belt will be sold at the local market at US\$48 per square meter, ex-factory. The export price of a square meter conveyor belt will be US\$35, FOB Tanjung Priok. This export price and the 90 per

cent margin of preference on tariff for AIJV products would result in competitive wholesale prices in the targeted ASEAN countries.

	Malaysia	Philippines	Thailand
	-----	-----	-----
Derived FOB Prices (US\$/sq.m.)	10 - 78	13 - 58	25 - 57

The proposed plant is capable of producing at full capacity 400,000 meters of conveyor belts equivalent to 3,600 metric tons per year. The plant will achieve 100 per cent capacity utilization by the third year of operations (1994).

On the first year and second year of commercial operations, the plant will operate at one and two eight-hour shifts a day, respectively. At full capacity, the plant will operate at three eight-hour shifts at 300 working days a year.

1.2 MATERIAL INPUTS

The raw material requirement for the manufacture of conveyor belts are sourced both locally and from other countries. Natural rubber, synthetic rubber, zinc oxide, stearic acid, paraffin wax, sulphur, winophil and cumar resin are locally available. Nylon cloth, carbon black, pine tar, nonox and vulcafor are imported.

Electricity cost at full capacity is estimated at US\$66,960 per year at an average cost of US\$0.062 per kilowatt-hour. Water expenses is estimated to amount to US\$10,875 per year at full capacity at a cost of US\$0.472 per cubic meter. Bunker fuel cost at full capacity is estimated to reach US\$336,960 per annum at a cost of US\$0.117 per liter.

1.3 PLANT LOCATION

The proposed plant site is Bekasi, West Java, Indonesia. Major considerations include proximity to Jakarta and to Tanjung Priok, the premiere port in Indonesia, and adequate supply of water, electricity, fuel and communication lines. Cost of land in Bekasi is estimated at US\$22 per square meter.

1.4 PROJECT ENGINEERING

The proposed project will occupy a 6,000-square meter lot. About 3,300 square meters is allocated for the factory, warehouse and office building. The other facilities include three storage tanks, each with a capacity of 8,000 liters. All of the plant machinery and auxiliary equipment needed for the project except for the storage tanks will be acquired from foreign suppliers.

The conveyor belt is produced by compounding rubber and chemicals (except accelerators) in the intensive mixer. Then, each compound (cover, friction and cushion) is transferred to the open mill where the accelerator is added. The compound is aged for 24 hours and then fed to the calender. The parts are then laminated together with the nylon cloth and built to the desired number of plies in the forming machine. The uncured rubber conveyor belt is then vulcanized to improve its mechanical properties. Inspection of the conveyor belt follows before it is packed and stored prior to distribution.

1.5 PLANT ORGANIZATION AND MANPOWER

The plant will be under the management of the board of directors. The day to day operations will be under the direct supervision of the general manager. The three major groups in the plant are the finance and administrative group, the marketing and sales group, and the plant/production group. Each group will be headed by a manager.

The direct labor force consist of nine skilled and 13 unskilled workers per eight-hour shift. There are 19 indirect factory workers. Total administrative and marketing personnel complement is 32 and seven, respectively.

1.6 PROJECT IMPLEMENTATION

The pre-production phase will take one year. Activities during this phase include: acquisition of government approvals and application for incentives, preparation of feasibility study and engineering specifications, land and site development, building construction, civil works, procurement and installation of machineries, test runs, and manpower training.

1.7 FINANCIAL EVALUATION

1.7.1 Total Investment Costs

Total initial investment requirement for the rubber belt project is estimated at around US\$8.8 million. Of this, about 90 per cent or US\$8.0 million is accounted for by foreign currency cost component. This consists mostly of plant and auxiliary equipment. Local cost component which accounts for land, building, office and transport equipment, pre-production cost and working capital investment is about US\$0.8 million.

	In US\$000

Fixed investment cost	
Land, site preparation, development	US\$ 216
Buildings and civil works	464
Auxiliary and service facilities	799
Incorporated fixed assets	68
Plant, machinery and equipment	6,880

Total fixed investment costs	8,427
Pre-production capital expenditures	419

Total	US\$ 8,846
	=====

1.7.2 Project Financing

The project is assumed to be financed through equity contributions (40 per cent) and a long term loan (60 per cent). Of the US\$3.5 million equity, 70 per cent will come from Indonesia. Foreign expenditure, which covers mainly the acquisition of the plant and auxiliary machinery and equipment, will be funded by foreign sources to the extent of 80 per cent. The foreign loan will finance 67 per cent of total foreign cost component. The foreign long term loan of US\$ 5.3 million will have a term of seven years inclusive of a two-year grace period on principal. The principal payments will be made in five equal yearly amortizations. The annual interest rate of the foreign loan is assumed at 12 per cent.

	In US\$000

Equity contributions	
Local	US\$ 2,477
Foreign	1,061

Total Equity	3,538
Long term loan (Foreign)	5,308

Total	US\$ 8,846
	=====

1.7.3 Production Cost

The breakdown of annual production cost at full capacity is as follows:

	In US\$000

Raw materials	US\$ 4,621
Other raw materials	1,818
Utilities	78
Energy	337
Direct labor	43
Repair and maintenance	203
Spares	20
Factory overhead	948

Total factory cost	8,068
Administrative overhead	545
Sales and distribution	439
Depreciation	953
Financial cost	510

Total	US\$ 10,515
	=====

1.7.4 Commercial Profitability

The results of the financial projections show that the project is highly viable with an internal rate of return (IRR) of 46.70 per cent. Likewise, it shows that the internally generated cash is sufficient to cover its financial cost for the same period.

US\$000

Year	Gross Revenue	Net Income(NI)	NI/Revenues (%)
1	5,880	358	6
2	11,760	2,453	21
3	17,640	4,631	26
7	17,640	5,119	29
15	17,640	5,567	32

The commercial profitability of the project is summarized below:

IRR on Total Project	46.70%
IRR on Equity	68.53%
Net Present Value at 20%	US\$ 13.7 Million
Payback Period	3 yrs. & 7 mos.
Break even sales excluding finance (% of sales at full capacity)	21.05%

To test the project's sensitivity to a change in selling price which is considered a critical factor, the selling price of the conveyor belt in the export market was decreased from US\$35 per square meter to its low-end pricing value of US\$28.36 per square meter. The sensitivity of the project to a change in the allocation of the sales volume from 70:30 (domestic sales:export sales) to 60:40 was also looked into. The case resulted in a decrease in the penetration rate in the domestic market from 28 per cent to 26 per cent in the first year of commercial operation. The results of the sensitivity analyses are shown below.

	Case 1	Case 2
IRR on Total Project	43.22%	44.44%
IRR on Equity	62.16%	64.39%
Net Present Value at 20%	US\$11.7 M	US\$12.4 M

Case 1 - Decrease in selling price in the export market to the low-end price.

Case 2 - Change in the sales allocation volume from 70:30 (domestic sales:export sales) to 60:40.

1.7.5 Financial Cashflow

The cashflow summary for the 15-year period of the project is shown below.

US\$000				
Year	Inflow	Outflow	Net Inflow (Outflow)	Cumulative Cashflow *
1	6,045	5,294	751	751
2	11,889	9,801	2,088	2,839
3	17,769	13,503	4,266	7,105
7	17,640	11,809	5,831	26,831
15	17,640	12,050	5,590	72,271

* available for cash dividends to the extent of retained earnings.

1.8 CONCLUSION

Based on the market and technical assessments and the financial projections, the project on the manufacture of rubber conveyor belts in Indonesia appears to be highly viable. There is a large domestic market for the said product particularly in the mining and cement industries.

There is also a large export market for rubber conveyor belts in the ASEAN region considering that most of these countries are net importers. Also, with the conveyor belts as an AIJV product, the belts will have an additional competitive advantage in terms of price. The price of the conveyor belts will generally be lower due to the 90 per cent tariff preference extended by participating countries.

2. PROJECT BACKGROUND AND HISTORY

2.1 PROJECT BACKGROUND

The ASEAN countries have continuously sought to achieve industrial cooperation and economic progress in the region as embodied in the Declaration of ASEAN Concord signed over ten years ago.

In April 1989, four projects have been put forward during the Committee on Industry, Minerals and Energy (COIME) National Coordinators meeting held in Kuala Lumpur. One of the four projects proposed is the establishment of a manufacturing plant of rubber-based products. The proposal came from Indonesia.

The United Nations Industrial Development Organization (UNIDO) has been working with COIME in the identification, preparation and promotion of ASEAN Industrial Joint Venture (AIJV) products. The AIJV is a program designed to promote among ASEAN member-countries industrial and economic cooperation with the private sector as the primary mover. It is in this light that UNIDO has engaged the services of SGV and Co. to prepare an investment opportunity study on the manufacture of conveyor belts.

Initially, the representative of Indonesia and COIME, in consultation with UNIDO, considered the following alternative projects but decided against them because of reasons indicated:

- o manufacture of dock fenders and railway pads - there is no markets for these rubber-based products here in ASEAN. The main market for these products is Europe.
- o manufacture of v-belts, flat belts, and conveyor belts - Japan is dumping its v-belt production in Singapore. Also, there are existing v-belt production facilities in the region. Flat belts, on the other hand, are already being replaced by v-belts.

The proposed plant will be located in Indonesia and participated in by nationals of at least two ASEAN countries with a minimum of 51 per cent ASEAN equity and minimum equity contribution of five per cent from nationals of each participating country.

2.2 PRODUCT DESCRIPTION

Conveyor belts play a vital role in a wide range of fields. They are designed to transport materials such as mineral ores, coal, soil and sand in key industries such as mining, cement, and construction. They are also used within the factory in production lines, at warehouses for intake and output of stocks, and at airport terminals to assist in the movement of baggage. It is usually made with a flanged edge which prevents materials from falling off or with a corrugated surface which will carry packages up and down inclines without slipping.

Conveyor belts are made of laminated rubber and nylon cloth. The number of plies of conveyor belts varies depending on the load of the material to be conveyed. The most widely used conveyor belt is the four-ply which is used in the mining industry. It usually comes in 900 to 1,000 millimeter width, 1/8 inch (6.4 millimeters) top cover, 1/16 inch (3.2 millimeters) bottom cover and weighs nine kilograms per square meter.

3. MARKET AND PLANT CAPACITY

3.1 DEMAND AND MARKET STUDY

3.1.1 Domestic Market - Indonesia

The apparent domestic consumption for conveyor belts in 1988 is estimated at 2,350 metric tons. (See Table 1.) Conveyor belts are used mainly in the mining and cement industries to transport minerals, non-metallic minerals, and cement raw materials such as limestone and clay from the quarry site to the mill site. They are also used in manufacturing establishments to move semi-processed and finished goods within the factory or production area.

The 1988 domestic production of conveyor belts is about 420 metric tons. According to interviews, this volume is about 70 per cent of the combined production capacity of all the conveyor belt manufacturers in Indonesia. In the same year, Indonesia imported 1,970 metric tons of conveyor belts. Export volume was negligible.

Table 1
Estimated 1988 Apparent Domestic Consumption

	Volume (Metric Tons)	Value (US\$000)
Domestic Production	420	2,140
Plus: Imports	1,970	10,037
Less: Exports	40	176
Apparent Consumption	2,350	12,001

Source: Interviews
Indonesia Foreign Trade Statistics.

3.1.2 Export Market - Selected ASEAN Countries
(excluding Brunei)

Malaysia, the Philippines, Singapore, and Thailand are generally net importers of conveyor belts. Net importation volume of conveyor belts of these countries (except Singapore) in 1989 is estimated at 5,100 metric tons, as presented in Table 2.

The main country source of imported conveyor belts of these selected ASEAN countries except Singapore is Japan. Singapore obtains most of its conveyor belts from the People's Republic of China (PROC), although their second largest country source is also Japan.

Over the period 1987 to 1989, importation volume of three of the four selected ASEAN countries grew at a rate of 16 per cent per annum. The trade statistics for Malaysia were not included in the computation of the growth rate due to the abnormal increase in import volume in 1987 to 1989 compared to the 1984 to 1986 levels. Presented below are the importation and exportation statistics as well as net importation volume for rubber conveyor belts of the four selected ASEAN countries.

Table 2
Importation and Exportation of Conveyor Belts of Selected ASEAN Countries
(Volume in Metric Tons; Value in US\$000)

ASEAN Country	1987		1988		1989 a/	
	Volume	Value	Volume	Value	Volume	Value
Importation:						
Malaysia	1,039	2,217	1,835	2,503	4,334	3,148
Philippines	1,001	4,478	1,297	4,231	1,040	4,959
Singapore b/	772	5,394	2,069	8,859	1,333	6,749
Thailand	208	912	777	3,037	305	2,745
Total	3,020	13,001	5,978	18,630	7,012	17,601
Less Exportation:						
Malaysia	19	67	177	81	138	428
Philippines	33	95	88	284	57	156
Singapore b/	748	2,702	1,049	3,420	1,660	3,274
Thailand	35	53	52	114	50	55
Total	835	2,917	1,366	3,899	1,905	3,913
Net Importation:						
Malaysia	1,020	2,150	1,658	2,422	4,196	2,720
Philippines	968	4,383	1,209	3,947	983	4,803
Singapore b/	24	2,692	1,020	5,439	(327)	3,475
Thailand	173	859	725	2,923	255	2,690
Total	2,185	10,084	4,612	14,731	5,107	13,688

a/ estimated based on partial data available

b/ estimated volume figures based on average price of conveyor belts in Malaysia, Philippines, and Thailand

Sources: Malaysia External Trade Statistics
Philippine Foreign Trade Statistics
Singapore Trade Statistics
Foreign Trade Statistics of Thailand.

3.1.3 Demand Projections

The domestic consumption of conveyor belts is projected to reach 2,840 metric tons in 1990, and about 7,380 metric tons by year 2000. (See Table 3.) This projection assumes an average annual growth rate of 10 per cent based on interviews with end-users.

Rubber belt importation of the four selected countries in the ASEAN region is estimated to reach 8,130 metric tons by 1990 and 35,880 metric tons by year 2000, assuming an average growth rate of 16 per cent per annum.

Table 3
Projected Demand for Rubber Conveyor Belts
1990 to 2005

(Metric Tons)

Year	Indonesia	Malaysia	Philippines	Singapore	Thailand	Total
1990	2,840	5,020	1,210	1,540	360	10,970
1991	3,130	5,830	1,400	1,790	420	12,570
1992	3,440	6,770	1,620	2,080	480	14,390
1993	3,780	7,850	1,880	2,410	560	16,480
1994	4,160	9,100	2,180	2,800	650	18,890
1995	4,580	10,550	2,530	3,240	760	21,660
2000	7,380	22,160	5,320	6,810	1,590	43,260
2005	11,880	46,550	11,190	14,300	3,330	87,250

3.1.4 Sources of Supply

The demand for conveyor belts in Indonesia in 1988 was met mainly by imports (82 per cent) and local production (18 per cent) to a lesser extent. According to the Indonesia Foreign Trade Statistics, more than 50 per cent of the 1,970 metric tons of imported conveyor belts in 1988 came from Japan. The other major country sources include: People's Republic of China, Taiwan, Australia and France. (See Table 4.)

Table 4
Importation of Conveyor Belts of Indonesia by Country of Origin
(Volume in Metric Tons; Value in US\$000)

Country	1987		1988		Jan. - May 1989	
	Volume	Value	Volume	Value	Volume	Value
Japan	463	9,581	1,030	6,684	N.A.	N.A.
China (PROC)	496	1,001	311	637	N.A.	N.A.
Taiwan	73	250	178	752	N.A.	N.A.
Australia	4	27	134	577	N.A.	N.A.
France	23	125	13	111	N.A.	N.A.
Others	257	1,250	302	1,276	N.A.	N.A.
Total	1,316	12,234	1,968	10,037	490	2,111

N.A. - Not available.

Source: Indonesia Foreign Trade Statistics.

There are about 15 to 20 local manufacturers of conveyor belts in Indonesia as shown in Table 5.

Table 5
List of Conveyor Belt Manufacturers in Indonesia

PT Perkalin Indah
PT Kerta Laksana
PT Ossiana Sakti Enterprises
PT Loma
PT Fata Jaya Metal Works
PT Indolaval
Coral Engineering
Mustang Tehnik
Revco
PT Boma Stork
PT Boma Bisma Indra
PT Karpindo Bahagia
PT Atmindu
CV Ayam Mas
PT Berca Indonesia
PT Bintang Harapan Mulia
PT Dirga Bratasena

Source: Board of Investment Coordinating, 1989
Indonesia Production Guidance Book, 1988.

Interviews indicate that the combined production capacity of these local manufacturers is about 600 metric tons per year. The industry utilization rate is about 70 per cent.

The largest manufacturer of conveyor belts is PT Perkalin Indah with an estimated annual production volume of 330 metric tons. The individual production volumes of the other firms are not available. However, interviews indicate that these range from five to 30 metric tons per year.

3.1.5 Profile of User Industries of Rubber Conveyor Belts

The users of conveyor belts may be classified into two groups: 1) heavy industries and 2) light industries. Heavy industries include mining, cement, and construction. Covered under light industries are the food and beverage manufacturers; cigarette and tobacco producers; and sugar, flour, and coconut millers.

Interview sources indicate that the average replacement rate of conveyor belts in both user industries is once every year.

3.1.5.1 Indonesia

The heavy industries' consumption of conveyor belts in Indonesia in 1988 is estimated at 1,880 metric tons or 80 per cent of total usage volume. (See Table 6.) On the other hand, the light industries' consumption of conveyor belts is estimated at 470 metric tons.

Table 6
Estimated 1988 Consumption of Conveyor Belts in Indonesia
by Major User Industry

Industry	Volume (Metric Tons)	Share (Per Cent)
Heavy industries	1,880	80
Mining	1,430	60
Cement	450	20
Light industries	470	20
Total	2,350	100

Source: Trade Interviews.

The mining industry is the largest user of conveyor belts having an estimated consumption volume of 1,430 metric tons in 1988. These conveyor belts were used to transport minerals such as tin, copper ores, iron sand, coal, etc. as well as non-metallic minerals such as granite, iodine, sulphur, phosphate rock, quartz sand, marble, and bentonite.

Interview sources indicate that there are four big mining companies in Indonesia. (See Table 7.)

Table 7
Major Mining Firms in Indonesia

Firm	Metals Mined
PT Aneka Tambang	largely coal
PT Tima Tambang	tin
PT Asahan Indonesia	aluminum
Freeport Indonesia	copper

Note: Production capacities not available.

Source: Interviews.

For the cement industry, consumption of conveyor belts is estimated at 450 metric tons. Interviews indicate that PT Indocement Tunggal Prakarsa, the biggest cement manufacturer in Indonesia, is also the biggest user of conveyor belts. The company accounts for over 40 per cent of conveyor belt consumption of cement manufacturers. The other large users of conveyor belts include PT Semen Padang, PT Semen Baturaja, PT Semen Cibinong, and PT Semen Gresik. These four firms account for about 30 to 40 per cent of total conveyor belt consumption in the

cement industry. Table 8 presents the cement manufacturers in Indonesia and their 1988 production capacity.

Table 8
Indonesian Cement Manufacturers and Production Capacities
1988

Firm	1988 Production Capacity (000 Metric Tons)
PT Indocement Tunggal Prakarsa	7,700
PT Semen Padang	2,130
PT Semen Baturaja	1,500
PT Semen Cibinong	1,500
PT Semen Gresik	1,500
PT Semen Tonasa	1,220
PT Tridaya Manunggal	1,200
PT Semen Andalas	1,000
PT Semen Nusantara	750
PT Semen Kupang	120
Total	18,620

Source: Association of Indonesian Cement Manufacturers.

3.1.5.2 Other ASEAN Countries

The estimated 1988 consumption of rubber conveyor belts of the four selected countries in the ASEAN region is about 20,100 metric tons. Malaysia accounts for almost 75 per cent of this volume. (See Table 9).

Table 9
Estimated 1988 Consumption of Conveyor Belts
in Selected ASEAN Countries

Country	Volume (Metric Tons)
Malaysia	1,600
Philippines	2,430
Singapore	*
Thailand	4,730
Total	8,760

* Negligible.

Source: Trade Interviews
Trade Statistics.

In Malaysia, interviews indicate that consumption of rubber conveyor belts may be estimated based on net importation volume as local production of conveyor belts is nil. In 1988, Malaysia imported about 1,800 metric tons of conveyor belts and exported 200 metric tons, resulting in a net importation volume of about 1,600 metric tons. The tin mining, quarry, and cement industries are the major users of conveyor belts. Other user industries include the following: construction, canning and packaging, and food processing.

There are three major tin mining firms in Malaysia. Their combined annual production capacity is estimated at 17,000 metric tons. Table 10 presents these three major mining firms.

Table 10
Major Tin Mining Firms in Malaysia

Malaysia Mining Corporation
Kumpulan Perangsang Selangor
Selangor Dredging Berhad

Source: Mines Department of Malaysia.

There are eight firms in the cement industry in Malaysia. The combined production capacity of these firms is estimated at 8.1 million metric tons. The cement manufacturers and their corresponding capacities are shown in Table 11.

Table 11
Malaysian Cement Manufacturers and Production Capacities

Firm	Production Capacity (000 Metric Tons)
Associated Pan Malaysia Cement Sdn Bhd	2,100
Kedah Cement Sdn Bhd	1,500
Perak Hanjoong Simen Sdn Bhd	1,200
Tasek Cement Bhd	1,200
Cement Industries of Malaysia Bhd	1,000
Cement Industries Sabah Sdn Bhd	500
Cement Manufacturers Sarawak Bhd	450
Malaya Industrial and Mining Corporation Bhd	180
Total	8,130

Source: Interviews.

For the Philippines, the estimated 1988 consumption of conveyor belts is about 2,400 metric tons. About 1,900 metric tons (80 per cent of the total industry usage) is accounted for by the heavy industries. Firms classified under light industries used about 500 metric tons in 1988.

Table 12
Estimated 1988 Consumption of Conveyor Belts in the Philippines
by Major User Industry

Industry	Volume (Metric Tons)	Share (Per Cent)
Heavy industries	1,940	80
Mining	1,820	75
Cement	120	5
Light industries	490	20
Total	2,430	100

Source: Trade Interviews.

It is estimated that about 1,800 metric tons of conveyor belts were used in the mining industry alone. Interviews indicate that the average annual consumption of conveyor belts per company in the mining industry is 900 square meters or about 8.1 metric tons. As of 1987, the Philippine Bureau of Mines and Geosciences lists about 200 to 250 companies (operating and undertaking exploration activities) involved in the mining of metallic and non-metallic ores. Table 13 lists the major firms in the mining industry in the Philippines.

Table 13
Major Mining Firms in the Philippines

Firm	Metals Mined
Apex Mining Company, Inc.	gold, silver
Atlas Consolidated Mining and Development Corporation	gold, silver, copper, molybdenum
Benguet Corporation	gold, silver, copper
Dizon Copper-Silver Mines, Inc.	gold, copper, silver
Itogon-Suyoc Mines, Inc.	silver, copper
Philex Mining Corporation	gold, silver, copper
Lepanto Consolidated Mining Corporation	gold, silver, copper
Marcopper Mining Corporation	gold, silver, copper
Maricalum Mining Corporation	silver, copper
North Davao Mining Corporation	hard ore
Acoje Mining Co., Inc.	chromite
Rio Tuba Nickel Mining Corporation	nickel
Benguet Exploration, Inc.	gold, silver, zinc
Hinatuan Mining Corporation	nickel

Source: Minerals News Service, 1988.

There are about 17 cement firms in the Philippines. Together, these firms have an estimated production capacity of 6.1 million metric tons of cement. Table 14 presents these firms and their corresponding production capacities.

Table 14
Philippine Cement Manufacturers and Production Capacities
1989

Firm	1989 Production Capacity (000 Metric Tons)
Solid Cement Corporation	630
Davao Union Cement Corporation	600
Northern Cement Corporation	480
Iligan Cement Corporation	480
Republic Cement Company	460
Floro Cement Corporation	400
Hi-Cement Corporation	370
Fortune Cement Corporation	360
Titan Cement	360
FR Cement Corporation	360
Rizal Cement Company, Inc.	340
Bacnotan Consolidated Industries, Inc.	290
Continental Cement Company	290
Central Cement Corporation	220
Pacific Cement Corporation	180
Apo Cement Corporation	150
Mindanao Portland Cement Corporation	150
Total	6,120

Source: Philippine Cement Manufacturers Corporation.

Interviews indicate that in the cement industry, the average annual consumption of conveyor belts per company is about 800 square meters or 7.2 metric tons. It is estimated that the cement industry used about 100 metric tons of rubber conveyor belts in 1988.

In Singapore, the main users of conveyor belts are firms in the construction industry. However, local market is very small because all the land reclamation projects in the country

nave been completed. The users procure their requirements mainly from the People's Republic of China, Japan, Korea and Thailand. This is due to the cheaper price of the imported belts relative to the locally manufactured products.

The estimated 1988 consumption of conveyor belts in Thailand is 4,730 metric tons. This is based on an estimated production volume of 4,000 metric tons and a net importation volume of 730 metric tons. Interviews indicate that the main consumers of conveyor belts in Thailand are the mining and cement industries.

The three major firms in the mining industry in Thailand are shown in Table 15.

Table 15
Major Mining Firms in Thailand

Firm	Metals Mined
Aokam Thai Ltd.	tin ore
Padaeng Industry Co., Ltd.	zinc ingot
Tongkah Harbour Ltd.	N.A.

N.A. - Not available.

Source: Interviews.

There are three cement manufacturers in Thailand. Their combined production capacity is estimated at 12 million metric tons. Table 16 presents the individual production capacity of these firms.

Table 16
Thai Cement Manufacturers and Annual Production Capacities

Firm	Production Capacity (000 Metric Tons)
The Siam Cement Co., Ltd.	6,500
Siam City Cement Co., Ltd.	4,550
Jalaprathan Cement Co., Ltd.	825
Total	11,875

Source: Interviews.

3.2 SALES AND MARKETING

3.2.1 Selling Prices

The conveyor belts will be sold directly to industrial end-users in Indonesia. Table 17 presents the proposed selling prices of conveyor belts for the domestic and export markets. The price for the domestic market is about 10 per cent lower than the existing price in Indonesia.

Table 17
Selling Prices of Conveyor Belts
(US\$)

	Price	
	Per Sq. M.	Per Metric Ton
Domestic Market (Ex-factory)	48	5,333
Export Market (FOB Tanjung Priok)	35	3,889

The export FOB price was determined based on an analysis of prices in the targeted ASEAN countries, particularly Malaysia, the Philippines, and Thailand. As shown in Table 18, the project's FOB price is

competitive with the computed FOB values of conveyor belts.

Table 18
Distribution Cost Build-up of Conveyor Belts
(US\$ per Metric Ton)

	Malaysia	Philippines	Thailand
(a) Prevailing Wholesale Price	2,390 - 18,960	3,050 - 13,310	6,080 - 13,560
(b) Distributor Margin [1 - [1/(1 + r)]] x (a)	480 - 3,790	610 - 2,660	840 - 1,870
(c) Landed Cost [(a) - (b)]	1,910 - 15,170	2,440 - 10,650	5,240 - 11,690
(d) Value-Added Tax/ Business Tax (v) x [(c)/(1 + v + t + d)]	120 - 950	160 - 710	280 - 620
(e) Tariff Rate (t) x [(c)/(1 + v + t + d)]	480 - 3,790	490 - 2,130	1,550 - 3,460
(f) Other Import Duties (d) x [(c)/(1 + v + t + d)]	120 - 950	160 - 710	310 - 690
(g) CIF Value [(c) - (d) - (e) - (f)]	1,190 - 9,480	1,630 - 7,100	3,100 - 6,920
(h) Insurance and Freight [1 - [1/(1 + i)]] x CIF	110 - 860	150 - 650	280 - 630
FOB Value [(g) - (h)]	1,080 - 8,620	1,480 - 6,450	2,820 - 6,290
Project's FOB Price	3,889	3,889	3,889

Notes:

1. r - Distribution Margin: 25 per cent for Malaysia and the Philippines, and 16 per cent for Thailand
2. v - Value-Added Tax: 10 per cent for Malaysia and the Philippines, and nine per cent for Thailand.
3. t - Tariff Rate: 40 per cent for Malaysia, 30 per cent for the Philippines, and 50 per cent for Thailand.
4. d - Other Import Duties - include brokerage fee, wharfage, arrastre charges, storage fees, etc. These are estimated to be about 10 per cent of CIF Value for all countries.
5. i - Insurance and Freight - 10 per cent for all countries.

Source: Interviews.

Tariff and Customs Code of the Philippines, 1989.

3.2.2 Sales Forecast and Market Penetration

The proposed market penetration program for the domestic and export markets for conveyor belts is shown in Table 19. During the initial year of operation, the project will target a penetration rate of 25 to 30 per cent of the domestic market. This takes into consideration the wide range of conveyor belt sizes and special types. Thus, there is a need for the project to target a particular niche in the market, i.e., the one meter width, four-ply general purpose conveyor belt. Other considerations include the geographical spread of Indonesia and the unfamiliarity of the proponents with the traders and distributors in the country. In the second year of operation, the project will target a penetration rate of 50 per cent. This is foreseen to increase further to 65 to 70 per cent of the unfilled demand in 1994 when the plant operates at full capacity.

For the export market, based on the project's pricing of rubber conveyor belts and the existing facilities in the region, the project can penetrate about one to five per cent of the unfilled ASEAN demand in the first year of commercial operation. During the second year, the project will target a penetration rate of five per cent. This is foreseen to increase to about six to 10 per cent in 1994.

Table 19
Sales Forecast and Market Penetration
(Metric Tons)

	1992	1993	1994
	-----	-----	-----
Indonesian Market			
Demand	3,440	3,780	4,160
Local Production	420	420	420
Unfilled Demand	3,020	3,360	3,740
Targeted Penetration Rate	25-30	50	65-70
Project's Domestic Sales	840	1,680	2,520
ASEAN Market			
Malaysia	6,770	7,860	9,110
Philippines	1,620	1,880	2,180
Singapore	2,080	2,410	2,800
Thailand	480	550	640
	-----	-----	-----
Total	10,950	12,700	14,730
Targeted Penetration Rate	1-5	5	6-10
Project's Export Sales	360	720	1,080

Source: Interviews.

Estimated sales during the first year of operation (1992) is 134,000 square meters or 1,200 metric tons. This is equivalent to sales revenue of US\$ 5.9 million. Annual sales revenue at full capacity (1994), by the third year of operation is projected to reach US\$17.6 million (400,000 square meters or 3,600 metric tons).

Seventy per cent of total production will be sold to the domestic market and the remaining 30 per cent is intended for the ASEAN export market. (See Table 20.)

Table 20
Domestic and Export Sales of Conveyor Belts

Sales	In US\$000	* In Meters (000)	In MT
One Shift (1992)			
Domestic	4,480	94	840
Export	1,400	40	360
Total	5,880	134	1,200
Two Shifts (1993)			
Domestic	8,960	186	1,680
Export	2,800	80	720
Total	11,760	266	2,400
Three Shifts (1994 to 2006)			
Domestic	13,440	280	2,520
Export	4,200	120	1,080
Total	17,640	400	3,600

* Conveyor belts are of one-meter width.

3.3 PRODUCTION PROGRAM

The plant will produce 1,200 metric tons of rubber conveyor belts in the first year of commercial operations. This represents the plant's capacity for one eight-hour shift operating at 300 days a year.

In the second year, the plant will operate at two eight-hour shifts, increasing its production to 2,400 metric tons of conveyor belts.

Full capacity (3,600 metric tons of conveyor belts per year) will be achieved during the third year of commercial operation when the plant will operate at 24 hours a day.

4. MATERIAL INPUTS

4.1 RAW MATERIALS

The direct materials used in the manufacture of conveyor belts include natural rubber, synthetic rubber and nylon cloth. Several chemicals and compounds are used in treating rubber during the production process. These include the following:

- o Accelerators (vulcafor HBS, sulphur and zinc) - hasten the curing process of rubber
- o Anti-oxidants (nonox BL and ZA) - prevent oxidation and preserve the element composition of the product
- o Dispersing agent (stearic acid) - facilitates the homogeneous mixture of all the ingredients
- o Releasing agent (zinc oxide) - ensures the easy removal of the end-product from the mould after the curing process
- o Filler or Whiting (carbon black) - provides the skeletal framework of the product
- o Paraffin wax - provides protective covering

The annual raw material requirements for the production of rubber conveyor belts at full capacity in terms of volume and value is shown in the next page.

Table 21
Annual Raw Material Requirements
for Production of Rubber Conveyor Belts at Full Capacity

Raw Material	Volume (MT)	Unit Cost (US\$/MT)	Total Cost (US\$000)
Direct Materials:			
Natural rubber	1,667.6	719	1,199.0
Synthetic rubber	714.7	1,350	964.8
Nylon cloth	512.0	4,800	2,457.6
Subtotal	-	-	4,621.4
Indirect Materials:			
Zinc oxide	476.5	2,361	1,125.0
Carbon black HAF N330	277.9	636	176.7
Carbon black GPF N660	39.7	617	24.5
Pine tar	47.6	675	32.1
Stearic acid	35.7	1,111	39.7
Paraffin wax	15.9	778	12.4
Nonox ZA	15.9	5,394	85.8
Nonox BL	19.9	5,394	107.3
Vulcafor HBS	14.7	6,742	99.1
Sulphur	59.6	389	23.2
Winophil	198.5	358	71.1
Cumar resin	15.9	1,333	21.2
Subtotal	-	-	1,818.1
Total	-	-	6,439.5

The above raw material requirements for the production of conveyor belts are sourced both locally and from other countries. Natural rubber (RSS1), synthetic rubber (SBR), zinc oxide, stearic acid, paraffin wax, sulphur, winophil and cumar resin are locally available. Nylon cloth, carbon black, pine tar, nonox and vulcafor are imported. Nylon cloth is sourced from South Korea while the other chemicals are imported from the People's Republic of China and the United States of America. Tariff duty for all imported materials except nylon cloth is five per cent. Nylon is subject to a 15 per cent tariff duty. Annex 1 presents the cost of direct and indirect materials used to manufacture conveyor belts.

4.2 UTILITY AND ENERGY REQUIREMENTS

Electricity cost at full capacity (at third year of operations - 1994) is estimated at US\$66,960 per year at an average cost of US\$0.062 per kilowatt-hour. Electric requirements per eight-hour shift of the plant is about 1,200 kilowatt-hours or a total of 1.08 million kilowatt-hours per annum at full capacity (three shifts, 300 days).

The annual water cost is estimated at about US\$10,875 at full capacity. In one eight-hour shift, 24 cubic meters of water are required for the steam-press and 1.6 cubic meters of water for the machinery and equipment cooling system. Cost of water is US\$0.472 per cubic meter.

Bunker fuel requirement at full capacity is estimated at about 2.9 million liters or US\$336,960 per annum. Bunker fuel usage per eight-hour shift is 3,200 liters.

Annex 2 presents in detail the utility and energy requirements for the plant at full capacity.

5. PLANT LOCATION

The proposed site for the project is Bekasi, West Java, about 30 kilometers from Jakarta. It is accessible to Tanjung Priok, the premiere shipping port in Indonesia. Bekasi also has adequate supply of water, electricity, fuel and communication facilities. Cost of land in Bekasi is estimated at US\$22 per square meter.

An alternative plant site is Pulogadung, Indonesia. This was decided against however because land prices in Pulogadung are more expensive (US\$43 per square meter) and the route from Pulogadung to Tanjung Priok passes through Jakarta whereas the Bekasi-Tanjung Priok route does not have to pass through the metropolitan area.

6. PROJECT ENGINEERING

6.1 LAYOUT AND PHYSICAL COVERAGE OF PROJECT

The total land area for the project is 6,000 square meters. About 3,300 square meters is allocated for the building space requirement and the remaining area will be used to accommodate the water and fuel tanks and possible plant expansion. The building space requirements are as follows: 1,600 sq. m. factory, 1,000 sq. m. finished goods warehouse, 500 sq. m. raw materials and spare parts warehouse and 200 sq. m. administrative building. (See Annex 3 for layout.)

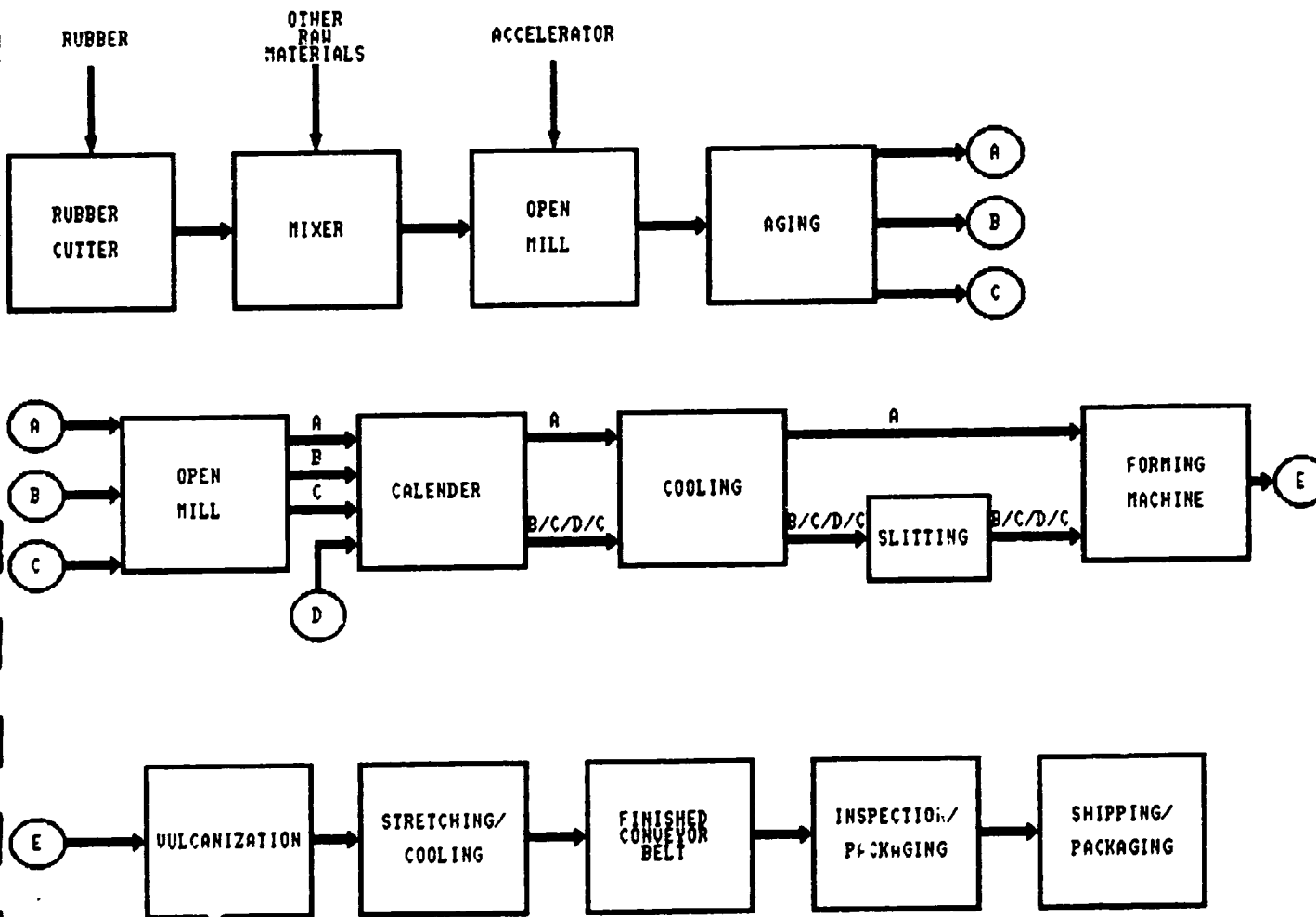
6.2 TECHNOLOGY AND EQUIPMENT

6.2.1 Production Process

The production of conveyor belts involves the following processes. (See Figure 1 for the schematic presentation of the production process.)

- o The raw materials for the conveyor cover, friction and cushion layers are weighed off and compounded one at a time in the intensive mixer and transferred to the open mill for further mixing.
- o The compounded materials are aged for 24 hours for further chemical reaction, after which, each compound is brought back to the open mill to soften.
- o After masticating on the mill, the conveyor cover is directed to the calender to bring the cover compound to the desired thickness. The friction and cushion material are laminated with the nylon fabric in the calender, bringing the compound to the desired ply thickness and width.
- o The conveyor cover is then laminated with the friction, cushion, and nylon sheets using the forming machine.

Figure 1
Process Flow for the Manufacture of Conveyor Belts



- Legend:
- A - Cover
 - B - Cushion Layer
 - C - Friction Layer
 - D - Nylon
 - E - Raw Finished Product - Conveyor Belt (4-ply)

- o The uncured conveyor belt is vulcanized for about 30 minutes at 141°C. Vulcanization improves the mechanical properties of rubber, e.g., increases tensile strength and resistance to abrasion, lessens susceptibility to temperature changes and makes it insoluble to all known solvents.
- o The cured conveyor belts then undergo extensive quality control inspection as to strength and pull/stress properties. In order to ensure quality finished products, samples of the incoming materials, chemicals and semi-finished products are checked at periodic intervals in the production process.
- o The rubber belts are then packed before they are stored in the warehouse and finally shipped to the customer.

6.2.2 Equipment

Total plant machinery and equipment cost is estimated at US\$6.9 million, inclusive of installation costs and shipping cost. This includes the three-roll calender, the intensive mixer, the two-roll mill, the building machine and the steam-heated flat press. The above plant equipment will all be procured from foreign suppliers.

Auxiliary equipment includes a forklift, a 300 HP boiler, a 20-HP air compressor, material handling equipment, laboratory equipment, a 1000-kilowatt generator, a water pump and storage tanks for fuel and water. The total cost of the auxiliary equipment is estimated to amount to US\$799,000, inclusive of installation and shipping cost. Except for the storage tanks, all the auxiliary equipment will be bought from foreign suppliers.

Annex 4 presents the specifications of the production and auxiliary equipment necessary for the manufacture of conveyor belts while Annex 5 shows the individual cost of these machineries and equipment.

6.3 CIVIL ENGINEERING

Site preparation which includes land clearing, grading, drainage, connection for water and electricity, and development of access roads is estimated at US\$14 per square meter for a total cost of US\$84,000. Total cost of land, site preparation and development is estimated at US\$216,000.

Estimated cost for the building and civil works is US\$464,300. Construction cost of the factory building and warehouse is estimated at US\$139 per square meter for a total of US\$430,900 while that of the office building is estimated at US\$167 per square meter for a total cost of US\$33,400.

7. PLANT ORGANIZATION AND OVERHEAD COSTS

7.1 ORGANIZATION

The organization will be under the management of the board of directors which consists of five members including the president/director. Day to day operations will be the responsibility of the general manager. There will be three major groups of personnel -- the finance and administrative group, the marketing and sales group, and the plant/production group. Each group will be headed by a manager. Under these managers are the section heads and the rank and file workers. The proposed organizational structure is shown in the next page.

7.2 ESTIMATED OVERHEAD COSTS

At full capacity, the total overhead cost is estimated at US\$1.9 million. This is classified by function - factory, administrative, and marketing and sales.

Factory overhead expense includes auxiliary material, indirect labor, delivery, packaging, research and development, insurance and factory supplies. This is estimated to amount to US\$948,000 at full capacity in 1994.

Administrative overhead consists of office salaries, office supplies, communications, repairs and maintenance, insurance and miscellaneous expenses. It is estimated to amount to US\$545,000 per year.

Marketing and sales overhead include salaries of the marketing personnel plus two per cent of total sales. Salaries of marketing personnel is estimated at US\$86,378 per year. The two per cent variable sales cost which will be used to cover expenses for travel, representation, brochures, pamphlets, and other miscellaneous items is estimated at US\$352,800 at full capacity.

Estimated overhead cost for the project is shown in Table 22.

Figure 2
Organizational Structure

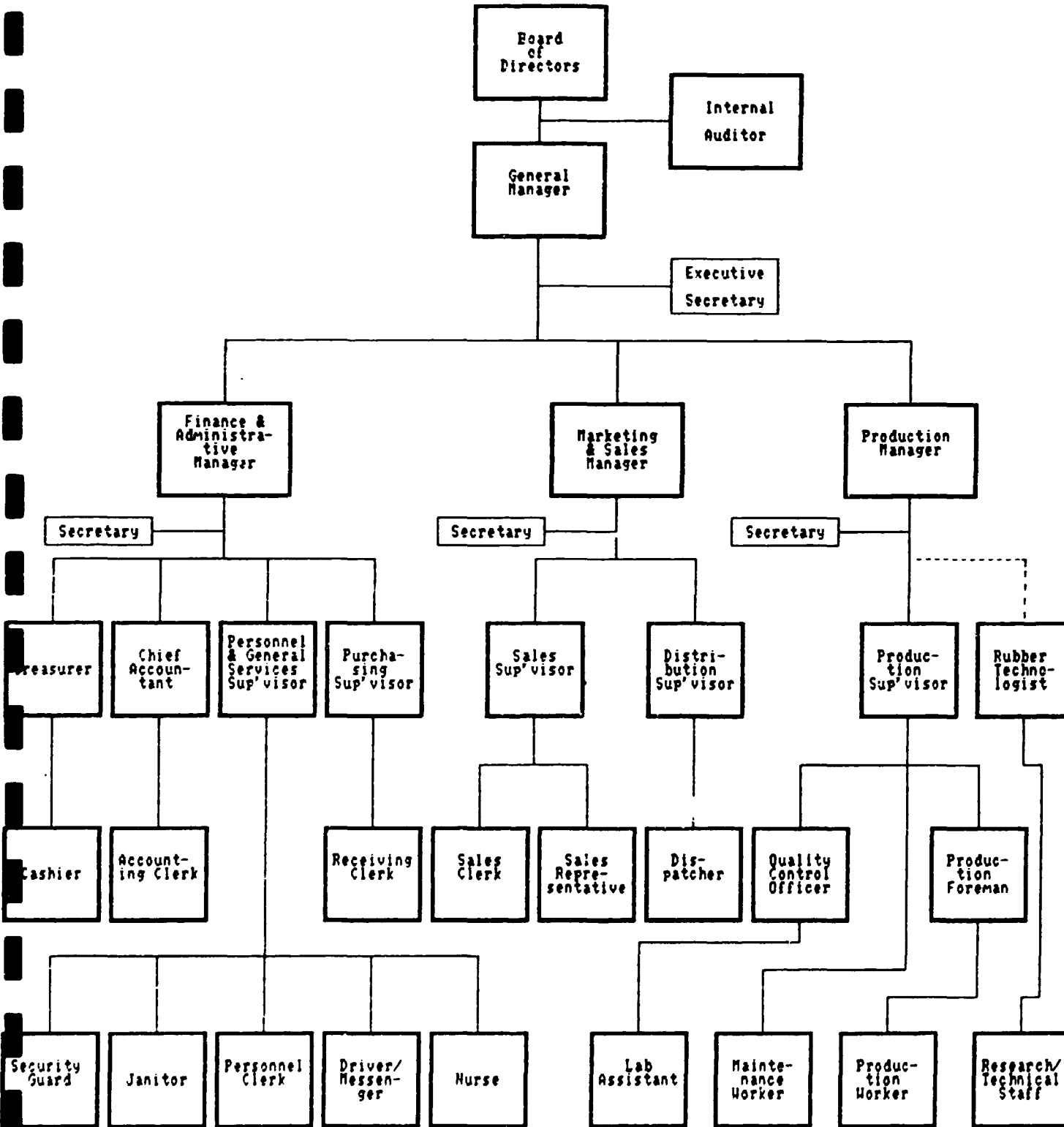


Table 22
Estimated Overhead Costs
(US\$000)

Overhead	1992 (1 Shift)		1993 (2 Shifts)		1994 - 2006 (3 Shifts)	
	Value	%	Value	%	Value	%
Factory	467	38	707	45	948	49
Administrative	545	45	545	35	545	28
Marketing and Sales	204	17	322	20	439	23
Total	1,216	100	1,574	100	1,932	100

The breakdown of overhead cost for the factory and administrative groups is shown in Annex 6.

8. MANPOWER

8.1 LABOR

There will be 41 factory workers per eight-hour shift. Twenty two persons are classified as direct labor while 19 persons are grouped under indirect labor. The direct labor force consists of nine skilled workers and 13 unskilled workers. Total annual salaries and benefits for the direct labor for one eight-hour shift is estimated at US\$43,329 while that of the indirect labor is estimated at US\$130,002. At full capacity, total salaries and benefits of direct and indirect factory labor is estimated to reach US\$326,437.

Table 23
Schedule of Factory Personnel
(US\$000)

Labor	1992 (1 Shift)		1993 (2 Shifts)		1994 - 2006 (3 Shifts)	
	No.	Cost	No.	Cost	No.	Cost
Direct	22	43	44	87	66	130
Indirect	19	130	27	163	35	196
Total	41	173	71	250	101	326

8.2 STAFF

Aside from the plant personnel, there are 32 administrative staff and seven marketing personnel. Total annual salaries and benefits for the administrative staff totals US\$531,700 at full capacity. Marketing staff compensation is estimated at US\$86,378 per annum.

Annex 7 presents a more detailed breakdown of labor cost by functional area for one eight-hour shift.

9. PROJECT IMPLEMENTATION

The plant is scheduled to begin commercial operations after a one-year pre-production phase.

The pre-production phase includes the following activities:

- o Acquisition of government approvals and application for incentives
- o Preparation of feasibility study and engineering specifications
- o Land and site development
- o Acquisition of plant machineries and other auxiliary equipment
- o Construction of the building, plant, and civil works
- o Delivery of plant machineries and other auxiliary equipment
- o Fabrication and installation of equipment and machineries
- o Procurement of raw materials for test runs
- o Recruitment and training of production and maintenance personnel
- o Test-runs of plant machineries and equipment
- o Start-up operations

Figure 3 shows the schematic diagram of the pre-production phase of the project. The pre-production expenses are presented in Table 24.

Figure 3
Implementation Schedule

Activity	Period 1	Period 2	Period 3	Period 4	Period 5
Acquisition of government approvals and application for incentives	****				
Feasibility study and engineering specifications	*****				
Land and site development		*****			
Acquisition of plant machineries and other auxiliary equipment		*****	*****		
Construction of the building and plant; civil works		*****	*****		
Delivery of plant machineries and other auxiliary equipment			*****		
Fabrication/installation of equipment and machineries				*****	
Procurement of raw materials for test run				*****	
Recruitment and training of production and maintenance personnel				*****	
Test-run of plant machineries and equipment				*****	
Start-up operations				*****	
Normal operations					***** ----->

Note: Each period represents one quarter.

Table 24
Pre-production Expenses
(US\$000)

	Amount
Project feasibility study and preparation of engineering specifications	20
Trial runs *	40
Manpower training	3
Organizational expenses **	25
Property tax	12
Capitalized interest	319

Total	419
	=====

* Include raw material costs, direct labor, utility expenses, etc.

** Include government licenses, fees, salary of key administrative personnel.

10. FINANCIAL EVALUATION

The conveyor belt output of the project is planned to be listed as an AIJV product. It will enjoy a 90 per cent tariff preference from participating ASEAN countries and be more competitive in these country markets.

10.1 TOTAL INVESTMENT OUTLAY

Total initial investment requirement for the rubber belt project is estimated at around US\$8.8 million. Of this, about 90 per cent or US\$8.0 million is accounted for by foreign currency cost component. This consists mostly of plant and auxiliary equipment. Local cost component which accounts for land, building, office and transport equipment, preproduction cost is about US\$0.8 million. (See Table 25.)

Table 25
Total Initial Investment
(US\$000)

Fixed investment cost

Land, site preparation, development	US\$	216
Buildings and civil works		464
Auxiliary and service facilities		799
Incorporated fixed assets		68
Plant, machinery and equipment		6,880

Total fixed investment costs		8,427
Pre-production capital expenditures		419

Total	US\$	8,846
		=====

As shown in Table 25, 95 per cent of total initial investment cost or US\$8.4 million is accounted for by fixed investments. Other initial investment cost include preproduction capital expenditure.

Pre-production capital expenditures include the cost of feasibility studies and engineering specifications, trial runs and manpower training, organizational expense, property tax and capitalized interest. (Refer to Table 24.)

10.2 PROJECT FINANCING

The project is assumed to be financed through equity contributions (40 per cent) and a long term loan (60 per cent). Of the US\$3.5 million equity, 70 per cent will come from Indonesia. Foreign expenditure, which covers mainly the acquisition of the plant and auxiliary machinery and equipment, will be funded by foreign sources to the extent of 80 per cent. The foreign loan will finance 67 per cent of total foreign cost component. The foreign long term loan of US\$ 5.3 million will have a term of seven years inclusive of a two-year grace period on principal. The principal payments will be made in five equal yearly amortizations. The annual interest rate of the foreign loan is assumed at 12 per cent. (See Table 26.)

Table 26
Sources of Financing
(US\$000)

Equity contributions		
Local		US\$ 2,477
Foreign		1,061
	Total Equity	3,538
	Long-term loan (Foreign)	5,308
	Total	US\$ 8,846
		=====

10.3 PRODUCTION COST

Total production cost at full capacity (1994) amounts to around US\$ 10.5 million. The majority of the production cost (77 per cent) is accounted for by factory expenses. Factory costs include raw material costs, utilities expense, energy cost, direct labor cost, repair and maintenance, spares and factory overhead. The remaining 23 per cent of the cost is accounted for as follows: administrative overhead - 5 per cent, sales and distribution - 4 per cent, depreciation - 9 per cent, and financial cost - 5 per cent.

Table 27 summarizes total production costs at full capacity.

Table 27
Production Cost at Full Capacity
(US\$000)

Raw materials	US\$ 4,621
Other raw materials	1,818
Utilities	78
Energy	337
Direct labor	43
Repair and maintenance	203
Spares	20
Factory overhead	948

Total factory cost	8,068
Administrative overhead	545
Sales and distribution	439
Depreciation	953
Financial cost	510

Total	US\$ 10,515
	=====

10.4 COMMERCIAL PROFITABILITY

The results of the financial projections are based on the assumptions presented in the previous sections and summarized in Annex 8. The financial statements for the project is presented in Annex 9.

The financial projections use constant 1989 prices. Any increase in cost is assumed to be compensated for by an increase in selling prices. All Rupiah costs were converted to US currency using an exchange rate of Rp 1800 to US\$1.

The results of the financial projections show that the project is highly viable with an internal rate of return (IRR) of 46.70 per cent. Likewise, it shows that the internally generated cash is sufficient to cover its financial cost for the same period. Table 28 presents the income statement highlights of the project.

Table 28
Income Statement Highlights
(US\$000)

Year	Gross Revenue	Net Income(NI)	NI/Revenues (%)
1	5,880	358	6
2	11,760	2,453	21
3	17,640	4,631	26
4	17,640	4,714	27
5	17,640	4,954	28
6	17,640	5,037	29
7	17,640	5,119	29
8	17,640	5,119	29
9	17,640	5,119	29
10	17,640	5,119	29
11	17,640	5,567	32
12	17,640	5,567	32
13	17,640	5,567	32
14	17,640	5,567	32
15	17,640	5,567	32

The commercial profitability of the project is summarized in Table 29.

Table 29
Commercial Profitability

IRR on Total Project	46.70%
IRR on Equity	68.53%
Net Present Value at 20%	US\$ 13.7 Million
Payback Period	3 yrs. & 7 mos.
Break even sales excluding finance (% of sales at full capacity)	21.05%

To test the project's sensitivity to a change in the selling price which is considered a critical factor, the selling price of the conveyor belt in the export market was decreased from US\$35 per square meter to its low-end pricing value of US\$28.36 per square meter. The sensitivity of the project to a change in the sales allocation from 70:30 (domestic sales:export sales) to 60:40 was also looked into. The case resulted in a decrease in the project's penetration rate in the domestic market from 28 per cent to 26 per cent. The results of the sensitivity analyses are shown below.

Table 30
Sensitivity Analyses

	Case 1	Case 2
IRR on Total Project	43.22%	44.44%
IRR on Equity	62.16%	64.39%
Net Present Value at 20%	US\$11.7 M	US\$12.4 M

Case 1 - Decrease in selling price in the export market to the low-end price.

Case 2 - Change in the sales allocation volume from 70:30 (domestic sales:export sales) to 60:40.

To further test the sensitivity of the project's IRR to unfavorable conditions, variations of the selling price, operating costs and initial investment costs were considered using the UNIDO COMFAR graphics. (See Annex 10.)

10.5 FINANCIAL CASHFLOW

The cashflow summary for the 15-year period of the project is presented in Table 31. As shown in the table, cash inflow of the project will stabilize after it has reached full capacity. The additional US\$129,000 cash inflow in year three is due to the additional working capital requirement brought about by the increase in the plant's capacity utilization. Cash outflow on the other hand will vary during the first three years due to increasing capacity utilization. The cash outflow variation from the fourth to the seventh year of operation is due to financing and depreciation costs while cash outflow variation on the succeeding years is due to depreciation costs alone.

Table 31
Financial Cashflow
(US\$000)

Year	Inflow	Outflow	Net Inflow (Outflow)	Cumulative Cashflow *
1	6,045	5,294	751	751
2	11,889	9,801	2,088	2,839
3	17,769	13,503	4,266	7,105
4	17,640	13,035	4,605	11,710
5	17,640	13,036	4,604	16,313
6	17,640	12,954	4,686	21,000
7	17,640	11,809	5,831	26,831
8	17,640	11,809	5,831	32,661
9	17,640	11,809	5,831	38,492
10	17,640	11,809	5,831	44,322
11	17,640	12,050	5,590	49,912
12	17,640	12,050	5,590	55,502
13	17,640	12,050	5,590	61,092
14	17,640	12,050	5,590	66,681
15	17,640	12,050	5,590	72,271

* available for cash dividends to the extent of retained earnings.

Note: Items may not add to total because of rounding.

ANNEXES

COST OF DIRECT AND INDIRECT MATERIALS
AT FULL CAPACITY
(Volume in Metric Tons; Cost in US\$)

Material	Volume	Unit Cost per MT	Total Cost	Cost of Imported Materials
Direct Material				
RSS 1	1,667.6	719.0	1,199,004.4	
SBR	714.7	1,350.0	964,845.0	
NN100	512.0	4,800.0	2,457,600.0	2,457,600.0
Subtotal			4,621,449.4	2,457,600.0
Indirect Material				
Zinc Oxide	476.5	2,361.0	1,125,016.5	
Carbon Black				
HAF N330	277.9	636.0	176,744.4	176,744.4
GPH N660	39.7	617.0	24,494.9	24,494.9
Pine Tar	47.6	675.0	32,130.0	32,130.0
Stearic Acid	35.7	1,111.0	39,662.7	
Paraffin Wax	15.9	778.0	12,370.2	
Nonox				
ZA	15.9	5,394.0	85,764.6	85,764.6
BL	19.9	5,394.0	107,340.6	107,340.6
Vulcafor HBS	14.7	6,742.0	99,107.4	99,107.4
Sulphur	59.6	389.0	23,184.4	
Winophil	198.5	358.0	71,063.0	
Cumar Resin	15.9	1,333.0	21,194.7	
Subtotal			1,818,073.4	525,581.9
Total			6,439,522.8	2,983,181.9

UTILITY AND ENERGY REQUIREMENTS
AT FULL CAPACITY

Electric Power Requirement

Electric Power Requirement per Hour (Kw)	100.0
Allowance Factor	x 1.5
<hr/>	
Adjusted Electric Power Requirement (Kw)	150.0
No. of Hours per Shift	x 8
<hr/>	
Electric Power Requirement for One Shift (kwh)	1,200.0
No. of Shifts in a Year	x 900.0
<hr/>	
Annual Electric Power Requirement at Full Capacity (kwh)	1,080,000.0
Cost of Electric Power (US\$/Kwh)	x 0.062
<hr/>	
Total Electricity Cost (US\$)	66,960.0
<hr/>	

Water Requirement

Water Requirement per Hour for the Steam-Press (cu. m.)	3.0
No. of Hours per Shift	x 8
<hr/>	
Total Water Requirement per Eight-hour Shift for the Steam Press (cu. m.)	24
<hr/>	
Water Requirement per Hour for the Cooling System (cu. m.)	0.8
No. of Hours per Shift	x 8
<hr/>	
Total Water Requirement per Eight-hour Shift for the Cooling System (cu. m.)	6.4
<hr/>	
Annual Water Requirement per Eight-hour Shift (cu. m.)	25.6
Number of Shifts per Year	x 900.0
<hr/>	
Annual Water Requirement at Full Capacity	23,040.0
Cost of Water (US\$/ cu. m.)	x 0.472
<hr/>	
Total Cost of Water (US\$)	10,874.2
<hr/>	

Fuel Requirement

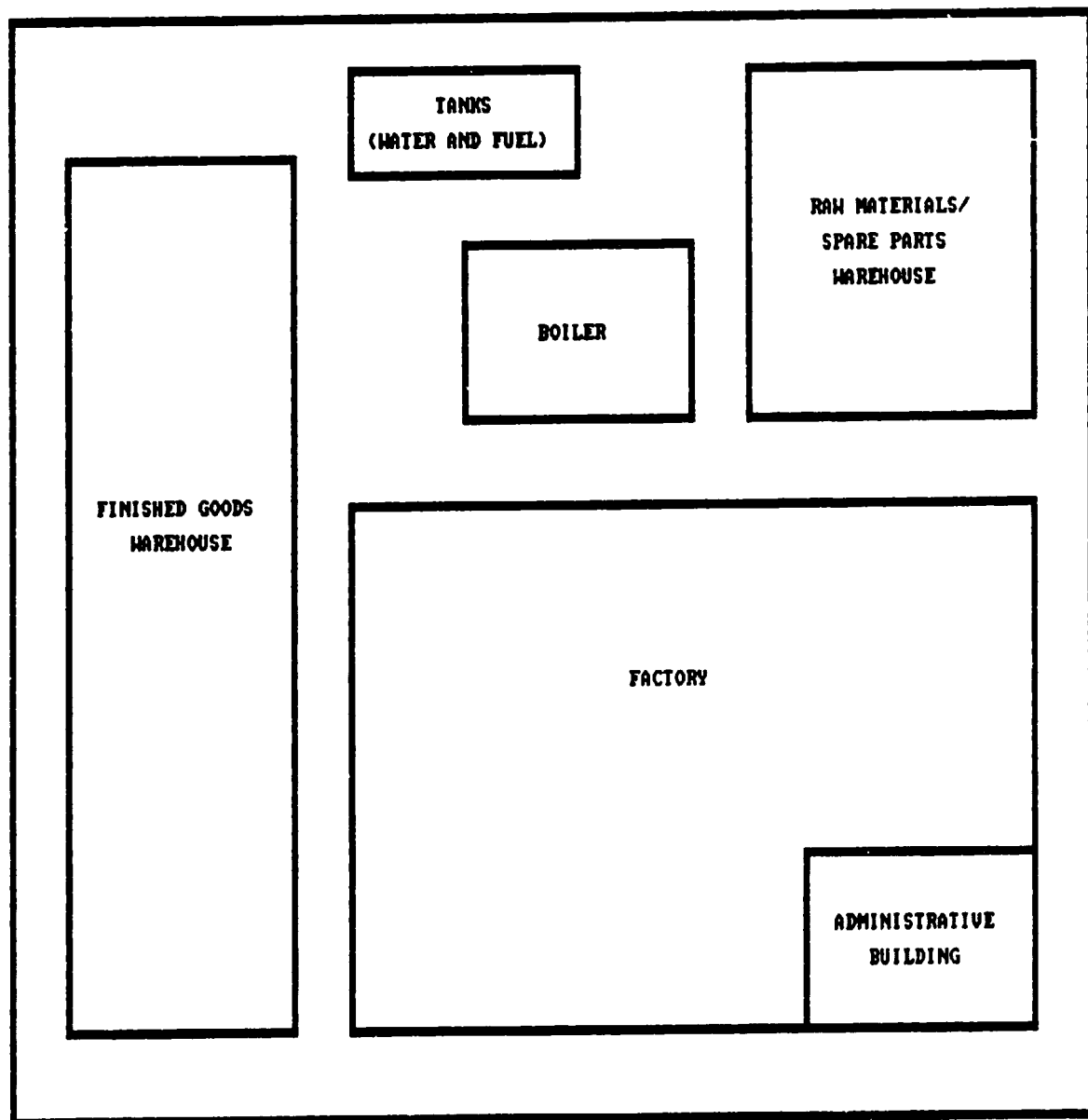
Fuel Requirement per Hour (liter)		400.0
No. of Hours per Shift	x	8.0

Fuel Requirement per Shift (liter)		3,200.0
No. of Shifts per Year	x	300.0

Annual Fuel Requirement at Full Capacity (liter)		960,000.0
Cost of Fuel (US\$/liter)	x	0.117

Total Fuel Cost (US\$)		112,320.0

PLANT LAYOUT



EQUIPMENT SPECIFICATIONS

A. Plant Machinery and Equipment

1. Intensive mixer

Capacity: 75 liters

Power: 175 Hp

Description: Used for mixing natural rubber and synthetic rubber with chemicals in short cycle to obtain a uniform mixed stock

2. Open mill

Power: 60 Hp

Description: This is also called rubber/plastic mixing mill

3. Three-roll calender with heating and cooling rolls

Power: 5 Hp

Description: 16" diameter rolls, 48" width

Used for making rubber sheets and for laminating nylon, friction, and cushion.

4. Slitting machine

Power: 2 Hp

Description: 2" x 10" diameter rolls, 1.2 m width

5. Forming machine

Power: 2 Hp

Description: Composed of 2" x 6" diameter rolls, one made of steel; the other made of rubber, with knife

6. Steam-heated flat press

Power: 25 Hp

Description: 1.2 m width x 51.5 m length

7. Rubber cutter

Power: 2 Hp

B. Auxiliary Equipment

1. Forklift truck

Capacity: 5 tons

2. Boiler

Power: 300 Hp

Steam Requirement: 3,000 kgs. per hour of saturated steam

Fuel Requirement: 400 liters of bunker fuel per hour

3. Air compressor

Power: 20 Hp

4. Rheometer

5. Electric Generator

Output: 100 kw at 750 rpm

Fuel Requirement: Diesel

Description: Includes one unit stationary four stroke diesel engine, one unit three phase alternator and one switchgear

6. Water Pump

Power Requirement: 0.6 kw

7. Storage tank

Capacity: 8000 liters

Material: sus 304 t 4 mm

Finishing: Interior and exterior polished using Grade 150

Dimensions: 6 m x 9 m

8. Batching machine

Dimensions: 4 ft. x 4 ft. x 4 ft.

COST OF PRODUCTION, AUXILIARY, AND OTHER EQUIPMENT
(in US\$)

A. Plant Machinery and Equipment

Description	Quantity	Net Cost	Tariff (5%)	Unit Cost	Total Cost
Three-roll calender with heating and cooling rolls (16" x 48"; 64 Hp)	2	32,479.00	1,623.90	34,101.90	68,203.80
Intensive mixer (75 l; 175 Hp)	2	2,452,800.00	122,640.00	2,575,440.00	5,150,880.00
Open mill (60 Hp)	4	1,078.00	53.90	1,131.90	4,527.60
Forming machine (19" diameter, 2 rolls, 1.2m width, 5 Hp)	1	1,000.00	50.00	1,050.00	1,050.00
Steam-heated flat press (1.2m x 5.15m; 25 Hp)	1	61,361.00	3,068.05	64,429.05	64,429.05
Rubber cutter (2 Hp)	2	1,000.00	50.00	1,050.00	2,100.00
Slitting Machine (5 Hp, 2 rolls, 6" diameter)	1	1,000.00	50.00	1,050.00	1,050.00
Subtotal					5,292,240.45
Add: 5% Contingency					264,612.02
15% Shipping/Installation					793,336.07
10% Value Added Tax					529,224.05
Total					6,879,912.59

B. Auxiliar Equipment

Description	Quantity	Net Cost	Tariff (5%)	Unit Cost	Total Cost
Fork lift truck	1	38,500.00	1,925.00	40,425.00	40,425.00
300 H.P. boiler	1	41,667.00	2,083.35	43,750.35	43,750.35
20 H.P. air compressor	1	9,042.00	452.10	9,494.10	9,494.10
Material handling equipment (except forklift truck)	1	13,333.00	666.65	13,999.65	13,999.65
Laboratory equipment (Rheometer)	1	35,000.00	1,750.00	36,750.00	36,750.00
Generator (1000 kw)	1	428,222.00	21,411.10	449,633.10	449,633.10
Water pump (600 watts)	1	556.00	27.80	583.80	583.80
Storage tank (8000 l)	2	6,134.00	-	6,134.00	12,268.00
Batching machine (4' x 4' x 4')	1	1,406.00	-	1,406.00	1,406.00
Subtotal					614,624.00
Add: 5% Contingency					30,731.20
15% Shipping/Installation					92,193.60
10% Value Added Tax					61,462.40
Total					799,011.20

C. Office Equipment

Description	Quantity	Unit Cost	Total Cost
Adding Machine	5	90.00	450.00
Airconditioner	3	540.00	1,620.00
Calculator	5	11.00	55.00
Computers	4	2,470.00	9,880.00
Conference Table	1	360.00	360.00
Fax Machine	1	3,595.00	3,595.00
Filing Cabinet	4	55.00	224.00
Office Table	25	90.00	2,250.00
Office Chair	25	45.00	1,125.00
Other Office Accessories		675.00	675.00
Refrigerator	1	450.00	450.00
Typewriter (electric)	4	675.00	2,700.00
Typewriter (manual)	2	135.00	270.00
Visitor's Chair	24	6.00	144.00
Subtotal			23,798.00
Add: Furniture and Fixture			4,494.00
Total			28,292.00

D. Transport Equipment

Description	Quantity	Unit Cost	Total Cost
Asian Utility Vehicle	3	13,330.00	39,990.00
Total			39,990.00

ANNUAL OVERHEAD COST AT FULL CAPACITY
(In US\$)

I. Production Department

Item	Cost
Variable Cost	
Auxiliary Material	64,395.23
Indirect Labor	99,672.00
Delivery Expense	176,400.00
Packaging Expense	352,800.00
Research and Development	28,434.15
Subtotal	721,701.38
Fixed Cost	
Indirect Labor	96,778.00
Insurance	121,647.00
Factory Supplies	7,678.92
Subtotal	226,103.92
Total	947,805.30

II. Finance and Administrative Department

Office Supplies	2,700.00
Communications	6,472.22
Repairs and Maintenance	2,033.64
Insurance	1,525.23
Utility	566.67
Miscellaneous	411.27
Subtotal	13,709.03
Labor Cost (see Annex 8 for details)	531,700.00
Total	545,409.03

LABOR COST BY FUNCTIONAL AREA
FOR ONE EIGHT-HOUR SHIFT
(in US\$)

I. Annual Production Labor Cost

Position	Number	Annual Salary*	Total Annual Salary
Direct Labor Cost:			
Rubber Millman	1	3,250	3,250
Calender Operator	1	3,250	3,250
Rubber Compounder	1	3,250	3,250
Machine Operator	1	3,250	3,250
Rubber Moulding	1	3,250	3,250
Forming Machine Operator	1	3,250	3,250
Press Operator	1	3,250	3,250
Slitting Machine Operator	1	3,250	3,250
Cutting Machine Operator	1	3,250	3,250
Packer	1	1,093	1,093
Production Helpers	2	1,093	2,186
Subtotal	22		43,329
Indirect Labor Cost:			
Production Manager	1	43,333	43,333
Secretary	1	1,950	1,950
Rubber Technologist	1	18,056	18,056
Research/Technical Staff	2	1,950	3,900
Production Supervisor	1	18,056	18,056
Quality Control Officer	1	3,250	3,250
Laboratory Assistant	2	1,950	3,900
** Maintenance Worker	4	3,250	13,000
** Production Foreman	4	5,068	20,274
Material Handling Equipment Operator	1	3,250	3,250
Production Helper	1	1,093	1,093
Subtotal	19		130,002
Total	41		173,331

Notes:

- * Includes fringe benefits such as social charges, bonus, etc.
- ** Varies directly with number of shifts

II. Annual Finance and Administrative Labor Cost

Position	Number	Annual Salary*	Total Annual Salary
Members of the Board of Directors	4	57,773	231,112
President/Director	1	57,773	57,773
Internal Auditor	1	43,333	43,333
General Manager	1	50,556	50,556
Executive Secretary	1	1,950	1,950
Fin. and Adm. Manager	1	43,333	43,333
Secretary	1	1,950	1,950
Treasurer	1	19,056	19,056
Cashier	1	1,950	1,950
Chief Accountant	1	19,056	19,056
Accounting Clerk	2	1,950	3,900
Personnel and Gen. Services			
Supervisor	1	19,056	19,056
Personnel Clerk	2	1,950	3,900
Janitor	2	1,083	2,166
Nurse	1	3,250	3,250
Security Guard	6	1,083	6,438
Driver/Messenger	2	1,950	3,900
Purchasing Supervisor	1	19,056	19,056
Receiving Clerk	2	1,950	3,900
Total	32		531,730

Note:

* Includes fringe benefits such as social charges, bonus, etc.

III. Annual Marketing and Sales Labor Cost

Position	Number	Annual Salary*	Total Annual Salary
-----		-----	-----
Marketing and Sales Manager	1	43,333	43,333
Secretary	1	1,950	1,950
Sales Supervisor	1	18,056	18,056
Sales Clerk	1	1,950	1,950
Sales Representative	1	1,950	1,950
Distribution Supervisor	1	18,056	18,056
Dispatcher	1	1,033	1,033
	-----		-----
Total	7		86,378
	-----		-----

Note:

* Includes fringe benefits such as social charges, bonus, etc.

NOTES AND ASSUMPTIONS
USED IN THE FINANCIAL PROJECTIONS

The financial projections for the project are computed using the UNIDO Computer Model for Feasibility Analysis and Reporting (COMFAR) software at constant 1989 prices. The exchange rate used is Rp 1,800 per US\$1.00.

INCOME STATEMENT

Sales

Sales Volume

The sales volume of conveyor belts for the period 1992 to 2006 is as follows:

(000 Sq. M.)

Year	Domestic	ASEAN	Total
1992	94	40	134
1993	186	80	266
1994-2006	280	120	400

Note: Conveyor belts are of one meter width.

Selling Price

Selling price are assumed as follows:

	Price (Per Sq. M.)
Domestic Market	US\$48
Export Market	US\$35

Variable Costs

o Raw Material

Below is a list of the unit prices of the raw materials used for conveyor belts.

Raw Material	Cost per Metric Ton (US\$)
RSS 1	719
SBR	1,350
NN100	4,800
Zinc Oxide	2,361
Carbon Black	
HAF N330	636
GPH N660	617
Pine Tar	675
Stearic Acid	1,111
Paraffin Wax	778
Nonox ZA	5,394
Nonox BL	5,394
Vulcafor HBS	6,742
Sulphur	389
Winophil	358
Cumar Resin	1,333

Details on the volume requirements requirements per shift of the various raw materials used to manufacture conveyor belts are presented in Annex 2.

o Utilities

Total utility cost is about US\$25,900 for the first year of operation, US\$51,900 for the second year, and US\$77,800 for the third year. Total utility cost covers both electricity and water. Bunker fuel has been classified under energy. The electricity rate for the first two years of operation is US\$0.074 per kilowatt-hour (the electricity rate from 6 a.m. to 10 p.m.). On the third year, the rate is US\$0.062 per kilowatt-hour. This is the weighted average electricity rate for a workday based on the following rates: US\$0.074 per kilowatt-hour from 6 a.m. to 10 p.m. and US\$0.038 per kilowatt-hour from 10 p.m. to 6 a.m. The water and fuel rates are assumed at US\$0.472 per cubic meter and US\$0.038 per liter, respectively. A detailed breakdown of utility and energy costs is shown in Annex 3.

o Direct Labor Cost

Twenty-two laborers are required for one eight-hour shift. The number of laborers classified by position are shown in Annex 8. The annual salaries per eight-hour shift of skilled and unskilled factory workers are as follows:

Skilled factory worker	US\$3,250 per year
Unskilled factory worker	US\$1,083 per year

The above rates include fringe benefits, i.e., social charges and bonuses.

o Factory Overhead

Included in this item are the following:

1. Auxiliary Materials - The cost of auxiliary materials is estimated at one per cent of total raw material cost.
2. Indirect Labor Cost - Indirect labor cost is estimated at US\$33,224 per year, computed based on the following annual salaries for one eight-hour shift of the production foreman and the maintenance worker:

	No.	Rate per Year (US\$)	Total (US\$)
	----	-----	-----
Production foreman	4	5,560	20,224
Maintenance worker	4	3,250	13,000
	----		-----
	8		33,224
	====		=====

3. Freight Delivery and Packaging Expense - Freight delivery expense and packaging expense are assumed at one per cent and two per cent, respectively, of sales.
4. Research and Development Cost - Research and development cost is estimated at three per cent of total factory overhead.

Fixed Cost

o Repairs and Maintenance

Repairs and maintenance cost is estimated at 2.5 per cent of plant machinery and equipment, auxiliary equipment, and factory building cost.

o Spares.

Spares are assumed to cost 2.5 per cent of plant machinery and equipment, and auxiliary equipment cost.

o Factory Overhead

The expenses in Annex 7 for fixed cost were computed based on the following assumptions:

1. Insurance - Insurance is 1.5 per cent of the building, plant machinery and equipment, and auxiliary equipment cost.
2. Indirect labor - Total cost of indirect labor is Rp 197,600,000 per year. This includes the following personnel -- production manager, secretary, rubber technologist, research/technical staff, production supervisor, quality control officer, and laboratory assistant. The annual salaries of these personnel are as follows:

	No.	Rate per Year (US\$)	Total (US\$)
	-----	-----	-----
Managers	1	43,333	43,333
Supervisor	2	18,056	36,112
Skilled factory worker	6	3,250	6,500
Office worker	5	1,950	9,750
Unskilled factory worker	1	1,083	1,083
	-----		-----
	15		96,778
	=====		=====

3. Factory supplies - This is assumed at 0.1 per cent of plant machinery and equipment, and auxiliary equipment.

o Administrative Costs

Total administrative and finance costs is composed of office supplies, communications, repairs and maintenance, insurance and miscellaneous expenses. Office supplies are assumed to cost US\$2,700 per annum. Communications expense is estimated at US\$6,742 per annum. Repairs and maintenance, and insurance is 2 per cent and 1.5 per cent, respectively, of office equipment, office building (which accounts for seven per cent of building cost), and transport equipment cost. Three per cent of total administrative overhead (less labor cost) is accounted for by miscellaneous expenses.

o Indirect Costs, Sales and Distribution

Indirect sales expense consists of the following:

- a) Advertising and promotions, representation, travel and transportation, communications, office supplies, and other miscellaneous expenses estimated at two per cent of total sales.
- b) Salaries and benefits of the marketing and sales department estimated at US\$86,378 per year over the 15-year projection period.

o Depreciation

Depreciation of fixed assets is computed based on Indonesia's depreciation system. Buildings and other immovable assets are depreciated on a straight line method whereas all the other assets are depreciated on a double-declining balance basis. The different fixed assets were depreciated using the following schedule:

Asset	Estimated Life Range (in years)	Per Cent Depreciation	Life of Asset (in years)
Building	8 and above	5	20
Plant Equipment	4-8	10	10
Auxiliary, Pre-production	4-8	25	5
Office Equipment	4-8	25	5
Transport Equipment	4-8	25	5

o Cost of Financing

The project will be financed by a foreign long term loan with interest rate of 12 per cent per annum. The loan is assumed to have a seven-year term inclusive of a two-year grace period.

o Taxes

The tax scheme in Indonesia on which the computations on taxes are based is shown below:

Corporate Income Tax:

- 15 per cent on the first Rp 10 million
- 25 per cent on the next Rp 40 million
- 35 per cent of the amount in excess of Rp 50 million

Tax/Value-Added Tax: 10 per cent

BALANCE SHEET AND CASHFLOW STATEMENTS

Cash-in-Bank

The minimum cash requirement for the project is equivalent to 60 days' cash.

Accounts Receivable

Export sales are assumed to be sold at letter of credit basis. Local sales are assumed to be collectible within 30 days.

Inventory

The following days' inventory levels are assumed:

Item	Number of Days	
	Imported	Local
Direct Materials	30	3
Indirect Material	45	3
Utilities		2
Energy		5
Spare Parts	450	450
Work in Progress		3
Finished Products		21

Accounts Payable

Imports are to be bought at letter of credit basis. Local purchases are assumed to be payable within 30 days.



----- COMFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA -----

Conveyor Belts
April 1990
+++++

1 year(s) of construction, .15 years of production
currency conversion rates:
foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: Thousand U.S. Dollars

Total initial investment during construction phase

fixed assets:	8845.96	90.134 % foreign
current assets:	0.00	0.000 % foreign
total assets:	8845.96	90.134 % foreign

Source of funds during construction phase

equity & grants:	3538.39	30.000 % foreign
foreign loans :	5307.58	
local loans :	0.00	
total funds :	8845.96	72.000 % foreign

Cashflow from operations

Year:	1	3	7
operating costs:	3738.90	9052.76	9052.76
depreciation :	953.03	953.03	711.21
interest :	636.91	509.53	0.00
production costs	5328.84	10515.32	9763.97
thereof foreign	47.52 %	41.78 %	37.80 %
total sales :	5879.98	17640.00	17640.00
gross income :	551.14	7124.68	7876.03
net income :	358.24	4631.04	5119.42
cash balance :	750.49	4265.87	5830.63
net cashflow :	1387.40	5836.91	5830.63

Net Present Value at: 20.00 % = 13730.69
Internal Rate of Return: 46.70 %
Return on equity1: 68.53 %
Return on equity2: 68.71 %

Index of Schedules produced by COMFAR

Total initial investment	Cashflow Tables
Total investment during production	Projected Balance
Total production costs	Net income statement
Working Capital requirements	Source of finance



----- COMFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA -----

Cashflow Tables, construction in Thousand U.S. Dollars

Year	1991
Total cash inflow . .	8845.965
Financial resources .	8845.965
Sales, net of tax . .	0.000
Total cash outflow . .	8845.961
Total assets	8527.506
Operating costs . . .	0.000
Cost of finance . . .	318.455
Repayment	0.000
Corporate tax	0.000
Dividends paid	0.000
Surplus (deficit) .	0.004
Cumulated cash balance	0.004
Inflow, local	2476.870
Outflow, local	872.739
Surplus (deficit) .	1604.131
Inflow, foreign	6369.095
Outflow, foreign . . .	7973.222
Surplus (deficit) .	-1604.126
Net cashflow	-8527.506
Cumulated net cashflow	-8527.506

Conveyor Belts --- April 1990



COMFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA

Cashflow tables, production in Thousand U.S. Dollars

Year	1992	1993	1994	1995	1996	1997
Total cash inflow . .	6044.630	11888.760	17768.746	17640.000	17640.000	17640.000
Financial resources .	164.646	128.745	128.744	0.000	0.000	0.000
Sales, net of tax . .	5879.984	11760.020	17640.000	17640.000	17640.000	17640.000
Total cash outflow . .	5294.137	9800.688	13502.880	13034.640	13036.480	12953.690
Total assets	725.426	385.438	385.436	0.000	0.000	0.000
Operating costs	3738.901	6395.840	9052.760	9052.760	9052.760	9052.760
Cost of finance	636.909	636.909	509.528	382.146	254.764	127.382
Repayment	0.000	1061.516	1061.516	1061.516	1061.516	1061.516
Corporate tax	192.901	1320.983	2493.639	2538.222	2667.444	2712.028
Dividends paid	0.000	0.000	0.000	0.000	0.000	0.000
Surplus (deficit) .	750.493	2088.074	4265.967	4605.357	4603.517	4686.314
Cumulated cash balance	750.497	2838.571	7104.438	11709.800	16333.310	20999.630
Inflow, local	4644.630	9088.762	13568.740	13440.000	13440.000	13440.000
Outflow, local	3525.857	6003.934	8839.116	8588.429	8717.651	8762.225
Surplus (deficit) .	1118.773	3084.828	4729.628	4851.571	4722.349	4677.765
Inflow, foreign	1400.000	2800.000	4200.000	4200.000	4200.000	4200.000
Outflow, foreign	1768.280	3796.753	4663.763	4446.215	4318.833	4191.451
Surplus (deficit) .	-368.280	-996.753	-463.763	-246.215	-118.833	8.549
Net cashflow	1387.402	3786.500	5836.910	6049.019	5919.796	5875.212
Cumulated net cashflow	-7140.104	-3353.604	2483.306	8532.325	14452.120	20327.330

Conveyor belts --- April 1990



----- CONFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA -----

Cashflow tables, production in Thousand U.S. Dollars

Year	1998	1999	2000	2001	2002	2003
Total cash inflow . .	17640.000	17640.000	17640.000	17640.000	17640.000	17640.000
Financial resources .	0.000	0.000	0.000	0.000	0.000	0.000
Sales, net of tax . .	17640.000	17640.000	17640.000	17640.000	17640.000	17640.000
Total cash outflow . .	11809.370	11809.370	11809.370	11809.370	12050.170	12050.170
Total assets	0.000	0.000	0.000	0.000	0.000	0.000
Operating costs . . .	9052.760	9052.760	9052.760	9052.760	9052.760	9052.760
Cost of finance . . .	0.000	0.000	0.000	0.000	0.000	0.000
Repayment	0.000	0.000	0.000	0.000	0.000	0.000
Corporate tax	2756.612	2756.612	2756.612	2756.612	2997.409	2997.409
Dividends paid	0.000	0.000	0.000	0.000	0.000	0.000
Surplus (deficit) . .	5830.629	5830.629	5830.629	5630.629	5589.832	5589.832
Cumulated cash balance	26830.260	32660.880	38491.520	44322.140	49911.980	55501.810
Inflow, local	13440.000	13440.000	13440.000	13440.000	13440.000	13440.000
Outflow, local	8806.818	8806.818	8806.818	8806.818	9047.615	9047.615
Surplus (deficit) . .	4633.182	4633.182	4633.182	4633.182	4392.385	4392.385
Inflow, foreign	4200.000	4200.000	4200.000	4200.000	4200.000	4200.000
Outflow, foreign . . .	3002.553	3002.553	3002.553	3002.553	3002.553	3002.553
Surplus (deficit) . .	1197.447	1197.447	1197.447	1197.447	1197.447	1197.447
Net cashflow	5830.628	5830.628	5830.628	5830.629	5589.832	5589.832
Cumulated net cashflow	26157.960	31988.590	37819.220	43649.850	49239.680	54829.510

Conveyor Belts --- April 1990



COMFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA -----

Cashflow tables, production in Thousand U.S. Dollars

Year	2004	2005	2006
Total cash inflow . .	17640.000	17640.000	17640.000
Financial resources .	0.000	0.000	0.000
Sales, net of tax . .	17640.000	17640.000	17640.000
Total cash outflow . .	12050.170	12050.170	12050.170
Total assets	0.000	0.000	0.000
Operating costs . . .	9052.760	9052.760	9052.760
Cost of finance . . .	0.000	0.000	0.000
Repayment	0.000	0.000	0.000
Corporate tax	2997.409	2997.409	2997.409
Dividends paid	0.000	0.000	0.000
Surplus (deficit) .	5589.832	5589.832	5589.832
Cumulated cash balance	61091.640	66681.470	72271.300
Inflow, local	13440.000	13440.000	13440.000
Outflow, local	9047.615	9047.615	9047.615
Surplus (deficit) .	4392.385	4392.385	4392.385
Inflow, foreign	4200.000	4200.000	4200.000
Outflow, foreign . . .	3002.553	3002.553	3002.553
Surplus (deficit) .	1197.447	1197.447	1197.447
Net cashflow	5589.832	5589.832	5589.832
Cumulated net cashflow	60419.340	66009.170	71599.000

Conveyor Belts --- April 1990



Cashflow Discounting:

a) Equity paid versus Net income flow:		
Net present value	14221.67 at	20.00 %
Internal Rate of Return (IRRE1) ..	68.53 %	
b) Net Worth versus Net cash return:		
Net present value	14477.06 at	20.00 %
Internal Rate of Return (IRRE2) ..	68.71 %	
c) Internal Rate of Return on total investment:		
Net present value	13730.69 at	20.00 %
Internal Rate of Return (IRR) ..	46.70 %	
Net Worth = Equity paid plus reserves		



----- COMFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA -----

Net Income Statement in Thousand U.S. Dollars

Year	1992	1993	1994	1995	1996
Total sales, incl. sales tax	5879.984	11760.020	17640.000	17640.000	17640.000
Less: variable costs, incl. sales tax.	2656.920	5313.858	7970.779	7970.779	7970.779
Variable margin	3223.064	6446.158	9669.221	9669.221	9669.221
As % of total sales	54.814	54.814	54.814	54.814	54.814
Non-variable costs, incl. depreciation	2035.010	2035.011	2035.011	2035.013	1793.188
Operational margin	1188.054	4411.147	7634.210	7634.208	7876.033
As % of total sales	20.205	37.510	43.278	43.278	44.649
Cost of finance	636.909	636.909	509.528	382.146	254.764
Gross profit	551.145	3774.238	7124.683	7252.063	7621.270
Allowances	0.006	0.000	0.000	0.000	0.000
Taxable profit	551.145	3774.238	7124.683	7252.063	7621.270
Tax	192.901	1320.983	2493.639	2538.222	2667.444
Net profit	358.244	2453.254	4631.044	4713.841	4953.825
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	358.244	2453.254	4631.044	4713.841	4953.825
Accumulated undistributed profit . . .	358.244	2811.498	7442.542	12156.380	17110.210
Gross profit, % of total sales	9.373	32.094	40.389	41.111	43.204
Net profit, % of total sales	6.093	20.861	26.253	26.722	28.083
ROE, Net profit, % of equity	10.125	69.333	130.880	133.220	140.002
ROI, Net profit+interest, % of invest.	10.950	33.068	53.538	53.074	54.247

----- Conveyor Belts --- April 199



----- COMFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MAN. A -----

Net Income Statement in Thousand U.S. Dollars

Year	1997	1998	1999	2000	2001
Total sales, incl. sales tax	17640.000	17640.000	17640.000	17640.000	17640.000
Less: variable costs, incl. sales tax.	7970.779	7970.779	7970.779	7970.779	7970.779
Variable margin	9669.221	9669.221	9669.221	9669.221	9669.221
As % of total sales	54.814	54.814	54.814	54.814	54.814
Non-variable costs, incl. depreciation	1793.187	1793.187	1793.187	1793.187	1793.188
Operational margin	7876.034	7876.034	7876.034	7876.034	7876.033
As % of total sales	44.649	44.649	44.649	44.649	44.649
Cost of finance	127.382	0.000	0.000	0.000	0.000
Gross profit	7748.652	7876.034	7876.034	7876.034	7876.033
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	7748.652	7876.034	7876.034	7876.034	7876.033
Tax	2712.028	2756.612	2756.612	2756.612	2756.612
Net profit	5036.624	5119.422	5119.422	5119.422	5119.422
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	5036.624	5119.422	5119.422	5119.422	5119.422
Accumulated undistributed profit . . .	22146.830	27266.250	32385.680	37505.100	42624.520
Gross profit, % of total sales	43.927	44.649	44.649	44.649	44.649
Net profit, % of total sales	28.552	29.022	29.022	29.022	29.022
ROE, Net profit, % of equity	142.342	144.682	144.682	144.682	144.682
ROI, Net profit+interest, % of invest.	53.782	53.318	53.318	53.318	53.318

Conveyor Belts --- April 1990



----- COMFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA -----

Net Income Statement in Thousand U.S. Dollars

Year	2002	2003	2004	2005	2006
Total sales, incl. sales tax	17640.000	17640.000	17640.000	17640.000	17640.000
Less: variable costs, incl. sales tax.	7970.779	7970.779	7970.779	7970.779	7970.779
Variable margin	9669.221	9669.221	9669.221	9669.221	9669.221
As % of total sales	54.814	54.814	54.814	54.814	54.814
Non-variable costs, incl. depreciation	1105.196	1105.196	1105.196	1105.196	1105.196
Operational margin	8564.025	8564.025	8564.025	8564.025	8564.025
As % of total sales	48.549	48.549	48.549	48.549	48.549
Cost of finance	0.000	0.000	0.000	0.000	0.000
Gross profit	8564.025	8564.025	8564.025	8564.025	8564.025
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	8564.025	8564.025	8564.025	8564.025	8564.025
Tax	2997.409	2997.409	2997.409	2997.409	2997.409
Net profit	5566.617	5566.617	5566.617	5566.617	5566.617
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	5566.617	5566.617	5566.617	5566.617	5566.617
Accumulated undistributed profit . . .	48191.140	53757.750	59324.370	64890.990	70457.600
Gross profit, % of total sales	48.549	48.549	48.549	48.549	48.549
Net profit, % of total sales	31.557	31.557	31.557	31.557	31.557
ROE, Net profit, % of equity	157.321	157.321	157.321	157.321	157.321
ROI, Net profit+interest, % of invest.	57.976	57.976	57.976	57.976	57.976

Conveyor Belts --- April 1990



----- COMFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA -----

Projected Balance Sheets, construction in Thousand U.S. Dollars

Year	1991
Total assets	8845.965

Fixed assets, net of depreciation	0.000
Construction in progress	8845.961
Current assets	0.000
Cash, bank	0.000
Cash surplus, finance available	0.004
Loss carried forward	0.000
Loss	0.000
Total liabilities	8845.965

Equity capital	3538.386
Reserves, retained profit	0.000
Profit	0.000
Long and medium term debt	5307.579
Current liabilities	0.000
Bank overdraft, finance required	0.000
Total debt	5307.579
Equity, % of liabilities	40.000

Conveyor Belts --- April 1990


COMFAR
21 UNIDO

----- COMFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA -----

Projected Balance Sheets, Production in Thousand U.S. Dollars

Year	1992	1993	1994	1995	1996
Total assets	9368.854	10889.340	14587.610	18239.940	22132.240
Fixed assets, net of depreciation	7892.932	6939.902	5986.873	5033.842	4322.636
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	517.067	860.079	1203.089	1203.089	1203.089
Cash, bank	208.359	250.785	293.211	293.211	293.211
Cash surplus, finance available	750.497	2838.572	7104.438	11709.790	16313.310
Loss carried forward	0.000	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.060
Total liabilities	9368.854	10889.340	14587.610	18239.940	22132.240
Equity capital	3538.386	3538.386	3538.386	3538.386	3538.386
Reserves, retained profit	0.000	358.244	2811.498	7442.542	12156.380
Profit	358.244	2453.254	4531.044	4713.841	4953.825
Long and medium term debt	5307.579	4246.063	3184.548	2123.032	1061.516
Current liabilities	164.646	293.391	422.135	422.135	422.135
Bank overdraft, finance required.	0.000	0.000	0.000	0.000	0.000
Total debt	5472.225	4539.455	3606.683	2545.167	1483.651
Equity, % of liabilities	37.768	32.494	24.256	19.399	15.987

----- Conveyor Belts --- April 1990 -----

----- COMFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA -----

Projected Balance Sheets, Production in Thousand U.S. Dollars

Year	1997	1998	1999	2000	2001
Total assets	26107.360	31226.780	36346.200	41465.620	46585.050
Fixed assets, net of depreciation	3611.430	2900.224	2189.018	1477.812	766.604
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	1203.089	1203.089	1203.089	1203.089	1203.089
Cash, bank	293.211	293.211	293.211	293.211	293.211
Cash surplus, finance available	20999.630	26830.250	32660.880	38491.510	44322.140
Loss carried forward	0.000	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	26107.350	31226.780	36346.200	41465.620	46585.040
Equity capital	3538.386	3538.386	3538.386	3538.386	3538.386
Reserves, retained profit	17110.210	22146.830	27266.250	32385.680	37505.100
Profit	5036.624	5119.422	5119.422	5119.422	5119.422
Long and medium term debt	0.000	0.000	0.000	0.000	0.000
Current liabilities	422.135	422.135	422.135	422.135	422.135
Bank overdraft, finance required.	0.000	0.000	0.000	0.000	0.000
Total debt	422.135	422.135	422.135	422.135	422.135
Equity, % of liabilities	13.553	11.331	9.735	8.533	7.596



----- COMFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA -----

Projected Balance Sheets, Production in Thousand U.S. Dollars

Year	2002	2003	2004	2005	2006
Total assets	52151.660	57718.280	63284.890	68851.510	74418.130
Fixed assets, net of depreciation	743.389	720.174	696.959	573.744	650.529
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	1203.089	1203.089	1203.089	1203.089	1203.089
Cash, bank	293.211	293.211	293.211	293.211	293.211
Cash surplus, finance available .	49911.970	55501.800	61091.640	66681.460	72271.300
Loss carried forward	0.000	0.000	0.000	0.000	0.000
Loss	0.000	0.000	0.000	0.000	0.000
Total liabilities	52151.660	57718.280	63284.890	68851.510	74418.130
Equity capital	3538.386	3538.386	3538.386	3538.386	3538.386
Reserves, retained profit	42624.520	48191.140	53757.750	59324.370	64890.990
Profit	5566.617	5566.617	5566.617	5566.617	5566.617
Long and medium term debt	0.000	0.000	0.000	0.000	0.000
Current liabilities	422.135	422.135	422.135	422.135	422.135
Bank overdraft, finance required.	0.000	0.000	0.000	0.000	0.000
Total debt	422.135	422.135	422.135	422.135	422.135
Equity, % of liabilities	6.785	6.130	5.591	5.139	4.755

Conveyor Belts --- April 1990

SENSITIVITY ANALYSIS AND IRR AND
BREAK EVEN CHARTS

ANNEX 10
Page 1 of 5



COMFAR
21 UN100

COMFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA

Conveyor Belts
April 1990
Sensitivity Analysis: Decrease in Price

1 year(s) of construction, 15 years of production

currency conversion rates:

foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: Thousand U.S. Dollars

Total initial investment during construction phase

fixed assets:	8845.96	90.134 % foreign
current assets:	0.00	0.000 % foreign
total assets:	8845.96	90.134 % foreign

Source of funds during construction phase

equity & grants:	3538.39	30.000 % foreign
foreign loans :	5307.58	
local loans :	0.00	
total funds :	8845.96	72.000 % foreign

Cashflow from operations

Year:	1	3	7
operating costs:	3738.90	9052.76	9052.76
depreciation :	954.03	953.03	711.21
interest :	636.91	509.53	0.00
production costs	5328.84	10515.32	9763.97
thereof foreign	47.52 %	41.78 %	37.80 %
total sales :	5614.38	16843.20	16843.20
gross income :	285.54	6327.88	7079.23
net income :	185.60	4113.12	4601.50
cash balance :	577.85	3747.95	5312.71
net cashflow :	1214.76	5318.99	5312.71

Net Present Value at: 20.00 % = 11716.79
Internal Rate of Return: 43.22 %
Return on equity1: 62.16 %
Return on equity2: 62.23 %

Index of Schedules produced by COMFAR

Total initial investment	Cashflow Tables
Total investment during production	Projected Balance
Total production costs	Net income statement
Working Capital requirements	Source of finance

CONFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA

Conveyor Belts
April 1990
Sensitivity: Change in Penetration Ratio

1 year(s) of construction, 15 years of production

currency conversion rates:

foreign currency 1 unit = 1.0000 units accounting currency
local currency 1 unit = 1.0000 units accounting currency
accounting currency: Thousand U.S. Dollars

Total initial investment during construction phase

fixed assets:	8845.96	90.134 % foreign
current assets:	0.00	0.000 % foreign
total assets:	8845.96	90.134 % foreign

Source of funds during construction phase

equity & grants:	3538.39	30.000 % foreign
foreign loans :	5307.58	
local loans :	0.00	
total funds :	8845.96	72.000 % foreign

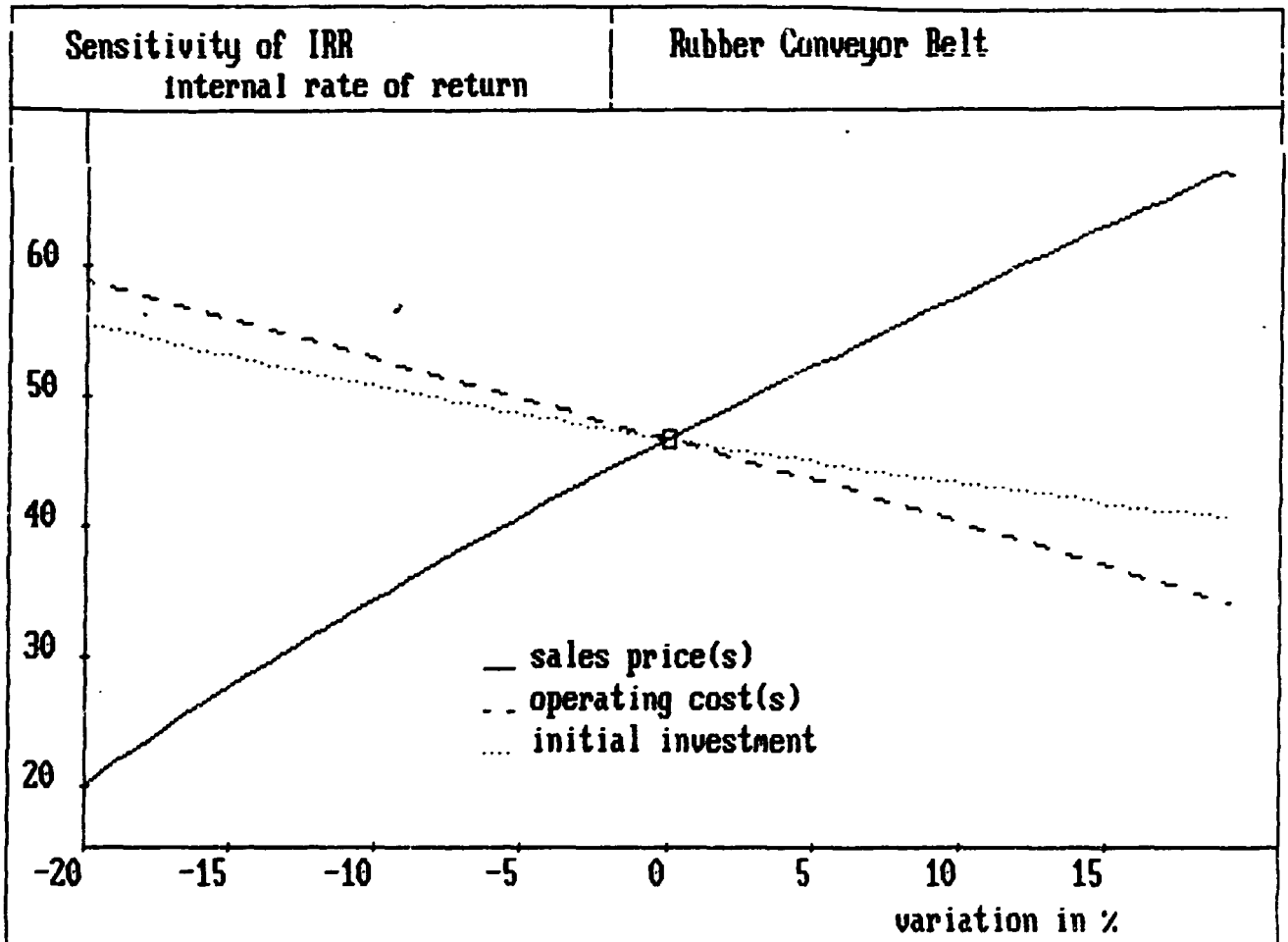
Cashflow from operations

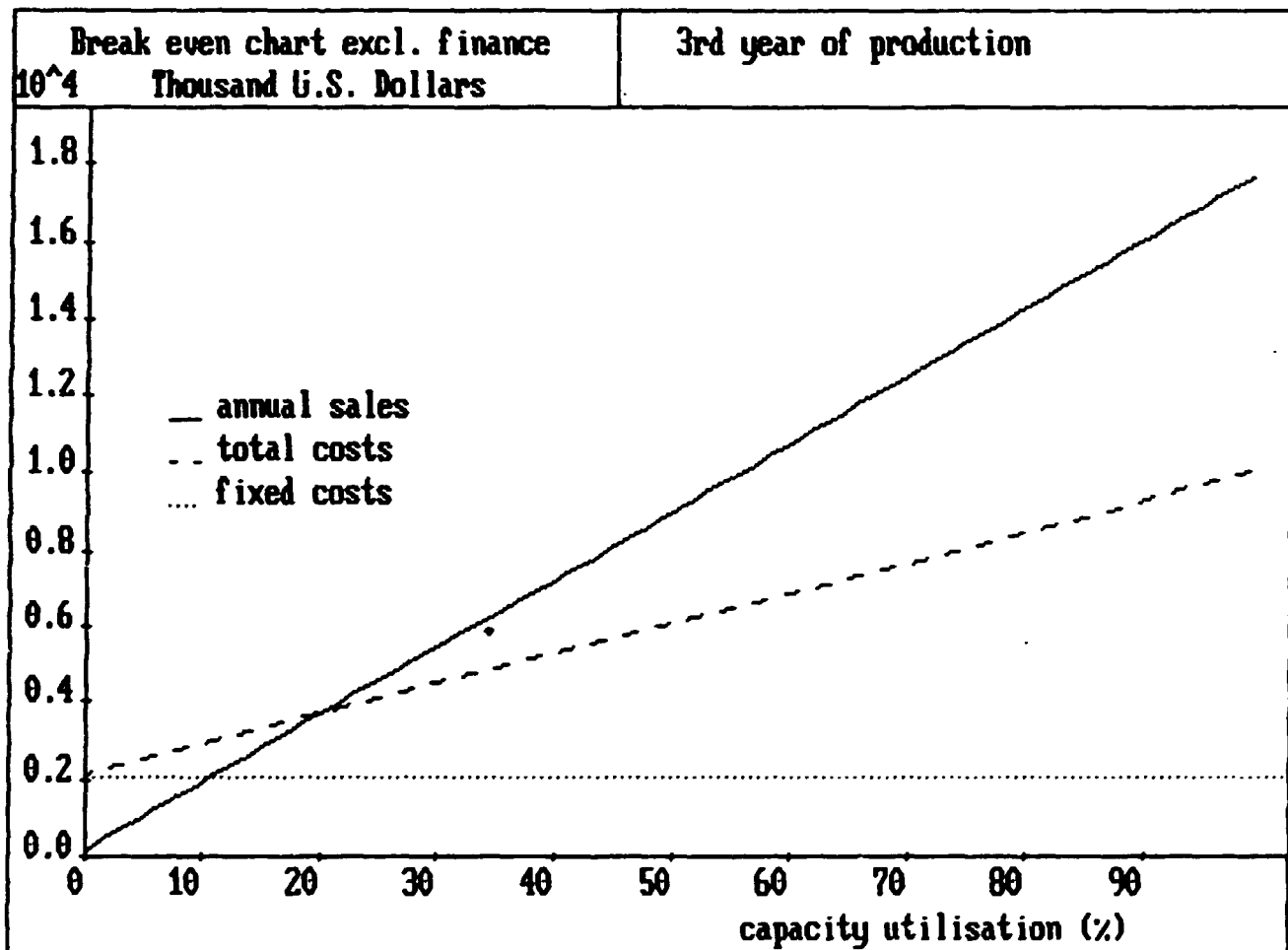
Year:	1	3	7
operating costs:	3739.90	9052.76	9052.76
depreciation :	953.03	953.03	711.21
interest :	636.91	509.53	0.00
production costs	5328.84	10515.32	9763.97
thereof foreign	47.52 %	41.78 %	37.80 %
total sales :	5706.66	17120.00	17120.00
gross income :	377.82	6604.68	7356.03
net income :	245.58	4293.04	4781.42
cash balance :	637.83	3927.87	5492.63
net cashflow :	1274.74	5498.91	5492.63

Net Present Value at: 20.00 % = 12416.40
Internal Rate of Return: 44.44 %
Return on equity1: 64.39 %
Return on equity2: 64.49 %

Index of Schedules produced by CONFAR

Total initial investment	Cashflow Tables
Total investment during production	Projected Balance
Total production costs	Net income statement
Working Capital requirements	Source of finance







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COMFAR 2.1 - SYCIP, GORRES, VELAYO & CO., MANILA

