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Indonesian Industrial Investment Opportunity Study
April 1990

MANUFACTURE OF WOODWORKING MACHINES

FINAL REPORT

JP/RAS/85/010

Dr. M. Kiehnatowski

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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 Woodworking Machines.

This study was conducted in accordance with the UNIDO Manual for the Preparation of Industrial Feasibility Studies. The report covers the following major 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 technical aspects of the study were prepared in association with the Metals Industry Research and Development Center (MIRDC). The financial projection used the UNIDO Computer Model for Feasibility Analysis and Reporting (COMFAR).

This study was prepared mainly to provide preliminary broad indication of the viability of the project and is not meant to serve as 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 WOODWORKING MACHINES

FINAL REPORT

TABLE OF CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY	1
PROJECT BACKGROUND	10
MARKET AND PLANT CAPACITY	11
Product Description	11
Band Saw	11
Planer	11
Spindle Shaper	12
Demand and Market Study	14
Domestic Market	14
Export Market (Selected ASEAN Countries)	15
Profile of Major Users of Woodworking Machines	20
Demand Projections	27
Prices	29
Distribution Network	30
Sales and Marketing	31
Market Penetration and Sales Forecast	31
Marketing	33
Production Program	36
MATERIALS INPUT	37
Basic Materials	37
Utility and Energy Requirement	37
PLANT LOCATION	38
PLANT ENGINEERING	39
Layout and Physical Coverage of the Project	39
Technology and Equipment	39
Production Process	39
Equipment	43
Civil Engineering	43
PLANT ORGANIZATION AND OVERHEAD COST	44
Organization	44
Overhead Costs	44

	<u>Page</u>
MANPOWER	46
Labor	46
Staff	46
PROJECT IMPLEMENTATION	47
Implementation Scedule	47
Cost Estimates	49
FINANCIAL AND ECONOMIC EVALUATION	50
Total Initial Investment Cost	50
Project Financing	50
Loans	50
Equity	51
Production Costs	52
Commercial Profitability	52
Financial Indicators	53
Sensitivity Analyses	54
Financial Cashflow	55

LIST OF TABLES

Table No.	Title	Page
1	Indonesia. Estimated Purchases of Woodworking Machines, 1989	14
2	Indonesia, List of Suppliers of Woodworking Machines	15
3	Selected ASEAN Countries, Estimated Importation and Exportation of Woodworking Machines, 1989	16
4	Selected ASEAN Countries, Importations of Woodworking Machines by Country of Origin, 1988	17
5	Malaysia, Estimated Purchases of Woodworking Machines, 1989	18
6	Philippines, Estimated Purchases of Woodworking Machines, 1989	19
7	Thailand, Estimated Purchases of Woodworking Machines, 1989	20
8	Indonesia, Exports of Wooden Furniture	21
9	Malaysia, Estimated Purchases of Woodworking Machines by Major User Industry, 1989	22
10	Philippines, Estimated Purchases of Woodworking Machines by Major User, 1989	23
11	Philippines, Exports of Wooden Furniture	24
12	Thailand, Estimated Purchases of Woodworking Machines by Major User, 1989	26
13	Thailand, Exports of Wooden Furniture and Parts	27
14	Projected Demand for Woodworking Machines, 1990-2006	28
15	Selected ASEAN Countries, Projected Demand for Woodworking Machines, 1990-2006	29
16	Prices of Selected Woodworking Machines	30
17	Domestic and Export Market Penetration, 1992-1994	32

<u>Table No.</u>	<u>Title</u>	<u>Page</u>
18	Domestic and Export Sales of Woodworking Machines	33
19	Proposed Ex-Factory Prices of Woodworking Machines for Selected Target Markets	34
20	Malaysia, Distribution Costs Build-Up of Woodworking Machines	35
21	Philippines, Distribution Costs Build-Up of Woodworking Machines	35
22	Thailand, Distribution Costs Build-Up of Woodworking Machines	36
23	Annual Production Program	36
24	Annual Material Requirements and Costs at Full Capacity	37
25	Cost of Machinery and Equipment	43
26	Estimated Overhead Costs at Full Capacity	44
27	Factory Labor Requirements and Costs	46
28	Preproduction Costs	49
29	Total Initial Investment	50
30	Sources of Financing	51
31	Standard Production Costs	52
32	Selected Financial Indicators	53
33	Income Statement Highlights	53
34	Summary of Sensitivity Analysis	55
35	Financial Cashflow	56

LIST OF FIGURES

<u>Figure No.</u>	<u>Title</u>	<u>Page</u>
1	Typical Woodworking Machines	13
2	Distribution Network of Woodworking Machines in ASEAN Countries	31
3	Plant Layout	41
4	Production Process Flow	42
5	Project Organizational Structure	45
6	Plant Organization	45
7	Implementation Schedule	48

LIST OF ANNEXES

<u>Annex No.</u>	<u>Title</u>
1	Foreign Trade Statistics
2	Annual Raw Material Requirements and Costs at Full Capacity by Type of Machine
3	Electric Power Consumption and Costs at Full Capacity
4	Detailed Process Flow
5	List of Equipment and Costs
6	Annual Overhead Costs at Full Capacity
7	Annual Labor Requirements and Costs at Full Capacity
8	List of Incorporated Fixed Assets and Costs
9	Financial Statements
10	Sensitivity Analyses Summary Sheets
11	Notes and Assumptions Used in the Financial Projections

1. EXECUTIVE SUMMARY

This opportunity study explores the possibility of establishing a plant in Indonesia to manufacture woodworking machines, particularly band saws, planers, and spindle shapers. The proposed project will be under the ASEAN Industrial Joint Venture (AIJV) Program.

1.1 MARKET AND PLANT CAPACITY

Based on indications provided by the Indonesian Machine Tool Industries Association (ASIMPI) on the size of the domestic market, domestic purchases of the selected woodworking machines in 1989 is estimated at 3,000 units valued at around US\$5 million. This consists of 800 units of band saws, 1,100 units of planers, and 1,100 units of spindle shapers.

Net importation volume of the selected woodworking machines in ASEAN export countries in 1989 totalled to 2,630 units. The Philippines, with a net importation volume of 1,350 units, was the largest net importer of the three machines.

Interviews indicate that the performance of the ASEAN woodworking machines industry is highly dependent on the state of the local woodworking industries, especially in terms of utilization of the machines. With the growth in exports for wooden furnitures in the region expected to average more than 20 per cent, the demand for woodworking machines in the ASEAN market is conservatively projected to increase at an annual rate of 11 per cent from 1990 to 2006.

The project expects to capture around 20 per cent of unfilled demand for woodworking machines in the Indonesian market during the first year of operations considering the geographical spread of users in Indonesia and the unfamiliarity with the local distribution system. This is foreseen to increase by 5 per cent in the succeeding year, and eventually to reach 40 per cent in 1994. With the wide range of sizes and features available for the selected woodworking machines, the project will only target a particular niche, i.e., the market for the lower cost, relatively simpler machines.

For the export market, the project will target about five to ten per cent of the unfilled demand for woodworking machinery requirements of the ASEAN countries. The exports of woodworking machines will mainly cater to small and medium scale furniture manufacturers and woodworking educational institutions that would require cheap and simple machinery. We understand that in Thailand, the big export furniture

manufacturers are beginning to acquire more sophisticated woodworking machinery.

	<u>1992</u>	<u>1993</u>	<u>1994</u>
Indonesian Market			
Demand	3,990	4,390	4,830
Domestic Production	1,500	1,500	1,500
Unfilled Demand	2,490	2,890	3,330
Target Market Penetration (% of Unfilled Demand)	20	25	40
Project's Domestic Sales	500	720	1,330
ASEAN Market			
Unfilled Demand			
Malaysia	990	1,160	1,350
Philippines	1,640	1,840	2,060
Thailand	1,570	2,200	3,020
Total Unfilled Demand	4,200	5,200	6,430
Target Market Penetration (% of Unfilled Demand)	5	5	10
Project's Export Sales	190	270	650

Around 70 per cent of the machines produced will be sold to the domestic market with the remaining 30 per cent exported to the selected ASEAN countries. Domestic and export prices are shown below. Compared with the derived FOB prices in the targetted ASEAN countries, the project's assumed prices are competitive.

	<u>Price (US\$)</u>		
	<u>Band Saw</u>	<u>Planer</u>	<u>Spindle Shaper</u>
Domestic Market	1,280	1,560	1,660
Export Market	1,080	1,150	1,500
Derived FOB Prices:			
Malaysia	897-2,000	1,121-3,364	3,812-5,612
Philippines	1,085	787-1,145	1,139-1,788
Thailand	692-1,156	322- 417	1,908

The proposed plant will have a total annual capacity of 1,980 units for the three machines (660 units per machine), assuming two-shift operations at 330 days per annum. During the first year of commercial production, utilization will be at 35 per cent of capacity. This will increase to 50 per cent of capacity in the second year, and to 100 per cent in the third year of production.

1.2 MATERIAL INPUTS

The major raw materials used in the production of woodworking machines are gray cast iron, mild steel, steel bars, and the motor. Other material inputs include the following: industrial oxygen, acetylene, electrodes, quenching oil, paint, primer, sandpaper, reducer, putty, and standard parts (nuts, bolts, roller, etc.). At full capacity, total direct raw material requirements amount to US\$1.1 million, while the cost of other materials will sum up to US\$204,540.

At full capacity, the plant will consume about 1.2 million kilowatt-hours (KWH) of electricity per year. Assuming an industrial rate of US\$0.062 (Rp 112) per KWH and 330-day operations, the plant's annual electricity cost will amount to US\$151,200.

1.3 PLANT LOCATION

The proposed plant will be located in the Special Territory of Yogyakarta. Yogyakarta covers a land area of 3,169 sq. km. and is easily accessible by land from Jakarta and by air through the Adisutjipto Airport. Container facilities are available at the Tanjung Mas Harbour in Semarang in neighboring Central Java. The cost of land in Yogyakarta is around US\$0.833 (Rp. 15,000) per square meter as indicated by the Ministry of Industry.

The project site of Yogyakarta was indicated by ASIMPI and the Ministry of Industry. An alternative site would be Jakarta which is the major market for woodworking machines. Based on plans, adequate electricity supply will be provided to Krakatao Steel and also to Jakarta.

1.4 PROJECT ENGINEERING

The plant will require a total land area of about 6,370 square meters (sq.m). Of this, 1,925 sq.m. will be occupied by the building, while the remaining space will be for additional plant expansion and an optional foundry.

The production of woodworking machines involves four basic processes: heat treatment, general machining, welding and fabrication, and assembly. The casted materials such as the table, handwheels, pulleys, and base/frames are first annealed or normalized in the chamber furnace in order to improve the machinability of the parts. In the general machining process, the metal parts (stock material) are cut to the required size and put together to form mechanical units or machines. Depending on the type of part to be produced, the parts then undergo several activities which include

turning, boring, threading, drilling, milling and grinding. In the fabrication or metalforming processes, force is applied on the steel plates by shearing or bending machines to produce the desired shapes for the frame, guards, stiffeners and housing. After several processes, the machine parts will be passed to the assembly area where they will be assembled, including the standard parts, motors, and blades. After trial runs, tests, and inspections, the assembled machines will be painted to the desired color and allowed to dry.

The plant will need several types of equipment to produce the required band saws, planers, and spindle shapers. Total machinery and equipment cost is estimated at US\$315,200, which includes shipment and installation costs.

Required auxiliary equipment include a forklift, water tank and water pump, and compressor, among others. The total cost of auxiliary equipment is estimated at US\$28,500.

It is assumed that all machinery and auxiliary equipment except for the water tank will be procured from foreign suppliers.

1.5 PLANT ORGANIZATION AND MANPOWER

Three major departments will comprise the organization, namely Production, Finance and Administrative, and Marketing. Overall management and management of day-to-day operations will be handled by the president/general manager. Each department will have its own manager.

At full capacity, the plant will employ 89 factory workers. Of these, 64 are direct laborers and 25 are indirect laborers. The direct labor force consists of 52 skilled and semi-skilled, and 12 unskilled workers. Total annual salaries and benefits for plant workers at full capacity is estimated at US\$177,450.

1.6 PROJECT IMPLEMENTATION

Commercial production will begin after a one-year preproduction phase. Preoperation activities include the following: acquisition of government approvals; feasibility study and preparation of engineering specifications; acquisition of plant machineries and other auxiliary equipment; civil engineering - site development and construction of building; delivery and installation of plant machineries and other auxiliary equipment; procurement of raw materials for test run; recruitment and training of production and maintenance personnel; trial production/startup operations; and normal operations.

The machinery requirements for the project are mainly lathes and milling machines which do not require detailed process technology and specialized civil works. They can be brought in as soon as the building is finished.

1.7 FINANCIAL EVALUATION

1.7.1 Total Investment Costs

Total investment requirement for the project is estimated at US\$956.3 thousand. The biggest investment will be on machinery and equipment, which is US\$315.2 thousand or almost 31 per cent of total initial investment.

About 37 per cent of the initial investment is foreign currency cost component, mainly machinery and equipment, and auxiliary and service facilities.

	Amount (000 US\$)
Land, site preparation & development	141.0
Building and civil works	272.0
Auxiliary and service facilities	28.5
Incorporated fixed assets	63.0
Machineries and equipment	<u>315.2</u>
Sub-total	819.7
Preproduction capital costs	<u>136.6</u>
Total Initial Investment	<u>956.3</u>

1.7.2 Project Financing

Financing for the project will come from a combination of loan and equity investments to be made during the preoperating period. The breakdown of investment is as follows:

	Amount (000 US\$)
Loans	
Foreign	270.6
Local	<u>303.2</u>
Sub-total	573.8
Equity	
Foreign	114.8
Local	<u>267.8</u>
Sub-total	<u>382.6</u>
Total	<u>956.3</u>

Foreign loans are assumed to have a term of seven years with a two-year grace period on principal and interest of 12 per cent per annum. Local long-term loans are assumed to carry an interest rate of 20 per cent per annum with a term of seven years inclusive of a two-year grace period on principal payments.

It is assumed that 70 per cent of equity contributions will come from local proponents. Foreign sources will invest up to 30 per cent in equity for the project. This will mainly come from nationals of ASEAN participating countries which may be Malaysia, the Philippines, and Thailand.

1.7.3 Production Costs

Annual production cost at full capacity is estimated as follows:

	Amount (000 US\$)
Factory Costs	
Raw Materials	1,352.3
Utility	151.2
Direct Labor	91.0
Repairs	8.6
Spares	10.3
Factory Overhead	<u>96.7</u>
Total Factory Costs	1,710.1
Administrative Overhead	201.6
Sales and Distribution Costs	264.2
Financial Costs	74.5
Depreciation	<u>98.1</u>
Total Production Costs	<u>2,348.5</u>

1.7.4 Commercial Profitability

The project will have a financial internal rate of return (IRR) of 27.72 per cent.

Internal Rate of Return	27.72%
Payback Period (in years)	5.05
Net Present Value	US\$453,112.60
Breakeven* (% of sales at full cap)	46.29%

* Excluding financing.

The results of financial projections show that the project will incur net losses during the first two years of production. The project is expected to pick up from its losses by the third year of operation when production will start to operate on full capacity. Return on sales from years 3 - 15 will range from 10 - 14 per cent.

Year	In US dollars		
	Gross Revenue	Net Income	Net Income/ Gross Revenue
1	983,900	(185,980.8)	(18.9%)
2	1,406,800	(38,950.4)	(2.8%)
3	2,799,800	293,378.0	10.5%
7	2,799,800	376,213.5	13.4%
15	2,799,800	396,701.5	14.2%

To determine the effect of changes in critical variables on the financial viability of the project, sensitivity analyses were conducted on the basic set of financial projections and on different scenarios. The three scenarios assumed that: (1) the project will be able to produce and sell only at 80 per cent of capacity from years three to 15; (2) export prices are reduced to lower end market prices and domestic prices are down by 10 per cent; and (3) production costs increase by 10 per cent.

The results of the sensitivity analysis show that the project is highly sensitive to changes in sales price and operating costs, and least sensitive to changes in initial investment.

The project will still be viable if production is at 80 per cent of capacity, with the internal rate of return at 20.59 per cent. In the other two scenarios, however, the project will have IRR's lower than the 20 per cent hurdle rate. In the scenario on decreasing sales prices, the internal rate of return will drop to around 13 per cent. On the other hand, the increase in production costs would result in a 38 per drop in IRR to 17.06 per cent. The summary of the results of sensitivity analyses on the different cases is shown in the next page.

	<u>Case 1</u>	<u>Case 2</u>	<u>Case 3</u>
Internal Rate of Return	20.59%	12.98%	17.06%
Payback Period (in years)	5.91	7.07	6.87
Net Present Value (in thousand US\$)	30.56	-380.80	-168.51
Breakeven* (% of sales at full capacity)	59.49%	68.14%	61.32%

* Excluding financing.

Case 1: Assuming that the project will not be able sell its targetted volume, and is able to produce and sell at 80 per cent of capacity.

Case 2: Reduction in selling prices of the three machines. For exports, the prices assumed are the lower end market prices; for the domestic market, prices are 10 per cent lower.

Case 3: Cost of production rises by 10 per cent while prices remain the same.

1.7.5 Financial Cashflow

The project is estimated to incur cash deficits during the first three years of commercial production due to operation losses and the debt repayments starting on the second year. These deficits will have to be covered by short-term financing. Recovery will occur on the fourth year when internally generated funds will be able to cover debt repayments and cash operations requirements.

Year	In US Dollars			
	Total Cash Inflow	Total Cash Outflow	Surplus (Deficit)	Cumulated Cash Balance*
1	1,038,064	1,224,397	(186,332.1)	(186,331.9)
2	1,426,933	1,505,265	(78,331.6)	(264,663.5)
3	2,867,152	2,666,321	200,830.5	(63,833.0)
7	2,799,800	2,378,467	421,333.5	1,223,162.0
15	2,799,800	2,389,499	410,301.5	4,538,670.0

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

1.8 CONCLUSION

Based on our analysis of the market, preliminary technical assessment, and financial projections, the manufacture of woodworking machines in Indonesia appears to be a viable project. Aside from the large market for woodworking machines in Indonesia, there is strong demand for woodworking machines in other ASEAN countries, particularly in Malaysia, the Philippines, and Thailand. The substantial worldwide demand for wooden furniture coupled with the fast expanding ASEAN local woodworking industries offer good prospects for the manufacture and sales of woodworking machines in the region.

Woodworking machine requirements in ASEAN countries are being supplied primarily through importations with only a few firms producing machines for the woodworking industries. There is opportunity for a country in the ASEAN region, particularly Indonesia, to encourage the growth of local manufacture of basic machineries such as woodworking machines.

The results of the financial projections indicate the viability of the project. The project will have a financial internal rate of return (IRR) of 27.72 per cent. Although losses will be incurred during the first two years of operations, the project will pick up and start earning profits starting on the third year when production will be at full capacity. Internally generated funds will be sufficient to cover cash operating requirements and debt service requirements during the fourth year of operations.

2. PROJECT BACKGROUND

Woodworking has been one of the fast growing industries in the ASEAN region. Local craftsmanship and art in creating fine wood products such as furniture, doors, and flooring, and cheap labor costs have contributed in making ASEAN wood products highly sought-after in the world market.

Integral to the continued development of the ASEAN woodworking industry, especially towards growth of the smaller manufacturers and the export sector, is the availability of affordable, quality woodworking machinery. One of the major problems facing the local woodworking industries is being able to supply the expected growth in the demand due to inadequate machines. It has been observed that with the high cost of the brand new machines from Japan and Europe, many woodwork manufacturers turn to the cheaper Taiwan machines or even to second-hand machines.

Likewise, with many of the training schools for woodworking, there is again the problem of finding good quality but reasonably priced machines.

In this light, the United Nations Industrial Development Organization (UNIDO) along with the Committee on Industry, Minerals and Energy (COIME) has engaged the services of SGV & Co. to prepare an investment opportunity study for the manufacture of basic woodworking machines, particularly band saws, planers, and spindle shapers. The proposed project will be under the ASEAN Industrial Joint Venture (AIJV) program. The plant will be located in Indonesia.

The study on the Indonesian market included assistance from Mr. Naoto Suzuki in research activities, particularly with the interviews in Indonesia. Several agencies also assisted in the research on the market and technical aspects of the study, including the Ministry of Industry in Indonesia and Indonesian Machine Tool Industries Association (ASIMPI).

As indicated by ASIMPI, one company which has expressed interest in the project is PT Cahaya Mas Cemerlang, an Indonesian firm engaged in the manufacture of woodworking machines. The company has a paid-up capital of US\$1.3 million and revenues of US\$2.3 million in 1989.

3. MARKET AND PLANT CAPACITY

3.1 PRODUCT DESCRIPTION

Woodworking industries and technical/vocational institutions employ various types of woodworking machines in production and training. Among the basic and commonly used machines are band saws, planers, and spindle shapers. Based on interviews with suppliers and users in various ASEAN countries, the following specifications for the three machines represent typical machines currently in use.

3.1.1 Band Saw

One of the basic machines in woodworking, the band saw is generally used to cut out curved and irregular shaped wood pieces. It consists of a continuous blade held between two wheels, one mounted below a table and the other above. A motor drives the lower wheel. The upper wheel runs entirely free in order to keep the saw in tension and at the required angle. Band saws come in different sizes, usually measured in terms of the diameter of the upper wheel. Sizes range from 254 mm (10 in.) to 1,524 mm (60 in.). The smaller sized machines (below 762 mm) are used mostly in woodworking industries, while the bigger sized band saws, normally referred to as band mills or head rigs, are used primarily in sawmills to cut lumber. The proposed plant will produce only band saws which cater to woodworking industries. They will have the following specifications:

Diameter of Wheels	:	700 mm
Band Saw Length	:	50 mm x 4,500 mm
Main arbor rotation	:	750 rpm
Motor	:	1.5 kw / 2 hp
Table Size	:	750 mm (L) x 1,080 mm (W)
Height of Machine	:	1,780 mm
Weight	:	400 kg

3.1.2 Planer

Planers employ a rotating cutterhead to generate a smooth, defect-free wood surface by cutting in a direction approximately along the grain of the wood. There are two basic types of planers: the surface planer and the thickness planer. The surface planer generates a flat even surface on the wide faces or edges of boards, while the thickness planer machines boards or panels to a uniform thickness or width. Some machines, however, incorporate these two functions in a single unit. The plant will produce surface planers with the following specifications:

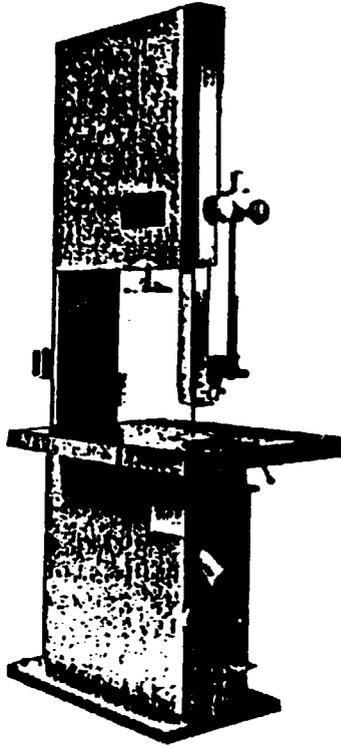
Max. Planing Width	:	300 mm
Planing arbors rotation	:	5,000 rpm
Length of Table	:	1,500 mm
Motor	:	3 hp x 2 p
Weight	:	650 kg

3.1.3 Spindle Shaper

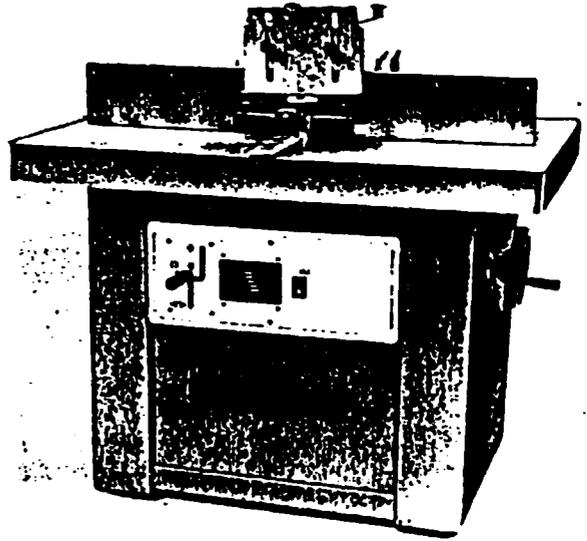
The spindle shaper is also known as the spindle machine or spindle moulder. It is chiefly used to make decorative cuts on straight and curved surfaces, although it can create other shapes such as joints and grooves. The shaper consists of a horizontal table through which a rotating spindle passes. The latter can be fitted with various types of cutterheads in accordance with the desired design, and it can be raised or lowered to enable it to operate in the required position. A fence is fitted, up against which the wood bears when being machined, and there are several tapped holes in the table to enable the fence to be held in various positions and to provide a fixing for any special forms of fences, leading-on or holding-down pieces, etc. Spindle shapers are usually classified as either light duty or heavy duty. The proposed plant will produce heavy duty spindle shapers with the following specifications:

Work thickness	:	80 mm
Table size	:	1,000 mm (L) x 800 mm (W)
Main arbor diameter	:	25.4 mm
Main arbor rotation	:	5,000 x 10,000 rpm
Diameter of cutter	:	90 mm
Vertical travel of spindle	:	75 mm
Motor	:	2 hp x 1.5 kw
Size of machine	:	1,000 mm (L) x 800 mm (W) x 950 mm (H)
Weight	:	500 kg

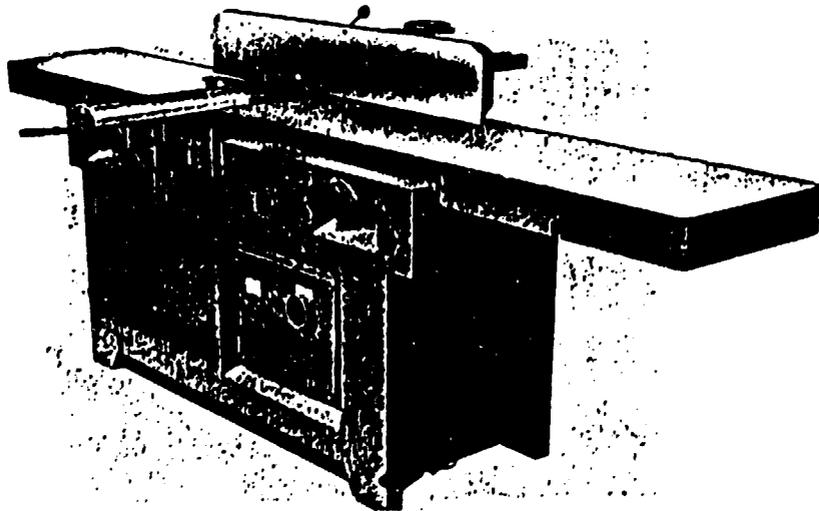
FIGURE 1
TYPICAL WOODWORKING MACHINE



Band Saw



Spindle Shaper



Surface Planer

3.2 DEMAND AND MARKET STUDY

The study considers two basic markets for woodworking machines. The first is the domestic market which represents the market in Indonesia. The second, which is referred to as the export market, comprises the combined markets of selected ASEAN countries. It should be noted that in presenting the the market for band saws, only the smaller sized machines used in woodworking industries were considered. Band saws used in sawmills were excluded. Also, the data on the planer market includes both thickness and jointer planers.

3.2.1 Domestic Market

Based on indications provided by ASIMPI on the size of the domestic market, domestic purchases of the selected woodworking machines in 1989 is estimated at 3,000 units valued at around US\$5 million. This consists of 800 units of band saws, 1,100 units of planers, and 1,100 units of spindle shapers. Furthermore, local production in 1989 is estimated at 1,500 units for the three machines.

Table 1
Indonesia
Estimated Purchases of Woodworking Machines, 1989

	<u>Number of Machines</u>			
	<u>Band Saw</u>	<u>Planers</u>	<u>Spindle Shaper</u>	<u>Total</u>
Estimated Purchases	<u>800</u>	<u>1,100</u>	<u>1,100</u>	<u>3,000</u>

Source: Trade Interviews.

There are around 11 manufacturers and 20 traders of woodworking machines in Indonesia, as gathered from the Indonesian Trade Directory and ASIMPI. It will be noted that most of the local manufacturers also produce other industrial machinery, with only PT Cahaya Mas Cemerlang concentrating on woodworking machines.

Table 2
Indonesia
List of Suppliers of Woodworking Machines

Manufacturer

Agung Jaya Machinery
Alam Wana Saki, PT
Asia Trapacindo Utama, PT
Cahaya Mas Cemerlang
Fatma Sentosa Agung, PD
Garcia Sumatra Timber, PT
Golden Pharos, PT
Kuraya, PT
Nanwa Inti Indonesia Co., PT
Sandvik Indonesia, PT
Sei Balayan Rimba Jaya Timber Industry, PT

Trader

Artha Sena Primantara, PT (ARSEMA)
Asia Trapacindo Utama, PT
Bina Energi, PT
Candratratna & Co.
Dainasint, PT
Dana Rattan Co., Ltd., PT
Harusindo Dwi Sakti, PT
Inko Eka Sejati, PT
Inter Tehnik Gelora Perkasa, PT
Interwood Pratama Praha, PT
J.O.B. Enterprises, PT
Kuraya, PT
Markonindo Graha Sejahtera, PT
OMETRACO, PT
Power Diesel Engineering, PD
Radar Motors, NV
Sedjati, PD
Sinar Timur, CV (Jakarta Branch)
Sudagu Dianta, PT
Sumber Motor (Palembang)

Source: Standard Trade & Industry Directory
of Indonesia, 1987
ASIMPI.

3.2.2 Export Market (Selected ASEAN Countries)

Three countries from the ASEAN region were identified as potential export markets for woodworking machines, namely Malaysia, the Philippines, and Thailand. These countries were considered based on the sizes and growth of their respective woodworking industries, as well as on their prospects as indicated

in the government's thrusts toward developing the woodworking sector. The study excluded Singapore since the market is small and it appears that the government's development thrusts emphasize other sectors.

Net importation volume for the selected woodworking machines in these countries in 1989 totalled to 2,630 units. The Philippines, with a net importation volume of 1,350 units, was the largest net importer of the three machines.

Table 3
Selected ASEAN Countries
Estimated Importation and Exportation of Woodworking Machines, 1989

	Number of Machines			
	Band Saw	Planers	Spindle Shaper	Total
Importation:				
Malaysia	160	620	110	890
Philippines	500	650	200	1,350
Thailand	180	230	60	470
Total	<u>840</u>	<u>1,500</u>	<u>370</u>	<u>2,710</u>
Exportation:				
Malaysia	-	80	-	80
Philippines	-	-	-	-
Thailand	-	-	-	-
Total	<u>-</u>	<u>80</u>	<u>-</u>	<u>80</u>
Net Importation (Exportation):				
Malaysia	160	540	110	810
Philippines	500	650	200	1,350
Thailand	180	230	60	470
Total	<u>840</u>	<u>1,420</u>	<u>370</u>	<u>2,630</u>

Source: Trade Interviews.

Based on interviews with importers, the most popular imported band saws in the Philippines are those with sizes 356 mm (60%), 406 mm (30%), and 660 mm (10%). In the case of planers, surface planers are more common than thickness planers. The popular surface planers are those having maximum planing widths of 152 mm (60%), 203 mm (30%), and 300 mm (10%). As for spindle shapers, around 90 per cent of imported machines consist of the heavy duty type.

Based on available import data of woodworking machines in the selected ASEAN countries, the major country-sources of woodworking machines include Taiwan, Italy, West Germany, the United Kingdom, and China.

Table 4
Selected ASEAN Countries
Importations of Woodworking Machines
by Country of Origin, 1988
(Volume in units, value in thousand US\$)

Country of Origin	Malaysia		Philippines		Thailand	
	Volume	Value	Volume	Value	Volume	Value
Taiwan	3,393	7,303	1,028	606	1,603	2,765
Italy	383	1,270	81	421	480	1,525
Japan	1,685	10,040	22,265	774	687	1,978
West Germany	140,159	4,934	337	1,161	84	616
China	43	32	1	4	196	11
U. Kingdom	5,116	5,122	185	69	-	-
Others	56,106	2,329	151	797	233	2,412
Total	<u>206,885</u>	<u>31,030</u>	<u>24,048</u>	<u>3,832</u>	<u>3,283</u>	<u>9,307</u>

* Data includes the following commodities:

- Malaysia: (1) Sawing Machines
(2) Planning, Milling or Moulding (by Cutting) Machines
(3) Splitting, Slicing or Paring Machines
- Philippines: (1) Machines for Working Wood (e.g., planing, drilling, rounding, sandpapering machines; lathes; and presses specialized for woodworking)
- Thailand: (1) Sawing Machines for Working Wood, Cork, Bone, Hard Rubber, Hard Plastics or Similar Hard Materials
(2) Planning, Milling or Moulding (by Cutting) Machines
(3) Drilling or Morticing Machines

Source: Foreign Trade Statistics of Malaysia, the Philippines, and Thailand.

3.2.2.1 Malaysia

Based on interviews with local suppliers, acquisitions of the three machines in Malaysia in 1989 amounted to an estimated 1,050 units (see Table 5). Domestic production accounted for roughly 20 per cent of band saw purchases and 16 per cent of planer purchases. On the other hand, around 84 per cent of new planer acquisitions and practically all spindle shaper purchases were sourced through importations.

Table 5
Malaysia
Estimated Purchases of Woodworking Machines, 1989

	Number of Machines			Total
	Band Saw	Planers	Spindle Shaper	
Domestic Production	40	200	-	240
Imports	160	620	110	890
Exports	-	80	-	80
Estimated Purchases	<u>200</u>	<u>740</u>	<u>110</u>	<u>1,050</u>

Source: Trade Interviews.

There are several local manufacturers of woodworking machines in Malaysia, although band saw manufacturers primarily produce machines for sawmills. Some of these firms export half of their production to various countries like Indonesia, Singapore, Brunei, Fiji, and Papua New Guinea. Among the major producers are Kejuruteraan Ngai Foong, Syarikat Kejuruteraan Meng Syarikat, Mah Cheok Pui Engineering. The sole manufacturer of planers, Mah Cheok Pui, produced around 200 planers in 1989.

The major local traders/dealers and their estimated unit sales in 1989 consist of the following:

<u>Company</u>	<u>Product</u>	<u>Est. 1989 Unit Sales</u>
Wadkin Robinson Sdn. Bhd.	band saw	40
	planer	54
	spindle	
	shaper	11
Seng Syarikat	planer	66

3.2.2.2 Philippines

Estimated acquisitions of band saws, planers, and spindle machines in 1989 reached 600 units, 700 units, and 200 units, respectively. Based on interviews with suppliers, it was found that imports accounted for approximately 90 per cent of the market for the three machines. Table 6 presents 1989 purchases of woodworking machines in the Philippines.

Table 6
Philippines
Estimated Purchases of Woodworking Machines, 1989

	<u>Number of Machines</u>			<u>Total</u>
	<u>Band Saw</u>	<u>Planers</u>	<u>Spindle Shaper</u>	
Domestic Production	100	50	-	150
Imports	500	650	200	1,350
Estimated Purchases	<u>600</u>	<u>700</u>	<u>200</u>	<u>1,500</u>

Source: Trade Interviews.

The study identified two local manufacturers of woodworking machines, namely, L. Angeles Machineries and J.A. Tan Enterprises. Operations of these firms are relatively small-scale with production on a job-order basis.

Based on interviews with local distributors of woodworking machines, there are some 50 to 60 importers dealing in

woodworking machines. The major traders include Golden Bell Marketing, Mayon Construction Supply, and Taiwan Machinery Display and Trade Center. Golden Bell Marketing sold around 20 band saws, 60 planers, and 30 spindle shapers in 1989.

3.2.2.3 Thailand

The size of the market of the selected woodworking machines in Thailand in 1989 is estimated at 960 units. Around 51 per cent of machine requirements are sourced locally. Based on interviews, local manufacturers produce around 60 units of band saws for woodworking industries annually. Domestic production of planers is estimated at 350 units per year, while importation is estimated at 230 units a year.

Table 7
Thailand
Estimated Purchases of Woodworking Machines, 1989

	Number of Machines			Total
	Band Saw	Planers	Spindle Shaper	
Domestic Production	60	350	80	490
Imports	180	230	60	470
Estimated Purchases	<u>240</u>	<u>580</u>	<u>140</u>	<u>960</u>

Source: Trade Interviews.

The major manufacturers of woodworking machines in Thailand are Brachai Engineering LP, Lawhahsanti Lath Shop LP, and Thai-Chalarn Lath Shop LP. The major importers, on the other hand, consist of Maco (Thailand) Co., Ltd. and Thai-Nagoya International Co., Ltd.

3.2.3 Profile of Major Users of Woodworking Machines

The study identified two major users of woodworking machines: woodworking industries, i.e., makers of furniture, builders' woodwork, woodcraft,

etc.; and the education/training sectors, particularly technical and vocational institutes offering woodworking courses. The performance of these sectors can serve indicators of demand patterns for the woodworking machines in ASEAN countries.

3.2.3.1 Indonesia

As indicated by ASIMPI, the major user sectors of woodworking machines in Indonesia are the various woodworking industries, and to a lesser extent schools and training institutes.

The 1986 Economic Census of Indonesia lists some 280 medium and large wood furniture manufacturing establishments. It appears that a large number of manufacturers are located in Jakarta, with around 82 manufacturers belonging to the Indonesian Furniture and Woodworking Association in Jakarta.

Indonesia's exports of wooden furniture has been rising at an impressive annual rate of 48 per cent from 1982 to 1988.

Table 8
Indonesia
Exports of Wooden Furniture

Year	FOB Value (000 US\$)
1982	1,803
1983	1,706
1984	3,145
1985	4,593
1986	3,274
1987	10,073
1988	18,673
1989*	26,326

* January to September 1989.

Source: Foreign Trade Statistics of Indonesia.

Growth of the local woodworking industry continues to be a major point of the country's development thrusts. Indonesia's Fifth Five-Year Development Program (Repelita

V) seeks to promote the development of the local wood industry, especially the export market. A number of projects for the wood processing sector have been proposed in the budget for the latest five-year development plan. Around 136 projects with funds allotment of Rp 1 trillion have yet to be implemented.

3.2.3.2 Malaysia

The primary user industries of woodworking machines in Malaysia are downstream wood processing industries such as joinery, furniture, and woodcraft makers. These industries account for practically all new acquisitions of the three machines.

Table 9
Malaysia
Estimated Purchases of Woodworking Machines
by Major User Industry, 1989

Major User	Band Saw		Planer		Spindle Shaper	
	No. of Units	% Share	No. of Units	% Share	No. of Units	% Share
Downstream wood processing industries	200	100	740	100	110	100

Source: Trade Interviews.

Malaysia has around 2,000 factories producing furniture, although many of these still belong to the small scale industry which caters mainly to the domestic market. Only about 50 firms are located in industrial zones and 35 of these are actively into exports.

Wood and rattan furniture continue to have good prospects both in the local and overseas markets. The country's Industrial Master Plan (IMP) projects exports to reach about US\$400 million by 1995 from US\$71 million in 1987 (or a 24 per cent annual growth). The Malaysian government has taken steps to set directions for this goal by providing infrastructure and other services. One such strategy has been to establish furniture complexes/zones. This will

comprise not only the setting up of factories but also providing the necessary assistance in furniture manufacturing - skill training, transportation as well as bulk purchasing of equipment/materials. At present, one such zone is being developed in Olak Lempit, Kuala Langat, and is expected to be fully operational by 1990.

3.2.3.3 Philippines

As shown in Table 10, the major users of woodworking machines in the Philippines are furniture makers, woodwork shops, builders' woodwork makers, and technical/vocational institutions.

Table 10
Philippines
Estimated Purchases of Woodworking Machines
by Major User, 1989

Major User	Band Saw		Planer		Spindle Shaper	
	No. of Units	% Share	No. of Units	% Share	No. of Units	% Share
Woodworking Industries *	480	80	630	90	200	100
Technical/ Vocational schools	120	20	70	10	-	-
Total	600	100	700	100	200	100

* Woodworking industries in the Philippines comprise manufacturers of wood furniture, builders' woodwork, and woodcraft.

Source: Trade Interviews.

Local woodworking industry experts estimate around 15,000 furniture manufacturers in the country. Available data, however, shows only some 5,798 cottage and small scale furniture makers (firms with assets of less than US\$220,000) registered with the National Cottage Industries Development Authority as of December 1985. In addition, the National Statistics Office listed some 289 large furniture firms in 1986.

Based on data from the Securities and Exchange Commission, there were 92 new wood processing firms registered in 1989. Of

these, 49 are manufacturers of wooden and rattan furniture. Note that a typical furniture firm in the country owns around two units of band saw, two units of planers, and between one to three units of spindle machines.

Studies conducted by the Chamber of Furniture Industries of the Philippines indicate that the average age of band saws, planers and spindle shapers in the country is seven years, six years, and five years, respectively. Moreover, utilization of these machines currently averages more than 60 per cent.

As shown in Table 11, the country's exports of wooden furniture has been increasing at the rate of 28 per cent per annum from 1982 to 1988. Exports reached more than US\$17 million in 1988.

Table 11
Philippines
Exports of Wooden Furniture

<u>Year</u>	<u>FOB Value (000 US\$)</u>
1982	3,942
1983	3,930
1984	5,780
1985	5,801
1986	6,577
1987	10,600
1988	17,558

Source: Foreign Trade Statistics
of the Philippines.

Prospects for the country's woodworking industries remain optimistic. Exports of wooden furniture is projected to grow by 22 per cent annually from US\$19 million in 1989 to US\$106 million in 1997. The future also looks bright for the builders' woodwork market, especially with the ongoing construction boom. This has also been helped by the current trend in the construction industry to revert back to the use of wooden materials for doors, windows, and panels.

Education/Training Institutes

Around 120 units of band saws and 70 units of planers were acquired by the country's secondary and post-secondary technical schools in 1989. At present, these schools total around 6,265, although there is no indication on the number of schools offering woodworking courses.

Based on interviews with the Department of Education and Culture (DECS), around 95 per cent of schools that offer woodworking courses would have planers, and 50 per cent would have band saws and spindle shapers.

A large user of woodworking machines is the National Manpower Youth Council (NMYC), which has about 16 regional training centers (RTC). There are plans to equip each RTC with a complete line of woodworking machines, and to further develop four RTCs into specialized woodworking training grounds.

Other developments in the education/training sector expected to increase the demand for woodworking machines include the establishment of an integrated woodworking training institute. The Department of Trade and Industry estimates that 40 per cent of the total project cost or US\$5.3 million will be allocated for the acquisition of machineries and equipment.

3.2.3.4 Thailand

Based on interviews, the largest users of woodworking machines in Thailand are furniture manufacturers, woodwork shops, and builders' woodwork makers. Furniture makers and woodwork shops account for practically all purchases of band saws and 85 per cent of planers and spindle shapers.

Table 12
Thailand
Estimated Purchases of Woodworking Machines
by Major User, 1989

Major User	Band Saw		Planer/Spindle Shaper	
	No. of Units	% Share	No. of Units	% Share
Furniture makers & woodwork shops	240	100	610	85
Floor, window, & door makers	-	-	110	15
Total	<u>240</u>	<u>100</u>	<u>720</u>	<u>100</u>

Source: Trade Interviews.

Thailand's furniture industry has risen from cottage type to large-scale operations. Many establishments have already employed some sophisticated machinery to produce quality products that could compete in the world market.

Currently, furniture manufacturers in Thailand number around 1,500. Of these, 700 factories are engaged in the manufacture of wooden furniture and from 100 to 200 firms are into rattan furniture. Around 50 firms are export their products.

Exports of wooden furniture have been rising at an average annual rate of 34 per cent from 1982 to 1988. Thailand's domestic market for furniture has likewise good prospects given the rise in the construction business. Currently, construction, particularly of housing facilities, has grown rapidly at a rate of 15 to 20 per cent annually from 1987 to 1989.

Table 13
Thailand
Exports of Wooden Furniture and Parts

<u>Year</u>	<u>Value</u> <u>(million baht)</u>
1982	492.1
1983	573.1
1984	654.3
1985	865.3
1986	1,300.1
1987	2,582.2
1988	3,760.4
1989*	1,931.8

* January to June 1989.

Source: Bangkok Monthly Review,
September 1989.

3.2.3 Demand Projections

Interviews indicate that the performance of the ASEAN woodworking machines industry is highly dependent on the state of the local woodworking industries, especially in terms of utilization of the machines. With the growth in exports for wooden furnitures in the region expected to average more than 20 per cent, the demand for woodworking machines in the ASEAN market is conservatively projected to increase at an annual rate of 11 per cent from 1990 to 2006. By year 2000, the demand for these machines will amount to more than 22,000 units. The demand for the band saws will have reached an estimated 6,100 units while those for planers and spindle shapers will be about 11,360 and 4,890 units, respectively. Table 14 presents the demand projections for the domestic and export markets. The projected demand by selected ASEAN country is presented in Table 15.

Table 14
Projected Demand for Woodworking Machines,
1990-2006

Year	Band Saw			Planer			Spindle Shaper		
	Indonesia	ASEAN	Total	Indonesia	ASEAN	Total	Indonesia	ASEAN	Total
1992	1,070	1,620	2,680	1,460	3,250	4,720	1,460	720	2,180
1993	1,170	1,800	3,060	1,610	3,860	5,470	1,610	850	2,460
1994	1,290	2,210	3,500	1,770	4,600	6,370	1,770	1,020	2,790
1997	1,720	3,030	4,750	2,360	6,460	8,820	2,360	1,410	3,770
2000	2,280	3,810	6,100	3,140	8,220	11,360	3,140	1,750	4,890
2005	3,600	5,650	9,330	5,050	12,500	17,560	5,050	2,530	7,580
2006	4,040	6,120	10,160	5,560	13,630	19,190	5,560	2,720	8,280
1990-2006									
Ave. Annual									
Growth	10%	11%	10%	10%	12%	11%	10%	11%	10%

3.2.3.1 Selected ASEAN Countries

Based on interviews with major suppliers in Malaysia, the demand for woodworking machines is projected to grow from 10 to 12 per cent within the next five years. The growth in demand for band saws and spindle shapers is projected to increase by 10 per cent per year, while demand for planers is expected to grow by 12 per cent annually. This is in view of the rapid growth of Malaysia's wood and rattan furniture industries.

The demand for woodworking machines in the Philippines is projected to grow by 10 per cent annually. As for Thailand, the demand for woodworking machines is expected to increase by 30 per cent annually for the next five years (1990-1995), as gathered from interviews. The rapid growth in demand is expected to taper off to around five per cent annually from 1996 onwards.

Table 15 presents projected demand for the various woodworking machines for each selected ASEAN country.

Table 15
Selected ASEAN Countries
Projected Demand for Woodworking Machines, 1990-2006

Year	Band Saw				Planer				Spindle Shaper			
	Malay- sia	Philip- pines	Thai- land	Total	Malay- sia	Philip- pines	Thai- land	Total	Malay- sia	Philip- pines	Thai- land	Total
1992	290	800	530	1,620	1,050	930	1,270	3,250	150	270	310	720
1993	320	880	690	1,880	1,180	1,030	1,660	3,860	160	290	400	850
1994	350	970	890	2,210	1,320	1,130	2,150	4,600	180	328	520	1,020
1997	470	1,290	1,280	3,030	1,870	1,500	3,090	6,460	240	430	750	1,410
2000	620	1,710	1,480	3,820	2,650	2,000	3,570	8,220	310	570	860	1,750
2005	1,010	2,760	1,890	5,650	4,730	3,220	4,560	12,500	510	920	1,100	2,530
2006	1,110	3,030	1,980	6,120	5,310	3,540	4,790	13,630	560	1,010	1,160	2,720
1990-2006 Ave. Annual Growth	10%	10%	12%	11%	12%	10%	12%	12%	10%	10%	12%	11%

3.2.4 Prices

Table 16 presents the average prices of woodworking machines in the target markets. It will be noted that based on interviews, the most inexpensive woodworking machines generally come from Taiwan. Prices of these machines can even be a third of those coming from other countries.

Table 16
Prices of Selected Woodworking Machines
(in US\$)

<u>Country</u>	<u>Band Saw</u>	<u>Planer</u>	<u>Spindle Shaper</u>
Indonesia \a	1,370	1,650-1,750	1,750
Malaysia	1,480-3,300 \b	1,850-5,550	6,290-9,260 \c
Philippines	1,820 \d	1,320-1,920 \e	1,910-3,000
Thailand \f	1,160-1,940	540-700 \g	3,200

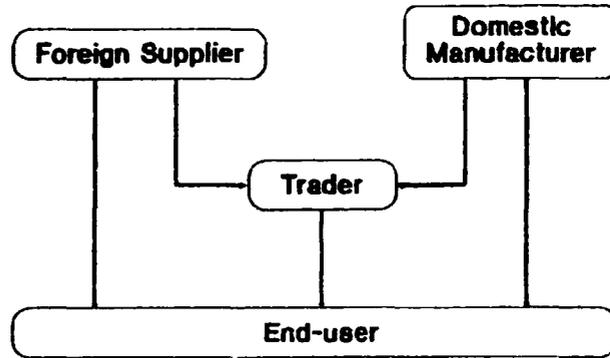
- \a ex-factory prices based on data provided by Indonesia Ministry of Industry
- \b covers sizes ranging 610 mm to 762 mm
- \c for smaller range of machines
- \d 711 mm band saw
- \e for sizes 305 mm - 406 mm
- \f wholesale prices
- \g These are prices are for locally produced machines. The price of the more sophisticated imported surface planers are from US\$14,000-18,000.

Source: Trade Interviews
Indonesia Ministry of Industry.

3.2.5 Distribution Network

Traders and manufacturers of woodworking machines in Indonesia and other ASEAN countries employ a fairly simple distribution system. Importers normally distribute the machines themselves, with the bigger dealers having branches in other regions of their respective countries. Manufacturers also employ direct selling and some make use of indirect channels like dealers, as in the case of the Philippines.

Figure 2
Distribution Network of Woodworking Machines
in ASEAN Countries



3.3 Sales and Marketing

3.3.1 Market Penetration and Sales Forecast

Table 17 shows the proposed market penetration program for the domestic and export markets of the three machines. The project expects to capture around 20 per cent of unfilled demand for woodworking machines during the first year of operations considering the geographical spread of users in Indonesia and the unfamiliarity with the local distribution system. This is foreseen to increase by 5 per cent in the succeeding year, and eventually to reach 40 per cent in 1994.

Moreover, with the wide range of sizes and features available for the selected woodworking machines, the project will only target a particular niche, i.e., the market for the lower cost, relatively simpler machines.

For the export market, the project will target about five to ten per cent of the unfilled demand for woodworking machinery requirements of the ASEAN countries. The exports of woodworking machines will mainly cater to small and medium scale furniture manufacturers and woodworking educational institutions that would require cheap and simple machinery. We understand that in Thailand, the big export furniture manufacturers are beginning to acquire more sophisticated woodworking machinery.

Table 17
Domestic and Export Market Penetration
1992-1994

	<u>1992</u>	<u>1993</u>	<u>1994</u>
Indonesian Market			
Demand \a	3,990	4,390	4,830
Domestic Production	1,500	1,500	1,500
Unfilled Demand	2,490	2,890	3,330
Target Market Penetration (% of Unfilled Demand)	20	25	40
Project's Domestic Sales	500	720	1,330
ASEAN Market			
Malaysia			
Demand \b	1,490	1,660	1,850
Domestic Production \c	500	500	500
Unfilled Demand	990	1,160	1,350
Philippines			
Demand \b	2,000	2,200	2,420
Domestic Production \d	360	360	360
Unfilled Demand	1,640	1,840	2,060
Thailand			
Demand \b	2,110	2,740	3,560
Domestic Production \e	540	540	540
Unfilled Demand	1,570	2,200	3,020
Total Unfilled Demand	4,200	5,200	6,430
Target Market Penetration (% of Unfilled Demand)	5	5	10
Project's Export Sales	190	270	650

\a from Table 14

\b from Table 15

\c based on suppliers' budgeted production for 1990

\d estimated local production capacity

\e based on given annual production of 60 band saws, 400 planers, and 80 spindle machines.

Based on the market penetration program established above, sales of woodworking machines are projected as follows: 690 units in 1992, 990 units in 1993, and 1,920 units in 1994. The proposed plant will cater mainly to the domestic market with the market in Indonesia absorbing around 70 per cent of the machines produced. Table 18 presents breakdown of unit sales by type of machine and target market.

Table 18
Domestic and Export Sales of Woodworking Machines

Sales	Projected Unit Sales			Projected Revenues (US\$)
	Band Saw	Planer	Shaper	
1992				
Domestic	150	160	190	757,000
Export	80	70	40	226,900
Total	<u>230</u>	<u>230</u>	<u>230</u>	<u>983,900</u>
1993				
Domestic	210	240	270	1,091,400
Export	120	90	60	323,100
Total	<u>330</u>	<u>330</u>	<u>330</u>	<u>1,414,500</u>
1994 - 2006				
Domestic	380	440	510	2,019,400
Export	260	200	130	780,400
Total	<u>660</u>	<u>660</u>	<u>660</u>	<u>2,799,800</u>

3.3.2 Marketing

Table 19 presents the proposed ex-factory unit prices of the machines for the selected target markets. In order for the machines to be more competitive in the domestic market, prices will be five per cent lower than the existing ex-factory prices in Indonesia. It should be noted the final selling price of the machines to end-users in Indonesia will be increased by various distribution costs, including: freight and handling charges (10 per cent), VAT (10 per cent), and dealers' mark-up (25 per cent).

Table 19
Proposed Ex-Factory Prices of Woodworking Machines
for Selected Target Markets

	Price (US\$)		
	<u>Band Saw</u> ¹	<u>Planer</u> ²	<u>Spindle Shaper</u> ³
Domestic Market	1,280	1,560	1,660
Export Market	1,080	1,150	1,500

- 1 Including motor and saw blade.
- 2 Including motor.
- 3 Including motor; excluding cutterheads.

As shown in the previous table, the proposed export prices are lower than the domestic ex-factory prices. Export prices were determined based on existing selling prices of the machines in selected ASEAN countries. In order for the machines to be competitive in these markets, FOB prices will have to be lower than the proposed ex-factory prices in Indonesia. Tables 20 - 22 present the reference for the derivation of dealers' prices in Malaysia, the Philippines, and Thailand.

In computing the competitive FOB prices, the import duties used reflects the AIJV incentive of a 90 per cent margin of preference on current tariff rates enjoyed by the project. Note that the existing tariff rate on woodworking machines in the Philippines and Thailand is 20 per cent. The duty on imports of woodworking machines in Malaysia is nil.

The project's dealers' prices are competitive with current prevailing prices in the ASEAN export countries except for the project's price for planers in Thailand. In this case, the market price is much lower than the project's calculated dealers' price.

Table 20
Malaysia
Distribution Costs Build-Up of Woodworking Machines
(in US\$)

	<u>Band Saw</u>	<u>Planer</u>	<u>Spindle Shaper</u>
a. Current Indicated Selling Price	1,480-3,300	1,850-5,550	6,290-9,260
b. Dealer's markup - $\{1-[1/(1+r)]\} \times a$	296- 860	370-1,110	1,258-1,832
c. Landed Cost - (a-b)	1,184-2,640	1,480-4,440	5,032-7,408
d. Value-added tax - $[c/(1+v+d)] \times v$	99- 220	123- 370	419- 617
e. Tariff - nil			
f. Other import duties - $[c/(1+v+d)] \times d$	99- 220	123- 370	419- 617
g. CIF Value - (c-d-e-f)	987-2,200	1,233-3,700	4,193-6,173
h. Insurance and freight - $\{1-[1/(1+i)]\} \times g$	90- 200	112- 336	381- 561
i. Derived FOB Price - (g-h)	897-2,000	1,121-3,364	3,812-5,612
Project's Price (FOB Surabaya)	1,080	1,150	1,500

- Notes: 1. r: 25 % dealer's markup
2. v: 10% value-added tax
3. d: other import duties at 10%
4. i: insurance and freight at 10%

Source: Tariff and Customs Code of the Malaysia.

Table 21
Philippines
Distribution Costs Build-Up of Woodworking Machines
(in US\$)

	<u>Band Saw</u>	<u>Planer</u>	<u>Spindle Shaper</u>
a. Current Indicated Selling Price	1,820	1,320-1,920	1,910-3,000
b. Dealer's markup - $\{1-[1/(1+r)]\} \times a$	364	264- 384	382- 600
c. Landed Cost - (a-b)	1,456	1,056-1,536	1,528-2,400
d. Value-added tax - $[c/(1+v+t+d)] \times v$	119	87- 126	125- 197
e. Tariff - $[c/(1+v+t+d)] \times t$	24	17- 25	25- 39
f. Other import duties - $[c/(1+v+t+d)] \times d$	119	87- 126	125- 197
g. CIF Value (c-d-e-f)	1,193	866-1,259	1,252-1,967
h. Insurance and freight - $\{1-[1/(1+i)]\} \times g$	108	79- 114	114- 179
i. Derived FOB Price - (g-h)	1,085	787-1,145	1,109-1,788
Project's Price (FOB Surabaya)	1,080	1,150	1,500

- Notes: 1. r: 25 % dealer's markup
2. v: 10% value-added tax
3. t: 2% (90 %margin of preference of existing tariff of 20%)
4. d: other import duties at 10%
5. i: insurance and freight at 10%

Source: Tariff and Customs Code of the Philippines.

Table 22
Thailand
Distribution Costs Build-Up of Woodworking Machines
(in US\$)

	<u>Sand Saw</u>	<u>Planer</u>	<u>Spindle Shaper</u>
a. Current Indicated Selling Price	1,160-1,940	540- 700	3,200
b. Dealer's markup - $\{1-[1/(1+r)]\} \times a$	232- 368	108- 140	640
c. Landed Cost - (a-b)	928-1,552	432- 560	2,560
d. Business tax : $[c/(1+v+t+d)] \times v$	78- 127	35- 46	210
e. Tariff - $[c/(1+v+t+d)] \times c$	15- 25	7- 9	42
f. Other import duties - $[c/(1+v+t+d)] \times f$	76- 127	35- 46	210
g. CIF Value - (c-e-f-g)	761-1,272	354- 459	2,099
h. Insurance and freight - $\{1-[1/(1+i)]\} \times g$	69- 116	32- 42	191
i. Derived FOB Price - (g-h)	692-1,156	322- 417	1,908
Project's Price (FOB Surabaya)	1,080	1,150	1,500

- Notes: 1. r: 25 % dealer's markup
2. v: 10% business tax
3. t: 2% (90 %margin of preference of existing tariff of 20%)
4. d: other import duties at 10%
5. i: insurance and freight at 10%

Source: Tariff and Customs Code of Thailand.

3.4 Production Program

The proposed plant will have a total annual capacity of 1,980 units for the three machines (660 units per machine), assuming two-shift operations at 330 days per annum. During the first year of commercial production, utilization will be at 35 per cent of capacity. This will increase to 50 per cent of capacity in the second year.

The plant will operate at full capacity in the third year of production. This will be made possible with the addition of a second 12-hour shift, resulting in 24-hour operations.

Table 23
Annual Production Program

<u>Year</u>	<u>No. of Shifts</u>	<u>Production Volume (Units)</u>	<u>% of of Capacity</u>
1992	1	690	35
1993	1	990	50
1994- 2006	2	1,980	100

4. MATERIALS INPUT

4.1 BASIC MATERIALS

The major raw materials used in the production of woodworking machines are gray cast iron, mild steel, steel bars, and the motor. Other material inputs include the following: industrial oxygen, acetylene, electrodes, quenching oil, paint, primer, sandpaper, reducer, putty, and standard parts (nuts, bolts, roller, etc.). At full capacity, total direct raw material requirements amount to US\$1.1 million, while the cost of other materials will sum up to US\$204,540.

Table 24
Annual Material Requirements and Costs
at Full Capacity

	<u>Value (US\$)</u>
Direct Materials	1,147,800
Other Materials	<u>204,540</u>
Total	<u><u>1,352,340</u></u>

Casting requirements will be subcontracted since there are ferro and nonferro casting facilities in nearby Ceper.

Annex 2 presents the detailed annual material requirements by type of machine at full capacity.

4.2 UTILITY AND ENERGY REQUIREMENT

At full capacity, the plant will consume about 1.2 million kilowatt-hours (KWH) of electricity per year. Assuming an industrial rate of US\$0.062 (Rp 112) per KWH and 330-day operations, the plant's annual electricity cost will amount to US\$151,200. Annex 3 presents the breakdown of electric power cost for each machine.

Since the plant will use its own pump to meet its water requirements, there will be no direct water costs. Instead, incurred costs will be reflected in the electric power consumption of the water pump.

5. PLANT LOCATION

The proposed plant will be located in the Special Territory of Yogyakarta. Yogyakarta covers a land area of 3,169 sq. km. and is easily accessible by land from Jakarta and by air through the Adisutjipto Airport. Container facilities are available at the Tanjung Mas Harbour in Semarang and also in Surabaya in neighboring provinces. The cost of land in Yogyakarta is around US\$0.833 (Rp. 15,000) per square meter as indicated by the Ministry of Industry.

The project site of Yogyakarta was indicated by ASIMPI and the Ministry of Industry. An alternative site would be Jakarta which is the major market for woodworking machines. Based on plans, adequate electricity supply will be provided to Krakatao Steel and also to Jakarta.

6. PLANT ENGINEERING

6.1 LAYOUT AND PHYSICAL COVERAGE OF THE PROJECT

Figure 3 presents the physical layout of the proposed plant. The plant will require a total land area of about 6,370 square meters (sq.m). Of this, 1,925 sq.m. will be occupied by the building, while the remaining space will be for additional plant expansion and an optional foundry.

The space for the building will be allocated as follows:

Factory	1,000 sq. m.
Heat Treatment Room	150 sq. m.
Finished Goods Warehouse	150 sq. m.
Administrative Building	150 sq. m.
Material/Spare Parts Warehouse	375 sq. m.
Tool Room	50 sq. m.
Locker Room	<u>50 sq. m.</u>
Total	<u>1,925 sq. m.</u>

6.2 TECHNOLOGY AND EQUIPMENT

6.2.1 Production Process

The production of woodworking machines involves four basic processes: heat treatment, general machining, welding and fabrication, and assembly (see Figure 4).

(1) The casted materials (subcontracted from casting plants in Ceper) such as the table, handwheels, pulleys, and base/frames are annealed or normalized in the chamber furnace. This is done to improve machinability of the parts. Heat treatment is also applied to the finished machine parts in order to improve their mechanical properties.

(2) In the general machining process, the metal parts (stock material) are cut to the required size and put together to form mechanical units or machines. Depending on the type of part to be produced, the parts then undergo several activities which include turning, boring, threading, drilling, milling and grinding.

- o The turning process is a method of metal removal whereby a piece of work is gripped in a suitable holding device and rotated under power against a single point cutting medium which is fed radially or longitudinally to the axis of the work piece.

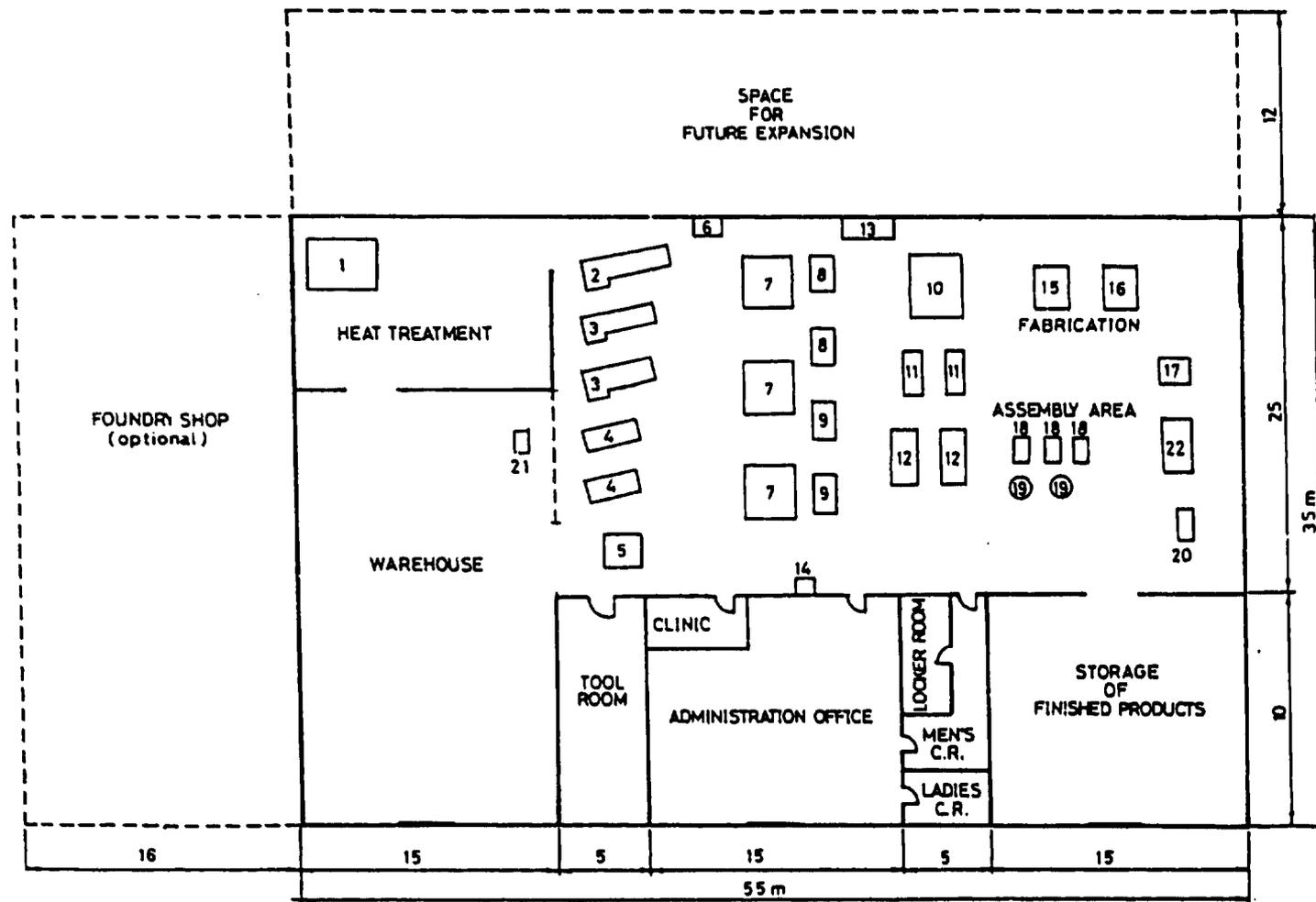
- o The milling process may be considered as a method of metal removal using a rotary cutter with several teeth, which revolves against the work which is fastened to the table or secured in a vise. Some of its numerous operations include drilling, boring, reaming, counter boring, spot facing, and producing flat surfaces, contours, grooves, gear teeth and helical forms. Milling operations utilize a milling machine.
- o The grinding process is done to produce a fine finish and to achieve extreme accuracy. Grinding is provided with a cutting tool known as an abrasive grinding wheel, which may be almost any shape. Grinding operations include producing finished flat surfaces, sharpening the cutting edges of tools, and grinding cylindrical shafts.
- o The vertical slotting machine operates on the same general principle as an ordinary shaper, except that the ram which carries the planing tool moves in a vertical direction and at right angles to the work table. A slotter is used for finishing slots or other enclosed parts such as keyways which could not be planed by the tool of a horizontal machine.

(3) In the fabrication or metalforming processes, force is applied on the steel plates by shearing or bending machines to produce the desired shapes for the frame, guards, stiffeners and housing.

(4) After several processes, the machine parts will be passed to the assembly area where they will be assembled, including the standard parts, motors, and blades. After trial runs, tests, and inspections, the assembled machines will be painted to the desired color and allowed to dry. When dry, it will be packed either for storage or for delivery.

Annex 4 shows in detail the various processes each major part undergoes.

FIGURE 3
PLANT LAYOUT



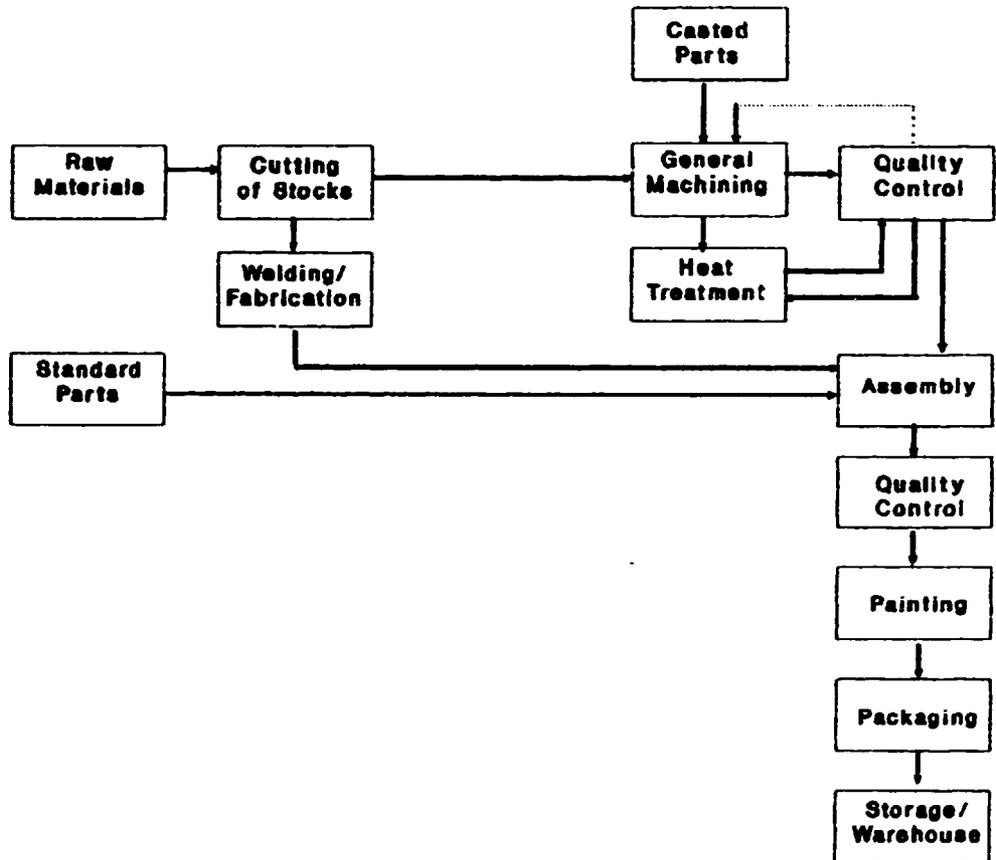
KEY:

- 1 Chamber furnace
- 2 Heavy duty lathe
- 3 High speed precision lathe
- 4 Precision lathe
- 5 Vertical slotting machine
- 6 Column drilling machine
- 7 Universal milling machine (big)
- 8 Milling machine
- 9 Universal milling machine (small)
- 10 Surface grinder (big)
- 11 Surface grinder (small)
- 12 Cylindrical grinder
- 13 Bench table
- 14 Pedestal grinder
- 15 Guillotine shears
- 16 Bending machine
- 17 Bench drill
- 18 Arc welding machine
- 19 Oxy-acetylene
- 20 Compressor
- 21 Power hacksaw
- 22 Bench table

PLANT FLOOR PLAN

NOTE: Drawn Not To Scale

Figure 4
Production Process Flow



6.2.2 Equipment

The plant will need several types of equipment to produce the required band saws, planers, and spindle shapers. Total machinery and equipment cost is estimated at US\$315,200, which includes shipment and installation costs.

Required auxiliary equipment include a forklift, water tank and water pump, and compressor, among others. The total cost of auxiliary equipment is estimated at US\$28,500.

Table 25
Cost of Machinery and Equipment
(in US\$)

Plant machinery and equipment	315,200
Auxiliary and service equipment	<u>28,500</u>
Total	<u><u>343,700</u></u>

It is assumed that all machinery and auxiliary equipment except for the water tank will be procured from foreign suppliers.

Annex 5 lists the required equipment and their costs.

6.3 CIVIL ENGINEERING

Site preparation activities include land clearing, grading, drainage, connection for electricity, and development of access roads. Site preparation costs are assumed at US\$13.89 (Rp. 25,000) per square meter, or US\$88,000 for the project.

Construction cost for the plant building and the warehouse is assumed at US\$139 per square meter or a total cost of US\$247,000. Construction of the office building will cost around US\$166 per square meter or a total cost of US\$25,000.

7. PLANT ORGANIZATION AND OVERHEAD COST

7.1 ORGANIZATION

Figures 5 and 6 illustrate the proposed organizational structure for the project. Three major departments will comprise the organization, namely Production, Finance and Administrative, and Marketing. Overall management and management of day-to-day operations will be handled by the president/general manager. Each department will have its own manager.

Plant operations will be headed by a plant manager. Under the plant manager will be the supervisors of the major sections of production, i.e., the Machine Shop/Fabrication, Assembly, Maintenance, and Quality Assurance. Each supervisor will have at least one foreman to perform close supervision on production operations.

7.2 OVERHEAD COSTS

At full production capacity, total overhead costs is estimated at US\$562,450. Marketing overhead, which includes marketing labor, commissions, and other advertising and promotions expense constitutes the biggest cost component at US\$264,200 or 47 per cent of total overhead. Administrative overhead is estimated at US\$201,600. Further breakdown of overhead costs is presented in Annex 6.

Table 26
Estimated Overhead Costs at Full Capacity
(in US\$)

<u>Overhead</u>	<u>Value</u>	<u>%</u>
Factory	96,650	17.2
Administrative	201,600	35.8
Marketing	<u>264,200</u>	<u>47.0</u>
Total	<u>562,450</u>	<u>100.0</u>

Figure 5
Project Organizational Structure

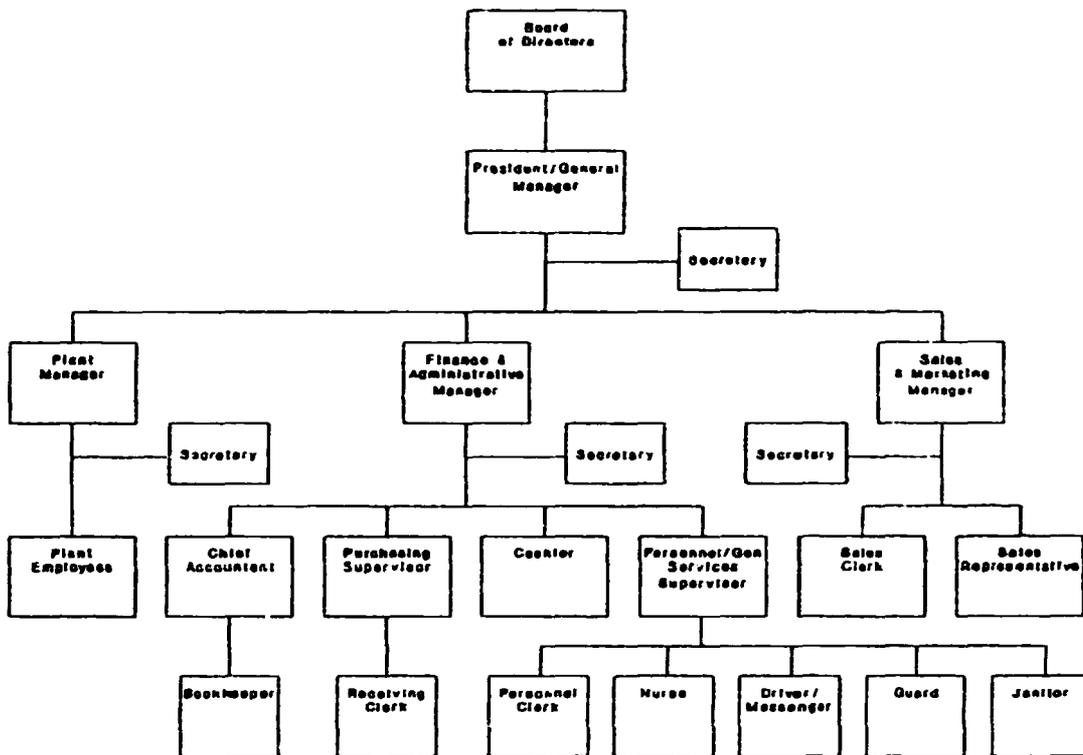
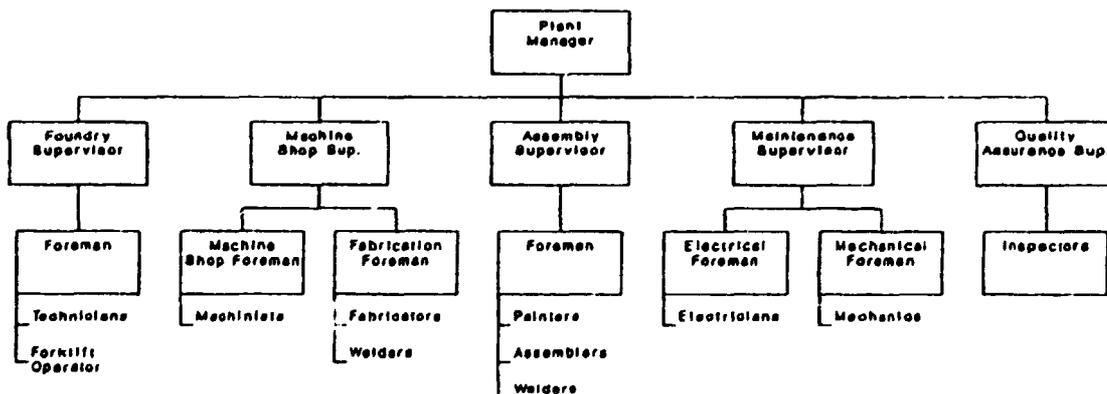


Figure 6
Plant Organization



8. MANPOWER

8.1 LABOR

At full capacity, the plant will employ 89 factory workers. Of these, 64 are direct laborers and 25 are indirect laborers. The direct labor force consists of 52 skilled and semi-skilled, and 12 unskilled workers. Total annual salaries and benefits for plant workers at full capacity is estimated at US\$177,450.

Table 27
Factory Labor Requirements and Costs
at Full Capacity

	<u>No.</u>	<u>Cost (US\$)</u>
Direct Labor	64	91,000
Indirect Labor	<u>25</u>	<u>86,450</u>
Total	<u>89</u>	<u>177,450</u>

Annex 7 details labor requirements as well as the costs of labor at full capacity.

8.2 STAFF

The project will employ a total of 29 administrative officers and staff. The salaries of the officers and the administrative staff are estimated at US\$190,900 per year. There will also be seven marketing personnel with a total annual compensation of US\$38,000. Annex 7 presents the project's staff requirements and compensation costs.

9. PROJECT IMPLEMENTATION

9.1 IMPLEMENTATION SCHEDULE

Commercial production will begin after a one-year preproduction phase. Preoperation activities include the following:

- o Acquisition of government approvals
- o Feasibility study and preparation of engineering specifications
- o Acquisition of plant machineries and other auxiliary equipment
- o Civil engineering: site development and construction of building
- o Delivery and installation of plant machineries and other auxiliary equipment
- o Procurement of raw materials for test run
- o Recruitment and training of production and maintenance personnel
- o Trial production/startup operations
- o Normal operations

The machinery requirements for the project are mainly lathes and milling machines which do not require detailed process technology and specialized civil works. They can be brought in as soon as the building is finished.

The schematic diagram of the preproduction phase is presented in Figure 7.

9.2 COST ESTIMATES

Preproduction costs include organization and preoperating expenses, property taxes, and interest on long term loans during the preoperating period. Trial production and manpower training cost covers raw materials (including wastage) and energy requirement, as well as allowances for trainees and trainers. Organization cost covers three-month salary of three managers and other expenses. Total preproduction cost is estimated at US\$136,553. Table 28 details expenses incurred during this period.

Table 28
Preproduction Costs
(in US\$)

Feasibility study and engineering specifications	30,000
Trial production and manpower training	18,000
Organizational costs	33,000
Property tax	9,000
Capitalized interest	<u>46,553</u>
Total	<u>136,553</u>

10. FINANCIAL EVALUATION

10.1 TOTAL INITIAL INVESTMENT COST

Total investment requirement for the project is estimated at US\$956.3 thousand. The biggest investment will be on machinery and equipment, which is US\$315.2 thousand or almost 31 per cent of total initial investment.

About 37 per cent of the initial investment is foreign currency cost component, mainly machinery and equipment, and auxiliary and service facilities.

Table 29
Total Initial Investment
(in thousand US dollars)

	<u>Amount</u>
Land, site preparation & development	141.0
Building and civil works	272.0
Auxiliary and service facilities	28.5
Incorporated fixed assets	63.0
Machineries and equipment	<u>315.2</u>
Sub-total	819.7
Preproduction capital costs	<u>136.6</u>
Total Initial Investment	<u><u>956.3</u></u>

10.2 PROJECT FINANCING

Financing for the project is assumed to come from a combination of loan and equity investments to be made during the preoperating period.

10.2.1 Loans

10.2.1.1 Foreign Loans

Foreign loans will cover 80 per cent of the foreign cost component of the project. This loan is assumed to have a term of seven years with a two-year grace period on principal and an interest of 12 per cent per annum.

10.2.1.2 Local Loans

Local loans, on the other hand, will finance 51 per cent of the local component of the project. Long-term local loans are assumed to carry an interest rate of 20 per cent per annum with a term of seven years, inclusive of a two-year grace period on principal payments.

10.2.2 Equity

Equity contributions will finance 40 per cent of the total initial investment in the project. It is assumed that 70 per cent of equity contributions will come from local proponents. Foreign sources will invest up to 30 per cent in equity for the project. This will mainly come from nationals of ASEAN participating countries which may be Malaysia, the Philippines, and Thailand.

Table 30 shows the schedule of financing for the project.

Table 30
Sources of Financing
(in thousand US dollars)

	<u>Amount</u>
Loans	
Foreign	270.6
Local	<u>303.2</u>
Sub-total	573.8
Equity	
Foreign	114.8
Local	<u>267.8</u>
Sub-total	<u>382.6</u>
Total	<u><u>956.3</u></u> *

* Figures do not add up to total due to rounding

10.3 PRODUCTION COSTS

Annual production costs at full capacity is estimated at US\$2.3 million. As shown in Table 31, the largest cost component is raw material which accounts for about 58 per cent of total production costs.

Table 31
Standard Production Costs at Full Capacity
(in thousand US dollars)

	<u>Amount</u>
Factory Costs	
Raw Materials	1,352.3
Utility	151.2
Direct Labor	91.0
Repairs	8.6
Spares	10.3
Factory Overhead	<u>96.7</u>
Total Factory Costs	1,710.1
Administrative Overhead	201.6
Sales and Distribution Costs	264.2
Financial Costs	74.5
Depreciation	<u>98.1</u>
Total Production Costs	<u>2,348.5</u>

10.4 COMMERCIAL PROFITABILITY

All financial computations have been based on assumptions previously discussed and those presented in Annex 11. It will be noted that the financial projections assume constant 1989 prices. Any increase in cost is assumed to be compensated for by a corresponding increase in prices. In addition, all Rupiah costs were converted to US currency using an exchange rate of Rp 1,800 to US\$1.

The results of the financial projections indicate the viability of the project. The project will have a financial internal rate of return (IRR) of 27.72 per cent. Although losses will be incurred during the first two years of operations, the project will pick up and start earning profits starting on the third year when production will be at full capacity. Internally generated funds will be sufficient to cover cash operating requirements and debt service requirements during the fourth year of operations.

10.4.1 Financial Indicators

Table 32 presents a summary of the financial indicators of the project.

Table 32
Selected Financial Indicators

Internal Rate of Return	27.72%
Payback Period (in years)	5.05
Net Present Value	US\$453,112.60
Breakeven* (% of sales at full cap)	46.29%

* Excluding financing.

The results of financial projections show that the project will incur net losses during the first two years of production. A large part of operating costs is fixed, and variable margin will not be able to cover fixed costs during this period. The project's fixed costs coverage ratio for the first three years (excluding financing) are 0.79 for year 1, 1.12 for year 2, and 2.16 for year 3. The project is expected to pick up from its losses by the third year when production will start to operate at full capacity. Return on sales from years 3 - 15 will range from 10 - 14 per cent.

Table 33
Income Statement Highlights
(in US dollars)

<u>Year</u>	<u>Gross Revenue</u>	<u>Net Income</u>	<u>Net Income/ Gross Revenue</u>
1	983,900	(185,980.8)	(18.9%)
2	1,406,800	(38,950.4)	(2.8%)
3	2,799,800	293,378.0	10.5%
4	2,799,800	305,481.8	10.9%
5	2,799,800	352,006.0	12.6%
6	2,799,800	364,109.7	13.0%
7	2,799,800	376,213.5	13.4%
8	2,799,800	376,213.5	13.4%
9	2,799,800	376,213.5	13.4%
10	2,799,800	376,213.5	13.4%
11	2,799,800	396,701.5	14.2%
12	2,799,800	396,701.5	14.2%
13	2,799,800	396,701.5	14.2%
14	2,799,800	396,701.5	14.2%
15	2,799,800	396,701.5	14.2%

10.4.2 Sensitivity Analyses

To determine the effect of changes in critical variables on the financial viability of the project, sensitivity analyses were conducted on the basic set of financial projections and on different scenarios.

The results of the sensitivity analysis on the basic set of financial projections is graphically presented in Annex 10. The project is highly sensitive to changes in sales price and operating costs, and least sensitive to changes in initial investment.

Simulations were made to determine the project's continued viability to specific unfavorable scenarios. The scenarios assumed the following:

Case 1:

Assuming that the project will not be able sell its targetted volume, and is able to produce and sell at 80 per cent of capacity.

Case 2:

Reduction in selling prices of the three machines. For exports, the prices assumed are the lower end market prices; for the domestic market, prices are 10 per cent lower. The prices used compared with the base case are as follows:

	<u>Domestic Price</u>		<u>Export Price</u>	
	<u>Base Case</u>	<u>Case 2</u>	<u>Base Case</u>	<u>Case 2</u>
Band Saw	1,180	1,242	1,080	900
Planer	1,560	1,404	1,150	1,121
Shaper	1,660	1,494	1,500	1,132

Case 3:

Cost of production rises by 10 per cent while prices remain the same.

As shown in Table 34, the project will still be viable under the first scenario. The internal rate of return will be at 20.59 per cent.

In the other two scenarios, however, the project will have IRR's lower than the 20 per cent hurdle rate. The biggest drop will occur with the scenario on decreasing sales prices, where the internal rate of return will be around 13 per cent (or a net present value of -US\$381 thousand).

The increase in production costs would result in a 38 per drop in IRR to 17.06 per cent. In this case, rises in operating costs can be offset by increases in selling price.

Table 34
Summary of Sensitivity Analyses

	<u>Case 1</u>	<u>Case 2</u>	<u>Case 3</u>
Internal Rate of Return	20.59%	12.98%	17.06%
Payback Period (in years)	5.91	7.07	6.87
Net Present Value (in thousand US\$)	30.56	-380.80	-168.51
Breakeven* (% of sales at full capacity)	59.49%	68.14%	61.32%

* Excluding financing.

Annex 10 presents the COMFAR generated financial summary sheets for the scenarios used in the sensitivity analyses.

10.5 FINANCIAL CASHFLOW

The cashflow summary for the 15-year period of the project is presented in the next page. The project is estimated to incur cash deficits during the first three years of commercial production due to operation losses and debt repayments starting on the second year. These deficits will have to be covered by short-term financing. As shown in Table 35, recovery will occur on the fourth year when

internally generated funds will be able to cover debt repayments and cash operations requirements.

Table 35
Financial Cashflow
(in US dollars)

Year	<u>Total Cash Inflow</u>	<u>Total Cash Outflow</u>	<u>Surplus (Deficit)</u>	<u>Cumulated Cash Balance*</u>
1	1,038,064	1,224,397	(186,332.1)	(186,331.9)
2	1,426,933	1,505,265	(78,331.6)	(264,663.5)
3	2,867,152	2,666,321	200,830.5	(63,833.0)
4	2,799,800	2,510,994	288,806.0	224,973.0
5	2,799,800	2,517,425	282,375.5	507,348.5
6	2,799,800	2,505,321	294,479.5	801,828.0
7	2,799,800	2,378,467	421,333.5	1,223,162.0
8	2,799,800	2,378,467	421,333.5	1,644,495.0
9	2,799,800	2,378,467	421,333.5	2,065,829.0
10	2,799,800	2,378,467	421,333.5	2,487,162.0
11	2,799,800	2,389,499	410,301.5	2,897,464.0
12	2,799,800	2,389,499	410,301.5	3,307,765.0
13	2,799,800	2,389,499	410,301.5	3,718,067.0
14	2,799,800	2,389,499	410,301.5	4,128,368.0
15	2,799,800	2,389,499	410,301.5	4,538,670.0

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

ANNEXES

FOREIGN TRADE STATISTICS

A. INDONESIA

Importations of Sawing Machines for Working Wood
1987-1988

Country of Origin	1987			1988		
	Quantity Units	Weight (kg)	CIF Value (US\$)	Quantity Units	Weight (kg)	CIF Value (US\$)
Japan	177	287,124	1,393,141	335	447,400	4,607,707
Hongkong	-	-	-	5	12,970	23,057
South Korea	44	121,100	327,975	45	71,108	250,572
Taiwan	113	70,430	209,424	368	186,327	752,727
Peoples Rep. of China	-	-	-	349	30,318	102,387
Thailand	-	-	-	8	6,910	18,499
Singapore	40	44,713	118,882	133	268,611	525,827
Malaysia	25	37,784	83,364	102	159,728	371,883
Australia	42	3,450	174,614	5	60	2,119
U.S.A.	3	2,704	11,252	6	3,808	83,518
United Kingdom	27	20,254	191,524	92	43,859	395,850
Netherlands	-	-	-	1	1,400	2,155
France	2	6,500	92,988	47	237,000	4,392,823
West Germany	72	66,068	381,363	568	51,950	457,259
Austria	-	-	-	1	4,678	101,176
Sweden	17	3,265	118,091	60	8,059	255,172
Finland	-	-	-	2	2,750	34,838
Italy	143	33,329	180,459	1,922	172,308	1,394,557
Hungary	-	-	-	4	14,017	42,157
Belgia & Luxemburg	9	2,500	18711	-	-	-
Switzerland	1	1,000	2150	-	-	-
Poland	-	-	-	6	19,050	147,875
Total	715	680,221	3,243,918	4,059	1,742,409	13,962,158

Source: Import Statistics of Indonesia, 1987-1988.

Indonesia
Importations of Woodworking Machineries
by Commodity Classification
January to September 1989

Commodity Classification	Weight (kg)	CIF Value (US\$)
Sawing Machines for Working Wood	490,036	2,972,118
Planing, Milling, or Moulding Machines for Working Wood	1,439,128	7,720,317
Grinding, Sanding, or Polishing Machines for Working Wood	574,006	13,648,606
Bending or Assembling Machines for Working Wood	347,670	4,702,976
Drilling or Morticing Machines for Working Wood	123,517	1,927,665
Splitting, Slicing, or Paring Machines for Working Wood	535,516	1,299,132
Other Machine Tools for Working Wood	5,369,760	4,854,455

Source: Foreign Trade Statistical Bulletin, September 1989.

B. MALAYSIA

Importations of Sawing Machines for Working Wood, Cork, Bone, Ebonite

Country of Origin	1988		Jan - Aug 1989	
	Quantity Units	CIF Value (M\$)	Quantity Units	CIF Value (M\$)
Australia	5	595,654	4	68,517
Germany, Fed. Rep. of	140,102	435,521	88	690,327
Italy	323	752,873	449	1,075,216
Japan	1,505	5,447,843	1,331	7,754,355
Singapore	183	202,297	54	215,823
Taiwan	2,748	2,317,897	279	2,392,128
Turkey	245	90	-	-
United Kingdom	5,043	234,500	24	803,014
Austria	-	-	1	81,544
Indonesia	-	-	1	1,110
Portugal	-	-	1	81,235
Spain	-	-	12	169,850
Thailand	-	-	2	2,200
Belgium	55,003	62,908	1	5,454
Others	376	119,330	377	140,959
Total	205,533	10,166,713	2,624	13,461,590

Importation of Planning, Milling or Moulding (by Cutting) Machines

Country of Origin	1988		Jan - Aug 1989	
	Quantity Units	CIF Value (M\$)	Quantity Units	CIF Value (M\$)
Australia	205	152,221	4	190,822
China, People's Rep. of	43	32,106	73	303,136
Germany, Federal Rep. of	55	3,952,607	28	4,289,481
Italy	58	345,395	47	411,801
Japan	164	2,356,661	247	5,620,443
Netherlands	1	156,067	1	165,744
Singapore, Rep. of	16	278,996	20	455,095
Spain	12	237,416	25	483,333
Taiwan	426	3,736,759	1,793	4,795,816
Thailand	2	133,958	-	-
United Kingdom	73	4,887,814	30	2,593,607
Portugal	-	-	2	102,899
Others	30	176,316	13	73,535
Total	1,085	16,448,316	2,283	19,485,712

Source: Foreign Trade Statistics of Malaysia.

C. PHILIPPINES

Importations of Machines for Working Wood (e.g., planing, drilling, rounding, sandpapering machines; lathes; and presses specialized for woodworking)

Country of Origin	1987		1988		Jan - Sep 1989	
	Quantity (NO.)	CIF Value (US\$)	Quantity (NO.)	CIF Value (US\$)	Quantity (NO.)	CIF Value (US\$)
China, Peoples Rep. of	-	-	1	3,824	6	11,487
Denmark	8	618,026	-	-	-	-
France	7	1,615,697	-	-	3	189,195
Germany, Fed. Rep. of	438	6,926,234	337	1,161,046	84	7,675,277
Hong Kong	-	-	8	11,827	5	148,754
Netherlands	19	1,759,624	1	41,527	2	1,136,316
Italy	56	4,727,575	81	421,253	94	4,660,299
Japan	2,393	9,210,660	22,265	774,297	1,124	18,447,910
Korea	-	-	-	-	7	25,554
Portugal	1	586,997	1	8,301	1	463,340
Singapore	13	541,078	79	84,393	16	162,881
Spain	1	163,317	2	16,603	21	814,168
Sweden	-	-	6	46,281	3	610,050
Switzerland	95	137,261	-	-	-	-
Taiwan	544	10,110,243	1,028	605,960	1,479	12,446,009
United Kingdom & Northern Ireland	3	261,139	185	68,591	26	694,186
United States	54	790,399	54	586,505	113	11,476,517
Total	3,632	21,801,094	24,048	2,192,931	2,984	45,160,615

Source: Foreign Trade Statistics of the Philippines.

D. THAILAND

Importations of Sawing Machines for Working Wood, Cork, Bone, Ebonite,

Country of Origin	1987		1988		Jan - Jul 1989	
	Volume Units	Value (000 US\$)	Volume Units	Value (000 US\$)	Volume Units	Value (000 US\$)
Taiwan	191	98	441	525	127	307
Italy	116	357	365	671	221	723
Japan	153	215	289	494	63	102
West Germany	53	256	58	519	77	135
Others	718	58	37	70	86	213
Total	1,229	884	1,190	2,279	576	1,460

Importations of Planning, Milling or Moulding (By Cutting) Machines

Country of Origin	1988		Jan - Jul 1989	
	Volume Units	Value (000 US\$)	Volume Units	Value (000 US\$)
Taiwan	507	1,546	157	437
Japan	285	612	46	595
China	196	11	2	**
Italy	77	496	82	468
Others	173	2,288	66	1,443
Total	1,238	4,953	353	2,943

Importations of Drilling Machines for Working Wood, Cork, Bone, Ebonite, Etc.

Country of Origin	1987		1988		Jan - Jul 1989	
	Volume Units	Value (000 US\$)	Volume Units	Value (000 US\$)	Volume Units	Value (000 US\$)
Taiwan	62	163	655	694	185	361
Japan	14	64	113	872	28	120
Italy	13	32	38	358	42	315
West Germany	21	6	26	97	2	24
Others	3	7	23	54	11	156
Total	113	274	855	2,075	268	976

Source: Foreign Trade Statistics of Thailand.

ANNUAL RAW MATERIAL REQUIREMENTS AND COSTS AT FULL CAPACITY
BY TYPE OF MACHINE

<u>Machine/Raw Material</u>	<u>Annual Raw Material Qty.</u>	<u>Unit Cost (US\$)</u>	<u>Annual Cost (US\$)</u>
A. BAND SAW			
Direct:			
Cast Iron	99,000.00 kg	1.11	110,000
Mild Steel	56,225.40 kg	0.83	46,800
Steel Bars	2,625.48 kg	1.33	3,600
Band Saw Blade	660.00 pcs	14.51	9,600
Motor	660.00 units	175.82	116,000
Indirect:			
Ind'l Oxygen	165.00 cyl	5.59	1,000
Acetylene	82.50 cyl	13.19	1,000
Electrodes	1,320.00 kg	4.08	5,400
Quenching Oil	660.00 drum	13.52	9,000
Paint	330.00 gal	13.38	4,400
Primer	330.00 gal	6.59	2,200
Sand Paper	3,300.00 sheets	0.18	600
Reducer	217.80 gal	7.03	1,600
Putty	165.00 gal	11.87	2,000
Subtotal			313,200
Add: Standard Parts (10% of total cost)			31,320
Total Annual Raw Material Cost			<u>344,520</u>
B. PLANER			
Direct:			
Cast Iron	303,600.00 kg	1.11	337,400
Mild Steel	9,546.90 kg	0.83	16,000
Steel Bars	19,092.38 kg	1.33	24,000
Motor	660.00 units	219.78	145,000
Indirect:			
Ind'l Oxygen	165.00 cyl	5.59	1,000
Acetylene	82.50 cyl	13.19	1,000
Electrodes	1,320.00 kg	4.08	5,400
Quenching Oil	660.00 drum	13.52	9,000
Paint	330.00 gal	13.38	4,400
Primer	330.00 gal	6.59	2,200
Sand Paper	3,300.00 sheets	0.18	600
Reducer	217.80 gal	7.03	1,600
Putty	165.00 gal	11.87	2,000
Subtotal			549,600
Add: Standard Parts (10% of total cost)			54,960
Total Annual Raw Material Cost			<u>604,560</u>

C. SPINDLE SHAPER

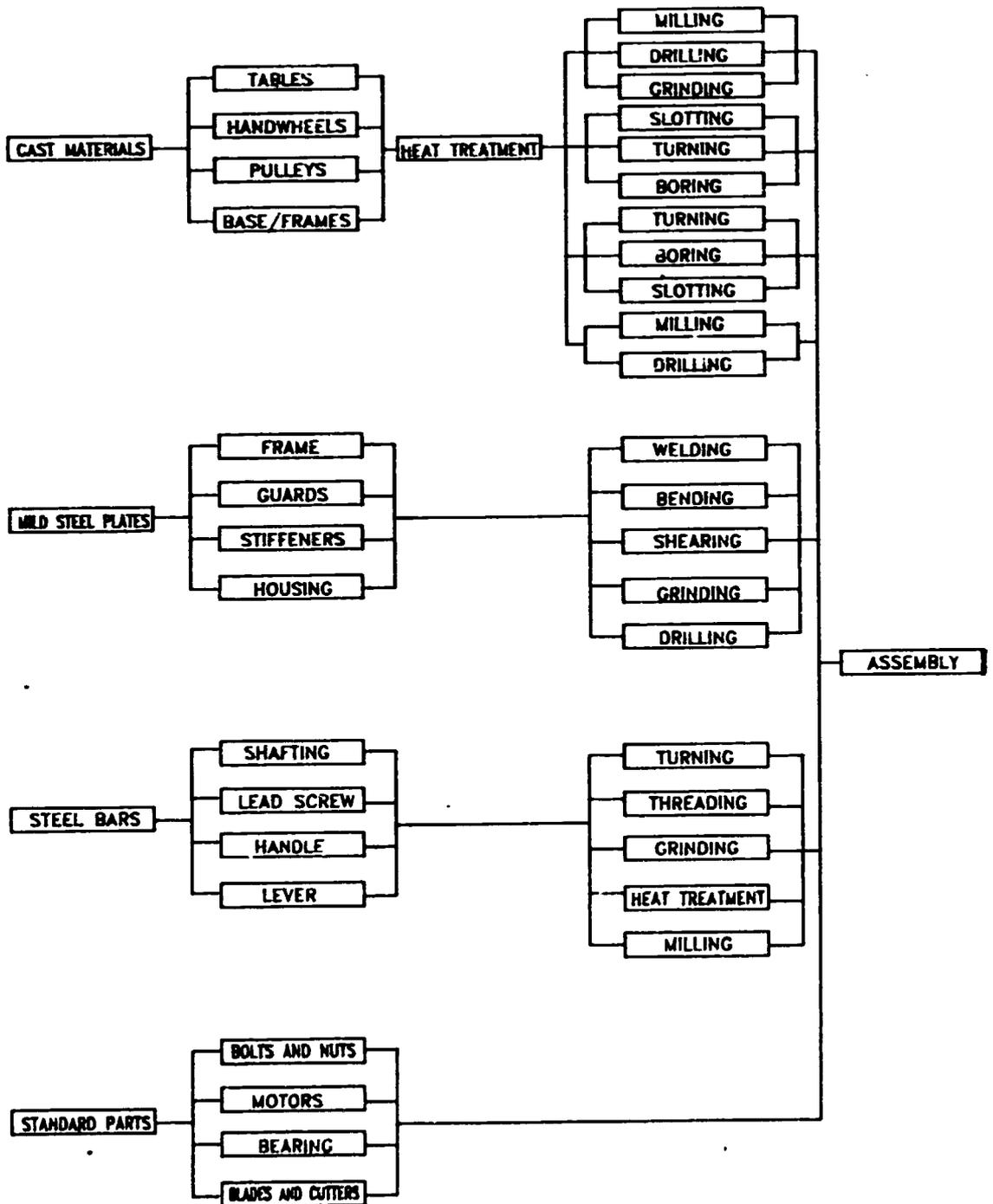
Direct:			
Cast Iron	198,000.00 kg	1.11	220,000
Mild Steel	1,399.20 kg	0.83	1,200
Steel Bars	1,656.60 kg	1.33	2,200
Motor	660.00 units	175.82	116,000
Indirect:			
Ind'l Oxygen	165.00 cyl	5.59	1,000
Acetylene	82.50 cyl	13.19	1,000
Electrodes	1,320.00 kg	4.08	5,400
Quenching Oil	660.00 drum	13.52	9,000
Paint	330.00 gal	13.38	4,400
Primer	330.00 gal	6.59	2,200
Sand Paper	3,300.00 sheets	0.18	600
Reducer	217.80 gal	7.03	1,600
Putty	165.00 gal	11.87	<u>2,000</u>
Subtotal			366,600
Add: Standard Parts (10% of total cost)			<u>36,660</u>
Total Annual Raw Material Cost			<u><u>403,260</u></u>

ELECTRIC POWER CONSUMPTION AND COSTS AT FULL CAPACITY

Machine	No.	Power Consump- tion (kw)	Monthly Operating Hours	Monthly Power Consump- tion (kwh)
GRINDING MACHINE				
Surface Grinder I	1	11.00	686	7,546
Surface Grinder II	2	7.60	686	10,428
Cylindrical Grinder	2	5.50	686	7,546
LATHE MACHINE				
Precision Lathe	2	1.50	686	2,058
High Speed Lathe	3	3.70	686	7,814
Heavy Duty Lathe	1	10.00	686	6,860
MILLING MACHINE				
Universal Milling Machine I	3	8.00	686	16,464
Milling Machine	2	3.00	686	4,116
Universal Milling Machine II	2	3.00	686	4,116
VERTICAL SLOTTING MACHINE				
	1	3.00	686	2,058
DRILLING MACHINE				
Column Drilling Machine	1	1.75	286	500
Electric Bench Drilling Machine	1	1.50	344	516
PEDESTAL GRINDER				
	2	0.50	286	286
QUILLOTINE SHEAR				
	1	2.25	572	1,288
PLATE BENDING MACHINE				
	1	3.73	572	2,134
ARC-WELDING MACHINE				
	3	15.00	572	25,740
POWER HACKSAW				
	1	0.75	572	430
COMPRESSOR				
	1	0.38	458	174
PORTABLE ELECTRIC GRINDER				
	2	0.19	458	174
PORTABLE ELECTRIC DRILL				
	1	0.19	458	88
CHAMBER FURNACE				
	1	40.00	686	27,440
WATER PUMP				
	1	0.80	360	304
LIGHTS				
	260	0.04	686	7,134
Total				<u>135,014</u>

Monthly Power Consumption	135,014	KWH
x Allowance Factor	1.5	
= Adjusted Monthly Power Consumption	202,521	KWH
x 12 Months		
= Annual Power Consumption	2,430,252	KWH
x US\$0.62/KWH (Rp 112/KWH)		
= Total Annual Energy Cost	US\$151,200	

DETAILED PROCESS DESCRIPTION



LIST OF EQUIPMENT AND COSTS

	<u>Unit</u>	<u>Unit Cost (US\$)</u>	<u>Total Cost (US\$)</u>
A. PLANT MACHINERY AND EQUIPMENT			
GRINDING MACHINES			
1. Surface Grinder Table size: 1,200 mm (L) x 850 mm (W)	1	39,600	39,600
2. Surface Grinder Table size: 450 mm (L) x 150 mm (W) Workpiece: 450 mm (L) x 150 mm (W) x 180 mm (H)	2	7,300	14,600
3. Cylindrical Grinder Diameter: 254 mm (Ø) Distance between centers: 1,016 mm (L) Workpiece: 240 mm (Ø) x 920 mm (L)	2	10,800	21,600
LATHE MACHINES			
4. Precision Lathe Swing over bed: 267 mm Distance between centers: 457 mm	2	5,500	11,000
5. High Speed Precision Lathe Swing over bed: 360 mm Distance between centers: 457 mm	3	3,100	9,300
6. Heavy Duty Lathe Swing over bed: 495 mm Distance between centers: 2,000 mm Swing in gap: 710 mm	1	8,800	8,800
MILLING MACHINES			
7. Universal Milling Machine Table size: 1,415 mm (L) x 700 mm (W) Workpiece: 1,397 mm (L) x 686 mm (W) x 1,000 mm (H)	3	41,800	125,400
8. Milling Machine Table size: 800 mm (L) x 420 mm (W) Workpiece: 400 mm (L) x (285+200) mm (W) x 400 mm (H)	2	3,400	8,800
9. Universal Milling and Boring Machine Table size: 700 mm (L) x 330 mm (W) Workpiece: 400 mm (L) x 220 mm (W) x 400 mm (H)	2	17,600	35,200
VERTICAL SLOTTING MACHINE			
10. Vertical Slotting Machine Stroke: 200 mm Workpiece: 432 mm (Ø) x 956 mm (H)	1	8,800	8,800

DRILLING MACHINES

11.	Column Drilling Machine Drill capacity: 40 mm (Ø) Workpiece: 440 mm (L) x 450 mm (W) x 800 mm (H)	1	4,000	4,000
12.	Electric Bench Drilling Machine Drill capacity: 25.4 mm (Ø) Workpiece: 240 mm (L) x 265 mm (W) x 250 mm (H)	1	700	700

PEDESTAL GRINDER

13.	Pedestal Grinder (Double wheel type)	2	900	1,800
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ASSEMBLY/FABRICATION MACHINES

14.	Guillotine Shear Working length: 1,080 mm Max. sheet thickness: 3 mm Max. guide adjustment, front: 1,000 mm Max. guide adjustment, rear: 500 mm Depth of gap: 125 mm	1	1,300	1,300
15.	Plate Bending Machine (Anstral Kleen) Working length: 1,219 mm Max. sheet thickness: 3 mm	1	1,200	1,200
16.	Arc-welding Machine Range: 30-200 Ampere	3	500	1,500
17.	Oxy-acetylene Equipment	2	500	1,000
18.	Power Hacksaw Workpiece: 200 mm (Ø)	1	900	900
19.	Chamber Furnace	<u>1</u>	21,700	<u>21,700</u>
	Total	<u>32</u>		<u>315,200</u>

B. AUXILIARY AND SERVICE EQUIPMENT

1.	Forklift (5 tons)	1	13,200	13,200
2.	Floor and truck crane	1	2,600	2,600
3.	Compressor Power: 1/2 hp	1	200	200
4.	Portable Electric Grinder	2	100	200
5.	Spray Gun Capacity: 1 quart	1	300	300
6.	Portable Electric Drill	1	300	300
7.	Bench Vice	2	50	100
8.	Bench Table	2	50	100
9.	Measuring Tools/Instruments			5,000
10.	Water Tank	1	6,000	6,000
11.	Water Pump	<u>1</u>	500	<u>500</u>
	Total	<u>13</u>		<u>28,500</u>

NOTE: Cost includes shipment and installation costs

ANNUAL OVERHEAD COSTS AT FULL CAPACITY
(in US\$)

<u>Overhead</u>	<u>Amount</u>
A. Production	
Indirect Labor	86,450
Insurance	7,600
Miscellaneous Expense	<u>2,600</u>
Total	96,650
B. Administrative	
Office Supplies	2,000
Communications	6,000
Repairs	1,800
Insurance	600
Miscellaneous	300
Administrative Labor	<u>190,900</u>
Total	201,600
C. Marketing	
Commission	141,400
Advertising Expenses	84,800
Marketing Labor Cost	<u>38,000</u>
Total	264,200

ANNUAL LABOR REQUIREMENTS AND COSTS AT FULL CAPACITY
(Costs in US\$)

	<u>No. of Employees</u>	<u>Monthly Compensation¹</u>	<u>Annual Labor Cost.²</u>
A. PRODUCTION			
<u>Direct Labor</u>			
Skilled			
Fabricator	4	122	7,300
Machinist	38	122	69,400
Subtotal	42		76,700
Semi-skilled			
Welder - Assembly	4	63	3,700
Machine Shop Welder	6	63	5,600
Subtotal	10		9,300
Unskilled			
Assembler	6	28	2,500
Painter/Assembler	6	28	2,500
Subtotal	12		5,000
Total Direct Labor	64		91,000
<u>Indirect Labor</u>			
Plant Manager	1	1,667	24,900
Supervisor			
Assembly	1	278	4,200
Machine Shop	1	278	4,200
Quality Assurance	1	278	4,200
Maintenance	2	278	8,300
Foremen			
Assembly	2	194	5,800
Maintenance (Electrical)	1	194	2,900
Machine Shop	4	194	11,600
Maintenance (Mechanical)	1	194	2,900
Inspector	2	122	3,700
Electrician	2	122	3,700
Machine Technician	3	122	5,550
Mechanic	2	122	3,700
Tool Keeper	2	28	800
Total Indirect Labor	25		86,450

1 Rates converted from Indonesian Rupiah.

2 Includes 13-month pay plus 15% benefits
Rounded off to the nearest hundreds.

	<u>No. of Employees</u>	<u>Monthly Compensation¹</u>	<u>Annual Labor Cost²</u>
B. ADMINISTRATIVE			
Board of Directors	3	2,000	89,700
President/Director	1	2,000	29,900
Executive Secretary	1	194	2,900
Financial Manager	1	1,667	24,900
Secretary	1	122	1,800
Cashier	1	194	2,900
Chief Accountant	1	278	4,200
Bookkeeper	3	194	8,700
Personnel/General Services Supervisor	1	278	4,200
Personnel Clerk	2	194	5,800
Janitor	2	28	800
Nurse	1	122	1,800
Guard	6	28	2,500
Driver/Messenger	2	28	800
Purchasing Supervisor	1	278	4,200
Receiving Clerk	2	194	5,800
Total	<u>29</u>		<u>190,900</u>
C. MARKETING			
Marketing Manager	1	1,667	24,900
Secretary	1	122	1,800
Sales Clerk	2	194	5,800
Sales Representative	3	122	5,500
Total	<u>7</u>		<u>38,000</u>

1 Rates converted from Indonesian Rupiah.

2 Includes 13-month pay plus 15% benefits
Rounded off to the nearest hundreds.

LIST OF INCORPORATED FIXES ASSETS AND COSTS
(Costs in US\$)

<u>Asset</u>	<u>Units</u>	<u>Unit Cost</u>	<u>Total Cost</u>
Adding Machine	5	90	450
Airconditioner	3	540	1,620
Calculator	5	10	50
Computer	2	2,470	4,940
Conference Table	1	360	360
Fax Machine	1	3,590	3,590
Filing Cabinet	4	60	240
Office Tables	25	90	2,250
Office Chairs	25	40	1,000
Other Office Accessories			670
Refrigerator	1	450	450
Typewriter (electric)	4	670	2,680
Typewriter (manual)	2	130	260
Visitors' Chairs	24	10	240
Furnitures and Fixtures			4,200
Asian Utility Vehicle (AUV)	3	13,330	<u>40,000</u>
Total			<u>63,000</u>



FINANCIAL STATEMENTS

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

Manufacture of Woodworking Machines

Date: 4-18-90

Base Case

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: US Dollars

Total initial investment during construction phase

fixed assets:	956252.80	37.013 % foreign
current assets:	0.00	0.000 % foreign
total assets:	956252.80	37.013 % foreign

Source of funds during construction phase

equity & grants:	382501.00	30.000 % foreign
foreign loans :	270560.00	
local loans :	303192.00	
total funds :	156253.00	40.294 % foreign

Cashflow from operations

Year:	1	4	8
operating costs:	978700.30	2175890.00	2175890.00
depreciation :	98074.80	98074.80	45120.00
interest :	93105.59	55863.36	0.00
production costs	1169881.00	2329828.00	2221010.00
thereof foreign	6.83 %	2.87 %	1.88 %
total sales :	983900.00	2799800.00	2799800.00
gross income :	-185980.80	469972.00	578790.00
net income :	-185980.80	305481.80	376213.50
cash balance :	-186332.00	288866.00	421333.50
net cashflow :	-93226.38	459419.80	421333.50

Net Present Value at: 20.00 % = 453112.60
 Internal Rate of Return: 27.72 %
 Return on equity1: 33.91 %
 Return on equity2: 30.90 %

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
21 UNITED

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

Cashflow Tables, construction in US Dollars

Year	1991
Total cash inflow . .	956253.000
Financial resources .	956253.000
Sales, net of tax . .	0.000
Total cash outflow . .	956252.800
Total assets	909700.000
Operating costs . . .	0.000
Cost of finance . . .	46552.800
Repayment	0.000
Corporate tax	0.000
Dividends paid	0.000
Surplus (deficit) .	0.188
Cumulated cash balance	0.188
Inflow, local	570943.000
Outflow, local	602319.200
Surplus (deficit) .	-31376.190
Inflow, foreign . . .	385310.000
Outflow, foreign . . .	353933.600
Surplus (deficit) .	31375.410
Net cashflow	-909700.000
Cumulated net cashflow	-909700.000

Manufacture of Woodworking Machines --- Date: 4-18-90



COMFAR
21 UNIDO

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

Cashflow tables, production in US Dollars

Year	1992	1993	1994	1995	1996	1997
Total cash inflow . .	1038064.000	1426933.000	2867152.000	2799800.000	2799800.000	2799800.000
Financial resources .	54164.420	20133.080	67351.670	0.000	0.000	0.000
Sales, net of tax . .	983900.000	1406800.000	2799800.000	2799800.000	2799800.000	2799800.000
Total cash outflow . .	1224397.000	1505265.000	2666321.000	2510994.000	2517425.000	2505321.000
Total assets	152590.600	42838.780	143223.400	0.000	0.000	0.000
Operating costs . . .	978700.300	1254570.000	2175890.000	2175890.000	2175890.000	2175890.000
Cost of finance . . .	93105.590	93105.590	74484.480	55863.360	37242.240	18621.120
Repayment	0.000	114750.400	114750.400	114750.400	114750.400	114750.400
Corporate tax	0.000	0.000	157972.800	164490.200	189541.700	196059.100
Dividends paid	0.000	0.000	0.000	0.000	0.000	0.000
Surplus (deficit) .	-186332.100	-78331.630	200630.500	288806.000	282375.500	294479.500
Cumulated cash balance	-186331.900	-264663.500	-63833.000	224973.000	507348.500	801828.000
Inflow, local	811164.400	1066533.000	2086752.000	2019400.000	2019400.000	2019400.000
Outflow, local	1180313.000	1408386.000	2575935.000	2427102.000	2440026.000	2434415.000
Surplus (deficit) .	-369148.700	-341852.400	-489183.600	-407701.800	-420625.500	-415015.000
Inflow, foreign . . .	226900.000	360400.000	780400.000	780400.000	780400.000	780400.000
Outflow, foreign . . .	44083.310	96879.200	90385.760	83892.320	77398.880	70905.440
Surplus (deficit) .	182816.700	263520.800	690014.300	696507.700	703001.100	709494.600
Net cashflow	-93226.390	129524.300	390065.400	459419.800	434368.300	427850.900
Cumulated net cashflow	-1002926.000	-873402.100	-483336.600	-23916.810	410451.500	838302.400

----- Manufacture of Woodworking Machines --- Date: 4-18-9

COMFAR
21 UNITED

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

Cashflow tables, production in US Dollars

Year	1998	1999	2000	2001	2002	2003
Total cash inflow . .	2799800.000	2799800.000	2799800.000	2799800.000	2799800.000	2799800.000
Financial resources . .	0.000	0.000	0.000	0.000	0.000	0.000
Sales, net of tax . .	2799800.000	2799800.000	2799800.000	2799800.000	2799800.000	2799800.000
Total cash outflow . .	2378467.000	2378467.000	2378467.000	2378467.000	2389499.000	2389499.000
Total assets	0.000	0.000	0.000	0.000	0.000	0.000
Operating costs	2175890.000	2175890.000	2175890.000	2175890.000	2175890.000	2175890.000
Cost of finance	-0.003	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	202576.500	202576.500	202576.500	202576.500	213608.500	213608.500
Dividends paid	0.000	0.000	0.000	0.000	0.000	0.000
Surplus (deficit) . .	421333.500	421333.500	421333.500	421333.500	410301.500	410301.500
Cumulated cash balance	1223162.000	1644495.000	2065929.000	2487162.000	2897464.000	3307765.000
Inflow, local	2019400.000	2019400.000	2019400.000	2019400.000	2019400.000	2019400.000
Outflow, local	2368167.000	2368167.000	2368167.000	2368167.000	2379199.000	2379199.000
Surplus (deficit) . .	-348766.500	-348766.500	-348766.500	-348766.500	-359798.500	-359798.500
Inflow, foreign	780400.000	780400.000	780400.000	780400.000	780400.000	780400.000
Outflow, foreign	10300.000	10300.000	10300.000	10300.000	10300.000	10300.000
Surplus (deficit) . .	770100.000	770100.000	770100.000	770100.000	770100.000	770100.000
Net cashflow	421333.500	421333.500	421333.500	421333.500	410301.500	410301.500
Cumulated net cashflow	1259636.000	1680969.000	2102303.000	2523637.000	2933938.000	3344240.000

Manufacture of Woodworking Machines --- Date: 4-18-9



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

Cashflow tables, production in US Dollars

Year	2004	2005	2006
Total cash inflow . .	2799800.000	2799800.000	2799800.000
Financial resources .	0.000	0.000	0.000
Sales, net of tax . .	2799800.000	2799800.000	2799800.000
Total cash outflow . .	2389499.000	2389499.000	2389499.000
Total assets	0.000	0.000	0.000
Operating costs . . .	2175890.000	2175890.000	2175890.000
Cost of finance . . .	0.000	0.000	0.000
Repayment	0.000	0.000	0.000
Corporate tax	213608.500	213608.500	213608.500
Dividends paid	0.000	0.000	0.000
Surplus (deficit) .	410301.500	410301.500	410301.500
Cumulated cash balance	3718067.000	4128368.000	4538670.000
Inflow, local	2019400.000	2019400.000	2019400.000
Outflow, local	2379199.000	2379199.000	2379199.000
Surplus (deficit) .	-359798.500	-359798.500	-359798.500
Inflow, foreign	780400.000	780400.000	780400.000
Outflow, foreign . . .	10300.000	10300.000	10300.000
Surplus (deficit) .	770100.000	770100.000	770100.000
Net cashflow	410301.500	410301.500	410301.500
Cumulated net cashflow	3754541.000	4164843.000	4575144.000

Manufacture of Woodworking Machines --- Date: 4-18-



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

Cashflow Discounting:

a) Equity paid versus Net income flow:

Net present value 533737.20 at 20.00 %
Internal Rate of Return (IRRE1) .. 33.91 %

b) Net Worth versus Net cash return:

Net present value 460841.10 at 20.00 %
Internal Rate of Return (IRRE2) .. 30.90 %

c) Internal Rate of Return on total investment:

Net present value 453112.60 at 20.00 %
Internal Rate of Return (IRR) .. 27.72 %

Net Worth = Equity paid plus reserves

Manufacture of Woodworking Machines --- Date: 4-18-90



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

Net Income Statement in US Dollars

Year	1992	1993	1994	1995	1996
Total sales, incl. sales tax	983900.000	1406800.000	2799800.000	2799800.000	2799800.000
Less: variable costs, incl. sales tax.	634500.300	910370.000	1820740.000	1820740.000	1820740.000
Variable margin	349399.700	496430.000	979060.000	979060.000	979060.000
As % of total sales	35.512	35.288	34.969	34.969	34.969
Non-variable costs, incl. depreciation	442274.900	442274.800	453224.800	453224.600	400270.000
Operational margin	-92875.190	54155.190	525835.200	525835.400	578790.000
As % of total sales	-9.439	3.850	18.781	18.781	20.673
Cost of finance	93105.590	93105.590	74484.480	55863.360	37242.240
Gross profit	-185980.800	-38950.380	451350.800	469972.000	541547.800
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	-185980.800	-38950.380	451350.800	469972.000	541547.800
Tax	0.000	0.000	157972.800	164490.200	189541.700
Net profit	-185980.800	-38950.380	293378.000	305481.800	352006.000
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	-185980.800	-38950.380	293378.000	305481.800	352006.000
Accumulated undistributed profit . . .	-185980.800	24931.100	68446.880	373928.700	725934.800
Gross profit, % of total sales	-18.902	-2.769	16.121	16.786	19.342
Net profit, % of total sales	-18.902	-2.769	10.479	10.911	12.573
ROE, Net profit, % of equity	-48.622	-10.183	76.700	79.864	92.027
ROI, Net profit+interest, % of invest.	-9.213	5.254	33.239	32.651	35.172

----- Manufacture of Woodworking Machines --- Date: 4-18-



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

Net Income Statement in US Dollars

Year	1997	1998	1999	2000	2001
Total sales, incl. sales tax	2799800.000	2799800.000	2799800.000	2799800.000	2799800.000
Less: variable costs, incl. sales tax.	1820740.000	1820740.000	1820740.000	1820740.000	1820740.000
Variable margin	979060.000	979060.000	979060.000	979060.000	979060.000
As % of total sales	34.969	34.969	34.969	34.969	34.969
Non-variable costs, incl. depreciation	400270.100	400270.000	400270.000	400270.000	400270.000
Operational margin	578789.900	578790.000	578790.000	578790.000	578790.000
As % of total sales	20.673	20.673	20.673	20.673	20.673
Cost of finance	18621.120	-0.003	0.000	0.000	0.000
Gross profit	560168.800	578790.000	578790.000	578790.000	578790.000
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	560168.800	578790.000	578790.000	578790.000	578790.000
Tax	196059.100	202576.500	202576.500	202576.500	202576.500
Net profit	364109.700	376213.500	376213.500	376213.500	376213.500
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	364109.700	376213.500	376213.500	376213.500	376213.500
Accumulated undistributed profit . . .	1090045.000	1466258.000	1842472.000	2218685.000	2594899.000
Gross profit, % of total sales	20.007	20.673	20.673	20.673	20.673
Net profit, % of total sales	13.005	13.437	13.437	13.437	13.437
ROE, Net profit, % of equity	95.192	98.356	98.356	98.356	98.356
ROI, Net profit+interest, % of invest.	34.583	33.994	33.994	33.994	33.994



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

Net Income Statement in US Dollars

Year	2002	2003	2004	2005	2006
Total sales, incl. sales tax	2799800.000	2799800.000	2799800.000	2799800.000	2799800.000
Less: variable costs, incl. sales tax.	1820740.000	1820740.000	1820740.000	1820740.000	1820740.000
Variable margin	979060.000	979060.000	979060.000	979060.000	979060.000
As % of total sales	34.969	34.969	34.969	34.969	34.969
Non-variable costs, incl. depreciation	368750.000	368750.000	368750.000	368750.000	368750.000
Operational margin	610310.000	610310.000	610310.000	610310.000	610310.000
As % of total sales	21.798	21.798	21.798	21.798	21.798
Cost of finance	0.000	0.000	0.000	0.000	0.000
Gross profit	610310.000	610310.000	610310.000	610310.000	610310.000
Allowances	0.000	0.000	0.000	0.000	0.000
Taxable profit	610310.000	610310.000	610310.000	610310.000	610310.000
Tax	213608.500	213608.500	213608.500	213608.500	213608.500
Net profit	396701.500	396701.500	396701.500	396701.500	396701.500
Dividends paid	0.000	0.000	0.000	0.000	0.000
Undistributed profit	396701.500	396701.500	396701.500	396701.500	396701.500
Accumulated undistributed profit . . .	2991600.000	3388302.000	3785003.000	4181705.000	4578406.000
Gross profit, % of total sales	21.798	21.798	21.798	21.798	21.798
Net profit, % of total sales	14.169	14.169	14.169	14.169	14.169
ROE, Net profit, % of equity	103.713	103.713	103.713	103.713	103.713
ROI, Net profit+interest, % of invest.	35.845	35.845	35.845	35.845	35.845

Manufacture of Woodworking Machines --- Date: 4-18-



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

Projected Balance Sheets, construction in US Dollars

Year	1991
Total assets	956253.000
Fixed assets, net of depreciation	0.000
Construction in progress	956252.800
Current assets	0.000
Cash, bank	0.000
Cash surplus, finance available .	0.250
Loss carried forward	0.000
Loss	0.000
Total liabilities	956253.000
Equity capital	382501.000
Reserves, retained profit	0.000
Profit	0.000
Long and medium term debt	573752.000
Current liabilities	0.000
Bank overdraft, finance required.	0.000
Total debt	573752.000
Equity, % of liabilities	40.000

Manufacture of Woodworking Machines --- Date: 4-18-9



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

Projected Balance Sheets, Production in US Dollars

Year	1992	1993	1994	1995	1996
Total assets	1196749.000	1180464.000	1225612.000	1127580.000	1364835.000
Fixed assets, net of depreciation	858177.900	760103.100	662028.300	563953.500	518833.500
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	138510.900	180775.200	321646.500	321646.500	321646.500
Cash, bank	14079.670	14654.170	17006.250	17006.250	17006.250
Cash surplus, finance available	0.000	0.000	0.000	224973.400	507349.000
Loss carried forward	0.000	165980.800	224931.100	0.000	0.000
Loss	185980.800	38950.380	0.000	0.000	0.000
Total liabilities	1196749.000	1180464.000	1225612.000	1127580.000	1364835.000
Equity capital	382501.000	382501.000	382501.000	382501.000	382501.000
Reserves, retained profit	0.000	0.000	0.000	68446.880	373928.700
Profit	0.000	0.000	293378.000	305481.800	352006.000
Long and medium term debt	573752.000	459001.600	344251.200	229500.800	114750.400
Current liabilities	54164.420	74297.500	141649.200	141649.200	141649.200
Bank overdraft, finance required.	186331.800	264663.500	63832.880	0.000	0.000
Total debt	814248.300	797962.600	549733.300	371149.900	256399.600
Equity, % of liabilities	31.962	32.403	31.209	33.922	29.025

Manufacture of Woodworking Machines --- Date: 4-18-90

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

Projected Balance Sheets, Production in US Dollars

Year	1997	1998	1999	2000	2001
Total assets	1614195.000	1990408.000	2366622.000	2742835.000	3119049.000
Fixed assets, net of depreciation	473713.500	428593.500	383473.500	338353.500	293233.500
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	321646.500	321646.500	321646.500	321646.500	321646.500
Cash, bank	17006.250	17006.250	17006.250	17006.250	17006.250
Cash surplus, finance available	801828.400	1223162.000	1644496.000	2065829.000	2467163.000
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	1614195.000	1990408.000	2366622.000	2742835.000	3119049.000
Equity capital	382501.000	382501.000	382501.000	382501.000	382501.000
Reserves, retained profit	725934.800	1090045.000	1466258.000	1842472.000	2218685.000
Profit	364109.700	376213.500	376213.500	376213.500	376213.500
Long and medium term debt	-0.016	-0.016	-0.016	-0.016	-0.016
Current liabilities	141649.200	141649.200	141649.200	141649.200	141649.200
Bank overdraft, finance required.	0.000	0.000	0.000	0.000	0.000
Total debt	141649.200	141649.200	141649.200	141649.200	141649.200
Equity, % of liabilities	23.696	19.217	16.162	13.945	12.263

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

Projected Balance Sheets, Production in US Dollars

Year	2002	2003	2004	2005	2006
Total assets	3515750.000	3912452.000	4309153.000	4705855.000	5102556.000
Fixed assets, net of depreciation	279633.500	266033.500	252433.500	238833.500	225233.500
Construction in progress	0.000	0.000	0.000	0.000	0.000
Current assets	321646.500	321646.500	321646.500	321646.500	321646.500
Cash, bank	17006.250	17006.250	17006.250	17006.250	17006.250
Cash surplus, finance available .	2897464.000	3307766.000	3718067.000	4126368.000	4538670.000
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	3515750.000	3912452.000	4309153.000	4705855.000	5102556.000
Equity capital	382501.000	382501.000	382501.000	382501.000	382501.000
Reserves, retained profit	2594899.000	2991600.000	3388302.000	3785003.000	4181705.000
Profit	396701.500	396701.500	396701.500	396701.500	396701.500
Long and medium term debt	-0.016	-0.016	-0.016	-0.016	-0.016
Current liabilities	141649.200	141649.200	141649.200	141649.200	141649.200
Bank overdraft, finance required.	0.000	0.000	0.000	0.000	0.000
Total debt	141649.200	141649.200	141649.200	141649.200	141649.200
Equity, % of liabilities	10.880	9.777	8.876	8.128	7.496

Manufacture of Woodworking Machines --- Date: 4-18-90

SENSITIVITY ANALYSES SUMMARY SHEETS



CASE 1

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

Manufacture of Woodworking Machines
Date: 4-18-90
Case - Dec. of Prod. at Full Cap. by 20%

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: US Dollars

Total initial investment during construction phase

fixed assets:	956252.80	37.013 % foreign
current assets:	0.00	0.000 % foreign
total assets:	956252.80	37.013 % foreign

Source of funds during construction phase

equity & grants:	382501.00	30.000 % foreign
foreign loans :	270560.00	
local loans :	303192.00	
total funds :	956253.00	40.294 % foreign

Cashflow from operations

Year:	1	4	8
operating costs:	978700.30	1797078.00	1797078.00
depreciation :	98074.80	98074.80	45120.00
interest :	93105.59	55863.36	0.00
production costs	1169881.00	1951016.00	1842198.00
thereof foreign	6.83 %	3.43 %	2.27 %
total sales :	983900.00	2203840.00	2203840.00
gross income :	-185980.30	252823.90	361642.00
net income :	-185980.80	164335.50	235067.30
cash balance :	-186332.00	147659.90	280187.30
net cashflow :	-93226.38	318273.60	280187.30

Net Present Value at: 20.00 % = 30560.69
Internal Rate of Return: 20.59 %
Return on equity1: 22.83 %
Return on equity2: 21.01 %

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
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CASE 2

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

Manufacture of Woodworking Machines
Date: 4-18-90
Case - Decrease in Selling 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: US Dollars

Total initial investment during construction phase

fixed assets:	956252.80	37.013 % foreign
current assets:	0.00	0.000 % foreign
total assets:	956252.80	37.013 % foreign

Source of funds during construction phase

equity & grants:	382501.00	30.000 % foreign
foreign loans :	270560.00	
local loans :	303192.00	
total funds :	956253.00	40.294 % foreign

Cashflow from operations

Year:	1	4	8
operating costs:	978700.30	2175890.00	2175890.00
depreciation :	98074.80	98074.80	45120.00
interest :	93105.59	55863.36	0.00
production costs	1169881.00	2329828.00	2221010.00
thereof foreign	6.83 %	2.87 %	1.88 %
total sales :	877050.00	2485880.00	2485880.00
gross income :	-292830.80	156052.00	264870.00
net income :	-292830.80	101433.80	172165.50
cash balance :	-293182.00	84758.00	217285.50
net cashflow :	-200076.40	255371.80	217285.50

Net Present Value at: 20.00 % = -380800.00
Internal Rate of Return: 12.98 %
Return on equity1: 11.79 %
Return on equity2: 11.34 %

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



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CASE 3

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

Manufacture of Woodworking Machines
Date: 4-18-90
Case - Production Cost up by 10 per cent

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: US Dollars

Total initial investment during construction phase

fixed assets:	956252.80	37.013 % foreign
current assets:	0.00	0.000 % foreign
total assets:	956252.80	37.013 % foreign

Source of funds during construction phase

equity & grants:	382501.00	30.000 % foreign
foreign loans :	270560.00	
local loans :	303192.00	
total funds :	956253.00	40.294 % foreign

Cashflow from operations

Year:	1	4	8
operating costs:	1076570.00	2393479.00	2393479.00
depreciation :	98074.80	98074.80	45120.00
interest :	93105.59	55863.36	0.00
production costs	1267751.00	2547417.00	2438599.00
thereof foreign	6.38 %	2.67 %	1.76 %
total sales :	983900.00	2799800.00	2799800.00
gross income :	-283850.60	252383.00	361201.00
net income :	-283850.60	164049.00	254780.70
cash balance :	-294044.60	147373.30	279900.80
net cashflow :	-200939.00	317987.00	279900.80

Net Present Value at: 20.00 % = -168512.70
Internal Rate of Return: 17.06 %
Return on equity1: 18.06 %
Return on equity2: 16.40 %

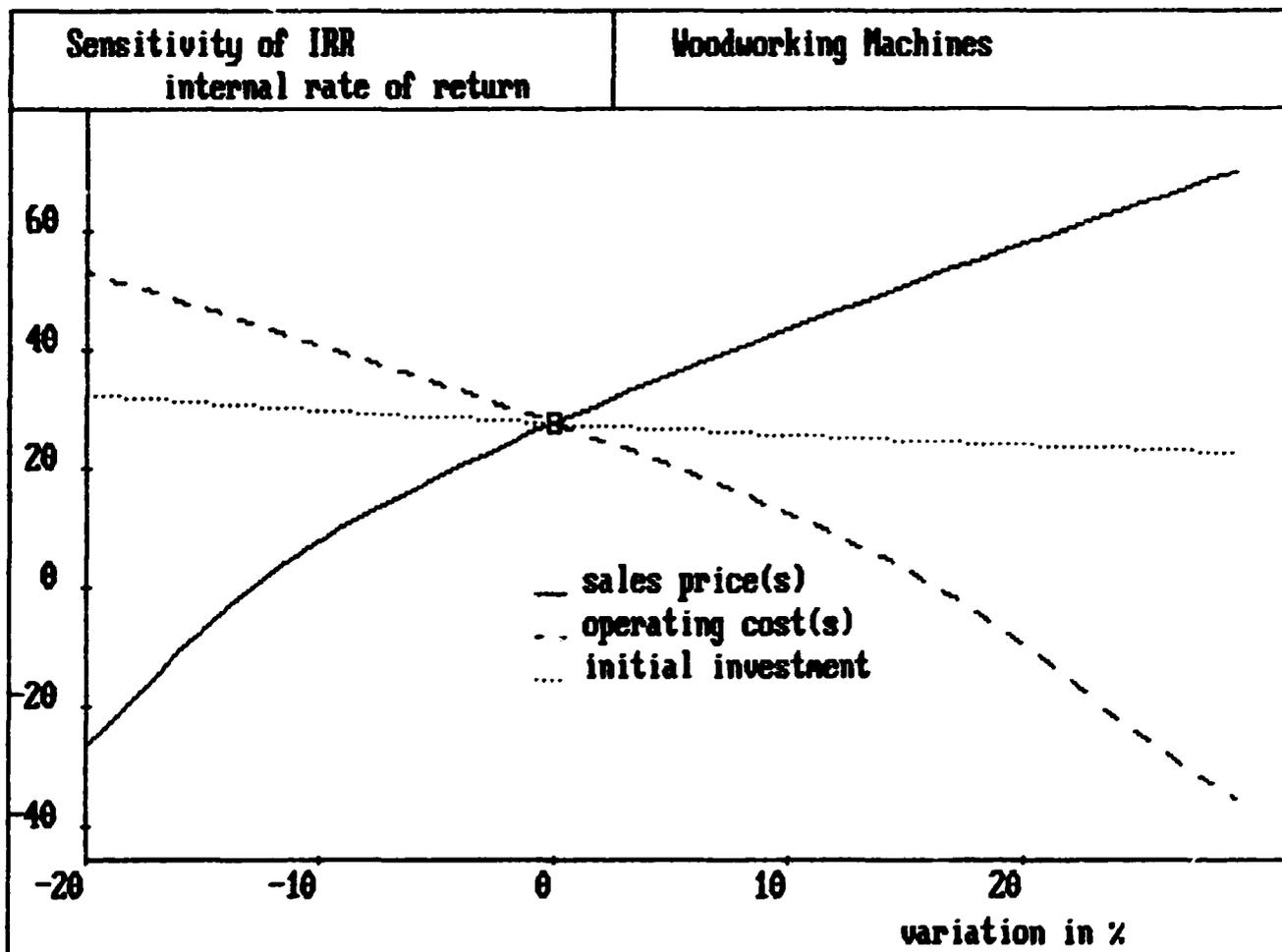
Index of Schedules produced by COMFAR

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



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21 UNIDO

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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 software. The currency used for both local and foreign components is the US dollar.

INCOME STATEMENT

Sales

The schedule of unit sales for woodworking machines from 1992 to 2006 is as follows:

	<u>Domestic</u>	<u>Foreign</u>
<u>Band Saw</u>		
1992	150	80
1993	210	120
1994-2006	360	280
<u>Planer</u>		
1992	160	70
1993	240	90
1994-2006	440	220
<u>Spindle Shaper</u>		
1992	190	40
1993	270	60
1994-2006	510	120

Selling Price

Selling prices for the machines are listed below.

	<u>(in US\$)</u>	
	<u>Domestic</u>	<u>Export</u>
Band Saw	1,280	1,080
Planer	1,560	1,150
Spindle Shaper	1,660	1,500

Variable Cost

o Raw Materials

Annex 2 presents the unit prices of materials used in the manufacture of woodworking machines.

o Utilities

Utilities cost for the plant and office estimated at US\$75,600 on a full capacity. Cost of water is reflected in the report in terms of the power consumption of the water pump.

o Direct labor cost

Sixty-four workers are required for a full capacity operation. A detailed presentation of the labor cost is shown in Annex 7.

FIXED COST

o Repairs and Maintenance

Repairs and maintenance is approximated at three per cent of the value of the plant machinery and auxiliary equipment.

o Spares

Spares is estimated at 2.5 per cent of plant machinery and auxiliary equipment

o Factory Overhead

Factory overhead includes the following:

- a. Indirect labor - Annex 7 presents a breakdown of indirect labor cost
- b. Insurance - one per cent of land, building and machineries
- c. Miscellaneous - approximately US\$2,600.

o Administrative cost

Administrative cost includes the following:

- a. Communications and Office supplies - 75 per cent of the total administrative overhead (25 per cent for office supplies, and 75 per cent for communication)

- b. Repairs and Maintenance - three per cent of incorporated fixed assets
 - c. Insurance - one per cent of incorporated fixed assets
 - d. Miscellaneous - three per cent of total administrative non-labor cost.
- o Indirect Sales and Distribution Cost

Indirect sale and distribution cost includes the following:

- a. Salaries and benefits - Details of labor cost are shown in Annex 7
- b. Commissions - 5 per cent of total sales
- c. Advertising Cost - 3 per cent of total sales.

In total, indirect marketing cost at full capacity sums up to US\$254,200.

o Depreciation

Depreciation of fixed assets were computed following Indonesia's depreciation system. Buildings and immovable assets are depreciated using the straight-line method, while other fixed assets using a double-declining balance. Intangible assets were depreciated in the same way as other fixed assets. Depreciation on the fixed assets are estimated below:

	<u>Estimated Life</u> <u>(in years)</u>	<u>Depreciation</u> <u>Rate</u>
Building	20	5%
Plant Machineries	10	10%
Auxiliary Equipment	10	25%
Incorporated Fixed Assets	5	20%
Preproduction Expenses	5	20%

o Cost of financing

The project financial scheme are based on the following assumptions:

a. Interest rates of loans

Foreign - 12 per cent per annum
Local - 20 per cent per annum

b. Terms of Payment - seven year term with a two-year grace period

o Taxes

Pertinent tax schedules in Indonesia are as follows:

Corporate Income Tax

- 15 per cent on the first Rp.10 million (US\$5,500)
- 25 per cent on the next Rp.40 million (US\$22,000)
- 35 per cent on the amount in excess of Rp.50 million (US\$27,000)

Value added tax rate: 10 per cent

BALANCE SHEET

Cash-in-bank

The minimum cash requirement for the project is equivalent to 15 days cash.

Accounts Receivable

Exports sales are to be paid in terms of letters of credit. On the other hand, machines sold domestically are assumed to be collectible within 30 days.

Other Inventories

Days coverage for the other inventory are as follows:

	<u>Days Coverage</u>
Direct Materials	15
Spares	15
Work-in-Process	1
Finished Products	15

Accounts Payable

Similar to accounts receivable, foreign purchases are to be paid in terms of letters of credit, while local sales are assumed to be payable within 30 days.