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INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT  
INTERNATIONAL DEVELOPMENT ASSOCIATION

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MALAYSIA  
NATIONAL ELECTRICITY BOARD  
APPRAISAL OF  
PORT DICKSON AND PRAI EXPANSION PROJECT  
(FOURTH POWER PROJECT)

December 10, 1968

Public Utilities Projects Department

CURRENCY EQUIVALENTS

US\$1	=	3.00 Malaysian dollars (M\$)
M\$1	=	US\$ cents 33.33
M\$1	=	US\$333,333.33

NEB's fiscal year ends August 31

MEASURES AND EQUIVALENTS

M w	=	Megawatt	= 1,000 kilowatts (kw)
Gwh	=	Gigawatt hour	= 1,000,000 kilowatt hours
kwh	=	Kilowatt hour	= 1,000 watt hours
=	Kilovolt	= 1,000 volts	
kva	=	Kilovolt amperes	= 1,000 volt amperes
psig	=	Pounds per square inch guage	= 0.07031 kilograms per square centimeter
oF	=	Degrees Fahrenheit	= 9/5 x degrees centigrade plus 32
One mile			= 1.6093 kilometers
One square mile			= 259 hectares (ha)
Load factor			= $\frac{\text{kwh generated in year}}{\text{maximum demand in kw} \times 8760}$

ABBREVIATIONS AND ACRONYMS

NEB	=	National Electricity Board
PCR	=	Preece, Cardew & Rider, London
PRHE	=	Perak River Hydroelectric Company

MALAYSIA  
NATIONAL ELECTRICITY BOARD  
PORT DICKSON AND PRAI EXPANSION PROJECT  
(FOURTH POWER PROJECT)

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This report has been prepared by Messrs. R.V. Sear and C. de Beaufort.



MALAYSIA

NATIONAL ELECTRICITY BOARD

SUMMARY

- i. At the request of the National Electricity Board (NEB) an electric power project has been appraised which consists of: the Second Stage of the Prai Steam Station; the Second Stage of the Port Dickson Steam Station and, transmission lines and associated substations to deliver the power to the load centers.
- ii. The total cost of the project is estimated at US\$29 million. The generating plant for the Port Dickson station is expected to be financed from US\$10.1 million of bilateral credits. The proposed Bank loan to NEB would cover the foreign exchange costs of the Second Stage of the Prai Station, miscellaneous items for the Port Dickson Station, the transmission expansion, and interest during construction, to give a loan amount of US\$11.5 million. The remainder of the project financing would be provided by about US\$7.4 million from NEB's own resources. All orders for equipment would be awarded on the basis of international competitive bidding.
- iii. The Project is needed to meet the growing demand for power on NEB's interconnected system and it is the most economic means of meeting this demand.
- iv. NEB is organized as a modern public utility corporation and has a high degree of autonomy. Its stock is almost entirely owned by the Malaysian Government. The financial record of NEB is good and its present position is sound. The financing plan for the period covering the proposed Project is satisfactory. Net internal cash generation is expected to finance about 45% of its capital requirements during the next five years. Contributions towards construction by the Government and consumers would raise the financing from sources other than borrowings to almost 53%. NEB is expected to earn a satisfactory average return of 8.5% on net fixed assets in operation during the next five years.
- v. The Project is suitable for a Bank loan of US\$11.5 million for a period of 20 years, including a grace period of four years.

## MALAYSIA

### NATIONAL ELECTRICITY BOARD

#### PORT DICKSON AND PRAI EXPANSION PROJECT

##### (FOURTH POWER PROJECT)

### 1. INTRODUCTION

1.01 This report covers the appraisal of a project of the National Electricity Board of Malaysia (NEB), consisting of the Second Stage of the Prai Thermal Station with a capacity of 30 Mw, the Second Stage of the Port Dickson Thermal Station with a capacity of 120 Mw, and the construction of associated transmission facilities.

1.02 The estimated cost of the Project is about M\$87 million (US\$29 million). The estimated foreign exchange cost, including interest during construction, is M\$72.6 million (US\$24.2 million). The Bank has been requested to finance M\$34.5 million (US\$11.5 million) of the foreign exchange cost. The remainder is to be financed from bilateral credit sources and from NEB's cash generation.

1.03 The Borrower would be the NEB to which the Bank has made three loans amounting to US\$117.5 million. The first loan (210-MA) of US\$28.6 million, net of cancellations, was made in September 1958 for the first stage of the Cameron Highlands hydroelectric scheme. A second loan (350-MA) of US\$51.9 million was made in July 1963 for the second stage of the Cameron Highlands scheme, the first stage of the Prai Thermal Station, and the expansion of transmission facilities. In July 1966 a third loan (458-MA) of US\$37 million was made for the first stage of the Port Dickson Thermal Station, the installation of additional generating units at the Cameron Highlands hydroelectric scheme, the second stage of Johore Bahru and the expansion of transmission facilities. Projects covered by the first two loans have been completed and are operating satisfactorily. Construction of the project covered by the third loan is proceeding very well and completion is expected to be on schedule.

1.04 The Project is the next logical step in the expansion of the NEB facilities. It was first discussed with the NEB in March 1968 during a project supervision inspection in connection with previous Bank loans. An application for a loan was received in May 1968 and Mr. R.V. Sear visited Malaysia in July 1968 to appraise the Project. This report is based on his findings and on information supplied by the NEB and its Consultants, Messrs. Preece, Cardew & Rider of London. It has been prepared by Messrs. R.V. Sear and C. de Beaufort.

### 2. THE ELECTRIC POWER SECTOR

2.01 Malaysia consists of the peninsula of Malaya (West Malaysia) which lies between Thailand and the equator, and the States of Sarawak and Sabah on the Island of Borneo (East Malaysia). The aggregate area of

Malaysia is about 145,000 square miles and it has a population of about 10 million.

2.02 Malaya (West Malaysia) which is the part of Malaysia with which this report is concerned covers an area of some 68,000 square miles and has a population of about 8.3 million. A mountain range which divides the country over almost its entire length runs parallel to and about 50 miles from the west coast to form a continuous watershed from the Thailand border to Malacca. The population and commercial life of the country is concentrated mainly in coastal areas on the western side of the mountain range.

2.03 Malaysia has no significant deposits of fossil fuels but it has an abundant rainfall and a number of water resources which could be developed to provide hydroelectric power. Most of these are situated on the eastern side of the mountain range in areas remote from load centers. There are however resources which can be developed to supply load centers on the western side of the country, and one of these is the Cameron Highlands which has been developed with Bank assistance. A number of water resources are currently being studied.

2.04 Historically the exports of tin and rubber have been the major source of growth for the economy of Malaysia. In the first half of the 1960's the Gross National Product maintained a rise averaging 6-1/2% a year mainly because of rapidly expanding public expenditures. Sharp drops in Malaysia's major export prices, especially of rubber and tin slowed down the growth rate considerably in the past two years to slightly below four per cent a year. The outlook for the immediate future is for a slight improvement, though still for a slower growth rate of GNP than in the first half of the 1960's. Public expenditures are expected to rise less fast. However, the development of manufacturing industries which has been moving forward rapidly during the last few years is likely progressively to make a significant contribution toward compensating for loss in the rubber and tin industries.

2.05 Electric power in Malaysia is provided principally by the NEB which serves the whole peninsula of Malaya with the exception of Penang Island which is supplied by a municipally owned plant and part of the State of Perak which is supplied by the Perak River Hydroelectric Power Company (PRHE). The two States on the Island of Borneo are supplied by the Government owned statutory authorities, the Sabah Electricity Board and the Sarawak Electricity Supply Corporation. The installed capacity of the entities is shown below.

	<u>Installed Capacity (Mw)</u>
NEB	564
Perak River Hydroelectric Company (PRHE)	145
Penang City Council	40
Sabah Electricity Board	20
Sarawak Electricity Supply Corporation	<u>25</u>
Total	<u>794</u>

### Facilities of the NEB

2.06 NEB's total generating capacity of 564 Mw is made up of 264 Mw of hydroelectric plant and 300 Mw of thermal plant. Details of the plants are given in Annex 1. An additional 150 Mw of thermal plant is under construction under Loan 458-MA and is scheduled to go into service in 1969. This will bring the total installed capacity to 714 Mw. The proposed project would add another 150 Mw by 1973 and bring the total installed capacity to 864 Mw.

2.07 Nearly all of NEB's generating capacity supplies the Interconnected System which covers most of the western side of the peninsula and the Southern System around Johore Bahru (see Map). About 50 small isolated systems in other parts of the country are supplied by diesel generating plants with an aggregate capacity of about 60 Mw.

2.08 The Interconnected System is connected to the PRHE System. Under the terms of an agreement recently signed PRHE will purchase power in bulk from the NEB to meet its requirements in excess of that produced by its own generation plants (see Paragraph 2.11). The NEB interconnected system is also connected to the Penang City Council System but power is only exchanged in an emergency.

2.09 The NEB's hydroelectric plants have only limited storage capacity. Because of this the firm capacity of the Interconnected System was reduced during the 1968 dry season from the plant rating of 444 Mw to 309 Mw. Annex 2 shows the existing and proposed system installed capacity, dry season capacity and dry season firm capacity.

2.10 NEB's main transmission system, some 450 route miles in length, operates at 132 Kv. It also has about 300 miles of 66 Kv and 435 miles of 33 Kv transmission lines. Distribution is carried out at 22 Kv and 11 Kv by some 1,600 miles of overhead lines and underground cables. Substation capacity is in excess of 1,700,000 Kva.

### Perak River Hydroelectric Company (PRHE)

2.11 This Company supplies part of the State of Perak under a concession granted in 1926 which extends until 2006. The Malaysian Government holds 51% of the shares of the Company and has the option to acquire the Company in 1976 or at ten year intervals thereafter. The Government has not yet declared whether or not it will acquire the Company in 1976 but if it does the Company would probably be handed over to the NEB in exchange for an issue of NEB shares. The Company is NEB's largest customer and a long-term contract was recently signed for a bulk supply to enable it to meet its requirements in excess of that produced by its own generating plants. The Company's generating plant is old and inefficient and only produces about 640 million kwh per year. At the present time about 260 million kwh per year are purchased from the NEB and it is estimated that this will increase to about 800 million kwh per year by 1975-76.

## Penang City Council

2.12 Special provisions were made in the Electricity Ordinance of 1949 for the Penang City Council to continue to operate its own electricity system to supply the Island of Penang. It has a 40 Mw thermal generating station which was constructed in 1967 and which is interconnected with the NEB system by 33 Kv and 11 Kv submarine cables.

### 3. THE BORROWER

3.01 The Borrower would be the NEB, which was established in 1949 by the Government under the provisions of the Electricity Ordinance enacted that year.

3.02 The NEB is organized and functions as a modern public utility corporation and has a high degree of autonomy. It is both a regulatory and operating agency. It is charged with the operation of the electric installations under its jurisdiction and the establishment of such new facilities as may be required. It regulates the production and use of electric energy in Malaya and grants licenses for the installation and operation of independent electricity works to be used for public or private purposes. The NEB has the power to set electricity tariffs without reference to other authority (see paragraph 3.09).

3.03 The Board of Directors of the NEB consists of a Chairman, Deputy Chairman and not more than ten or less than five other members. At the present time there are nine members. All members, with the exception of the Deputy Chairman who is also the General Manager, serve in a part-time capacity. Members are appointed by the Minister of Commerce and Industry for terms and subject to conditions, as he may determine. The present members are prominent in the political, labor and business communities and have been associated with the NEB for from three to five years.

3.04 Over the course of time the NEB has developed into a well organized and operated utility. In the past, most key positions were occupied by foreigners, chiefly of British nationality. Following independence in 1957, the Government established the principle of Malayanization and by the end of 1967 all key positions were held by Malaysians. Only four foreigners remain in advisory appointments which are expected to be terminated by the end of 1968.

3.05 Although most of the senior staff now in key positions have only held such posts for a relatively short period their performance to date has generally been satisfactory. It is, however, too early to make a meaningful judgment and the matter should be given special attention during project supervision visits. During negotiations assurances were obtained that during the life of the loan the Bank will continue to be consulted before appointments are made to the positions of General Manager, Chief Engineer and Chief Financial Officer.

3.06 The policy of Malayanization was accompanied by a program of intensive professional training. Many potential officers and supervisory personnel were sent abroad, principally to the United Kingdom, for training and have since assumed their new responsibilities. The Board has its own training center which has recently expanded its activities to include training programs for senior supervisory staff which terminate in a period of training abroad, as well as training programs for technicians, clerical staff, trade apprentices and plant operators. About 84 technicians, 40 clerks, and 220 trade apprentices and plant operators are presently undergoing training. The training programs are comprehensive in scope and well administered. The NEB has approximately 8,700 employees which may be classified as follows:

(a) Management, professional engineers and accountants	305
(b) Technical monthly paid staff	1,632
(c) Non-technical monthly paid staff	1,858
(d) Semi-skilled and unskilled workers	<u>4,902</u>
Total	<u>8,697</u>

During the negotiations NEB confirmed that it intends to continue the training program.

3.07 The ratio of consumers per employee is low, mainly because NEB's activities cover the whole peninsula of Malaya which has many isolated communities supplied by their own diesel generating plant and also because of the amount of construction work carried out by the NEB's staff. The NEB is well aware of the situation and is taking steps to improve the ratio by keeping the number of new posts approved to a minimum and by increasing efficiency. The expansion of transmission facilities now taking place which will eliminate a number of diesel generating plants will help to improve the ratio. During the negotiations the matter was discussed with the NEB and an assurance was obtained that it will continue to improve the situation.

3.08 On the basis of its past performance the NEB, with the assistance of its Consulting Engineers, Preece, Cardew & Rider of London, is considered fully capable of carrying out the construction of the Project. The Board is also considered to be fully capable of operating the Project efficiently after its completion.

#### Tariffs

3.09 Under the Ordinance the NEB has power to fix tariffs without reference to any other authority. In practice the Minister of Commerce and Industry is consulted and he has the right to give the Board directions of a general character not inconsistent with the provisions of the Ordinance. These provisions require that total revenues must be sufficient to meet total outgoings properly chargeable to revenue, including depreciation and interest on capital, taking one year with another. This provision is regarded as determining the minimum level of tariffs. The NEB's stated

policy is to produce a return on its average net fixed assets in operation of at least eight per cent per annum and to endeavor to finance about 40% of capital requirements out of internal resources.

3.10 Under Loan 458-MA, the NEB is required to maintain tariffs sufficient to yield, together with revenues from other sources, a return of not less than eight per cent on its average net fixed assets in operation. The return is calculated by relating "net income" from operations to average net fixed assets in operation after deducting accumulated depreciation, Government contributions for rural electrification, and consumers' contributions towards construction. During negotiations agreement was reached on a continuation of this requirement under the proposed loan (see also paragraph 6.10).

3.11 There have been only two tariff changes since 1960. The first occurred in 1964 when tariffs were lowered after the completion of the Cameron Highlands hydroelectric scheme (Loan 210-MA). This resulted in a reduction in revenues by about M\$1.3 million per annum or about two per cent. In 1967 the Minister exercised his right under the Ordinance and directed the NEB to introduce a new tariff for large industry to assist the Government's efforts to promote industrial development (paragraph 5.04). The NEB engaged a tariff specialist, D.C. Bolton of England, to make a study of its entire tariff structure. As a result of this study and recommendations by the consultant a special tariff (known as Tariff R) was introduced in August 1967 for large industry. At the present time only six consumers qualify for this tariff. Sales to these consumers represent only 3.2% of the NEB's total sales and 1.7% of gross revenue.

3.12 The other recommendations of the consultant's report refer to simplification of the tariff structures and these are now being studied by the NEB. No changes in tariffs are expected for at least two years and any that are made are not expected to result in any loss in total revenue.

#### Accounting and Audit

3.13 The NEB has a modern and efficient accounting organization with an adequate and well qualified staff. The NEB's auditors since its inception in 1949 have been Price Waterhouse & Co. Besides carrying out the annual audit, the firm has from time to time been engaged to advise on accounting methods and procedures. The Board in 1966 appointed a Malaysian firm of auditors, Messrs. Hanafiah, Raslan, Ong and Mahomad, to carry out the audit of about 23 out of a total of 60 isolated locations on the NEB system. The audit as a whole continues to be done by Price Waterhouse & Co. who have been reappointed for the 1968 audits. During negotiations an assurance was obtained that the NEB will continue to employ independent auditors acceptable to the Bank.

#### Capital Structure and Financial Position

3.14 Summaries of the NEB's audited balance sheets as of the end of August 1963 through 1967 and of the preliminary 1968 balance sheet are given in Annex 3.

3.15 The NEB's capital structure and financial position are generally sound and its negative current position is manageable (paragraph 3.20).

3.16 The following is a summary of the preliminary balance sheet at August 31, 1968:

	<u>M\$</u>	<u>US\$</u>
	(millions)	
<u>ASSETS</u>		
Utility plant at cost	813.4	271.1
Less: depreciation	167.0	
consumers' contributions	<u>23.5</u>	<u>63.5</u>
Net fixed assets in operation	622.9	207.6
Work in progress	78.3	26.1
Current assets	<u>52.4</u>	<u>17.4</u>
TOTAL ASSETS	<u>753.6</u>	<u>251.1</u>
<u>LIABILITIES AND EQUITY</u>		
Ordinary stock	163.3	54.4
Reserves	<u>121.6</u>	<u>40.5</u>
Total equity	<u>284.9</u>	<u>94.9</u>
Long-term debt		
Government of Malaysia	86.3	28.8
Employees' provident fund	10.0	3.3
Commonwealth Development Finance Company	4.3	1.4
IBRD loan 210-MA	70.8	23.6
IBRD loan 350-MA	144.1	48.1
IBRD loan 458-MA	38.4	12.8
Commonwealth Development Corporation	<u>48.1</u>	<u>16.0</u>
Total long-term debt	<u>402.0</u>	<u>134.0</u>
Current liabilities (including M\$11.3 million current maturities of long-term debt)	<u>66.7</u>	<u>22.2</u>
TOTAL LIABILITIES AND EQUITY	<u>753.6</u>	<u>251.1</u>

3.17 With the exception of M\$3 million held by the Pahang State Government, the ordinary stock of the NEB is owned by the Malaysian Government. The stock pays dividends which under the Ordinance cannot exceed six per cent per annum on its face value. The dividend has been set at five per cent since 1962/63.

3.18 Reserves comprise the General Reserve and Capital Development Account, which represent the accumulated earned surplus to date.

3.19 Details of the long-term debt are given in Annex 4. Of the total debt 63% is owed to the Bank under the following loans:

- (i) Loan 210-MA for US\$28.6 million, net of cancellations, at an interest rate of 5-3/4% made in 1958;
- (ii) Loan 350-MA for US\$51.9 million at an interest rate of 5-1/2% made in 1963;
- (iii) Loan 458-MA for US\$37.0 million at an interest rate of six per cent made in 1966.

3.20 At the end of August 1968 the current ratio was 0.8:1.0, current liabilities exceeding current assets by M\$14.3 million. But in view of the composition of the current liabilities which include M\$14.9 million of customers' deposits and M\$11.3 million of long-term debt maturities which are spread evenly over the fiscal year 1968/69, no serious cash problems are expected.

3.21 At the end of August 1968 the overdraft included under Current Liabilities amounted to only M\$1 million, as compared with a peak of M\$13 million reached in 1965. The overdraft facilities consist of M\$9 million from the Chartered Bank and M\$6 million from the Chase Manhattan Bank, both secured by a Government guarantee. In order to prevent an excessive use of these facilities the NEB undertook, in connection with Loan 458-MA, not to use bank overdrafts or other short-term money to finance capital expenditures except as an interim measure pending receipt of long-term finance. The NEB again agreed during the negotiations not to draw in excess of M\$10 million against the overdraft facilities without advising the Bank and stated that it was NEB's policy to keep overdraft drawings to a minimum and not to use them to finance capital expenditures.

#### Earnings Record

3.22 Income statements for the six fiscal years 1962/63 through 1967/68 are included in Annex 5 and the annual percentages for the Return on Net Plant and the Operating Ratio for these years are included in Annex 6.

3.23 The average return on net fixed assets in operation for the six-year period was 9.4% well above the minimum rate of eight per cent agreed upon between the Bank and the NEB under loans 350-MA and 458-MA. Depreciation is calculated on a straight line basis and the provisions made are adequate.

3.24 The Operating Ratio shows a steady decline from 78.0% in 1962/63 to 68.1% in 1966/67 and, mainly because of increased fuel costs, an increase to 69.0% in 1967/68. The improvement in the Operating Ratio is largely due to the coming into operation of Cameron Highlands' hydro plants in 1963 and 1967. These ratios show that operating costs are reasonable.

3.25 Revenues during the last year of the period were 91% above those during the first year. Because of the improvement in the operating ratio net income from operations showed an even larger increase of 170%.

#### 4. THE PROJECT

4.01 The project proposed for Bank financing constitutes 14% of the NEB's 1968-1972 expansion program. It consists of the construction of:

- a) The Second Stage of the Prai Thermal Power Station with an installed capacity of 30 Mw. Scheduled for service in 1970.
- b) The Second Stage of the Port Dickson Power Station with an installed capacity of 120 Mw. Scheduled for service in 1972.
- c) Transmission lines and associated substations to deliver the additional power generated at the two stations to the load centers.

The remainder of NEB's expansion program consists of, (a) the completion of works now under construction under Loan 458-MA (paragraph 2.06), (b) distribution system expansion and (c) the addition of small diesel generating units at some isolated localities.

##### A. Prai Thermal Power Station

4.02 The first stage of the Prai Station, with 2-30 Mw generating units was financed by Loan 350-MA. It was planned for an ultimate capacity of 270 Mw but initially foundations and buildings were only provided for 3-30 Mw generating units, two of which have been in satisfactory service since May 1967.

4.03 The Second Stage consists of the installation of the third 30 Mw generating unit on the existing foundations and the construction of associated cooling water and control facilities. The unit would be identical in specifications to the two existing units, and consists of a 300,000 lbs per hour boiler designed to operate with steam conditions of 925 psi and 925°F and a turbo-alternator with a maximum continuous rating of 30 Mw.

4.04 The estimated cost of the Second Stage is based upon the known cost of the First Stage plus allowance for price increases. A summary of the cost estimates, which are realistic, is as follows:

Item	Foreign	Local	Total	Foreign	Local	Total
	Exchange	Cost	Cost	Exchange	Cost	Cost
	(M\$ Millions)			(US\$ Millions)		
Civil Works	0.32	0.25	0.57	0.11	0.08	0.19
Plant and Equipment	9.85	1.28	11.13	3.28	0.43	3.71
Engineering and Supervision	0.78	0.18	0.96	0.26	0.06	0.32
Contingencies	0.82	0.12	0.94	0.27	0.04	0.31
NEB Administration	-	0.40	0.40	-	0.13	0.13
Interest and other charges during Construction	<u>1.67</u>	<u>-</u>	<u>1.67</u>	<u>0.56</u>	<u>-</u>	<u>0.56</u>
Total	<u>13.44</u>	<u>2.23</u>	<u>15.67</u>	<u>4.48</u>	<u>0.74</u>	<u>5.22</u>

B. Port Dickson Thermal Power Station

4.05 The First Stage of the Port Dickson Station which is being financed by Loan 458-MA and is now under construction will consist of 2-60 Mw generating units which are scheduled to be in service by mid-1969. After some initial delays due to piling difficulties, construction of this project is progressing satisfactorily and the completion date is expected to be met. This station was planned for 4-60 Mw units and the site is adequate for further extensions to accommodate 4-120 Mw units.

4.06 The Second Stage of this station comprises the construction of an extension to the power house with the necessary foundations for the plant, a smoke stack and the installation of two boilers and two turbo-alternator sets with associated cooling water and control facilities. The units would each have a capacity of 60 Mw and would be identical in specifications to the two units now being installed. Each unit would consist of a boiler with a maximum continuous rating of 550,000 lbs per hour and with steam conditions of 925 psig and 915°F. The turbo-alternator will have a maximum continuous rating of 60 Mw.

4.07 The estimated cost of the Second Stage is based upon the cost of the First Stage now under construction plus allowances for price increases. A summary of the cost estimates, which are realistic, is as follows:

<u>Item</u>	<u>Foreign</u>	<u>Local</u>	<u>Total</u>	<u>Foreign</u>	<u>Local</u>	<u>Total</u>
	<u>Exchange</u>	<u>Cost</u>	<u>Cost</u>	<u>Exchange</u>	<u>Cost</u>	<u>Cost</u>
	(M\$ Millions)			(US\$ Millions)		
Civil Works	5.90	4.05	9.95	1.97	1.35	3.32
Plant and Equipment	27.10	6.55	33.65	9.03	2.19	11.22
Engineering and Supervision	3.42	0.49	3.91	1.14	0.16	1.30
Contingencies	2.76	0.93	3.69	0.92	0.31	1.23
NEB Administration	-	0.50	0.50	-	0.17	0.17
Interest and other charges during Construction	<u>0.80</u>	<u>4.20</u>	<u>5.00</u>	<u>0.27</u>	<u>1.40</u>	<u>1.67</u>
Total	<u>39.98</u>	<u>16.72</u>	<u>56.70</u>	<u>13.33</u>	<u>5.58</u>	<u>18.91</u>

C. Transmission Lines and Substations

4.08 In order to transmit the power generated by the additional plant at the Prai and Port Dickson Stations it will be necessary to extend and modify existing transmission lines.

4.09 This work consists of constructing the second 132 kv circuit between Prai Station and Papan and the conversion of the 132 kv circuits between Port Dickson and Kuala Lumpur south to 275 kv operation. These lines are shown on the Map.

4.10 The cost estimates for this work, based upon the known costs of similar equipment and material now being purchased, adjusted for price increases are realistic and are as follows:

<u>Item</u>	<u>Foreign</u>	<u>Local</u>	<u>Total</u>	<u>Foreign</u>	<u>Local</u>	<u>Total</u>
	<u>Exchange</u>	<u>Cost</u>	<u>Cost</u>	<u>Exchange</u>	<u>Cost</u>	<u>Cost</u>
	(M\$ Millions)			(US\$ Millions)		
Equipment and Installation	8.96	2.78	11.74	2.99	0.93	3.92
Engineering and Supervision	0.40	0.09	0.49	0.13	0.04	0.17
Contingencies	0.79	0.16	0.95	0.27	0.05	0.32
Interest and other charges during Construction	<u>1.21</u>	<u>-</u>	<u>1.21</u>	<u>0.40</u>	<u>-</u>	<u>0.40</u>
Total	<u>11.36</u>	<u>3.03</u>	<u>14.39</u>	<u>3.79</u>	<u>1.02</u>	<u>4.81</u>

Bilateral Financing

4.11 The borrower has agreed to obtain the financing for the generating plant for the Port Dickson Second Stage from bilateral sources. The borrower intends to invite international tenders for all goods whether financed from Bank funds or from bilateral sources. The invitations to tender for goods to be financed from bilateral sources will stipulate that financing terms must be stated along with the offer to supply the goods. Discussions were held during the appraisal mission with a representative of the Malaysian Government Treasury, the NEB and their Consultants Preece Cardew & Rider of London to determine the most suitable division of financing between bilateral sources and the Bank. The following was accepted by all parties concerned:

	<u>Approximate Foreign Exchange Cost</u>
(i) <u>IBRD Loan</u>	
Prai Plant, Transmission system expansion and miscellaneous items for Port Dickson Plant	M\$34.5 million (US\$11.5 million)
(ii) <u>Bilateral Financing</u>	
Port Dickson Turbines, Boilers and Steel Structures	M\$38 million (US\$12.7 million)

It is assumed that NEB would pay about 10% down and the interest during construction from its own resources. Therefore the actual credit amount received would be M\$30.3 million (US\$10.1 million) and NEB would finance M\$7.8 million (US\$2.6 million) from its cash generation.

4.12 The criteria used were to provide financing for offshore or foreign costs only and assume that the NEB would meet all local costs and the down payments and interest on the bilateral credits; then to seek easily identifiable large items which could be financed as a unit or package by the bilateral lenders. However, there is insufficient time left to negotiate bilateral credits for the Prai Thermal Plant extension and its offshore cost is therefore to be financed entirely by the Bank. Finally, the transmission system expansion and the miscellaneous items at Port Dickson were included in the proposed Bank loan because they consist of a number of comparatively small items or units unsuitable for bilateral financing.

4.13 On the basis of the above, the breakdown of the cost estimate for the Port Dickson Plant Second Stage would be as follows:

Item	<u>Foreign Exchange</u>			Local Total		<u>Foreign Exchange</u>			Local Total	
	<u>IBRD</u>	<u>Bilateral</u>	<u>NEB</u>	<u>Cost</u>	<u>Cost</u>	<u>IBRD</u>	<u>Bilateral</u>	<u>NEB</u>	<u>Cost</u>	<u>Cost</u>
	(M\$ Millions)					(US\$ Millions)				
Civil Works	2.48	3.42	0.41	3.64	9.95	0.83	1.14	0.14	1.21	3.32
Plant and Equipment	2.50	24.60	2.92	3.63	33.65	0.83	8.20	0.97	1.22	11.22
Engineering and Supervision	3.42	-	-	0.49	3.91	1.14	-	-	0.16	1.30
Contingencies	0.47	2.29	0.27	0.66	3.69	0.16	0.76	0.09	0.22	1.23
NEB Administration	-	-	-	0.50	0.50	-	-	-	0.17	0.17
Interest and other charges during Construction	<u>0.80</u>	<u>-</u>	<u>4.20</u>	<u>-</u>	<u>5.00</u>	<u>0.27</u>	<u>-</u>	<u>1.40</u>	<u>-</u>	<u>1.67</u>
Total	<u>9.67</u>	<u>30.31</u>	<u>7.80</u>	<u>8.92</u>	<u>56.70</u>	<u>3.23</u>	<u>10.10</u>	<u>2.60</u>	<u>2.98</u>	<u>18.91</u>

4.14 In order to avoid a partial completion of the Port Dickson project and since the major pieces of equipment are to be obtained through bilateral financing, the loan agreement requires the securing of supplementary financing satisfactory to the Bank, before disbursements are made from the Bank Loan for this portion of the Project.

D. Summary of Cost Estimates

4.15 The cost estimates for the various items in the Project and a breakdown for the financing of the foreign costs, are summarized below:

Item	<u>Foreign Exchange</u>				<u>Foreign Exchange</u>					
	<u>IBRD</u>	<u>Bilat.</u>	<u>NEB</u>	<u>Local Cost</u>	<u>Total Cost</u>	<u>IBRD</u>	<u>Bilat.</u>	<u>NEB</u>	<u>Local Cost</u>	<u>Total Cost</u>
	(M\$ Millions)					(US\$ Millions)				
Prai Station 2nd Stage	11.77	-	-	2.23	14.00	3.92	-	-	0.74	4.66
Port Dickson Station 2nd Stage	8.87	30.31	3.60	8.92	51.70	2.96	10.10	1.20	2.98	17.24
Prai and Port Dickson Transmission Lines and Substations	10.15	-	-	3.03	13.18	3.39	-	-	1.02	4.41
Interest and other charges during construction	<u>3.68</u>	<u>-</u>	<u>4.20</u>	<u>-</u>	<u>7.88</u>	<u>1.23</u>	<u>-</u>	<u>1.40</u>	<u>-</u>	<u>2.63</u>
Total	<u>34.47</u>	<u>30.31</u>	<u>7.80</u>	<u>14.18</u>	<u>86.76</u>	<u>11.50</u>	<u>10.10</u>	<u>2.60</u>	<u>4.74</u>	<u>28.94</u>

Foreign exchange costs assumed to be met out of NEB's cash generation consist of down payments (US\$1.2 million) and interest during construction (US\$1.4 million) on the bilateral credits.

E. Engineering, Construction and Procurement

4.16 The NEB has retained its principal consultants Preece, Cardew & Rider, of London (PCR) for the project under arrangements previously found satisfactory to carry out engineering, construction supervision and evaluation of bids. During negotiations assurances were obtained that the NEB will continue to use consultants satisfactory to the Bank.

4.17 Construction will be carried out by contractors and the suppliers of equipment. The transmission line work will be done by NEB crews which are capable of undertaking the work. These arrangements are satisfactory.

4.18 All orders for equipment would be awarded on the basis of international competitive bidding. Some tenders are to be invited before the proposed loan is made in order to meet construction schedules, but no contracts are expected to be awarded before the loan is signed. Any expenditures made prior to the date of the loan signing will not be eligible for reimbursement. Except for interest during construction, disbursements would be made against presentation of the usual documents evidencing the expenditure of foreign exchange for equipment, materials and services. If savings are made any excess loan funds will be available for cancellation.

4.19 The construction schedule is designed to achieve completion of the project in time to meet the forecast system demand, shown in Annexes 2 & 7. The schedule is reasonable and calls for completion of the Prai Second Stage by the end of 1970 and the Port Dickson Second Stage by mid-1972. In both cases the transmission lines extensions would also be ready by the completion dates of the respective plants. It is expected that this schedule will be met.

#### Future Expansion Program

4.20 Future expansion beyond that contemplated under the present program has been continuously studied by the NEB and it has engaged consultants to continue this work and to pay particular attention to specific projects.

4.21 One of the projects is the Upper Perak Hydroelectric Development. This scheme would consist of an initial hydroelectric plant of 192 Mw installed capacity with a dam to create a storage reservoir which would regulate the river downstream and facilitate further hydroelectric developments. This scheme has been studied by the Shawinigan Engineering Company Ltd., Canada, and up to the present the power benefits have been considered marginal by the Bank. However, further studies are being carried out by the consultants and NEB to determine if other benefits, such as flood control could be attributed to the project. It is unlikely that a decision will be made before 1970 and if NEB then decides to construct the project the earliest completion date would be 1975-76.

4.22 As the proposed project for Bank financing would only meet forecast power demand until about 1973, NEB's consultant, PCR, have tentatively recommended the third stage of the Port Dickson Thermal Station which would consist of 2-120 Mw units (Nos. 5 and 6) as the next development to meet forecast demand up to 1975-76 when the Upper Perak Hydroelectric Development or some other power expansion project would be in operation. Until the studies on system development now being carried out are completed it is impossible to say precisely what the next stage of development should be.

### 5. JUSTIFICATION OF THE PROJECT

#### A. Estimate of Sales

5.01 The power market served by NEB, has had a long history of steady and substantial growth. Since 1960 the average annual increase in total power sales

has been 13.5% and during the past five years the rate has been 14.1%. The annual rate of growth in sales for the next four years may be somewhat lower as explained in paragraph 5.06.

5.02 In 1966-67 NEB had total sales of 1,373 million kwh, divided among the various categories of consumers as follows: Domestic 14.8%, Commercial 34.4%, Industrial 25.7% and Mining 25.1%.

5.03 NEB, with the assistance of consultants, PCR, has made very complete studies of its load statistics and based on the trends shown in the past along with known new developments for the next four years, has prepared a realistic forecast of future sales and system demand to 1976. See Annex 8 for details.

5.04 Power sales to the general industrial section have been increasing at an annual rate of about 17% during the past five years. The Map shows the location of industrial zones which have been established by the Government to encourage external investment in industrial facilities and which are expected to foster industrial growth. During the past five years industry's share of NEB's total sales has risen from 22.5% to 25.7% and is forecast to increase to 27% by 1976.

5.05 Tin mining is a very important activity in Malaysia. During the past five years its share of the total power sales has dropped from 30% to 25%. While the present demand is expected to remain about constant, its share of total sales would decline to about 11% by 1976. From NEB's point of view this is a helpful trend because the tin mining demand is very sensitive to fluctuations in tin prices.

5.06 Total sales for 1967/68 show an increase of about 29% over 1966/67. This is largely due to the agreement reached during the year with the PRHE to sell its power in bulk, representing an increase of over 11% in NEB's total sales. (See paragraph 2.11.) For 1968/69 and 1969/70 annual increases in total sales are forecast at about 13%, which is close to the average growth rates achieved during the past ten years. In 1970-71 some decline in the annual growth rate to about 10% is forecast to reflect the anticipated economic slowdown caused by the withdrawal of the British forces from Malaysia. From 1971/72 to 1975/76 annual growth rates are forecast at a conservative level of about 12%. These forecasts are considered realistic and if economic activity in Malaysia continues at the level of the past 5 years, the sales achieved could well be about 10% higher than forecast.

5.07 In order to assess the probable effect of a simultaneous drop in tin and rubber prices along with the withdrawal of the British forces, a low or pessimistic forecast was made. See Annex 9. This shows that the growth rate in 1969-1970 could fall from 13% to 10% and to 9% in 1971. However, after that the growth rate is forecast to recover to the conservative level of 12% given in the higher forecast. In the long term the measures being taken by the Government to foster industrial development and the diversification of agricultural products - palm oil and other crops are now being cultivated in some areas previously given over exclusively to rubber production - will help to offset adverse trends resulting from tin and rubber price declines.

### Estimate of System Demand

5.08 Climatic conditions in Malaysia give rise to a very steady system load throughout the year. The use of air conditioning and the twenty-four hour per day tin mining load combine to reduce the difference between holiday and workday demands. Annex 10 shows a typical load curve. The factors mentioned above give rise to an exceptionally high system load factor of about 73%. This would tend to decrease with the growth of the percentage of total sales going to industry. However, it is forecast to remain at about 70% for at least the next eight years.

5.09 The forecast of system demand has also been prepared based on the "normal" and "low" sales forecasts, discussed in paragraphs 5.06 and 5.07. Annex 7 shows the demand forecasts along with the proposed additions to generating capacity. It shows an average increase in peak demand during the next four years of 12.4% for "normal" growth and 11.4% for the "low" growth rate. Based on the detailed study made by NEB it is considered most unlikely that growth in demand would fall below the "low" forecast during the next four years.

### C. Plant Operations

5.10 The NEB Interconnected System, shown in the Map and Annex 2, consists at present of 264 Mw of hydro plants and 180 Mw of thermal plants. Another 120 Mw of thermal plant is under construction at the Port Dickson Station which will bring the thermal plant capacity to 300 Mw by 1969 for the interconnected system.

5.11 The hydro plants are generally used for peaking purposes and the thermal plants supply the base load. However, during periods of plentiful water supply, hydro plants are used to supply base load to save fuel and to enable thermal units to be taken out of service for essential maintenance work.

5.12 NEB has made detailed studies and schedules for the operations of its plants to meet system demand during dry and wet periods and to enable plant maintenance to be carried out. On the basis of these studies and the experience in operating the system the dry season firm capacity of the interconnected system has been established as shown in Annexes 2 and 7. It will be seen from this that the proposed additions of generating plant capacity are essential to meet forecast system demand for either the normal or the low forecast. During 1969 and 1970 the dry season firm capacity is just sufficient to meet the normal load forecast if Port Dickson units 1 and 2 and Prai unit 3 come into service on schedule. In 1971 the situation again becomes tight until Port Dickson units 3 and 4 come into service in 1972 and 1973. The forecast also shows that construction of units 5 and 6 at Port Dickson should be started before the present project is completed if power shortages are to be avoided in 1974 and 1975.

D. Choice of New Generating Capacity

5.13 The major load center of the Interconnected System is at Kuala Lumpur, hence the Port Dickson Station is being developed as the major thermal station. However, due to the length of the Interconnected System and the increasing PRHE load the 30 Mw unit proposed for Prai is required to maintain a stable system and reduce spare generating capacity to a minimum.

5.14 The two additions to generating plant capacity in this project both consist of the expansion of existing stations where some of the facilities required for the plant additions already exist and would be used in common with existing generating units. Indeed, the two stations were planned on the assumption that they would be extended, they are the latest thermal stations to be constructed by the NEB and they are efficient and up-to-date for the size and type of equipment installed. The extension of these stations by adding units of similar specification to those previously installed is the most economic compared with any other alternative thermal plant expansion. There are no immediately available hydroelectric sites which could be developed in time to meet the forecast demand. The next potential hydroelectric project, the Upper Perak Hydroelectric Scheme (see paragraph 4.21) is still being studied. It would not be in operation before 1975 or 1976 if work was started in 1969.

E. Rate of Return

5.15 The part of NEB's system affected by the project is the interconnected network along the west coast. This network is supplied by both thermal and hydroelectric plants, as shown in the Map. Therefore the output of each plant on any particular day of the year to meet system demand will vary in accordance with the amount of water available to the hydro plants. Preference is always given to using water in hydro plants instead of imported fuel in thermal plants so as to keep the cost of producing electrical energy to a minimum. It is therefore not possible to segregate the production which can be assigned to a particular plant during its life time in any meaningful way because the entire combination of plants supplying the Interconnected System is operated as a group and each plant is assigned functions from time to time to achieve the maximum of efficiency for the entire system. Some idea of the relative value of each plant may be obtained by comparing the cost of energy generated. It should, however, be kept in mind that even this is not an exact comparison because the plant factor which varies during the year, influences the cost per kwh of energy produced. The following table, based on a plant factor of 60%, shows that both Port Dickson and Prai stations produce power at lower cost than the older thermal stations.

<u>Station</u>	<u>Cost of Kwh Produced</u>	
	<u>Cents of Malayan \$</u>	<u>US\$ cents</u>
Port Dickson Units 1 & 2	1.5737	0.5246
Port Dickson Units 1 - 4	1.5259	0.5086
Prai Units 1 - 2	1.7307	0.5769
Prai Units 1 - 3	1.7307	0.5769
Connaught Bridge	2.4675	0.8225
Malacca	2.5497	0.8499

5.16 It will be seen that some slight reduction in overall cost of power produced is expected at Port Dickson when units 3 & 4 go into service. This is principally due to the allocation of capital costs between the 4 units as against the 2 units initially. There is no appreciable change to Prai Station costs with the addition of the third unit.

5.17 Since the overall rate of return on average net fixed assets in operation for the NEB system as a whole is expected to average about 8.5% during the period under consideration (1969-1973), it would be reasonable to assume that the rate of return on the generating plant added to the system by the project would be somewhat above the system average of 8.5%, because of its lower production costs. This return values kwh sales at prevailing prices.

## VI. FINANCING PLAN AND FUTURE FINANCIAL POSITION

### Financing Plan

6.01 A forecast of sources and applications of funds for the period August 31, 1968 - August 31, 1973 is given in Annex 11. The projections are based on:

- (a) Sales of energy in accordance with the estimates given in paragraph 5.06. (It should be noted that the last column is based on sales under the lower forecast mentioned in paragraph 5.07.)
- (b) Tariffs at the present level.
- (c) Operating, administration and maintenance expenses based on present costs for each method of generation, adjusted for fuel consumption and increases in labor costs.
- (d) Depreciation calculated by the straight-line method on principal categories of plant. The average annual charge is equivalent to between three per cent and four per cent of the value of gross fixed assets.
- (e) Interest of 6-1/2% and commitment charges of 3/4% on the proposed Bank loan which is assumed to be for a period of twenty years including a grace period of four years. In view of the very substantial contribution to the financing of the program from NEB's own funds and the already existing tight cash position interest and other charges during construction totalling US\$1.2 million have been included in the loan. Interest on the proposed bilateral financing and on the overdraft has been assumed at seven per cent and on the future loan at 6-1/2%. It has also been assumed that the bilateral financing would be repaid in ten equal annual installments.
- (f) Dividends at the present annual rate of five per cent.
- (g) Transfer to the reserves of the entire surplus after interest and dividends.

6.02 During the five-year period from August 31, 1968 through August 31, 1973 NEB should complete the developments financed by loan 350-MA, loan 458-MA and the present project. It has been assumed that the construction on the third stage of the Port Dickson plant would be started in 1971. Investments will also have to be made in the diesel generating plants to supply isolated localities, and the distribution system will require annual investments which have been assumed to increase at the rate of five per cent per year.

6.03 A summary of the Financing Plan for the period August 31, 1968 through August 31, 1973 is shown in the following table:

<u>Financial Requirements:</u>	<u>M\$</u>	<u>US\$</u> (millions)	<u>Percentage</u>
Construction expenditures (excluding interest)			
Batang Padang and Prai (Loan 350-MA)	33.6	11.2	5.8
South Malaya (Loan 458-MA)	128.4	42.8	22.2
Port Dickson and Prai Extension (the project)	78.9	26.3	13.7
Port Dickson future extension	88.7	29.6	15.3
Other generation and transmission	23.5	7.8	4.1
Distribution	183.4	61.1	31.7
Administration and miscellaneous	<u>30.4</u>	<u>10.1</u>	<u>5.3</u>
Total construction expenditures	566.9	188.9	98.1
Working capital provision	<u>4.0</u>	<u>1.4</u>	<u>0.7</u>
Total requirements	570.9	190.3	98.8
Cash surplus	<u>7.1</u>	<u>2.4</u>	<u>1.2</u>
Total applications	<u>578.0</u>	<u>192.7</u>	<u>100.0</u>

The applications would be financed in the following manner:

<u>Sources of Funds</u>	<u>M\$</u>	<u>US\$</u> (millions)	<u>Percentage</u>
Internal cash generation	576.9	192.3	99.8
Less: Debt Service	265.3		
Dividends	<u>49.7</u>	<u>105.0</u>	<u>54.5</u>
Net internal cash generation	261.9	<u>87.3</u>	<u>45.3</u>
Government:			
Contribution for rural electrification	19.0	6.3	3.3
Stock participation for South Malaya power development	15.0	5.0	2.6
Contributions from consumers	<u>8.7</u>	<u>2.9</u>	<u>1.5</u>
Total contributions	42.7	<u>14.2</u>	<u>7.4</u>
Borrowings:			
(a) Disbursements under existing loans:			
IBRD loan 350-MA	32.3	10.8	5.6
IBRD loan 458-MA	101.9	34.0	17.6
(b) Proposed borrowings:			
IBRD loan	34.5	11.5	6.0
Bilateral Financing	30.3	10.1	5.2
Future loan for Port Dickson 2nd extension	<u>75.8</u>	<u>25.3</u>	<u>13.1</u>
Total Borrowings	274.8	<u>91.7</u>	<u>47.5</u>
Overdraft at local banks	<u>(1.4)</u>	<u>(0.5)</u>	<u>(0.2)</u>
Total Sources	<u>578.0</u>	<u>192.7</u>	<u>100.0</u>

6.04 Internal cash generation, net of debt service and dividends, would finance 45.3% of the application of funds. This is satisfactory and in accordance with NEB's stated policy that its internal resources will finance 40% to 50% capital expenditure. Contributions by the Government and consumers towards construction would raise the financing from sources other than borrowings to 52.7%. The Financing Plan is satisfactory.

6.05 Borrowings totaling M\$274.8 million (US\$91.7 million) would consist of:

- (a) the undisbursed balances as of August 21, 1968 totaling US\$44.8 million of IBRD loans 350-MA and 458-MA.
- (b) the proposed Bank loan for US\$11.5 million which would finance 39.7% of the total cost of the project.
- (c) bilateral financing of a part of the foreign costs of the project estimated at M\$30.3 million (US\$10.1 million). This would cover 34.9% of the total cost of the project.
- (d) disbursements totaling M\$75.8 million (US\$25.3 million) under a future loan which has been assumed to finance the third stage of the Port Dickson plant.

6.06 The bilateral financing mentioned under (c) has been discussed in paragraph 4.11. The items of equipment to be financed by it are of a kind for which satisfactory bilateral financing is normally available.

6.07 It is expected that NEB's current position will be quite tight during the next three years so that increasing use will have to be made of the overdraft facilities (paragraph 3.21). The projections show that a peak overdraft of M\$8 million in 1971 would be fully repaid within two years.

6.08 Under the lower forecast for energy sales as discussed in paragraph 5.07 operating revenues during the six-year period to August 31, 1973 would be M\$69.7 million lower than under the forecast on which the Financing Plan is based. Lower operating costs, mainly through a reduction in fuel consumption, would reduce the difference between the two forecasts as regards the internal cash generation to M\$14.7 million. Under the lower level of sales there would be no need to increase the annual investments in the distribution system at the rate of five per cent per year. Assuming that a rate of increase of three per cent would be sufficient, the investments could be reduced by M\$9.3 million.

6.09 As shown in the last columns of Annexes 5 and 11 the reduction in operating costs and investments mentioned in the previous paragraph, would compensate for all but M\$5.4 million of the expected loss of revenues under the lower forecast. There would still be a small but sufficient cash surplus over the six-year period and the financing of the project would remain secure.

#### Future Earnings and Financial Position

6.10 The income statement projections (Annex 5) and the table of financial ratios (Annex 6) show that future earnings during the six years to August 1973

should be satisfactory. The rate of return which is expected to be 9.2% in 1967/1968 and 8.8% in 1968/1969, may decline to 7.6% during 1969/1970 and 1970/1971. This development which is partly due to the addition of sizable amounts of new construction to the rate base, will be rectified in 1971/1972. In view of the temporary nature of the decline of the rate of return under the required level of eight per cent, it may not be necessary to revise the tariffs. In 1972 the rate would improve to 8.3% and in 1973 to 9.8%. The average rate for the whole period would be 8.5%.

6.11 Interest would be covered more than two times by income before interest and debt service would be covered more than two times by internal cash generation throughout the period. The debt/equity ratio which would remain at 59/41 during the first half of the period, would gradually change to 56/44 in 1973.

6.12 Loan 458-MA requires NEB to obtain the Bank's approval before incurring any long-term debt if internal cash generation for a recent twelve-month period is less than 1.5 times maximum future debt service. During negotiations satisfactory assurances were obtained that this requirement will be continued under the proposed loan. NEB should be able to meet this test as regards the proposed loan and the bilateral financing.

6.13 As already mentioned in paragraph 6.07 the current position would be tight but manageable with the use of the overdraft facilities.

## 7. CONCLUSIONS AND CONDITIONS OF LENDING

7.01 The Project is technically sound, the cost estimates realistic and the arrangements for construction satisfactory (paragraphs 4.14, 4.15 & 4.16).

7.02 The generating capacity which the Project would provide is necessary to meet the forecast demand and the proposed installations would be the most economical means of doing this (paragraphs 4.15, 4.16 & 4.17).

7.03 The power demand and sales forecasts are realistic and have been based upon a careful evaluation of the effect of future changes in the growth patterns of the area served (paragraph 5.07).

7.04 NEB's financial position is sound and promises to remain so in the future. A tight current position expected during the next three years will be manageable with the use of overdraft facilities (paragraphs 3.15 and 6.07).

7.05 The proposed financing plan for the period August 31, 1968 through August 31, 1973 is satisfactory. NEB would earn a satisfactory return, achieve an adequate coverage of interest and debt service, and would generate more than 40% of its capital expenditure (paragraphs 6.04, 6.10 and 6.11).

7.06 During negotiations satisfactory undertakings were obtained that the NEB will:

1. Consult the Bank before making appointments to the positions of General Manager, Chief Engineer and Chief Financial Officer (paragraph 3.05).
2. Continue to employ independent auditors acceptable to the Bank (paragraph 3.13).
3. Continue to maintain tariffs at a level to yield not less than eight per cent on its net fixed assets in operation (paragraph 3.10).
4. Keep its bank overdraft and short-term borrowings to a minimum. (paragraph 3.21).
5. Only incur long-term debt without the approval of the Bank, if its maximum annual debt service shall be covered at least 1.5 times by net revenues (paragraph 6.12).
6. Continue to engage consultants satisfactory to the Bank for the engineering, supervision of construction and evaluation of bids (paragraph 4.16).

7.07 During negotiations discussions were held to insure that the NEB intends to continue the following activities:

1. The staff training program (paragraph 3.06).
2. Measures to improve the ratio of customers or employee (paragraph 3.07).

7.08 Disbursements under the portions of the proposed Loan allocated for Port Dickson and related transmission system are conditioned on the prior conclusion, satisfactory to the Bank, of supplementary financing (paragraph 4.14).

7.09 The Project is suitable for a Bank Loan of US\$11.5 million equivalent for a period of twenty years including a grace period for amortization payments of four years.



MALAYSIA  
NATIONAL ELECTRICITY BOARD  
GENERATING PLANT CAPACITY (JULY 1968)

<u>Station</u>	<u>Year Installed</u>	<u>Installed Capacity MW</u>	<u>Location</u>
<u>Plants in Service</u>			
Cennaught Bridge Thermal Station	1953	80	Near Kuala Lumpur
Robinson Falls & Upper Telom Hydro Stations	1959/65	2.2	120 miles north of Kuala Lumpur
Malacca Thermal Station	1959	40	In Malacca
Ulu Langat Hydro Electric Station		2.3	Near Kuala Lumpur
Cameron Highlands (Jor & Habu Hydro Plants)	1963	105.5	110 miles North of Kuala Lumpur
Johore Bahru Thermal Station	1963	60	Southern end of Peninsula
Prai Thermal Station	1966	60	Near Penang
Cameron Highlands (Woh and Odak Hydro Plants)	1967	154.2	100 miles North of Kuala Lumpur
Diesel Stations	Various	<u>60</u>	About 50 Individual Stations serving areas not connected to the Main Networks
Total		<u>564</u>	
<u>Plants Under Construction</u>			
	<u>Scheduled in Service Date</u>		
Johore Bahru Thermal Station Extension	1969	30	Southern end of Peninsula
Port Dickson Thermal Station	1969	<u>120</u>	90 miles south of Kuala Lumpur
Total		<u>150</u>	
<u>Plants Proposed Under New Loan</u>			
Prai Thermal Plant Extension	1970	30	
Port Dickson Thermal Plant Extension	1972/73	<u>120</u>	
Total		<u>150</u>	
GRAND TOTAL BY 1972		864	October 16, 1968



MALAYSIANATIONAL ELECTRICITY BOARDINTERCONNECTED SYSTEM PLANT <sup>1/</sup>CAPACITY AND MAXIMUM DEMAND

The following information is given in chart form in Annex 7.

<u>Year</u>	<u>Plant <sup>2/</sup> Addition</u>	<u>Installed Capacity</u>	<u>Dry Season</u>		<u>Estimated Maximum Demand</u>	
			<u>Capacity MW</u>	<u>Firm Capacity</u>	<u>Normal</u>	<u>Low</u>
1968		444	339	309	282	282
1969	PD 1 & 2	564	459	369	330	308
1970	P 3	594	489	399	366	340
1971		594	489	399	400	370
1972	PD 3 & 4	714	609	519	455	415
1973		714	609	519	515	468
1974	PD 5	834	729	579	575	530
1975	PD 6 <sup>3/</sup>	954	849	699	645	590

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<sup>1/</sup> Does not include the Southern System and isolated diesel plants.

<sup>2/</sup> PD = Port Dickson Steam Plant  
P = Prai Steam Plant

<sup>3/</sup> Either PD 6 or some other project e.g., Upper Perak Hydroelectric Development Project if proven feasible (see "Future Expansion Program" in text of report).

October 28, 1968

## MALAYSIA

## NATIONAL ELECTRICITY BOARD OF THE STATES OF MALAYA

Actual and Forecast Balance Sheets 1962/63 - 1972/73  
(in millions of M\$)

As of August 31	Actual					Preliminary	Forecast				
	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
<b>ASSETS</b>											
<b>FIXED ASSETS</b>											
Utility Plant at cost	367.1	442.7	467.9	505.9	571.7	813.4	901.1	1,022.8	1,094.1	1,167.4	1,235.1
Less: Accumulated depreciation	82.6	96.1	107.6	125.0	144.3	167.0	193.6	224.7	258.1	294.6	332.9
Consumers contributions	11.3	13.7	16.7	18.7	20.8	23.5	27.5	32.0	36.0	39.5	42.5
Net Fixed Assets in Operation	273.2	332.9	343.6	362.2	406.6	623.9	680.0	766.1	800.0	833.3	859.7
Construction work in progress	59.3	53.2	104.7	178.9	221.1	78.3	103.0	68.7	69.9	64.9	112.0
<b>CURRENT ASSETS</b>											
Cash and banks	0.4	0.6	0.8	1.6	5.2	5.3	5.4	8.4	8.6	7.9	12.3
Inventories, receivables, etc.	32.0	33.9	33.5	41.0	48.1	47.1	49.1	51.1	53.1	55.1	58.1
Total Current Assets	32.4	34.5	34.3	42.6	53.3	52.4	54.5	59.5	61.7	63.0	70.4
<b>TOTAL ASSETS</b>	<b>364.9</b>	<b>420.6</b>	<b>482.6</b>	<b>583.7</b>	<b>681.0</b>	<b>753.6</b>	<b>837.5</b>	<b>894.3</b>	<b>931.6</b>	<b>961.2</b>	<b>1,042.1</b>
<b>LIABILITIES AND EQUITY</b>											
<b>EQUITY</b>											
Ordinary stock	51.3	72.3	87.3	122.3	152.7	163.3	167.7	167.7	167.7	167.7	167.7
Reserves	46.4	52.8	64.4	81.6	102.7	121.6	149.1	169.6	192.8	222.2	264.7
Total Equity	97.7	125.1	151.7	203.9	255.4	284.9	316.8	337.5	360.5	389.9	432.4
<b>LONG-TERM DEBT</b>											
Government of Malaysia	93.4	93.0	91.6	89.9	88.2	86.3	84.3	82.2	80.0	77.7	75.3
Employees Provident Fund	10.0	10.0	10.0	10.0	10.0	10.0	10.0	9.8	9.4	8.8	8.0
ODFC	4.3	4.3	4.3	4.3	4.3	4.3	3.9	3.5	3.1	2.7	2.3
IIRD loan 210-MA	66.5	72.9	76.1	76.9	74.0	70.8	67.4	63.8	60.0	56.0	51.7
IIRD loan 350-MA	-	10.5	37.9	83.1	124.5	144.1	147.8	142.9	137.7	132.2	126.4
IIRD loan 458-MA	-	-	-	-	11.4	38.4	85.4	109.2	104.8	100.2	95.3
OD	56.0	54.7	53.1	51.6	49.9	48.1	46.2	44.2	42.1	39.9	37.5
Proposed IIRD loan	-	-	-	-	-	-	4.5	18.1	29.6	33.3	32.0
Bilateral Financing	-	-	-	-	-	-	1.3	3.7	17.4	23.3	20.3
Future loan Port Dickson 2nd Ext.	-	-	-	-	-	-	-	-	0.7	12.7	75.8
Total Long-Term Debt	230.2	245.4	273.0	315.8	362.3	402.0	450.8	477.4	484.8	486.8	524.6
<b>CURRENT LIABILITIES</b>											
Payables, provisions, consumers deposits	29.8	36.6	39.3	55.9	53.4	54.4	55.4	56.4	57.4	58.4	59.4
Bank overdraft	2.9	8.5	13.0	2.0	1.4	1.0	2.0	5.0	8.0	2.0	-
Current portion of long-term debt	4.3	5.0	5.6	6.1	6.5	11.3	12.5	18.0	20.9	24.1	25.7
Total Current Liabilities	37.0	50.1	57.9	64.0	61.3	66.7	69.9	79.4	86.3	84.5	85.1
<b>TOTAL LIABILITIES AND EQUITY</b>	<b>364.9</b>	<b>420.6</b>	<b>482.6</b>	<b>583.7</b>	<b>681.0</b>	<b>753.6</b>	<b>837.5</b>	<b>894.3</b>	<b>931.6</b>	<b>961.2</b>	<b>1,042.1</b>
Debt/Equity ratio	71/29	67/33	65/35	61/39	59/41	59/41	59/41	59/41	58/42	57/43	56/44
<b>Conversion rates</b>											

In the Actual Balance Sheets US dollars have been converted into sterling at the rate of US \$2.60 to £1 and sterling into Malayan dollars at the rate of 2 shillings 4 pence to M\$1.  
In the projections the rate of US\$1 = M\$3 has been used.

October 16, 1968

MALAYSIA

NATIONAL ELECTRICITY BOARD OF THE STATES OF MALAYA

Details of Long-Term Debt as at August 31, 1968  
(in million of M\$)

<u>Lender</u>	<u>Year Drawn</u>	<u>Amount Drawn</u>	<u>Interest Rate %</u>	<u>Repayment Period</u>	<u>Repaid to August 31, 1968</u>	<u>Balance Outstanding August 31, 1968</u>
Government	1954/59	40.0	5	1955-2019	1.6	38.4
"	1960	7.0	5.75	1965-1979	1.1	5.9
"	1961	6.0	5.75	1966-1980	0.7	5.3
"	1960/63	42.5	6	1964-1988	3.9	38.6
Employees Provident Fund	1960	5.0	6	1971-1980	-	5.0
" " "	1962	5.0	6	1973-1982	-	5.0
Commonwealth Development Finance Co., Ltd.,	1959	4.3	6.75	1970-1979	-	4.3
IBRD Loan 210-MA	1959/66	87.6	5.75 <sup>2/</sup>	1964-1983	13.6	74.0
IBRD Loan 350-MA	1963/68	150.6 <sup>1/</sup>	5.5 <sup>2/</sup>	1968-1988	2.1	148.5
IBRD Loan 458-MA	1966/68	38.4 <sup>3/</sup>	6	1970-1986	-	38.4
Commonwealth Development Corporation	1960	60.7	6.25	1961-1985	10.8	<u>49.9</u>
						<u>413.3</u>

<sup>1/</sup> Loan 350-MA is for US\$51.9 million (M\$158.9 million)

<sup>2/</sup> The interest rate has been reduced slightly due to sales participations in early maturities.

<sup>3/</sup> Loan 458-MA is for US\$37.0 million (M\$113.3 million)

October 14, 1968

MALAYSIA  
NATIONAL ELECTRICITY BOARD OF THE STATES OF MALAYA  
Actual and Forecast Income Statements 1962/63 - 1972/73  
(in millions of M\$)

Fiscal year ending August 31	Actual					Preliminary	Forecast					Total 1968 through 1973	
	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	as forecast in preceding columns	under minimum conditions
Sales increase in percent	13.1	14.4	16.8	14.4	11.8	29.3	15.8	10.7	9.8	12.9	12.8	131.6	111.5
Sales (Gwh)	803	919	1,073	1,228	1,373	1,775	2,056	2,275	2,498	2,819	3,180	14,603	13,642
Average revenue per kwh (M. cents)	9.4	9.2	9.1	9.0	8.9	8.1	7.9	7.7	7.7	7.6	7.6	7.7	7.8
OPERATING REVENUES	75.1	84.4	97.8	110.6	122.4	143.8	162.4	175.2	192.3	214.2	241.7	1,129.6	1,059.9
OPERATING COSTS													
Operating administration and maintenance expenses	47.7	48.6	54.1	59.0	63.6	75.0	80.1	90.7	100.5	111.5	121.9	579.7	524.7
Depreciation	10.9	14.7	16.0	17.5	19.8	24.2	28.1	32.6	34.9	38.0	39.8	197.6	196.3
Total Operating Costs	58.6	63.3	70.1	76.5	83.4	99.2	108.2	123.3	135.4	149.5	161.7	777.3	721.0
NET INCOME FROM OPERATIONS	16.5	21.1	27.7	34.1	39.0	44.6	54.2	51.9	56.9	64.7	80.0	352.3	338.9
Other Income	2.4	2.2	2.6	2.9	3.1	3.0	3.0	3.0	3.0	3.0	3.0	18.0	16.0
NET INCOME BEFORE INTEREST	18.9	23.3	30.3	37.0	42.1	47.6	57.2	54.9	59.9	67.7	83.0	370.3	356.9
Interest Payable	12.7	15.4	16.5	18.2	20.3	23.0	25.6	28.4	30.1	30.8	32.1	170.0	170.0
Less: Interest Capitalized	5.0	1.5	1.8	3.4	6.1	2.1	4.2	2.6	1.6	0.9		11.4	11.4
Interest charged to operation	7.7	13.9	14.7	14.8	14.2	20.9	21.4	25.8	28.5	29.9	32.1	158.6	158.6
NET INCOME	11.2	9.4	15.6	22.2	27.9	26.7	35.8	29.1	31.4	37.8	50.9	211.7	198.3
Surplus at beginning of year	37.5	46.4	52.8	64.4	81.6	102.7	121.6	149.1	169.8	192.8	222.2	102.7	102.7
Less: Dividends	2.3	3.0	4.0	5.0	6.8	7.8	8.3	8.4	8.4	8.4	8.4	49.7	49.7
Surplus at end of year	46.4	52.8	64.4	81.6	102.7	121.6	149.1	169.8	192.8	222.2	264.7	264.7	251.3
Times interest covered by net income before interest	1.5	1.5	1.8	2.0	2.1	2.1	2.2	2.0	2.0	2.2	2.6	2.2	2.1
Return on average net fixed assets in operation	8.6	7.7	9.0	10.5	11.0	9.2	8.8	7.6	7.6	8.3	9.8	8.5	8.2

October 16, 1968

MALAYSIA

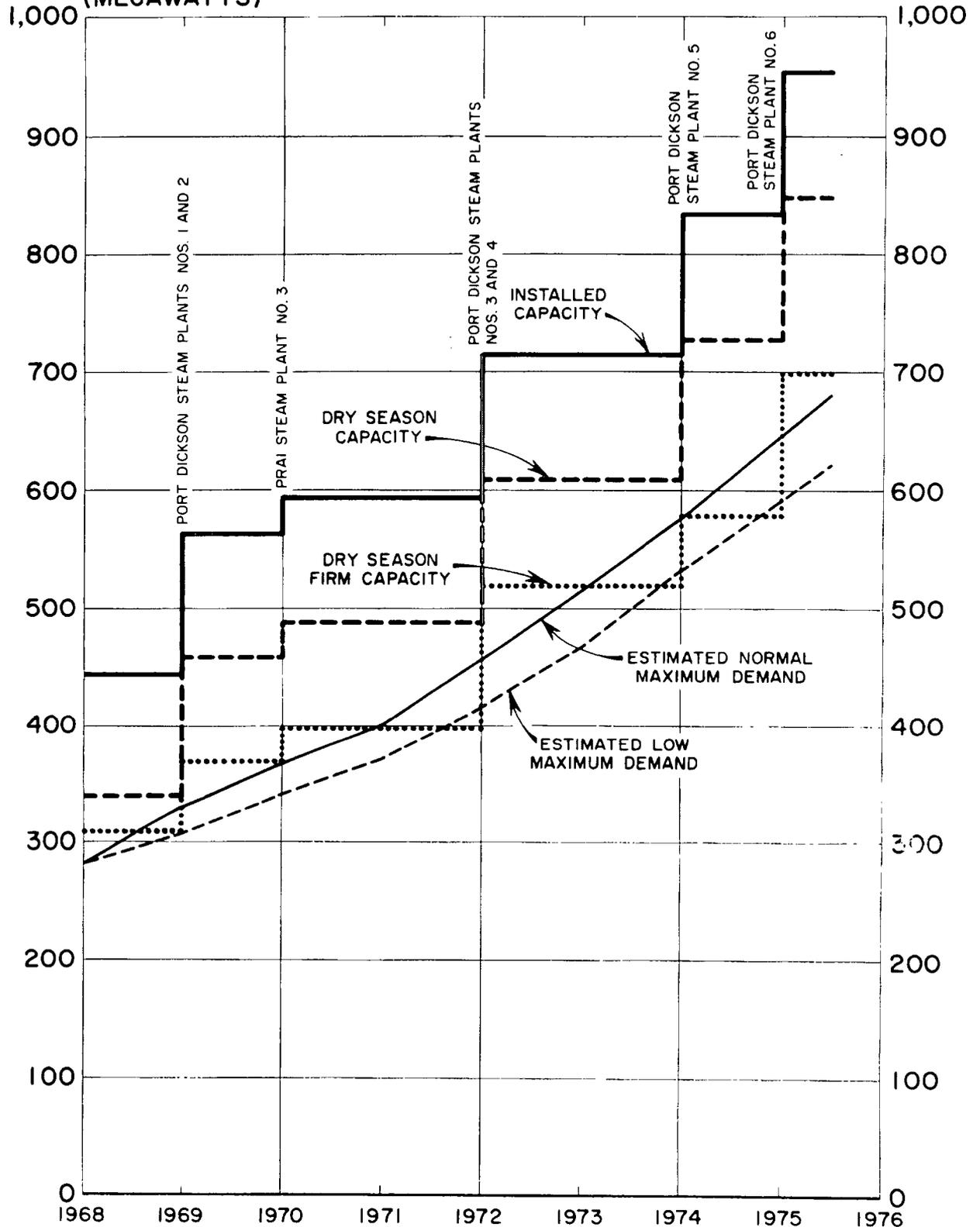
NATIONAL ELECTRICITY BOARD OF THE STATES OF MALAYA

Actual and Forecast Financial Ratios  
(in millions of RM)

	Actual					Forecast					
	<u>1963</u>	<u>1964</u>	<u>1965</u>	<u>1966</u>	<u>1967</u>	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
Fiscal year ending August 31											
<u>Return on Net Plant</u>											
Average net fixed assets in operation	220.0	303.1	338.3	352.9	384.4	514.8	651.5	723.1	783.1	816.7	846.5
Net income before interest	18.9	23.3	30.3	37.0	42.1	47.6	57.2	54.9	59.9	67.7	83.0
Percentage return (%)	8.6	7.7	9.0	10.5	11.0	9.2	8.8	7.6	7.6	8.3	9.8
<u>Operating Ratio</u>											
Ratio of operating expenses to operating revenues (%)	78.0	75.0	71.7	69.2	68.1	69.0	66.6	70.4	70.4	69.8	66.9
<u>Interest</u>											
Times interest covered by net income before interest	1.5	1.5	1.8	2.0	2.1	2.1	2.2	2.0	2.0	2.2	2.6
<u>Debt</u>											
Times debt service covered by internal cash generation				2.4	2.4	2.3	2.4	2.2	2.0	2.1	2.2
Debt/Equity ratio	71/29	67/33	65/35	61/39	59/41	59/41	59/41	59/41	58/42	57/43	56/44

October 14, 1968

# MALAYSIA: NATIONAL ELECTRICITY BOARD INTERCONNECTED SYSTEM PLANT CAPACITY AND MAXIMUM DEMAND (MEGAWATTS)



MALAYSIA  
NATIONAL ELECTRICITY BOARD PROJECT

Actual and Forecast Sales of Energy

Year	Domestic			Commercial			Industrial - Mines			Industrial - Others			Bulk Supply to Perak River Hydro Co.			Total	
	Millions kwh	% Increase over previous years	% of total sales	Millions kwh	% Increase over previous years	% of total sales	Millions kwh	% Increase over previous years	% of total sales	Millions kwh	% Increase over previous years	% of total sales	Millions kwh	% Increase over previous years	% of total sales	Millions kwh	% Increase over previous years
<u>Actual</u>																	
1962-63	120	11.1	14.9	267	15.1	33.5	235	9.3	29.3	131	13.8	22.5	-	-	-	803	13.1
1963-64	140	15.7	15.2	314	17.6	34.2	250	6.4	27.2	215	18.8	23.4	-	-	-	919	14.4
1964-65	163	16.4	15.2	366	16.6	34.1	281	12.4	26.2	263	22.3	24.5	-	-	-	1,073	16.8
1965-66	134	12.4	15.0	423	15.6	34.4	315	12.1	25.7	306	16.3	24.9	-	-	-	1,228	14.4
1966-67	203	10.8	14.8	473	11.8	34.4	344	9.2	25.1	353	15.4	25.7	-	-	-	1,373	11.3
<u>Estimated</u>																	
1967-68	225	10.6	12.7	530	12.0	29.9	380	10.5	21.4	435	23.2	24.5	205	-	11.5	1,775	29.3
1968-69	248	10.4	12.1	594	12.0	23.9	400	5.3	19.5	550	26.4	26.7	264	23.8	12.8	2,056	15.8
1969-70	273	10.2	12.0	665	12.0	29.2	420	5.0	18.5	587	6.7	25.8	330	25.0	14.5	2,275	10.7
1970-71	300	10.0	12.0	745	12.0	29.8	440	4.9	17.6	653	11.2	26.2	360	9.1	14.4	2,498	9.8
1971-72	330	10.0	11.7	834	12.0	29.6	460	4.5	16.3	775	18.7	27.5	420	16.7	14.9	2,819	12.9
1972-73	363	10.0	11.4	934	12.0	29.4	480	4.3	15.1	943	21.7	29.6	460	9.5	14.5	3,130	12.8
1973-74	399	10.0	11.3	1,046	12.0	29.5	500	4.2	14.1	1,064	12.8	30.1	530	15.2	15.0	3,539	11.3
1974-75	439	10.0	11.1	1,172	12.0	29.7	500	-	12.6	1,281	20.4	32.4	560	5.7	14.2	3,952	11.7
1975-76	483	10.0	10.9	1,313	12.0	29.7	500	-	11.3	1,502	17.3	33.9	630	12.5	14.2	4,423	12.0

October 14, 1968

SUMMARY OF SALES AND MAXIMUM DEMAND FORECASTSNORMAL AND LOW FORECASTS

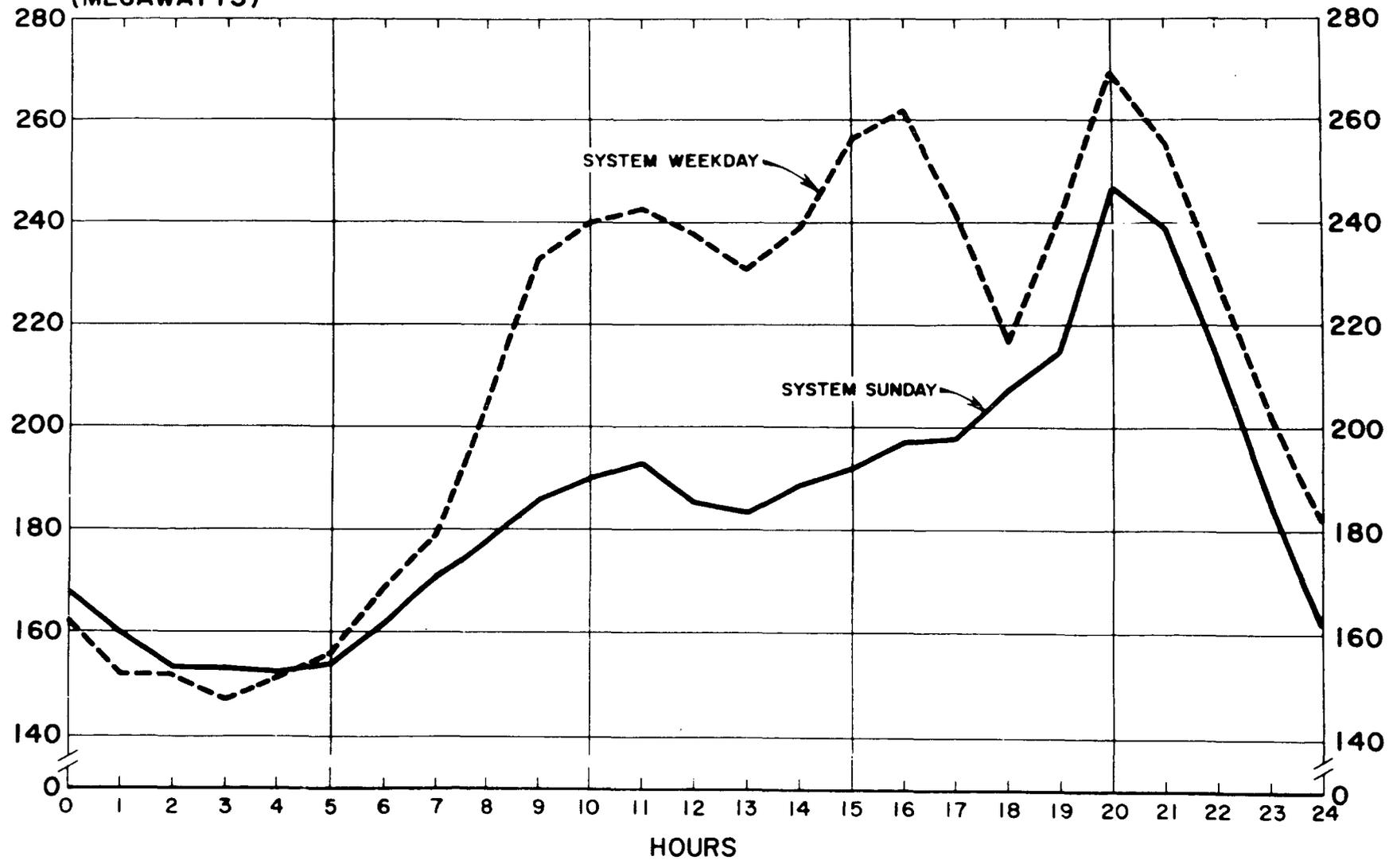
Year	SALES				MAXIMUM DEMAND	
	Normal		Low		Normal	Low
	<u>Gwh</u>	<u>Increase</u>	<u>Gwh</u>	<u>Increase</u>	<u>Mw</u>	
1968	1775	29.3	1775	29.3	282	282
1969	2056	15.8	1938	10.4	330	308
1970	2275	10.7	2133	10.1	365	340
1971	2498	9.8	2319	8.7	400	370
1972	2819	12.9	2593	11.8	455	415
1973	3180	12.8	2904	12.0	515	468
1974	3539	11.3	3268	12.5	575	530
1975	3852	11.7	3626	11.0	645	590
1976	4428	12.0	4067	12.2	725	665

October 16, 1968

# MALAYSIA: NATIONAL ELECTRICITY BOARD

## TYPICAL SYSTEM LOAD CURVES

(MEGAWATTS)



## MALAYSIA

## NATIONAL ELECTRICITY BOARD OF THE STATES OF MALAYA

Actual and Estimated Sources and Applications of Funds 1965/66 - 1972/73  
(in millions of M\$)

Fiscal Year ending August 31	Actual		Forecast						Total 1968 through 1973	
	1966	1967	1968	1969	1970	1971	1972	1973	as forecast in preceding columns	under minimum conditions
<b>SOURCES OF FUNDS</b>										
Net income before interest	37.0	42.1	47.6	57.2	54.9	59.9	67.7	83.0	370.3	356.9
Depreciation	19.0	21.1	25.7	29.6	34.1	36.4	39.5	41.3	206.6	205.3
Internal cash generation	<u>56.0</u>	<u>63.2</u>	<u>73.3</u>	<u>86.8</u>	<u>89.0</u>	<u>96.3</u>	<u>107.2</u>	<u>124.3</u>	<u>576.9</u>	<u>562.2</u>
Government contributions for rural electrification	1.5	2.2	2.5	3.5	4.0	3.5	3.0	2.5	19.0	19.0
Consumers' contributions and sales of fixed assets	1.2	1.0	1.2	1.5	1.5	1.5	1.5	1.5	8.7	8.7
Borrowings:										
IBRD Loan 210-MA	3.6	-	-	-	-	-	-	-	-	-
IBRD Loan 350-MA	45.2	43.5	24.0	8.3	-	-	-	-	32.3	32.3
IBRD Loan 450-MA	-	11.4	27.0	47.0	27.9	-	-	-	101.9	101.9
Proposed IBRD Loan	-	-	-	4.5	13.6	11.5	4.9	-	34.5	34.5
Proposed bilateral financing	-	-	-	1.5	3.1	16.1	9.2	0.4	30.3	30.3
Future loan Port Dickson 2nd Ext.	-	-	-	-	-	0.7	12.0	63.1	75.8	75.8
Total Borrowings	<u>48.8</u>	<u>54.9</u>	<u>51.0</u>	<u>61.3</u>	<u>44.6</u>	<u>28.3</u>	<u>26.1</u>	<u>63.5</u>	<u>274.8</u>	<u>274.8</u>
Issues of Stock:										
Batang Padang	15.0	10.4	-	-	-	-	-	-	-	-
South Malaya	20.0	20.0	10.6	4.4	-	-	-	-	15.0	15.0
TOTAL SOURCES	<u>142.5</u>	<u>151.7</u>	<u>138.6</u>	<u>157.5</u>	<u>139.1</u>	<u>129.6</u>	<u>137.8</u>	<u>191.8</u>	<u>894.4</u>	<u>879.7</u>
<b>APPLICATIONS OF FUNDS</b>										
Construction expenditures (excluding interest)										
Batang Padang and Prai	76.4	55.1	19.1	14.0	0.5	-	-	-	33.6	33.6
South Malaya	2.9	19.0	47.8	53.2	26.5	0.9	-	-	128.4	128.4
Proposed Port Dickson and Prai ext.	-	-	-	7.0	22.8	31.7	15.1	2.3	78.9	78.9
Port Dickson 2nd ext.	-	-	-	-	-	0.8	15.2	72.7	88.7	88.7
Other generation and transmission	9.0	4.3	3.0	4.5	4.0	5.0	3.0	4.0	23.5	23.5
Distribution and vehicles	18.2	23.4	25.5	28.5	30.0	31.5	33.1	34.8	183.4	174.1
Administration and miscellaneous	4.5	3.1	5.4	5.0	5.0	5.0	5.0	5.0	30.4	30.4
Total construction expenditures	<u>111.0</u>	<u>104.9</u>	<u>100.8</u>	<u>112.2</u>	<u>88.8</u>	<u>74.9</u>	<u>71.4</u>	<u>118.8</u>	<u>566.9</u>	<u>557.6</u>
Bank overdraft	11.0	0.6	0.4	(1.0)	(3.0)	(3.0)	6.0	2.0	1.4	1.4
Debt Service (Annex 12)	23.8	26.4	31.5	36.9	40.9	48.1	51.7	56.2	265.3	265.3
Working Capital (excl. cash)	(8.3)	9.4	(2.0)	1.0	1.0	1.0	1.0	2.0	4.0	4.0
Dividends	5.0	6.8	7.8	8.3	8.4	8.4	8.4	8.4	49.7	49.7
TOTAL APPLICATIONS	<u>142.5</u>	<u>148.1</u>	<u>138.5</u>	<u>157.4</u>	<u>136.1</u>	<u>129.4</u>	<u>138.5</u>	<u>187.4</u>	<u>887.3</u>	<u>878.0</u>
Cash surplus (deficit)	-	3.6	0.1	0.1	3.0	0.2	(0.7)	4.4	7.1	1.7
Cumulative cash balance	1.6	5.2	5.3	5.4	8.4	8.6	7.9	12.3	12.3	7.0
Times debt service covered by internal cash generation	2.4	2.4	2.3	2.4	2.2	2.0	2.1	2.2	2.2	2.1

October 16, 1968

MALAYSIANATIONAL ELECTRICITY BOARD OF THE STATES OF MALAYADebt Service Projections

(in millions of M\$)

Fiscal year ending August 31	<u>1968</u>	<u>1969</u>	<u>1970</u>	<u>1971</u>	<u>1972</u>	<u>1973</u>
<u>Interest and other Financial charges</u>						
Government of Malaysia	5.0	4.8	4.7	4.6	4.5	4.4
Employees Provident Fund	0.6	0.6	0.6	0.6	0.6	0.6
CDFC	0.3	0.3	0.3	0.3	0.2	0.2
IBRD loan 210-MA	4.3	4.1	3.9	3.7	3.5	3.3
IBRD loan 350-MA	7.7	8.3	8.4	8.1	7.8	7.5
IBRD loan 458-MA	1.8	3.9	6.0	6.7	6.4	6.2
CDC	3.2	3.1	3.0	2.9	2.8	2.7
Proposed IBRD loan	-	0.3	0.9	1.6	2.1	2.2
Bilateral Financing	-	0.1	0.3	1.1	2.0	2.1
Future loan Port Dickson 2nd Ext.	-	-	-	-	0.5	2.9
Overdraft	<u>0.1</u>	<u>0.1</u>	<u>0.3</u>	<u>0.5</u>	<u>0.4</u>	<u>-</u>
Total interest and other Financial charges	<u>23.0</u>	<u>25.6</u>	<u>28.4</u>	<u>30.1</u>	<u>30.8</u>	<u>32.1</u>
<u>Amortization</u>						
Government of Malaysia	1.7	1.9	2.0	2.1	2.2	2.3
Employees Provident Fund	-	-	-	0.2	0.4	0.6
CDFC	-	-	0.4	0.4	0.4	0.4
IBRD loan 210-MA	3.0	3.2	3.4	3.6	3.8	4.0
IBRD loan 350-MA	2.1	4.4	4.6	4.9	5.2	5.5
IBRD loan 458-MA	-	-	-	4.1	4.4	4.6
CDC	1.7	1.8	1.9	2.0	2.1	2.2
Proposed IBRD loan	-	-	-	-	-	1.2
Bilateral Financing	-	-	0.2	0.7	2.4	3.3
Total amortization	<u>8.5</u>	<u>11.3</u>	<u>12.5</u>	<u>18.0</u>	<u>20.9</u>	<u>24.1</u>
Total debt service	<u>31.5</u>	<u>36.9</u>	<u>40.9</u>	<u>48.1</u>	<u>51.7</u>	<u>56.2</u>

October 14, 1968

# MALAYSIA NATIONAL ELECTRICITY BOARD PROJECT

