ECUADOR AND A BUSINESS OPPORTUNITY

BY

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ABSTRACT

As a result of its recent status as a petroleum exporting country, Ecuador is enjoying an economic boom, which is expected to lead to the formation of new enterprises, the creation of jobs, the utilization of human and natural resources and the encouragement of harmonious development of the national economy.

This thesis is based on the belief that the private sector must assume a decisive role in the adequate implementation of Ecuador's industrial development programs, and it aims to show the feasibility of establishing there an enterprise that would manufacture domestic electric irons.

The coverage of the subject comprises three main sections: 1) It offers a general overview of the current business environment in Ecuador. 2) It explores the history, the present status and the future of the electric iron industry in the United States. 3) It presents the specific enterprise proposal, as well as an evaluation of its feasibility.

Modern methods and techniques of management analysis and design were utilized in the thesis development, and the end result is an enterprise proposal which is quite attractive in its economical and technical perspectives. It will eventually be submitted to a venture capital organization and, conceivably, the required financing for the enterprise will be approved.

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PREFACE

Import substitution is an industrialization strategy that developing countries, like Ecuador, adopt in order to increase the national product and attain favorable balance of payment status. This strategy is applied, along with trade controls and/or high tariffs, to keep down the competition from imports.

The Ecuadorean Industrial Development Center, CENDES, has listed as a promotion project, the manufacturing of domestic electric irons, and as such, it is entitled to a preference treatment by the government in terms of tax exemptions and other incentives.

Presently there is no production of electric irons in Ecuador and its demand is entirely covered by imports. Within the context of the Andean Pact, this appliance, NABANDINA code No. 85.12.04.01, would enjoy an automatic tariff preferential status, and at the same time it would be protected by a minimun external tariff of 90%. It has already been reserved by Ecuador for its eventual manufacturing.

Section One depicts a series of factors, which give the reader a frame of reference to be taken into consideration by potential investors, who are contemplating the possibility of investing in an industrial project in Ecuador. The author

intends this section to give a rather short but comprehensive overview of the country's sociological, political and economical situation, and to arouse investment interest.

Section Two looks at historical and present facts that have led the electric iron industry in the United States to develop and reach a stage in which, the market is already at its saturation level and the technology in a sophisticated degree. It also peers into the future short term projections.

The purpose of this section is to gather information which would help the author to understand better the electric iron business, as an entity in itself, and also as part of the total housewares industry.

The scope of the feasibility study, presented in Section Three, comprises four main areas:

-- Market study,
-- Technical considerations regarding the project's design,
-- Project's economic and financial evaluation, and
-- Project's social evaluation.

The enterprise size and characteristics are determined by the market, the most suitable product processing, and the specific requirements in terms of labor, materials, equipment, and related production costs.

The economic and financial evaluation covers the evolution

of the costs of manufacturing and selling the product throughout a ten-year period, as opposed to the projected volume of sales.

The product subject of the study is a representative model of the electric iron dry-type, which is currently being imported and sold in Ecuador.

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TABLE OF CONTENTS

Page

SECTION ONE

"STUDY OF THE BUSINESS ENVIRONMENT IN ECUADOR"

Page

Page

Page

SECTION TWO

"ASPECTS OF THE ELECTRIC IRON INDUSTRY IN THE UNITED STATES"

CHAPTER TEN.- HISTORY OF THE ELECTRIC IRON INDUSTRY IN THE USA.

CHAPTER ELEVEN.- PRESENT STATUS OT THE ELECTRIC IRON INDUSTRY IN THE USA

Page

CHAPTER FOURTEEN.- THE ENTERPRISE AND THE PRODUCT

CHAPTER FIFTEEN.- THE ENTERPRISE AND THE PROCESS

LIST OF FIGURES

LIST OF TABLES

Page

SECTION ONE

"STUDY OF THE BUSINESS ENVIRONMENT IN ECUADOR"

CHAPTER ONE.- GENERAL INFORMATION

1.1 Geography.

Ecuador, a country named after the Equatorial Line, is located in the northwestern region of South America, between Colombia and Peru. Its total area is 106,000 square miles.

The country has four main geographical regions: Coastal, Andean, Oriental or Amazon Basin, and The Galapagos Islands. Its location on the coast of the Pacific Ocean favors a considerable commercial activity with the rest of the world.

1.2 Population.

Ecuador's population, based on the 1974 census, is estimated to be 7,556,000 inhabitants. Its annual growth rate is 3.4%.

The urban population comprises about 38% of the total. Quito, the capital, and Guayaquil, the principal port, have populations close to one million people each; Cuenca, the third most important city, has about 130,000 people.

The population's ethnic composition is: Mestizos (46%), Caucasians (39%), Indians (10%), and Blacks (5%).[1]

1.3 Climate.

Coastal region: tropical with temperatures moderated by

1 "Image of Ecuador," p. S-2.

the Humbolt Current.

Andean region: mild and dry.

Oriental region: hot and humid.

Galapagos islands: temperate.[2]

1.4 Natural Resources.

A) Land.- Ecuador, with its variety of soils and climates, has the most favorable conditions for the development of all kind of crops. The larger crops are bananas, coffee and cacao. Others increasing in their importance are pyrethrum, mushrooms, abaca, tea and tobacco.

The new Agrarian Reform Law regulates land usage.

B) Fishing.- Ecuador possesses a great fishing wealth, and has developed its fishing industry to a remarkable extent during recent years.

The Law of Fishing and Fishing Development regulates and stimulates the activities of the fishing industry.

C) Mining.- Valuable and varied mining resources are found throughout the Ecuadorean territory. Petroleum is the country's primary mineral, with a production of approximately 200,000 barrels per day. Non-metallic minerals include: gypsum, lime and limestone, clay, coal, sulfur, silica sand, and phosphates.

2 "Image of Ecuador," p. S-2.

Metal ores include: mercury, silver, lead, manganese, iron, gold, and copper.

The Ecuadorean State Petroleum Corporation and the Ministry of Natural Resources and Energy are the highest agencies responsibles for implementing the country's petroleum and mining policies.

D) Forests.- The main forests resources are located on the northwestern area, with an estimated 2.5 million hectares. The government holds a complete inventory of the different species of lumber to be exploited.

E) Tourism.- The rich variety of geographical, cultural, and historical attractions are encouraging the recent development of the Ecuadorean tourism industry. The new Law of Tourism Development created the National Directorate of Tourism, which is responsible for planning and implementing the country's tourist development.[3]

1.5 Language.

Spanish is the official language. Various dialects of Quechua are also spoken throughout the indian communities.

1.6 Education.

Ecuador has a relatively high level literacy rate, 70%. Table 1 depicts the distribution of educational centers and

3 "Invest in Ecuador," p. 28.

their attendance as of 1977.[4]

TABLE 1

EDUCATIONAL STATUS

	Number of Centers	Number of Students
Elementary schools	9,871	1,318,474
Secondary schools	1,151	431,315
Universities	17	187,971

1.7 Religion.

There is complete freedom of worship in Ecuador; however, the Catholic religion is, by far, predominant (90%).

4 "Cifras para Pensar," p. 55.

CHAPTER TWO.- POLITICAL FACTORS

2.1 Government.

Ecuador is presently governed by a three-party Military Junta composed of the chief commanders of the Army, Navy and Air Force.

The government is composed of three main powers: Executive, Legislative, and Judicial.

The principal organs designed to assist the Central government are the Cabinet of Ministers, The National Planning Board, and the National Security Council. The National Planning Board, known also as the Ecuadorean National Board of Planning and Economic Coordination, advises the government on trade and financial policy, and also submits programs for improvement in agriculture, fishing, manufacturing, transportation, communications, infrastructure, and public administration.

For administrative purposes the country is divided into twenty provinces. Provinces are subdivided into cantons or municipalities, and these in turn, into parishes.

Each province has a provincial Council whose duties include ensuring that public services are maintained, accomplishing necessary public works, coordinating the activities of the municipalities within the province, and informing the

Central government of budget expenditures.

Each canton constitutes a municipality whose government is entrusted to a Council, which is responsible for plans for the improvement of welfare within the canton.[5]

2.2 Political Climate.

The military government has announced its intention to return to the Constitutional regimen. There is not a definite date yet, for the election of President of the Republic, but it is expected that it will take place during 1978.

The first phase of the plan of "Constitutional Restructuration" was completed in March, 1977, when the seven member "Supreme Tribunal of Referendum" was appointed. This tribunal is an electorate board which will supervise the Constitutional Referendum and the presidential election by popular vote.[6]

5 Weil and others, "Area Handbook for Ecuador," p. 183.
6 "Plan de Retorno," p. 1.

CHAPTER THREE.- ECONOMIC FACTORS

3.1 Economic Structure.

The Ecuadorean economy, like other Latin American countries, depends largely on its foreign trade. Petroleum is its main product of exportation.

Prior to the start of large scale petroleum operations, the country has been exporting almost exclusively such farm products as bananas-of which it is the world's leading exporter-coffee and cacao. In this way it secures about 80% of the foreign exchange needed to supply the raw materials, manufactures and capital goods required for the development of its economy.

It can be assumed that the impact of the extractive industry in Ecuador will profoundly alter the country's economic structure. Its status as a developing country with its unexploited opportunities constitute a promising invitation to all economic activities.

It should be noted that the stability of the Ecuadorean economy is unparalleled in South America, where most of the countries have been affected by heavy inflationary pressures.[7]

3.2 Economic Growth.

Ecuador has accomplished an impressive Gross Domestic

7 "Image of Ecuador," p. S-22.

Product increase, as well as a real growth of GDP, during the past four years, as shown in table 2.[8]

TABLE 2

ECONOMIC GROWTH

GDP (Market Prices)	1973	1974	1975	1976[p]	Change 75-76
GDP at current prices (M$)	2,530	3,660	4,305	5,053	17%
-- Per Capita ($)	383	536	610	692	13%
GDP at constant 1970 prices (M$)	1,797	2,041	2,148	2,272	6%
Real Growth of GDP	18%	14%	5%	6%	
-- Petroleum sector	180%	- 5%	- 10%	21%	
-- Agriculture, forestry, fishing sectors	4%	11%	7%	6%	
-- Manufacturing sector	8%	12%	14%	- 5%	

M = Million; $ = U.S. dollars; p = provisional.

3.3 Government in Industry.

With the exception of petroleum, the government considers industry to be within the sphere of private enterprise and the governmental role limited to maintaining a favorable investment climate and providing infrastructure facilities.

The principal agencies responsible for industrial development are: The National Planning Board, The Ministry of

8 "Foreign Economic Trends and their Implications for the United States," p. 2.

Industry, Commerce and Integration, and the National Development Center.[9]

Most of the industrial enterprises are now concentrated in Quito and Guayaquil, but in recent years the government has encouraged and implemented a comprehensive policy of industrial decentralization.

3.4 Industrial Production.

The contribution of the different sectors of the economy to the Ecuadorean Gross Domestic Product in 1973 and 1976 is depicted on table 3.[10]

TABLE 3

ECONOMIC SECTORS AND THE GDP

	1973	1976
Agriculture, forestry and fishing	20%	20%
Manufacturing	15%	16%
Commerce	12%	NA
Construction	5%	NA
Transportation and communications	6%	NA
Government	15%	NA
Mining and minerals	7%	15%
Others	20%	NA

NA Not Available.

9 Weil and others, p. 263.
10 "Marketing in Ecuador," p. 2.

From the preceding table it can be seen that the mining-minerals sector achieved a considerable growth, which is mainly due to the oil exploitation.

Manufacturing, although still an infant sector, has kept signs of growth and constitutes an important sector of the economy. It is concentrated in areas of consumer goods based on Ecuador's raw materials, which led to the establishment of sugar and food processing facilities, breweries, textile mills, cigarette and tobacco factories, and leather and cement factories. In most recent years other type of industries have joined the manufacturing sector: plastics, non-metallic minerals, home appliances, basic metals, light engineering, chemicals, timber and paper industries, and petroleum refining.

It should be mentioned also, that despite the strides made in factory manufacturing, handicraft-artisan activities still account for about one-third of manufacturing output.[11]

3.5 Foreign Trade.

A) Imports.- In 1975 licenses of import were granted for a value of US$ 943.3 million, and in 1976 for US$ 993.2 million. The major supplier is the United States with approximately 32.5%. Other suppliers include: West Germany 11.7%, Japan 10.9%, Colombia 4.9%, United Kingdom 4.8%.

11 "Marketing in Ecuador," p. 6.

The major imports are chemicals, industrial machinery, motor vehicles and parts, petroleum products, kraft paper and paperboard.

B) Exports.- In 1975 licenses of export were granted for a value of US$ 897.1 million, and in 1976 for US$ 1,127.3 million. The countries of destination included: United States 34.7%, West Germany 6.6%, Peru 6.2%, Japan 5.1%, Chile 3.6%.

The major products of export are petroleum, bananas, cocoa beans, coffee, and sugar.

C) Trade Policy.- Ecuador aims at an expansion of its exports, and its present condition favors expansion of imports as well. Ecuador is member of the Latin American Free Trade Association (LAFTA) and the Andean Common Market. It has been granted a tariff preferential status by other Andean and LAFTA member nations.[12]

3.6 The Andean Pact.

The member countries of the Andean Pact, also known as Andean Common Market, are Venezuela, Colombia, Ecuador, Peru, and Bolivia.

The Andean Pact was originated in May 1969, with the signing of the Cartagena Agreement, which is an international instrument that pursues the following objectives:

12 "Marketing in Ecuador," p. 2.

-- To promote a well-balanced and harmonious development of the member countries.

-- To speed up their growth through economic integration.

-- To facilitate their participation in the integration process contemplated in the Montevideo Treaty (LAFTA).

-- To establish favorable conditions for conversion of the LAFTA into a common market.

The ultimate goal is to achieve a persistent improvement in the standard of living of the population of the sub-region.

The Andean Pact has meant to Ecuador a perspective of modification in the economic structure, for it offers a market of 60 million people as opposed to the traditional narrowness of consumption of Ecuador's internal market.[13]

13 "Invest in Ecuador," p. 7.

CHAPTER FOUR.- INVESTMENT FACTORS

4.1 Investment Climate.

Ecuador is basing its development in its own efforts, however, it is supplementing them with foreign cooperation, properly guaranteed in its legitimate desire for economic benefits.

Industry represents a dynamic sector of the national economy, and companies are taking advantage of the incentives offered by the Industrial Development Law.

Specific legislation enacted by the Ecuadorean government for development, benefits the investment of foreign capital and insures fair profits for them. Moreover, a climate of political peace and a sound currency, recognized as such by the International Monetary Fund, provides security which foreign investment desires.

4.2 Government Incentives Toward Investment.

Government incentives are available to both foreign and domestic investors under the Industrial Development Law, in the form of tax and import duty reductions and exemptions for a large number of product categories and projects classified as Special, Category A, Category B, and Registered. The industrial companies are assigned by a government committee to their respective categories in accordance with their contribution to

the national economy.

-- Special category: those which refer to new high priority projects for the economic development of the country and included in the annual list prepared by the National Planning Board.

-- Category A: those exporting 50% or more of their production, which manufacture articles which are used in productive processes, which replace imported commodities, and which are included in the proper annual list.

-- Category B: those which are considered necessary for the national economic development.

-- Registered: those industrial companies which are not classified under the above categories.

4.3 Andean Foreign Investment Code.

The Andean Pact's Decision 24 legislates, through a common system for the Andean countries, on the treatment of foreign investments, trademarks, patents, licenses and royalties.

The foreign investor is given a set of rules governing his rights and duties which determine the terms and conditions for his participation. It presents a framework for negotiation which is strong and equitable for both the foreign investor and the government receiving the investment.

Foreign capitals have the juridical support of the government for investment, since all risks of expropriation have been removed and they are, on the contrary, guaranteed as regards a full right to ownership and control of investment, such as exportation of capital and profits, transfer of shares, etc.[14]

14 "Invest in Ecuador," p. 40.

CHAPTER FIVE.- MARKETING FACTORS

5.1 Nature of the Market.

Ecuador lives in an economic period which makes it possible to offer to the world excellent opportunities for investment in highly profitable industrial sectors, both in agroindustrial lines and ventures requiring complex technology or large capital which the country is lacking.

New prospects have opened up for an economic take-off, increased production and a greater capacity for consumption, as a result of its current status as a petroleum producing and exporting country.

The Ecuadorean market is one of the fastest growing markets in Latin America. Table 4 shows the growth of the market in terms of imports and exports for the past five years.[15]

TABLE 4

ECUADOR - COMMERCIAL BALANCE
(Values in thousands of dollars)

Year	Exports	Imports	Balance
1972	362,292	318,599	7,693
1973	532,048	397,282	134,766
1974	1,050,338	958,492	91,846
1975	897,055	943,249	- 46,194
1976	1,127,331	993,230	134,101

15 "Ecuador Balanza Comercial," p. 3.

A continued growth potential is apparent because of the large number of development projects to be undertaken and the accelerated pace of overall economic activities expected in coming years, assuming favorable levels of petroleum output and export prices. Moreover, as a member of the Andean Pact, Ecuador has assured perspectives of an expanded market for its industrial production. The Andean Pact's present population of 60 million people is expected to double in 25 years.[16]

5.2 Division of the Market.

In the Ecuadorean booming market demand is strong for most types of goods. However, the immediate needs are for design, engineering, construction and financial services.

The following prospects are the best in terms of current Ecuadorean imports aimed to impulse the country's development:

-- Agricultural machinery and equipment.- In its effort to foster agricultural growth, the government has allocated considerable funds for importing agricultural machinery. Ecuadorean agencies of the government constitute the principal purchasers in this area.

-- Food processing and packaging equipment.- Most buyer interest is for meat, fish, fruit and vegetable processing and canning equipment. Sugar refiners and cocoa processors are also potential buyers.

16 "Invest in Ecuador," p. 2.

-- Electrical generating and switching equipment.- The Ecuadorean government has given electrification a high priority status. It intends to expand electrical power and transmission facilities substantially during the next decade. There is emphasis on hydroelectrical projects to form a national interconnected system.

-- Construction equipment.- Highway construction is given considerable attention by the government and most of the equipment needed for it must be imported. Building construction is booming too, thus representing another attractive market.

-- Communications systems and equipment.

-- Business equipment and systems.- Computers and related electronic equipment.

-- Chemical processing equipment.- The construction of the oil refinery in Ecuador is leading to the establishment of a petrochemical industry of considerable importance.[17]

5.3 Market Research and Advertisement.

The market research function is developing in Ecuador. Among the most important agencies that engage in market research are: Instituto Ecuatoriano de Opinion Publica, Organizaciones NORLOP, Agencia CIESPAL, and CENDES. Banks are another source of market information.

The advertisement market and media are concentrated in Quito

17 "Marketing in Ecuador," p. 6.

and Guayaquil. The principal advertising agencies are: McCarm Erickson Corporation (Guayaquil, Quito), Publicidad UNO (Quito), Marcel Rivas y Asociados (Quito), Publicistas Sudamericanos (Guayaquil), Organizaciones NORLOP (Quito, Guayaquil), and Corporacion Publicitaria (Quito).

The principal advertisement media is newspapers. The two major newspapers with nation-wide circulation are El Universo (Guayaquil), and El Comercio (Quito). Other important newspapers are El Tiempo (Quito), El Telegrafo (Guayaquil), and El Mercurio (Cuenca). Combined total daily circulation is about 300,000.

Television is the second most important advertising mean. There are 16 channels serving an estimated 250,000 sets. The four largest channels have nation-wide coverage.

There are 264 radio stations in the country broadcasting to about 3,500,000 listeners.

There are three major national magazines: Vistazo, Estadio, and Hogar, with a combined total circulation of about 110,000 per month.

Finally, movie theaters are also an important means of advertisement. There are 220 movie theaters with a total seating capacity of 150,000.

5.4 Distribution Practices.

Quito and Guayaquil are the two main distribution centers for most imported products, as well as for local products, which are then distributed to other cities.

In terms of import channels, the goods are distributed or sold through the following: import houses, commission or independent agents, subsidiaries of foreign firms, and direct imports including government agencies.[18]

Wholesalers are in most cases also retailers.

5.5 Transportation and Utilities.

Ecuador is served by four important ports and nine minor ones. The largest is Guayaquil, which handles 90% of the imports and 65% of the exports.

There are two international airports, one in Quito and the other in Guayaquil. Internal air transportation is provided by TAME, SAN, SAETA and AEESA. All important cities in the country are served, and rates are inexpensive.

High ways are the principal means of transportation in Ecuador. There are about 14,000 miles of roads, which connect all major ports and towns. Ecuador also has a small railroad system.

Gasoline is very cheap, costing about 20 cents per gallon.

18 "Marketing in Ecuador," p. 12.

Diesel fuel costs about 15 US. cents per gallon.

Electricity costs between 2 - 4 US. cents per kwt.hr. Bottled gas costs about 25 US. cents per kilogram.[19]

19 "Marketing in Ecuador," p. 15.

CHAPTER SIX.- LABOR FACTORS

6.1 Labor Force and Productivity.

The estimate is that there are about 2 million economically active persons in Ecuador. The distribution among the most important sectors is: 56% in agriculture, 13% in manufacturing industries, 17% in services. About 1.5 million people are affected by unemployment and marginal employment.

It must be noted that in terms of labor, fundamentally two economies coexist in the country: the coast and the sierra. The first is oriented toward external market, and therefore has greater productivity per person employed and broad prospects for further expansion. The sierra economy is characterized by a comparative shortage of suitable farmland and by an abundant supply of cheap labor.[20]

6.2 Wage Structure.

By law, the minimum monthly salary is 60 dollars plus 10 dollars a month of compensation for the increase in cost of living. This compensation is paid to the employee who has a monthly salary of between 60 and 200 dollars. Employees with monthly salaries above 200 dollars are not entitled to the compensation.

The Ministry of Welfare and Labor has an agency in charge

20 "Image of Ecuador," p. S-22.

of determining, along with the representatives of employees and employers, the minimum salaries for semiskilled and skilled workers in specific areas of production.

Generally the employee starts out with the legal basic salary that lasts for a trial period of three months, after which a final working contract is signed and the salary is steadily increased according to the employee's skill and experience.[21]

6.3 Working Conditions.

The number of working hours per week is 40, with 8 hours per shift.

There are 11 legal holidays per year. Each employee is entitled to a 15 days vacation period per year. After completion of 5 years working for a company, the employee receives an additional 1 day off per year up to a maximum total of 30 days.

There are additional rates to the employee's favor when working overtime, between the hours from 7 p.m. to 6 a.m., and on holidays.

The Ecuadorean Institute of Social Security is in charge of enforcing the employer's compliance with all labor laws.

21 "Datos Basicos para Inversiones Industriales en el Ecuador," p. IV-35.

6.4 Employee Benefits.

The law stipulates the following fringe benefits for the workers:

-- The employers or firms must distribute among workers 15% of net profit annually.

-- Workers also receive "thirteenth" month (in December), "fourteenth" month (in April or September), and"fifteenth" month (prorrated throughout the year) salaries during the year.

-- There are supplemental benefits such as Social Security contributions and severance indemnities.

It is estimated that fringe costs may amount to about 50% of the payroll.[22]

6.5 Labor and Trade Unions.

Workers are entitled to establish labor unions, which must be legally acknowledged by the government.

The most important labor unions in Ecuador are: The Ecuadorean Confederation of Workers (CTE), The Ecuadorean Confederation of Labor Unions (CEDOC), and The Ecuadorean Confederation of Free Labor Unions (CEOSL).

Employer's organizations include the Chamber of Commerce, the Chamber of Industry, and the Chamber of Agriculture, with their respective provincial branches. There are also Trade

22 "Marketing in Factor," p. 20.

Associations for several industrial areas like textiles, food, oil, etc.

6.6 Industrial Disputes.

The Ministry of Labor and Welfare has several agencies and Arbitration Tribunals in charge of preventing and solving individual and collective grievances, as well as orienting the proper utilization of the labor force.

The Judicial system, in turn, has specific labor courts, which decide the outcome of any labor dispute.[23]

23 "Datos Basicos para Inversiones Industriales en el Ecuador," p. IV-52.

CHAPTER SEVEN.- FINANCIAL FACTORS

7.1 Currency and Money Supply.

The monetary unit is the SUCRE (s/.), which is divided into 100 CENTAVOS (cents). The official market exchange rate to the dollar is s/. 25.00 for buying and s/. 25.25 for selling transactions.[24]

The Central Bank of Ecuador, with headquarters in Quito and 11 branch offices in the country, has the basic function of conducting the national monetary, credit and foreign exchange policies. It manages the mechanism of Financial Funds, established for the purpose of channeling the national and foreign resources through the country's banking and financial systems, and intended for livestock-farming and industrial programs, and others which are directly productive.

7.2 Banking System.

The Ecuadorean banking system consists of four types of agencies: The Central Bank, private banks, development banks, and the Housing bank.

There are 22 private banks, of which four are foreign banks, i.e. Hollandsche Bank-Unie, The Bank of London and South America, The Citybank, and the Bank of America.

24 "Image of Ecuador," p. S-23.

The National Development Bank with headquarters in Quito and 50 branch offices in the nation, has the main purpose of encouraging the development of livestock-farming production and the country's small industries and handicrafts.

The Ecuadorean Housing Bank implements programs intended to solve urban and rural housing. This work is supplemented by the operation of 11 Savings and Loans Associations located throughout the country.[25]

7.3 Finance Corporations.

The Ecuadorean government has encouraged the establishment of financial corporations, both public and private, in order to assist the work of the banking system and channel capital toward productive activities, particularly in the industrial field.

The most important financial corporation is the Securities Commission-National Finance Corporation (CV-CFN) which is responsible for extending the loans required for promoting the industrial sector, in terms of investment for medium and large sized companies, as well as the promotion of exports. There is also the National Financial Corporation (COFIEC), which engages in extending loans to those productive sectors which require them.[26]

25 "Invest in Ecuador," p. 36.
26 Ibid.

7.4 Stock and Security Exchanges.

The Ecuadorean Stock Exchange has one office in Quito and another in Guayaquil.

It is responsible for a rational marketing of securities and similar negotiable instruments.

7.5 Credit Facilities.

A) Consumer Credit.- It has increased several fold since 1972, because of its recognition as a mean to increase sales. However, it still is limited and expensive.

Interest rates range from 14 to 20%. Down payment of 15 to 20% is required for almost all items. Credit cards of internationally known companies are used widely.

B) Commercial Credit.- It is available for periods of 90, 120 and 180 days by commercial banks. Repayment of half the loan offers the opportunity to renew it for the original period. Interest rates are from 16 to 18%.

C) Industrial Credit.- For the acquisition of equipment, it is available for periods between 5 and 10 years, and a maximum of 3 years grace period. Interest ranges from 6 to 12%. For working capital and raw materials, credit may be extended up to 5 years with similar interest rates.

D) Agricultural Credit.- Agricultural loans for cattle and farming equipment are available up to 9 years at 10%, with a

3-year grace period.

For short cycle crops, credit is offered for up to 18 months at 9% interest.[27]

27 "Marketing in Ecuador," p. 16.

CHAPTER EIGHT.- TAXATION

8.1 Income Tax System.

The Income Tax Law states that there are two main categories of income tax contributions: Individual income taxes and Corporate taxes. At the same time, general taxes are classified as direct or indirect types.

Direct taxes are levied on income, property, and property transfer. Indirect taxes are levied on external commerce, financial transactions, production and sales, stamp tax, and others.

The Ministry of Finance is the top agency in charge of collecting and administering the income tax system.[28]

8.2 Individual Income Taxes.

Individuals are subject to two types of taxes, the proportional tax and the progressive tax. The first one is a tax levied at various rates, depending on the nature of an individual source of income. Income derived from employee or professional services, is taxed at the rate of 6% of the excess over US$ 4,800 of the net taxable income. Income from earnings derived from activities in which capital is one of the factors is subject to a tax of 6% on net taxable income. Such activities include partnerships and sole proprietorships. On

28 "Datos Basicos para Inversiones Industriales en el Ecuador," p. VIII-2.

income from exclusively capital sources, the tax is 18%, as on stock dividends, interests, rents or rural and mining properties, royalties on patents, trademarks, etc.

The progressive tax is a graduated tax on the aggregate income of individuals. The rates are shown on table 5.[29]

TABLE 5

INDIVIDUAL PROGRESSIVE TAX RATES

Income (sucres)		Tax Rate	
From	To	Percent	Accumulated Tax
----	10,000	10	1,000
10,000	20,000	14	2,400
20,000	50,000	18	7,800
50,000	100,000	22	18,800
100,000	150,000	26	31,800
150,000	200,000	30	46,800
200,000	500,000	34	148,800
500,000	1,000,000	38	338,800
1,000,000	2,000,000	42	758,800
2,000,000	3,000,000	46	1,218,000
3,000,000	more	50	- - -

8.3 Corporate Income Tax.

Corporations established in Ecuador pay a basic tax of 20%

29 "Marketing in Ecuador," p. 19.

on undistributed profits whether or not the shareholders are foreign or local citizens. Profits paid out to local shareholders are taxable at 20%, while profits payable as dividends to shareholders abroad would be taxable at 40%. In the case of a corporation having retained earnings and paying 20% tax, the tax on dividends sent abroad would amount to another 20% for a maximum total of 40%. The 40% tax is also applicable to interests, royalties and other benefits remitted abroad from Ecuadorean sources.

In addition to the basic rate, there is an 11% surtax which is applied to the basic rate (11% of 20% or 11% of 40%, as applicable), except in the provinces of Guayas and Manabi where the surtax is 8%. The foregoing applies to nominative shares; in the case of bearer shares, dividends are taxed at a rate of 45% to foreign shareholders.[30]

8.4 Tax Incentives and Exemptions.

Ecuador has different laws aimed to promote industrial, agricultural and tourism activities. Such laws state a series of tax incentives and exemptions, which will hopefully lead to a harmonious increasing of investment activities.

The tax incentives and exemptions related with the industrial sector are described in the next chapter.

30 "Marketing in Ecuador," p. 19.

CHAPTER NINE.- INDUSTRIAL POLICY

l Industrial Development Programs.

The country's overall economic development objectives are ated in a 5 years development plan known as "PLAN INTEGRAL TRANSFORMACION Y DESARROLLO, 1973 - 1977". This plan, in sence, calls for manufacturing capacity to increase by 39% ring this period, at an annual rate of 9.9%.

Industrial development includes consumer goods for the ıadorean market as well as for the markets of surrounding lean countries, where Ecuadorean goods are supposed to be ven virtually tariff-free treatment under the Andean Pact. ıador also plans to produce efficiently mass consumption ems which are essentially, at the present, being imported, pecially in areas like food, chemical products, petroleum rivatives, and wood, where it considers itself to have a les advantage.

Table 6 shows major industrial projects by categories, as ll as related statistical projections.[31]

2 Industrial Development Policy.

The Ecuadorean government has created a comprehensive gal and institutional background with the purpose of carrying t and supporting a sound industrial development policy.

9.2.1 Legal Background.- In order to elaborate this point

[31] "Marketing in Ecuador," p. 7.

TABLE 6

INDUSTRIAL AREAS OF CONCENTRATION, 1972-1977
Projected Gross Value of Production to 1977
(Millions of U.S. Dollars)

Industry	Expanded Domestic Market	Import Substitution	Exports	Gross Value of Production in 1977	Rate of Increase 1972-1977 (percent)	Required Investment (Millions of U. S. Dollars)
Food	205.8	12.2	38.0	255.9	8.6	48.9
Wood products	9.9	.1	7.9	18.0	12.4	9.8
Paper and Cardboard	35.0	11.3	.8	47.2	14.5	20.7
Rubber	9.9	2.4	.2	12.6	12.4	3.8
Chemicals	38.8	27.5	15.1	81.4	23.1	100.0
Petroleum der/.	38.6	1.3	8.0	47.9	12.5	50.0
Base Metals	11.7	19.2	.3	31.3	30.4	53.4
Nonelectrical machinery	.2	9.8	1.5	11.6	120.0	6.0
Electrical machinery	16.8	10.7	2.5	30.1	12.4	17.0
Material for transport ind/.	5.7	3.8	.5	10.1	32.2	15.3

it becomes necessary to note the distinction between the peripheral legislation and the legislation that covers directly the development of the industrial, production and investment sectors.

The peripheral legislation includes:

1.- Law of Companies, which regulates the establishment and behavior of business corporations in general.

2.- Law of Tariffs, which controls the country's import-export flow.

3.- Law of International Exchange, which regulates monetary exchanges.

4.- Labor Code and Labor Law, which regulates the employer-employee relations.

5.- Income Tax Law, which controls taxation of all economic units.

The direct legislation includes:

1.- Industrial Development Law, which regulates and creates incentives for the establishment of industrial enterprises. Table 7 shows the benefits and incentives contemplated by this law.[32]

2.- Law on Development of Small Industries and Handicrafts, which determines benefits and incentives for the establishmen of small industrial enterprises and artisan shops.

32 "Datos Basicos para Inversiones Industriales en el Ecuador," p. III-10

3.- Law of Tourism Development.

4.- Law of Fishing Development.

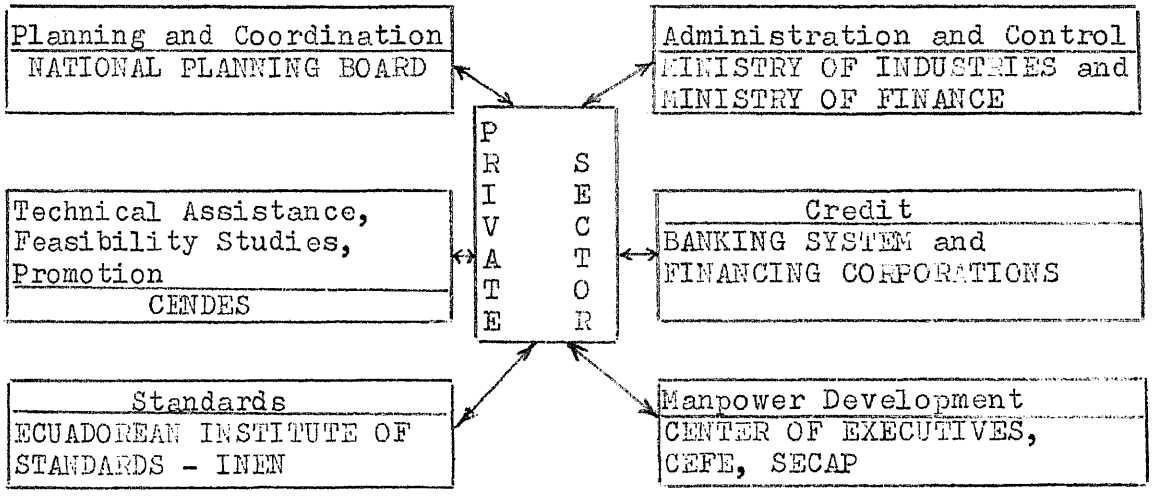
5.- Law of Mining Development.

6.- Law of Agriculture and Forestry Development.

9.2.2 Institutional Background.- The Ecuadorean Institutional Background, which supports the country's industrial development, can best be depicted in figure 1.[33]

FIGURE 1

INSTITUTIONAL BACKGROUND



33 "Datos Basicos para Inversiones Industriales en el Ecuador," p. I-24.

TABLE 7

BENEFITS UNDER THE INDUSTRIAL PROMOTION LAW

Benefits	CATEGORIES Special			A			B		
	[1]	Zone 1[2]	Zone 2[3]	[1]	Zone 1[2]	Zone 2[3]	[1]	Zone 1[2]	Zone 2[3]
Exemption from taxes in general (except income & sales taxes	100% first 5 yrs.	100% first 10 yrs.	100% first 10 yrs.	—	100% first 5 yrs.	100% first 5 yrs.	—	100% first 3 yrs.	100% first 3 yrs.
Duty-free importation of new machinery, new accessory equipment and new parts	100%	100%	100%	100%	100%	100%	100%	100%	100%
Duty-free importation of raw materials (which are not produced in Ecuador)	80% first 5 yrs. to 70% starting 6th yr.	90% first 5 yrs. to 80% starting 6th yr.	100% first 5 yrs. to 90% starting 6th yr.	to 65%	to 75%	to 85%	to 40% in special cases	10% (in special cases, up to 50%)	20% (in special cases, up to 60%)
Exemption from property transfer taxes	100%	100%	100%	100%	100%	100%	—	50%	75%
Income tax deductions for initial/new investments for:									
a) Fixed Capital	50%	75%	100%	50%	75%	100%	50%	75%	100%
b) Capital Contributions	—	50%	100%	—	50%	100%	—	50%	100%

[1] General benefits under the Industrial Promotion Law
[2] Zone 1 includes Imbabura, Cotopaxi, Tungurahua, Chimborazo, Azuay (Cuenca), Esmeraldas, Manabi and El Oro Provinces.
[3] Zone 2 includes all other provinces except Pichincha (Quito), Guayas (Guayaquil) and Galapagos provinces

SECTION TWO

"ASPECTS OF THE ELECTRIC IRON INDUSTRY IN THE UNITED STATES"

CHAPTER TEN.- HISTORY OF THE ELECTRIC IRON INDUSTRY IN THE USA

10.1 General Background.

The history of the housewares industry in the United States reflects in itself the story of the country's ever growing standard of living. As the industry made and merchandised more and more time and labor saving products for everyday family living in and around home, it fulfilled the needs of a buying public ever less dependent on its own labor, and increasingly desirous of leisure time and creature comforts.

In this case, history develops around electric power that brought along an overwhelming array of electrical housewares which perform countless functions and have become the servants of man, providing personal care to a degree no one ever imagined in the past.

10.2 Industry Formation.

Ironing has long been one of mankind's minor but tiresome burdens. Through the ages, historians and anthropologists agree there has been an urge to make woven fabrics more attractive and more usable by removing wrinkles caused by use and washing.

The first known sale of an electric iron was made in 1896 by The Ward Leonard Company, located in Wisconsin. Details are scant, but it is known that the first electrically heated flat

iron was made with replaceable heating units, probably because iron, which was the only metal available at that time for heating elements, had a very short life.[34]

10.3 Industry Organization.

The initial afforts to market household irons were concentrated in convincing the electric power companies to sell the irons-current consuming items-as load devices. As a matter of fact, the organization of the electric iron industry as well as the whole electric appliances business was seriously handicapped by the fact that electric power companies thought of electricity only in terms of lighting.

Electric irons were promoted by house-to-house sales crews. Free trial merchandising plans and easy time-payment plans were widely used during the initial period.

It was not until 1912 that the utility companies started to place large orders for electric irons, thus launching an important industry.[35]

10.4 Industry Development.

A) Growth Patterns.- Table 8 depicts the pattern of growth for the electric iron in terms of units, sales and retail price.[36]

34 Lifshey, "The Housewares Story", p. 228.
35 Ibid, p. 230.
36 Ibid.

TABLE 8

ELECTRIC IRON INDUSTRY GROWTH

Year	Units	Sales Volume US$.	Price US$.
1922	3,300,000	20,000,000	6
1930	2,362,500	10,867,000	5
1940	5,171,000	18,853,500	4
1950	7,475,000	101,188,500	14
1960	6,410,000	91,678,000	14
1970	9,275,000	159,210,000	17

B) Major Events Related to the Industry.-

1882.- First electric iron patent No. 250054 issued to H. W. Seely of New York.

1909.- First iron with fusible over-temperature device on an iron used by Hotpoint.

1924.- First automatic iron (non-adjustable) featuring the Klixon disc thermostat, introduced by Westinghouse.

1939.- First steam iron to get Underwriters' Laboratories approval, the "Steam-O-Matic", introduced by Steam-O-Matic Corporation of Milwakee.

1953.- First steam travel iron introduced by General Electric.

1961.- First steam and dry iron with a single control for temperature and steam, introduced by Westinghouse.

1972.- First self-cleaning steam/spray and dry iron, introduced by General Electric.[37]

37 Lifshey, "The Housewares Story, p. 238.

10.5 Public Factors.

A) Public Acceptance.- There is virtually no task inside, outside, or anywhere else around the home for which someone, somewhere, in the long history of the housewares industry, has not developed a device of some sort by which, the task in question is made less painful or even a pleasure.

In terms of ironing, history tells that wrinkles have been a pressing problem ever since the ancient greeks first devised a crimping iron to pleat their linen robes. Today, even with permanent-press and new fabric finishes, wrinkles still happen, and irons are still essential. Having an electric iron in every household is indeed a must; it is a hard working appliance used by everyone.

B) Growth Factors.- The two largest factors responsible for the growth of the domestic iron industry are the advent of electric power and the merchandising concept.

Since 1880, that dazzling new wonder, electricity, has been stimulating the inventive ingenuity of men all over the world. As electric power became widely understood and many power companies entered the field, the electric iron gained a vast household market.

Parallel to the development of electric power, appliances for helping everyday domestic chores proliferated. To support

and induce these developments, there was present the modern concept of mass production, and its corollary, mass distribution.[38]

C) Basis for Product Demand.- The short term consumer demand for electric irons, as well as for most electric appliances, is determined by the present level of disposable income and consumers' expectations as to future levels of disposable income.

Over the long term, growth of the business reflects an increasing population and a rising number of family formations.[39]

10.6 Trade Agreements.

The first attempt to bring together into one organization all manufacturers of electric irons, and housewares in general, was made in 1927 when the National Home Furnishings Manufacturers Association was formed in Chicago. Its initial main purpose was to sponsor and present an annual trade show.

By 1947 it changed its name into the National Housewares Manufacturers Association (NHMA). By then, the organization had grown in size and importance broadening the scope of its activities. For instance, technical and marketing departments were organized and the trade exhibits were conducted twice a year.

38 Lifshey, "The Housewares Story", p. 224
39 "SCM Corporation: A Profile," p. 14.

Nowadays the National Housewares Manufacturers Association constitutes the most important trade association that leads the housewares industry in the USA.[40]

10.7 Technology.

The first flat irons were hand-machined and assembled, one at a time. The largest problem was getting adequate resistance wire for the heating elements, which was imported from Germany and of limited quality.

During the turn of the century up to 1927 great strides were made in the development of electric irons, in fact a whole new manufacturing technology emerged. The voluntary industry standard for safety became the approval of products by Underwriters' Laboratory; this has long been supplemented by the manufacturers own efforts to impose even stricter quality controls.

In 1927 the electric iron business took a big leap forward with the perfection of the adjustable automatic thermostat. Then the concept of the steam iron became a reality, putting the iron business in a position to cope with the new demands of synthetic fabrics just coming in the market.

The improvement continued with the new applications of colors and designs to household irons. New platics with remarkable performance characteristics, available in many colors,

40 Lifshey, "The Housewares Story", p. 65.

have stimulated the leading designers to transform the once black and sooty item into a beautiful, highly efficient household convenience.[41]

10.8 Marketing Techniques.

At the beginning of this century salesmen of irons concentrated their efforts in visiting houses in areas where the power lines poles unmistakably announced that electricity had arrived. In many cases payments were made through a small extra charge on the monthly bill from the electric company. As the usefulness and convenience of the electric iron became more apparent, its demand increased and mass production started; the item began to be sold by retailers in hardware stores, department stores and even the old country store.

The department store gradually took the largest share in selling the item, and parallel to its success as a channel of distribution, the whole housewares industry developed a real identity of its own and eventually emerged as an independent industry.

10.9 Industry Statistics.

Table 9 depicts statistics of the electric iron industry in the USA for the past five years, and its relation to the total electric housewares market.[42]

41 Lifshey, "The Housewares Story", p. 231
42 "Merchandising-The 10 year tables," p. 49.

Table 10 shows statistics in terms of the particular types of irons produced during the past three years in the USA.[43]

TABLE 9

THE ELECTRIC IRON AND THE HOUSEWARES MARKET

Year	Number shipped	Retail Value US $	Electric Housewares Retail Value US $	% Irons / Housewares
1972	9,510,000	179,410,000	2,598,060,000	6.9
1973	9,745,000	201,090,000	3,003,746,000	6.7
1974	9,700,000	220,450,000	3,773,258,000	5.8
1975	7,883,000	187,314,000	3,296,711,000	5.7
1976	8,003,000	213,882,000	3,875,035,000	5.7

TABLE 10

SEGMENTS OF THE ELECTRIC IRON MARKET

Type	1974		1975		1976	
	NS*	RV*	NS*	RV*	NS*	RV*
Steam, Steam/spray	8,750	210,000	7,086	117,150	7,311	204,708
Automatic dry	710	7,810	600	7,800	514	6,682
Travel	240	2,640	197	2,364	178	2,492
Irons total	9,700	220,450	7,883	187,314	8,003	213,882

NS : Number shipped
RV : Retail Value (US $)
* : Thousands

43 "Merchandising-The 10 Year Tables," p. 49.

The foregoing tables reflect the level of market saturation reached by the electric iron in the USA: 99.9%. Saturation specifically refers to the number of wired homes owning an electric iron.

Sales of electric irons account for a small segment of the total housewares market. It is noticeable in the slight decrease suffered during the past five years, in terms of percentage of the total housewares market. Sales of steam and steam/spray irons, in turn, account for about 90% of total sales of electric irons.

CHAPTER ELEVEN.- PRESENT STATUS OF THE ELECTRIC IRON INDUSTRY IN THE USA

11.1 Market Size and Location.

In the United States most staple housewares show considerable market saturation. For example, it is estimated taht almost every home has an electric iron, a toaster, a coffee maker, and a mixer. In the case of the electric iron, its market saturation reaches a level of 99.9%.

In general the efforts of the manufacturers of housewares are directed toward the production on a large scale of mature household appliances for which the market is largely replacement sales.

Sales of standarized replacement market appliances, in essence, tends to be cyclical, and it is noticeable that volume follows consumer retail sales very closely.[44]

11.2 Major Firms in Industry and Share of Market.

About 10 companies cover most of the market for electric irons in the USA.

Table 11 shows the manufacturers' share of the market for the five leading companies, all of which also make a broad range of domestic appliances.[45]

44 "SCN Corporation: A Profile," p. 14
45 "Appliance Manufacturer-The Universe of Appliances," p. 56.

TABLE 11

MANUFACTURERS' SHARE OF THE MARKET FOR ELECTRIC IRONS

Company	% (Dollars volume)
1. General Electric	44.
2. Sunbeam	20.
3. SCM - Proctor-Silex	12.
4. The Hoover Company	11.
5. Scovill Mfg. Company	7.
	Σ 94.

11.3 Marketing Practices of Major Firms.

Electric irons, along with coffee percolators and toasters, are stable products in terms of being year-in and year-out sellers, and yet large manufacturers have to come up with new ideas to lure customers. Competition is severe and the case has been that modern technology allows competitors to copy new design inmediately.

Electric appliances have been sold mostly through appliance distributors, independent businessmen who provide warehousing, merchandising and credit functions to the distribution process, however, the influx of new electric housewares has led to an upsurge in business for the whole industry, but at the same time it has also shaken traditional means of distribution. For instance, in 1966 the volume of small electric appliances sold

by mass merchandisers-discount store chains-was 22%; in 1972 it was 35%, and at the same time sales by department stores dropped from 21% of the total to 18%. As mass merchandisers seek to buy directly from manufacturers, the number of distributors in the appliance industry is declining. The growth of catalogue houses is squeezing the remainder distributors still more.

Major firms sell an important segment of their production to the private label market, making this one of the best ways to meet competition. In fact, none of the larger firms likes to lose market by default.

11.4 Statistical Indicators of Major Firms.

Since electric irons are manufactured by large firms in the USA, it is deemed convenient to present statistics relevant to their standing. Table 12 shows how they compare to each other in terms of total number of employees, net sales for 1976, earnings per share, and capital expenditures for the past two years.[46]

It has not been possible to collect isolated statistics for electric irons from any of the five companies. The case is that the electric iron is only a small segment of these firms' total operations.

46 "Standard and Poor's Corporation Records,"

TABLE 12

STATISTICAL INDICATORS OF MAJOR FIRMS

Company	No. of Employees	Net sales US $ x 10^3	% Housewares	Earnings per share	Capital Expen/.*	
					1975	1976
G. E.	380,000	15,697,300	N.A.	4.12	588,200	740,400
Sunbeam	28,200	953,772	63.7	2.35	25,090	18,156
SCM Corp.	27,100	1,331,897	16.0	3.30	87,139	38,702
Hoover	22,897	571,913	N.A.	0.52	11,966	11,395
Scovill	16,344	596,638	25.7	2.32	13,312	25,028

N.A. :Not available; * : Thousands US$.

11.5 Industry Ratios.

Industry ratios are presented on table 13. They pertain to the whole household appliances industry.[47]

11.6 Products and Competition Strategy.

The major manufacturers of electric irons face competition among each other in terms of offering a broad range of household appliances and a high level of product differentiation through advertising.

The signs of revolution in household electric appliance distribution that has been mentioned in point 11.3, has had a variety of responses from the manufacturers, and the market place is presently in a state of flux. It is expected, however, that

47 "Dun and Bradstreet : Key Business Ratios for 1975," p. 9.

TABLE 13

INDUSTRY RATIOS

		upper Quartile	median	lower quartile
Current Assets / current debt	(times)	4.21	3.03	2.34
Net profits / net sales	(%)	6.93	3.92	1.98
Net profits / Net Working cap/.	(%)	20.90	11.31	6.20
Net sales / Net working cap/.	(times)	4.17	3.68	3.10
Collection period	(days)	42	60	68
Net Sales / Inventory	(times)	6.1	4.5	3.8
Fixed Assets / Tangible Net Worth	(%)	22.7	34.4	52.2
Current debt / Tangible Net Worth	(%)	20.7	39.1	81.6
Total Debt / Tangible Net Worth	(%)	42.4	68.5	139.7
Inventory / Net working cap/.	(%)	56.5	75.0	85.7
Current debt / Inventory	(%)	52.3	71.8	99.0
Funded debts / Net Working cap/.	(%)	14.8	34.8	51.1
Net Sales / Tangible Net Worth	(times)	4.17	2.90	2.33

in the long run such development might have a beneficial effect on the housewares business. In essence, distribution of all housewares has been planned to maximize retail coverage in all types of outlets in the most efficient and economic manner, whatever the ultimate point of sale.

There is a considerable export business in Latin America, and some housewares are sold in Europe through licenses, but the great bulk of the market and the marketing effort is in the USA.

Consumer feedback plays a most important role in the product manufacturing decisions of major firms through marketing people, who remain in close contact with the customer and consumer, and very responsive to their reactions.[48]

11.7 Foreign Trade.

Electric irons are listed under code 7250535 by the United States Department of Commerce. Table 14 shows statistics of US exports of this product over the past five years.[49]

48 "SCM Corporation : A Profile," p. 16
49 "US Exports : Schedule B Commodity by Country,"

TABLE 14

U.S. EXPORTS OF ELECTRIC IRONS

Year	Total No. units	Total dollar value
1972	506,542	2,523,994
1973	733,899	4,534,731
1974	951,856	6,515,322
1975	780,006	6,206,651
1976	1,251,433	10,378,922

11.8 Trademarks.

The five major manufacturers of electric irons sell to the consumer their product under the following trademarks:[50]

1. General Electric : General Electric.
2. Sunbeam : Oster, Northern Electric.
3. Proctor-Silex : Proctor-Silex.
4. The Hoover Co. : Knapp, Monarch, Wesco.
5. Scovill : Hamilton Beach, Dominion.

Private-label sellers of electric irons include names like Sears, Wards, and J.C. Penney.

11.9 Trade Associations.

Trade Associations related to the electric iron industry include:

50 "Appliance Manufacturer-The Universe of APPLIANCES," p. 54.

-- National Housewares Manufacturers Association.

1130 Merchandise Mart

Chicago, Illinois. 60654

-- Association of Home Appliance Manufacturers.

20 N. Wacker Drive

Chicago, Illinois. 60606

-- American National Standards Institute.

1430 Broadway

New York City, New York. 10018

CAIPTER TWELVE.- FUTURE OF THE ELECTRIC IRON INDUSTRY IN THE USA.

12.1 Trends in consumption.

The housewares industry, being the innovative, dynamic, and competitive force that it is, will continue to reflect the needs of U.S. consumers, as it moves forward.

Long term trends in consumption are now, more than ever, hard to predict; however, in 1977 retail business has been good overall and there is scant evidence that conditions will change in 1978. As a matter of fact short term trends are rather bright, the best news are from the recent Consumer Buying Plans Index of the Conference Board, which reported a gain of nearly 24 points in families intentions to buy hard goods. With employment and income rising and with the evident willingness of consumers to spend holding at comfortably levels, retail sales generally should improve over the next few months.

In terms of electric irons, specifically, the increase of ready-to-wear clothing made of natural fibers-cotton and wool-along with replacement sales will mean having good sales gains, especially the high-end self-cleaning/steam/spray models.[51]

12.2 Market Projection.

Estimates for 1977 project a gain of 4.9% over 1976 for

51 "Merchindising : National Outlook," p. 10.

the total of electric irons. Steam/steam-spray models with a 5.4% increase account for the largest share at 7.7 million units.

Perhaps reflecting that Americans are on the move again, travel irons are projected ahead by 6.7%, whereas automatic dry irons are the only losers in this category, with a decrease of 2.8% seen.

A first break down of self-cleaning iron unit sales shows a healthy 14.7% increase for this group which now accounts for 37% the entire volume.

The growing popularity of natural fibers in clothing for the entire family as well as those more sophisticated but at the same time simpler to operate new models are said to be, key factors in total irons' unit sales projected gains.

Table 15 shows the entire projection and the expected % change for 1977.[52]

12.3 Trade Regulations.

It is the feeling of the whole household appliance industry that government intervention may be causing the appliance industry to lose the advantages of mass production, according to a statement by the Association of Home Appliance

52 "Merchandising : National Outlook," p. 22.

Manufacturers. AHAM suggests that the lower industry production levels of late years, were attributable in part at least, to the higher price levels engendered by conformity to government regulations. In fact the most acute of these regulatory problems was energy conservation.

Government interventions and regulations include warranties and disclosure requirements, safety and product testing, and even the attempt to have industry products labeled with the annual operating costs. However, as the Association of Home Appliance Manufacturers states it, "all costs are ultimately paid by the consumer".

Finally, despite pressures from manufacturers, the Federal Energy Administration is not likely to rule that states can not impose stricter energy efficiency standards and regulations than Washington.[53]

53 "Merchandising : Happenings," p. 36.

TABLE 15

SHORT TERM PROJECTION FOR THE ELECTRIC IRON MARKET

Product	Units 1976	Units 1977	%Change 76-77
Automatic	514,000	500,000	- 2.8
Travel	178,000	190,000	+ 6.7
Steam/steam-spray	7,311,000	7,771,000	+ 5.4
Irons total	8.003,000	8,400,000	+ 4.9

SECTION THREE

"ENTERPRISE PROPOSAL"

CHAPTER THIRTEEN.- MARKET STUDY

13.1 Trends in consumption.

Ecuador being one of the fastest growing markets in Latin America presents an attractive opportunity for establishing an enterprise that would manufacture electric irons. Its impressive economy growth, shown in the first part of this thesis, which is mainly supported by the petroleum exports, is expected to continue in the future, thus incorporating a large number of people to the consumer market as their income increases. This would therefore lead to higher levels os consumer expenditure in durable goods, particularly staple appliances, at front of which there would be the domestic electric iron.

The foregoing optimistic view is strongly enhanced by the fact that the several projects for electric power that the government is undertaking, are already becoming a reality, thus introducing vast rural areas and communities to the benefits of electricity, which in turn, is expected to be reflected in the purchasing of electric housewares, among other commodities. The electric iron, being a relatively inexpensive item, would definitely be in the list of those to be purchased first.

13.2 Electric Iron Imports.

Information gathered from the Central Bank of Ecuador's files indicate that between 1969 and 1975, electric iron imports

grew at an impressive average rate of 15%. Table 16 details the imports in terms of net weight as well as FOB and CIF prices.[53]

TABLE 16

ECUADOREAN IMPORTS OF ELECTRIC IRONS

Year	Net weight kgms.	% 1969=100	Value (US$)	
			FOB*	CIF*
1969	71818	100.0	82914	96540
1970	65238	90.8	82151	97207
1971	96230	134.0	112916	133292
1972	100409	139.8	107027	130423
1973	138363	192.6	195527	233918
1974	173500	241.6	366800	426800
1975	165110	229.9	495000	573750

* FOB Free on Board; CIF Cost, Insurance, Freight.

13.3 Products and Market Competition.

A further analysis of the electric iron imports in 1975 shows a break down in terms of trade marks, which is presented in table 17. It must be noted that the electric irons are imported by large private importing firms, which sell them wholesale and in most cases retail too.[54]

13.4 Origin of Imports.

Table 18 depicts electric iron import competition by countries of origin, for the year 1975.[55]

53 "Planchas Electricas-Proyecto en Promocion-CENDES," p. E-3.
54 Ibid. p. E-4.
55 Ibid. p. E-6.

TABLE 17

ELECTRIC IRON IMPORTS BY TRADEMARKS. 1975

TRADEMARK	No. UNITS	%	NET WEIGHT Kgrms.	VALUE (US $) FOB	CIF
Oster	33970	32.4	41927	156367	171724
Solac	23830	22.7	45506	102795	124135
General Electric	7560	7.2	11794	55132	60920
Tupy	6750	6.4	12270	16658	18028
Jata	4432	4.2	5692	14858	17644
Selecto	4000	3.8	8000	5970	8863
Phillips	2992	2.8	2992	23705	26787
Ozecu	2444	2.3	3546	3790	4860
Convair	2312	2.2	5548	5418	6916
Hoover	2000	2.0	1800	18780	20890
Vernado	1200	1.1	1540	6000	6962
Ufesa	1000	1.0	1000	5769	7070
Universal	1000	1.0	1207	2260	3000
Hamilton Beach	20	-	40	210	238
N. S.	11490	10.9	22318	77288	95713
TOTAL	105000	100.0	165110	495000	573750

N. S. Non specified.

TABLE 18

ELECTRIC IRON IMPORTS BY COUNTRY OF ORIGIN. 1975.

COUNTRY	No. UNITS	Net WEIGHT Kgms.	VALUE (US $)	
			FOB	CIF
United States	20596	30983	123213	138990
Spain	30694	54863	128788	155394
Mexico	29124	33997	143039	157019
Brazil	11250	20184	62349	74443
Other Countries	13336	25083	37611	47904
TOTAL	105000	165110	495000	573750

13.5 Types of Imports.

A final analysis of the Import permits granted by the Central Bank shows the types of electric irons imported in 1975. This analysis is depicted on table 19.[56]

TABLE 19

ELECTRIC IRON IMPORTS BY TYPE. 1975

ELECTRIC IRONS	UNITS	%
Automatic-dry	85940	81.2
Standard	11020	10.9
Steam/steam-spray	8040	7.9
TOTAL	105000	160.0

[56]"Planchas Electricas - Proyecto en Promoción- CENDES," p. E-5.

13.6 Imports from the United States.

The U.S. Department of Commerce reports the data shown in table 20 as the total electric iron exports to Ecuador during the past five years. There is a discrepancy between this data and that obtained from the Ecuadorean Central Bank, as of 1975. The difference is believed to be due to the unlike timing in terms of collecting and recording the data.[57]

TABLE 20

ELECTRIC IRON IMPORTS FROM THE UNITED STATES

Year	No.Units	Value (US$)
1972	1424	15143
1973	8955	18197
1974	1820	13234
1975	9763	87592
1976	14698	69502

13.7 Market Potential.

Table 21 shows the projected demand for electric irons in Ecuador. It is the result of a forecast based on a trend analysis by the least squares method. The index of correlation is equal to 0.95. This table also shows the projected number of units taking as a basis that the average weight of the imported electric iron is 1.658 kgms.

The projection is extended up to 1988 for the proposed enterprise and will be evaluated within a 10 year frame.

57 "US Exports: Schedule B Commodity by Country FT 410,"

TABLE 21

PROJECTED DEMAND OF ELECTRIC IRONS

Year	Weight Kgms.	No. Units
1976	192743	116250
1977	211976	127850
1978	231209	139450
1979	250443	151050
1980	269676	162652
1981	288910	174252
1982	308143	185850
1983	327376	197500
1984	346609	209052
1985	365842	220652
1986	385076	232252
1987	404309	243853
1988	423542	255452

CHAPTER FOURTEEN.- THE ENTERPRISE AND THE PRODUCT

14.1 Public and Legal Factors.

The enterprise that would manufacture electric irons, would be considered as a small industry with a second category status, since its fixed assets, excluding land and buildings, would not exceed 200,000 dollars.

The enterprise would be entitled to the following benefits:

-- Full exemption from taxes and other assessments on the incorporation of companies or artisan unions; on amendments to such acts of incorporation and on the issue, exchange, division or conversion of securities, shares or contribution certificates.
-- Exemption from taxes on operating capital.
-- Exemption from taxes on production for export.
-- Full exemption from tariffs on import of raw materials to be used in the production of articles for export.
-- Full exemption from tariffs and additional duties on importation of machinery, tools and equipment.
-- 50% exemption from tariffs on imports of raw materials.
-- Use of system of accelerated depreciation of machinery and equipment.[58]

14.2 Corporate Organization.

According to the current Ecuadorean legislation, the type of corporate organization in terms of capital, of the proposed

58 "Planchas Electricas - Proyecto en Promocion - CENDES," p. E-9.

enterprise would be, "Company of Limited Responsibility". The company's inception capital would be US$ 200,000, which would be funded by its initial shareholders, with an equal share of the capital, preferably. Under this scheme, each shareholder would be liable only for the amount of money corresponding to his share of the capital. The shares will not be negotiable, and any transfer of shares will be possible only with the unanimous consent of the rest of the shareholders.

14.3 Program of Production.

The proposed program of production of electric irons has been established taking into consideration the following criteria:

-- A progressive production increase supported by a continuous improvement of manpower skills and manufacturing technology.

-- Development of production in successive stages aiming to an increasing share of the market; it is expected that by the end of the projected 10 year period, the proposed enterprise will enjoy an approximate 70% share of the market.

Table 22 shows the proposed program of production for the first 10 years of operations, and annex A presents the computational scheme utilized to obtain the proposed program of production.

TABLE 22

PROPOSED PRODUCTION TARGETS

Year	Total No. Units	Daily* Production
1979	43800	182
1980	47170	196
1981	50530	210
1982	70620	294
1983	75050	313
1984	98250	410
1985	103700	432
1986	130060	542
1987	136550	569
1988	166040	692

* 240 Working days per year.

14.4 Product Definition.

The product subject of this study is the domestic electric iron - dry type, known also as automatic iron because of the thermostat it has, which allows adjustable temperature and automatic heat control.

By means of the corresponding fabric dial setting it could be used to press any of the following fabrics:

A) Acetates; acrylics; nylons; and Caprolan.

B) Polyesters; dacron; fortel; vycron; and rayons.

C) Triacetates; annel; and cotton.

D) Silks; wool; and linen.

Its operational characteristics are A.C. current; 120 volts; 1200 watts; and a maximum temperature of 550 ^{o}F (288 ^{o}C).

14.5 Electric Iron Parts.

The automatic electric iron has 22 parts, which are displayed in figure 2. A description of each part as well as its main function is presented in table 23.

TABLE 23

AUTOMATIC ELECTRIC IRON PARTS

Item	Part name	Function
1	Line cord	Electric power conduit
2	Sleeve	Protects the line cord
3	Wire connector	Connects line cord to heating element
4	Strain relief sleeve	Protects line cord from soleplate
5	Handle	Allows user to manipulate the iron
6	Lamination	Base for assemblying handle to shell and soleplate.
7	Screw	Seals item 6 to handle
8	Shell	Gives body and presentation to iron
9	Nameplate	Means of identification
10	Screw	Seals nameplate to handle
11	Soleplate	Does the actual pressing job
12	Heating element	Heats up the soleplate

TABLE 23 - continued -

ITEM	Part name	Function
13	Soleplate wire	Connects heating element to line cord
14	Insulator	Protects the thermostat base
15	Thermostat	Allows adjustable temperature control
16	Screw	Seals thermostat to soleplate
17	Cap - 1	Covers item 18
18	Screw	Seals thermostat to handle
19	Label	Dial setting identification
20	Screw	Seals handle to soleplate
21	Cap - 2	Covers item 20
22	Cardboard box	Packing and shipping container

14.6 Bill of Materials.

Table 24 presents a detailed bill of materials for the automatic electric iron.

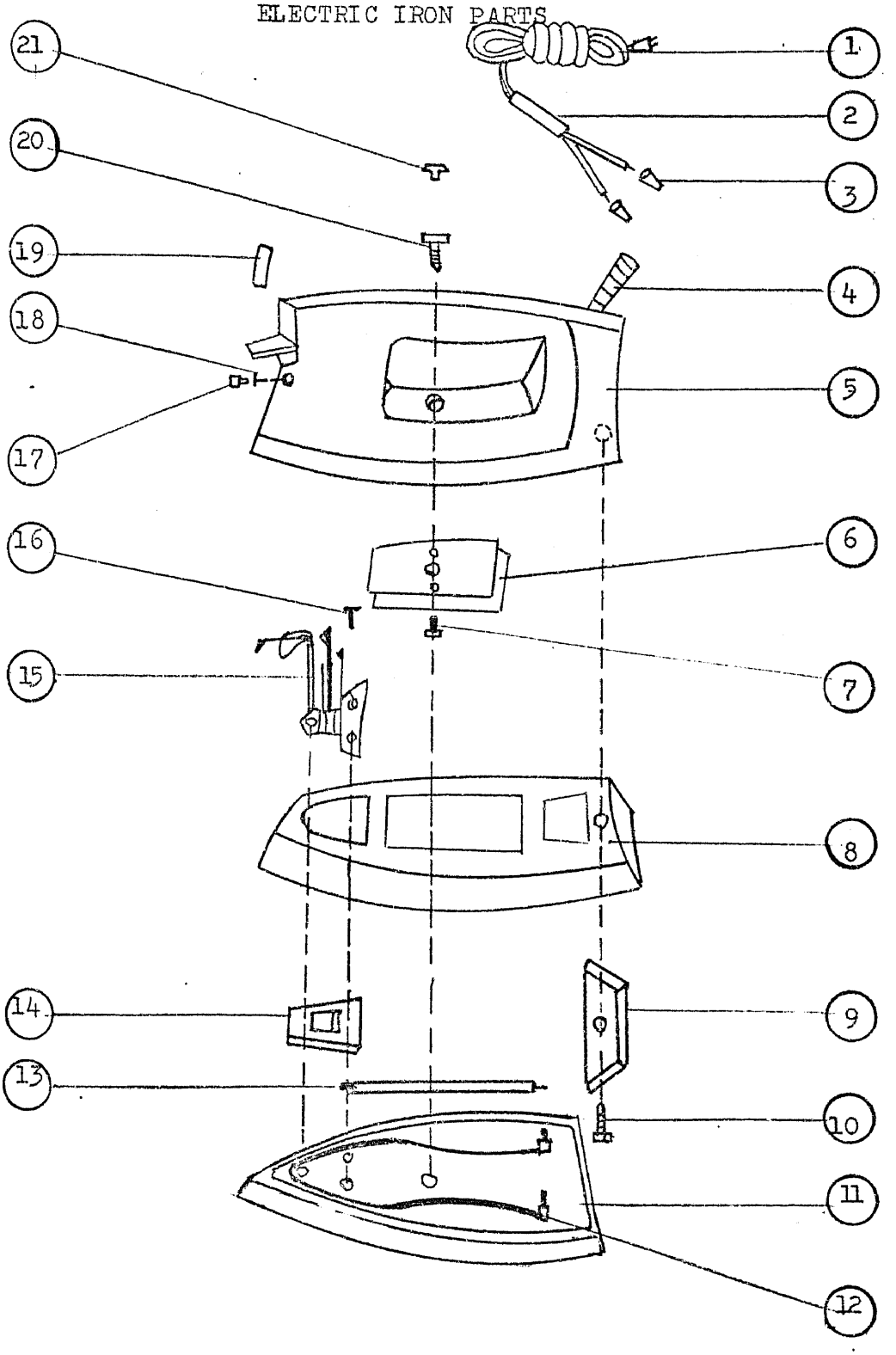
14.7 Make or Buy Analysis.

The main factors taken into consideration include: 1) Unit material and processing costs reduction; 2) Minimizing cash investment; 3) How critical the part is to the company; 4) Degree of standarization and delivery terms provided by outside suppliers; 5) Considerations of inventory control and optimum use of facilities.

The make or buy decision calls for the proposed enterprise

FIGURE 2

ELECTRIC IRON PARTS



to manufacture the following parts: 1) Handle; 2) Shell; 3) soleplate; 4) Laminations; and 5) Nameplate. In terms of weight these five items represent about 70% of total.

TABLE 24

BILL OF MATERIALS

Item	Part name	No. pieces	Material	Weight grms.	Dimension inches
1	Line cord	1	Copper-plastic	128.0	90
2	Sleeve	2	Plastic	1.5	8
3	Wire connector	2	Plastic	2.0	$\frac{1}{4}\phi$ x $\frac{3}{4}$
4	Strain relief	1	Steel	4.0	$\frac{1}{4}\phi$ x 2
5	Handle	1	Bakelite	261.0	$7\frac{1}{2}$x3x3
6	Lamination	2	Steel	86.0	4x$2\frac{1}{2}$
7	Screw self-tap	2	Steel	4.0	$\frac{1}{8}\phi$ x $\frac{1}{2}$
8	Shell	1	Pre-finished steel	85.0	$8\frac{1}{2}$x4x1
9	Nameplate	1	Aluminum	4.0	4x1
10	Screw self-tap	1	Steel	4.5	$\frac{3}{16}\phi$ x $1\frac{1}{2}$
11	Soleplate	1	Aluminum	410.0	$7\frac{1}{2}$x$4\frac{3}{4}$ x$\frac{1}{2}$
12	Heating element	1	Chrome-nickel	22.0	$\frac{1}{4}\phi$x14
13	Soleplate wire	3	Asbesto lead wire	8.0	No.18x18
14	Insulator	1	Fiberglass	1.0	
15	Thermostat	1	Bimetal	30.0	$1\frac{1}{2}$x3
16	Screw	3	Steel	5.1	3/16ϕx7/16
17	Cap - 1	1	Plastic	0.1	1/8ϕx$\frac{1}{4}$
18	Screw	1	Steel	1.0	1/8ϕx$\frac{1}{4}$
19	Label	2	Aluminum foil	0.2	$2\frac{1}{2}$x1
20	Screw	1	Steel	2.5	3/16ϕx$1\frac{1}{4}$
21	Cap - 2	1	Plastic	0.1	$\frac{1}{2}\phi$x$\frac{1}{4}$
22	Cardboard box	1	cardboard	140.0	9x5x6

14.8 Characteristics of the Raw Materials.

1) Handle.- It is to be made out of phenol-formaldehyde resin, which is most commonly known in the market as Bakelite. This synthetic resin made by reacting phenol with formaldehyde, is widely used as an electrical insulator, in molding and casting operations, as an adhesive, and in paints and baked enamel coatings. It is a thermosetting resin of high mechanical strength and electrical and heat resistance. [59]

-- Mechanical strength:

Impact, ft.lb/in. notch : 0.23 - 0.48

Flexural, psi. : 6,000 - 10,000

-- Electrical tests:

Dielectric strength. S/T, volts/mil. : 150 - 300

Dissipation factor @ 10^6 cps. : 0.04 - 0.15

-- Fabrication characteristics:

Compression ratio (bulk factor) : 2.0 - 2.5

Tabletting: good

-- Molding (compression)

Temperature. ^{o}F : 275 -350

Pressure, psi. : 2000 - 5000

Shrinkage, in/in : 0.002 - 0.006

-- Miscellaneous:

Specific gravity : 1.55 - 1.90

Water absorption, % gain : 0.2 - 0.4

59 Dubois. "Plastics" p. 32.

2) Soleplate.- It is to be made out of aluminum alloy # AA-238.2, which is a special type of casting alloy. Its characteristics include electrical and thermal conductivity, essentially non-sparking and non-magnetic, improved tensile properties and malleability in cryogenic application, non-toxic, high reflectivity, low emisivity, attractiveness, resonance, and the widest availability of any metal.[60]

-- Tensile strength, ksi, ultimate : 30
-- Tensile elongation, % in 2 in. . 1.5
-- Compressive yield strength, ksi. : 30
-- Hardness Brinnell - 500 kg. load, 10 mm ball : 100
-- Shearing strength, ksi. : 24
-- Endurance limit, ksi. : 9.0
-- Percentages of other elements present in this alloy are: silicon 3.5 - 4.5; iron 1 - 2; copper 9.5 - 10.5; manganese 0.50; magnesium 0.20 - 0.35; nickel 0.50; zinc 0.50; titanium 0.20; others total 0.50.

3) Shell.- It is to be made out of pre-finished nickel-steel grade C. This material is made by an electrodeposition of a nickel coating on a SAE 1010 low carbon steel.

With this material, time, expense, investment and handling savings can be achieved. It comes as a finished material featuring rigid, smooth, lustrous, and heat resisting properties. The pre-finished material is versatile, and can be processed

60 "Reynolds Aluminum Mill Products," p. 8.

with the customary production methods, using standard tools. Moreover, it requires no cleaning, post plating or buffing. After fabrication it can be immediately assembled.[61]

4) Lamination.- It is to be made from commercial low carbon steel SAE 1010 - 1/16". This material has good strength and rigidity, exceptional formability, excellent weldability, as well as low cost.

5) Nameplate.- It is to be made from aluminum alloy # 5457 - 1/32".

14.9 Origin of Raw Materials and Parts.

The nature of the product, the type of materials and parts needed, and the limited scale of production, make quite feasible the procurement of raw materials and parts to meet the proposed targets of production. Several raw materials and parts are not presently produced in Ecuador, but they can be easily imported from the United States. Table 25 shows the origin of the raw materials and parts for the electric iron.

14.10 Raw Materials and Parts Requirements.

Table 26 presents the requirements of direct materials according to the proposed projected production for 10 years. The raw materials that will be processed at the plant include an additional 10% weight because of the rate of scrap and rejects

61 "Nickeloid Metals," p. 15.

that can be expected while being processed.

TABLE 25

ORIGIN OF RAW MATERIALS AND PARTS

Item	Part	Country
1	Line cord	Ecuador
2	Sleeve	Ecuador
3	Wire connector	Ecuador
4	Strain relief sleeve	Ecuador
5	Handle (Bakelite)	U. S.
6	Lamination	Ecuador
8	Shell (pre-finished steel)	U. S.
7	Screw	Ecuador
9	Nameplate	Ecuador
10	Screw	Ecuador
11	Soleplate (aluminum)	U. S.
12	Heating element	U. S.
13	Soleplate wire	U. S.
14	Insulator	Ecuador
15	Thermostat	U. S.
16	Screw	Ecuador
17	Cap - 1	Ecuador
18	Screw	Ecuador
19	Label	Ecuador
20	Screw	Ecuador
21	Cap - 2	Ecuador
22	Cardboard box	Ecuador

TABLE 26

MATERIALS REQUIREMENTS*.- Years 1 - 10

No.	Part	1	2	3	4	5	6	7	8	9	10
1	Line cord	5.61	6.04	6.46	9.03	9.61	12.58	13.27	16.65	17.48	21.25
2	Sleeve	0.07	0.07	0.08	0.11	0.11	0.15	0.16	0.20	0.21	0.25
3	Wire Connect/.	0.09	0.09	0.10	0.14	0.15	0.20	0.21	0.26	0.27	0.33
4	Strain R/S.	0.18	0.20	0.21	0.30	0.32	0.41	0.44	0.55	0.57	0.70
5	Handle	12.58	13.54	14.51	20.28	21.55	28.21	29.77	37.34	39.21	47.67
6	Lamination	4.14	4.46	4.78	6.68	7.10	9.29	9.81	12.30	12.92	15.71
7	Screw	0.18	0.19	0.20	0.28	0.30	0.39	0.42	0.52	0.55	0.66
8	Shell	4.09	4.41	4.72	6.60	7.02	9.18	9.70	12.16	12.77	15.53
9	Nameplate	0.20	0.21	0.22	0.31	0.33	0.43	0.46	0.57	0.61	0.73
10	Screw	0.21	0.22	0.23	0.32	0.34	0.44	0.47	0.58	0.62	0.75
11	Soleplate	19.76	21.27	22.88	31.86	33.85	44.32	46.77	58.66	61.60	74.88
12	Heating elem/.	0.96	1.04	1.11	1.55	1.65	2.16	2.28	2.86	3.00	3.65
13	Wire ceramic	0.36	0.38	0.40	0.56	0.60	0.78	0.84	1.04	1.10	1.32
14	Insulator	0.05	0.05	0.05	0.07	0.08	0.10	0.11	0.13	0.14	0.17
15	Thermostat	1.32	1.42	1.51	2.12	2.25	2.95	3.11	3.90	4.10	4.98
16	Screw	0.24	0.25	0.26	0.36	0.39	0.50	0.53	0.66	0.70	0.85
17	Cap	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
18	Screw	0.05	0.05	0.05	0.07	0.08	0.10	0.11	0.13	0.14	0.17
19	Label	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
20	Screw	0.11	0.11	0.13	0.18	0.19	0.25	0.26	0.33	0.34	0.41
21	Cap	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.02	0.02	0.02
22	Cardboard box	4.38	4.72	5.05	7.06	7.50	9.82	10.37	13.00	13.66	16.60

* METRIC TONS.

14.11 Logistics and Phisical Distribution.

The term logistics refers to the management scheme for providing an orderly flow of materials to the firm and of finished goods to the market place. It embraces the details of supply, product handling, and transportation activities.

The logistics operations of the proposed enterprise will have a dual purpose. First, the procurement of raw materials and supplies in the right quantities, at the right time, and at an acceptable price. Second, the logistics plan must deliver the finished products to customers in a manner satisfactory to them. In essence, logistic operations will give time and place utility to goods.

The finance manager, who will be carrying on the purchasing function in this case, will be in charge of procuring materials and supplies; he will be developing needed purchasing policies related to quality standards, requisition and buying procedures, and inventory and maintenance control.

In relation to the organization for physical distribution, it would be of the centralized type since the enterprise's operational activities will be around a single product. That is to say that, the finished product will be distributed through the conventional trucking companies to the wholesalers and retailers throughout the country, and who in turn, would ultimately sell the electric irons to the final customers. In order to support sales efforts a discretionary amount of money will be allocated for advertisement purposes.

CHAPTER FIFTEEN.- THE ENTERPRISE AND THE PROCESS

15.1 Manufacturing Process.

The selected process for manufacturing the electric irons is conditioned by two main factors: the projected levels of production and the economical development situation that exists in the area where the proposed enterprise will be established.

With these premises, the process would utilize universal type of machinery and would be labor intensive. This leads to the consideration that, when needed, it will be more convenient to work overtime or extra shifts, than to purchase more machinery.

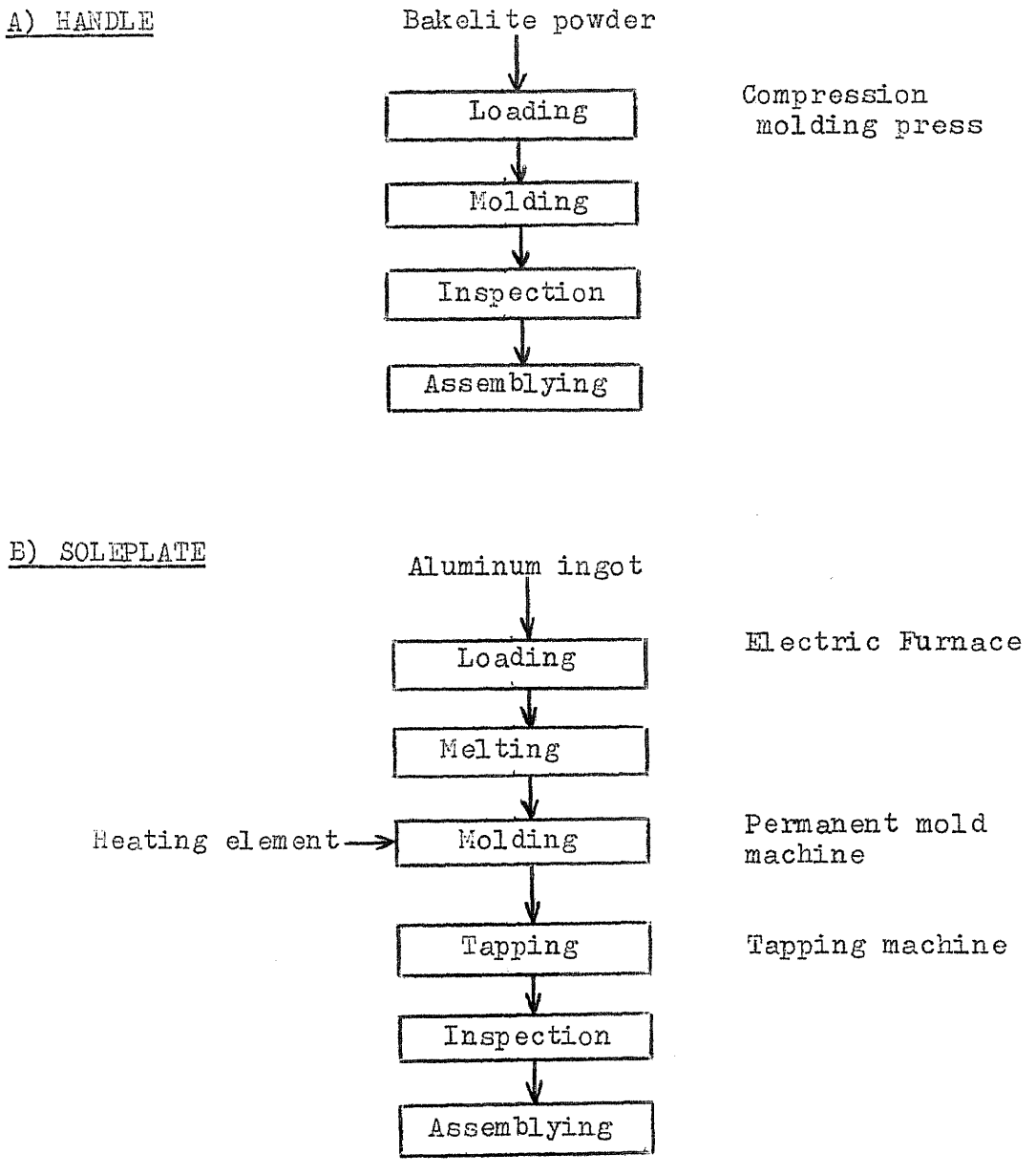
The proposed process is thus characterized by its flexibility, labor intensiveness, economies of scale in machinery utilization; all the foregoing geared to a high quality final product.

15.2 Process Flowcharts and Methods.

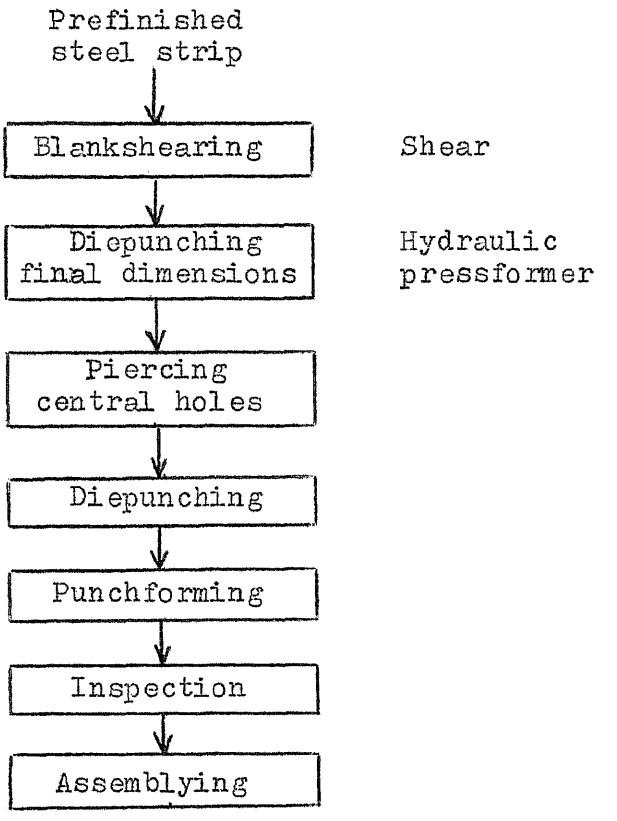
Figure 3 shows the process flowcharts for the parts that will be manufactured by the proposed enterprise, as well as the final assembly. It depicts the major operations to be completed in, the manufacture of the soleplate, handle, shell, lamination, and assembling.

FIGURE 3

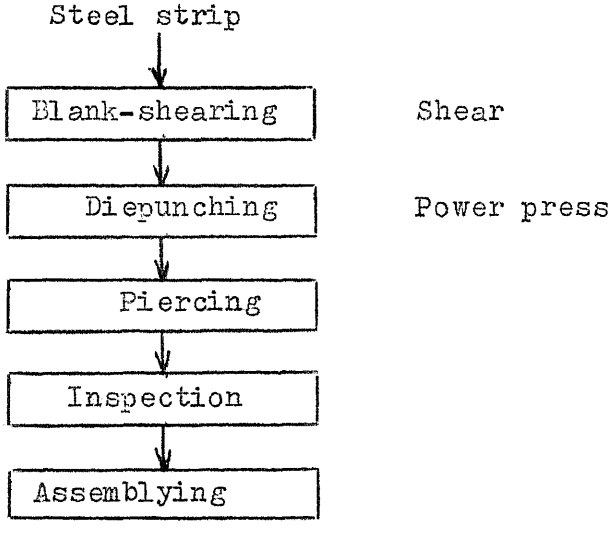
PROCESS FLOWCHARTS



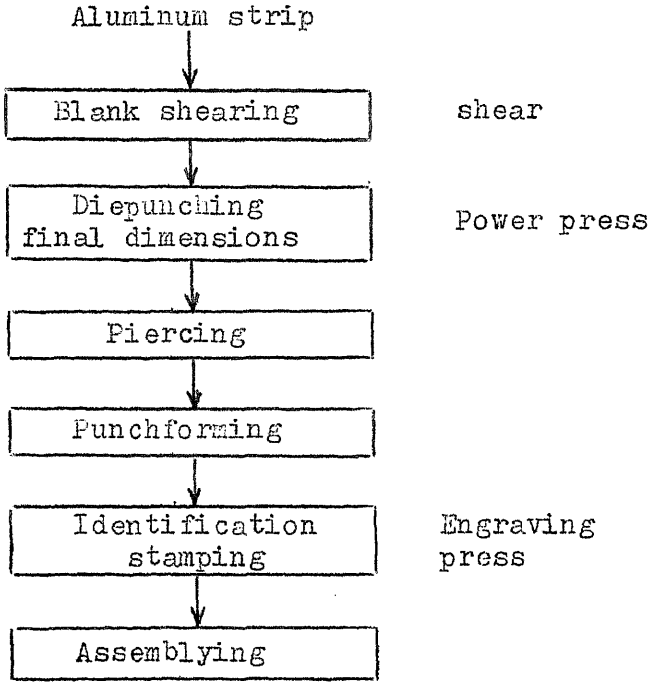
C) SHELL



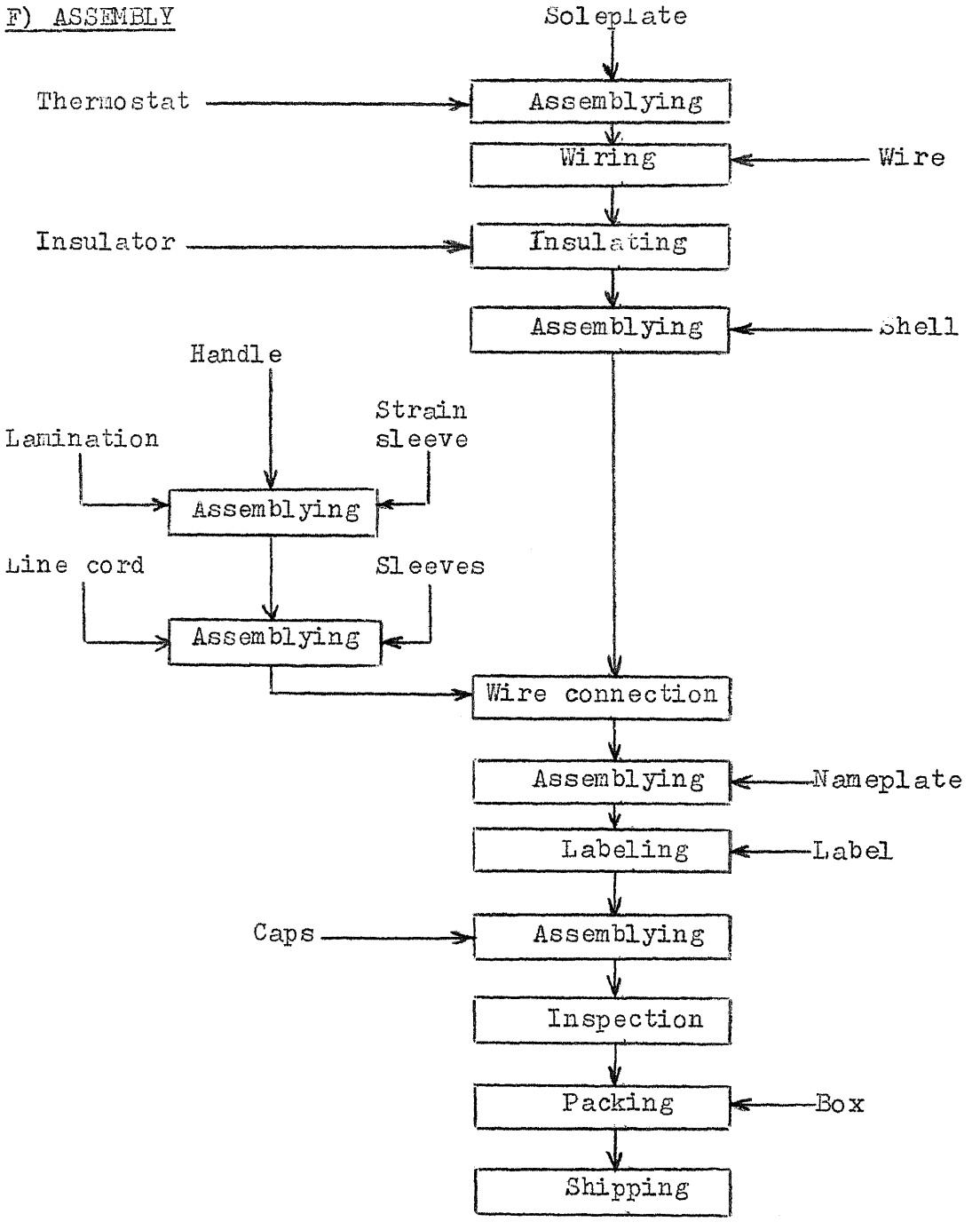
D) LAMINATION



E) NAMEPLATE


Aluminum strip
Blank shearing
shear
Diepunching
final dimensions
Power press
Piercing
Punchforming
Identification
stamping
Engraving
press
Assemblying

F) ASSEMBLY


Soleplate
Thermostat
Assemblying
Wiring
Wire
Insulator
Insulating
Assemblying
Shell
Handle
Strain sleeve
Lamination
Assemblying
Line cord
Sleeves
Assemblying
Wire connection
Assemblying
Nameplate
Labeling
Label
Caps
Assemblying
Inspection
Packing
Box
Shipping

15.3 Production Equipment.

The machinery needed by the proposed enterprise is the following:

-- 50 Ton automatic compression molding press. Electric heating plates.
-- Aluminum melting and holding furnace. 10 kgms/hr.
-- Permanent-mold casting machine.
-- Tapping machine.
-- 10 gauge square shear. 5 feet cutting length.
-- 50 ton hydraulic pressformer.
-- 30 ton power press.
-- 10 ton engraving press.

The number of machines needed for the projected yearly production was determined by taking into account their capacity and the estimated cycle times for each operation.

Table 27 shows the estimates for the cycle times. Table 28 shows the number of pieces that the machines can process per day considering 6 net hours of average production for one shift, 13 for two shifts, and 22 for three shifts, depending upon how set up, maintenance, etc. times are prorrated across the three shifts.

Table 29 shows the number of machines that will be needed in the plant during the first 10 years of operations. It is considered that the plant would complete 240 net days of operation per year.

TABLE 27

ESTIMATES OF OPERATIONS CYCLE TIMES

Machine	Operation	Part	Average time scs.	Average cycle time scs.
Compression press	Molding	Handle	60	60
Furnace	Melting	Soleplate	74	74
Permanent mold mac/.	Casting	Soleplate	100	100
Shear	Cutting	Shell	10	
	Cutting	Lamination	10	
	Cutting	Nameplate	10	30
Tapping machine	Tapping	Soleplate	25	100
Pressformer	Diepunching	Shell	13	
	Piercing	Shell	13	
	Punchforming	Shell	13	
	Diepunching	Nameplate	10	
	Piercing	Nameplate	10	
	Punchforming	Nameplate	10	70
Power press	Diepunching	Lamination	15	
	Piercing	Lamination	15	30
Engraver	Stamping	Nameplate	15	15

TABLE 28

EQUIPMENT PRODUCTION CAPACITY (pieces/day)

Machine	Shifts		
	1	2	3
Compression molding press	360	780	1320
Electric furnace	292	632	1070
Permanent-mold machine	216	468	792
Tapping machine	216	468	792
Square shear	720	1560	2640
Hydraulic pressformer	308	668	1131
Power press	720	1560	2640
Engraving press	1440	3120	5280

TABLE 29

NUMBER OF MACHINES NEEDED - FIRST 10 YEARS

Machine	Years									
	1	2	3	4	5	6	7	8	9	10
Compression press	1	1	1	1	1	1	1	1	1	1
Electric furnace	1	1	1	1	1	1	1	1	1	1
Permanent mold	1	1	1	1	1	1	1	1	1	1
Tapping machine	1	1	1	1	1	1	1	1	1	1
Square shear	1	1	1	1	1	1	1	1	1	1
Hydraulic pressformer	1	1	1	1	1	1	1	1	1	1
Power press	1	1	1	1	1	1	1	1	1	1
Engraving press	1	1	1	1	1	1	1	1	1	1

15.4 Plant Capacity Utilization.

It is shown in table 30. It has been determined based upon the "bottle neck" point of production, which in this case, would be the permanent-mold machine, and taking into consideration the total 3 shifts production capacity available.

TABLE 30

PLANT CAPACITY UTILIZATION. First 10 years.

	1	2	3	4	5	6	7	8	9	10
Installed capacity. (pieces/day)	792	792	792	792	792	792	792	792	792	792
Capacity Utilization (pieces/day)	182	196	210	294	313	410	432	542	569	692
% Capacity Utilization	23	25	27	37	39	52	55	68	72	87

15.5 Effective Degree of Machinery Utilization .

Table 31 shows the effective capacity utilization for each of the machines, based in the proposed production program.

From table 31, the determination of the required number of shifts that each machine will be utilized throughout the 10 years, was obtained. It is depicted in table 32.

TABLE 31

PERCENTAGE OF MACHINERY CAPACITY UTILIZATION

Machine	1	2	3	4	5	6	7	8	9	10
Compression press	14	15	16	22	24	31	33	41	43	53
Electric furnace	17	18	20	28	29	38	40	51	53	65
Permanent mold	23	25	27	37	39	52	55	68	72	87
Tapping machine	23	25	27	37	39	52	55	68	72	87
Square shear	7	8	8	11	12	16	17	21	22	27
Hydraulic press/.	16	17	19	26	28	36	38	48	50	61
Power press	7	8	8	11	12	16	17	21	22	27
Engraving press	4	4	4	6	6	8	9	11	11	14

TABLE 32

NUMBER OF WORKING SHIFTS

Machine	1	2	3	4	5	6	7	8	9	10
Compression press	1	1	1	1	1	1	1	2	2	2
Electric furnace	1	1	1	1	1	1	2	2	2	2
Permanent mold	1	1	1	1	1	2	2	2	3	3
Tapping machine	1	1	1	1	1	2	2	2	3	3
Square shear	1	1	1	1	1	1	1	1	1	1
Hydraulic press/.	1	1	1	1	1	1	2	2	2	2
Power press	1	1	1	1	1	1	1	1	1	1
Engraving press	1	1	1	1	1	1	1	1	1	1

15.6 Tooling.

From the process charts, it can be seen that the following tooling will be required in order to complete the operations:

-- Handle.- compression plastic mold

-- Soleplate.- permanent-mold die; tapping heads

-- Shell.- Progressive die # 1

-- Lamination.- progressive die # 2

-- Nameplate.- progressive die # 3; engraving die

-- Assemblying.- assembly jigs 1, 2 and 3; electric resistance welder; wrench set; screwdriver set.

15.7 Plant Design Considerations.

Plant design includes considerations of the production area layout as well as the corresponding auxiliary services needed. These, have been divided into three groups: 1) Administrative services, 2) Auxiliary production services, and 3) Other auxiliary services.

Administrative services would include, general management, as well as the specific management functions of Personnel, Finance, Sales, Purchasing, etc. Point 15.9 presents details of the organization chart and its corresponding required manpower.

Auxiliary production services include all the departments needed to support the achievement of the projected levels of

production and quality. This group includes Engineering, Quality Control, Production Planning and Control, Repair and Maintenance, and Storeroom services. Table 33 shows the equipment necessary for Quality Control and Maintenance.

Other auxiliary services include basic utilities: electric power, water, air, fuel; and security installations.

TABLE 33

QUALITY CONTROL AND MAINTENANCE EQUIPMENT

	Years									
Equipment	1	2	3	4	5	6	7	8	9	10
Iron tester	2	2	2	2	2	4	4	4	4	4
Caliber set	1	1	1	1	1	1	1	1	1	1
Drill press	1	1	1	1	1	1	1	1	1	1
Scale	1	1	1	1	1	1	1	1	1	1
Emery	1	1	1	1	1	1	1	1	1	1
Air compressor	1	1	1	1	1	1	1	1	1	1

15.8 Basic Utilities Requirements.

Table 34 presents the approximate requirements of electric power for the installed machinery.

Table 35 shows the projected number of net hours per year that each machine will operate.

Table 36 shows the annual consumption of electric power for

all the machinery, taking into account that the machines would not operate at 100% capacity, but they would absorb various levels of power during their operation. The correction factor is estimated to be 50%.

TABLE 34

NOMINAL ELECTRIC POWER REQUIREMENTS

Machine	HP	Kw.
Compression press	20	14.92
Electric furnace	15	11.20
Tapping machine	2	1.42
Square shear	5	3.73
Hydraulic pressformer	20	14.92
Power press	5	3.73
Other equipment	10	7.46

TABLE 35

ANNUAL MACHINERY OPERATION. (hours)

Machine	1	2	3	4	5	6	7	8	9	10
Compr/. press	806	864	922	1267	1382	1785	1900	2362	2476	3052
Furnace	973	1034	1156	1582	1703	2191	2313	2922	3044	3713
Tap machine	1324	1440	1555	2131	2246	2995	3168	3916	4147	5011
Shear	403	432	461	634	696	893	950	1181	1238	1526
Pressformer	921	979	1094	1497	1612	2073	2188	2764	2880	3513
Power press	403	432	461	634	696	893	950	1181	1238	1526
Other equi/.	1900	1900	1900	1900	1900	2880	2880	2880	2880	2880

TABLE 36

ANNUAL CONSUMPTION OF ELECTRIC POWER. (kw.hr)

Machine	1	2	3	4	5	6	7	8	9	10
Compr/. press	6013	6445	6878	9452	10309	13316	14174	17620	18470	22767
Furnace	5449	5790	6743	8859	9592	12269	12953	16755	17046	20792
Tap/. machine	940	1022	1104	1513	1594	2126	2249	2780	2944	3558
Square shear	751	805	859	1182	1298	1665	1771	2202	2308	2845
Hydraulic press	9131	9889	10748	14725	15583	20638	21820	27087	28594	34612
Power press	451	483	516	710	779	1000	1064	1322	1386	1709
Other equi/.	7087	7087	7087	7087	7087	10742	10742	10742	10742	10742
TOTALS	29822	31521	33935	43528	46242	61756	64773	78508	81490	87323

TABLE 37

ANNUAL CONSUMPTION OF WATER (m^3)

Concept	Average comsumption	1	2	3	4	5	6	7	8	9	10
Administration	8 $\frac{lts.day}{person}$	15	15	15	15	21	21	21	21	21	21
Production	20 $\frac{lts.day}{person}$	62	62	62	72	72	72	81	86	86	86
Rest rooms	40 $\frac{lts.day}{person}$	201	201	201	220	250	250	268	268	268	268
Housekeeping	3 $\frac{lts.day}{m^2}$	1080	1080	1080	1080	1080	1080	1080	1080	1080	1080
TOTALS		1358	1358	1358	1387	1423	1423	1450	1456	1456	1456

15.9 Company Organization.

The manpower needed for the proposed enterprise is reflected on the company's organization chart that is shown on figure 4.

Table 38 presents the manpower requirements for the first 10 years of operations.

FIGURE 4

COMPANY ORGANIZATION

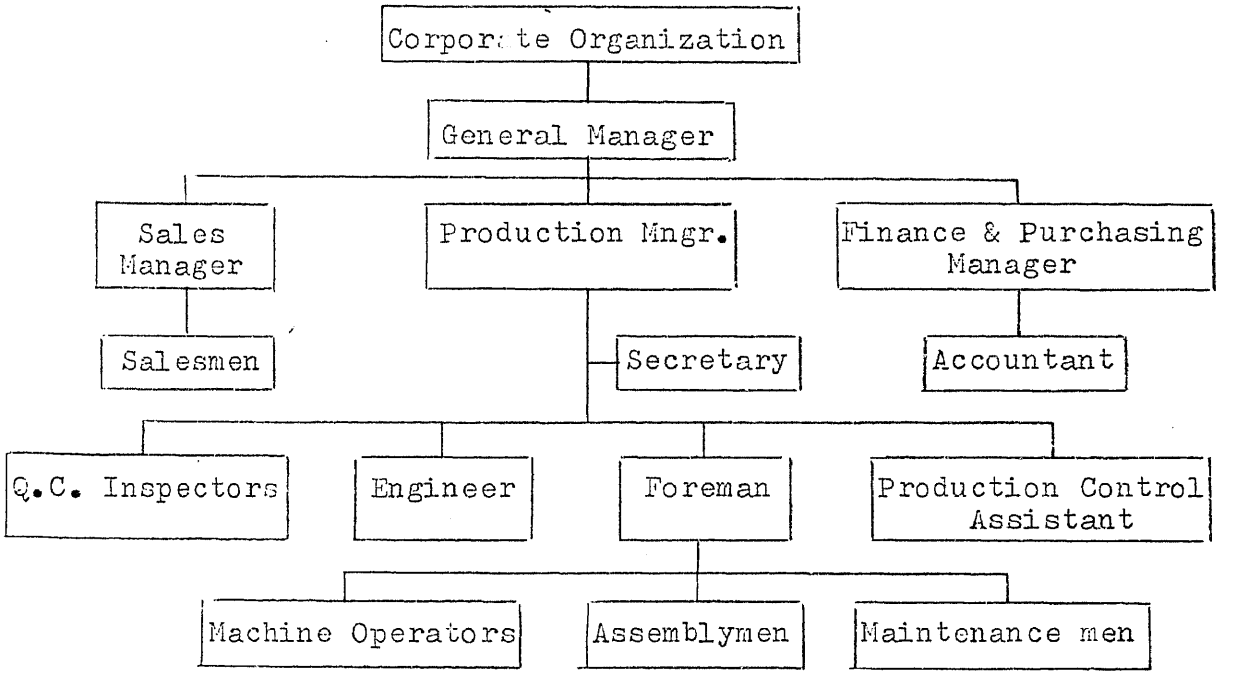


TABLE 38

SUMMARY OF MANPOWER REQUIREMENTS

Personnel	- 1	1	2	3	4	5	6	7	8	9	10
Selling and Administrative	2	8	8	8	8	11	11	11	11	11	11
Direct Labor	-	10	10	10	11	11	11	11	13	13	13
Indirect Labor	-	3	3	3	4	4	4	4	5	5	5
TOTALS	2	21	21	21	23	26	26	28	28	28	28

15.10 Duties, Responsibilities, Authorities.

The General Manager function should attain the objectives set forth by the ownership function. It should accomplish its responsibility by planning outcomes, delegating responsibilities that it does not have the time or knowledge to carry out, coordinating departmental efforts and appraising performance as a basis for control. Since this is a small enterprise, the General Manager will be in direct charge of executing the duties of the Personnel function, which are recruiting, selecting, hiring and keeping manpower at optimum levels.

The sales and marketing people should be the medium through which the company and the consumer make contact and sales are accomplished. They should conduct marketing activities striving to achieve a condition of optimum sales potential.

The Finance Manager should, in this case, carry on the responsibility of the procurement function too. He should look after the financial health of the business, as well as be in charge of the record keeping function. He should stress his contribution in terms of attention-directing and problem-solving endeavors.

The Production Manager should have two major roles. First, he should contribute to all product planning and manufacturing decisions, which should make a reasonable balance between the

market value of the product and the cost of its manufacture. Secondly, he should be responsible for making the final product. He should be assisted in his responsibility by the staff personnel which includes, quality control inspectors, Engineer, production and control assistant and a secretary.

The requirements of direct labor are presented in accordance to the nature and the number of machines needed for the processing and the type of operations to be performed.

Finally, indirect labor should be present with its important supportive services, which should provide for successful manufacturing of the electric irons.

15. 11 Schedule of Activities for the Project.

The main activities needed to carry on the project include:

A) Pre-operating Activities.-

-- Corporation inception and Organization
-- Completion and evaluation of the final feasibility study
-- Investment financing activities
-- Plant selection and rental agreement
-- Facilities installation and equipment acquisition
-- Start up activities
-- Hiring and training of manpower

B) Operating Activities.-

Which include the conventional functions of production

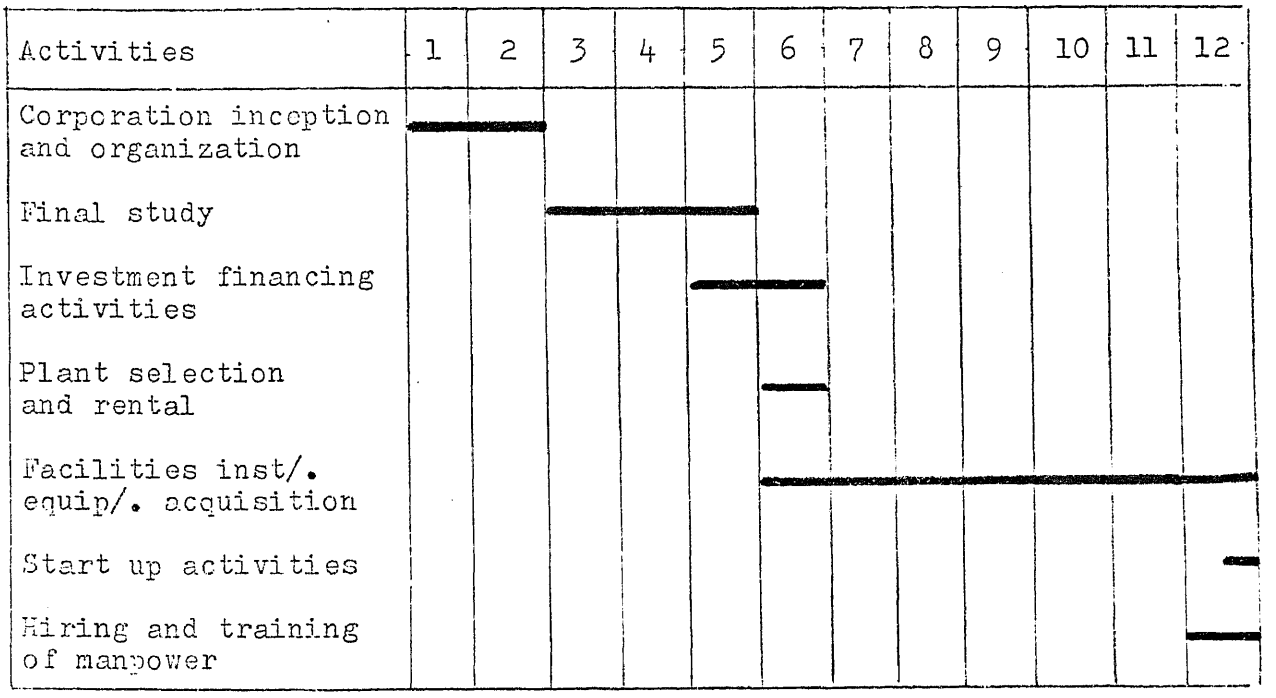
planning and control, that is to say, master scheduling, scheduling, routing, dispatching and follow up.

15.12 Summary of Pre-operating Activities.

Figure 5 presents a time chart and the scheduling of the pre-operating activities, as mentioned in the previous point.

FIGURE 5

PRE-OPERATING ACTIVITIES PROGRAM (months)



CHAPTER SIXTEEN.- FACILITIES

16.1 Plant Location.

The following criteria was considered in determining the proposed plant location:

1) Policies of industrial decentralization in Ecuador.

2) Minimization of the investment and operation costs.

In relation to the first point, it has already been mentioned the series of incentives that the Ecuadorean government grants to enterprises that are established in areas other than Quito and Guayaquil.

In considering the second point, the factors with larger weight are labor, transportation, initial investment and basic infrastructure like electric power, water, degree of labor skill and housing.

Under this criteria, the proposed enterprise would be located in the city of Cuenca.

Additional benefits to those listed in point 14.1, that the enterprise would receive, because of its location, are the following:

-- Full exemption of all taxes other than income taxes and sales taxes for the first five years.

-- Full exemption from taxes on the transfer of title to real property.

-- Full deduction of reinvestments and new investments for payment of income tax, for fixed assets and capital contribution.

16.2 Site Selection.

The proposed enterprise would occupy one of the standard industrial lots that the Cuenca's Industrial Park has already available; lot type A2 - building A.

This lot would include a total area of 1500 mts^2, (30 x50), with a one-floor pre-built area of 450 mts^2, (15 x 30). There is enough space left to support a future program of expansion approximately equal to the initially built area.

In order to minimize the initial investment, and taking advantage of the benefits that the Industrial Park offers, the proposed site and building would be rented at a fixed yearly rate. Its estimated value is presented in the analysis of point 17.6.3.

16.3 Plant Layout.

The proposed plant layout is shown in figure 6. It is basically a product-type layout, and it has been designed keeping in mind the following objectives:

-- To provide overall simplification.
-- To minimize cost of materials handling.
-- To provide high work-in-process turnover.
-- To provide effective space utilization.

-- To provide for worker convenience, and promote job satisfaction and safety.

-- To avoid unnecessary capital investment.

-- To stimulate effective labor utilization.

The general area distribution of the layout is presented in table 39. The detailed layout of the processing area is shown in figure 7.

TABLE 39

PLANT LAYOUT AREA DISTRIBUTION

	mts.^{2}
1) Receiving area	30
2) Parts and raw materials storage	45
3) Processing area	163
4) Repair and maintenance shop	24
5) Locker room, rest rooms	30
6) Production control area	18
7) Finished goods storage and shipping area.	50
8) Administrative offices	90
TOTAL AREA	450

16.4 Materials Handling.

Because of the limited volume of production, the short distances between the different working stations, and the nature and weight of raw materials and parts, it is estimated that the

FIGURE 6

PLANT LAYOUT

Scale : 1 cm. --- 2 mts.

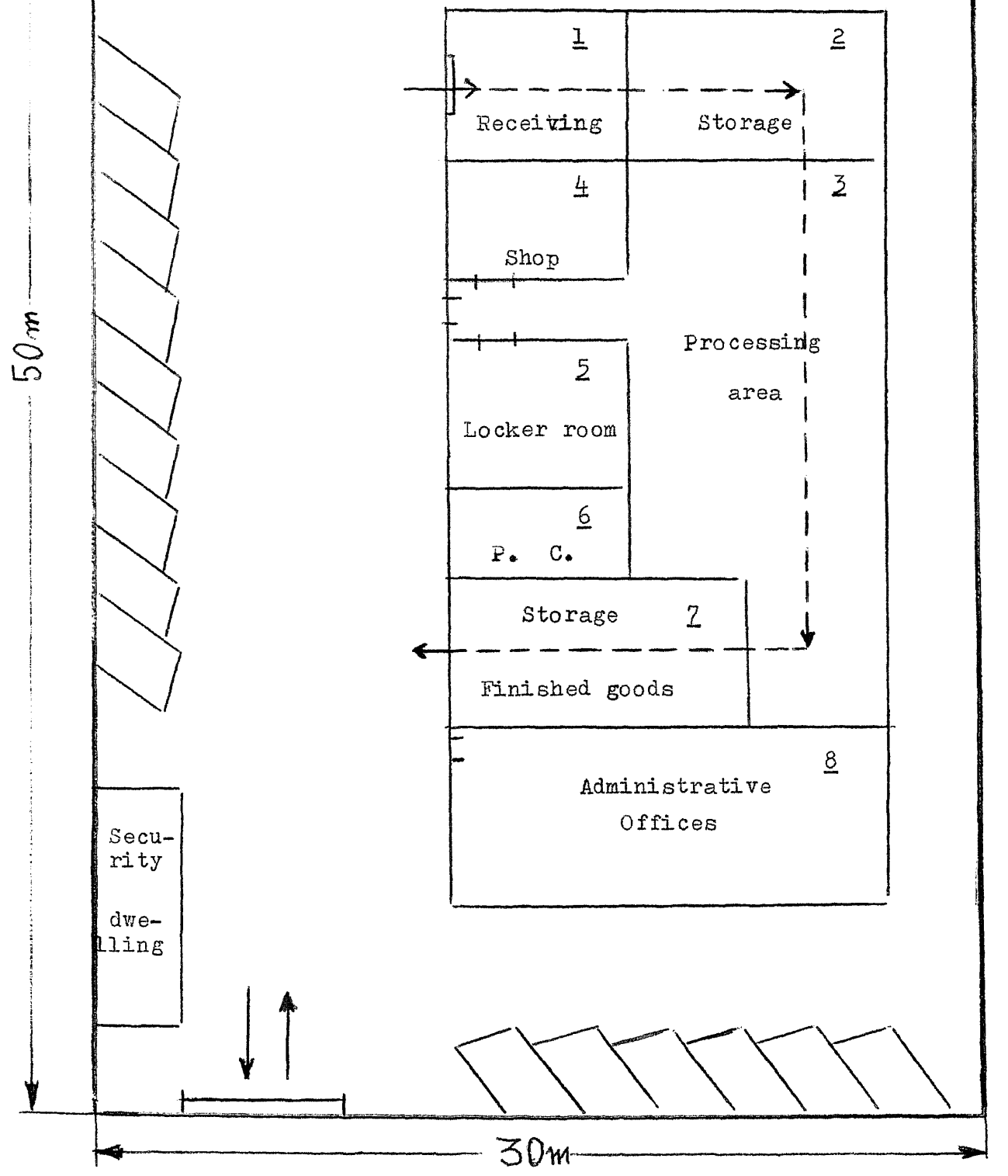
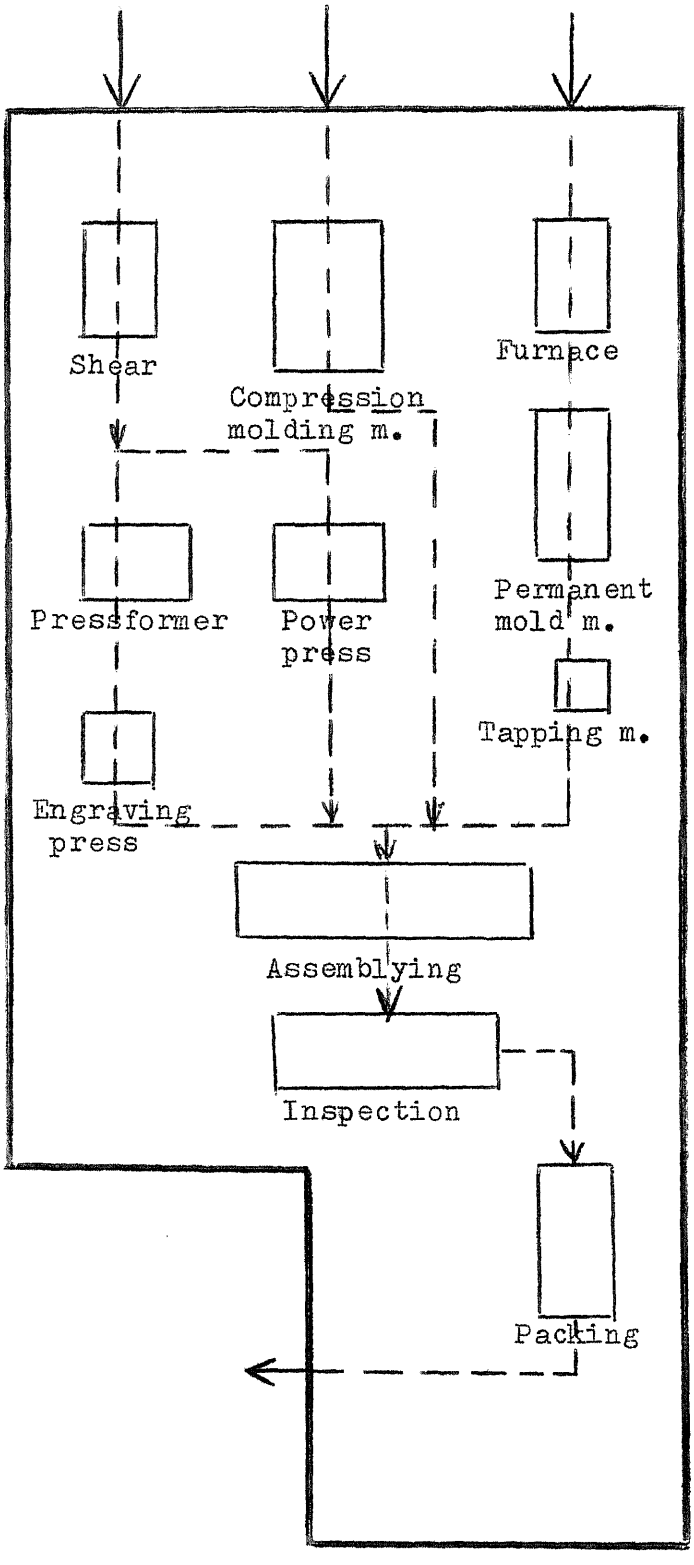


FIGURE 7

PROCESSING AREA LAYOUT

Scale : 1 cm --- 1 mt.



equipment needed for materials handling is the following:

-- Two hydraulic lift trucks - 2 ton capacity

-- Two 2-wheel hand trucks

-- Two woodcarts

16.5 Facilities and equipment acquisition considerations.

Since the proposed enterprise would operate in one of the standard buildings of Cuenca's Industrial Park, activities left to be done in terms of plant engineering are:

-- Equipment purchasing

-- Basic utilities installations

-- Equipment afixing

-- Fire protection and security installations.

Because of the priority status of the present project, it is estimated that a period of 6 months will be needed to carry on all the equipment importing procedures and its final installation.

CHAPTER SEVENTEEN.-

ECONOMIC AND FINANCIAL EVALUATION

17.1 Debt and Equity Policies.

The proposed enterprise would follow the conventional financing schemes taht are provided by the Ecuadorean financing corporations for these type of projects. Accordingly, it is estimated the enterprise could be entitled for a long term loan up to 70% of the required initial investment, for the financing of all fixed assts, including installation expenses.

From point 17.3 it can be seen that the total investment in this respect amounts to almost US$ 150,000, therefore the long term loan the enterprise could obtain is equal to US$ 105,000.

From point 14.2, it follows that the company's inception capital, in turn, would be US$ 200,000.

17.2 Investment Program Analysis.

The materialization of the project requires an investment that can be best analyzed when considering it as being composed of the two following parts:

-- Fixed investment, and

-- Working capital.

17.3 Fixed Investment.

It comprises all items that are not subject of transactions during the normal business cycle, but serve to program,

carry on and support it, including certain intangibles.

The present study includes within this category, the following:

-- Corporation inception and organization
-- Feasibility studies
-- Consulting and specialized technical assistance
-- Equipment
-- Equipment installation
-- Office equipment
-- Auxiliary installations
-- Monitoring and Supervising of installations
-- Pre-operating expenses
-- Pre-operating interests
-- Unforeseen expenses.

It should be noted that land and buildings are not included in the foregoing list, because the proposed enterprise would operate in a rented plant. The corresponding expenses will be taken into account in the analysis of the regular business cycle.

17.3.1 Corporation Inception and Organization.- This item concerns to all the legal duties, lawyer's fees and notarial expenses needed for the legal recognition of the company. It is estimted this investment will amount to US$ 1,200.

17.3.2 Feasibility Studies.- The elaboration of the project's final details and engineering specifications will

involve an investment of approximately US$ 4000.

17.3.3 Consulting and Specialized Technical Assistance.- This account includes the contracting of transfer of technology, as well as expenses to be paid to experts and technicians who will assist in the plant's implementation phase. It is estimated this will amount to about US$ 6,000.

17.3.4 Equipment.- Analysis of the investment in equipment is presented using the fixed price method, based on valid price quotations received during the period of elaboration of the present study - 1977. This method was selected due to the constant variation in prices both for machinery as well as for raw materials.

Price quotations were obtained from suppliers' direct quotations, from information available in specialized publications, and from information provided by people who have experience in similar acquisitions. Table 40 shows FOB and CIF prices for the equipment needed. The CIF price is computed as an average 1.25 times the corresponding FOB prices.

17.3.5 Equipment Installation.- The conventional estimate for this item is about 10% of the equipment cost. In this case it will amount to approximately US$ 12,000.

TABLE 40

EQUIPMENT INVESTMENT (US$)

Equipment	Years		
	1	3	6
A) PROCESSING:			
-- Compression molding press	10000		
-- Electric furnace	8000		
-- Permanent mold machine	9000		
-- Tapping machine	2000		
-- Square shear	3000		
-- Hydraulic pressformer	10000		
-- Power press	6000		
-- Engraving press	1500		
SUBTOTAL PROCESSING	49500		
B) TOOLING:			
-- Compression mold	9500		10500
-- Permanent-mold die	9000		
-- Progressive dies (3)	10000	3500	4000
-- Engraving die	2500		
-- Assembly fixture and jigs	1500		500
SUBTOTAL TOOLING	32500	3500	15000
C) Q. C. and MAINTENANCE:			
-- Iron testers	4000		
-- Drill press	1000		
-- Scale, emery, air compressor	4700		
-- Various tools	2300		2000
SUBTOTAL Q.C. and MAINTENANCE	12000		2000

TABLE 40 - continued -

Equipment	Years		
	1	3	6
D) MATERIALS HANDLING:			
-- Hydraulic lift hand trucks	1000		1000
-- 2-wheel hand trucks	200		
-- Wood carts	200		
SUBTOTAL MATERIALS HANDLING	1400		1000
TOTAL INVESTMENT FOB:	95400	3500	18000
Total Investment CIF:	119250	4375	22500

17.3.6 Office Equipment.- This account involves an investment of approximately US$ 300 per person in the administrative offices. It amounts to US$ 3000.

17.3.7 Auxiliary Installations.- Table 41 shows details of this investment.

17.3.8 Pre-operating Expenses.- This refers to expenses required to cover administrative costs prior to production; the hiring and training of personnel; materials needed for it; and miscellaneous auxiliary expenses. Table 42 details them.

17.3.9 Pre-operating Interest.- Is that interest accrued by the long term loan used in the initial investment. It amounts to US$ 6300, corresponding to 6 months pre-operating period.

TABLE 41

AUXILIARY INSTALLATIONS

Item	Value. US$
A) Electric Installation:	
-- Substation 100 kVA	7600
-- Control board	2000
-- Office wiring	200
-- Plant wiring	300
-- Light bulbs	100
SUBTOTAL	10200
B) Air and Water Installation:	
-- Air piping and equipment	3600
-- Water tank	600
-- Water pumps and piping	1000
SUBTOTAL	5200
TOTAL	15400

TABLE 42

PRE-OPERATING EXPENSES

Item	Value US$
Administrative salaries	14000
Hiring and training	3000
Materials and Miscellaneous	3000
TOTAL	20000

17.3.10 Unforeseen Expenses.- It is computed as being equal to 5% of the total initial investment. This account would cover unforeseen expense situations and will give a larger marginal safety for the project's economical evaluation.

17.3.11 Summary of the Fixed Investment Program.- It is shown in table 43.

TABLE 43

SUMMARY OF THE FIXED INVESTMENT PROGRAM (US$)

Concept	Years		
	1	3	6
Corporation Inception and organization	1200		
Final studies	4000		
Specialized assistance	6000		
Equipment total	120000	4375	22500
Equipment installation	12000		
Office equipment	3000		
Auxilliary installations	15400		
Pre-operating expenses	20000		
Pre-operating interests	6300		
Unforeseen expenses	9395		
TOTAL INVESTMENT	197,295	4375	22500

17.4 Working Capital.

It refers to the enterprise's investment in short-term assets that flow through the normal business cycle. In the present analysis working capital is considered in terms of:

-- National Materials inventory
-- Imported materials inventory
-- Work-in-process inventory
-- Finished goods inventory
-- The cash position.

These inventory accounts were obtained from the costs of operations analysis, and the summary of their values can be seen on table 44.

17.4.1 National materials inventory.- It was computed on the basis of the materials needed to support the plant one-month operation period.

17.4.2 Imported Materials Inventory.- It is the equivalent to four months supply, because the purchasing costs are higher and the delivery time longer.

17.4.3 Work-in-Process Inventory.- It is estimated to be equal to the variable costs corresponding to half of a production period of 15 days.

17.4.4 Finished Goods Inventory.- It is assumed that sales will be evaluated in terms of monthly cycles, and from this, the

finished goods average inventory is equivalent to the variable costs incurred during one month of operations.

17.4.5 The Cash Position.- It is computed as being equal to the total costs of labor, supplies, maintenance and repair, and administrative expenses for a period of 15 days.

17.5 Operating Budgets.

The proposed enterprise throughout its operating cycles will have two basic types of budgets:

-- The expenses budget

-- The revenues budget

17.6 Expenses Budget.

Expenses incurred during operations are classified in four groups:

-- Operations variable costs

-- Operations fixed costs

-- Investment fixed costs

-- General expenses.

17.6.1 Operations Variable Costs.- Are those that vary with the volume of production. These include:

A) Raw materials and parts.- Table 45 shows each item's unit cost, and table 46 shows the summary of annual costs for this account.

B) Labor costs.- Table 47 presents the average monthly salaries of direct and indirect labor. From this, table 48 is computed,

TABLE 44

WORKING CAPITAL SUMMARY (US$)

Concept	YEARS									
	1	2	3	4	5	6	7	8	9	10
National Materials Inventory	5534	5958	6383	8967	9481	12412	13101	16430	17251	20976
Imported Materials Inventory	80073	86223	92372	129098	137191	179606	189572	237749	249624	303522
Work-in Process Inventory	7770	8279	8789	11695	12636	16176	17135	21201	22184	26646
Finished Goods Inventory	31513	33579	35646	48526	51246	65604	69493	85982	89971	108065
Cash	4431	4433	4435	4709	5166	5228	5497	5657	5660	5665
TOTAL	129321	138473	147626	203266	215720	279027	294799	367019	384691	464875

which shows a summary of annual costs of labor.

C) Supplies.- These include electric power, water, and lubricants.

- Electric power was evaluated applying Cuenca's current rates, US$ 0.014 per kw.hr. Electricity usage for items other than machinery, like lighting, maintenance equipment, etc., was estimated to have an annual average consumption equal to 50% of that of the production machinery.
- Water was evaluated applying the ongoing rate of US$ 0.012 per cubic meter.
- Lubricants were computed at a cost of US$ 0.50 per liter. The estimate for the annual average consumption is 80 lts.

Table 49 depicts a summary of annual supplies costs.

D) Maintenance and Repair.- Because of the nature of the process and the equipment characteristics, this cost is estimated to be about 0.6% of the equipment total cost.

E) Licensing Fee.- It is assumed that the proposed enterprise will obtain a license agreement from a foreign manufacturer of electric irons. This cost is estimated to be equivalent to 3% the sales value, for each year.

TABLE 45

RAW MATERIALS AND PARTS COSTS

Item	Part	Cost per ton US$	Weight grms	Unit cost US$
1	Line cord	5625	128.0	0.720
2	Sleeve	66000	1.5	0.100
3	Wire connector	23000	2.0	0.046
4	Strain relief sleeve	14350	4.0	0.057
5	Handle	3150	261.0	0.822
6	Lamination	350	86.0	0.030
7	screw	2400	4.0	0.010
8	Shell	6880	85.0	0.584
9	Nameplate	2200	4.0	0.009
10	Screw	2400	4.5	0.011
11	Soleplate	3460	410.0	1.418
12	Heating element	43500	22.0	0.957
13	Wire ceramic	87500	8.0	0.700
14	Insulator	3520	1.0	0.004
15	Thermostat	33300	30.0	1.000
16	Screw	2400	5.1	0.012
17	Cap - 1	6000	0.1	0.001
18	Screw	2400	1.0	0.003
19	Label	10000	0.2	0.002
20	Screw	2400	2.5	0.006
21	Cap - 2	6000	0.1	0.001
22	Cardboard box	3570	140.0	0.500
		TOTALS	1200.0	6.993

TABLE 46

SUMMARY OF ANNUAL COSTS OF PARTS AND RAW MATERIALS

(US$)

MATERIALS	YEARS									
	1	2	3	4	5	6	7	8	9	10
National	66406	71506	76606	107064	113776	148951	157216	197171	207019	251718
Imported	240221	258669	277117	387296	411574	538819	568718	713249	748873	910568
TOTAL	306627	330175	353724	494360	525350	687771	725934	910420	955892	1162286

TABLE 47

AVERAGE MONTHLY SALARIES. (US$)

Personnel	First Shift	Second Shift	Third Shift
A) DIRECT LABOR:			
Machine operators	200	225	250
Assembly men	160	180	200
B) INDIRECT LABOR:			
Foreman	240	270	300
Q.C. Inspectors	200	225	250
Maintenance men	200	225	250

TABLE 49

SUMMARY OF SUPPLIES COSTS. (US$)

Year	Lubricants	Water	Electric Power		Total
			Machinery	Other	
1	40	16	417	208	681
2	40	16	441	220	717
3	40	16	475	237	768
4	40	16	609	304	969
5	40	17	647	323	1026
6	40	17	864	432	1353
7	40	17	906	453	1416
8	40	17	1099	549	1705
9	40	17	1140	570	1767
10	40	17	1222	611	1890

TABLE 48

SUMMARY OF ANNUAL COST OF LABOR.* (US$)

Personnel	Years									
	1	2	3	4	5	6	7	8	9	10
A) DIRECT LABOR:										
Machine operators	28800	28800	28800	28800	28800	28800	32400	32400	32400	32400
Assemblymen	5760	5760	5760	85640	8640	8640	11520	11520	11520	11520
SUBTOTAL	34560	34560	34560	37440	37440	37440	43920	43920	43920	43920
B) INDIRECT LABOR:										
Foreman	4320	4320	4320	4320	4320	4320	4320	4320	4320	4320
Q.C. Inspectors	3600	3600	3600	7200	7200	7200	7200	10800	10800	10800
Maintenance man	3600	3600	3600	3600	3600	3600	3600	3600	3600	3600
SUBTOTAL	11520	11520	11520	15120	15120	15120	15120	18720	18720	18720
TOTAL	46080	46080	46080	52560	52560	52560	59040	62640	62640	62640

* It includes, 13th., 14th., 15th-month salaries and other fringe benefits. About 50% extra.

17.6.2 Operations Fixed Costs.- This account involves the following:

-- Costs incurred because of the need to coordinate certain services in the plant like, medical services, catering sevices, social services. The estimate is 4% of labor costs.

-- Plant insurance and rent. It amounts to about 1% of the fixed investment, per year.

17.6.3 Investment Fixed Costs.- These are due to the fixed investment and therefore tend to remain constant. In the present study there are two types considered:

-- Depreciation, and

-- Amortization.

Fixed assets depreciation, along with intangible assets amortization, represent costs that are included in computing the operating costs budget. Table 50 shows the corresponding values according to the ongoing rates validated in Ecuador.

17.6.4 General Expenses.- Are those incurred in order to sell the product, keep the enterprise in a competitive situation, and maintain a profitable business. The ones considered part of this project are the following:

-- Administrative expenses,

-- Selling expenses, and

-- Financing expenses.

TABLE 50

INVESTMENT FIXED COSTS. (US$)

Concept	Rate %	Years 1	2	3	4	5	6	7	8	9	10
A) DEPRECIATION:											
Equipment	10	12000	12000	12000	12400	12400	12400	14700	14700	14700	14700
Office equip/.	10	300	300	300	300	300	300	300	300	300	300
Auxilliary Installations	5	770	770	770	770	770	770	770	770	770	770
SUBTOTAL		13070	13070	13070	13470	13470	13470	15770	15770	15770	15770
B) AMORTIZATION:											
Organization	10	120	120	120	120	120	120	120	120	120	120
Final studies	5	200	200	200	200	200	200	200	200	200	200
Specialized Assitance	5	300	300	300	300	300	300	300	300	300	300
Equipment Installation	5	600	600	600	600	600	600	600	600	600	600
Pre-operating expenses	5	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
Interests	5	315	315	315	315	315	315	315	315	315	315
Unforeseen expenses	5	500	500	500	500	500	500	500	500	500	500
SUBTOTAL		3035	3035	3035	3035	3035	3035	3035	3035	3035	3035
TOTAL		16105	16105	16105	16505	16505	16505	18805	18805	18805	18805

A) Administrative expenses.- Table 51 presents monthly salaries of administrative personnel. Table 52 shows the summary of annual expenses regarding this account.

B) Selling expenses.- These include advertisement and freight charges. Advertisement is budgeted as equivalent to 5% of sales. Freight charges correspond to an average of US$ 22 per ton. Table 53 summarizes annual selling expenses.

C) Financing expenses.- The interest rate on the long term loan is equal to 12% of the unpaid principal balance. The loan will be amortized since the first year of operations and over the 10 year period. Table 54 details the financing expenses and their computation.

TABLE 51

MONTHLY SALARIES OF ADMINISTRATIVE AND SALES PERSONNEL

Personnel	US$
General Manager	800
Sales manager	640
Production manager	640
Finance manager	640
Salesmas	500
Accountant	500
Engineer	500
Secretary	120
Production control assistant	300

17.7 General Summary of the Expenses Budget.

It is presented in table 55.

TABLE 52

SUMMARY OF ANNUAL COSTS OF ADMINISTRATIVE AND SELLING PERSONNEL (US$)

Personnel	Years										
	- 1	1	2	3	4	5	6	7	8	9	10
General Mngr.	9600	9600	9600	9600	9600	9600	9600	9600	9600	9600	9600
Sales Mngr.		7680	7680	7680	7680	7680	7680	7680	7680	7680	7680
Production M/.	3840	7680	7680	7680	7680	7680	7680	7680	7680	7680	7680
Finance Mngr.		7680	7680	7680	7680	7680	7680	7680	7680	7680	7680
Salesmen (2)		12000	12000	12000	12000	12000	12000	12000	12000	12000	12000
Accountant		6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
Engineer						6000	6000	6000	6000	6000	6000
Pro/. Assist/.						3600	3600	3600	3600	3600	3600
Secretary # 1		1440	1440	1440	1440	1440	1440	1440	1440	1440	1440
Secretary # 2						1440	1440	1440	1440	1440	1440
TOTALS	13440	52080	52080	52080	52080	63120	63120	63120	63120	63120	63120

TABLE 53

SELLING EXPENSES. (US$)

Year	Advertisement	Freight charges.		Total
		Weight (tons)	Value	
1	26282	50.8	1117	27400
2	28300	54.7	1203	29503
3	30319	58.6	1290	31609
4	42373	82.0	1802	44175
5	45030	87.0	1915	46945
6	58951	114.0	2507	61458
7	62223	120.3	2646	64869
8	78036	150.8	3319	81355
9	81934	158.4	3484	85418
10	99124	192.6	4237	103861

TABLE 54

FINANCING EXPENSES. (US$)

Year	Interest due	Money owed at year-end	Year-end payment	Principal paid	Money owed after payment
-1	6300.00				105000.00
1	12600.00	11700.00	18582.90	5982.90	99017.10
2	11882.05	110899.15	18852.90	6700.85	92316.25
3	11077.95	103394.20	18582.90	7504.95	84811.30
4	10177.36	94988.66	18582.90	8405.54	76405.76
5	9168.69	85574.45	18582.90	9414.21	66991.51
6	8038.99	75030.54	18582.90	10543.91	56447.64
7	6773.72	63221.35	18582.90	11809.18	44638.45
8	5356.61	49995.07	18582.90	13226.29	31412.17
9	3769.46	35181.63	18582.90	14813.44	16598.73
10	1991.85	18590.57	18582.90	16591.05	7.67

TABLE 55

GENERAL SUMMARY OF THE EXPENSES BUDGET (US$)

Item	Years									
	1	2	3	4	5	6	7	8	9	10
A) OPERATIONS VARIABLE COSTS										
-Materials	306628	330176	353724	494361	525350	687771	725935	910420	955892	1162287
-Labor	46080	46080	46080	52560	52560	52560	59040	62640	62640	62640
-Supplies	681	717	768	969	1026	1353	1416	1705	1767	1890
-Maintenance	9000	9000	9000	9000	9000	10200	10200	10200	10200	10200
-License fee	15769	16980	18191	25424	27018	35371	37333	46821	49160	59774
SUBTOTAL	378158	402953	427763	582314	614954	787255	833924	1031786	1079659	1296791
B) OPERATIONS FIXED COSTS:										
-Services	1843	1843	1843	2102	2102	2102	2361	2505	2505	2505
-Insurance and rent	1300	1300	1300	1300	1300	1300	1300	1300	1300	1300
SUBTOTAL	3143	3143	3143	3402	3402	3402	3661	3805	3805	3805
C) INVESTMENT FIXED COSTS:										
-Depreciation & Amortization	16105	16105	16105	16505	16505	16505	18805	18805	18805	18805
D) GENERAL EXPENSES:										
-Administrative	52080	52080	52080	52080	63120	63120	63120	63120	63120	63120
-Selling	27400	29503	31609	44175	46945	61458	64869	81355	85418	103861
-Financing	12600	11882	11077	10177	9168	8038	6773	5356	3769	1991
SUBTOTAL	92080	93465	94766	106432	119233	132616	134762	149831	152307	168972
T O T A L	489486	515666	541777	708653	754094	939778	991152	1204227	1254576	1488373

17.8 Revenues Budget.

17.8.1 Selling Price.- It has been determined to be US$ 12.00 per electric iron. Its main consideration is foreign competition conditions. It is considerably below the current selling price of foreign electric irons; inexpensive enough to attract customers within the whole range of income brackets.

Table 56 shows the expected revenues at this selling price.

17.8.2 Unit Costs Evolution.- Table 57 presents it for the 10 year evaluation period.

TABLE 56

REVENUES BUDGET

Year	No. Units	Value US$
1	43804	525648
2	47168	566016
3	50532	606384
4	70623	847476
5	75050	900600
6	98253	1179036
7	103705	1244460
8	130060	1560720
9	136556	1638672
10	166041	1992492

TABLE 57

EVOLUTION OF THE UNIT COSTS. (US$)

Concept	Years									
	1	2	3	4	5	6	7	8	9	10
1) Operations Variable costs	378158	402953	427763	582314	614954	787255	833924	1031786	1079659	1296791
2) Operations Fixed costs	3143	3143	3143	3402	3402	3402	3661	3805	3805	3805
3) Investment fixed costs	16105	16105	16105	16505	16505	16505	18805	18805	18805	18805
4) General Expenses	92080	93465	94766	106432	119233	132616	134762	149831	152307	168972
TOTAL	489486	515666	541777	708653	754094	939778	991152	1204227	1254576	1448373
No. Units	43804	47168	50532	70623	75050	98253	103705	130060	136556	166041
UNIT COST	11.17	10.93	10.72	10.03	10.04	9.56	9.55	9.25	9.18	8.72

17.9 Economic and Financial Analysis.

17.9.1 Profit and Loss Statement.- Table 58.

17.9.2 Sources and Uses of Funds.- Table 59.

17.9.3 Return on Investment.- Table 60.

17.9.4 Break Even Point.- From the profit and loss statement,

Let: m slope.

Pn Gross profit year n.

Sn Sales year n.

P^* Break even point profits

S^* Break even point sales

Then: $m = \frac{P_2 - P_1}{S_2 - S_1} = \frac{50350 - 36162}{566016 - 525648} = 0.3515$

Interception: $P^* - P_1 = m (S^* - S_1)$

by definition: $P^* = 0$, then: $S^* = S_1 - \frac{P_1}{m}$

$$S^* \quad 525648 - \frac{36162}{0.3515} = 422768$$

Break even sales point = US$ 422,768.00

The Break even point is shown in figure 8, too.

17.9.5 Payback Period.- Table 61 and figure 9.

TABLE 58

PROFIT AND LOSS STATEMENT (US$)

Concept	Years									
	1	2	3	4	5	6	7	8	9	10
Total sales	525648	566016	606384	847476	900600	1179036	1244460	1560720	1638672	1992492
- Total costs	489486	515666	541777	708653	754094	939778	991152	1204227	1254576	1488373
GROSS PROFIT	36162	50350	64607	138823	146506	239258	253308	356493	384096	504119
- 15% Labor bonus	5424	7552	9691	20823	21976	35888	37996	53473	57614	75617
TAXABLE INCOME	30738	42798	54916	118000	124530	203370	215312	303020	326482	428502
- Income tax (30%)	9222	12839	16474	35400	37359	61011	64593	90906	97944	128550
NET PROFIT	21516	29959	38442	82600	87171	142359	150719	212114	228538	299952
Depreciation & Amortization	16105	16105	16105	16505	16505	16505	18805	18805	18805	18805
SOURCES FROM OPERATIONS	37621	46064	54547	99105	103676	158864	169524	230919	247343	318757

TABLE 59

SOURCES AND USES OF FUNDS (US$)

Concept	Years										
	- 1	1	2	3	4	5	6	7	8	9	10
SOURCES:											
-Capital	92295	97683									
-Long term debt	105000										
SUBTOTAL	197295										
-Sources from Operations		37621	46064	54547	99105	103676	158864	169524	230919	247343	318757
-Last year's balance				30211	63725	98785	180593	243107	385050	530523	745381
TOTAL	197295	135304	46064	84758	162830	202461	339457	412631	615969	777866	1064138
USES:											
-Fixed Assets increment	150000			4375			22500				
-Deferred Assets Inves/.	47295										
-Working capi/. increment		129321*	9152	9153	55640	12454	63307	15772	72220	17672	80184
-L/T debt payments		5893	6701	7505	8405	9414	10543	11809	13226	14813	16591
TOTAL	197295	135304	15853	21033	64045	21868	96350	27581	85446	32485	96775
B A L A N C E			30211	63725	98785	180593	243107	385050	530523	745381	967363

* From table 44.

TABLE 60

RETURN ON INVESTMENT

Concept	YEARS											
	- 1	1	2	3	4	5	6	7	8	9	10	TOTAL
Capital	92295	97683										
L/T debt payment		5983	6701	7505	8405	9414	10543	11809	13226	14813	16591	
Total capital	92295	103666	6701	7505	8405	9414	10543	11809	13226	14813	16591	
Sources from ope.		37621	46064	54547	99105	103676	158864	169524	230919	247343	318757	
FIRST ITERATION:												
Discount factor35%	1.0	0.748	0.549	0.406	0.311	0.223	0.165	0.122	0.091	0.067	0.050	
PV of Capital 1	92295	76816	3678	3047	2613	2099	1739	1440	1203	992	833	186759
PV of sources 2		27877	25289	22146	30821	23119	26212	20681	21013	16571	15397	229671
EXCESS 2 - 1												+42912
SECOND ITERATION:												
Discount fac. 50%	1.0	0.667	0.444	0.296	0.197	0.132	0.088	0.059	0.039	0.026	0.017	
PV of capital 1	92295	69145	2975	2221	1655	1242	927	697	515	385	282	172343
PV of sources 2		25093	20452	16146	19523	13685	13980	10002	9005	6430	5418	139738
EXCESS 2 - 1												-32605

Interpolation:

Estimated rate of return: $35\% + \frac{42912}{(42912 + 32605)} (50\% - 35\%) = 43.5\%$ ROI

FIGURE 8

BREAK EVEN POINT

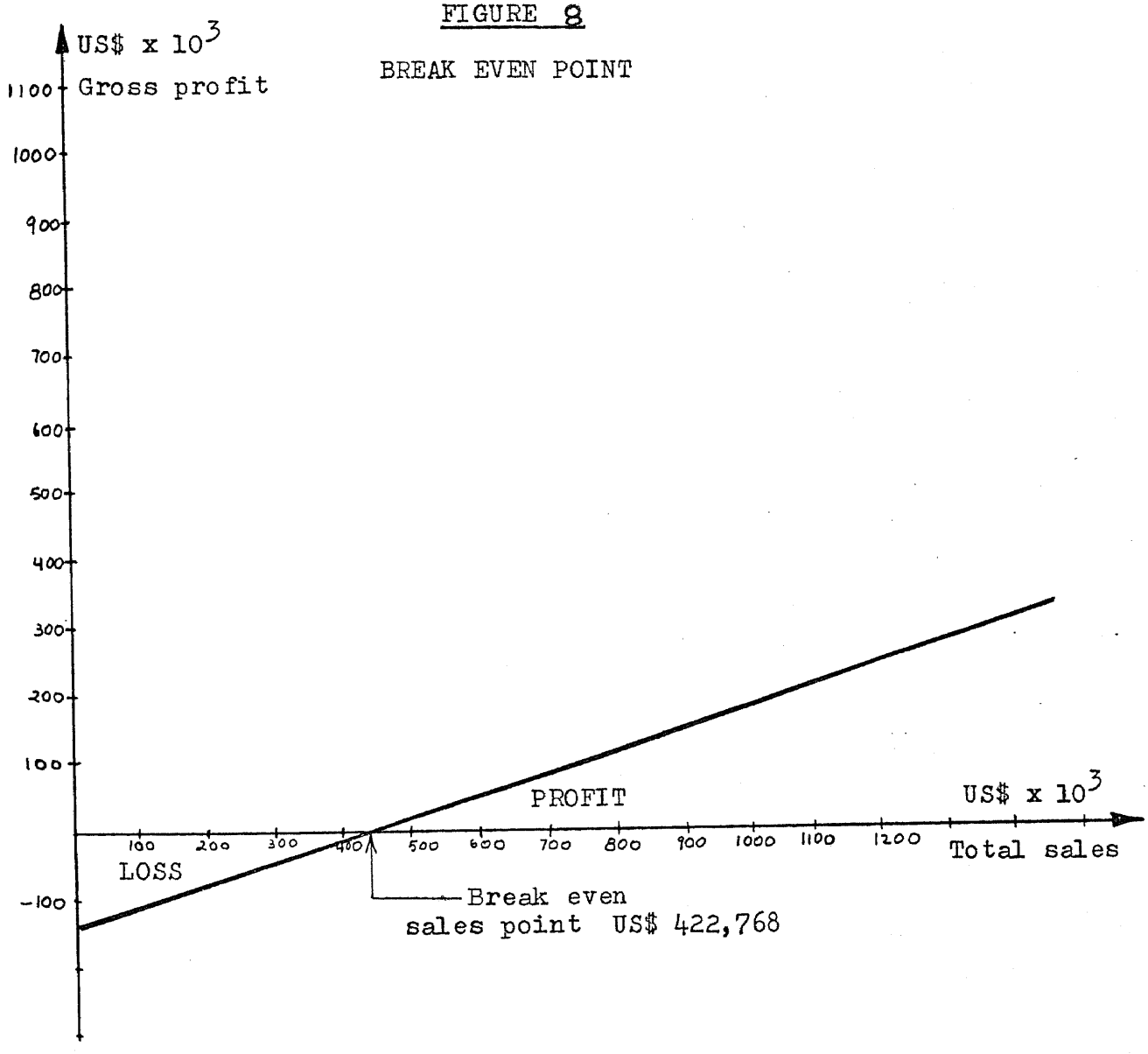


TABLE 61

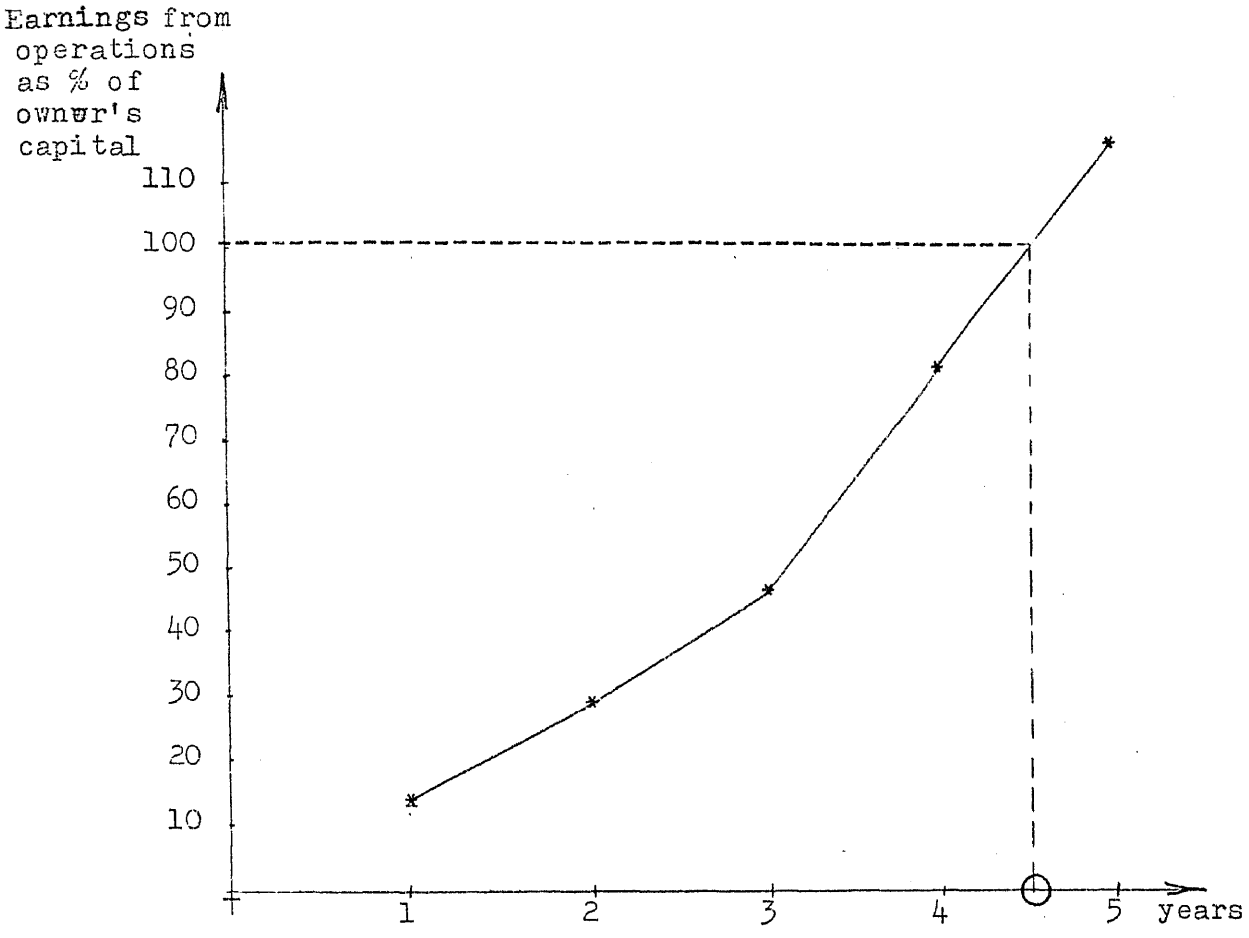
PAYBACK PERIOD

Year	Accumulated Investment (US$)	Accumulated sources from operations	Sources from operations as % of owner's capital
- 1	197295		
1	294978	37621	12.75
2	294978	83685	28.37
3	294978	138232	46.86
4	294978	237337	80.46
5	294978	341013	115.60 --*
6	294978	499877	
7	294978	499877	
8	294978	900320	
9	294978	1147663	
10	294978	1466420	

* Payback period, $4\frac{1}{2}$ years.

FIGURE 8

PAYBACK PERIOD



○ Payback period, $4\frac{1}{2}$ years.

CHAPTER EIGHTEEN.- SOCIAL EVALUATION

Table 62 presents various indices which depict the relative social benefit that the proposed enterprise would eventually bring to the local and national community.

18.1 Gross Value Added.

During the first year of operations the enterprise will generate a gross value added of US$ 148,381, and at the end of 10 years, US$ 2,683,171. Of this 42% will correspond to salaries, 48% to net profit, 7% to depreciation and amortization, and 3% to interest paid.

18.2 Ratio of Gross Value Added to Gross Value of Production.

The average value for the 10 year period comes out to be equal to 25.10%.

18.3 Marginal Relation Product-Capital.

Capital productivity is given by the ratio of gross value added to the cummulative capital investment. The first year of operations, this ratio is equal to 0.75, which means that for each dollar invested, 75 cents are generated in terms of value added. By the 10th year, this ratio increases to almost two dollars.

18.4 Capital Intensity.

This refers to the relative use of capital in the project,

and it is quantitatively expressed as the inverse of the capital productivity. This index represents the investment needed by the project, per unit of value added to be produced.

The first year this index is equal to 1.33, which means that 1.33 dollars must be invested in order to generate one dollar of value added. The 10th year, only 50 cents are needed to generate a value added of one dollar.

18.5 Capital Density.

This index represents the amount of capital per employee. The first year it is equal to US$ 9395 and in the 10th year, it is equal to US$ 8006.

TABLE 62

SOCIAL EVALUATION (US$)

Accounts	Years										
	1	2	3	4	5	6	7	8	9	10	Total
Salaries	98160	98160	98160	104640	115680	115680	122160	125760	125760	125760	1129920
Interest paid	12600	11882	11077	10177	9168	8038	6773	5356	3769	1991	80831
Depr. & Amorti.	16105	16105	16105	16505	16505	16505	18805	18805	18805	18805	179050
Net Profit	21516	29959	38442	82600	87171	142359	150719	212114	228538	299952	1293370
GROSS VALUE ADDED	148381	156106	169784	213922	228524	282582	298457	362035	376872	446508	2683171
Purchasing from third party	377267	409910	436600	633554	672076	896454	946003	1198685	1261800	1545984	8378333
Gross value of production	525648	566016	606384	847476	900600	1179036	1244460	1560720	1638672	1992492	11061504
% GVA/GVP	28.23	27.57	28.00	25.24	25.37	23.96	23.98	23.19	22.99	22.40	Ave. 25.1%
Cumulative total investment	197295	197295	201670	201670	201670	224170	224170	224170	224170	224170	
No. employees	21	21	21	23	26	26	28	28	28	28	
Capital Produc/.	0.75	0.79	0.84	1.06	1.13	1.26	1.33	1.61	1.68	1.99	
Capital Intens/.	1.33	1.26	1.18	0.94	0.88	0.79	0.75	0.62	0.59	0.50	
Capital Density	9395	9395	9603	8768	7756	8621	8006	8006	8006	8006	

CHAPTER NINETEEN.- CONCLUSIONS AND RECOMMENDATIONS

19.1 Conclusions.

- The establishment of an enterprise taht would manufacture electric irons in Ecuador, is quite feasible. The project offers technical and economical perspectives that are good enough to attract capital investors in order to materialize the enterprise proposal.

- The projected production targets aim to supply the potential Ecuadorean market only. An expansion of the market considerations towards the Andean Pact region, would result in even better economical projections.

- The proposed enterprise presents a good index of national integration since most of the raw materials and parts are to be procured in Ecuador.

- A major point to bear in mind while implementing the projectis, the licensing and "know-how" agreements to be arranged with a reliable and well known foreign manufacturer of electric irons.

- The establishment of the enterprise according to the parameters set forth by this study, would allow and support the development of collateral and complementary industries in Ecuador.

19.2 Recommendations.

- While negotiating the licensing and technology agreement with a foreign firm, the following should be analized too: a) possibilities of cost reductions in terms of imported raw materials and parts, b) optimization of financing terms regarding technical assistance, machinery and materials procurement.

- The scheduling of pre-operating activities should be coordinated in such a way that the starting of production would rest on solid bases.

- The concept of "Venture Management" should be explored in the final study, in order to assess the possibility of having an existing Ecuadorean manufacturer of domestic appliances, as a founding investor for the proposed enterprise.

- After the initial production stage, the enterprise should consider driving its efforts toward supplementing its product line with steam, steam/spray models of electric irons, thus broadening the market. The "Product Life Cycle" concept should be given prime importance in this respect.

- Negotiations should be started with a competent consulting firm, in order to contract the final study and the planning and implementation of the proposed plant. The consulting firm must have experience in carrying on industrial projects of this kind, in developing countries.

ANNEX A

PROPOSED PROGRAM OF PRODUCTION

Year	Total units	Automatic 80%	Standard 10%	Attempted market gain				Total proposed Production	Daily production
				Automatic		Standard			
	A	B = A x 0.8	C = A x 0.1	%	D=B x %	%	E=C x %	F= D + E	F/240
1979	151050	120840	15105	30	36252	50	7552	43804	182
1980	162652	130121	16265	30	39036	50	8132	47170	196
1981	174252	139401	17425	30	41820	50	8712	50530	210
1982	185850	148680	18585	40	59472	60	11151	70620	294
1983	197500	158000	19750	40	63200	60	11850	75050	313
1984	209052	167241	20905	50	83620	70	14633	98250	410
1985	220652	176521	22065	50	88260	70	15445	103700	432
1986	232252	185801	23225	60	111480	80	18580	130060	542
1987	243852	195081	24385	60	117048	80	19508	136550	569
1988	255449	204359	25545	70	143051	90	22990	166040	692

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