ELECTRICITY IN CYPRUS

AN ECONOMIC AND FINANCIAL ANALYSIS

BY

KEVORK HAROUTUNE KEBABJIAN

A Thesis

Submitted in Partial Fulfilment of the Requirements of the

Degree of Master of Business Administration in the

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By

Kevork Kebabdjian

Approved :

Dr. Muhammad Atallah Lecturer	Advisor	M. Atallah
Prof. Emile Ghattas Assistant Prof.	Member of Committee	E. Ghattas
Prof. Burhan Dajani Lecturer	Member of Committee	Burhan Dajani

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PREFACE

In our present day modern life electricity plays an essential and vital role within a society's infra-structure. The importance of electricity services in Cyprus is heavily felt by the Cypriot community at large and by the industrial sector and rural areas in particular.

The purpose of this thesis is to study and analyze the major factors contributing to the development of electricity services in Cyprus through the collection, classification as well as interpretation of primary pertinent data. However, a detailed analysis and evaluation of all the operational phases of the Electricity Industry is beyond the scope of such a work. Rather, the main emphasis in this study is placed on the economic and financial aspects of the industry's operative performance and its development. In later parts, an attempt is made to assess the performance of the Electricity Authority of Cyprus and propose some basic policy guide lines.

The assistance and cooperation of many persons were essential to the accomplishment of this study. In this respect, the writer wishes to acknowledge and express, with sincere and deep gratitude, his intellectual indebtedness to Prof. Salim Hoss and Dr. Muhammad Atallah of the Department of Business Administration of the American University of Beirut, for their close supervision, guidance and criticisms. Moreover, their generosity in time and effort on comments and valuable advice had a great bearing towards the improvement of this research work both in content and presentation.

Finally, thanks are duly extended to all those who contributed to the achievement of such a study.

Kevork H. Kebabjian.

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INTRODUCTION

CYPRUS BACKGROUND SURVEY

Geography.

Cyprus, a large island but a small country, is the most easterly island in the Mediterranean Sea, positioned in the extreme north-west corner of the Levant. With an area of 3,572 square miles of land it ranks as the third largest after Sicily and Sardenia in the Mediterranean.

Its greatest breadth from north to south, from Cape Kormakiti to Cape Gata, is just 60 miles, while its greatest length from east (Cape St. Andreas) to West (Paphos) is around 140 miles.[1]

The two mountain ranges, one in the north and the other in the southwest, surrounded by coastal and inland plains, constitute the Island's main morphological features. The Kyrenia range, with its narrow belt of limestone mountains

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[1]Great Britain, Colonial Office, Cyprus--Report for the Year 1956, p. 90.

rising to about 3,000 feet, occupies the northern part of the Island. The southwestern massive Troodos range embraces Mount Olympus with its highest peak of 6,400 feet above sea level, an igneous and limestone formation.[2] The shoulders of the mountain ranges and the fertile central plain which connects them, known as the Mesaoria, "provide Cyprus its agricultural land for citrus plantings along the sea, grapes and olive, carob, and deciduous fruit trees on the terraced hillsides, cereals on the flat expanses of the plain."[3]

According to the latest available official estimates, Cyprus had a population of 587,000.[4] Based on a net average annual rate of growth of 1.7 per cent,[5] the population at present (1966) can be estimated at around 607,000. The Greek Cypriots (Christian Orthodox) constitute around 77 per cent of the population and Turkish Cypriots (Sunni Moslems) comprise around 18.3 per cent of the Cyprus population. The

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[2]A. Meyer, and S. Vassiliou, The Economy of Cyprus (Cambridge: Harvard University Press, 1962), p. 1.

[3]Meyer and Vassiliou, op. cit., pp. 1 - 2.

[4]Cyprus, Ministry of Finance, Department of Statistics and Research, Statistical Abstract (1964), p. 14.

[5]Ibid.

remaining 4.7 per cent is composed of minorities such as Armenians (Gregorians) and others.[6]

Cyprus has the typical eastern Mediterranean seasonal variations of distinct and most beneficial summer and winter climates, with spring and autumn often hardly distinguishable as seasons. During the winter the prevailing mild and invigorating weather would be interrupted by occasional (but little) rains and travelling cyclones amidst the arrays of bright sunshine. Summers are virtually rainless featured with hot-dry weather on the inland plains, and hot-humid along the coast-lines.[7] On the mountains, especially at Troodos and its vicinity, summer is mild, chilly, and pleasant, thus rendering the area a natural summer resort favoured by residents and foreign vacationers.[8]

The country's geological structure aggravates severely the problem of water shortage since "the igneous and limestone formations of subsoil are porous, faulted, and seemingly perniciously designed by nature to assist the eroded topsoil in depositing far too much of the island's

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[6] Ibid., p. 23.

[7] Meyer and Vassiliou, op. cit., p. 2.

[8] Meyer and Vassiliou, op. cit., p. 4.

annual rainfall into the sea."[9] This has had an adverse effect on the usage of pump irrigation systems in agriculture for the limited quantity of residual water retained in the subsoil.

Cyprus' geographic location, being the watch-tower and the outwork of Port Said --the connecting link of East and West,[10] has rendered itself invaluable to Western military strategists. History has witnessed this fact. On evacuation of the British forces from Suez, Cyprus was destined to be the headquarters for commando troops garrisoned to quell potential disturbances in the Levant. In fact, during the Suez crisis in 1956, paratroop battalions launched their reinforcing military flights from aerodromes on the Island. Military expeditures of the United Kingdom could be considered as the economic lifeblood of Cyprus.[11]

History.

The history of Cyprus is influenced greatly by its geographical position.[12] Cyprus ". . . is a land placed

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[9] Ibid., p. 3.

[10] W. Hepworth Dixon, British Cyprus (London: Chapman & Hall, Piccadilly, 1879), p. 10.

[11] Meyer and Vassiliou, op. cit., p. 5.

[12] Philip Newman, A Short History of Cyprus (London: Longmans, Green & Co., 1953), p. vii.

by geography at the cross-roads of the civilizations of Europe, Asia and ancient Egypt; a land where races have always met yet have rarely mingled.[13] The Island has been the stage scene for numerous races, nationalities, religions and communities warring for supremacy and domination; thus, it has witnessed battles fought between Aryans and Semites, East and West, Christians and Moslems, and recently, Greeks and Turks. Its dual strategic and economic endowments have aroused the interests of the Great Powers in it. Throughout the centuries, Micenaeans, Assyrians, Persians, Romans, Byzantines, Arabs, Lusignans, Venetians, Ottomans, and lately the British have ascended the political scene only to disappear later. In short, it was destined for Cyprus to be a battlefield of the Levant and the prey of contending powers.[14]

In 1878, the Ottoman Sultan conceded the Island's custodianship to Great Britain. When Turkey entered World War I on Germany's side, Great Britain proclaimed the outright annexation of the Island. Independence was granted to Cyprus in 1960 in compliance with the London-Zurich agreements of

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[13]Harry Luke, Cyprus (London: George G. Harrap & Co., 1957), p. 17.

[14]Harry Luke, Cyprus (London: George G. Harrap & Co., 1965), p. 28.

1959 - 1960, whereby Cypriots' alleged independence was secured and guaranteed by Great Britain, Turkey and Greece.

Political instability and social upheavals profoundly characterized the Island's independence since 1960. This was mainly due to radical differences in prevailing political ideologies of two[15] major native communities. On the one hand, the Cypriot Greeks pleading for union with Greece (Enosis) backed by E.O.K.A., a terrorist organization supported by Greece as camouflaged under the slogan of "self-determination;" while on the other side Cypriot Turks denouncing all such plans and countering by proposals of partitioning the Island. As a result, serious communal disturbances engaged the Island in a large scale bloody civil war in 1963 and 1964. The situation was complicated and aggravated further by the existence of two other factors. First, the two communities, due to their different religions, languages and cultural heritage, seem to have little in common; second, there have been conflicting political interests among foreign powers.[16]

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[15]Sweet-Escott Bickham, "Cyprus--History," Encyclopaedia Britannica, VI (1965), p. 953.

[16]Varoujan V. Vartanian, "Telecommunication In Cyprus" (unpublished Master's dissertation, Dept. of Bus. Admn., A.U.B., 1966), p. 5.

Economy.

Natural Resources

Cyprus, due to its geographical position and its climatic conditions, is a semi-arid country and its available water is of meteoric origin with an average annual rainfall of 19.4 inches.[17] The adverse and unpredictable state of water supply constitutes a major bottleneck for the agriculture sector. Cypriots, having no flowing rivers to provide a regular and adequate water supply, direct their efforts to the conservation of rain water which is neither stable nor abundant. Dams constructed to preserve the rain water would be useful to replenish underground water resources and reclaim larger areas of land.[18] The disalination of sea water is thought to be a possible solution for this perennial problem.

Agriculture is considered to be the backbone of the Cyprus economy in three respects: First, it contributes significantly (18.8% in 1964) to the national product; second, it absorbs around 40% of the economically active population;

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[17] W.L. Thorp, Cyprus--Suggestions for a Development Programme (New York: The United Nations, 1961), p. 6.

[18] Cyprus, Five Year Programme of Economic Development (1961), pp. 7 - 8.

and third, the country's industry and export depend highly upon agriculture.[19] Due to the water shortage, vast areas are subjected to dry-farming and are dependent upon rainfall. Cyprus' principal agricultural produce are wheat, barley, vetches, cotton, chick peas, sesame, tobacco, citrus fruits, grapes, olives, almonds, and carobs.[20]

The Cyprus agriculture seems to have three general characteristics. First, the average agricultural holding is small in size. Second, the modern techniques in cultivation are limited in use, as evidenced by the small scale irrigation, the limited use of fertilizers and mechanization.. Third, the remuneration to the farmer is inadequate due to the heavy burden of indebtedness, and defective methods of exportation of agricultural produce.[21]

Owing to the foregoing factors, the Cyprus economy now suffers from two main problems: on the one hand is the low per capita income of the farmer, and on the other, the excess of agricultural imports over the agricultural exports.[22]

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[19] Ibid., p. 5.

[20] Meyer and Vassiliou, op. cit., p. 22.

[21] Cyprus, Five Year Programme of Economic Development, op. cit., p. 5.

[22] Ibid.

Eighteen per cent of the Island's area is covered with forests, which constitute a significant part of the country's national wealth notwithstanding the fact that this sector has already suffered serious fires over the past decade.

The government has forestry and reafforestation development programmes aimed at conservation of forest wealth and upgrading the quality of its products and achieving a greater degree of self-sufficiency.

Fishing in Cyprus is still an infant industry. The underdeveloped state of the fisheries may be attributed mainly to the lack of nutrient fishing grounds as well as the inefficacy of methods and means used by Cypriot fishermen. On the other hand the development of fresh-water fishing is non-feasable. The prospects for development of Cypriot fishing industry lie presumably in the long-distance and deep-sea fishing, a solution which would necessitate additional capital investments, training of crews and development of ship yards.[23]

Mining industry in Cyprus is of very old origin dating back to 2,500 years before Christ.[24] The mineral wealth

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[23] Thorp, op. cit., p. 37.

[24] Ibid., p. 38.

of the Island makes a significant contribution to the Gross National Product and provides about 50 per cent in value of total exports of the country. Moreover, it accounts for a significant portion of public revenues.

As will be referred to later in this chapter, due to the progressive depletion of ore reserves (mainly copper & iron) the industry has passed its climax. Unless new adequate supply of ores are found, this important sector's survival would be at stake.

Income

Per capita national income viewed as a proper yardstick for measuring a country's economic performance, Cyprus (according to available official estimates in the Middle East), with a £194 per capita income, occupies the second place after Israel.

Table 1 presents the comparative per capita net national income statistics for 1958 and 1963 covering some selected important countries falling in the Eastern Mediterranean region. However, a further analysis of the table would reveal a notable fact that with respect to the pace of economic growth measured in terms of per capita income, Turkey has been in the forefront, followed by Greece & Cyprus, respectively.

TABLE 1

COMPARATIVE PER CAPITA NATIONAL INCOME
(IN CYPRUS POUNDS)

1958 = 100

Country	1958	1963	Index (1958=100)
Cyprus	162	194	119.8
Greece	107	154	143.9
Israel	271	302	111.4
Lebanon	---	---	---
Turkey	51	78	152.9
U.A.R.	49	n.a.	---

Source: Cyprus, Statistical Abstract, (1964), op. cit., p. 297.

Table 2 presents the Gross National product (GNP) both at current market prices and constant market prices of 1958. The results of economic activity, measured in terms of GNP, highlights an ascending trend in performance as experienced from 1958 to 1963.

Notwithstanding this fact, however, in 1964, the Island's GNP decreased by 7.6 per cent at current prices and by 8.8 per cent at constant prices. Both consumption and investment decreased resulting in increase in unemployment. Consequently, the Island's per capita GNP which in 1963 reached a peak of £220.9, declined to £204.8. The main factor which contributed to this setback is primarily the instability of political conditions then pervading Cyprus.

In 1964 the anomalous internal communal situation which started in December 1963, coupled with threats of foreign military intervention, had an unfavourable influence upon the economy of Cyprus.

The annual compound rate of growth of GNP covering the period 1958-1964 inclusive at current market prices is 2.71 per cent and at constant market prices of 1958, 2.18 per cent. The corresponding annual rate of growth in per capita income at current market prices is 1.77 percent while at

TABLE 2

CYPRUS

GROSS NATIONAL PRODUCT

Year	Population	GNP at current market prices				GNP at 1958 prices			
	(in 000's)	(Mn.) aggregate	% change	Per Capita	% change	(Mn.) aggregate	% change	Per Capita	% change
1958	558	102.4	---	184	---	102.4	---	184	---
1959	567	106.4	3.9	188	2.3	105.8	3.3	187	1.7
1960	573	105.8	(0.6)	185	(1.7)	104.6	(1.1)	183	(2.2)
1961	577	114.9	8.6	199	7.9	114.6	9.6	199	8.8
1962	580	122.5	6.6	211	6.1	120.0	4.7	207	4.2
1963	589	130.1	6.2	221	4.6	127.8	6.5	217	4.9
1964	587	120.2	(7.6)	205	(7.3)	116.5	(8.8)	199	(8.5)

Source: Cyprus, Ministry of Finance, Department of Statistics and Research, Economic Report, (1964), pp. 13, 20, 32, 23.

constant market prices of 1958, 1.30 per cent. Excluding the abnormal year of 1964, the annual compound rate of GNP would be 4.90 per cent at current market prices while 4.53 per cent at constant market prices of 1958. The corresponding annual rate of growth in per capita income (NNP/population) would be in the magnitude of 3.67 per cent at current market prices. Thus, with the imputation of 1.7 per cent annual increase in demography, Cyprus would be having experienced a net growth in per capita income of 1.97 per cent measured in terms of current market prices.

Structure of GDP

Table 3 shows the sectorial classification of Gross Domestic Product (GDP) by industrial origin at current factor cost for 1958-1964. Appendix I-1 presents the index of industrial origin of GDP at current factor cost. Appendix I-2 reveals the share of each sector in GDP at current factor cost. Finally Appendix I-3 shows the economically active population in 1963/1964.

The statistical picture of Cyprus economic life is summarized in Table 3. The pattern of the Cypriot economy is ever dominated by its agriculture sector. The contribution of

TABLE 3

INDUSTRIAL ORIGIN OF GROSS DOMESTIC PRODUCT
AT CURRENT FACTOR COST
(MILLIONS OF CYPRUS POUNDS)

SECTOR	1958	1959	1960	1961	1962	1963	1964
Agriculture, forestry, fishing and hunting	17.9	16.8	15.5	21.1	21.8	21.0	18.8
Mining and Quarrying	7.6	7.6	8.1	6.9	6.1	6.3	5.4
Manufacturing	10.7	11.3	11.8	13.0	13.4	14.4	14.4
Construction	7.9	6.6	6.2	7.4	8.4	10.2	6.6
Electricity, gas and water	1.5	1.6	1.7	1.9	2.0	2.2	2.3
Transportation, Storage and communication	9.8	10.2	9.8	11.2	12.5	14.3	13.8
Wholesale and retail trade	10.3	10.9	10.6	11.6	13.2	14.0	12.7
Banking, insurance and real estate	1.7	1.7	2.1	2.2	2.6	3.2	3.1
Ownership of dwellings	8.6	9.5	9.2	9.3	9.5	9.9	10.7
Public administration and defence	7.7	9.2	7.2	5.7	6.5	6.9	6.3
Services	9.4	10.2	10.9	11.4	12.1	12.6	11.0
Gross Domestic Product at Factor Cost	93.1	95.6	93.1	101.7	108.1	115.0	105.1

Source: Cyprus, Economic Report, (1964) op. cit., p. 9.

this sector to GDP in absolute terms was 18.8 million in 1964 or relatively 17.9 per cent of the GDP. While income generated in this sector accounts for 17.9 per cent of GDP, it provides employment to around 40.5 per cent of the economically active population. Thus, agriculture, being the largest industry on the island, is the backbone of the Cyprus economy.

Mining activities seem to be slackening. This could be explained by the gradual depletion of presently existing reserves of mineral resources and the difficulties confronted in new explorations. As a consequence, a remarkable contraction in the contribution of this sector to GDP has been experienced both in absolute and relative terms. Thus, in absolute terms the sector has diminished its contribution to GDP, from £7.6 million to £5.4 million while in terms of percentage it has declined from 8.2 in 1958 to 5.1 in 1964. Only 1.5 per cent of the economically active population presently are engaged in this sector.

Industry in Cyprus is still in the initial stages of development. However, manufacturing has shown a significant increase in its contribution to the GDP in both absolute as well as relative terms. Industrial development in Cyprus is

of recent origin and due exclusively to private entrepreneurship. The country's industrial underdevelopment could be attributed mainly to the lack of enterprise, local market limitations, reliance on imports and inadequate supply of technical skills.[25] Between 1958 and 1964 this sector's contribution to GDP has increased by 34.6 per cent. Whilst 13.7 per cent of GDP, arises in this sector, it accounts for 14.3 per cent of the economically active population.

Construction activity had expanded significantly in absolute terms from a level of £7.9 million in 1958 to £10.2 million in 1963.

However, the abnormal 1964 year witnessed a remarkable shrinkage in construction activity. This adverse change would naturally be explained by the uncertain political conditions pervading the country which not only paralyzed the construction business, but dampened expectations in real estate investments. This sector accounted for 8.6 per cent of the economically active population in 1964.

Public utilities mainly (electricity industry) exhibited a steady growth in their contribution to GDP from £1.5 million in 1958 to £2.3 million in 1964 with a relative

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[25] Cyprus, Five-Year Programme of Economic Development, op. cit., p. 10.

increase in GDP percentage share from 1.6 per cent to 2.2 per cent, respectively.

The transport, storage and communication sector of the Cyprus economy experienced a 40.8 per cent increase in its contribution to GDP from 1958 to 1964; with a relative increase in its sectorial share of GDP from 10.5 per cent to 13.1 per cent, respectively. This sector accounted for 4.2 per cent of the economically active population in 1964.

Wholesale and retail trade, playing a vital role in the Cyprus economy, showed a 35.9 per cent growth in its activity over the period 1958-1963 with a rise in its relative share of GDP from 11.1 per cent in 1958 to 12.2 per cent in 1963. However, the adverse repercussions of the 1964 political situation caused a contraction in this sector's activity, lowering its contribution to GDP to a level of £12.1 million, with no significant change in its relative sectorial share.

The Banking, insurance and real estate sector has expanded significantly, showing an 82.4 per cent increase in its contribution to GDP in absolute terms and a corresponding increase in its sectorial share of GDP from 1.8 per cent in 1958 to 2.9 per cent in 1964.

The sector of dwellings' ownership has witnessed a gradual but slow increase since 1958 in its contribution to GDP from £8.6 million to £10.7 million in 1964, with a corresponding £1 per cent increase in its sectorial share.

The government and defence sector had experienced a steady decrease in its contribution to GDP from £7.7 million in 1958 to £6.3 million in 1964 with a corresponding drop of 2.3 per cent in its relative sectorial share of GDP. Notwithstanding the fact that increased amounts were spent in 1964 by the government for defence and internal security, yet the contraction of government activity in this sector would be attributable mainly to two factors. The first relates to the appreciable curtailment in government subsidies due to the decline in output of subsidized agricultural products; the second is the nonimplementation of the government development programme during 1964, being hampered by the ensuing political disturbances.[26]

Although a steady growth in services sector's activities were witnessed from 1958 to 1963, yet it suffered a major setback in 1964 mainly due to the curtailment in tourism

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[26]Cyprus, Central Bank of Cyprus, Economic Research Department, Bulletin, II, June 1965, p. 10.

industry as inflicted by the communal political upheavals on the Island.[27] Thus, in absolute terms, the contribution of this sector to GDP dropped from a peak of £12.6 million in 1963 to the level of £11.0 million as of 1964 with an almost insignificant corresponding change in its percentage sectorial share.

A concluding remark to the preceding analysis would be that with the exclusion of instabilities of 1964, the Cyprus economy had achieved a 23.5 per cent increase in GDP at factor cost, void of any major structural changes in the economy, with the fastest developing sector of banking, insurance and real estate followed by public utilities.

The Republic's five year programme of economic development, as effected in 1961 to achieve one of the major goals, namely, stable growth, envisaged an average annual increase of GNP in the magnitude of 5.7 per cent; notwithstanding this fact, however, the economy experienced during the first 3 years of the plan a 7.3 per cent as an average real growth.[28]

A sketchy analysis of how the Cyprus GDP's revenue side, converted to current prices has been accounted for by

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[27] Ibid., p. 6.

[28] Cyprus, Economic Report, (1963), op. cit., p. 5.

its expenditure counterpart, namely, private consumption, government consumption, investment expenditures, and foreign trade balance is portrayed in Appendix I-4.

Lastly, the subject of electrification is also receiving the government's serious attention, particularly in parallel to the prospective development of industry and tourism as envisaged in the five year economic plan, for, the adequate supply of electric power is a vital prerequisite to such phases of economic and social developments.

Balance of Payment.

A comparative global position of Cyprus balance of payments as measured by the change of net foreign exchange reserves of official and banking institutions is presented in table 4. One of the primary targets of the five-year development programme was the achievement of a sound balance of payments position. The dual prominent features of the Cyprus' balance of payments are first, the unfavourable structure of the balance of trade, and second, the instability of the sources in balancing the former.[29]

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[29] Cyprus, Five-Year Programme of Economic Development, (1961), op. cit., p. 14.

TABLE 4

CYPRUS BALANCE OF PAYMENTS
(MILLIONS OF CYPRUS POUND)

	1960	1961	1962	1963	1964 (Prov.)
CURRENT ACCOUNT					
Exports (fob)	17.2	15.9	18.4	19.7	18.3
Imports (fob)	-32.2	-33.6	-38.6	-40.9	-32.8
TRADE BALANCE	-15.0	-17.7	-20.2	-21.2	-14.5
Freight and insurance	- 3.1	- 3.2	- 3.7	- 3.9	- 3.1
Other transportation	- 1.0	- 0.9	- 1.2	- 1.4	- 1.1
Travel: Credit	1.8	2.8	3.5	4.5	1.0
Debit	- 2.4	- 2.4	- 2.7	- 2.9	- 2.4
Investment income	- 3.5	- 2.7	- 2.3	- 1.7	- 1.3
Government (nie)	15.0	16.9	16.9	16.1	17.0
Other Services	1.0	0.9	0.9	1.1	0.8
Transfer Payments: Private	2.8	3.0	3.6	3.5	4.0
Official aid	4.3	4.9	4.2	3.0	0.2
CURRENT ACCOUNT BALANCE	- 0.1	1.6	- 1.0	- 2.9	0.6
CAPITAL ACCOUNT					
Direct investment	- 0.5	1.3	1.8	2.0	...
Long-term loans received	0.2	1.9	...	1.4	1.1
Government investments[1]	0.2	- 0.5	- 0.5	- 1.3	- 0.9
Other	...	- 0.1	- 0.1	0.2	0.3
Net capital movement	- 0.1	2.6	1.2	2.3	0.5
Net errors and ommissions[2]	2.0	4.7	6.6	5.5	0.9
Balance on external transactions	1.8	8.9	6.8	4.9	2.0
MONETARY MOVEMENTS					
I.M.F. position	...	- 0.7	...	...	0.7
Official reserves					
Government[3]	- 1.7	- 4.8	- 1.2	- 3.3	2.4
Central Bank	- 0.4	- 1.4	- 0.6	- 0.8	- 2.9
Bilateral balances	...	...	0.4	- 0.3	...
Commercial banks					
Assets	- 0.8	- 0.7	- 5.1	- 0.8	- 1.2
Liabilities	1.1	- 1.3	- 0.3	0.3	- 1.0
Net monetary movements (-increase)	- 1.8	- 8.9	- 6.8	- 4.9	- 2.0

Source: Cyprus, Central Bank of Cyprus, Bulletin II, (June, 1965), p. 24.

+) Decrease of assets or increase of liabilities
-) Increase of assets or decrease of liabilities
1) Government sinking funds and other special funds held abroad
2) Includes private miscellaneous capital
3) Holdings of Short-term securities and balances abroad

The prevailing trend of an increasing unfavourable trade gap over the period 1960-1963, due to the rapid growth of imports associated with the heavy investment expenditure in fixed capital and accompanied growth in GNP, was reversed in 1964.[30] Because of the high ratio of foreign trade to GNP, the internal political disturbances and ensuing economic fluctuations in 1964 had adverse incidences on the level of imports primarily due to the tendency then towards higher liquidity preference of both investors and consumers to match eventual emergencies. These factors coupled with the general decline in disposable incomes were responsible for the £8.1 million saving on the import bill to more than counterbalance the £1.4 million drop of export receipts and thus reducing the trade deficit from a level of £21.2 million in 1963 to £14.5 million in 1964.

The invisible transactions comprising services, transfer payments, tourism and government transactions generated foreign exchange earnings in 1963 and 1964 in the amount of £18.3 million and £15.1 million, respectively. The main factors attributing to this unfavourable change were the loss of revenues from tourism and the absence of foreign aid. The

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[30] Cyprus, Bullettin, II, op. cit., p. 22.

ultimate result of the aforementioned transactions accompanied with the increased foreign military expenditures caused an "experienced improvement" in the overall current account balance from a deficit of £2.9 million in 1963 to a surplus of £0.6 million in 1964 --an absolute increase of £3.5 million.

The prevailing abnormal conditions had naturally adverse bearings on the influx of foreign capital. As a consequence, the identified net capital movement was decreased from 2.3 million in 1963 to 0.5 million in 1964. The inflow of private capital for "direct investment" in 1964 was nill, after experiencing a steady increase for the last few years. Table 5 exposes detailed changes in foreign long-term loans received for the years 1963 and 1964 totalling in aggregate £1.4 million and £1.1 million, respectively; with the Electricity Authority of Cyprus receiving the largest share.

Finally, net monetary assets (foreign exchange reserves) held by the government, the Central Bank and commercial banks increased by £2.0 million, hence rendering the international monetary position of the economy improved by the same amount, i.e. a surplus in its balance of payments.

TABLE 5

LONG-TERM LOANS RECEIVED

(THOUSANDS OF CYPRUS POUND)

	1963	1964
I.B.R.D. Loan to Electricity Authority	611	811
U.K. Loan to Electricity Authority	156	53
Federal Republic of Germany Loan	427	149
Council of Europe Loan	179	---
National Estate Bank of Greece Loan	---	32
	1,373	1,045

Source: Cyprus, Bulletin, II, op. cit., p. 26.

THE ELECTRICITY AUTHORITY OF CYPRUS

Development of the Industry.

The Electricity Authority of Cyprus is an independent corporation, established under the Electricity Development Law, (Cap. 171), enacted in 1952, which envisaged the constitution of an Island-wide electrification scheme with the purpose of

generating, supplying, promoting and encouraging the use of electricity at reasonable prices. The Authority commenced its task through acquisition (outright purchase) of the two major privately - owned undertakings, namely, the Nicosia Electric company Ltd., and the Limassol Electric light Co. Ltd. The E.A.C. is presently considered to be (with the exception of minor industrial establishements) the sole producer and distributor of electricity on the Island. In order to meet the ever-increasing demand for electricity services the Industry's activities have expanded tremendously in phases of generation , transmission and distribution. This fact will be reflected in the following discussion of demand analysis.

Legal Status:

The E.A.C. is a public corporation and being a public utility enterprise it forms a natural monopoly . It is an autonomous body with separate legal entity and personality, liable in law and not enjoying any of the immunities or privileges particular to government.

Since the board of directors of E.A.C., comprising a chairman, a vice-chairman and five members, are appointed by the Council of Ministers, the Authority turns to be responsible and accountable to the Council of Minister through the

Ministry of Communications and Works, on all matters relating to the generation, transmission, distribution and the use of electricity.

Organization Structure.

Chart 1 presents the organization chart of E.A.C. The Chart reveals that the span of control of the General Manager is three, namely Accounts, Administration and Engineering. Thus, each division head reports directly to the General Manager. Moreover, each division encompasses a certain number of departments. The organization, moreover, practices both line as well as staff relationships.

A further analysis of the chart would reveal that the Engineering Section enjoyed relatively to other divisions a higher status in the organizational hierarchy of the Authority. This confirms the fact that the organization is production oriented, with the aim of provision and development of electricity services, rather than profit oriented, since virtually public utilities are not meant to make profit and in case of surplus they are primarily utilized for development purposes and secondarily applied towards reduction of electricity rates (tariffs). However, the developmental stages of electricity services, and set up of administrative machinery

CHART I

ORGANISATION TREE OF THE AUTHORITY

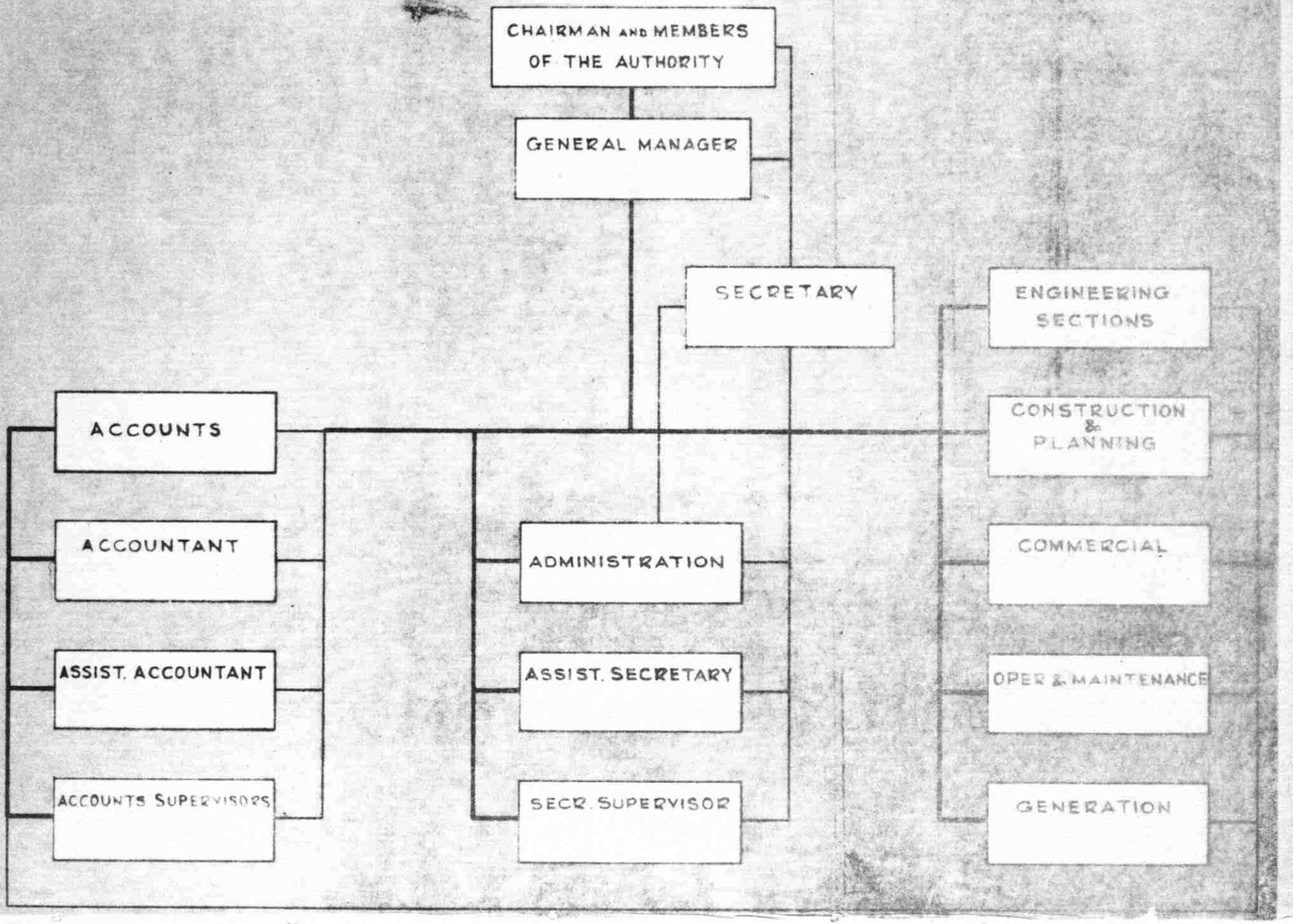
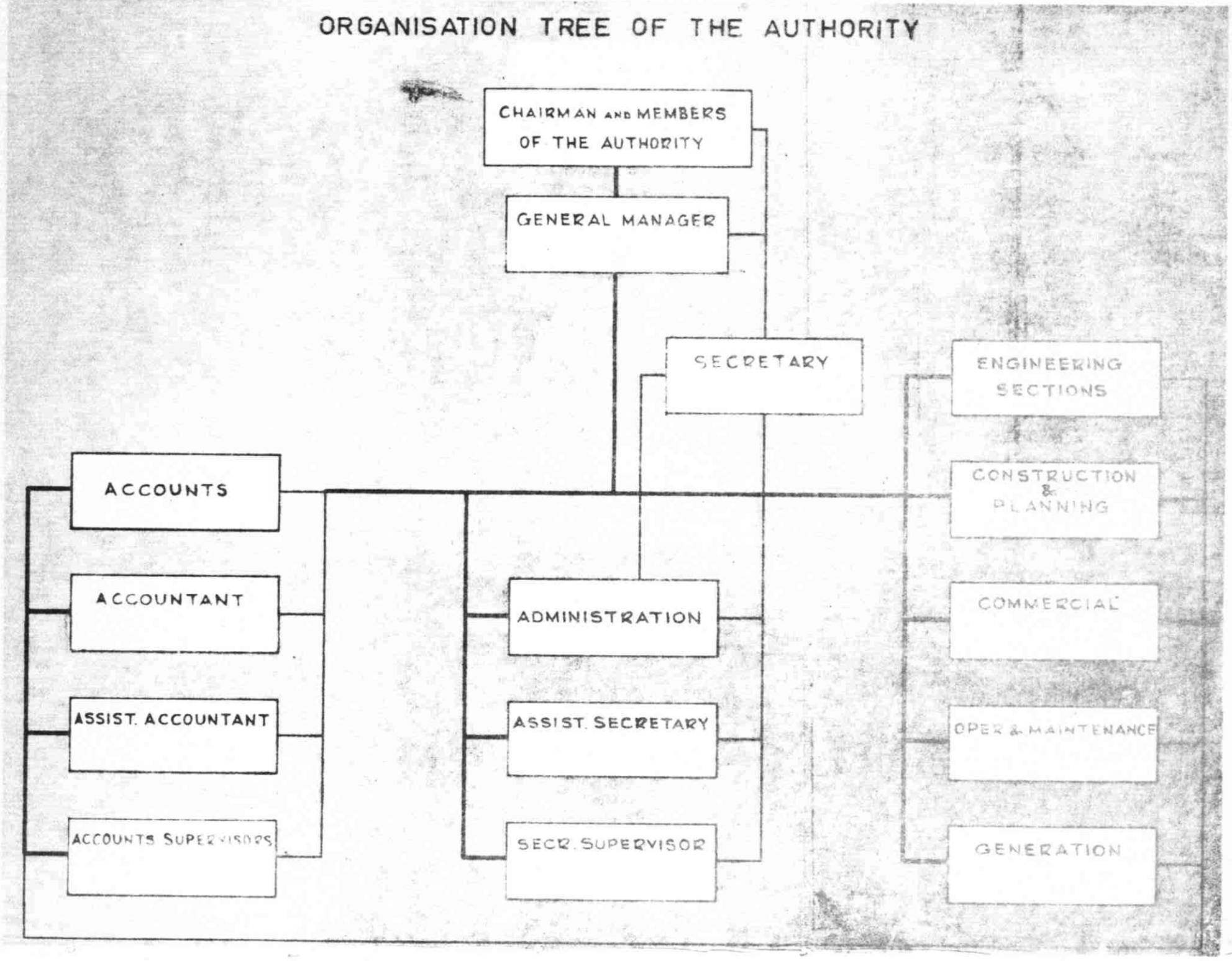


CHART 1

ORGANISATION TREE OF THE AUTHORITY



are of vital importance for managerial philosophy and orientation in the future.

Because the Authority is production oriented the performance and efficiency of the enterprise is measured in physical units. However, the level of tariffs, public goodwill, and employee satisfaction are of equal importance as measuring yardsticks.

For administration purposes, Cyprus electricity network system is divided into seven districts. Nicosia being the largest and most important, others being Limassol, Famagusta, Larnaca, Morphou/Lefka, Kyrenia and Paphos.

Summary and Conclusions.

In conclusion to our preceding discussion, the economy of Cyprus could be conceived to be intimately associated to its geographical position and historical background. The two main targets of the Cyprus five year development programme were the achievement of stability in economic growth and improvement in the overall balance of payments position. The actual performance of the economy has in fact met these exigent goals up till 1963. The success of the commissioned aims was attributable not only to the Island's natural endowments

such as agriculture, mining and tourism, but also to its strategic position as evidenced by the economy's high dependence on foreigners in terms of military expenditures, gratis aids and long term loans (mainly to finance the Electricity Authority of Cyprus). However, the Island's historical background, in view of its experienced social frictions and racial communal conflicts leading to mass disturbances and bloody civil upheavals as was lately witnessed in 1964, had the adverse impacts on the economy at large with at least temporary reversal of its trend in economic growth and international monetary position.

The emergence of the Electricity Authority of Cyprus in 1952 as the sole producer of electricity services introduced a radical change in the economic structure of the industry. Being a non-profit seeking regulated public utility enterprise, the organization turned to be production oriented, and in case of any surplus applied it primarily for development projects, and secondarily towards reduction of electricity rates.

APPENDIX I-1

INDEX OF INDUSTRIAL ORIGIN OF GROSS DOMESTIC PRODUCT
AT CURRENT FACTOR COST

1958=100

SECTORS	1958	1963	1964
Agriculture, forestry, fishing and hunting	100	117.3	105.0
Mining and quarrying	100	82.9	71.1
Manufacturing	100	134.6	134.6
Construction	100	129.1	83.5
Electricity, gas and water	100	146.7	153.3
Transportation, storage and communication	100	145.9	140.8
Wholesale and retail trade	100	135.9	123.3
Banking, insurance and real estate	100	188.2	182.4
Ownership of dwellings	100	115.1	124.4
Public administration and defence	100	89.6	81.8
Services	100	134.0	117.0
Gross Domestic Product at Factor Cost	100	123.5	112.9

Source: Cyprus, Economic Report, (1964), op. cit., p. 10.

APPENDIX I-2

SHARE OF EACH SECTOR IN GROSS DOMESTIC PRODUCT
AT CURRENT FACTOR COST

	1958 %	1963 %	1964 %
Agriculture, forestry, fishing and hunting	19.2	18.3	17.9
Mining and quarrying	8.2	5.5	5.1
Manufacturing	11.5	12.5	13.7
Construction	8.5	8.9	6.3
Electricity, gas and water	1.6	1.9	2.2
Transport, storage and communication	10.5	12.4	13.1
Wholesale and retail trade	11.1	12.2	12.1
Banking, insurance and real estate	1.8	2.8	2.9
Ownership of dwellings	9.2	8.6	10.2
Public administration and defence	8.3	6.0	6.0
Services	10.1	10.9	10.5
Total	100.0	100.0	100.0

Source: Cyprus, Economic Report, (1964), op. cit., p. 24.

APPENDIX I-3

ECONOMICALLY ACTIVE POPULATION[1]

Activity	1963		1964	
	Thousands	Percentage	Thousands	Percentage
Agriculture, forestry and fishing	98.0	40.2	98.5	40.5
Mining and quarrying	5.3	2.2	3.7	1.5
Manufacturing, electricity, gas, water and Sanitary Services	34.1	14.0	34.8	14.3
Construction	21.5	8.8	20.8	8.6
Commerce	17.5	7.2	18.0	7.4
Transport and communication	10.1	4.1	10.2	4.2
Government and Communal institutions	21.4	8.8	20.5	8.5
Military authorities	8.2	3.3	9.4	3.9
Entertainment and recreation	5.7	2.3	5.4	2.2
Other	22.2	9.1	21.7	8.9
Total	244.0	100.0	243.0	100.0

Source: Cyprus, Statistical Abstract, (1964), op. cit., p. 27.

[1] "Estimates based on the 1960 census of population, and 1962 census of Industrial production and Annual surveys. They include unemployed, but exclude alien armed forces stationed in the Island.

Note: The economically active population comprises all persons who participate in the production of economic goods and services; it does not include school children and students, children not reporting any occupation, pensioners and other persons not gainfully occupied." Ibid.

APPENDIX I-4

GROSS DOMESTIC PRODUCT ACCOUNT
AT CURRENT PRICES

	1958	1959	1960	1961	1962	1963	1964
1. Gross Domestic Product at factor Cost	93.1	95.6	93.1	101.7	108.1	115.0	105.1
2. Plus Indirect Taxes	7.8	9.8	9.5	9.1	10.3	11.1	9.6
3. Less Subsidies	0.6	0.2	0.4	1.1	1.3	1.2	0.7
Gross Domestic Product at Market Prices	100.3	105.2	102.2	109.7	117.1	124.9	114.0

	1958	1959	1960	1961	1962	1963	1964
1. Private Consumption Exp.	74.2	80.0	86.2	90.1	91.6	99.2	84.6
2. General Govt. Consumption Exp.	20.6	21.5	12.6	12.6	14.0	14.4	15.5
3. Gross Domestic Fixed Capital Formation	18.6	16.9	14.6	16.7	22.7	25.7	16.1
4. Increase in Stocks	-1.9	1.3	-0.4	1.8	3.0	0.5	0.1
5. Exports of Goods and Services	25.9	27.5	28.9	30.0	33.7	35.7	38.6
6. Less Imports of Goods and Services	37.1	42.0	39.7	41.5	47.9	50.6	40.9
	100.3	105.2	102.2	109.7	117.1	124.9	114.0

Source: Cyprus, Statistical Abstract, (1964), op.cit., p. 267.

CHAPTER II

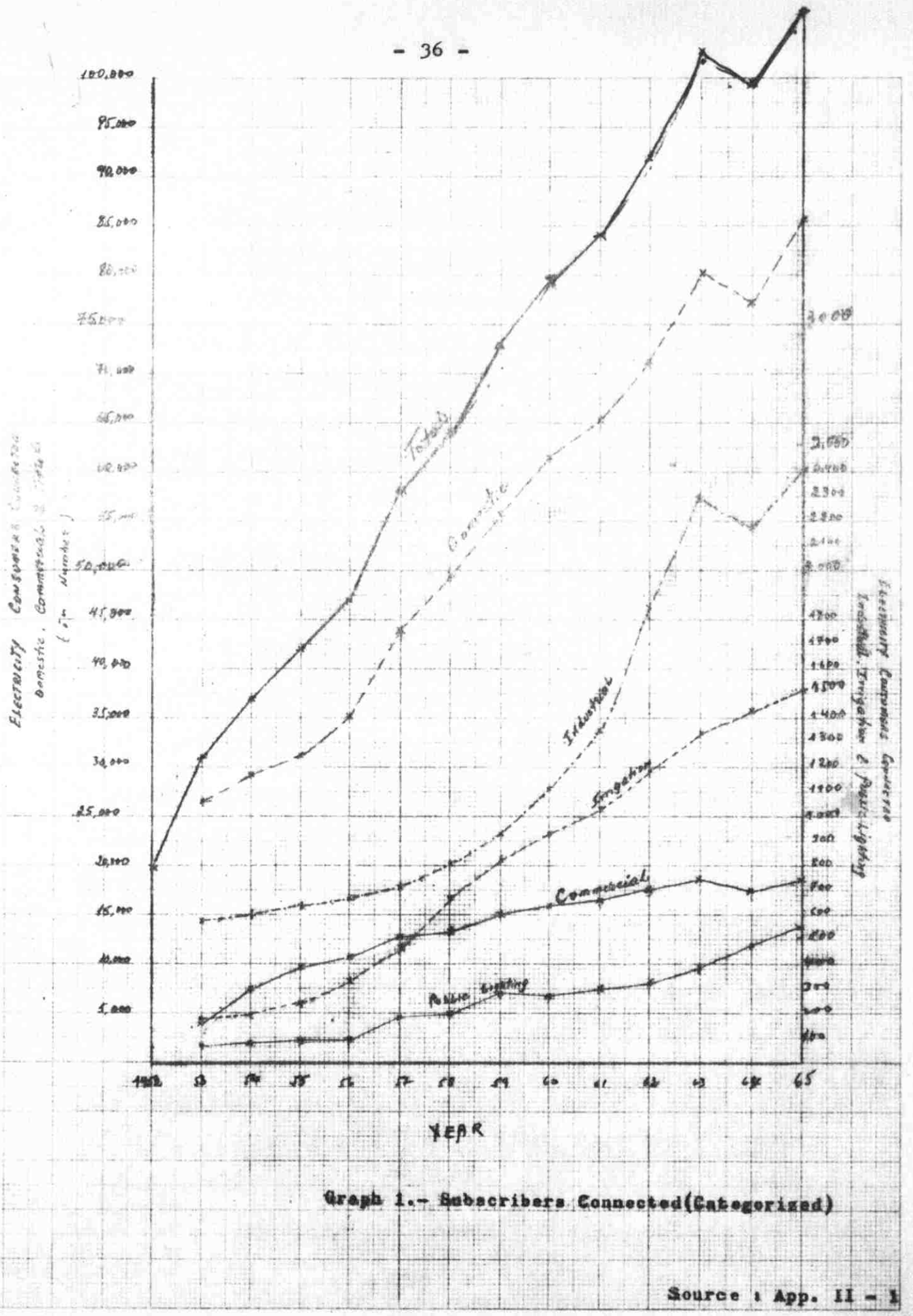
DEMAND FOR ELECTRICITY

The present chapter deals with demand for electricity services. In the first place, structure and various measurements of demand for electricity services are analyzed. In the second part, various determinants of demand for electricity is studied. The third part of this chapter treats the behaviour of demand for electricity. Lastly, demand expressed in terms of gross annual receipts is forecast through the use of multi-correlation regression analysis.

Structure of Demand for Electricity.

The measurement of Demand for electricity services could be either in form of physical units or gross annual receipts.

Graph 1 presents the demand for use of electricity in terms of subscribers connected categorized. It shows an increasing trend for electricity demanded for domestic, commercial, industrial, irrigation or public lighting use.



Graph 1.- Subscribers Connected(Categorized)

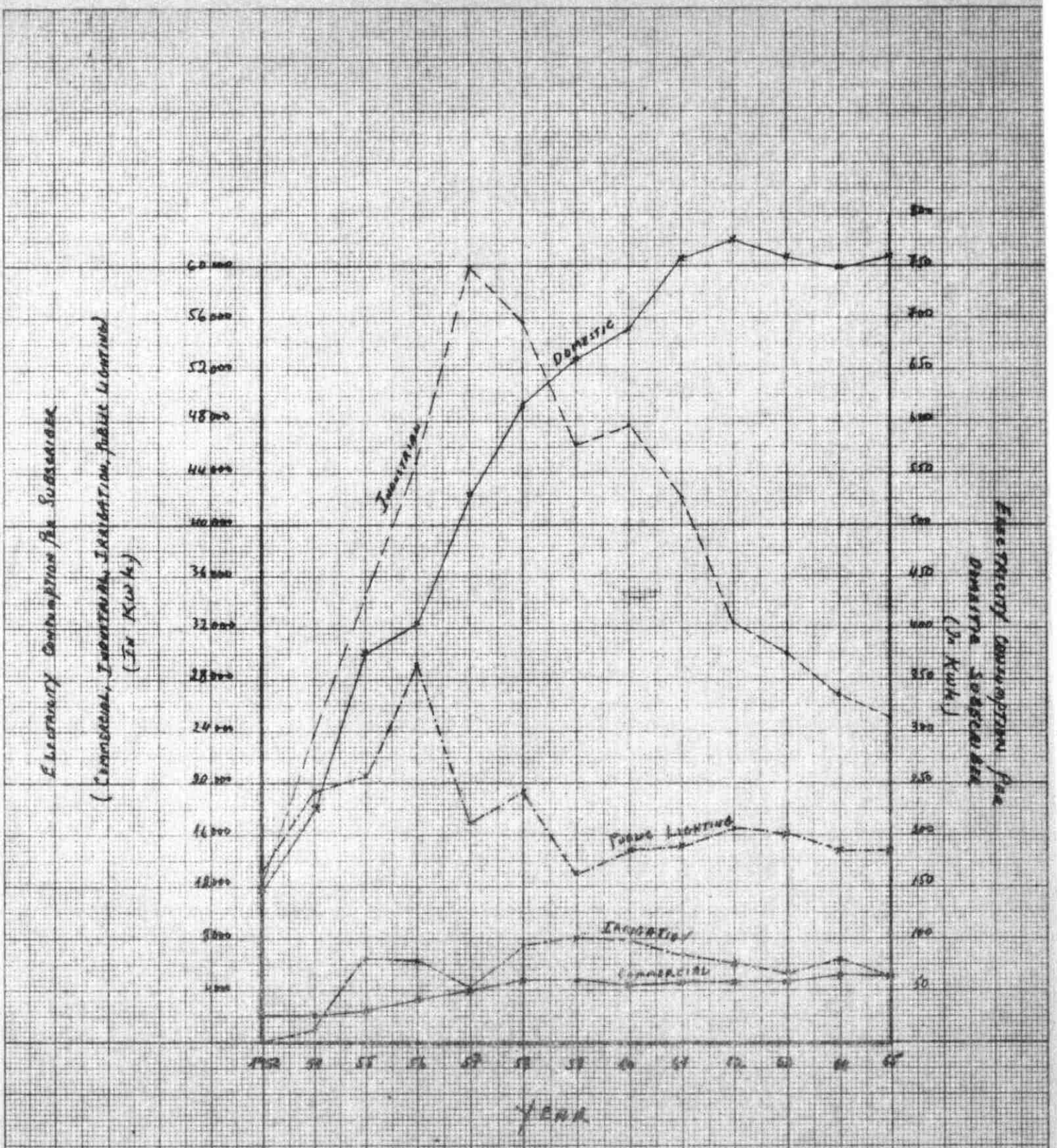
Source : App. II - 1

Graph 2 presents electricity consumption per subscriber (categorized). In case of industrial, public lighting and irrigation, the consumption per subscriber shows a decreasing trend; this is due to the higher rate of increase in number of subscribers connected than the rate of consumption in respective fields; in other words the consumption of the marginal subscriber is below the average consumption per subscriber.

Graph 3 presents per capita and per subscriber consumption in aggregate. It indicates an upward trend in this respect also. This could be associated with the remarkable pace of economic growth achieved during the period under study.

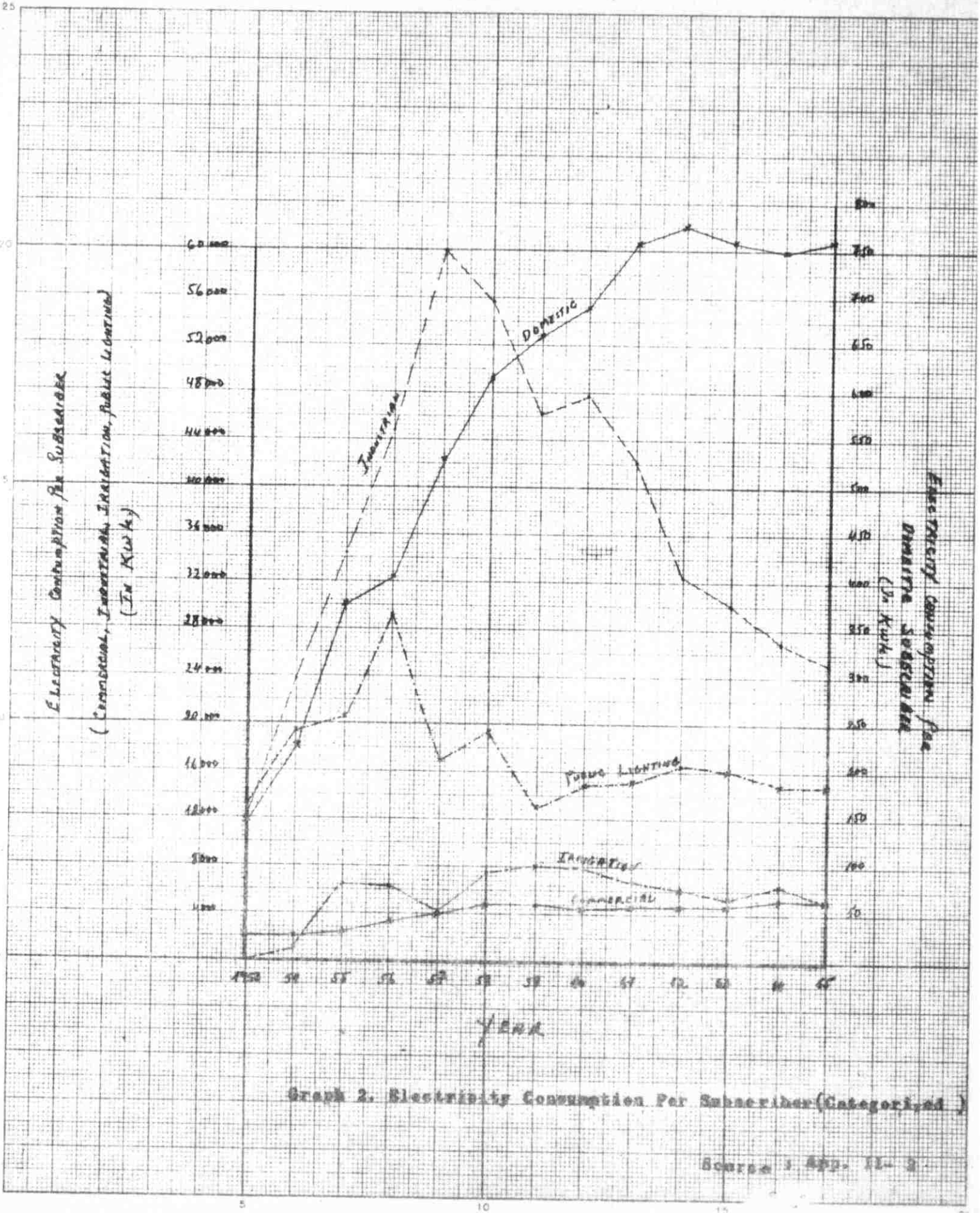
Demand for electricity services measured in terms of kilo-watt hours and gross annual receipts (categorized as well as in aggregate) is presented in table 6. Gross annual receipts excludes revenues from rentals of meters, public lighting and other miscellaneous minor sources of income.

Graphs 4 and 5 indicate a very sharp growth trend in consumption of electricity. Total kilo-watt hours consumed increased from a level of 20 million in 1953 to a level of 238 million in 1965 (a multiple of 12). While in terms of Gross annual receipts, it has increased from 361.000 in 1953 to 2,476.500 in 1965. Moreover, in 1964 there was a slight decline due to the political turmoil pervading the country then.



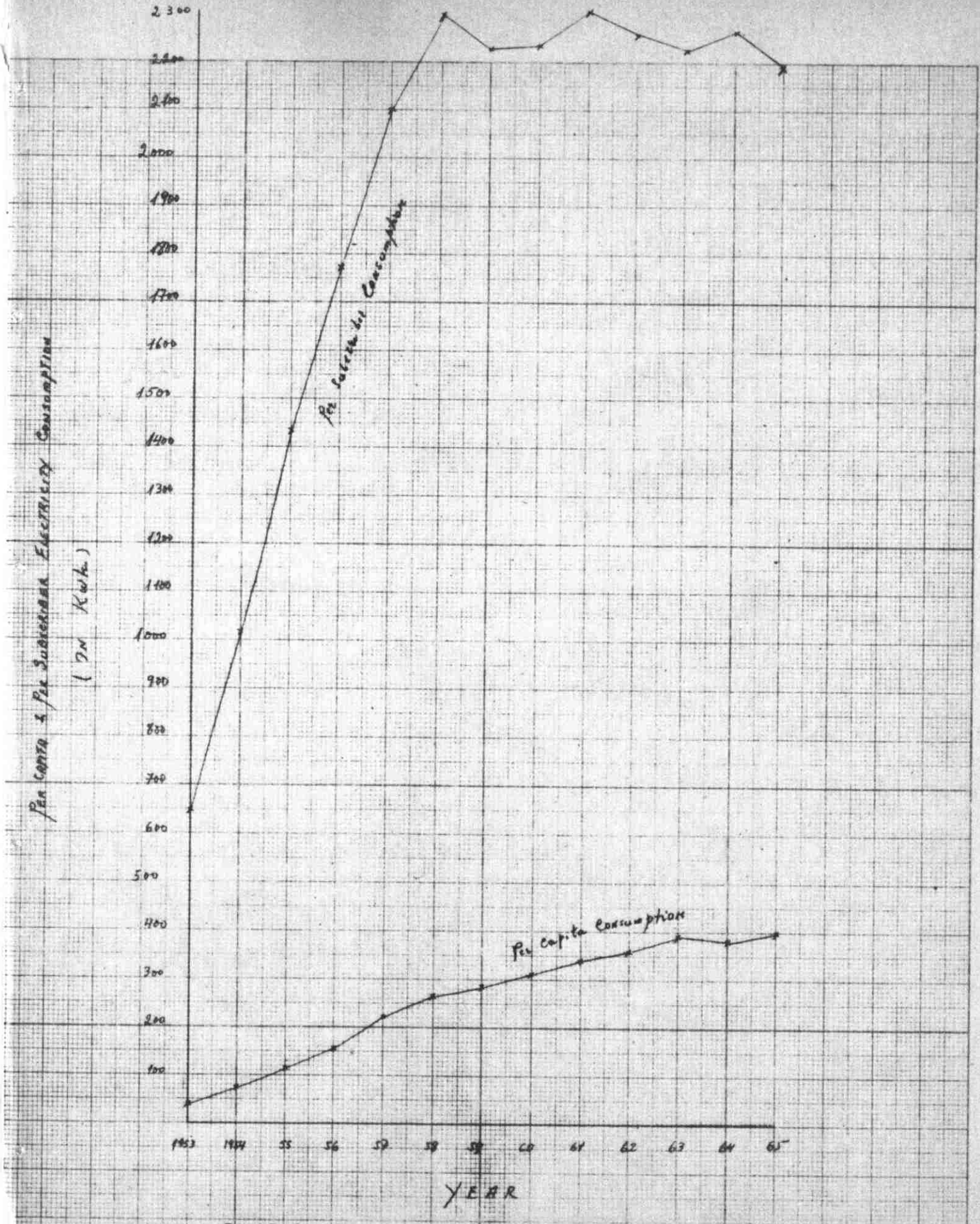
Graph 2. Electricity Consumption Per Subscriber(Categorised)

Source : App. II- 2.

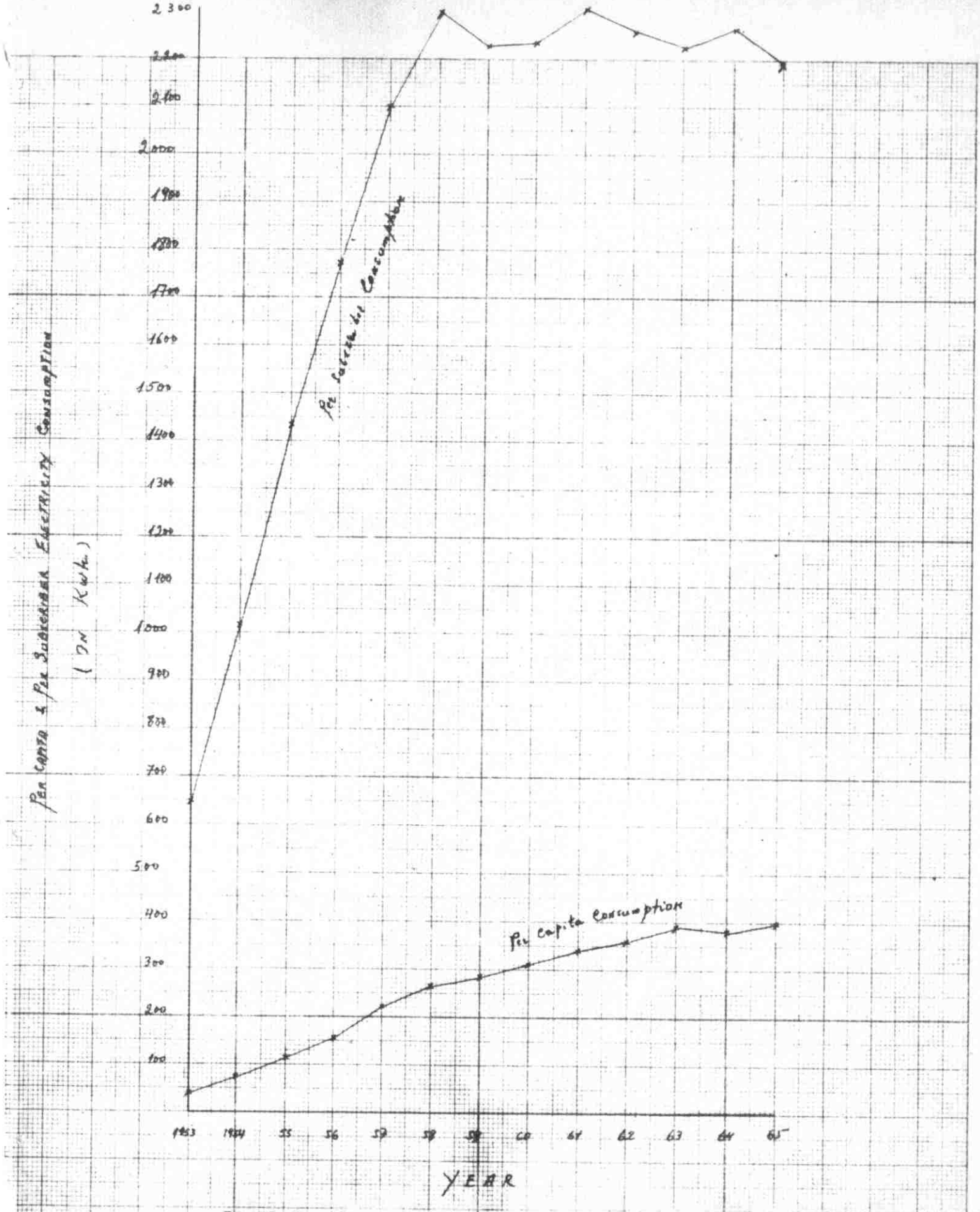


Graph 2. Electricity Consumption Per Subscriber (Categorised)

Source : App. II- 2.



Graph 3.- Per Capita and Per Subscriber Consumption Source: App II-3



Graph 3.- Per Capita and Per Subscriber Consumption

Source: App II-3

(9)

TABLE 6

ANALYSIS OF PRICE AND DEMAND

VOLUME OF ELECTRICITY

YEAR	DOMESTIC			COMMERCIAL			INDUSTRIAL			IRRIGATION			PUBLIC LIGHTING			AGGREGATES		
	Average Price m/Kwh	Quantity Kwh.(000)	Value £(000)	Average Price m/Kwh	Quantity Kwh.(000)	Value £(000)	Average Price m/Kwh	Quantity Kwh.(000)	Value £(000)	Average Price m/Kwh	Quantity Kwh.(000)	Value £(000)	Average Price m/Kwh	Quantity Kwh.(000)	Value £(000)	Average Price m/Kwh	Quantity Kwh.(000)	Value £(000)
1953	26.86	3.901	104.8	17.91	8.413	150.7	13.76	7.023	96.6	16.00	30	0.5	8.44	996	8.4	17.73	20.363	361.-
1954	21.76	6.574	143.-	12.87	15.714	202.3	8.88	14.328	127.2	8.82	226	20	6.46	1.547	10.-	12.62	38.389	434.5
1955	19.59	11.725	229.7	14.28	23.313	332.9	6.18	21.784	134.6	7.91	1.561	12.3	5.97	1.835	10.9	11.96	60.218	720.4
1956	19.38	14.215	275.5	13.90	34.884	484.9	6.62	29.716	196.7	8.09	2.080	16.9	10.71	2.600	27.9	12.00	83.495	1.001.9
1957	15.64	23.384	365.8	13.47	50.730	683.4	7.84	42.795	335.5	8.21	2.005	16.5	11.32	3.137	35.5	11.77	122.051	1.436.7
1958	14.52	30.403	441.4	11.63	63.741	741.3	7.09	44.869	318.1	8.14	5.112	41.6	10.52	3.828	40.2	10.70	147.953	1.582.6
1959	13.97	36.745	513.3	11.36	72.443	823.-	7.16	42.788	306.4	8.09	6.612	53.5	9.71	3.667	35.6	10.67	162.255	1.731.8
1960	13.67	42.541	581.4	11.10	71.394	792.3	6.68	53.176	351.8	8.28	7.347	60.8	8.85	4.023	35.6	10.21	178.481	1.821.9
1961	13.11	49.572	649.7	11.39	76.541	871.6	6.51	56.968	371.-	8.12	6.957	56.5	8.91	4.574	40.8	10.22	194.612	1.989.6
1962	13.03	55.359	721.2	11.32	80.261	908.9	6.56	59.970	393.4	8.15	7.068	57.6	8.68	5.290	45.9	10.23	207.948	2.127.-
1963	13.02	61.125	796.-	11.14	85.435	951.-	6.49	68.774	446.-	8.28	7.260	60.-	8.43	6.223	53.-	10.08	228.817	2.306.-
1964	13.09	57.910	758.-	11.06	90.604	1.002.-	6.92	58.492	405.-	8.19	9.262	76.-	8.41	7.076	59.-	10.30	223.344	2.300.-
1965	12.97	65.019	843.4	11.07	97.135	1.075.2	7.12	59.951	426.8	8.20	7.668	62.9	8.35	8.163	68.2	10.41	237.936	2.476.5

Source: Annual Reports and Accounts of Electricity Authority of Cyprus, 1953-1965.

(9)

TABLE 6

ANALYSIS OF PRICE AND DEMAND
VOLUME OF ELECTRICITY

YEAR	DOMESTIC			COMMERCIAL			INDUSTRIAL			IRRIGATION			PUBLIC LIGHTING			AGGREGATES		
	Average Price m/kWh	Quantity KWh (000)	Value £ (000)	Average Price m/kWh	Quantity KWh (000)	Value £ (000)	Average Price m/kWh	Quantity KWh (000)	Value £ (000)	Average Price m/kWh	Quantity KWh (000)	Value £ (000)	Average Price m/kWh	Quantity KWh (000)	Value £ (000)	Average Price m/kWh	Quantity KWh (000)	Value £ (000)
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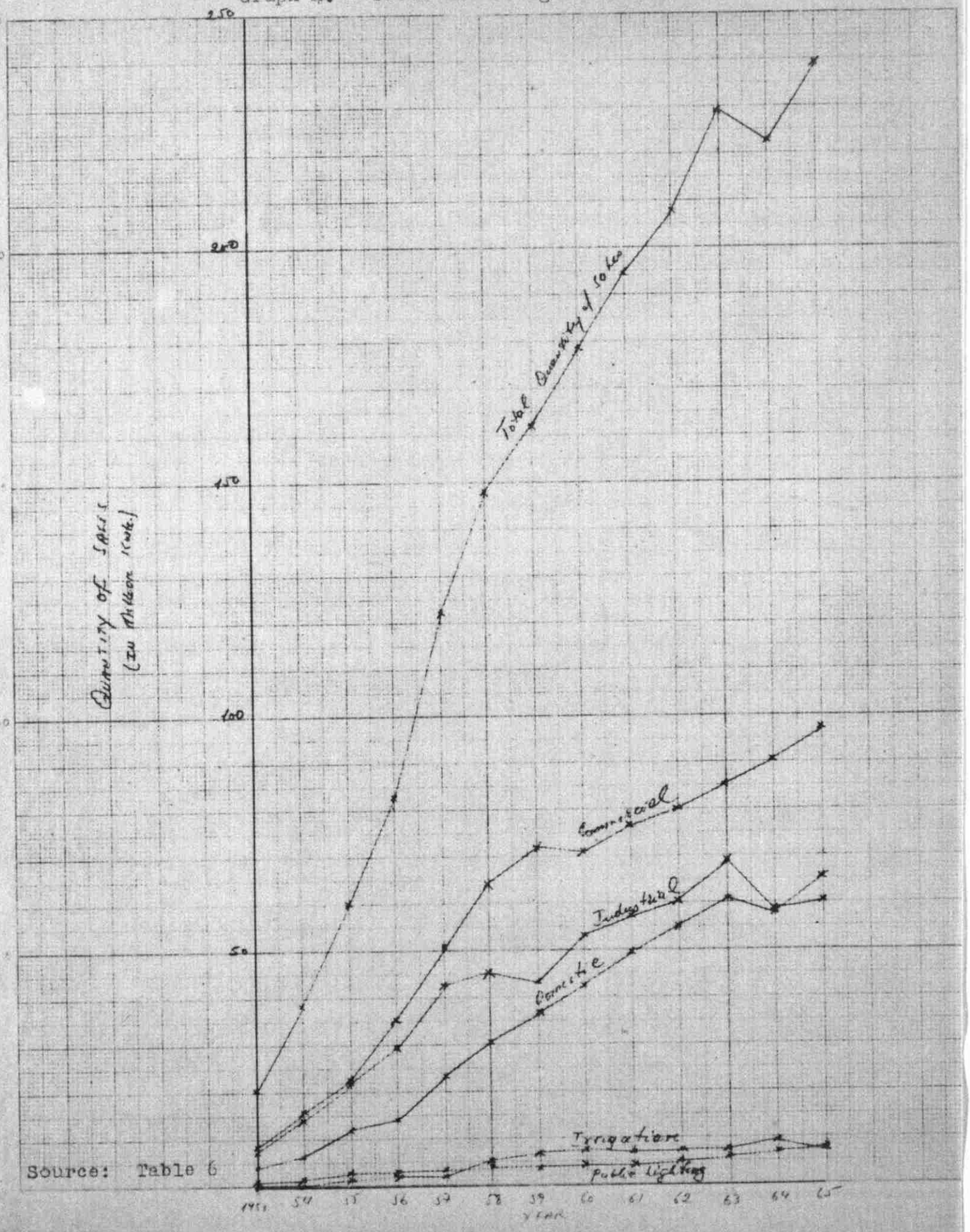
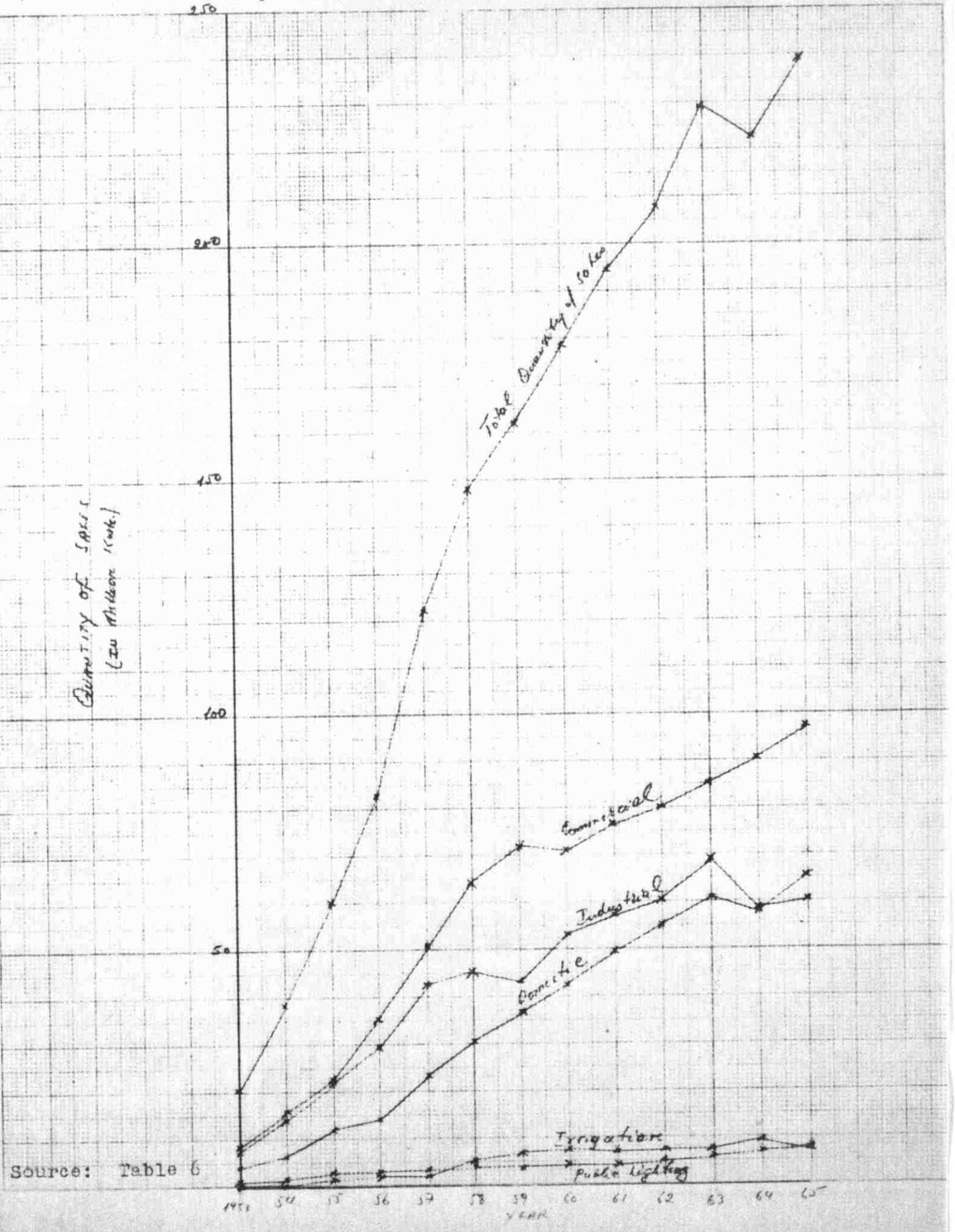
Source: Annual Reports and Accounts of Electricity Authority of Cyprus, 1953-1965.

Graph 4.- Total and Categorized Volume of Demand



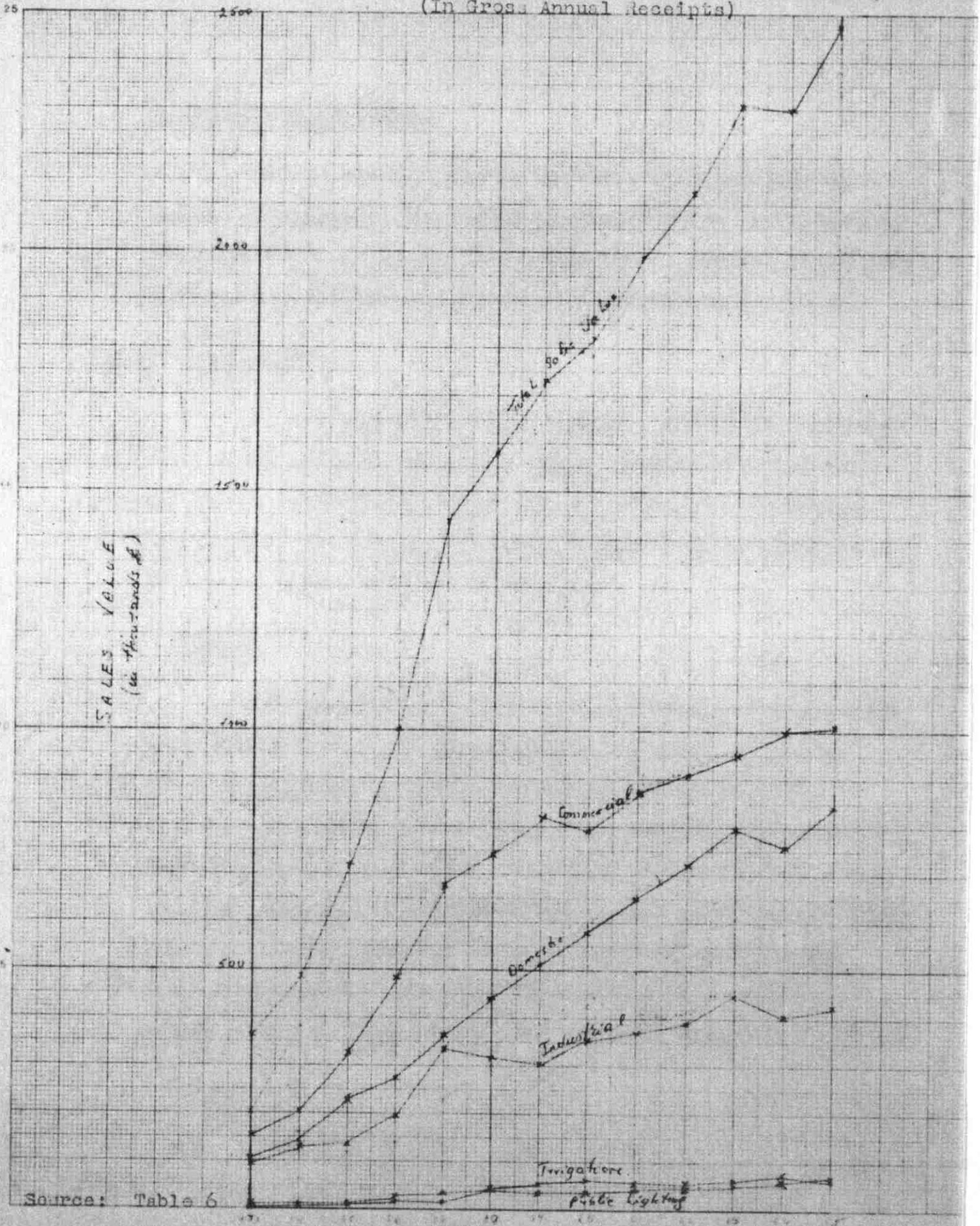
Source: Table 6

Graph 4.- Total and Categorized Volume of Demand



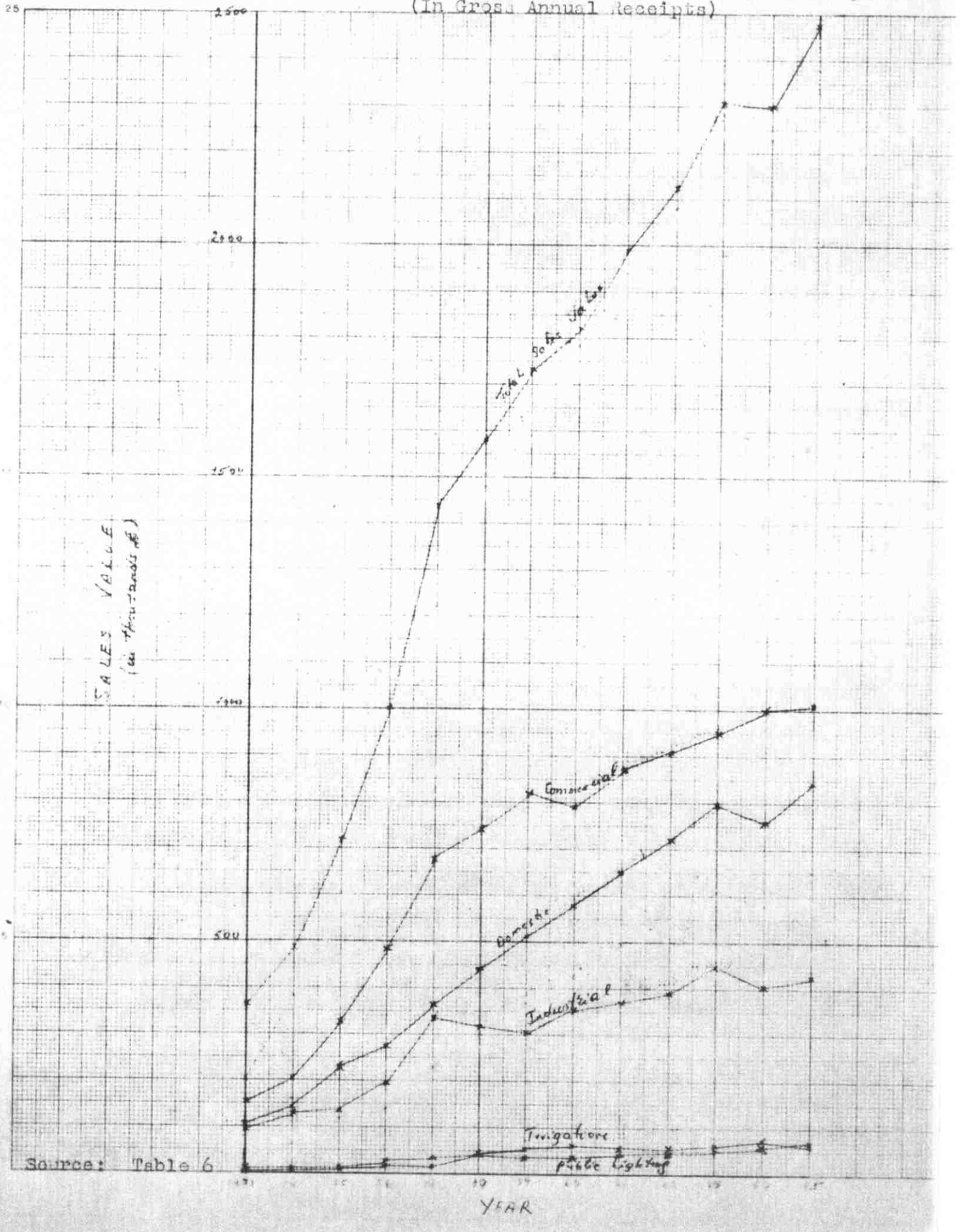
Source: Table 6

Graph 5.- Total and Categorized Demand for Electricity
(In Gross Annual Receipts)



Source: Table 6

Graph 5.- Total and Categorized Demand for Electricity
(In Gross Annual Receipts)



Source: Table 6

Determinants of Demand.

Demand for electricity services is determined by a number of factors. The most important factors are viewed to be population, prices or rates, per capita income, sales promotional activities and social and institutional factors.

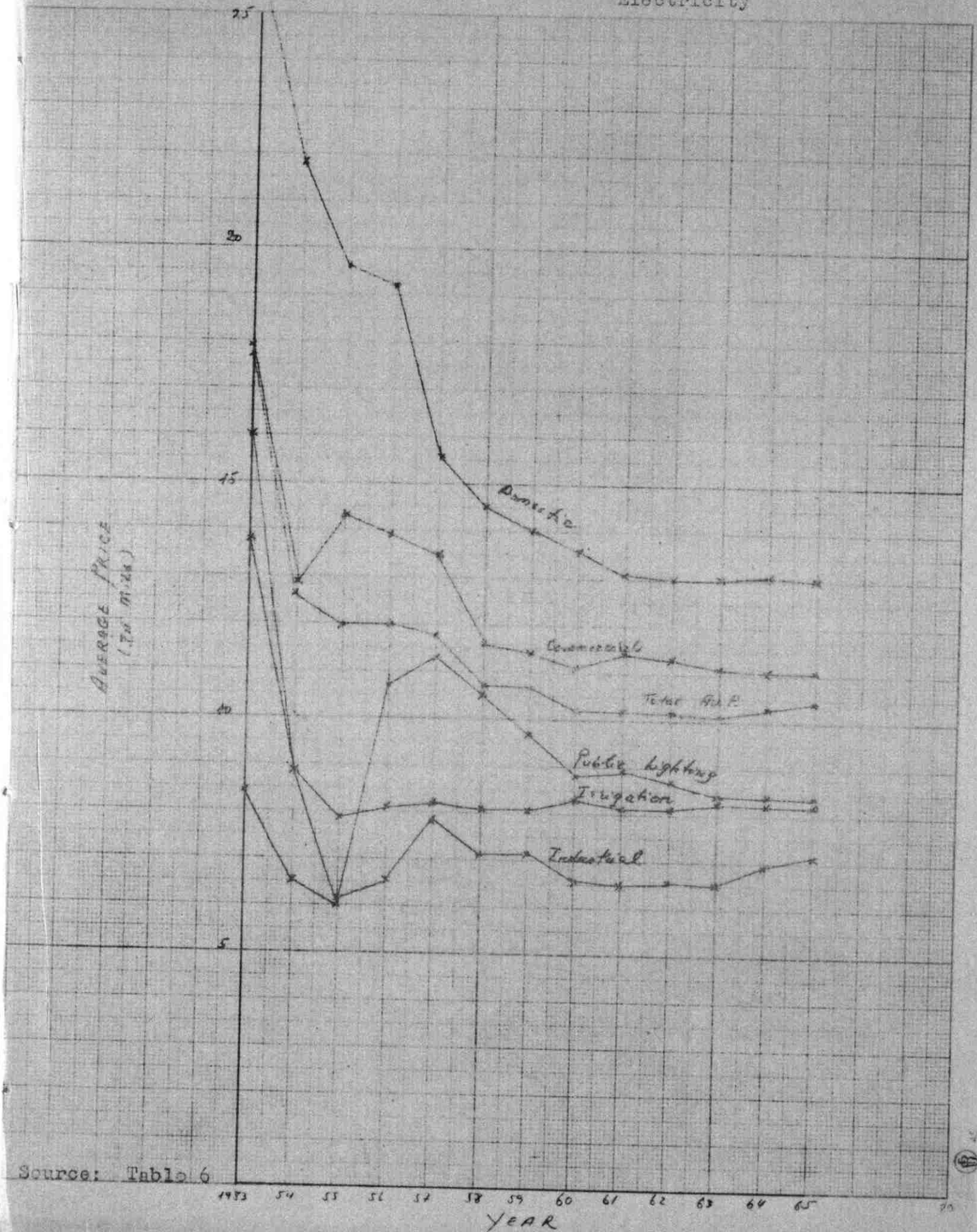
Population.

As was seen previously, Cyprus experienced a population growth of 1.7% per year. It is natural for such rate of growth increase the demand for electricity consumption. The E.A.C. has already provided for this fact in order to match the community's needs properly.

Rates.

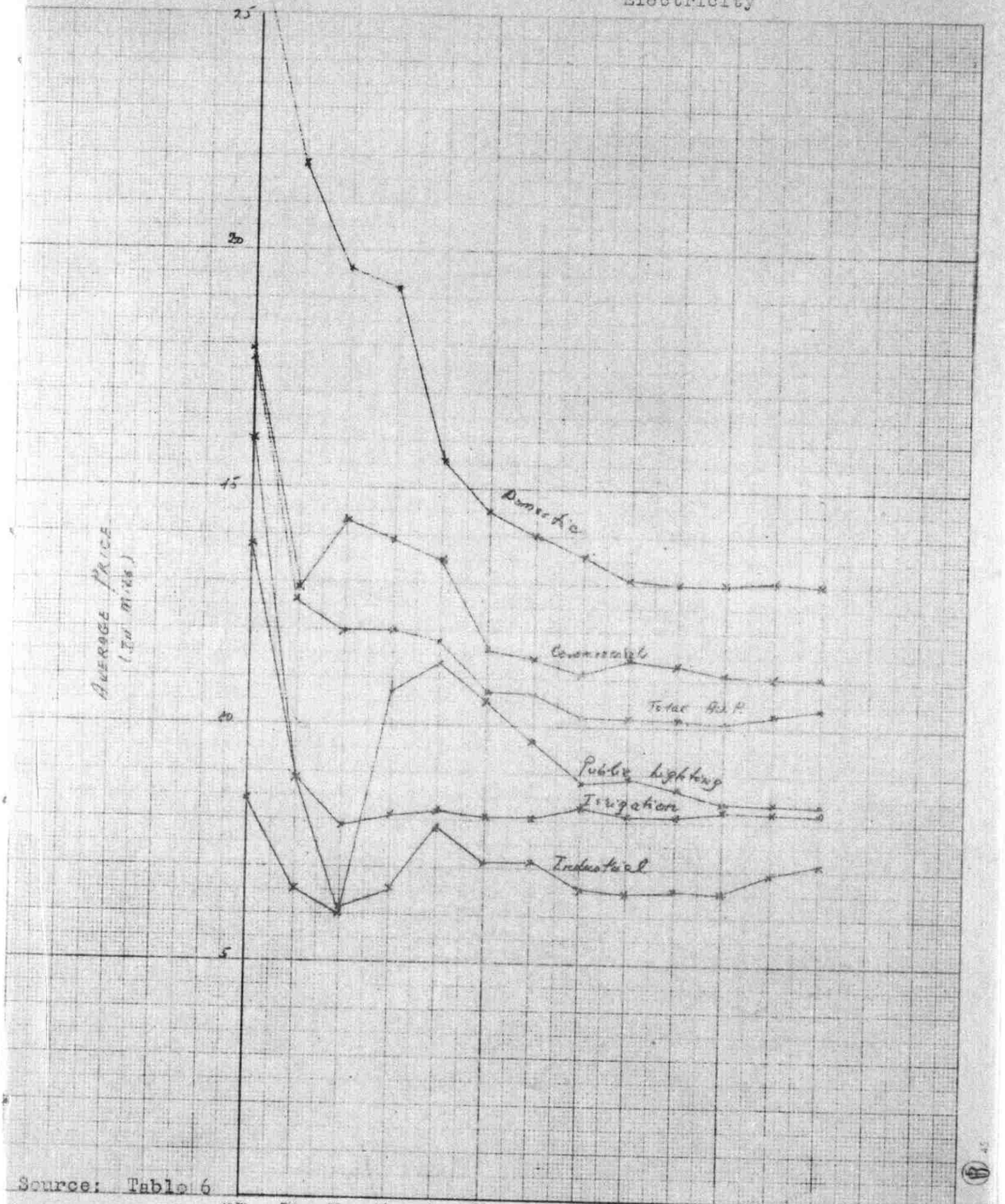
One of the most important determinants of demand for electricity service is the level and structure of rates. Graph 6 indicates a significant decline in electricity tariffs since 1953, from a level of 17.73 mils/Kwh as average (weighted) price to a level of 10.41 mils/Kwh in 1965. This sharp decline in rates could be associated with the efficient and economical production of electricity services to the Cypriot community. The significance of such a decline in prices would be noted if compared with the increasing cost of

Graph 6.- Total and Categorized Average Price for Electricity



Source: Table 6

Graph 6.- Total and Categorized Average price for Electricity



Source: Table 6

living trend (refer app. II-7). Moreover, the Authority, with the intention of promoting further the use of electricity, has adopted a discriminatory pricing policy in favour of industrial establishments and rural electrification development schemes.

Taking 1958-1965 level of prices, the demand for electricity is found to enjoy a high price elasticity. Point elasticity for 1963 amounts to -6.83[1]; arc elasticity for 1958-1965 amounts to -17.02.[2] These elasticities measure the effect of one per cent change in prices on the relative change in quantity of electricity demanded. As such, even though they ignore the dynamic effect of population and income (etc.) on demand, yet they still remain as useful tools for

---

[1] Point : $\frac{Q}{Q}\ \frac{P}{P} = \frac{228.817 - 207.948}{207.948}\ \frac{10.08 - 10.23}{10.23} =$

$10.04 \quad -1.47 \quad = \quad -6.83$

[2] Arc $= \frac{Q_1 - Q_2}{Q_1 + Q_2}\ \frac{P_1 - P_2}{P_1 + P_2} = \frac{147.953 - 237.936}{147.953 + 237.936}$

$\frac{10.70 - 10.41}{10.70 + 10.41}$

$= -23.32\% \quad 1.37\% = \quad -17.02$

better prediction, planning and control by management. Ceterus-paribus, consumption of electricity is inversely related to prices.

The analysis of electricity rates would reveal the fact that they are volatile, subject to changes year-in year-out. The E.A.C. has subjected its tariffs to constant revision in compliance with its basic enterprising policies. The organization being a non-profit seeking institution (rather production oriented) strives towards promoting social welfare and hence in determining rates it seeks fairness, charging for its services by tariffs just enough to cover its annual total costs. As was mentioned previously, if in any year a surplus arises it would be utilized either for reduction of rates for the following year or reserve it for development purposes, the latter having the priority. In this sense, the Authority regards rates to be inversely proportional to profits of the preceding year, and that since such utility services are essential to the welfare of the individual and of the community, it is viewed to be in the public interest that the rendered services should be immune from any monopolistic measures.

Income.

Another important factor influencing demand is income. Generally speaking, the level of a consumer's disposable income depends to a large extent on the level of economic growth. The higher the per capita income of a Cypriot consumer (experienced per capita income growth of 3.67%) the higher would be his standard of living, thus the use of most modern facilities (which are luxeries and normally run by electricity) such as refrigerators, televisions, heaters, laundry machines etc. becomes a necessity. However, once a consumer gets accustomed to a level of living standard the reverse might not realize (at least in the short run) if his disposable income is lowered.

Taking 1958-1965 level of per capita income, the demand for electricity is found to enjoy also a high income elasticity. Point elasticity for 1965 equals +1.78;[3] arc

---

[3] $\text{Point} = \frac{Q}{Q} \quad \frac{I}{I} = \frac{237.936 - 223.344}{223.344} \quad \frac{187.- - 180.4}{180.4}$

$= 6.53\% \quad 3.66\% = +1.78$

elasticity for 1958-1965 equals +3.31[4]. These elasticities measure the effect of one per cent change in per capita income on the relative change in quantity of electricity demanded. Such elasticities again ignore the effect of population, price (etc.) dynamism on demand. Singling out such limitations, income elasticities still could be useful managerial tools for planning and forecast. Ceterus-paribus, consumption of electricity is positively related to income.

Other Determinants.

The E.A.C. bearing in mind that the Cypriot community is in a state of inelastic demand for its necessary electricity services and being the only supplier, has refrained itself from embarking on any sales promotional campaign. Nevertheless, the Authority attempts always to encourage the public to increase electricity consumption during off-peak hours through reduction of tariffs for such uses. Thus, from the social welfare point of view, attempts as such on the

---

$$^{4}\text{Arc} = \frac{Q_1 - Q_2}{Q_1 + Q_2} \quad \frac{I_1 - I_2}{I_1 + I_2} = \frac{147.953 - 237.936}{147.953 + 237.936}$$

$$\frac{162.4 - 187}{162.4 + 187} =$$

$$-23.32\% \quad -7.04\% = +3.31$$

part of E.A.C. should be considered to be rational even in its non-profit context.

As to the social and institutional factors, the development of commercial and industrial sectors towards mechanization would naturally need electricity services, if their aim is to achieve efficiency and economies in operations.

In the latter part of this chapter, the regression analysis excludes such determinant factors of demand since their measurement is not quantifiable.

Behaviour of Demand.

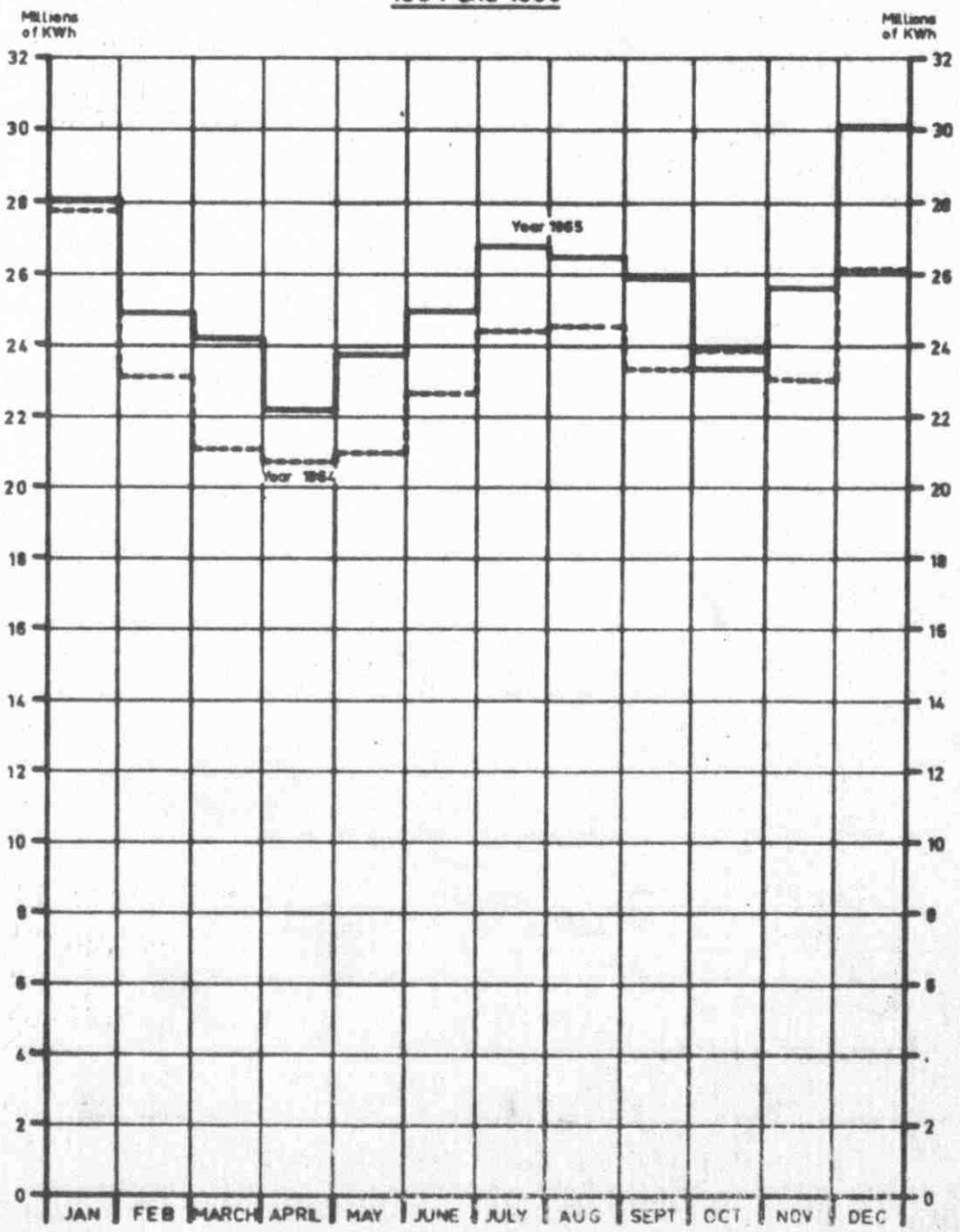
Consumption of electric energy, as revealed from the following three graphs, (7, 8, & 9), varies from hour to hour, from day to day, months to months and even season to season. Thus, the mere existence of maximum use of electricity (peak hous) and minimum use (off-peak hours) subject the E.A.C. to operate at below capacity. Nevertheless, the Authority, in an attempt to utilize this excess capacity, strives towards increasing the load factor (ratio of average power used to maximum power used during a given period). This aim is achieved, as mentioned previously, through offering electricity services in off-peak hours at reduced prices. Such tariffs are tolerable since the cost of generating energy at those periods is claimed to be relatively small.

Graph. 7

UNITS GENERATED MONTHLY

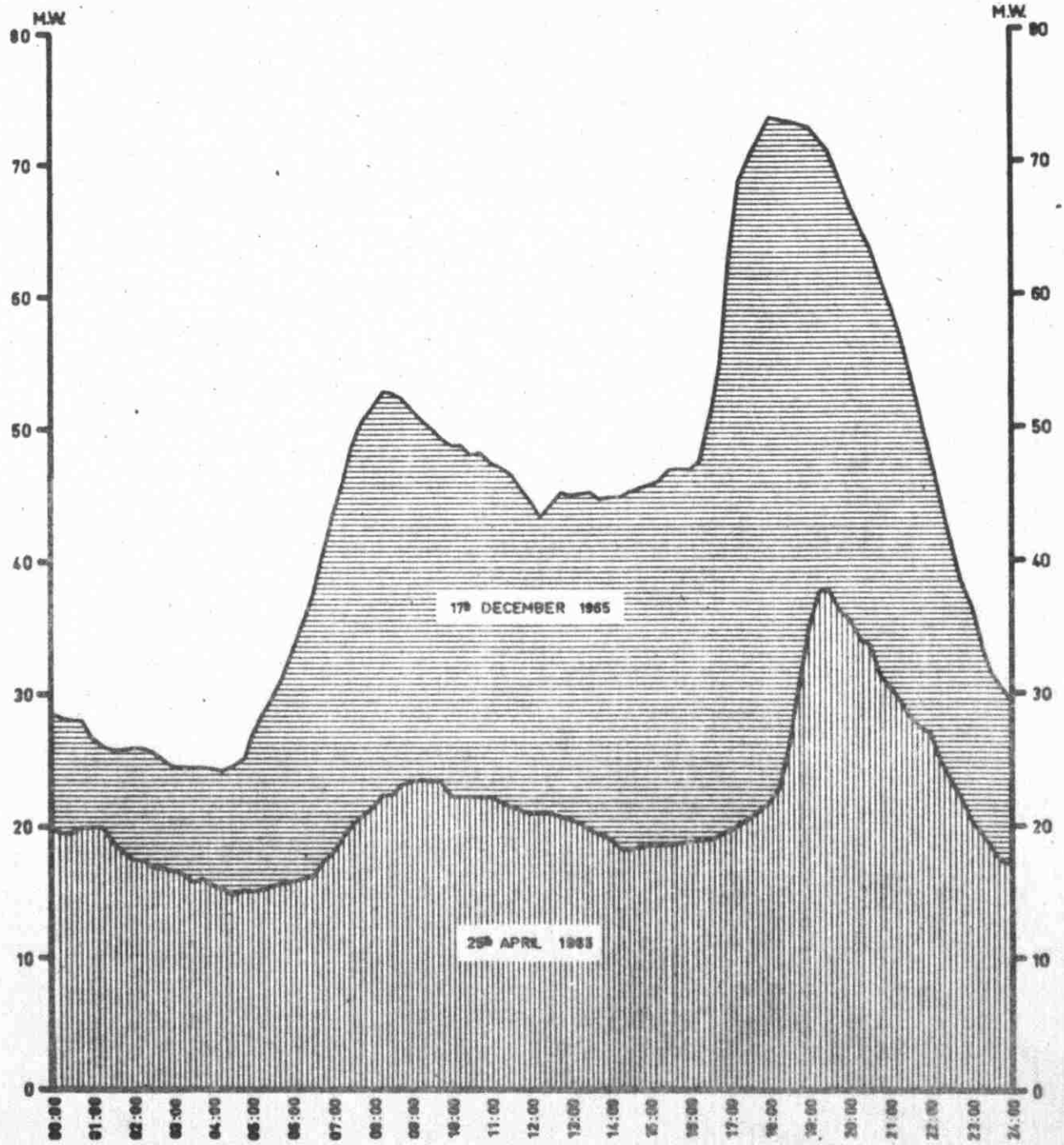
by E.A.C.

1964 and 1965

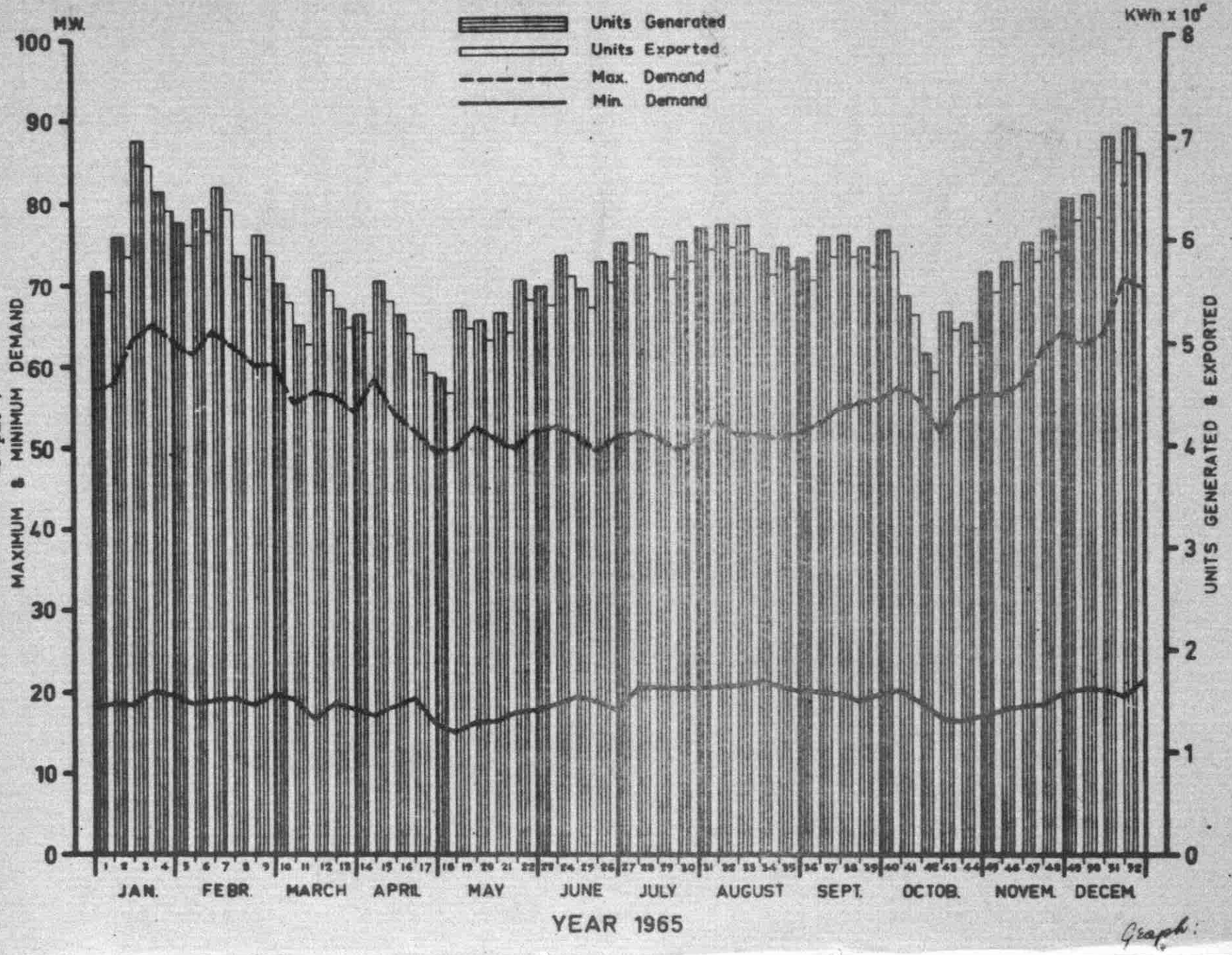


Graph. 8

VARIATION IN DEMAND
ON THE DAY OF HIGHEST AND LOWEST MAXIMUM DEMAND
IN 1965



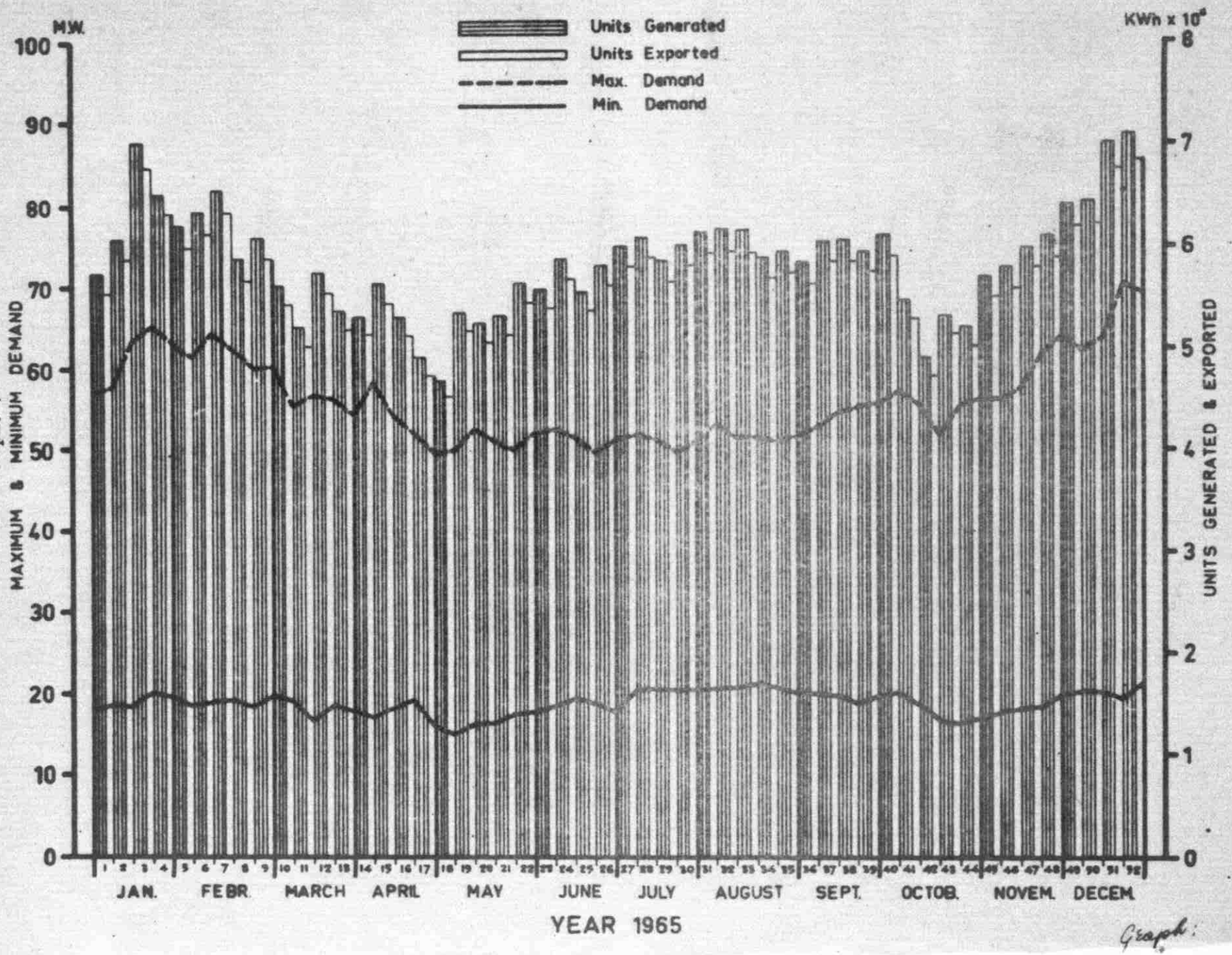
MAXIMUM & MINIMUM DEMAND — UNITS GENERATED & EXPORTED



- 52 -
Graph. 9

Graph:

MAXIMUM & MINIMUM DEMAND — UNITS GENERATED & EXPORTED



Graph:

Projection of Demand.

In this latter part of this chapter a multi-correlation regression analysis is presented. The regression equation equates sales volume of electricity as a function of three independent variables, namely, per capita income, price per Kwh. and population. The formula used is of the form:

$$S = a + bX + cY + dZ$$

where S stands for sales, X for per capita income, Y for price per Kwh and Z for population. Solving for the values of constants, a, b, c, d, through the normal equations as shown in the appendix, our final regression equation becomes

$$S = -1236.4 + 18.6X - 49.5Y + 0.895Z$$

The coefficient of multiple determination, which measures the extent to which the dependent variable is explained by the independent variables, is 0.81; while the coefficient of multiple correlation which measures the degree of correlation existing between the dependent and independent variable is 0.9, which is quite significant (refer appendix).

An important limitation of this regression analysis is that the number of observations is only eight, which renders the usefulness of this equation to be limited only for a small

number of years. Another limitation might be the underlying assumption of linear relationship between the dependent and independent variables.

To forecast the demand for electricity service for any one year, it needs to replace the estimated values for per capita income, price per Kwh, and population as for that particular year in question. The trends for projection of the three independent variables individually (refer app. II-8) are derived by solving the linear equations,

(1) $X = 156.1 + 4.45\ p$
(2) $Y = 10.6 - 0.05\ p$
(3) $Z = 555.8 + 5.05\ p$

In each of the above equations the respective independent variable in question is projected as a function of time "P". If the abnormal year 1964 is excluded from the analysis we would naturally obtain totally different trend results. Moreover, the trends in quest have limitations again in terms of the number of observations (eight), the presumption of linear relationship function, and the lack of any imputations for possible adjustments in retrospect within the industry.

Thus solving for the values of independent variables, through projected (though rough) estimates of per capita income, price per Kwh and population for the years 1968, 1969,

and 1970, (refer app. II-8), in our sales regression formula the demand expressed in terms of gross annual receipts would amount to as following:

1968	£ 2,626.300/-
1969	£ 2,726.300/-
1970	£ 2,807.700/-

Summary and Conclusions.

The emergence of the Electricity Authority of Cyprus as a non-profit seeking institution (rather production oriented) with its primary objective of rendering services to the public meant to enhance the industry's rate of growth.

The consumption of electricity in Cyprus has expanded steadily and quite substantially since 1953 (a multiple of twelve).

Demand for electricity services is dependent on a number of factors, the most important being population, prices and per capita income, all having a positive contribution to the industry's expansion. The E.A.C., in striving to alleviate the use of electric energy, has adopted a descriminatory pricing policy in favour of industrialization and rural electrification schemes.

Due to the peculiar nature of demand for its services, the Authority has been anxious to minimize its unavoidable excess capacity through offering its electricity services in off-peak hours at reduced rates.

As an outlook for the future, the potential for a persistent pace of growth in demand for electric energy on the part of Cypriot community appears undiminished.

APPENDIX II-1

SUBSCRIBERS (CONSUMERS) CONNECTED (Categorized)

Year End	Domestic	Commercial	Industrial	Irrigation	Public Lighting	Total
1952	n.a.	n.a.	n.a.	n.a.	n.a.	19,869
1953	26,625	3,942	580	180	75	31,402
1954	29,235	7,542	603	196	80	37,656
1955	31,201	9,837	634	240	89	42,001
1956	35,223	10,779	664	332	89	47,087
1957	43,998	12,704	714	476	185	58,077
1958	49,467	13,272	808	678	197	64,422
1959	55,741	15,151	927	820	282	72,921
1960	61,558	16,067	1,114	930	273	79,942
1961	65,380	16,593	1,352	1,032	300	84,657
1962	71,354	17,573	1,855	1,184	320	92,286
1963	80,394	18,756	2,291	1,346	390	103,177
1964	77,306	17,528	2,180	1,427	478	98,919
1965	85,575	18,697	2,406	1,509	552	108,739
Totals	713,057	178,441	16,128	10,350	3,310	921,286

Source: Annual Reports and Accounts of Electricity Authority of Cyprus, 1952-1965, op. cit.

APPENDIX II-2

CONSUMPTIONS PER SUBSCRIBER
(categorized)

YEAR	DOMESTIC Kwh.	COMMERCIAL Kwh.	INDUSTRIAL Kwh.	IRRIGATION Kwh.	PUBLIC LIGHTING Kwh.
1953	147	2,134	12,109	165	13,283
1954	225	2,084	23,761	1,154	19,336
1955	376	2,370	34,360	6,505	20,618
1956	404	3,236	44,753	6,267	29,210
1957	531	3,993	59,936	4,213	16,955
1958	615	4,803	55,531	7,541	19,431
1959	659	4,781	46,158	8,063	13,002
1960	691	4,444	47,734	7,900	14,737
1961	758	4,613	42,136	6,742	15,246
1962	776	4,567	32,329	5,969	16,531
1963	760	4,555	30,019	5,394	15,958
1964	749	5,169	26,831	6,491	14,803
1965	760	5,195	24,917	5,081	14,788

Source: Annual Reports and Accounts of Electricity, Authority of Cyprus, 1953-1965, op. cit.

APPENDIX II-3

PER CAPITA AND PER SUBSCRIBER CONSUMPTION

YEAR END	TOTAL CONSUMPTION Kwh. (000)	DEMOGRAPHY (000)	TOTAL SUBSCRIBERS (at the end of the year)	PER CAPITA CONSUMPTION Kwh.	PER SUBSCRIBER CONSUMPTION Kwh.
1953	20,363	515	31,402	39.5	648.5
1954	38,389	523	37,656	73.4	1,019.5
1955	60,218	530	42,001	113.6	1,433.7
1956	83,495	536	47,087	155.8	1,773.2
1957	122,051	546	58,077	223.5	2,101.5
1958	147,953	558	64,422	265.1	2,296.6
1959	162,255	567	72,921	286.2	2,225.1
1960	178,481	573	79,942	311.5	2,232.6
1961	194,612	577	84,657	337.3	2,298.8
1962	207,948	580	92,286	358.5	2,253.3
1963	228,817	589	103,177	388.5	2,217.7
1964	223,344	587	98,919	380.5	2,257.8
1965	237,936	597[a]	108,739	398.6	2,188.1

Sources: Population figures are obtained from Cyprus, Statistical Abstract, (1964), op. cit., p. 14. Total consumption and total subscribers figures are obtained from Annual Reports and Accounts of Electricity Authority of Cyprus, 1953-1965, op. cit.

a. Extrapolated from 1964 1.7% increase
$s=p(1+i)^n = 587(1+0.017)^1$

APPENDIX II-4

YEARLY SALES, PER CAPITA INCOME, PRICE AND POPULATION

Year	Sales (000)	Popula-tion	Price/Kwh. (Mils)	N.N.P. (at current Market Prices) (Million)	Per Capita N.N.P.
1958	1582.6	558,000.-	10.70	90.6	162.4
1959	1731.8	567,000.-	10.67	92.0	162.3
1960	1821.9	573,000.-	10.21	91.9	160.4
1961	1989.6	577,000.-	10.22	101.7	176.3
1962	2127.-	580,000.-	10.23	108.0	186.2
1963	2306.-	589,000.-	10.08	114.3	194.1
1964	2300.-	587,000.-	10.30	105.9	180.4
1965	2476.5	597,000.-[a]	10.41		187.-[b]

Sources: Population figures are obtained from Cyprus, Economic Report, (1964), op. cit., p. 32. Net National product figures are obtained from Cyprus, Economic Report, (1964), op. cit., p. 13. Sales and price/Kwh are obtained from Annual Reports and Accounts of Electricity Authority of Cyprus, 1958-1965, op. cit.

[a] Extrapolated from 1964 1.7% compounded growth.

[b] Extrapolated from 1964 3.67% compounded growth.

APPENDIX II-5

REGRESSION EQUATION

I) $\Sigma S = Na + b\Sigma X + c\Sigma Y + d\Sigma Z$

II) $\Sigma SX = a\Sigma X + b\Sigma X^2 + c\Sigma YX + d\Sigma ZX$

III) $\Sigma SY = a\Sigma Y + b\Sigma XY + c\Sigma Y^2 + d\Sigma ZY$

IV) $\Sigma SZ = a\Sigma Z + b\Sigma XZ + c\Sigma YZ + d\Sigma Z^2$

$16,335 = 8a + 1409b + 83c + 4628d$

$2,902,752 = 1409a + 249,383b + 14,576c + 816,132d$

$168,820 = 83a + 14576b + 857c + 47,899d$

$9,477,434 = 4628a + 816,132b + 47,899c + 2,678,410d$

Year	ΣS (000) £	ΣX £	ΣY mils	ΣZ (000)	ΣSX	ΣX^2	ΣYX	ΣZX	ΣSY	ΣY^2	ΣZY	ΣSZ	ΣZ^2
1958	1582.6	162.4	10.70	558	257,014	26,374	1738	90,619	16,934	114	5971	883,091	311,364
1959	1731.8	162.3	10.67	567	281,071	26,341	1732	92,024	18,478	114	6050	981,931	321,489
1960	1821.9	160.4	10.21	573	292,233	25,728	1638	91,909	18,601	104	5850	1,043,949	328,329
1961	1989.6	176.3	10.22	577	350,766	31,082	1802	101,725	20,334	104	5897	1,147,999	332,929
1962	2127.-	186.2	10.23	580	396,047	34,670	1905	107,996	21,759	105	5933	1,233,660	336,400
1963	2306.-	194.1	10.08	589	447,595	37,675	1956	114,325	23,244	102	5937	1,358,234	346,921
1964	2300.-	180.4	10.30	587	414,920	32,544	1858	105,895	23,690	106	6046	1,350,100	344,569
1965	2476.5	187.0	10.41	597	463,106	34,969	1947	111,639	25,780	108	6215	1,478,470	356,409
	16335.4	1,409.1	82.82	4,628.-	2,902,752	249,383	14576	816,132	168,820	857	47899	9,477,434	2678,410

REGRESSION EQUATION $S = -1236.4 + 18.6X - 49.5Y + 0.895Z$

$a = -1236.4$

$b = 18.6$

$c = -49.5$

$d = 0.895$

APPENDIX II-6

COEFFICIENTS OF MULTIPLE CORRELATION & MULTIPLE DETERMINATION

Year	S (000)	S^2	S^1	$(S-S^1)$ d	d^2
1958	1582.6	2,504,623	1754.-	-171.4	29,378
1959	1731.8	2,999,131	1761.7	- 29.9	894
1960	1821.9	3,319,320	1754.4	+ 67.5	4,556
1961	1989.6	3,958,508	2053.3	- 63.7	4,058
1962	2127.0	4,524,129	2239.6	-112.6	12,679
1963	2306.-	5,317,636	2402.1	- 96.1	9,235
1964	2300.-	5,290,000	2134.6	+165.4	27,357
1965	2476.5	6,133,052	2260.8	+215.7	46,526
	16,335.4	34,046,399 (S^2)			134,683 (d^2)

$\bar{S}$ = 16,335.4 8 = 2,041.92

$\bar{S}^2$ = 4,169,437.-

$(\bar{S})^2 N$ = 4,169,437 x 8 = 33,355,496.-

Coef. of Multiple Determination = $R^2 = 1 - \frac{\Sigma(d^2)}{\Sigma(S^2) - (\bar{S})^2 N}$ =

$1 - \frac{134,683}{34,046,399 - 33,355,496}$

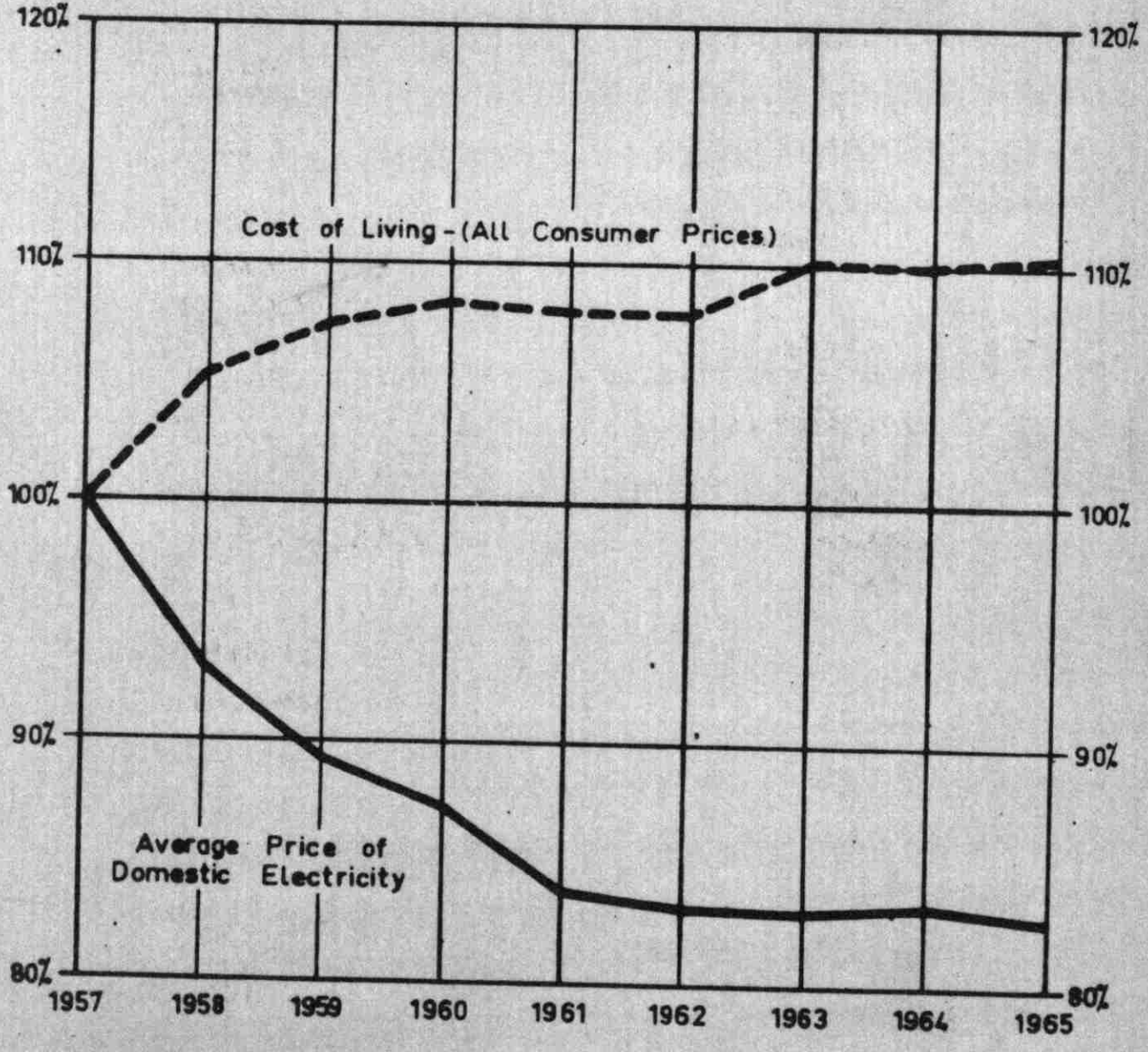
$= 1 - \frac{134,683}{690,903} = 1 - 0.1949 = 0.8051 =$

0.81 Coef. of Multiple Determination

Coef. of Multiple Correlation = $R = \sqrt{0.81} =$ 0.9 Coef. of Multiple Correlation

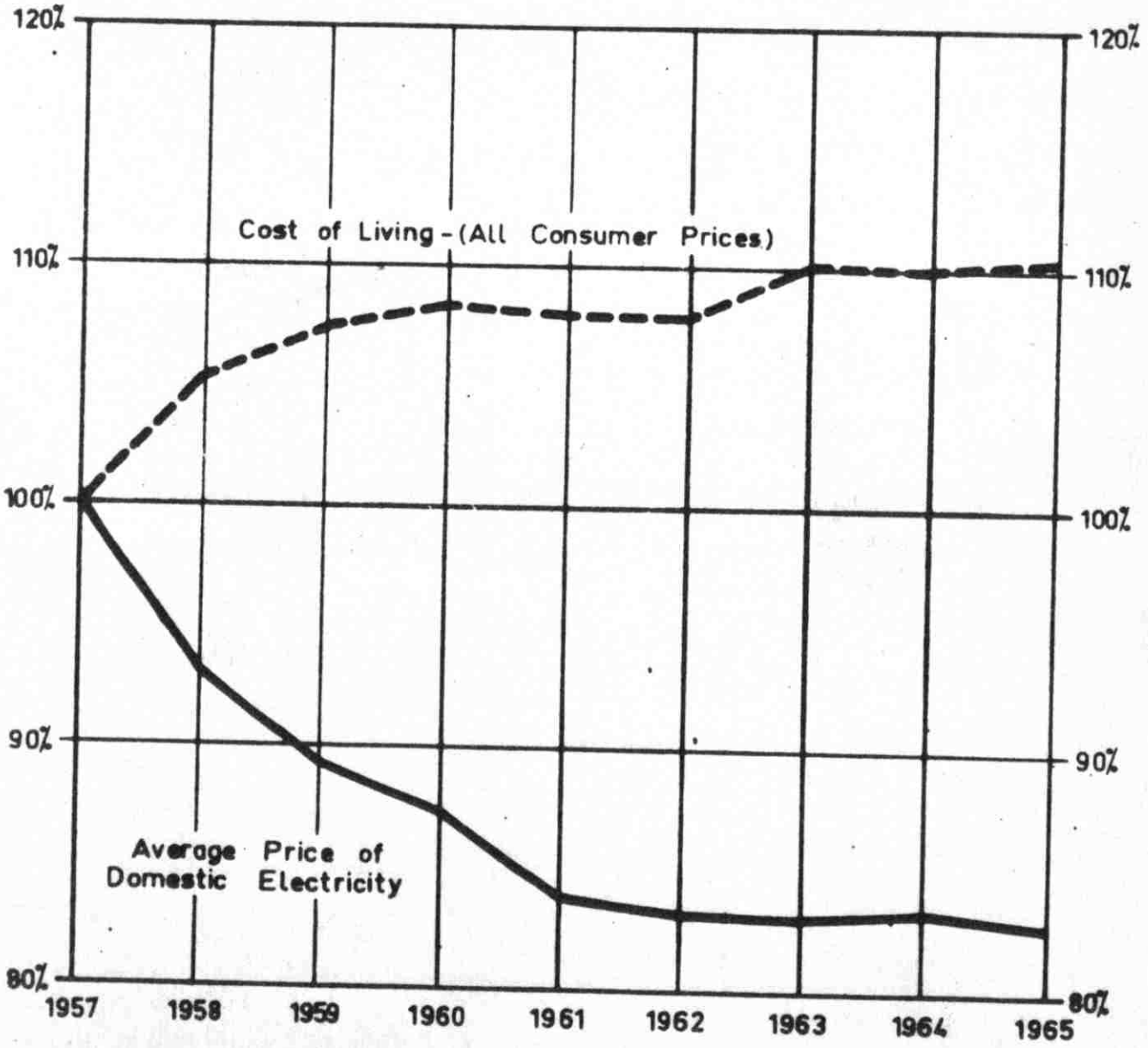
APPENDIX II-7

COST OF LIVING
&
AVERAGE PRICE PER DOMESTIC KWh



APPENDIX II-7

COST OF LIVING
&
AVERAGE PRICE PER DOMESTIC KWh



APPENDIX II-8

PROJECTIONS FOR PER CAPITA INCOME, PRICES AND POPULATION

I) Per Capita Income

1) $\Sigma X = Na + b \Sigma P$
2) $\Sigma PX = a\Sigma P + b \Sigma P^2$

$1409.1 = 8a + 36b$
$6528.- = 36a + 204b$

II) Price

1) $\Sigma Y = Na + b\Sigma P$
2) $\Sigma PY = a\Sigma P + b\Sigma P^2$

$82.82 = 8a + 36b$
$370.6 = 36a + 204b$

III) Population

1) $\Sigma Z = Na + b\Sigma P$
2) $\Sigma PZ = a\Sigma P + b\Sigma P^2$

$4628 = 8a + 36b$
$21038 = 36a + 204b$

YEAR	Per Capita Income ΣX £	Price Per Kwh. ΣY Mils	Population ΣZ (000)	Period ΣP	ΣP^2	ΣPX	ΣPY	ΣPZ
1958	162.4	10.70	558	1	1	162	10.7	558
1959	162.3	10.67	567	2	4	325	21.3	1134
1960	160.4	10.21	573	3	9	481	30.6	1719
1961	176.3	10.22	577	4	16	705	40.9	2308
1962	186.2	10.23	580	5	25	931	51.2	2900
1963	194.1	10.08	589	6	36	1165	60.5	3534
1964	180.4	10.30	587	7	49	1263	72.1	4109
1965	187.0	10.41	597	8	64	1496	83.3	4776
	1409.1	82.82	4628	36	204	6528	370.6	21038

I) $X = 156.1 + 4.45p$, 1968 $X = 205.-$ £ , 1969 $X = 210.-$ £ 1970 $X = 214.-$ £

II) $Y = 10.6 - 0.05p$, 1968 $Y = 10.05$ mils , 1969 $Y = 10.-$ mils 1970 $Y = 9.95$ mils

III) $Z = 555.8 + 5.05p$, 1968 $Z = 611.4$, 1969 $Z = 616.4$ 1970 $Z = 621.4$

CHAPTER III

THE AUTHORITY'S RESULTS OF OPERATIONS AND FINANCIAL POSITION

That the primary objective of E.A.C. is and has been not only the efficient provision of services to the public but also the promotion and encouragement of the use of electricity has led the Authority to be confronted with three major problems that are simultaneously interrelated subjects proper for investment and financial management.

Two of these problems relate to the investment field. The first is the question of the volume of investment undertakings. This is the expansion problem which in turn is a function of demand. As was noted previously, demand for electricity services has experienced an increasing trend throughout the last fourteen years (1952-1965). In an attempt to cope with the potentially increasing demand for its services, the E.A.C. had to expand its operations with a corresponding increase in its asset holdings from a level of £ 4,993,890 in 1952 to £15,641,380, a multiple of 4.32. The second is

the aspect of selection among various investment proposals. This is the allocation problem. The Authority's management had to determine on the type and composition of its assets holdings in the light of its present and future plans of action.

The third problem pertains to the area of finance. The Authority should decide on the manner of financing its expansionary investment projects. This is the financial problem. The discussion in this chapter will dwell, among the other things, on the way and means by which the E.A.C. dealt with its investment as well as financial issues.

BALANCE SHEET ANALYSIS

As was seen previously, in November 1952 the E.A.C. gave effect to the provisions of the Electricity Development Law, enacted in 1952, which envisaged the constitution of an Island-wide electrification scheme. The Authority commenced its task through acquisition the two major company owned undertakings, namely, the Nicosia Electric Company Ltd., and the Limassol Electric Light Co., Ltd. In an effort to finance the acquisition of the said undertakings, the Government of

Cyprus floated loans through two consecutive issues under the title of "Cyprus 3½% Inscribed Stock 1969-71." By the end of 1952, the E.A.C. had actually borrowed from the Government of Cyprus the sum of £3,984,011 as a long term capital borrowing. Of this £2,872,747 was outlayed for capital expenditures (fixed assets), the principal items of which were £682,963 for generating plant, machinery and equipment, £638,029 for high tension transmission, £281,193 for low tension distribution, and £121,944 for land and buildings.[1] The acquisition costs of such fixed assets to the Authority represented the original cost less the depreciation up to date. The remaining balance of the loan (£1,111,264) was mainly to provide for the Authority's necessary working capital requirements.

Table 7 presents the condensed balance sheet of Electricity Authority of Cyprus, at the end of each year during the 1952-1965 period. For convenience purposes of the analysis, a peculiar form of presentation is adapted whereby the balance sheet items are classified under three major captions, namely, net working capital, other liabilities and other assets.

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[1] First Annual Report and Accounts of Electricity Authority of Cyprus, 1952, op. cit., p. 12.

TABLE 7

ELECTRICITY AUTHORITY OF CYPRUS
CONDENSED BALANCE SHEET
1952-1965
(In Cyprus Pounds)

YEAR	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
CURRENT ASSETS:														
Stocks at cost below cost	82,829	90,413	178,429	268,606	400,957	595,591	524,879	571,769	477,914	400,028	513,027	569,072	766,285	927,072
Debtors & debit balances Less Provision...	92,382	200,286	172,480	292,083	393,302	573,841	614,148	455,677	435,749	445,524	487,375	467,479	487,554	501,982
Progress Payments	21,848	2,580	105,816	223,924	133,422	21,161	-	-	-	-	-	-	161,219	223,234
Investments-at market value								12,856						
Funds on deposit	1,916,838	880,731	209,159	725,107	105,113	41,650	192,307	421,720	146,000	268,814	256,062	983,884	1,227,796	1,220,584
Balance at banks & Cash in hand	4,856	46,202	21,140	13,921	19,578	48,060	36,213	108,116	160,418	69,426	137,871	71,318	89,324	65,938
Total Current Assets	2,118,753	1,220,212	687,024	1,523,641	1,052,372	1,280,306	1,370,547	1,570,138	1,220,091	1,183,792	1,394,335	2,091,753	2,732,178	2,937,810
CURRENT LIABILITIES & Provisions:														
Creditors, Accrued Liabilities & Provisions	983,037	719,360	757,407	945,404	481,217	464,108	407,394	481,561	220,439	175,416	369,405	532,752	578,091	987,191
Subscribers deposits	-	-	-	-	-	63,591	82,204	102,837	117,221	122,509	134,053	148,504	148,621	164,647
Government of Cyprus-Short term advances	-	-	-	-	1,282,068	2,402,681	1,080,064	150,000	-	-	-	-	-	-
Total Current Liab. & Provisions	983,037	719,360	757,407	945,404	1,763,285	2,930,380	1,569,662	734,398	337,660	297,925	503,458	681,256	726,712	1,151,838
NET WORKING CAPITAL	1,135,716	500,852	(70,383)	578,237	(710,913)	(1,650,074)	(199,115)	835,740	882,431	885,867	890,877	1,410,497	2,005,466	1,785,972
OTHER LIABILITIES: (1)														
Capital Borrowings	3,484,011	4,033,784	4,067,870	5,562,254	5,536,513	5,530,585	7,544,369	9,038,081	9,281,553	9,274,778	9,717,745	10,129,981	10,573,066	12,155,263
Reserve for Development Works	-	-	-	-	-	150,000	-	-	-	-	-	-	-	-
Retained Earnings	1,153	(78,110)	(139,675)	(63,285)	56,042	56,703	387,210	490,022	184,990	461,414	840,676	1,315,715	1,762,934	2,252,784
Provision for Pensions	-	-	-	114,521	110,549	106,141	103,462	99,391	96,708	93,672	90,829	87,808	84,703	81,495
Sinking Fund	25,689	99,921	187,216	302,508	-	-	-	-	-	-	-	-	-	-
Total (1)	4,010,853	4,055,595	4,125,411	5,915,998	5,723,104	5,863,399	8,035,041	9,627,494	9,563,251	9,829,864	10,649,250	11,533,504	12,420,703	14,489,542
OTHER ASSETS: (2)														
Fixed Assets (Net of Depreciation)	2,872,747	3,552,291	4,193,267	5,242,943	6,334,542	7,413,938	8,134,681	8,717,161	8,394,596	8,394,077	8,907,705	9,332,926	9,847,210	12,416,121
Long term Investments	2,390	2,452	2,527	94,818	99,475	99,475	99,475	-	-	-	-	-	-	-
Stock Redemption Fund	-	-	-	-	-	-	-	74,593	286,224	542,920	850,668	784,081	568,027	287,449
Total (2)	2,875,137	3,554,743	4,195,794	5,337,761	6,434,017	7,513,413	8,234,156	8,791,754	8,680,820	8,943,997	9,758,373	10,123,007	10,415,237	12,703,570
(1) - (2)	1,135,716	500,852	(70,383)	578,237	(710,913)	(1,650,014)	(199,115)	835,740	882,431	885,867	890,877	1,410,497	2,005,466	1,785,972
CURRENT RATIO[a]	2.16:1	1.70:1	0.91:1	1.61:1	0.60:1	0.44:1	0.87:1	2.14:1	3.61:1	3.97:1	2.77:1	3.07:1	3.76:1	2.55:1
ACID TEST RATIO[b]	2.67:1	1.57:1	0.67:1	1.33:1	0.37:1	0.23:1	0.54:1	1.36:1	3.20:1	2.63:1	1.75:1	2.24:1	2.70:1	1.75:1

Source: Derived from Annual Reports and Accounts of Cyprus Electricity Authority, 1952-1965, op. cit.

1: The Balance Sheet items are presented in such a form so as to serve the purpose of the study to its best.

a: Current Assets divided by Current Liabilities, b: Current assets (exclusive of inventories) divided by current liabilities.

TABLE 7

ELECTRICITY AUTHORITY OF CYPRUS
CONDENSED BALANCE SHEET
1952-1965
(In Cyprus Pounds)

YEAR	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
CURRENT ASSETS:														
Stocks at or below cost	82.829	90.413	178,429	268,606	400,957	595,591	524,879	571,769	477,914	400.028	513,027	569,072	766,285	927,072
Debtors & debit balances less Provisions	92,382	200.286	172,480	292,083	393,302	573,844	614,148	455,677	435,749	445,524	487,375	467,479	487,554	501,982
Progress Payments	21,848	2,580	105,816	223,924	133,422	21,161	-	-	-	-	-	-	161,219	223,234
Investments-at market value								12,856						
Funds on deposit	1,916,838	880,731	209,159	725,107	105,113	41,650	192,307	421,720	146,000	268,814	256,062	983,884	1,227,796	1,220,584
Balance at banks & Cash in hand	4,856	46,202	21,140	13,921	19,578	48,060	36,213	108,116	160,448	69,426	137,871	71,318	89,324	65,938
Total Current Assets	2,118,753	1,220,212	687,024	1,523,641	1,052,372	1,280,306	1,370,547	1,570,138	1,220,091	1,183,792	1,394,335	2,091,753	2,732,178	2,937,810
CURRENT LIABILITIES & PROVISIONS:														
Creditors, Accrued Liabilities & Provisions	983,037	719,360	757,407	945,404	481,217	464,108	407,394	481,561	220,439	175,416	369,405	532,752	578,091	987,191
Subscribed deposits	-	-	-	-	-	63,591	82,204	102,837	117,221	122,509	134,053	148,504	148,621	164,647
Government of Cyprus-Short term advances	-	-	-	-	1,282,068	2,402,681	1,080,064	150,000	-	-	-	-	-	-
Total Current Liab. & Provisions	983,037	719,360	757,407	945,404	1,763,285	2,930,380	1,569,662	734,398	337,660	297,925	503,458	681,256	726,712	1,151,838
NET WORKING CAPITAL	1,135,716	500,852	(70,383)	578,237	(710,913)	(1,650,014)	(199,115)	835,740	882,431	885,867	890,877	1,410,497	2,005,466	1,785,972
OTHER LIABILITIES: (1)														
Capital Borrowings	3,984,011	4,033,784	4,067,870	5,562,254	5,556,513	5,550,565	7,544,369	9,038,081	9,281,553	9,274,778	9,717,745	10,129,981	10,573,066	12,155,263
Reserve for Development Works	-	-	-	-	-	150,000	-	-	-	-	-	-	-	-
Retained Earnings	1,153	(78,110)	(139,675)	(63,285)	56,042	56,703	387,210	490,022	184,990	461,414	840,676	1,315,715	1,762,934	2,252,789
Provision for Pensions	-	-	-	114,521	110,549	106,141	103,462	99,391	96,708	93,672	90,829	87,808	84,703	81,495
Sinking Fund	25,689	99,921	197,216	302,508	-	-	-	-	-	-	-	-	-	-
Total (1)	4,010,853	4,055,595	4,125,411	5,915,998	5,723,104	5,863,399	8,035,041	9,627,494	9,563,251	9,829,864	10,648,250	11,533,504	12,420,703	14,489,542
OTHER ASSETS: (2)														
Fixed Assets (Net of Depreciation)	2,872,747	3,552,291	4,193,267	5,242,943	6,334,542	7,413,938	8,134,681	8,717,161	8,394,596	8,394,077	8,907,705	9,338,926	9,847,210	12,416,121
Long Term Investments	2,390	2,452	2,527	94,818	99,475	99,475	99,475	-	-	-	-	-	-	-
Stock Redemption Fund	-	-	-	-	-	-	-	74,593	286,224	549,920	850,668	784,081	568,027	287,449
Total (2)	2,875,137	3,554,743	4,195,794	5,337,761	6,434,017	7,513,413	8,234,156	8,791,754	8,680,820	8,943,997	9,758,373	10,123,007	10,415,237	12,703,570
(1) - (2)	1,135,716	500,852	(70,383)	578,237	(710,913)	(1,650,014)	(199,115)	835,740	882,431	885,867	890,877	1,410,497	2,005,466	1,785,972
CURRENT RATIO[a]	2.16:1	1.70:1	0.91:1	1.61:1	0.60:1	0.44:1	0.87:1	2.14:1	3.61:1	3.97:1	2.77:1	3.07:1	3.76:1	2.55:1
ACID TEST RATIO[b]	2.07:1	1.57:1	0.67:1	1.33:1	0.37:1	0.23:1	0.54:1	1.36:1	2.20:1	2.63:1	1.75:1	2.24:1	2.70:1	1.75:1

Source: Derived from Annual Reports and Accounts of Cyprus Electricity Authority, 1952-1965, op. cit.

1: The Balance Sheet items are presented in such a form so as to serve the purpose of the study to its best.

a: Current Assets divided by Current Liabilities, b: Current assets (exclusive of inventories) divided by Current Liabilities.

The term net working capital denotes the excess of current assets over current liabilities. As such it is considered to be a measure of liquidity in absolute terms. A further analysis of table 1 would reveal that with the exception of 1954, 1956, 1957, 1958, E.A.C. enjoyed a positive position in its net working capital. Normally speaking, such a favorable financial state would enable the concerns to settle their current obligations to outsiders within a short period of time enough not to resort to media as external financing, disposal of long term investments or liquidation of fixed assets. Moreover, the fact that electricity utilities are by nature heavily capitalized enterprises they tend towards keeping a relatively low ratio of net working capital to fixed assets since the stability of their financial operations would not necessitate otherwise. Hence, the net working capital would by and large be utilized to finance day to day operations of the Authority and its replacement outlays.

As it could be noticed from the analysis in table 1 the current ratio (current assets over current liabilities) has fluctuated throughout 1952-1965; the lowest index being 0.44: 1 in 1957 and the highest being 3.97: 1 in 1961.

In our analysis in table 1 the acid test ratio (or quick asset ratio), the same as current ratio but excludes inventories, reveals a parrallel trend to that of current ratio but of course with a resultant lower magnitude due to the exclusion of inventories.

Table 8 presents the index of working capital items with 1952 as the base year. Since 1952 total current assets have increased by 39%. Cash (funds on deposit plus balance at banks and cash in hand) being the major item has witnessed wild fluctuations in its trend. This fact could be intimately linked to the pattern of capitalization (borrowed funds) and the timing of capital outlays.

Stocks at or below cost increased from a level of £82,829/- to the level of £927,072/- an increase of 11.19 times. "Debtors and debit balances (net)" has increased since 1952 by 5.43 times.

Total current liabilities show a fluctuating trend since 1952. However the rate of increase was remarkable during 1956; mainly due to the Government of Cyprus short term advances as was then effected in the magnitude of £1,282,068.

Creditors, accrued liabilities and provisions, and subscribers' deposits are among the components of current

TABLE 8

ELECTRICITY AUTHORITY OF CYPRUS
INDEX OF WORKING CAPITAL ITEMS
1952 - 1965

YEAR	1952	1952 (100)	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1965
CURRENT ASSETS																
Stocks at or below cost.	82,829	100	109	215	324	484	719	634	690	577	483	619	687	925	1119	927,072
Debtor & debit balances Less provision	92,382	100	217	187	316	426	621	668	493	472	482	528	506	528	543	501,982
Progress payments	21,848	100	12	484	1025	611	97	-	-	-	-	-	-	738	1017	222,234
Investments at market value	-	-	-	-	-	-	-	-	100	-	-	-	-	-	-	-
Funds on deposit	1,916,838	100	46	11	38	6	2	10	22	8	14	13	51	64	64	1,220,584
Balance at banks and cash in hand	4,856	100	951	435	287	403	990	746	2226	3304	1430	2839	1469	1839	1358	65,938
Total Current Assets	2,118,753	100	58	32	72	50	60	65	74	58	56	66	99	129	139	2,937,810
CURRENT LIABILITIES AND PROVISIONS																
Creditors, Accrued Liabilities and Provisions (A/P)	983,037	100	73	77	96	49	47	41	49	22	18	38	54	59	101	987,191
Consumers' deposits	-	-	-	-	-	-	100	129	162	184	193	211	234	234	259	164,647
Government of Cyprus.- Short term advances	-	-	-	-	-	100	187	84	12	-	-	-	-	-	-	-
Total Current Liabilities and Provisions	983,037	100	73	77	96	179	298	160	75	34	30	51	69	74	117	1,151,838
WORKING CAPITAL	1,135,716	100	44	(6)	51	(63)	(145)	(18)	74	78	78	79	124	177	157	1,785,972

Source: Derived from figures in Table 7.

liabilities.

Table 9 exhibits the composition of working capital items. For reasons previously mentioned, total cash has been subject to sharp fluctuations the lowest hit being 7 per cent of current assets in 1957 and the highest being 91 percent in 1952.

Stocks valued at the lower of cost or market have also fluctuated within the range of 4 percent and 46 percent of current assets in 1952 and 1957 respectively while debtors and debit balances (net of provision) have also fluctuated within the range of 4 percent and 45 percent of current assets as achieved in 1952 and 1957 respectively.

Both, the inventory turnover (as computed by dividing the inventory utilized at acquisition cost by the average inventory) and accounts receivable turnover (as computed by dividing the average accounts receivable into the total credit sales) ratios are important criteria for E.A.C. to determine the optimal volume of funds to be tied up in such assets. These ratios would measure the average period of time needed for those assets to be converted to liquid cash. Thus, a low ratio would be unfavourable since the misutilization of excessive funds of Authority would mean misallocation of

TABLE 9

ELECTRICITY AUTHORITY OF CYPRUS
COMPOSITION OF WORKING CAPITAL
1952-1965
(In Percentages)

YEAR	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
CURRENT ASSETS														
Stocks at or below lost	4	7	26	18	38	46	38	36	39	34	37	27	28	32
Debtors & debit balances Less provision	4	16	25	19	37	45	45	29	36	37	35	22	18	17
Progress Payments	1	1	15	15	13	2	-	-	-	-	-	-	6	8
Investments at market value	-	-	-	-	-	-	-	1	-	-	-	-	-	-
Funds on deposit	90	72	31	47	10	3	14	27	12	23	18	47	45	41
Balance at banks & cash in hand	1	4	3	1	2	4	3	7	13	6	10	4	3	2
Total Current Assets	100	100	100	100	100	100	100	100	100	100	100	100	100	100
CURRENT LIABILITIES & PROVISIONS														
Creditors, Accrued Liabilities and Provisions	100	100	100	100	27	16	26	66	65	59	73	78	80	86
Consumers' deposits	-	-	-	-	-	2	5	14	35	41	27	22	20	14
Government of Cyprus short term advances	-	-	-	-	73	82	69	20	-	-	-	-	-	-
Total Current Liabilities and Provisions	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: Derived from figures in Table 7.

economic resources. On the other hand a higher ratio would indicate a rather more rational utilization of funds on the part of Authority's management. The computation of such ratios was an impossibility to the author due to the lack of pertinent information..

In Table 10 further breakdown of the "Other Liabilities" section of the condensed balance sheet is traced. Table 11 treats moreover the classification of the "Capital Borrowings" item as outstanding in the financial records of E.A.C. at 31st December, 1965.

An analysis of the financial position of the Authority as experienced at 31st December, 1965, would reveal a notable fact that net capital employed (total assets net of depreciation, current liabilities and provisions) was £14,489.5 thousand of which £12,416.1 thousand or 85.69 percent was represented mainly by property, plant and equipment (and some intangible assets). (The original cost of these assets was £16,938.8 thousand and by the end of the year £4,522.7 thousand had been provided by way of accumulated depreciation, leaving a written down value of 73.30 percent).

Thus by the end of 1965, 81.71 percent of the net capital employed had been financed by long term borrowings,

TABLE 10

OTHER LIABILITIES

(In Cyprus Pounds)

YEAR	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
CAPITAL BORROWINGS:														
Government Loans	3,984,011	3,984,011	3,984,011	5,483,926	5,483,926	5,483,926	7,083,926	7,883,926	7,883,926	7,883,926	7,883,926	7,883,926	7,883,926	7,883,926
Long term foreign loans	-	-	-	-	-	-	-	-	-	-	-	767,366	1,649,363	3,956,098
Electricity Development Stock	-	-	-	-	-	-	400,000	1,100,000	1,350,000	1,350,000	1,700,000	1,300,000	900,000	300,000
Other Loans	-	-	-	-	-	-	-	-	-	-	100,000	152,171	120,838	-
Loans taken over From local authorities	-	49,773	83,859	78,328	72,587	66,629	60,443	54,155	47,627	40,853	33,819	26,518	18,939	15,239
Total Capital Borrowings	3,984,011	4,033,784	4,067,870	5,562,254	5,556,513	5,550,555	7,544,369	9,038,081	9,281,553	9,274,778	9,717,745	10,129,981	10,573,066	12,155,263
RESERVE, NET REVENUE A/c & PROVISIONS:														
Reserve for Development Work	-	-	-	-	-	130,000	-	-	-	-	-	-	-	-
Retained Earnings	1,153	(78,110)	(139,675)	(63,285)	56,042	56,703	387,210	490,022	184,990	461,414	840,676	1,315,715	1,762,934	2,252,784
Sinking Fund	25,689	99,921	197,216	302,508	-	-	-	-	-	-	-	-	-	-
Provision for Pensions	-	-	-	114,521	110,549	106,141	103,462	99,391	96,708	93,672	90,829	87,808	84,703	81,495
TOTAL	4,010,853	4,055,595	4,125,411	5,915,998	5,723,104	5,863,399	8,035,041	9,627,494	9,563,251	9,829,864	10,649,250	11,533,504	12,420,703	14,489,542

Source: Annual Reports and Accounts of Electricity Authority of Cyprus, 1952-1965, op. cit.

TABLE 10

OTHER LIABILITIES

(In Cyprus Pounds)

YEAR	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
CAPITAL BORROWINGS:														
Government Loans	3,984,011	3,984,011	3,984,011	5,483,926	5,483,926	5,483,926	7,883,926	7,883,926	7,883,926	7,883,926	7,883,926	7,883,926	7,883,926	7,883,926
Long term foreign loans	-	-	-	-	-	-	-	-	-	-	-	767,366	1,649,363	3,956,098
Electricity Development Stock	-	-	-	-	-	-	400,000	1,100,000	1,350,000	1,350,000	1,700,000	1,300,000	900,000	300,000
Other Loans	-	-	-	-	-	-	-	-	-	-	100,000	152,171	120,838	-
Loans to Kem. Orgs. From local authorities	-	49,773	83,859	78,328	72,587	66,629	60,443	54,155	47,627	40,852	33,819	26,518	18,939	15,239
Total Capital Borrowings	3,984,011	4,033,784	4,067,870	5,562,254	5,556,513	5,550,555	7,544,369	9,038,081	9,281,553	9,274,778	9,717,745	10,129,981	10,573,066	12,155,263
RESERVE, NET REVENUE A/C & PROVISIONS:														
Reserve for Development Work	-	-	-	-	-	150,000	-	-	-	-	-	-	-	-
Retained Earnings	1,153	(78,110)	(139,675)	(63,285)	56,042	56,703	387,210	490,022	184,990	461,414	840,676	1,315,715	1,762,934	2,259,784
Sinking Fund	25,689	99,921	197,216	302,508	-	-	-	-	-	-	-	-	-	-
Provision for Pensions	-	-	-	114,521	110,549	106,141	103,462	99,391	96,708	93,672	90,829	87,808	84,703	81,495
TOTAL	4,010,853	4,055,595	4,125,411	5,915,998	5,723,104	5,863,399	8,035,041	9,627,494	9,563,251	9,829,864	10,649,250	11,533,504	12,420,703	14,489,542

Source: Annual Reports and Accounts of Electricity Authority of Cyprus, 1952-1965, op. cit.

TABLE 11

CAPITAL BORROWINGS
(IN CYPRUS POUNDS)
As Outstanding at 31st December, 1965

Class of Issue	Date Received	Effective Rate of Interest %		Total
I. Government Loans:				
1st Loan	11.6.1953	3.645	2,494,211	
2nd Loan	11.6.1953	4.593	1,489,800	
3rd Loan	19.12.1955	5.177	1,499,915	
4th Loan	27.9.1958	5.750	1,600,000	
5th Loan	20.8.1959	5.250	800,000	7,883,926
II. Long Term Foreign Loans:				
I.B.R.D.	---	---	3,729,098	
British Government	---	---	227,000	3,956,098
III. Electricity Development Stock:				
3rd Issue, 1967	31.12.1959	5.5	300,000	300,000
IV. Loans taken over from Local Authorities:				
Arising from Loans made for the transferred undertakings	---	---	15,239	15,239
Total Borrowings				12,155,263

Source: Annual Reports and Accounts of Electricity Authority of Cyprus, 1965, op. cit.

2.18 per cent through the electricity development stock and other loans, while the remaining 16.11 per cent had been financed internally from reserves.

Moreover, table 11 unveils the fact that government loans advanced to the Authority represent the major sources of capital borrowings (64.86 per cent); the other important source of finance being the foreign loans secured from the I.B.R.D. and the British Government (32.55 percent).

During 1952 - 1965 the Authority's capital borrowings have increased by 3.05 times; this should be attributed mainly to the implementation of Island-wide electrification schemes. Other liabilities include reserve for development work, retained earnings (net revenue account), sinking fund and provision for pensions.

It should be mentioned that the discontinuation of Authority's contribution to sinking fund reserves in 1956, which was originally instituted in 1952 representing appropriate depreciation provisions with the aim of investing such funds in suitable securities as to provide for the replacement of the fixed assets on the termination of their useful life, was in effect due to the management's radical shift in depreciation policy in utilizing such provisions to meet further capital

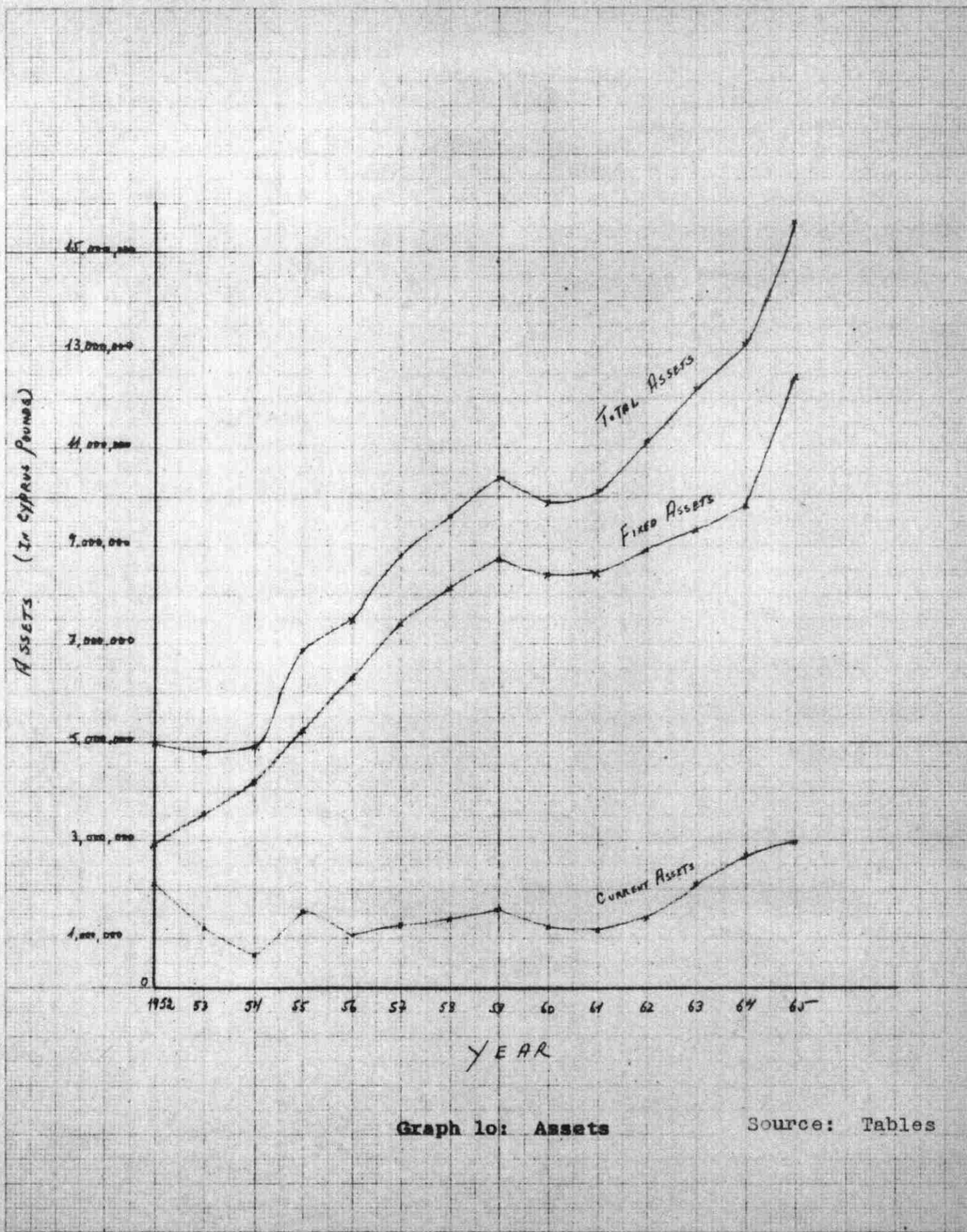
expenditures instead of being invested in approved securities.

However, with respect to the electricity Development Stock, the Authority has instituted in 1959 a stock redemption fund with the sole purpose of redeeming the stock issues at maturity dates.

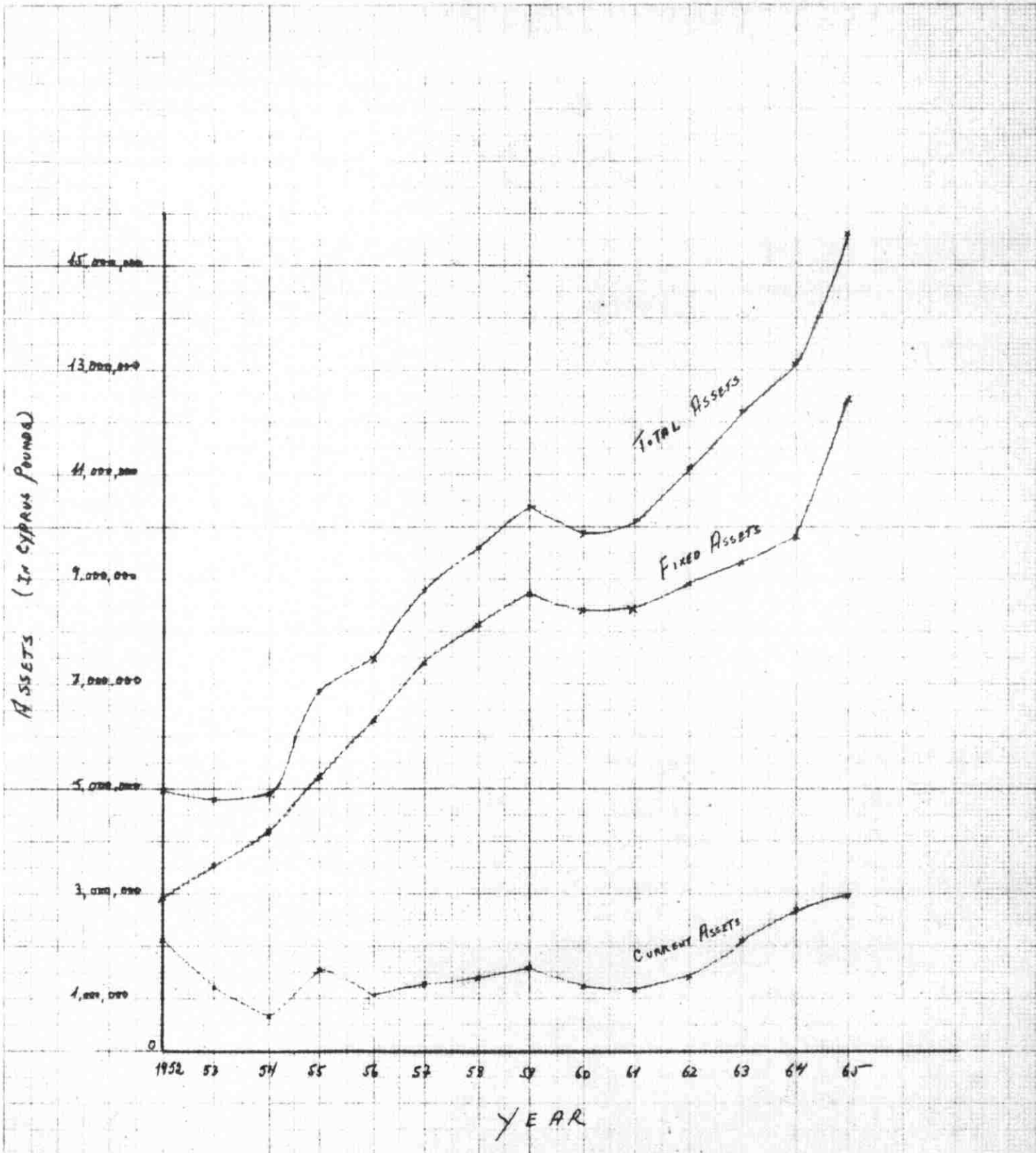
Due to the Authority's successful expansionary programs the retained earnings account has witnessed since 1952 significant improvement in its balance.

A trend analysis for fixed as well as current assets in relation to the total assets is presented in Graph 10. As was referred previously to the single fact that heavy capitalization is a special phenomenon of utility business, the E.A.C. can not possibly render any service to the public before it commits itself to large capital outlays for the acquisition and replacement of fixed assets in the form of plant, machinery, equipment, cables, wires and other facilities.

Thus, over fourteen years period, on the average 79.3 percent of total funds invested is represented by fixed assets (table 12), the remaining 20.7 percent being geared for working capital requirements.



Graph 10: Assets Source: Tables



Graph 10: Assets Source: Tables

TABLE 12

FIXED ASSETS
(IN CYPRUS POUNDS)

YEAR	FIXED ASSETS	TOTAL ASSETS	FIXED ASSETS PERCENT OF TOTAL	INDEX OF GROWTH FOR FIXED ASSETS
1952	2,872,747	4,993,890	57.52	100
1953	3,552,291	4,774,955	74.39	124
1954	4,193,267	4,882,818	85.88	146
1955	5,242,943	6,861,402	76.41	182
1956	6,334,542	7,486,389	84.61	220
1957	7,413,938	8,793,719	84.31	258
1958	8,134,681	9,604,703	84.69	283
1959	8,717,161	10,361,892	84.13	303
1960	8,394,596	9,900,911	84.79	292
1961	8,394,077	10,127,789	82.88	292
1962	8,907,705	11,152,708	79.87	310
1963	9,338,926	12,214,760	76.46	325
1964	9,847,210	13,147,415	74.90	343
1965	12,416,121	15,641,380	79.38	432

Source: Annual Reports and Accounts of Electricity Authority of Cyprus, 1952-1965, op. cit.

Since 1952 fixed assets have experienced a constant growth reaching a level of increase of 4.32 times as of 1965.

The E.A.C. has adopted consistently the policy of recording fixed assets at acquisition cost less depreciation provisions based on the straight line method which is applied to match current revenues with current expenses through periodic allocation of acquisition costs over the estimated useful life of the asset in quest.

INCOME STATEMENT ANALYSIS

Table 13 presents a condensed income statment for 1952-1965. The Electricity Authority of Cyprus has experienced since 1954 significant growth in its net revenues, mainly in parallel with the constant increase in sales volume. As it could be noticed from the condensed income statement, the Authority is exempted from taxes since it is a government statutory body.

Graph II presents the trend of Authority's revenues for 1952-1965. Revenues from sales of electricity constitute the primary source of receipts which have increased steadily since 1952 with the exception of 1964 abnormal year's

TABLE 13

ELECTRICITY AUTHORITY OF CYPRUS
CONDENSED INCOME STATEMENT
1952-1965
(In Cyprus Pounds)

(20)

Cyp £

Year	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Revenues:														
Sales of Electricity	45,139	360,985	484,500	720,367	1,001,887	1,436,740	1,582,610	1,731,758	1,821,931	1,989,580	2,122,073	2,306,088	2,299,930	2,476,462
Rentals of Meters	1,075	9,248	9,800	10,955	11,882	13,052	14,190	14,845	15,523	15,630	16,168	17,865	17,536	18,270
Public Lighting Maintenance	-	-	-	-	-	-	-	-	-	-	2,867	4,566	4,682	4,666
Miscellaneous Income	4,683	42,894	15,273	11,684	21,120	9,220	12,071	12,906	27,293	37,038	1,515	4,525	1,645	4,356
Total Revenues	50,897	413,127	509,573	743,006	1,034,889	1,459,012	1,608,871	1,759,559	1,864,747	2,042,248	2,147,623	2,333,044	2,323,793	2,503,754
Revenue Deductions:														
Generation	25,099	252,221	340,404	334,376	443,329	722,138	526,383	526,317	500,190	521,752	542,343	546,708	551,080	585,228
** Transmission	** 1,232	** 13,802	** 23,268	** 39,594	** 41,395	** 53,776	** 50,709	** 78,254	** 120,975	** 87,120	20,442	22,157	29,698	33,868
** Distribution	**	**	**	**	**	**	**	**	**	**	82,266	85,510	95,500	93,762
Consumer Service	-	-	-	-	-	-	-	-	-	-	29,383	73,116	72,528	71,387
Meter reading, billing & Collection	-	-	-	-	-	-	-	-	-	-	98,921	106,744	10[illegible],615	140,980
Administration & general Exp.	13,783	55,950	80,192	96,482	147,663	197,679	256,569	393,740	440,754	304,905	158,341	157,901	130,117	162,623
Rents & Insurances	481	4,888	6,966	10,342	11,838	16,036	18,100	19,307	17,574	11,744	9,875	9,478	14,333	12,418
Depreciation	1,893	35,900	48,627	62,942	81,064	101,507	205,306	237,448	353,210	400,463	409,330	442,082	467,634	502,325
* Net interest charges	7,256	129,629	101,681	122,930	186,273	217,220	371,303	401,681	437,387	439,844	403,020	414,239	409,069	411,313
Total Revenue Deductions	49,744	492,390	571,138	666,616	915,562	1,308,351	1,428,364	1,656,747	1,701,150	1,765,824	1,768,361	[illegible]	1,876,574	2,013,904
Net Income at Dec. 31.	1,153	(79,263)	(61,565)	76,390	119,327	150,661	180,507	102,812	163,597	276,424	379,262	[illegible]	447,219	489,850
Provision for Depreciation	-	-	-	-	-	-	-	-	(462,629)	-	-	-	-	-
Transfer (to) from Reserve for Dev. work.	-	-	-	-	-	(150,000)	150,000	-	-	-	-	-	-	-
Previous Revenue A/c	-	1,153	(78,110)	(139,675)	(63,285)	56,042	56,703	387,210	490,022	184,990	461,414	[illegible]	1,315,715	1,769,934
Revenue A/c at Dec 31 i.e.(R.E)	1,153	(78,110)	(139,675)	(63,285)	56,042	56,703	387,210	490,022	184,990	461,414	840,676	[illegible]	1,769,934	2,259,784

Source: Annual Report & Accounts of Electricity Authority of Cyprus, 1952-1965, op. cit.

* Excludes capitalized interest

** In the first years of operations no distinction was made between Transmission & Distribution costs.

TABLE 13

ELECTRICITY AUTHORITY OF CYPRUS
CONDENSED INCOME STATEMENT
1952-1965
(In Cyprus Pounds)

(2d)

Cyp £

Year	1952	1953	1954	1955	1956	1957	1958
Revenues:							
Sales of Electricity	45,139	360,985	484,500	720,367	1,001,887	1,436,740	1,582,610
Rentals of Meters	1,075	9,248	9,800	10,955	11,882	13,052	14,190
Public Lighting Maintenance	–	–	–	–	–	–	–
Miscellaneous Income	4,683	42,894	15,273	11,684	21,120	9,220	12,071
Total Revenues	50,897	413,127	509,573	743,006	1,034,889	1,459,012	1,608,871
Revenue Deductions:							
Generation	25,099	252,221	310,404	334,376	447,329	722,132	526,383
** Transmission	** 1,232	** 13,802	** 23,268	** 39,594	** 41,395	** 53,786	** 50,709
** Distribution	**	**	**	**	**	**	**
Consumer Service	–	–	–	–	–	–	–
Meter reading, billing & Collection	–	–	–	–	–	–	–
Administration & General Exps.	13,783	55,950	80,192	96,482	147,663	197,67[illegible]	256,563
Rents & Insurances	481	4,888	6,966	10,342	11,838	16,036	18,100
Depreciation	1,893	35,900	48,627	62,942	81,064	101,507	205,306
* Net interest charges	7,256	129,629	101,681	122,930	186,273	217,220	371,303
Total Revenue Deductions	49,744	492,390	571,138	666,616	915,562	1,308,351	1,428,364
Net Income at Dec. 31.	1,153	(79,263)	(61,565)	76,390	119,327	150,661	180,507
Provision for Depreciation	–	–	–	–	–	–	–
Transfer (to) from Reserve for Dev. work.	–	–	–	–	–	(150,000)	150,000
Previous Revenue A/c	–	1,153	(78,110)	(139,675)	(63,285)	56,042	56,703
Revenue A/c at Dec 31 i.e. (R.E.)	1,153	(78,110)	(139,675)	(63,285)	56,042	56,703	387,210

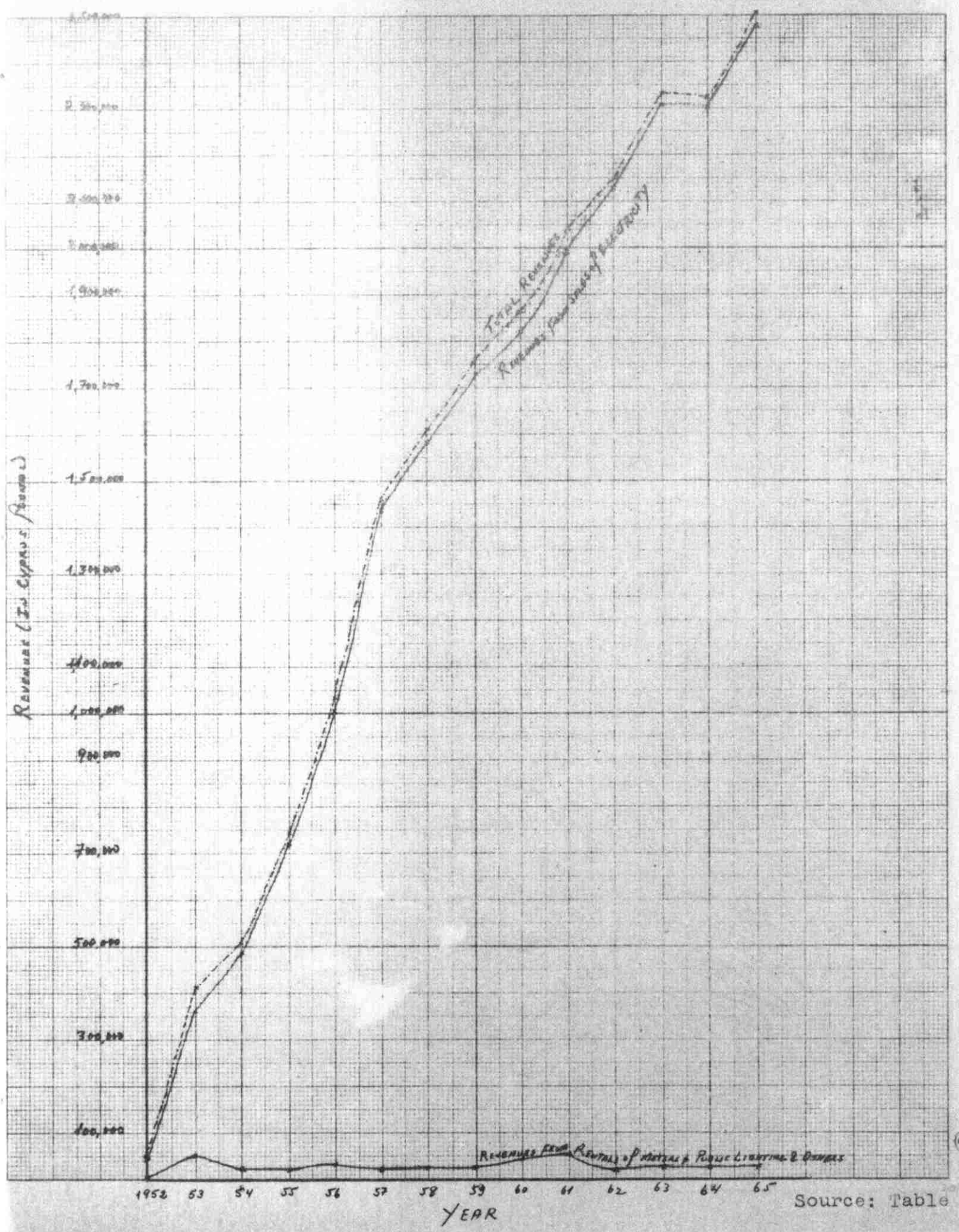
Year	1959	1960	1961	1962	1963	1964	1965
Revenues:							
Sales of Electricity	1,731,758	1,821,931	1,989,580	2,122,073	2,306,088	2,299,930	2,476,462
Rentals of Meters	14,895	15,523	15,630	16,168	17,865	17,536	18,270
Public Lighting Maintenance	–	–	–	2,867	4,566	4,682	4,666
Miscellaneous Income	12,906	27,293	37,038	1,515	4,525	1,645	4,356
Total Revenues	1,759,559	1,864,747	2,042,248	2,147,623	2,333,044	2,323,793	2,503,754
Revenue Deductions:							
Generation	526,317	500,190	531,752	542,343	546,708	551,080	585,228
** Transmission	** 78,254	** 136,995	** 37,170	20,442	22,157	29,698	33,868
** Distribution	**	**	**	82,236	85,510	95,500	93,762
Consumer Service	–	–	–	49,873	73,116	72,528	71,387
Meter reading, billing & Collection	–	–	–	98,921	106,744	10[illegible],615	140,980
Administration & General Exps.	393,740	290,714	304,905	152,311	157,901	130,117	162,623
Rents & Insurances	19,307	17,574	11,744	9,375	9,428	14,333	12,418
Depreciation	237,448	353,210	400,463	409,330	412,082	467,634	502,325
* Net interest charges	401,681	437,327	439,844	403,020	414,2[illegible]	409,069	411,313
Total Revenue Deductions	1,656,747	1,701,150	1,765,824	1,768,361	1,852,0[illegible]	1,876,574	2,013,904
Net Income at Dec. 31.	102,812	163,597	276,424	379,262	475,0[illegible]	447,219	489,850
Provision for Depreciation	–	(468,629)	–	–	–	–	–
Transfer (to) from Reserve for Dev. work.	–	–	–	–	–	–	–
Previous Revenue A/c	387,210	490,022	184,990	461,444	840,676	1,315,715	1,762,934
Revenue A/c at Dec 31 i.e. (R.E.)	490,022	184,990	461,444	840,676	[illegible]	1,762,934	2,252,784

Source: Annual Report & Accounts of Electricity Authority of Cyprus, 1952-1965, op. cit.

* Excludes capitalized interest

** In the first years of operations no distinction was made between Transmission & Distribution costs.

GRAPH 11: REVENUES



Source: Table 1

operating results. Receipts from rentals of meters, public lighting maintenance and the like, relatively, render an insignificant contribution to total revenues.

Table 14 presents the index of revenue deductions for 1953-1965. During the period under consideration generation, transmission, and distribution costs have increased considerably due to the expansionary activities of the Authority to meet the ever increasing demand of consumers for electricity.

Depreciation expenses and interest charges have also increased.

Depreciation expenses have increased almost 14 times. This constant increase in the amounts provided for depreciation is based on the straight line method applied to the capital expenditure at the beginning of the year.[2]

The increase in interest charges is significant too (3.17 times). This is attributable to the Authority's growing capital borrowings to finance its expansionary programs for electrification schemes.

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[2] Annual Report and Account of Electricity Authority of Cyprus, 1965, op. cit., p. 48.

TABLE 14

ELECTRICITY AUTHORITY OF CYPRUS
INDEX OF REVENUE DEDUCTIONS
1953 - 1965

YEAR	1953	1953 (100)	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965	1965
Generation	252,221	100	123	133	177	286	209	209	198	207	215	217	218	232	585,228
Transmission & Distribution	13,802	100	169	287	300	390	367	567	739	632	744	780	907	925	33,868 93,762
Consumer Service	-	-	-	-	-	-	-	-	-	-	100	147	145	143	71,387
Meter reading, billing & collection	-	-	-	-	-	-	-	-	-	-	100	108	108	142	140,980
Administration and General Exps.	55,950	100	143	172	264	353	459	704	520	545	272	282	233	291	162,623
Rents & Insurances	4,888	100	142	212	242	328	370	395	360	240	202	194	293	254	12,418
Depreciation	35,900	100	135	175	226	283	572	661	984	1115	1140	1231	1303	1399	502,325
Net interest charges	129,629	100	78	95	144	168	286	310	337	339	311	320	316	317	411,313
Total Deductions	492,390	100	116	135	186	266	290	336	346	359	359	377	381	409	2,013,904

Source: Derived from figures in Table 13.

Interest paid on capital borrowings, and as such included under revenue deductions, represent cost of money utilized to finance authority's current operations thus matching current revenues. The classification of this cost element in the net income figure is justifiable since virtually the E.A.C. is not a profit making organization. However, the authority has the practice to capitalize that portion of interest charges applicable to the specific fixed asset during the construction period. A similar treatment is found in the United States where utilities are allowed to capitalize interest in order that rate fixing bodies will impute in determining future rates and earnings; while profit conscious enterprises do not need to capitalize interest for any such reason. Since they are permitted to earn what they can; as such, theoretically speaking interest is a money cost, not a construction, and it can be avoided by an additional owners capital investment.[3]

Table 15 presents the composition of Revenue deductions. The major revenue deductions are generation costs, depreciation expenses and interest charges on capital

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[3] H.A. Finney & H.E. Miller; Principles of Accounting Intermediate (New Jersey, Prentice-Hall, Inc., 1958), pp. 339 - 340.

TABLE 15

ELECTRICITY AUTHORITY OF CYPRUS
COMPOSITION OF REVENUE DEDUCTIONS
1952 - 1965
(In Percentage)

YEAR	1952	1953	1954	1955	1956	1957	1958	1959	1960	1961	1962	1963	1964	1965
Generation	50	51	54	50	49	55	37	32	29	29	31	29	29	29
Transmission	2	3	4	6	5	4	4	5	6	5	1	1	1	2
Distribution											5	5	5	5
Consumer Service	-	-	-	-	-	-	-	-	-	-	3	4	4	3
Meter reading, billing & collection	-	-	-	-	-	-	-	-	-	-	5	6	6	7
Administration & Gen. Exps.	28	12	14	15	16	15	18	24	17	17	8	8	7	8
Rents and Insurances	1	1	1	2	1	1	1	1	1	1	1	1	1	1
Depreciation	4	7	9	9	9	8	14	14	21	23	23	24	25	25
Net interest charges	15	26	18	18	20	17	26	24	26	25	23	22	22	20
Total Deductions	100	100	100	100	100	100	100	100	100	100	100	100	100	100

Source: Derived from figures in Table 13.

borrowings, the three accounting for around 75 per cent of total revenue deductions. The remaining 25 per cent represents transmission, distribution, and miscellaneous administrative expenses.

SOURCES AND USES OF FUNDS

The discussion in the preceding analysis of financial-statements covers, among other things, the Cyprus Electricity Authority's treatment of its two main problems, namely, expansion and allocation, both relating to investment field. It remains to see how the Authority has coped with its financial problem; mainly confining to sources and uses of funds.

The word "fund" is a generic term. In its narrow sense the term fund denotes cash items. However, over and above this, the foregoing analysis will view "funds" also as relating to movement of working capital items.

Table 16 presents a cash flow statement for 1956-1965. The statement implies the categorized movement of all receipts and disbursements made during the period under study with

TABLE 16

ELECTRICITY AUTHORITY OF CYPRUS
CASH FLOW STATEMENT
1956-1965

(In Cyprus Pounds)

YEAR	SOURCES							USES												NET CHANGE IN CASH (1-2)
	NET INCOME FROM OPERATIONS	DEPRECIATION	ACCOUNTS PAYABLE	CONSUMERS' DEPOSITS	GOVT. OF CYPRUS SHORT TERM ADVANCES	CAPITAL BORROWINGS	TOTAL (1)	ACCOUNTS RECEIVABLE	PROGRESS PAYMENTS	ACQUISITION OF FIXED ASSETS	REPLACEMENT (DEP.)	INVENTORY	INVESTMENTS	SINKING FUND	STOCK REDEMPTION FUND	TRANSFER TO RESERVE FOR EXPANSION	PROVISION FOR PENSIONS	TOTAL (2)	
1956	119,327	81,064	(464,187)	-	1,282,068	(5,741)	1,012,531	101,219	(90,568)	1,491,577	81,064	132,351	4,657	302,568	-	-	3,978	1,626,868	(644,337)
1957	150,661	101,507	(17,109)	63,591	1,120,553	(5,958)	1,413,245	180,542	(112,261)	1,079,396	101,567	194,624	-	-	-	-	4,408	1,448,226	(34,981)
1958	180,567	205,306	(56,744)	18,613	(1,322,557)	1,993,814	1,018,969	43,304	(21,161)	720,743	205,306	(70,712)	-	-	-	-	2,679	880,159	138,810
1959	102,812	237,448	74,167	20,633	(930,064)	1,493,742	998,708	(161,421)	-	582,480	237,448	46,890	(86,619)	-	74,593	-	4,071	697,392	301,316
1960	163,587	353,240	(261,122)	14,384	(150,000)	243,472	363,571	(49,928)	-	(322,565)	353,240	(93,845)	(12,856)	-	211,631	468,629	2,683	586,989	(223,418)
1961	276,424	400,403	(45,023)	5,288	-	(6,735)	630,317	9,775	-	(549)	400,403	(77,896)	-	-	263,696	-	3,036	598,425	31,822
1962	379,262	409,330	193,989	11,544	-	442,967	1,437,092	41,851	-	513,628	409,330	112,989	-	-	300,748	-	2,843	1,381,399	55,693
1963	475,039	442,082	163,347	14,451	-	412,236	1,507,155	(19,876)	-	431,221	442,082	56,045	-	-	(66,587)	-	3,021	845,886	661,269
1964	447,219	467,634	45,339	117	-	443,085	1,403,394	20,075	161,219	508,284	467,634	197,213	-	-	(216,054)	-	3,105	1,141,476	261,918
1965	489,850	502,325	409,100	16,026	-	1,582,197	2,997,498	14,428	61,015	2,568,911	502,325	160,787	-	-	(280,578)	-	2,208	3,030,096	(30,598)
Total	2,784,678	3,200,339	41,787	164,647	-	6,593,009	12,784,420	209,899	(1,690)	7,173,178	3,200,339	658,466	(94,818)	302,568	287,449	468,629	33,026	12,236,986	547,494
p.c. cent	21.78	25.03	0.33	1.29	-	51.57	100	1.72	-0.01	58.62	26.15	5.38	-0.78	2.47	2.35	3.83	0.27	100	

Source: Derived from Annual Reports & Accounts of Electricity Authority of Cyprus, 1956-1965, op. cit.

TABLE 16

ELECTRICITY AUTHORITY OF CYPRUS
CASH FLOW STATEMENT
1956-1965

(In Cyprus Pounds)

YEAR	SOURCES							USES											NET CHANGE IN CASH (1-2)
	NET INCOME FROM OPERATIONS	DEPRECIATION	ACCOUNTS PAYABLE	CONSUMERS' DEPOSITS	GOVT. OF CYPRUS SHORT TERM ADVANCE	CAPITAL BORROWINGS	TOTAL (1)	ACCOUNTS RECEIVABLE	PROGRESS PAYMENTS	ACQUISITION OF FIXED ASSETS	REPLACEMENT (DEP.)	INVENTORY	INVESTMENTS	SINKING FUND	STOCK REDEMPTION FUND	TRANSFER TO RESERVE FOR CONTINGENCIES	PROVISION PENSIONS	TOTAL (2)	
1956	119,327	81,064	(464,187)	-	1,282,068	(5,741)	1,012,531	101,219	(90,508)	1,491,599	81,064	132,351	4,657	302,568	-	-	3,979	1,626,868	(614,337)
1957	150,661	101,507	(17,109)	63,591	1,120,553	(5,958)	1,413,245	180,542	(112,261)	1,079,396	101,567	194,634	-	-	-	-	4,408	1,448,286	(34,981)
1958	180,507	205,306	(56,714)	18,613	(1,322,557)	1,993,814	1,018,969	43,304	(21,161)	720,743	205,306	(70,712)	-	-	-	-	2,679	880,159	138,810
1959	102,812	237,448	74,167	20,633	(930,064)	1,493,712	998,708	(141,471)	-	582,480	237,448	46,890	(86,619)	-	74,593	-	4,071	697,392	301,316
1960	163,597	353,240	(261,122)	14,384	(150,000)	243,472	363,571	(19,928)	-	(322,565)	353,240	(93,848)	(12,858)	-	211,631	468,628	2,683	586,989	(223,418)
1961	276,424	400,403	(45,023)	5,288	-	(6,775)	630,317	9,775	-	(549)	400,403	(77,896)	-	-	263,696	-	3,036	598,495	31,822
1962	379,262	409,330	193,989	11,544	-	442,967	1,437,092	41,851	-	513,628	409,330	112,999	-	-	300,748	-	2,843	1,381,399	55,693
1963	475,039	442,082	163,347	14,451	-	412,236	1,507,155	(19,876)	-	431,201	442,082	56,045	-	-	(16,587)	-	3,021	845,886	661,269
1964	447,249	467,634	45,339	117	-	443,085	1,403,394	20,075	161,219	508,284	467,634	197,213	-	-	(216,054)	-	3,105	1,141,476	261,918
1965	489,850	502,325	409,100	16,026	-	1,582,197	2,997,498	14,428	61,015	2,568,941	502,325	160,787	-	-	(280,578)	-	3,208	3,030,096	(30,598)
Total	2,784,698	3,400,339	41,787	164,647	-	6,593,009	12,784,480	209,899	(1,690)	7,173,178	3,400,339	658,466	(94,818)	302,568	287,449	468,628	33,026	12,236,986	547,494
p.cent	21.78	25.03	0.33	1.29	-	51.57	100	1.72	-0.01	58.62	26.15	5.38	-0.78	2.47	2.35	3.83	0.27	100	

Source: Derived from Annual Reports & Accounts of Electricity Authority of Cyprus, 1956-1965, op. cit.

their net effect on cash position of the Authority. In short it shows the sources and uses of cash. Operations, depreciation and capital borrowings constitute the three major sources for cash receipts. Operations account for around one-fifth (21,78%) of cash receipts, depreciation reserves for around one-quarter (25.03%), while capital borrowings account for 51.57 percent. The two other negligible sources of cash as could be noticed are accounts payable and consumers' deposits.

Around sixty per cent of total receipts were applied for acquisition of fixed assets; around one-fourth used for replacement purposes; the remaining utilized mainly for inventory, accounts receivable, sinking fund, stock redumption fund and for transfer as reserve for depreciation. Over ten years time, the aggregate sources of cash exceeded their uses by £ 547,494 (12,784,480 - 12,236,986) being the net change (inflow) in cash since 1956.

"Funds" regarded as relating to movement of Authority's working capital could be analysed by a fund flow statement. In this sense a fund statement shows the sources and uses of working capital items.

Table 17 presents a funds flow statement for 1956-1965, showing the aggregate sources and uses of constituents of Authority's working capital. Operations, depreciation charges and capital borrowings represent the three sources of funds. Of the total inflow of funds during the period under study, capital borrowings have accounted for 52.42 per cent, depreciation allowed for 25.44 per cent, while operations accounted for 22.14 per cent.

Of the total funds used, 63.09 per cent have been applied for acquisition of fixed assets; 28.15 per cent allowed for replacement purposes; the remaining used mainly for sinking fund, stock redumption fund and transfer as reserve for depreciation purposes. Over ten years period under consideration the aggregate sources of funds have exceeded their uses by £1,207,735 (12,578,046 - 11,370,311) being the net change (inflow) in funds since 1956.

From the foregoing cash flow and funds flow analysis, depreciation charges pose two important issues to be clarified. First, the fact that depreciation is a non-cash expenditure, to that extend loosely speaking, it could be considered as a source of fund or cash over and above the net income figure from operations which in itself do not

A 17

ELECTRICITY AUTHORITY OF CYPRUS
FUNDS FLOW STATEMENT
19 -1965
(In Cyprus Pounds)

YEAR	SOURCES				USES								NET CHANGE IN WORKING CAPITAL (1-2)
	NET INCOME FROM OPERATIONS	DEPRECIATION	CAPITAL BORROWINGS	TOTAL (1)	ACQUISITION OF FIXED ASSETS	REPLACEMENT (DEP.)	INVESTMENTS	SINKING FUND	STOCK REDEMPTION FUND	TRANSFER AT RESERVE FOR DEPR.	PROVISION FOR PENSIONS	TOTAL (2)	
1956	119,327	81,064	(5.741)	194,650	1,091,599	81,064	4,657	302,508	-	-	3,972	1,483,800	(1,289,150)
1957	150,661	101,507	(5,958)	246,210	1,079,396	101,507					4,408	1,185,311	(939,101)
1958	180,507	205,306	1,993,814	2,379,627	720,743	205,306					2,679	928,728	1,450,899
1959	102,812	237,448	1,493,712	1,833,972	582,480	237,448	(99,475)		74,593		4,071	799,117	1,034,855
1960	163,597	353,240	243,472	760,309	(322,565)	353,240			211,631	468,629	2,683	713,618	46,691
1961	276,424	400,403	(6,775)	670,052	(519)	400,403			263,696		3,036	666,616	3,436
1962	379,262	409,330	442,967	1,231,559	513,628	409,330			300,748		2,843	1,226,549	5,010
1963	475,039	442,082	412,236	1,329,357	431,221	442,082			(66,587)		3,021	809,737	519,620
1964	447,219	467,634	443,085	1,357,938	508,284	467,634			(216,054)		3,105	762,969	594,969
1965	489,850	502,325	1,582,197	2,574,372	2,568,911	502,325			(280,578)		3,208	2793,866	(219,494)
Total	2,784,698	3,200,339	6,593,009	12,578,046	7,173,178	3,200,339	(94,818)	302,508	287,449	468,629	33,026	11,370,311	1,207,735
Per cent	22.14	25.44	52.42	100	63.09	28.15	- 0.84	2.66	2.53	4.12	0.29	100	

Source: Derived from Annual Reports and Accounts of Electricity Authority of Cyprus, 1955-1965, op. cit.

TABLE 17

ELECTRICITY AUTHORITY OF CYPRUS
FUNDS FLOW STATEMENT
1956-1965
(In Cyprus Pounds)

YEAR	SOURCES				USES								NET CHANGE IN WORKING CAPITAL (1-2)
	NET INCOME FROM OPERATIONS	DEPRECIATION	CAPITAL BORROWINGS	TOTAL (1)	ACQUISITION OF FIXED ASSETS	REPLACEMENT (DEP.)	INVESTMENTS	SINKING FUND	STOCK REGULARIZATION FUND	TRANSFER AS RESERVE FOR DEPR.	PROVISION FOR PENSIONS	TOTAL (2)	
1956	119,327	81.064	(5.741)	194,650	1.091,599	81.064	4,657	302,508	-	-	3,972	1,483,800	(1,289,150)
1957	150,661	101,507	(5,958)	246,210	1,079,396	101.507					4,408	1,185,311	(939,101)
1958	180,507	205,306	1.993,814	2,379,627	720,743	205,306					2.679	928,728	1,450,899
1959	102,812	237,448	1,493,712	1,833,972	582,480	237,448	(99,475)		74,593		4,071	799,117	1,034,855
1960	163,597	353,240	243,472	760,309	(322,565)	353,240			211,631	468,629	2,683	713,618	46,691
1961	276,424	400,403	(6,775)	670,052	(519)	400,403			263,696		3,036	666,616	3,436
1962	379,262	409,330	442,967	1,231,559	513,628	409,330			300,748		2,843	1,226,549	5,010
1963	475,039	442,082	412,236	1,329,357	431,221	442,082			(66,587)		3,021	809,737	519,620
1964	447,219	467,634	443,085	1,357,938	508,284	467,634			(216,054)		3,105	762,969	594,969
1965	489,850	502,325	1,582,197	2,574,372	2,568,911	502,325			(280,578)		3,208	2793,866	(219,494)
Total	2,784,698	3,200,339	6,593,009	12,578,046	7,173,178	3,200,339	(94,818)	302,508	287,449	468,629	33,026	11,370,311	1,207,735
Per cent	22.14	25.44	52.42	100	63.09	28.15	- 0.84	2.66	2.53	4.12	0.29	100	

Source: Derived from Annual Reports and Accounts of Electricity Authority of Cyprus, 1955-1965, op. cit.

constitute the whole cash-fund inflow. In this sense the net inflow of cash or funds during a given period of time exceeds the net income figure as reported by the income statement by all non-cash expense items which have not actually given rise to cash outlays. Second, depreciation charges have been equated to replacement outlays. This is mainly due, as mentioned previously, to the policy adopted by the E.A.C. and approved by the Government for setting aside amounts for depreciation of fixed assets primarily to be utilized for meeting further capital expenditure to replace the old depreciated machinery and equipment instead of being invested in approved securities.[4]

The preceding discussion dealt with the cash flow and funds flow analysis both being ex-post relating to Authority's past financial performance. However, projected flow of funds (budgets) statements, in connection with the conventional profit and loss and balance sheet statements, are appropriate tools to aid management in financial control and formulation of necessary financial policies. Due to the lack of pertinent and reliable data it renders impossible at

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[4] Annual Report and Account of Electricity Authority of Cyprus, 1956, op. cit., p. 34.

this stage to formulate any useful budget serving the Authority's purpose.

Summary and Conclusions.

The E.A.C., in implementing its policy of producing electricity services and the promotion and encouragement of its use by the Cypriot community, has encountered three major simultaneously interrelated problems proper to its investment and financial management.

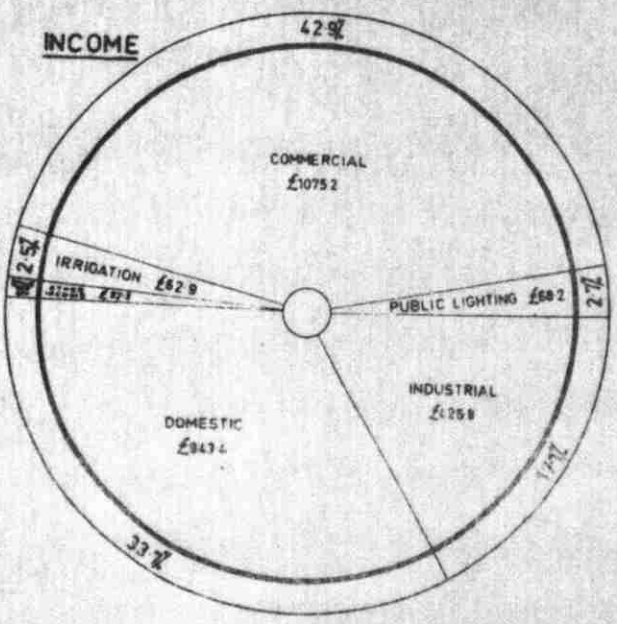
The first is the expansion problem relating to the volume of investment undertakings. To meet the potentially ever increasing demand for its services the Authority had to expand its operations with a corresponding quadrupled increase in its asset holdings.

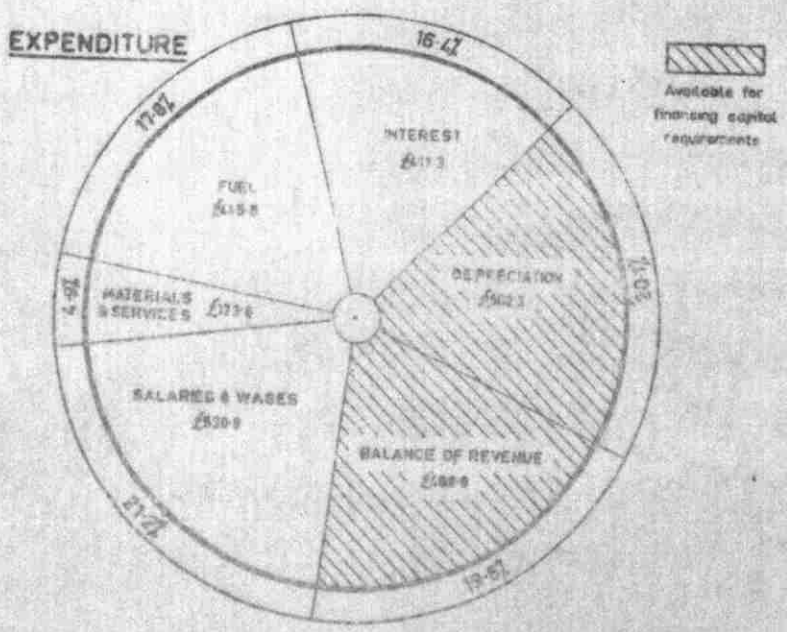
The second is the allocation problem pertaining to the type and composition of investment holdings. Due to its heavy capitalization, over fourteen years period, on the average around 79 per cent of total funds were invested in fixed assets, the remaining 21 per cent being applied for working capital requirements. Moreover, current assets have been subject to sharp fluctuations throughout the period under study.

The third is the financial problem. The Authority should resolve on the manner of financing its expansionary investment projects. The Authority's net capital employed had been financed through mainly three major sources, namely, external long term capital borrowings, and internally through operations and reserves.

COMPOSITION OF INCOME & EXPENDITURE 1965

(Thousand Pounds)





CHAPTER IV

APPRAISAL OF THE AUTHORITY'S PERFORMANCE

Having the preceding discussion as a background to our study, it is deemed worthwhile at this stage to evaluate the extent of the Authority's efficiency of performance and its adequacy in terms of the financial, economic and social impacts upon the industry.

FINANCIAL EVALUATION

The fact that the electricity enterprises are heavily capitalized their current working capital position need not be highly volatile. As was noted previously, the E.A.C. has experienced sharp fluctuations in working capital items in general and in cash and accounts receivable in particular. The mere scarcity of financial resources would compel the Authority's management to avoid tying up excessive funds in such assets, since otherwise, any misallocation of public resources would be defeating the organization's objectives.

Hence, it is the financial management's responsibility to see that neither too much nor too little is invested in such assets. "Too much cash" would mean that some funds have better opportunity to be invested elsewhere or used against settlement of liabilities; on the other hand, too little cash involves the danger of technical insolvency and its concomitant loss of public good will. Comparative percentages (based on historical standards) such as cash to sales, cash to current assets, and cash to current liabilities are viewed to be useful policy guidelines for cash management.[1] As to accounts receivable, "too much receivable would mean that the incremental net revenue obtained from credit sales is not enough to offset the decreased liquidity (due to the risk of non settlement of electricity bills), the increases in collection costs, and bad debts; on the other hand, too little receivable may imply the foregone opportunity to add more to our net income. Turnover ratio and aging of accounts receivable (which measure both the efficiency of granting credit and collecting past due accounts) are considered to be useful tools for accounts receivable

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[1]Robert Johnson, Financial Management (Boston: Allyn and Bacon Inc., 1959), pp. 465, 482, 483.

management.[2]

It is rather to the interest of all concerns to synchronize the uses and sources of such funds through such techniques as budgetary planning and ratio analysis. This would lead to a proper matching of inflow and outflow of funds through an efficient and integrated system of budgets and scientific analysis. However, the ultimate quantitative relationship for handling such funds must be settled on the over-all merits of the attendant circumstances within the industry.

As to the fairness of the financial statements of the Authority, it is by now a wellknown fact that the E.A.C. as a public utility enterprise is a non-profit seeking institution. Yet, from the moral, social and performance assessment points of view the issued financial statements should present the financial position and operative performance of the entrusted concerns as fairly as possible. The unrealistic assumption of stable monetary unit in periods of changing price levels and interest rates, reports profits or incomes, which are disposable by definition, thus preserving intact the money capital of the Authority instead of maintaining its

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[2] Ibid., pp. 481, 482, 483.

real productive capital intact. To serve the aforementioned purpose, it is rather recommendable to introduce (not necessarily within the books) such elements as price level adjustments and valuation of fixed assets into the Authority's financial statements in furthering their fairness and meaning.

Regarding the depreciation policy of the Authority, it was seen that such provisions are based on the straight line method applied to the original capital expenditure (historical costs). The Authority, recognizing the limitations of such reserves based on historical costs to replace fixed assets upon the expiration of their useful life, and in justification for such a deficient practice, has shifted to the policy of utilizing such funds (year in year out) for meeting further capital outlays (as noticed in cash and fund flow analysis) in replacement of old depreciated assets instead of investing such funds in approved securities. Notwithstanding this fact however, the adequacy of such reserves as a provision for major capital expenditures (in case of technological rehabilitations) remains to be highly questionable. Thus, it is rather expected for such major capital outlays to be incorporated in the Authority's capital plans.

With regards to the problem of surplus, as was noted previously, the Authority's adopted policy of utilizing

such excess funds primarily for development projects and secondarily for reduction of rates in the following year would pose a question for the effectiveness of such a policy. In this respect, the E.A.C., in order to render such a pricing policy to be effective and compatible with its alleged objectives, should rather attempt to remedy the undesirable time lag (in determining electricity rates as referred to previously) between its decision taking at the end of its fiscal year (based on the results of the financial operations of the current year in quest) and policy execution process for the following year (for the application of the modified rates). This could possibly be achieved through scientific budgetary planning and use of break even analysis whereby the necessary capital outlays for planned development projects during the year and the manipulation of rate determination would, among other forecasted items (mainly revenues and expenses), be incorporated in such a manner as to obtain neither a resultant surplus nor a deficit for the same year in quest. At such an optimum point the "break even rate" would be determined without any delay or time lag thus avoiding unnecessary administrative or production bottlenecks. However, in case of major changes in electricity rates, it is the Authority's responsibility to educate the public justifying

such amendments so as not to create any industrial uncertainties.

ECONOMIC AND SOCIAL IMPACTS

The unification of the electricity industry of Cyprus in one public utility company underlies some economic and social implications. Electric energy being a necessity has its supply immune from any monopolistic or exploitive tendencies if publicly owned. A public utility, perse, is claimed to contribute to the social welfare through provision of improved services and relatively lower rates due to their non-profit seeking orientation and managerial cost consciousness. The differential cost savings could be confined to (1) savings in cost of capital, (2) savings due to unification and coordination of administrative as well as production services, (3) savings on sales promotional activities (since no competition), (4) savings on the lack of profit margin due to the inexistence of risk taking function. Besides, the increased civic interest and morale of the Authority's employees under improved and non-exploitive conditions would certainly promote the efficiency of labor and minimize the

possibility of strikes and operational red tapes. Regarding the integration of priorities, the unification of the industry into one public utility is expected to introduce a more efficient planning in scaling priorities as to what areas to be developed.

To meet the ever increasing demand for consumption of electricity, over a period of nine years (1956-1964) the E.A.C. has nearly doubled its installed productive capacity for electric power generation (all thermic) from 48.7 thousand Kw. to 88.45 thousand Kw. Actual production of electric energy during the same period has nearly tripled from 104.9 million Kwh to 281.8 million Kwh. While consumption has also nearly tripled over the same period from 83.5 million Kwh to 223.3 million Kwh. Thus, as was seen also in chapter II, due to the special nature of demand for electric energy the Authority has been confronted with the problem of maintaining reserve capacity, since electricity cannot be stored and its provision is necessary at the moment of use. Due to the heavy fixed capitalization and large over head costs, and in an attempt to spread such costs over larger output, the E.A.C. has striven to utilize the produced excess capacity of plants at off-peak hours through offering such services at reduced rates. However, reaping economies

through increasing load factor (ratio of average power used to maximum power used during a given period) is a necessary but not sufficient solution in itself. The Authority should also reap economies by increasing the capacity factor (ratio of average output to capacity of generation) through promotion and encouragement of intensive as well as extensive use of electricity by the public at all times.

Finally, the important role of electric energy played for the Cypriot community is felt in many respects. The influence of electric power on the promotion of mechanized industrialization, which raises the real productivity of labor and increases disposable incomes, is substantial in raising the standards of living, leading to resultant induced efforts to increase the society's productivity in aggregate. The electrification schemes in rural areas coupled with mechanized agricultural irrigation would definitely improve the living conditions of such districts. Besides, the improved agricultural methods enables the absorption of more labor thus reducing unemployment with a positive contribution to social welfare. In considering the potential expansion of tourism in Cyprus, it is essential for the E.A.C. to concentrate its attention on the extension of electricity services to the various attractions (mainly hotels) found in touristic centers

(as mountain resorts and beaches), since the quality and operation of such facilities are crucial to the animation and development of the tourism industry.

In addition to these, the Authority's contribution, with steady growth, to employment (1191 employees as of 1965) and to the national income of Cyprus as referred to in chapter I is of no less importance.

CHAPTER V

CONCLUSIONS

The Electricity Authority of Cyprus (with its primordeal objective of service maximization) has been established with the sole purpose of provision and development of Island-wide electricity services and electrification schemes through an efficient and effective coordination of human faculties with physical facilities. The vital role of electric power as played in the Cypriot society could be felt through a short disabling of a central power station enough to paralyze the entire community leading to disastrous ends.

The Authority being a public utility is supposed to render services at all times adequate both in quality and quantity at reasonable and non-discriminatory (exploitive) prices to all who apply for it within each of the five (domestic, commercial, industrial, irrigation and public lighting) usage category.

As was seen in the preceding discussion (chapter II) the growth of E.A.C. was mainly attributable to increase in

demand. This growth was bolstered by three main factors. First, the Authority enjoying a monopolistic status was safeguarded from any competitive threatenings; second, the Authority being a public corporation was privileged in being exempted from taxes in addition to its relatively lower costs of debt financing from government; third, the management's production orientation purporting solely to render services to the public implied a faster rate of growth for the industry.

Having the intention of effectuating full and efficient utilization of public funds and avoiding any misallocation of various economic resources, the E.A.C. with its nature of heavy capitalization should tend towards large scale production in generating electricity and transmitting the current over longer distances. Such specialization coupled with skilled staff would engender technical and economical organizational efficiencies. An important by-product of economies of large scale production should be the inherent flexibility and adaptability facing the dynamism of future developments and innovations within the industry. Moreover, the Authority in order to ensure the most efficient and economical use of its resources (as referred to in chapter III)

should be gearing such funds towards development of its different types of services in such a manner so as to equalize the "marginal efficiency of capital" in terms of social welfare in each activity to the best interest of the Cypriot community as a whole.

As to the industry's excess capacity, the Authority's recognition of economies of higher "Load" as well as "Capacity" factors should culminate in adoption of those policies which help to increase average consumption per consumer.

In determining the level and structure of electricity rates, the management's systematic revision of its rate schedules should be based on scientific studies having targets for maximization of electricity usage for various purposes and realizing further economies not only through fuller utilization of existing plants but also via adoption of large scale production.

Finally, the E.A.C. in order to fulfil its prescribed functions to the best interest of the Cypriot community, the government should at all times tend to exact greater social responsibility upon the Authority through effective and fair regulative policies against exploitive

rates and unsatisfactory services. Thus, it is only through such strict measures that the responsible authorities could claim the contribution of electricity services towards higher and modernized standards of living for their society.

APPENDIX III

LIMITATIONS OF THE STUDY

It is found appropriate at this stage to reveal and acknowledge briefly the shortcomings of the undertaken study.

The thesis, as such, was confined merely to outlining the main features of the industry in question, and highlighting the merits of the monopoly form of structure presently prevailing in the Cypriot electricity market; this, in addition to the study's concentration on the economic and financial aspects of the industry's operative performance and its development.

However, due to the limited pertinent information and lack of direct access to field survey, as was noted previously, a detailed analysis and an over-all assessment of all the operational aspects of the Cypriot Electricity Industry was beyond the scope of this study. Actually, each one of these operational phases, and specifically those relating to the generation, organization, legal, costing

and pricing could be viewed as extensive enough to be treated as different fields proper for research projects, or even subjects fit for thesis writing.

Finally, the appraisal of the overall performance of the E.A.C. would be regarded as mediocre without studying the non-financial aspects pertaining to managerial and organizational policies, various phases of planning, technological set up, human relations, etc. In this respect, the mere exclusion of an elaborate evolutionary development background (past) of the industry and its expected performance in retrospect (future) as envisaged by the national economic as well as industrial plans and development programmes renders the study to be described as static.

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