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The World Bank

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Report No. 1372

PROJECT PERFORMANCE AUDIT REPORT

TURKEY: THIRD AND FOURTH CUKUROVA POWER PROJECTS

(LOANS 623-TU and 775-TU)

November 30, 1976

Operations Evaluation Department

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Fiscal Year: CEAS's Fiscal Year ends December 31.

Currency Equivalents (Turkish Lira)	Consumer Price Index
1969: US$1 = LT 9.04	1969 = 100
1970: US$1 = LT 14.93	1970 = 107
1971: US$1 = LT 14.15	1971 = 124
1972: US$1 = LT 14.15	1972 = 138
1973: US$1 = LT 14.15	1973 = 159
1974: US$1 = LT 13.99	1974 = 185

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PREFACE

This report presents the results of a performance audit on the projects supported by Loans 623-TU and 775-TU of 1969 and 1971, respectively, made to the Government of Turkey and relent to Cukurova Electric A.S. (CEAS). It is based upon the corresponding Project Completion Report (PCR) herewith attached, on Bank files, on discussions with Bank staff and with the staff of the beneficiary.

The valuable assistance provided by CEAS is gratefully acknowledged.

PROJECT PERFORMANCE AUDIT BASIC DATA SHEET

TURKEY: THIRD AND FOURTH CUKUROVA POWER PROJECTS
(LOANS 623-TU and 775-TU)

(Amounts in US$ mln)

	Original	Disbursed	Cancelled	As of 4/30/76 Repaid	As of 4/30/76 Outstanding
Loan 623-TU	11.5	11.5	0	.8	10.7
Loan 775-TU	7.0	7.0	0	.3	6.8[1]
	18.5	18.5	0	1.1	17.5

Project Data

	Original Plan	Revisions	Actual or Est. Actual
Conception in Bank:			
Loan 623-TU	-		1964
Loan 775-TU	-		5/69[2]
Board Approval:			
Loan 623-TU	6/69		6/24/69
Loan 775-TU	6/71		6/29/71
Loan Agreement:			
Loan 623-TU	-		6/27/69
Loan 775-TU	-		6/30/71
Effectiveness:			
Loan 623-TU	10/69		12/11/69
Loan 775-TU	9/71		10/14/71
Physical Completion:			
Loan 623-TU	12/72	12/73	2/74
Loan 775-TU[3]	9/74		9/74
% of original project actually completed:			
Loan 623-TU	80%		100%
Loan 775-TU[3]	100%		100%
Loan Closing:			
Loan 623-TU	9/15/73		9/28/73
Loan 775-TU	3/31/75		5/07/75

PROJECT PERFORMANCE AUDIT BASIC DATA SHEET

TURKEY: THIRD AND FOURTH CUKUROVA POWER PROJECTS
(LOANS 623-TU and 775-TU)

Project Data

	Original Plan	Revisions	Actual or Est. Actual
Total Costs (US$ mln):			
Loan 623-TU	17.15[4]	22.05	27.61
Loan 775-TU[3]	7.09		10.29
Financial Return on incremental investment:			
Loan 623-TU	15.3%		19.7%
Loan 775-TU[5]	14.5%		15.6%

Mission Data

	Month, Year	No. of Weeks	No. of Persons	Manweeks	Date of Report
Identification:					
Loan 623-TU	3/68	-	-	-	
Loan 775-TU	6/70	-	-	-	
Appraisal:					
Loan 623-TU	11/68	3½	2	7	6/69
Loan 775-TU	3/71	1	2	2	6/71
Subtotal:		4½		9	
Supervision I[6]	6/70	1½	2	3	8/70
Supervision II	9/71	1½	2	3	10/71
Supervision III	5/73	1	1	1	6/73
Supervision IV	6/74	½	1	½	7/74
Supervision V[7]	6/75	2	2	4	8/75
Subtotal:		6½		11½	

1/ Exchange adjustment.
2/ Only for the transmission. The conception in the Bank of the cost overrun on Kadincik II was realized in June 1970.
3/ Transmission work only.
4/ The appraisal estimate is based on the exchange rate of US$1 = LT9.
5/ Includes Kadincik II (Loan 623-TU) as well as the transmission work.
6/ Loan 623-TU and Second Cukurova Project (Cr. 59-TU). The other supervision missions are for both Loan 623-TU and Loan 775-TU.
7/ Completion report mission.

PROJECT PERFORMANCE AUDIT REPORT

TURKEY: THIRD AND FOURTH CUKUROVA POWER PROJECTS
(Loans 623-TU and 775-TU)

HIGHLIGHTS

Two credits and two loans, both loans presently audited, have been extended to the Government of Turkey, with Cukurova Electric A.S. (CEAS) as the beneficiary. Loan 623-TU was to help finance the installation of a 50 MW hydrostation, and loan 775-TU was to finance the cost overrun the hydrostation had incurred and some transmission lines. Both loans included financing for the training of the Company's officials, both abroad and within the country. The construction of the hydrostation and the transmission lines posed no unusual problems. The Company has developed an effective internal training program; training abroad was therefore not found necessary. The project, as completed, met its objectives.

The following points may be of particular interest:

Improving cost estimates by more detailed analysis of feasibility report (PCR para. 26).

Successful project despite time delay (PCR para. 26).

PROJECT PERFORMANCE AUDIT MEMORANDUM

TURKEY: THIRD AND FOURTH CUKUROVA POWER PROJECTS
(Loans 623-TU and 775-TU)

1. The Bank has been associated with the Turkish power sector since 1952 when a Loan (63-TU) was made to help finance the multipurpose hydroelectric Seyhan project in Adana. CEAS was formed in 1953 to purchase and operate the powerhouse of the Seyhan 54MW hydroelectric facility. CEAS is responsible for electricity generation and sells wholesale energy in the Cukurova area in the southeast of Turkey (Adana, Icel and Hatay provinces), and transmits energy outside the boundaries of this area. Energy is sold to municipalities for distribution and directly to industries. Over 90% of the electricity sales in Turkey are supplied from the interconnected system of the Turkish Electricity Authority (TEK), which basically serves western and central Turkey. The CEAS system was connected to this larger system in early 1970 by a tie line, but more interconnection is planned between the two systems in the immediate future. CEAS' structure is that of a corporation with the majority of its stock privately held and a 25.5% government holding through TEK. The supervising authority for the electricity sector is the Ministry of Energy and Natural Resources under which TEK is responsible for the development planning of the whole sector.

2. An IDA Credit (34-TU) was extended to the Government in 1963 and a second IDA Credit (59-TU) in 1964. Both were relent on commercial terms to CEAS to assist finance a) a third 18 MW generating unit at Seyhan and b) the Kadincik I hydroelectric plant (70 MW), respectively. Loan 623-TU, presently audited, was for the installation of a 50 MW unit at the Kadincik II hydroelectric plant (a short distance downstream of the Kadincik I plant) and a small training program for the personnel of the company. Loan 775-TU, also presently audited, was to cover the cost overrun on Kadincik II; transmission facilities, which consisted of three principal lines with related substations; centralized control facilities; and the training program which was not implemented under the previous loan. The projects associated with Loans 623-TU and 775-TU cost 30% more in money terms than originally envisaged and only about 2% in real terms, mainly because of increased material and labor costs, a prolonged construction period and currency fluctuations. The Kadincik II hydroelectric station (Loans 623-TU and part of Loan 775-TU) was implemented largely as planned but with a time delay of more than one year. The main reason for the time delay was late delivery of materials and electrical equipment, together with having to await the awarding of major contracts until the consultants could verify the economic justification for the project at the increased cost (covered under Loan 775-TU). Some electrical and mechanical problems related to the operation of the hydrostation also contributed to this

delay. These problems have all been solved. The transmission work was completed on schedule, but it deviated slightly from the original plan mainly because of new industrial customers, which were not foreseen at the time of appraisal. This deviation did not have any adverse effect on the project. The program to train staff members abroad was not implemented under Loan 775-TU either. However, this was quite a small part of the Loan (about $100,000) and proved not to be necessary as originally thought because CEAS has been quite successful in training its personnel within the country.

3. Actual sales of energy during the 1970-74 period increased on the average by 20% annually compared to the 19% estimated at the time of the appraisal (Loan 623-TU) of Kadincik II. Actual maximum demand was also quite close to the estimate, so that, in retrospect, the timing of the hydroplant was about right. At the appraisal in 1969 of the project assisted by Loan 623-TU, the Kadincik II hydroelectric station, at an estimated cost of US$343 per KW installed (1969 price level), was compared to a thermal power station, and was found to be the least cost solution to meeting the additional electricity requirements in the Cukurova area for the period 1973 onwards. When Kadincik II was reappraised in 1971 because of the cost overrun it had incurred (Loan 775-TU), TEK was considering building a 380 KV Keban-Osmanyie-Seydishir transmission interconnected system which was expected to be completed by 1976. This affected the justification of the hydrostation. Whereas during the first appraisal, Kadincik II had been considered only in the context of load development within the CEAS system, it would, after completion of the 380 KV line, become a generating source for the interconnected system. The principle justification for completing Kadincik II was, at the time of the reappraisal, that it was part of TEK's development plan, then currently being designed as the least cost alternative for meeting the forecast load growth of the interconnected system as a whole. In retrospect, this justification has not changed, and the construction of Kadincik II rather than a thermal station was a worthwhile investment. The world-wide increase in fuel prices has reinforced this fact. The actual cost of Kadincik II in current value at $490 per Kw installed (only about $353 at 1969 price level) is now expected to yield a rate of return of 19.7% * on its incremental investment compared to 15.3% at appraisal (Loan 623-TU) mainly because the increase in tariffs and the increase in the hydro power capacity (50 MW at appraisal compared to an actual of 56 MW) more than offset the increase in the actual capital cost.

4. The construction of the Seyhan-Osmanyie-Payas 154 KV transmission line assisted by Loan 775-TU was needed to strengthen the system in that area, and to supply a new steel mill at Payas. Although the steel mill is now expected to take less power from CEAS than originally envisaged (and therefore the installed capacity of the Payas substation was reduced from the original four 23 MVA transformers to one at 40 MVA), the completion of this line has improved the reliability of the power supply in the Cukurova area. The construction of the Silifke and Antakya transmission lines, which also were assisted by Loan 775-TU, were at appraisal compared to additional thermal generation, and found to be the least cost solution for meeting the increase in demand for electricity in these areas. With the actual sales of energy being close to their appraisal estimates, and the transmission lines being completed close to their original cost estimate, this justification has

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* The 1975 average sales price of Krs 38.7/KWh was used in calculating the rate of return.

not changed.

5. The financial performance of CEAS during the 1971-74 period was consistent with the project agreement. Although the actual rate of return on average net fixed assets decreased from 14.1% in 1971 to 8.6% in 1974 because of the higher than expected fuel cost (1972 through 1974 were dry years for Cukurova so more than expected energy was generated from its thermal units), the actual rate of return for 1975 was about 20% mainly due to a better than normal year of rainfall. CEAS financed 26% of its construction program during the 1971-74 period from its own net cash generation compared to the 16% estimated at appraisal.

6. Supervision missions, averaging about one per year, were adequate when taking into consideration the high competence of the company. The Bank contributed positively toward these projects, particularly in helping to finance the cost overrun of the hydroelectric station, which, in retrospect, represented the least cost solution for meeting the energy requirements in the Cukurova area and in the Turkish power system as a whole. The objectives of the projects have been met.

TURKEY

Loans 623-TU and 775-TU Completion Report

Third and Fourth Cukurova Power Projects

1.	Borrower	-Republic of Turkey	
2.	Beneficiary	-Cukurova Elektrik A.S. (CEAS)	
		Loan No. 623-TU	Loan No. 775-TU
3.	Amount of Loan	-US$ 11,500,000	-US$ 7,000,000
4.	Date Loan Signed	-June 27, 1969	-June 30, 1971
5.	Effective Date	-December 11, 1969	-October 14, 1971
6.	Closing Date	-September 15, 1973	-June 30, 1975
7.	Period of Grace	-4 years	-3½ years
8.	Terms of Loan	-25 years	-23 years
9.	Interest Rate	-6½%	-7¼%
10.	Comittment Charge	-3/4%	-3/4%
11.	Fiscal Year	Ends December 31	
12.	Exchange Rate		
	Original	-LT9 = US$1	-LT15 = US$1
	Present	-LT14 = US$1	-LT14 = US$1
13.	Appraisal Report No. and Date	-PU-13a -June 2, 1969	-PU-74 -June 15, 1971
14.	Amortization	-Paid semi-annually commencing September 15, 1973 and ending September 15, 1994.	-Paid semi-annually commencing April 1, 1975 and ending October 1, 1994.

The final repayments are substantially coincident for both loans since a part of the Fourth Cukurova Power Project is to meet cost overruns on the Third Cukurova Power Project (Kadincik II Power Plant).

15. Project Description (Original)

(1) Third Cukurova Power Project (Loan No.623-TU) consists of:

I. Construction of the second Kadincik Hydroelectric Power Plant (Kadincik II)

Kadincik II comprises; a concrete diversion dam about 15 meters high containing two radial gates and situated on the Kadincik River about 200 meters downstream from the existing Kadincik plant (Kadincik I); an intake, immediately upstream from the dam, leading to a concrete-lines tunnel about 6,100 meters long; a steel pile extending about 1,400 meters to a surge tank and valve chamber; a steel penstock sloping to a powerhouse containing a 50 MW turbo generator unit to be located on the banks of the Tarsus River just below the mouth of the Kadincik River; a travelling crane, switchyard, and other powerhouse equipment.

II. Engineering Services

The procurement of consulting engineering services to prepare detailed plans for Kadincik II and to supervise its construction.

III. Training

The provision of a training program for the personnel of the Company, consisting of training visits outside Turkey and the employment in the Company's offices of experts to teach modern techniques in electrical systems operations and public utility financial planning, including accounting.

(2) Fourth Cukurova Power Project (Loan No. 775-TU) consists of:

I. Construction and installation of the following power system works:

(a) a 154-KV transmission line from Seyhan to Osmaniye and Payas.

(b) a 154-KV transmission line from Iskenderun to Antakya.

(c) substations at Tarsus, Payas and Antakya with an aggregate capacity of about 180 MVA.

(d) a sub-transmission line from Tarsus to Mersin and Silifke.

(e) centralized control, telemetering and communications equipment.

II. Construction of the Second Kadincik Hydroelectric Power Plant (Kadincik II) (see (1)).

III. Training

A training program for the personnel of the Company, consisting of training visits outside Turkey and the employment of experts to assist and train personnel in modern techniques of electric systems engineering and operations and public utility financial planning, including accounting.

16. Project Description (Actual)

(1) The Third Cukurova Power Project (Kadincik II Hydroelectric Power Plant) was carried out broadly in accordance with the original project description. The Kadincik II Hydroelectric Power Plant Project actually consists of a 28 m high concrete dam, 6,100 m long power tunnel, 1,345 m long steel conduit, 66 m high surge tank and a 56 MW turbo-generator. This power plant controlled from the upstream Kadincik I Hydroelectric Power Plant through a remote control system is expected to produce 307 GWh energy in an average water year.

(2) The Fourth Cukurova Power Project (Transmission Network and completion of the Kadincik II Hydroelectric Project) was, to a certain extent, changed from the original plan, particularly transformer substations. Installed capacity of the Payas substation was reduced from the original 4 x 23 MVA to 1 x 40 MVA. The Tarsus substation capacity was increased from the original 2 x 16 MVA to 2 x 40 MVA because of the emergence of new non-expected industrial customers (textile industry, food and fruit processing plants etc.). The actual installed capacity of the Antakya substation is 40 MVA instead of 2 x 16 MVA as originally planned. Also, the existing 154 KV substations Seyhan, Osmaniye and Iskenderun were expanded in order to provide better energy supply. The changes and transformer unit reallocation in the transmission network resulted mostly from the decision to supply the new Iron and Steel Mill, being erected at Payas, directly from 154 KV transmission system. The Iron and Steel Mill will install its own step-down transformers. The Incirlik substation was extended in order to transfer energy from the 154 KV system to the present 66 MW system and to supply energy to the industries between Adana and Incirlik. Consequently, 40 MVA in transformer capacity was transferred from the 154-KV system to the 66 KV system. All of these changes were consistent with the flexible description allowed for the Project.

17. Objective and Justification of the Project

New additional generating capacity was needed to meet the rapidly increasing demand of the Cukurova Region consisting of Adana, Hatay and Icel provinces (with a population of about 2.5 million). The annual increases varied from 15 to 28% in both energy and peak power requirements. Although

most of the developments in this region were agricultural, in recent years, large industrial installations were also built such as a fertilizer plant and Iron and Steel Mill. In spite of the fact that the largest industrial customer, and new Iron and Steel Mill at Payas, has not yet entered into operation the total electric energy sales in the period 1971-1974 exceeded the Appraisal Report estimates by 10%. The growth of electricity supply capacity (1965-1974) is given in Annex 1, and the forecast of future power generation and demand (1975-1984) in Annex 2. A study made by CEAS' consultants (Syndibel, Belgium) to determine the least cost generation development concluded that the Kadincik II Hydroelectric Plant with a capacity of 50 MW was the least cost method of meeting expected power needs in the near future. The selection of the transmission lines and stations in relation to Kadincik II Hydroelectric Plant was considered appropriate for enforcing the CEAS transmission network and the interconnection with the TEK grid. TEK's development plan derived by determining the least-cost alternative power system development program to meet the forecast load growth for Turkey as a whole included the construction of Kadincik II Hydroelectric Plant and transmission lines and substations in the Cukurova Region. With the construction of the Kadincik II Hydroelectric Plant and related power transmission network the main objectives of the Project have been achieved.

18. Construction Schedule and Problems Encountered

(a) Kadincik II Hydroelectric Power Plant - The General Contract for civil works was awarded to the Senzai Turkes-Peysi Akkaya (STPA) Istanbul, Turkey and the official starting date was October 26, 1970. The contractor has occupied the job site area as from the end of October 1970 and started the erection site installations immediately thereafter. At the end of December 1970, the driving of the power tunnel had been started and the contractor was ready to start the excavation in the powerhouse area. The main equipment began to arrive to the sites in February 1971. At the end of March the batching plants and the excavators were available but not yet erected. However, the auxiliary equipment for the tunnel (locomotives, rails and wagons) as well as structural steel were not yet delivered. The late delivery in April and May 1971 affected the excavation works in the powerhouse area and tunnels (power and diversion).

The only troubles during the diversion tunnel excavation were due to water inflows through the transverse faults connecting the tunnel with the very close gorge of the river and due to difficulties encountered by the contractor to get on time the necessary explosives and fuses due to Government regulations.

Following construction of the cofferdams water was diverted, through the diversion tunnel on November 8, 1971.

The civil works contractor used a tunnel-boring machine ("mole") to excavate the major portion of the power tunnel; he also used conventional excavation methods from the upstream face of the tunnel. Neither, the availability of the machine nor the driving speed were good, mainly because of the necessity to transport the mucking material by trucks.

At the end of June 1971 it became evident that in order to complete the tunnel driving works on time, it was necessary to resume using the conventional method from the upstream end of the tunnel. The power tunnel boring came to an end on September 10, 1972. The machine boring had been 4,090 m in 16 months. Slow progress in tunnel concrete lining was attributed to insufficient concrete supply as well as the contractor's lack of experience in the use of the telescopic form of shutters for the execution of the concrete lining. The concrete lining work for the entire tunnel was completed in October 1973. The dam execution works began in October 1971 and the end of February 1972, a total volume of about 12,000 m^3 had been excavated in the dam area. On September 2, 1973 the river was diverted through the dam, and in November 1973 the initial filling of the reservoir was started.

The placement of the sills of the 3 radial gates and their stop logs was completed at the end of January 1973 and the provisional acceptance of the equipment was pronounced in January 1974.

Other civil works were successfully executed. Aside from the above mentioned difficulties encountered during construction including a shortage of certain materials, the main civil works contractor performed well, completing the work only 1½ months after his contractual obligation. The hydroelectric power plant went into test operation on February 18, 1974,i.e. about 13 months later than planned at the time of the first appraisal in 1968.

The contractor for the Tunnel Intake Gate and Dam Gates B.V.S., France, completed the works on time and performed quite well.

The contractor for Penstock, Steel Conduits, Surge Tank and Butterfly Valves was Vevey, Switzerland. Some problems were encountered on this contract. Mainly, overspeed devices of the butterfly valves give closing command when the power plant operates over 53 MW and the butterfly valves close. Experimental means are being employed to overcome the faulty overspeed tripping, and loading to 56 MW is possible. The Vevey firm claims that the fault is due to air entering into the tunnel from the intake and does not assume responsibility for this. However, systematic study leading to an acceptable solution is being undertaken by the consultants.

The contractor for the turbine was Escher Wyss, Switzerland. The performance in operation of delivered equipment has not been fully satisfactory. The turbine governor does not function properly; load fluctuations of about 2 MW are experienced. Modifications to be made on the draft tube to stop load fluctuations are in hand. The limit alarm switches are not suitable and should be replaced.

The contractor for the generator Technomashio Italiana Brown Boveri (TIBB), Italy was late in the shipment of material and, as a consequence, the erection works were delayed. According to the contract the shipment was supposed to be completed by April 20, 1972, however, it was delayed to November 29, 1973. This caused a delay in the erection works from March 20, 1973 to December 31, 1973. Total shipment delay was 580 days and total

erection works delay was 280 days. TIBB claimed that the delay was due to strikes, which lasted 199 days. Nonetheless, since civil works were completed in January 1974, this delay had not caused any loss in power generation.

The contractor for the electrical equipment BBC, Federal Republic of Germany, was also very late in the delivery of the electrical equipment. According to the Contract the equipment was to be delivered by October 30, 1972, but it was not delivered until July 24, 1973 and even then, some spare parts were not included. The contractor claims that this delay was due to late approval of the design drawings and changes made on some designs. BBC had not started the training program for the delivered electrical equipment; all drawings and documentations were not yet submitted to CEAS; several BBC indicators and recorders are not functioning properly and they were not replaced. Particularly many problems were encountered on BBC remote control system which has since been put into operation, and personnel trained. After evaluation of delay, the contractual penalty clause was applied.

The contractors for the main transformer (Secheron, Switzerland) and the Powerhouse Travelling Bridge (Mague-Portugal) performed satisfactorily.

At the time of the completion inspection (July 1975) in addition to the above mentioned problems the following works were still outstanding:

(i) completion of remote control system to enable operation of Kadincik II Hydroelectric Plant from Kadincik I;

(ii) replacement of defective parts for Tunnel Intake Gates and Dam Gates;

(iii) amelioration and adjustment of turbine speed governor to operate stably and respond properly;

(iv) repair of closing solenoid of the butterfly valve receiving closing signal;

(v) one of the air valves in the butterfly valve is jammed and does not open. The contractor is supposed to complete remaining works and to repair valve;

(vi) final acceptance of Main Civil Works, Intake Gate and Dam Gates, Main Transformer and Power Crane.

By September 1976, these outstanding matters had been corrected.

(b) Transmission Lines and Substations

The contractor for Civil Works and Erection were local firms Elta, Rebii; Gurun and Ozkik, Turkey. They completed their tasks satisfactorily and on time.

The contractors for equipment and materials were as follows:

Equipment	Contractor
Electrical equipment	BBC, W. Germany
Transformers and lightning arresters	J. Schneider, France
Galvanized steel structures	SAE, Italy
ACSR conductors and ground wire	Echevarria, Spain
Insulators and hardware	Sumitomo, Japan
Load dispatching center	BBC, Switzerland

All equipment has been delivered except for the Load Dispatching Center, which is expected to be delivered by September 1975. The power transmission lines and substations are completed and commissioned into normal operation. Some delay was encountered in completion of substations because of steel shortage. Occasional problems and disputes with the equipment suppliers did not affect transmission network construction schedule. The completion of the Load Dispatching Center was delayed further because of lack of effort on the part of the contractor. The contractor did not pay much attention to this because for him this was a rather small contract. From the operational standpoint of view, the delay has not caused difficulties or loss in generation. Outstanding matters were completed by September 1976.

19. Cost of Project

Details of the original allocations of proceeds and the allocation of expenditures as finally disbursed are shown in Annex 3. The construction costs estimated in the Appraisal Report and actual costs are shown in Annex 4 for the Kadincik II Hydroelectric Power Plant and in Annex 5 for the transmission lines and substations. The original estimate of costs compared with the actual costs for both the Kadincik II and the transmission lines and stations are summarized in Annex 6.

The total Project cost was LT121.2 million (US$8.75 million) higher than the LT403.7 million) estimated in the Appraisal Reports of 623-TU and 775-TU (see Annex 6). The 30% overrun was made up of 16% in actual construction cost, 3% interest during construction due to the longer construction time of Kadincik II and the remaining 11% increase was due to fluctuations in the US dollar parity of exchange. A summary of the overrun is:

OVERRUN	LT MILLION			US$ MILLION			% OF APPRAISAL ESTIMATE		
	Foreign	Local	Total	Foreign	Local	Total	Foreign	Local	Total
Kadincik II	3.5	16.7	20.2	0.24	1.21	1.45	1.3	11.3	5.0
Trans. Lines & S/Stns.	15.9	28.2	44.1	1.15	2.04	3.19	6.2	19.1	11.0
Subtotal construction	19.4	44.9	64.3	1.39	3.25	4.64	7.5	30.4	16.0
Training	(3.1)	(0.2)	(2.9)	(0.19)	(0.01)	(0.20)	(1.0)	(0.1)	(-)
Interest	(6.7)	19.8	13.1	(0.49)	1.43	0.94	(2.7)	(13.4)	3.0
$/LT Fluctuations	-	46.7	46.7	-	3.37	3.37	-	3.8	11.0
TOTAL	10.0	111.2	121.2	0.71	8.04	8.75	3.8	75.4	30.0

Kadincik II was reappraised in 1971 for Loan 775-TU and the estimated overrun of foreign exchange of LT36.6 million (US$2.44 million) needed to complete that Project was included in Loan 775-TU. This additional foreign costs of Kadincik II were due mainly to underestimation of the civil works costs and the unexpected worldwide price increases for equipment. This amount included US$68,000 additional loan interest for 623-TU due to the extended construction period. In 1971 local costs were also increased by LT61.6 million (US$4.4 million).

The main reasons for the construction cost changes were rapid material and labor cost increases in past several years, prolongation of the construction period and occurrence of some unexpected conditions during the construction as indicated under Paragraph 18. (Construction Schedule and Problems Encountered).

The originally calculated economic rate of return of the development program (Kadincik II and transmission) was 14.5%, valuing sales at the tariff rate of 23 Krs/kWh. The recalculated project rate of return using actual construction and operating costs and estimated benefits is 15.6% (average tariff rate 39 Krs/kWh).

20. Consultants

The Project was designed and supervised by the consulting firm Syndibel, Belgium. The main services rendered by the consultants were: preliminary investigations, general reports, preparation of bidding documents, evaluations of bids, detailed engineering designing, contraction and erection works supervision, inspection, testing and acceptance of the equipment and hydrolic model test. The performance of the consultant has been satisfactory and site supervision has been good. In general, the consultants could have been more successful if they had fully recognized and utilized the capabilities of the local contractor and their staff. The consultants' presentation of results was very good except for their application drawings which CEAS found not descriptive enough and difficult to understand. Assessing the progress at the end of May 1974 performance tests execution and works finalizing, the activity of Syndibel superintendence at the site was ceased early in June 1974. The consultants are still currently involved in clarification of unsolved problems and disputes with equipment contractors.

Arthur Young & Co.,USA accounting consultants, were carrying out a major assignment with TEK. Under an agreement with CEAS, the TEK consultants have been periodically required to visit CEAS (from TEK) to advise and assist CEAS in changing over to standard American Federal Power Commission (FPC) categories of account. So far eight consulting days have been spent at CEAS and the changeover to FPC categories has been successfully completed.

21. Organization and Management

The Cukurova Elektrik A.S. (CEAS) is a private sector limited liability company formed in 1953 initially to operate the power portion of the multi-purpose Seyhan Dam and Power Plant, which was built with the help of Bank Loan 63-TU. The stock is about 25.5% Government owned. Under its 1953 concession, which expires in 2013 when all fixed assets revert free to the Government, CEAS is responsible for generation and wholesale transmission within the Cukurova Region (Adana, Icel and Hatay provinces). The Board of seven directors comprise, a chairman and three directors representing the private stockholders and three directors representing TEK, the Government power entity. The Cukurova Elektrik A.S. is, generally speaking, well managed and its operations are in accordance with sound public utility practice. The senior and professional staff have relevant experience in the electric power industry and are fully capable of operating the project efficiently. Furthermore, CEAS is the only electric power company in Turkey with competent management and adequate professional staffing. The organizational scheme is given in Annex 7, and necessary data on personnel are shown in Annex 8. CEAS' salaries are competitive with salaries offered by other similar employers; therefore while unlike other power organizations in Turkey CEAS is in a position to attract and retain highly qualified professional staff as well as skilled workers. CEAS has a permanent training program for new and younger personnel. The chairman of the CEAS Board of Directors is a prominent figure in Turkey and has excellent managerial ability, and his management style has contributed to CEAS' success.

22. Financing

(a) Operating Statements

During the 4 years since the 725-TU appraisal, CEAS sales have exceeded the forecast growth rate of 13% annually and have in fact achieved an average of 16.6% despite the delay of the coming into operation of the Payas steel mill, scheduled for 1973 and now unlikely to be in full operation before 1976. Both general sales and sales to TEK increased, and in 1974 totalled 1,186.6 GWh (1,103 GWh forecast) of which 1,176 GWh were to general consumers (1,023 forecast) and 107 GWh to TEK for export to other regions in Turkey (80 forecast). Over the 4 years however, sales to TEK at the lower average tariff of Krs/KWh 18.51 (as compared to Krs/KWh 28.14 for general sales) provided 13% of total sales (8% in the forecast) and thus CEAS' overall average tariff price only increased 22.6% from Krs/KWh 21.7 in 1971 and to Krs/KWh 37.0 in 1974. A major tariff increase for 1974 reflecting increased oil prices was the main reason for the average price for the 4 years 1971/1974 reaching Krs/KWh 26.9 as against the forecast Krs/KWh 23.1 over the same period.

The higher volume and higher average sales price resulted in CEAS' gross sales revenue for the 4 years of LT1,094 million (US$78 million) exceeding the forecasts by 30%. However, its operating surplus of LT270 million (US$19 million) was 25% lower, mainly because of the smaller proportion of hydro generation due to lack of rain in 1973 and the delay of Kadincik II generation until 1974. The adverse effect of the additional thermal (and purchased) energy on CEAS' operating results was intensified because of the steep rise in the price of fuel oil. By 1974 the overall average fuel oil cost to CEAS had increased from 9.5 in 1971 to 35.1 Krs/KWh generated as against the forecast 12.5 Krs/KWh. Labor costs for the 4 years also increased by 10% over the forecast, which had assumed an annual overall rise of 17% from 1970, whereas in fact labor costs rose by 28% annually. Detailed information in the Forecast and Actual Operating Statements 1971-1975 are given at Annex 9.

1975 has been particularly wet and, with Kadincik II in full operation CEAS has been able to increase its hydro generation substantially to an expected 978 GWh for 1975. This would be 58% of production as compared with 33% in 1973 and 43% in 1974. CEAS is therefore forecasting an operating surplus of LT144 million for 1975; more than double 1974 and almost 3 times that of 1973.

(b) Construction Financing

CEAS financed 26% of its 1971/1974 construction program from its own net cash generation, issue of new equity and consumers contribution and 74% from long term borrowing. The details of the appraisal forecast and actual sources and application of funds are given in Annex 10 and can be summarized as follows:

	Appraisal LT Million	%	Actual LT Mill.	%	% Deviation of Item	% Deviation of Total
Sources:						
Net cash generation	527.9		468.3		(-11%)	
(Less) Debt service	(282.4)		(289.5)		+2%	
Increase in working capital	(110.9)		(46.9)		(-57%)	
Subtotal	134.6	34%	131.9	21%	(- 2%)	
Dividends in shareholders	(96.9)		(120.7)		+25%	
Outside investments	(15.5)		(0.3)		(-98%)	
Cash generation for construction	22.2	6%	10.9	2%	(-51%)	(- 3%)
Issues of additional equity	7.3	2%	95.4	15%	+1207%	+22%
Consumer contributions	33.1	8%	56.8	9%	+ 72%	+ 6%
Subtotal local resources	62.6	16%	163.1	26%	+ 161%	+25%
Longterm Borrowing:						
Credit 59-TU	38.7	10%	36.1	5%		(- 1%)
Loan 623-TU 1/	156.7	39%	146.3	23%		(- 3%)
Loan 775-TU 1/	105.0	26%	86.0	14%		(- 4%)
Parity rate increases to Bank group debts 2/	3.6	1%	115.7	18%		+28%
Deferred local payments and duties 3/	34.0	8%	87.3	14%		+13%
Subtotal longterm borrowing	338.0	84%	471.4	74%	+ 40%	+33%
Total construction financing sources	400.6	100%	634.5	100%		+58%
Construction Program Applications						
Construction						
Project 623-TU, 775-TU	295.1	74%	402.0	63%	+ 36%	+26%
Project from 39-TU	3.6	1%	3.5	1%	-	-
Other construction	98.3	25%	113.3	18%	+ 15%	+ 4%
Total construction	397.0		518.8			
Parity increase in asset values	3.6		115.7	18%	+321%	+28%
Total construction	400.6	100%	634.5	100%		+58%

1/ US$1.05 million of Loan 623-TU had been drawn down at appraisal, and US$1 million of 775-TU was not drawn down until 1975.

2/ Due to changes in US$ parity rates during the period.

3/ In 1973 and 1974 CEAS temporarily defaulted in their local debt repayment to DSI and the government which, however, have been fully repaid in 1975.

CEAS' financing plan in 1971 has required to be increased by LT234 million (58%) to meet the additional actual cost of construction in 1971/1974. CEAS had asked whether the Bank would be prepared to increase its loan by US$1 million to meet the additional construction costs arising from the reduced US dollar parity value, but this request was not accepted by the Bank. CEAS accordingly resolved its financing problem by raising LT95 million (US$6.8 million) in new equity capital; and increasing its short term advances from local banks by LT33 million (US$2.3 million) in 1973; and in 1973 and 1974 by temporarily defaulting on its repayments to DSI and to the government of debts rescheduled at the time of the 775-TU Loan. Full payment of the default amounts have since been made in 1975 and no sums are presently overdue to DSI or to the government. Excessive short term advances from the local banks have also been repaid, and such advances now stand at their customary level of about LT20 million.

(c) Appraisal and Actual Balance Sheets

The balance sheets as appraised for 1974 (Loan 775-TU) and actual ones for 1970 and 1974 are shown in Annex 11. These balance sheets also include forecast for 1975.

23. Covenants

Section 4.01 of the Loan Agreement 775-TU required the Borrower shall not abrogate, terminate, amend or waive the concession granted to CEAS, except as the Bank shall otherwise agree.

In 1968, CEAS' concession was redrafted and, with the concurrence of the Bank, was submitted to the government for passing into law in substitution of the original agreement. The new draft's differences of substance included giving to CEAS the specific right to distribute in Hatay as well as Icel and Adana, and to generate in Adana and Icel provinces. During the governmental processes, the legal department of the Supreme Council of Turkey modified the text which had been agreed by the Bank. The tariff clause was originally unmodified and included the requirement to provide CEAS with a "reasonable profit" after deduction of all the usual expenses, depreciation, taxes, duties, etc., and capital amortization reserve. The legal department of the Supreme Council of Turkey changed this unspecific "reasonable profit" to a specific definition which can be paraphrased as meaning "a profit not exceeding 12% of the total paid in capital plus all extraordinary reserves (i.e.,reserves in excess of the legal reserve) and including capital amortization reserve." The Bank reconsidered that under certain conditions this 12% could become inadequate and informed the government of this opinion during negotiations of 775-TU in 1971.

The decree setting up the revised concession was taken through all its governmental stages and signed by the President of the Republic of Turkey. However, publication in the official gazette was delayed by the government until March 25, 1976 when it came into full force.

CEAS has now decided that it is prepared to accept the "12%" revision of the tariff clause and does not consider that this clause would be detrimental to its interest. Other particular covenants of substance have been fulfilled.

The performance of the beneficiary (CEAS) has been very satisfactory. The formal provisions of the Project Agreement and the targets established in the Appraisal Report have been met.

24. Supervision

Since the Project is performing satisfactorily there is no need for further supervision. One exception may be a periodical supervision to compare operation results and performance with other power entities in Turkey (TED, IETT) not performing satisfactorily, in order to draw necessary conclusions for the improvement in the whole power sector in the country.

25. Auditors

Under the terms of the concession, CEAS is subject to Government audit, and as a condition of Credit 59-TU which has been maintained, has agreed to an independent audit. Since 1975, CEAS' accounts have been audited by Newberry & Co.,an experienced Istanbul firm which also performs a useful advisory function. CEAS' accounting records are well maintained and financial reports are prepared promptly.

26. Lessons Learned

It is instructive to note that despite more than one year of the Project delay, the Kadincik II Hydroelectric Power Plant as well as the transmission lines and substations were successfully constructed and are completely fulfilling the expectations of their planners. This outcome was largely brought about by the ability shown by the project management. The capable project management and well organized power company are essential features for the success of the Project and obtaining full Project benefits. It is probably true that the more detailed analysis of the feasibility report and design specification might have resulted in the better Project cost estimates and avoidance of the Kadincik II reappraisal. It is also worthwhile to realize very favorable influences of the additional hydropower capacity on the improvement of the financial situation of the beneficiary and to learn that it is still possible to build not large hydroelectric power plant (56 MW capacity and 305 GWh annual generation) for less than 500$/KW installed, having in mind all benefits and conveniences offered by hydroelectric power plants.

EMENA Regional Office
August 1975

TURKEY

CUKUROVA ELEKTRIK A.S. (CEAS)

Loans 623-TU amd 775-TU Completion Report

List of Annexes

TURKEY

CUKUROVA ELEKTRIK A.S. (CEAS)

Loans 623-TU and 775-TU Completion Report

Growth of Electricity Supply Capacity, Transmission System, Customers and Sales, 1965-74

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
GENERATING CAPACITY (MW)										
Hydropower Plants										
Seyhan	60	60	60	60	60	60	60	60	60	60
Kadincik I	-	-	-	-	-	-	70	70	70	70
Kadincik II	-	-	-	-	-	-	-	-	-	56
Yuregir	-	-	-	-	-	-	-	6	6	6
Sub-total Hydro	60	60	60	60	60	60	130	136	136	192
Thermal Power Plant										
Mersin	-	53	53	53	106	106	106	106	106	106
Total Installed Capacity	60	113	113	113	166	166	236	242	242	298
TRANSMISSION NETWORK										
Substation Capacity (MVA)										
154 kV Stations	26	26	26	46	46	46	72	72	72	292
66 kV Stations	90	90	100	107.5	117.5	147.5	217.5	217.5	227.5	250
Transmission Lines (km)										
154 kV Lines	117.6	117.6	117.6	134.6	134.6	220.2	220.2	220.2	259	430
66 kV Lines	98.8	98.8	103.3	103.3	103.3	103.3	118	118	121	121.7
30 kV Lines	-	-	32.2	77.5	107.5	282.5	350	425	504.6	661.1
NUMBER OF CUSTOMERS	61	64	86	105	139	175	281	363	486	591
TOTAL SALES (GWh)	241.3	311.3	363.8	421.5	483.7	678.5	766.8	997.3	1058.3	1182.6
GROSS GENERATION (GWh)	251.3	322.4	379.4	439.4	514.2	716.5	815.8	1055.7	1139.7	1272.4
PEAK DEMAND (MW)	51.8	66	77	90	107	140	203.6	204	226	270
SALES										
Distribution	87.5	113.4	132.7	169.8	218.8	261.0	311.9	397.8	452.2	499.4
Industrial	153.8	197.9	230.8	251.1	264.1	287.7	273.2	356.9	461.8	524.6
TEK	-	-	-	-	-	1.1	141.2	197.5	92.5	106.8
Others	-	-	0.3	0.6	0.8	678.5	40.5	45.1	51.8	51.8
TOTAL (GWh)	241.3	311.3	363.8	421.5	483.7	678.5	766.8	997.3	1058.3	1182.6
GENERATION										
CEAS	251.3	322.4	379.4	439.4	514.2	716.5	815.8	1048.7	1081.8	1167.3
Purchased from TEK	-	-	-	-	-	-	-	7.0	57.9	105.1
TOTAL (GWh)	251.3	322.4	379.4	439.4	514.2	716.5	815.8	1055.7	1139.7	1272.4
Plant Service & Losses (GWh)	10.0	11.1	15.6	17.9	30.5	38.0	49.0	58.4	81.4	89.8
as % of total generation	(4.0)	(3.4)	(4.1)	(4.1)	(5.9)	(5.3)	(6.0)	(5.5)	(7.1)	(7.1)
System Peak Load (MW)	51.8	66	77	90	107	140	203.6	204	226	270
Annual Load Factor (%)	(55)	(56)	(56)	(56)	(55)	(58)	(46)	(59)	(58)	(54)

August 1975

TURKEY

CUKUROVA ELEKTRIK A.S. (CEAS)

Loans 623-TU and 775-TU Completion Report

Forecast Power Generation and Demand

	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984
POWER GENERATION (Average water year)										
CEAS	1,610.0	1,500.0	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
Purchased from TEK	73.5	160.0	-	-	-	-	-	-	-	-
Total (GWh)	1,683.5	1,660.0	1,500	1,500	1,500	1,500	1,500	1,500	1,500	1,500
GENERATION (GWh) (Dry water year)		1,360.0	1,200	1,200	1,200	1,200	1,200	1,200	1,200	1,200
SALE										
General	1,254.8	1,350.0	1,498	1,662	1,878	2,140	2,439	2,761	3,058	3,430
TEK	333.9	204.0	-	-	-	-	-	-	-	-
Total (GWh)	1,588.7	1,554.0	1,498	1,662	1,878	2,140	2,439	2,761	3,058	3,430
PLANT SERVICE AND LOSSES (GWh)	94.8	106.0	120	133	150	170	195	220	245	270
TOTAL ENERGY DEMAND (GWh)	1,683.5	1,660.0	1,618	1,795	2,028	2,310	2,634	2,981	3,303	3,700
Rate of Increase (%) 1/	(17)	(8)	(11)	(11)	(13)	(14)	(14)	(13)	(11)	(12)
Required New Generation (GWh) (Average water year)	-	-	118	295	528	810	1,134	1,481	1,803	2,200
Required New Generation (GWh) (Dry water year)		300	418	595	828	1,110	1,434	1,781	2,103	2,500
System Peak Load (MW)	216	277	308	341	386	439	501	567	628	704
Rate of Increase (%)	(14)	(28)	(11)	(11)	(13)	(14)	(14)	(13)	(11)	(12)
New Peak Load Requirements (MW)	6	67	98	131	176	229	291	357	418	494

1/ Without sale to TEK

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ANNEX 3

TURKEY
CUKUROVA ELEKTRIK A.S. (CEAS)
Loans 623-TU and 775-TU Completion Report

Original and Actual Allocation of the Proceeds of the Loans

Category	Amount Expressed in US$ Equivalent	
623-TU	Original	Actual
I. Civil Works	4,870,000	5,876,000
II. Electrical and Mechanical Equipment	3,670,000	5,470,000
III. Engineering and Supervision	600,000	142,000
IV. Training	100,000	12,000
V. Interest	1,050,000	---
VI. Unallocated	1,210,000	---
TOTAL	11,500,000	11,500,000
755-TU		
I. Equipment, materials, special vehicles and associated services for Part I of the Project	3,510,000	4,458,564
II. Part II of the Project	2,440,000	2,333,898
III. Training	100,000	---
IV. Interest and other charges	600,000	107,538
V. Unallocated	350,000	---
TOTAL	7,000,000	7,000,000

August 1975

TURKEY

CUKUROVA ELEKTRIK A.S. (CEAS)

Loans 623-TU and 775-TU Completion Report

Hydroelectric Power Plant Kadincik II Construction Costs
(LT 13.85 = US$1)

	APPRAISAL REPORT						ACTUAL					
	----LT Million-------			----US$ Million -----			----LT Million------			----US$ Million------		
	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total
Civil Works:												
Dam	10.5	14.3	24.8	0.76	1.03	1.79	8.5	7.2	15.7	0.61	0.52	1.13
Intake	2.2	2.8	5.0	0.6	0.20	0.36	0.8	1.3	2.1	0.06	0.09	0.15
Tunnel	43.4	52.1	95.5	3.13	3.76	6.89	37.8	30.1	67.9	2.74	2.17	4.91
Surge Tank	1.2	1.5	2.7	0.09	0.11	0.20	0.4	0.7	1.1	0.03	0.05	0.08
Penstock	3.7	5.3	9.0	0.27	0.38	0.65	2.3	2.6	4.9	0.17	0.19	0.36
Powerhouse	5.6	7.3	12.9	0.40	0.53	0.93	5.3	3.9	9.2	0.38	0.29	0.67
Switchyard	0.3	0.1	0.4	0.02	0.01	0.03	0.6	0.7	1.3	0.04	0.05	0.09
Contingencies	14.5	1.5	16.0	1.05	0.11	1.16	-8.9 1/	8.9	-	-0.64	0.64	-
Subtotal	81.4	84.9	166.3	5.88	6.13	12.01	46.8	55.4	102.2	3.39	4.00	7.39
Camp and Preliminary Works	11.9	-	11.9	0.86	-	0.86	22.3	19.1	41.4	1.61	1.38	2.99
A. TOTAL CIVIL WORKS	93.3	84.9	178.2	6.74	6.13	12.87	69.1	74.5	143.6	5.00	5.38	10.38
Equipment:												
Gates and Screens	0.9	13.3	14.2	0.06	0.96	1.02	1.4	15.0	16.4	0.10	1.08	1.18
Penstock and Valves	0.5	26.3	26.8	0.04	1.90	1.94	7.9	32.4	40.3	0.57	2.34	2.91
Powerhouse and Switchyard	2.3	41.5	43.8	0.17	3.00	3.17	2.4	52.1	54.5	0.18	3.76	3.94
Contingencies	0.2	4.2	4.4	0.01	0.30	0.31	-	-			-	
B. TOTAL EQUIPMENT	3.9	85.3	89.2	0.28	6.16	6.44	11.7	99.5	111.2	0.85	7.18	8.03
Other Expenses:												
Land	1.2	-	1.2	0.09	-	0.09	14.1	-	14.1	1.02	-	1.02
Administration	12.2	-	12.2	0.88	-	0.88	31.0	-	31.0	2.24	-	2.24
Engineering	0.3	6.2	6.5	0.02	0.45	0.47	3.0	6.6	9.6	0.21	0.47	0.68
Contingencies	1.3	0.7	2.0	0.09	0.05	0.14	-	-	-	-	-	-
C. TOTAL OTHER	15.0	6.9	21.9	1.08	0.50	1.58	48.1	6.6	54.7	3.47	0.47	3.94
SUBTOTAL (A + B + C)	112.2	117.1	289.3	8.10	12.79	20.89	128.9	180.6	309.5	9.32	13.03	22.35
LT FLUCTUATION IN $ EXCHANGE	-	-	-	-	-	-	46.7	-	46.7	3.37	-	3.37
TOTAL CONSTRUCTION COST	112.2	177.1	289.3	8.10	12.79	20.89	175.6	180.6	356.2	12.69	13.03	25.72
Training	0.2	1.4	1.6	0.01	0.10	0.11	-	0.1	0.1	-	0.01	0.01
Interest during Construction	-	14.5	14.5	-	1.05	1.05	11.4	14.7	26.1	0.82	1.06	1.88
TOTAL PROJECT COST	112.4	193.0	305.4	8.11	13.94	22.05	187.0	195.4	382.4	13.51	14.10	27.61

1/ 12% of civil works contract value as foreign

August 1975

TURKEY

CUKUROVA ELEKTRIK A.S. (ÇEAS)

Loans 623-TU and 775-TU Completion Report

Transmission Lines and Stations Construction Costs
(LT 13.85 = US$ 1)

	APPRAISAL REPORT						ACTUAL					
	--- LT Millions -------			--- US$ Millions-------			---LT Millions-------			----US$ Millions-------		
	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total	Local	Foreign	Total
A. TRANSMISSION LINES:												
154 kV Seyhan-Osmaniye	1.7	10.1	11.8	0.12	0.73	0.85	10.67	7.20	17.87	0.77	0.52	1.29
154 kV Osmaniye-Payas	1.9	8.3	10.2	0.14	0.60	0.74	9.56	4.57	14.13	0.69	0.33	1.02
154 kV Iskenderun-Antakya	1.1	5.7	6.8	0.08	0.41	2.49	7.06	3.74	10.80	0.51	0.27	0.78
30 kV Mersin-Silifke	6.0	3.5	9.5	0.43	0.25	0.68	7.76	1.52	9.28	0.56	0.11	0.67
30 kV Tarsus-ACS	4.3	1.1	5.4	0.31	0.08	0.39	2.77	1.52	4.29	0.20	0.11	0.31
Subtotal (A)	15.0	28.7	43.7	1.08	2.07	3.15	37.82	18.55	56.37	2.73	1.34	4.07
B. SUBSTATIONS:												
Telemetering and Communication	3.9	5.1	9.0	0.28	0.37	0.65	0.56	5.40	5.96	0.04	0.39	0.43
Seyhan Substation	-	-	-	-	-	-	4.16	1.80	5.96	0.30	0.13	0.43
Osmaniye Substation	-	-	-	-	-	-	1.24	3.19	4.43	0.09	0.23	0.32
Payas Substations	5.9	8.2	14.1	0.43	0.59	1.02	9.43	11.75	21.19	0.68	0.85	1.53
Iskenderun Substation	-	-	-	-	-	-	0.84	2.90	3.94	0.06	0.21	0.27
Antakya Substation	2.9	2.6	5.5	0.20	0.19	0.39	4.72	2.62	7.34	0.34	0.19	0.53
Tarsus Substation	2.3	1.3	3.6	0.17	0.09	0.26	4.58	6.08	10.66	0.33	0.44	0.77
Subtotal (B)	15.0	17.2	32.2	1.08	1.24	2.32	25.53	33.75	59.28	1.84	2.44	4.28
Land and Rights 2/	1.2	-	1.2	0.09	-	0.09	-	-	-	-	-	-
Engineering 2/	1.4	2.8	4.2	0.10	0.20	0.30	-	-	-	-	-	-
TOTAL	32.6	48.7	81.3	2.85	3.51	5.86	63.35	52.30	115.65	4.57	3.78	8.35
Price Contingencies	2.5	4.8	7.3	0.1	0.35	0.53	-	17.10 1/	17.10	-	1.23	1.23
TOTAL LINES AND SUB-STATIONS	35.1	53.5	88.6	2.53	3.86	6.39	63.35	69.4	132.75	4.57	5.01	9.58
TRAINING	-	1.4	1.4	-	0.10	0.10	-	-	-	-	-	-
Interest during Construction on Loan (IDC)	-	8.3	8.3	-	0.60	0.60	8.4	1.4	9.8	0.61	0.10	0.71
TOTAL PROJECT COST	35.1	63.2	98.3	2.53	4.56	7.09	71.75	70.80	142.55	5.18	5.11	10.29

1/ Inventories attributed to transmission lines and stations

2/ Land Rights (0.54 million TL) and Engineering (1.47 million TL) included in actual construction costs.

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ANNEX 6

TURKEY

CUKUROVA ELEKTRIK A.S. (CEAS)

Loans 623-TU and 775-TU Completion Report

Construction Costs
(LT 13.85 = US$ 1)

	Appraisal Reports 623-TU	Appraisal Reports 775-TU	Appraisal Reports Total	Actual	Overrun	% Item	Actual LT Million
	US$ Million						
Foreign Cost - US$ million							
Kadincik II 1/	10.35	2.44	12.79	13.03	0.24	2	180.6
Lines and S/Stations 2/	-	3.86	3.86	5.01	1.15	30	69.4
Subtotal Construction	10.35	6.30	16.65	18.04	1.39	8	250.0
Training 3/	0.10	0.10	0.20	0.01	(0.19)	(95)	0.1
Interest included in loans 4/	1.05	0.60	1.65	1.16	(0.49)	(30)	16.1
Total Foreign Cost-US$ million	11.50	7.00	18.50	19.21	0.71	4	
Total Foreign Cost- LT million	159.3	96.9	256.2	266.2	10.0	4	266.2
Total Local Cost-LT Million							
Kadincik II	50.6	61.6	112.2	128.9	16.7	15	
Lines and S/Stations	-	35.1	35.1	63.3	28.2	79	
Subtotal Construction	50.6	96.7	147.3	192.2	44.9	30	
Training	0.2	-	0.2	-	(0.2)	(100)	
Interest during Construction 4/	-	-	-	19.8	19.8		
Total Local Cost	50.8	96.7	147.5	212.0	64.5	44	% Project
Total Cost - LT Million							
Kadincik II	193.9	95.4	289.3	309.5	20.2	7	5
Lines and S/Stations	-	88.6	88.6	132.7	44.1	50	11
LT fluctuations in $ exchange rates 5/	-	-	-	46.7	46.7	-	11
Subtotal construction	193.9	184.0	377.9	488.9	111.0	29	27
Training	1.6	1.4	3.0	0.1	(2.9)	(97)	-
Interest during construction	14.5	8.3	22.8	35.9	13.1	57	3
Total LT Cost of Project	210.0	193.7	403.7	524.9	121.2	30	30

Notes:

1/ US$ 255,000 was additionally paid for preliminary engineering out of Credit 59-TU. The actual is $83,700 less than that shown in the Bank records due to a misallocation of 2 payments by the Bank which should be Category 2.

2/ The actual includes US$1.23 million carried in inventory in the Balance Sheet.

3/ Apart from US$12,000 paid to Arthur Young to standardize and improve accounting, training was virtually deleted from the ultimate Project with the concurrence of the Bank.

4/ Except for US$110,000 already disbursed, CEAS paid interest on Loan 775-TU itself (included in Local Cost). The US$490,000 remaining in the category was reallocated to construction (Bank letter 7/18/73). US$680,000 of additional interest on Loan 623-TU arising from the delay in completion of Kadincik II was transferred to that category and included in the Kadincik II category of 775-TU.

5/ Accounting action taken to adjust asset value to the current LT/US$ parity rates.

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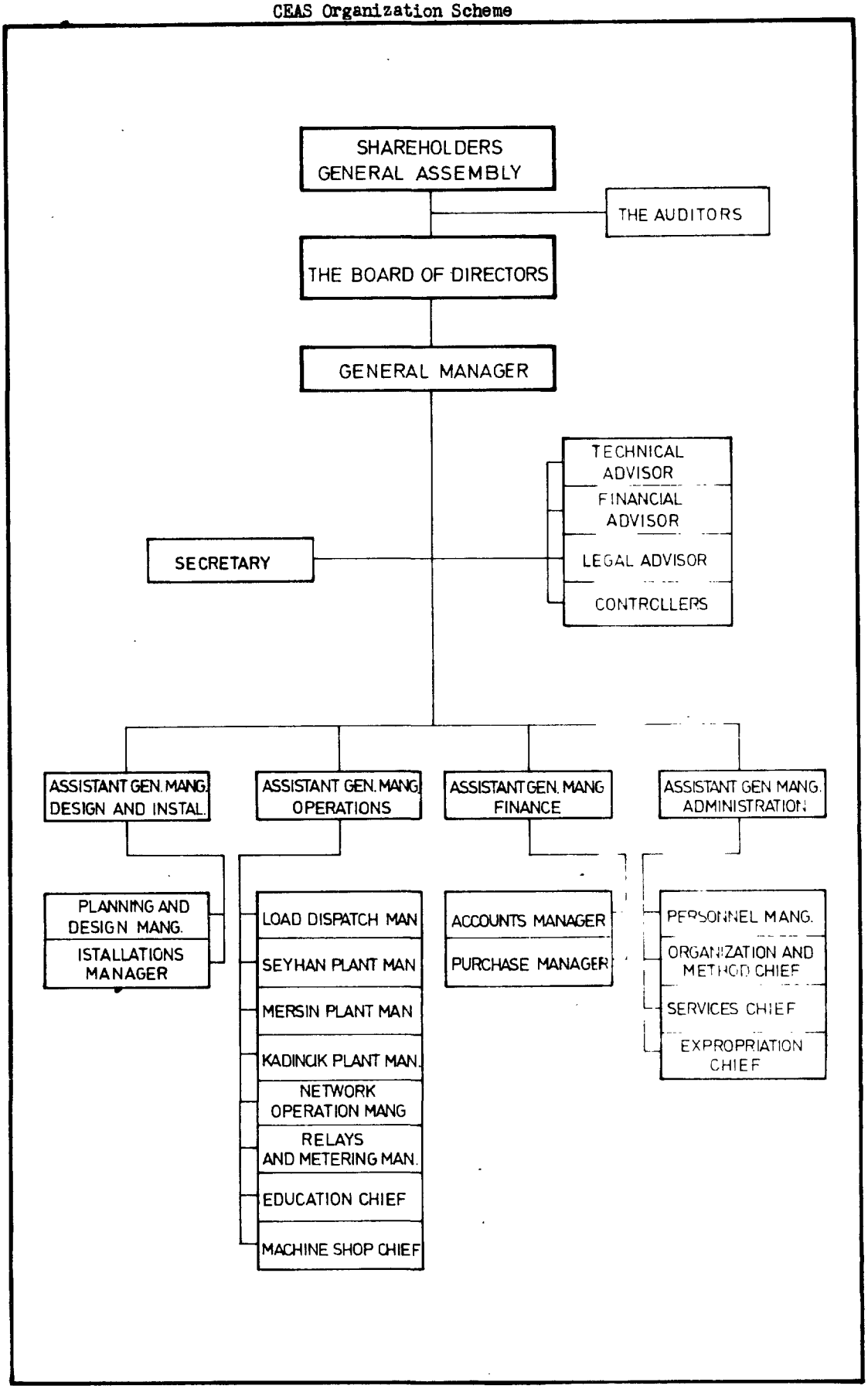
TURKEY

CUKUROVA ELEKTRIK A.S. (CEAS

Loans 623-TU and 775-TU Completion Report

CEAS Organization Scheme



TURKEY

CUKUROVA ELEKTRIK A.S. (CEAS)

Loans 623-TU and 775-TU Completion Report

Number of Personnel

	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
Generation Capacity Installed (MW)	60	113	113	113	166	166	236	242	242	298
Number of Employees in Power Plant										
Mersin Thermal Power Plant (106 MW)	-	119	93	92	124	122	133	130	138	136
Seyhan Hydro Power Plant (60 MW)	50	51	43	43	42	42	48	41	41	42
Kadincik I Hydro Power Plant (70 MW)	-	-	-	-	-	-	41	46	71	87
Kadincik II Hydro Power Plant (56 MW)	-	-	-	-	-	-	-	-	-	17
Yuregir Power Hydro Plant (6 MW)	-	-	-	-	-	-	-	8	11	11
Sub-total	50	170	136	135	166	164	222	225	261	293
Number of Employees per MW installed	0.23	1.60	1.20	1.19	1.00	0.99	0.94	0.93	1.08	0.98
Number of Employees in Transmission Network	53	65	81	85	87	100	101	111	127	135
General Services										
General Administration 1/	103	107	137	145	161	154	155	159	165	166
Construction	83	31	91	155	205	137	102	117	106	46
Sub-total	186	138	228	300	366	291	257	276	271	212
Total Number of Employees	289	373	445	520	619	555	580	612	659	640
Structure										
Graduate Engineers	12	12	14	15	17	24	24	32	29	28
University Educated	6	6	7	7	7	9	12	15	21	23
Others	133	237	260	300	369	336	399	402	457	417
Laborers	138	118	164	198	266	186	145	163	152	172
Skilled	(50)	(48)	(50)	(58)	(67)	(59)	(47)	(53)	(53)	(59)
Unskilled	(88)	(70)	(114)	(140)	(159)	(127)	(98)	(110)	(99)	(113)

1/ Includes General Management, Expropriation, Education, Organization, Shops, Accounting, Purchases and Personnel Services.

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TURKEY

CUKUROVA ELEKTRIK A.S. (CEAS)

Forecast and Actual Operating Statements 1971-1975
LT (Million)
LT14 = US$1

	----- Estimates of 1971 Appraisal Report 775-TU---------						----------Actual----------						% Increase (Decrease) from Appraisal	1975 Present Estimate
	1971	1972	1973	1974	1971/1974	%	1971	1972	1973	1974	1971/1974	%		
GWH Generated Thermal	318	323	423	210	1,274	33%	423.6	417.9	704.0	623.1	2,168.6	51%		632.0
Hydro	387	595	657	944	2,583	67%	392.2	630.8	377.8	544.2	1,945.0	45%		978.0
Purchased	-	-	-	-	-		-	7.0	57.9	105.1	170.0	4%		73.5
Total	705	918	1,080	1,154	3,857	100%	815.8	1,055.7	1,139.7	1,272.4	4,283.6	100%		1,683.5
GWH Sold General	632	767	920	1,023	3,342	92%	625.6	799.8	965.8	1,075.8	3,467.0	87%		1,254.8
TEK	30	100	100	80	310	8%	141.2	197.5	92.5	106.8	538.0	13%		333.9
Total	662	867	1,020	1,103	3,652	100%	766.8	997.3	1,058.3	1,182.6	4,005.0	100%		1,588.7
Average price of sale Krs/kWh														
General	23.34	24.09	24.14	24.06	23.91 1/		23.38	24.61	25.84	38.75	24.14	1/		39.80
TEK	11.36	14.50	14.50	14.50	13.71 1/		14.23	14.61	15.76	28.43	18.51	1/		34.40
Overall	22.80	22.98	23.08	23.37	23.06 1/		21.70	22.69	24.96	37.00	26.59	1/		38.66
Operating Revenue - Sale of Electricity	150.9	199.3	235.4	257.7	843.3		166.4	226.2	264.1	437.6	1,094.3			614.3
Operating Expenses														
Salaries and Wages	14.5	15.1	16.7	19.3	65.6		11.6	15.7	20.8	25.4	73.5			43.5
Bonus at year end	1.2	1.4	1.5	1.6	5.7		1.4	2.8	2.9	4.2	11.3			5.2
Maintenance and Materials	4.6	4.8	5.0	5.2	19.6		5.7	8.7	11.0	14.9	40.3			17.5
Water costs - Seyhan	4.5	4.8	4.8	4.5	18.6		4.4	5.1	3.5	3.3	16.3			6.2
Fuel Oil	31.3	40.4	52.9	26.2	150.8		40.2	55.6	115.6	218.8	429.7			246.5
Purchased Power	0.8	0.8	0.8	0.8	3.2		-	1.5	10.4	31.6	43.5			23.7
Insurance and Taxes	3.3	7.2	9.0	11.2	30.7		2.7	2.4	2.8	3.8	11.7			4.8
Corporate Tax	-	11.3	12.4	22.1	45.8		3.9	16.3	8.8	10.7	39.7			63.0
Depreciation	31.3	31.9	35.1	44.5	142.8		31.3	33.7	37.2	56.1	158.3			57.3
Total Operating Expenses	91.5	117.7	138.2	135.4	482.8		101.2	141.8	212.5	368.8	824.3			469.7
Operating Surplus	59.4	81.6	97.2	122.3	360.5		65.2	84.4	51.6	68.8	270.0			144.6
Other Income	5.5	5.7	6.7	6.7	24.6		4.9	8.8	7.8	18.5	40.0			19.1
Total Surplus	64.9	87.3	103.9	129.0	385.1		70.1	93.2	59.4	87.3	310.0			163.7
Interest	30.0	37.3	39.1	40.6	147.0		25.4	32.8	43.4	47.0	148.6			47.9
(Less) Interest during construction	(9.5)	(13.0)	(15.6)	-	(38.1)		(7.2)	(8.3)	(15.2)	(7.5)	(38.2)			-
Net Interest	20.5	24.3	23.5	40.6	108.9		18.2	24.5	28.2	39.5	110.4			47.9
Net Surplus	44.4	63.0	80.4	88.4	276.2		51.9	68.7	31.2	47.8	199.6			115.8
Appropriation of Surplus														
Capital Amortization	16.8	16.4	24.9	24.8	82.9		-	-	-	8.5	8.5			8.6
Legal Reserve	3.0	6.5	8.1	11.6	29.2		5.4	8.2	4.2	5.9	23.7			13.9
Transfer to/(from) Extraordinary Reserve	(1.6)	13.9	21.2	25.8	59.3		14.0	16.7	0.6	(2.3)	29.0			43.4
Cash Dividend	26.2	26.2	26.2	26.2	104.8		32.5	43.8	26.4	35.7	138.4			49.9
Total Appropriation	44.4	63.0	80.4	88.4	276.2		51.9	68.7	31.2	47.8	199.6			115.8
Average Net Fixed Assets in Operation	476.5	591.4	767.4	926.8			463.2	567.3	563.3	801.1				1,021.5
Rate of Return	12.5%	13.8%	12.7%	13.2%			14.1	14.9	9.2	8.6				14.2

1/ Average sales price Krs/kWh for 1971/1974

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TURKEY

CUKUROVA ELEKTRIK S.A. (CEAS)

Sources and Applications of Funds

Comparison of Actual 1971/74 with Appraisal Estimate

LT (Million)

Exchange Rate US$1 = LT14 (1975), LT15 (Appraisal - 1970)

	725-TU Appraisal Estimate 1971/74	Actual 1971	1972	1973	1974	1971/74	Forecast 1975	1971/74 Variation from 725-TU Appraisal Estimate	Remarks
SOURCES									
Net Surplus	385.1	70.1	93.2	59.4	87.3	310.0	163.6	(75.1)	
Depreciation	142.8	31.3	33.7	37.2	56.1	158.3	57.3	19.2	Devaluation
Net Cash Generation	527.9	101.4	126.9	96.6	143.4	468.3	220.9	(55.9)	Fuel Oil
(Increase)/Decrease in Working Capital 1/	(56.5)	(22.7)	1.7	(50.4)	12.5	(58.9)	(46.5)	(6.1)	
Increase in Equity Capital	7.3	7.3	-	45.0	43.1	95.4	1.9	88.1	
Customers contributions 2/	33.1	17.8	18.8	24.0	(3.8)	56.8	9.2	23.7	
Subtotal	511.8	103.8	147.4	115.2	195.2	561.6	185.5	49.8	
Longterm Borrowing:									
Currency rates adjustments:									
Credits 34-TU 59-TU	3.6	-	30.7	42.6	(4.3)	69.0	4.2	65.4	
Loans 623-TU 775-TU	-	-	-	-	46.7	46.7	3.2	46.7	
Borrowing: 59-TU	38.7	31.2	4.9	-	-	36.1	-	(2.6)	
623-TU	156.7	69.8	41.7	34.8	-	146.3	-	(10.4)	
775-TU	105.0	-	7.1	50.7	28.2	86.0	14.3	(19.0)	
Deferred customs duty	5.6	-	-	13.6	-	13.6	-	8.0	
Total Longterm Borrowing	309.6	101.0	84.4	141.7	70.6	397.7	21.7	88.1	
Short-term borrowing:									
Increase/(Decrease) in local bank loans	(7.8)	(1.7)	(1.1)	32.8	(12.9)	17.1	(4.8)	24.9	
Contractual deferment of: Debt-service 34TU - 59TU 3/	-	-	-	18.8	-	18.8	-	18.8	
D.S.I. debts 4/	28.4	28.4	-	-	-	28.4	-	-	
Unofficial deferment of: D.S.I. debts 5/	-	-	-	6.2	20.3	26.5	-	26.5	
TOTAL SOURCES	842.0	231.5	230.7	314.7	273.2	1,050.1	202.4	208.1	
APPLICATIONS									
Construction:									
Project 59-TU	3.6	3.5	-	-	-	3.5	-	-	
Projects 623-TU and 775-TU	295.1	105.8	87.0	121.2	87.9	401.9	-	-	
Other	98.3	44.8	20.9	36.9	10.8	113.4	30.2	-	
Subtotal	397.0	154.1	107.9	158.1	98.7	518.8	30.2	121.8	
Currency rate adjustment to asset values	3.6	-	30.7	42.6	42.4	115.7	7.4	112.1	
Total Construction	400.6	154.1	138.6	200.7	141.1	634.5	37.6	233.9	
Investments 6/	5.5	0.2	0.4	(0.1)	(0.2)	0.3	7.2	(5.2)	
Debt Service									
Amortization									
Deferred debt service re: Credits 34-TU	29.3	-	-	1.5	3.0	4.5	1.7	-	
59-TU	-	-	-	11.4	30.0	41.4	13.2	-	
Loans 623-TU	5.9	-	-	2.1	3.7	5.8	4.8	-	
775-TU	-	-	-	-	-	-	2.8	-	
Subtotal World Bank Group	35.2	-	-	15.0	36.7	51.7	22.5	16.5	
D.S.I. Protocol and Contractually deferred debts	64.9	22.1	9.9	10.1	12.1	54.2	5.2	(10.7)	
Government Deferred: Interest 34-TU, 59-TU	18.9	9.9	1.6	1.6	1.6	14.7	1.6	(4.2)	
Customs duty	16.3	3.9	7.5	1.5	1.1	14.0	13.7	(2.3)	
Unofficial deferred D.S.I. Debt	-	-	-	-	6.2	6.2	20.3	6.2	
Total Amortization	135.3	35.9	19.0	28.2	57.7	140.8	63.3	5.5	
Interest									
To Government re: Credits 34-TU	1.1	1.2	1.3	1.4	1.4	5.3	1.3	-	
59-TU	80.3	17.7	20.3	22.3	21.2	81.5	20.8	-	
Loans 623-TU	38.2	3.5	7.3	11.2	12.3	34.3	12.1	-	
775-TU	13.5	-	0.8	1.9	5.6	8.3	8.3	-	
Subtotal World Bank Group	133.1	22.4	29.7	36.8	40.5	129.4	42.5	(3.7)	
D.S.I.	9.4	2.7	2.5	2.3	2.0	9.5	1.8	0.1	
Interest on deferred customs duty	-	-	-	1.9	-	1.9	-	1.9	
Short term financing	4.6	0.3	0.6	2.5	4.5	7.9	3.5	3.3	
Total Interest	147.1	25.4	32.8	43.5	47.0	148.7	47.8	1.6	
Total Debt Service	282.4	61.3	51.8	71.7	104.7	289.5	111.1	7.1	
Dividend paid to Shareholders	96.9	18.2	32.4	43.7	26.4	120.7	35.7	23.8	Capital increased
Invested Capital Amortization	10.0	-	-	-	-	-	-	(10.0)	Dec, March, Nov.
Subtotal	795.4	233.8	223.2	316.0	272.0	1,045.0	191.6	249.6	
Change in Cash	46.6	(2.3)	7.5	(1.3)	1.2	5.1	10.8	(41.5)	
TOTAL APPLICATIONS	842.0	231.5	230.7	314.7	273.2	1,050.1	202.4	208.1	
Cash at start of period	16.1 7/	16.4 1/	14.1	21.6	20.3	16.4	21.5	-	
Cash at end of period	62.7	14.1	21.6	20.3	21.5	21.5	32.3	-	

1/ Excluding cash

2/ Customers contributions are "net" received i.e. less 10% of contributions received for completed work, which is transferred annually to revenue and included under "Other Income". During 1971 through 1974 TL 11.0 million has been so transferred (0.8, 1.1, 2.2, 6.9).

3/ On 8/16/73 the Government agreed to an additional deferal of IETT's repayment of debt service on Credits 34-TU and 59-TU.

4/ In 1971 DSI agreed to defer existing overdue debts for water charges and under the 1961 protocol (LT Millions 10.7 and 17.7 respectively).

5/ Although intended as short term borrowing the deferment of Government and DSI debts were in fact converted into longer term borrowing by CEAS non payment in 1973 and 1974. All these outstanding debts have been paid in 1975.

6/ In 1973 and 1974 net repayments of matured government bonds exceeded investment in such bonds. All investments shown are net of maturities.

7/ In the Appraisal report the 1970 accounts were still only preliminary and the final accounts contained minor changes.

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TURKEY

CUKUROVA ELEKTRIK S.A. (CEAS)

ANNEX 11

Appraisal TU-775 and Actual Balance Sheets

1970 and 1974 - Forecast 1975
LT Million LT1 = US$14

	1970 Actual	1974 Appraisal 775-TU	1974 Actual	1975 Forecast
NET ASSETS				
Fixed Assets				
Gross fixed assets in operation	464.5	1,189.6	1,366.2	1,393.6
Less Depreciation reserve	(89.9)	(236.3)	(254.4)	(311.6)
Net fixed assets in operation	374.6	953.3	1,111.8	1,082.0
Work-in-progress	257.1	-	11.4	21.6
Subtotal	631.7	953.3	1,123.2	1,103.6
Investments	17.5	22.2	17.8	24.9
Total Fixed Assets	649.2	975.5	1,141.0	1,128.5
Net Current Assets				
Current Assets				
Cash	16.4	62.8	21.5	32.3
Less Temporary local bank advances	(7.8)	-	(24.8)	(20.0)
Net cash resources	8.6	62.8	(3.3)	12.3
Accounts receivable - consumers	21.4	46.4	106.2	173.7
Notes receivable - consumers	6.8	20.6	21.6	30.5
Inventories	21.0	24.9	66.8	62.3
Other receivables & prepayments	18.5	12.8	12.7	14.8
Total Current Assets	76.3	167.5	204.0	293.6
Current Liabilities				
Accounts payable: DSI for water	(16.1)	(4.5)	(10.8)	(6.3)
: Other	(3.3)	(12.2)	(29.9)	(82.7)
Current portion of longterm debt	(27.6)	(28.5)	(63.2)	(31.1)
Other provisions and advances	(12.4)	(21.5)	(90.2)	(69.4)
Total Current Liabilities	(59.4)	(66.7)	194.1	(189.5)
Net Current Assets	16.9	100.8	9.9	104.1
TOTAL NET ASSETS	666.1	1,076.3	1,150.9	1,232.6
EQUITY AND LONGTERM DEBT				
Equity				
Paid in share capital	168.3	175.0	248.6	250.0
Paid in share premium	14.4	15.0	29.6	30.0
Reserves & undistributed surplus	23.5	69.7	68.1	71.7
Surplus for year	14.7	88.4	47.8	115.8
Capital amortization reserve	-	48.1	-	8.5
Consumers contributions	14.6	47.6	70.8	80.0
Total Equity	235.5	443.8	464.9	556.0
LongTerm Debt				
Credits: 34-TU	22.6	22.4	22.4	20.8
59-TU	319.5	319.0	363.4	353.1
Loans: 623-TU	15.6	162.4	180.8	177.7
775-TU	-	102.4	99.8	112.5
Subtotal Bank Group	357.7	606.2	666.4	664.1
DSI	29.7	10.0	10.0	4.6
Government: Debt Service 34-TU, 59-TU	32.9	14.1	9.6	7.9
: Deferred customs duty	10.3	2.2	-	-
Total Longterm Debt	430.6	632.5	686.0	676.6
TOTAL EQUITY AND LONGTERM DEBT	666.1	1,076.3	1,150.9	1,232.6

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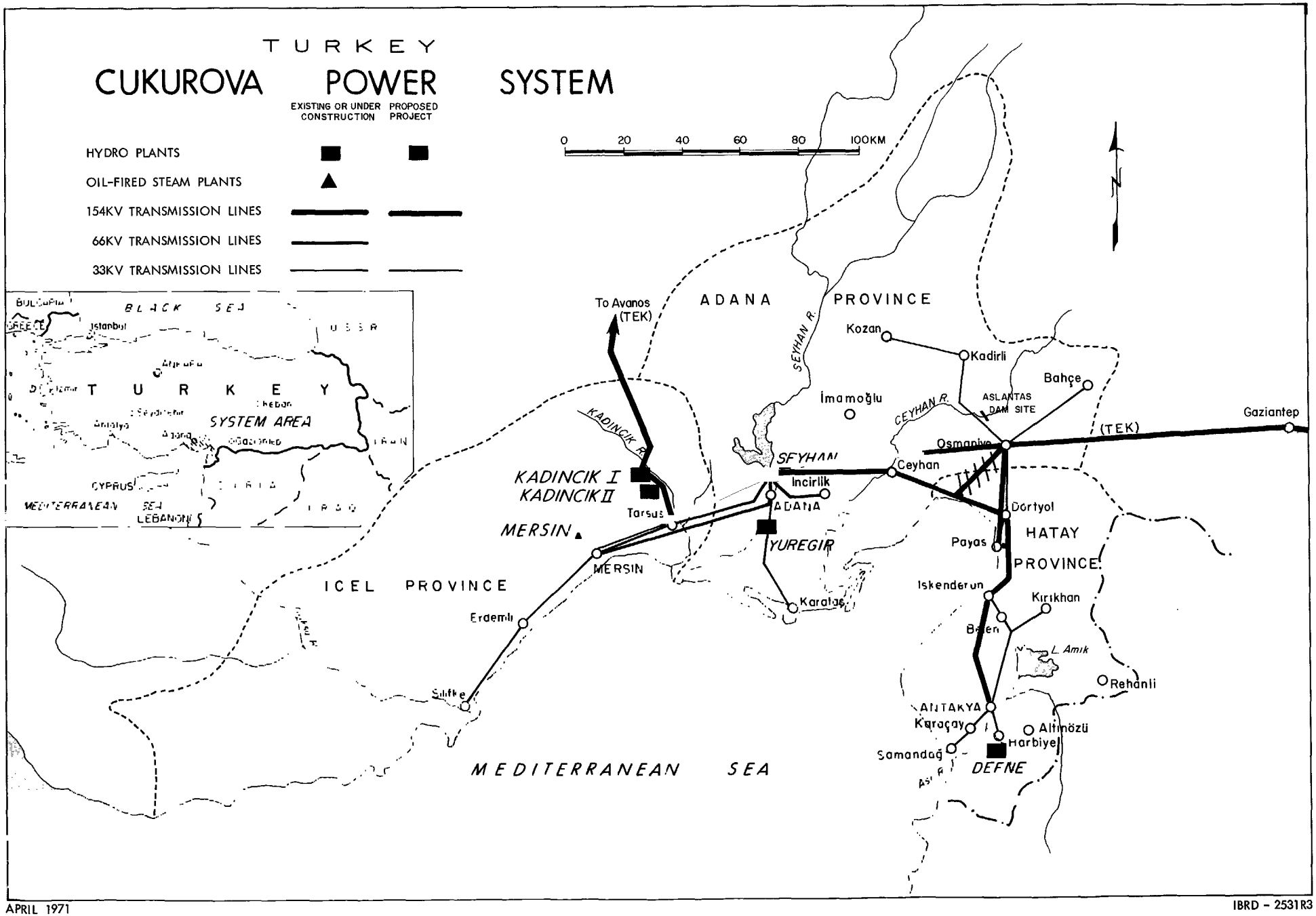

APRIL 1971

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