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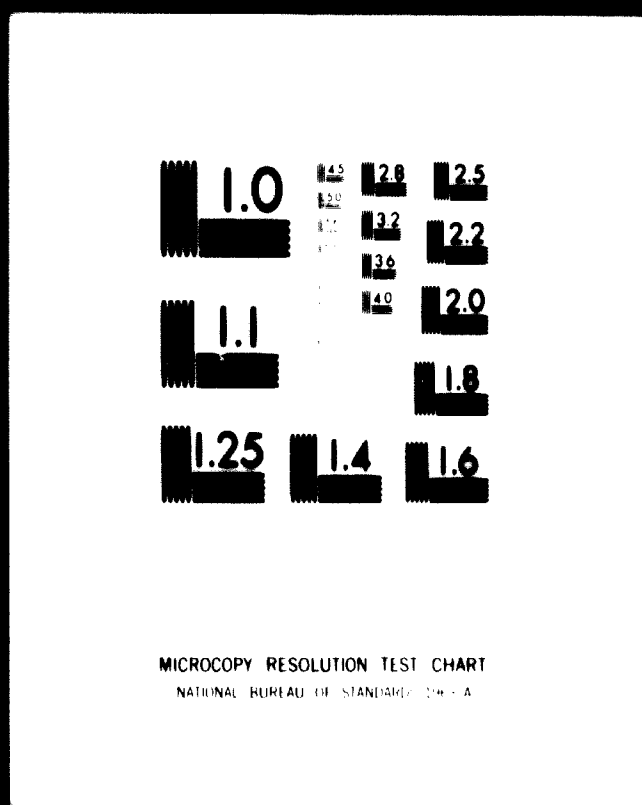
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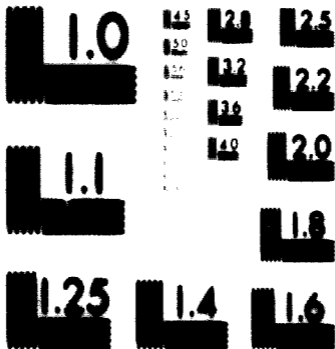
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United Nations Industrial Development Organization

THIRD ASIAN MEETING TO PROMOTE
Industrial Projects

Kuala Lumpur, Malaysia, 14-21 November 1973

Project Information Sheet

SMALL DIESEL COMBUSTION ENGINES

COUNTRY	Thailand
PROJECT	Manufacture of 5 - 8 HP Internal Diesel Combustion Engines Capacity: 10,000 units p.a. Total Investment: US\$ 2.1 million
FOREIGN CONTRIBUTION REQUIRED	Equity Loan Know-how/Licence Management Marketing

Sponsored by: The Economic Commission for Asia and the Far East (ECAFE) and the United Nations Industrial Development Organisation (UNIDO).

IMPORTANT NOTICE

The basic purpose of this meeting is to provide an Exchange or Market Place for the initiation of contacts on specific industrial projects between their proponents from the Asian countries and potential suppliers of capital, finance, equipment or know-how, as the case may be, from the industrialized countries.

This Project Information Sheet has been prepared as a basis for such contacts. Its purpose is not to present detailed information about the project but to provide the recipient with an outline sufficient to determine tentative interest in principle. Any further available information on the project will be furnished on request to interested parties at the Meeting.

Experience has shown that industrialists frequently prefer to carry out their own further investigations in detail into projects in which they are interested, but assistance from UNIDO in these matters can be rendered to the Asian country concerned on request.

This Information Sheet contains only the information supplied to UNIDO by the proponent of the Project. UNIDO can therefore take no responsibility for its accuracy.

SMALL DIESEL COMBUSTION ENGINES

I. THE PROJECT

It is proposed to establish a plant for the manufacture of small internal combustion engines with an installed capacity of 10,000 units per annum. To begin with, the production programme comprises 5 HP/2,000 rpm/4 cycle hopper cooled Diesel engines. Later on an expansion of production both of capacity to 20,000 units per annum and of the range to 5 HP engines is envisaged.

Although export opportunities may exist either to nearby countries or to markets served by the potential foreign partner, the project will mainly cover the local demand.

Government attitude

High priority is given to small and medium scale private industries in the machine manufacturing sector which will provide a basis for future expansion.

The project will contribute to the increase of employment, substitution of imports, promotion of other industrial activities in Thailand (e.g. the foundry industry), some of which are already established.

Incentives

Five years tax exemption, duty free import of machinery and equipment, reduction of import duties on raw material and spare parts, etc.

II. ECONOMIC ASPECTS

The total number of combustion engines in Thailand is estimated at 500,000 units of which 200,000 two stroke and 300,000 four stroke engines, 90% thereof belonging to the 3 to 10 HP types.

Only two stroke engines are manufactured locally at a rate of 3,000 units per annum, the main demand is covered by imports.

The import statistics show an increasing proportion of 4 stroke engines in comparison with the 2 stroke units.

The following table shows the projected demand for 10 years:

<u>Table 1 :</u>		<u>Projected Annual Demand in Units</u>					
<u>Type</u>	<u>1972</u>	<u>1973</u>	<u>1974</u>	<u>1975</u>	<u>1976</u>	<u>1981</u>	
4-stroke gasoline							
3 - 10 HP	30,000	33,000	36,000	38,500	41,000	50,000	
of which 3-4 HP	15,000	16,500	18,000	19,000	20,500	25,000	
of which 7-8 HP	7,500	8,000	9,000	9,500	10,000	12,500	
Total 3-4 HP and 7-8 HP	22,500	24,500	27,000	28,500	30,500	37,500	
Medium speed diesel							
3 - 5 HP	20,000	21,000	24,000	30,000	36,000	60,000	
of which 4-5 HP	16,000	17,000	19,000	24,000	29,000	48,000	
of which 7-8 HP	8,000	8,000	9,500	11,000	13,500	23,000	
Total 4-5 HP and 7-8 HP	24,000	25,000	28,500	35,000	42,500	71,000	

It appears that the most promising market exists for 4 to 5 HP Diesel engines with an expansion to 7 to 8 HP units.

Calculating an average between 1/3 and 1/2, the estimates for the market share of the 4-5 HP engine are as follows:

<u>Year</u>	<u>Units</u>
1972	6,700
1973	7,000
1974	8,000
1975	10,000
1976	12,000
1981	20,000

It is proposed to sell the 5 HP engine to sub-dealers at 3,500 Batha (= 170 US\$), ex factory.

Actual prices for sub-dealers are:

<u>HP</u>	<u>Batha/unit</u>
3	3,500 - 3,800
4	3,800 - 4,100
5	4,300 - 5,200

PHYSICAL ASPECTS

Location Bangkok area

Land and Buildings: 6,000sq.m. of land required

Floor Space: 4,500sq.m. (3 halls 100 x 15 m. each)

Labour Requirement 290 men

	<u>Wages</u>	
	<u>Baths P.M.</u>	<u>US\$ P.M.</u>
Operators unskilled	7,200	360
Operators skilled	16,800	840
Foremen skilled	21,000	1,050
Overseers	30,000	1,500

Raw Materials

Cast iron, high tensile bolts and nuts and profiled steel can be provided locally. A Thai-Japanese company will start production of pistons in the near future.

Value of locally available parts 435 Baths per engine

Components to be imported:

	<u>Baths/unit</u>
Valves and valveguides	100
Fuel pump with atomiser	600
Various	130
Total cost of raw material	1,265 (= US\$ 63.25)

Infrastructure

The Bangkok Area has excellent rail, roads and water transport facilities to all parts of the country.

Utilities

Electricity: 900,000 kWh/year required. Price: US\$ 0.0125 per kWh.

IV. FINANCIAL ASPECTS

<u>Composition of Investment</u>	<u>Local</u>	<u>Foreign</u>	<u>Total</u>
	<u>Currency</u>	<u>Currency</u>	
	<u>US \$</u>	<u>US \$</u>	<u>US \$</u>
Land	55,000	-	55,000
Buildings	270,000	33,000	303,000
Machinery	59,000	533,000	592,000
Traction and supervision	60,000	60,000	120,000
Licence	-	100,000	100,000
Contingencies	<u>58,000</u>	<u>94,000</u>	<u>152,000</u>
	502,000	820,000	1,322,000
Working capital (at full capacity)	<u>660,000</u>	<u>133,000</u>	<u>793,000</u>
Total	<u>1,162,000</u>	<u>953,000</u>	<u>2,115,000</u>
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A detailed financial plan has not yet been prepared and is open for negotiation.

Profitability estimate (for the 5th year of production)

	<u>US \$</u>	<u>US \$</u>
Sales revenue		1,680
Engine components	608,000	
Other material	12,000	
Energy	10,800	
Labour	326,000	
Overhead	17,400	
Administration	16,800	
Licence	10,000	
Production loss	<u>18,000</u>	
	1,019,000	
Depreciation and interest	181,000	1,200
Gross profit before tax		480
Gross profit/total investment		23.4%
Gross profit/sales		29.2%

V. OTHER RELEVANT INFORMATION

Project presented by the Applied Scientific Research Corporation of Thailand (ASRCT), 196 Pahonyothin Rd., Bangkok 9. Telephone: 791121-30. (On behalf of a domestic entrepreneur).

Legal Structure

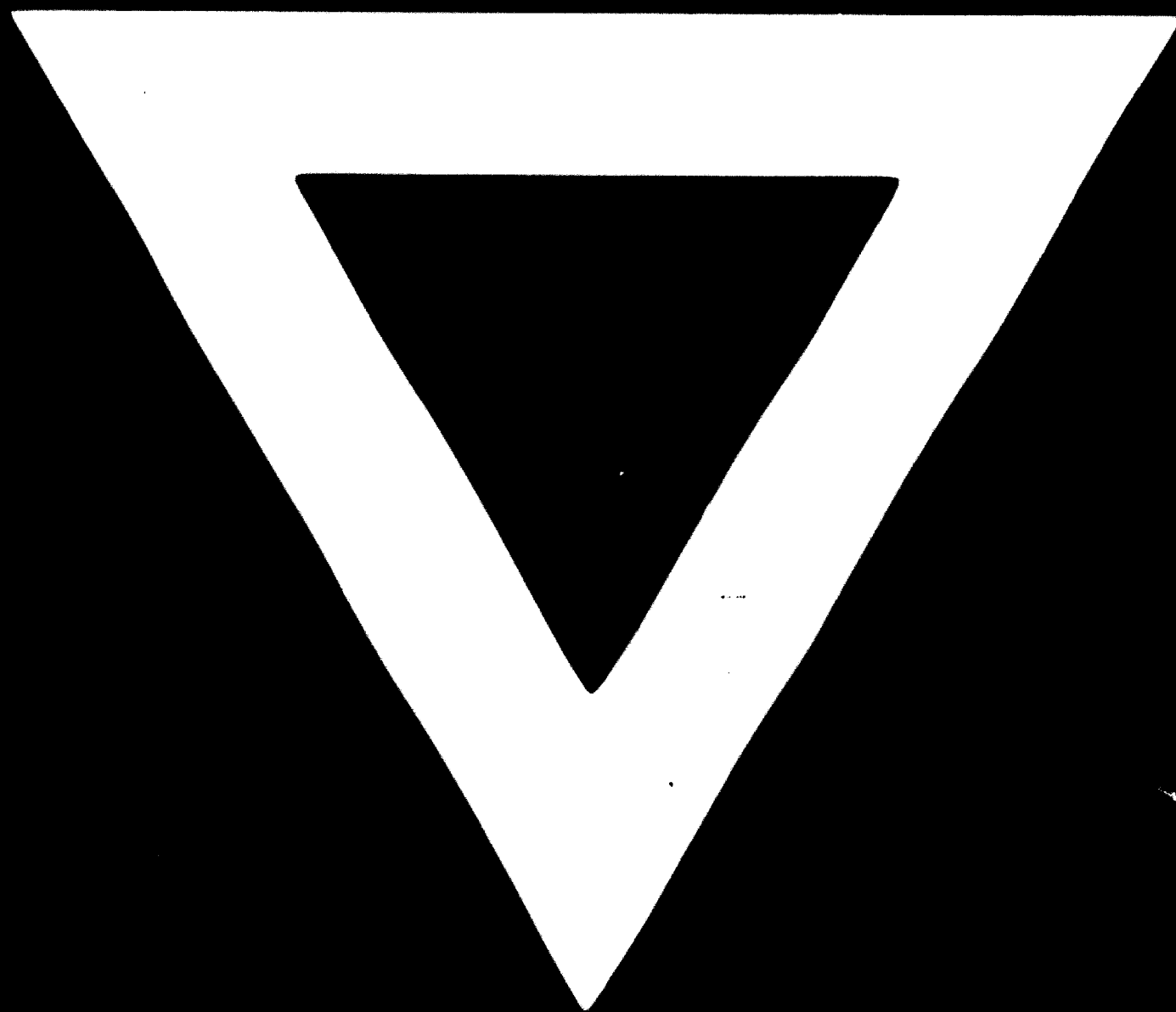
A private joint venture company will be established.

Documentation

The United Nations Industrial Development Organisation retained Berenshot - Bosboom N.V. to investigate the possibilities of the manufacture of small internal combustion engines in Thailand. The report on these investigations (dated July 1972) can be made available to interested parties at the Meeting.



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