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DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

CAPITAL ASSISTANCE PAPER

Proposal and Recommendations
For the Review of the
Development Loan Committee

TURKEY - Keban Hydroelectric and Transmission Line Project

277-H-063
277-0423

AID-DLC/P-353

A.I.D.
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DEPARTMENT OF STATE
AGENCY FOR INTERNATIONAL DEVELOPMENT
Washington, D.C. 20523

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AID-DLC/P-353
June 22, 1965

MEMORANDUM FOR THE DEVELOPMENT LOAN COMMITTEE

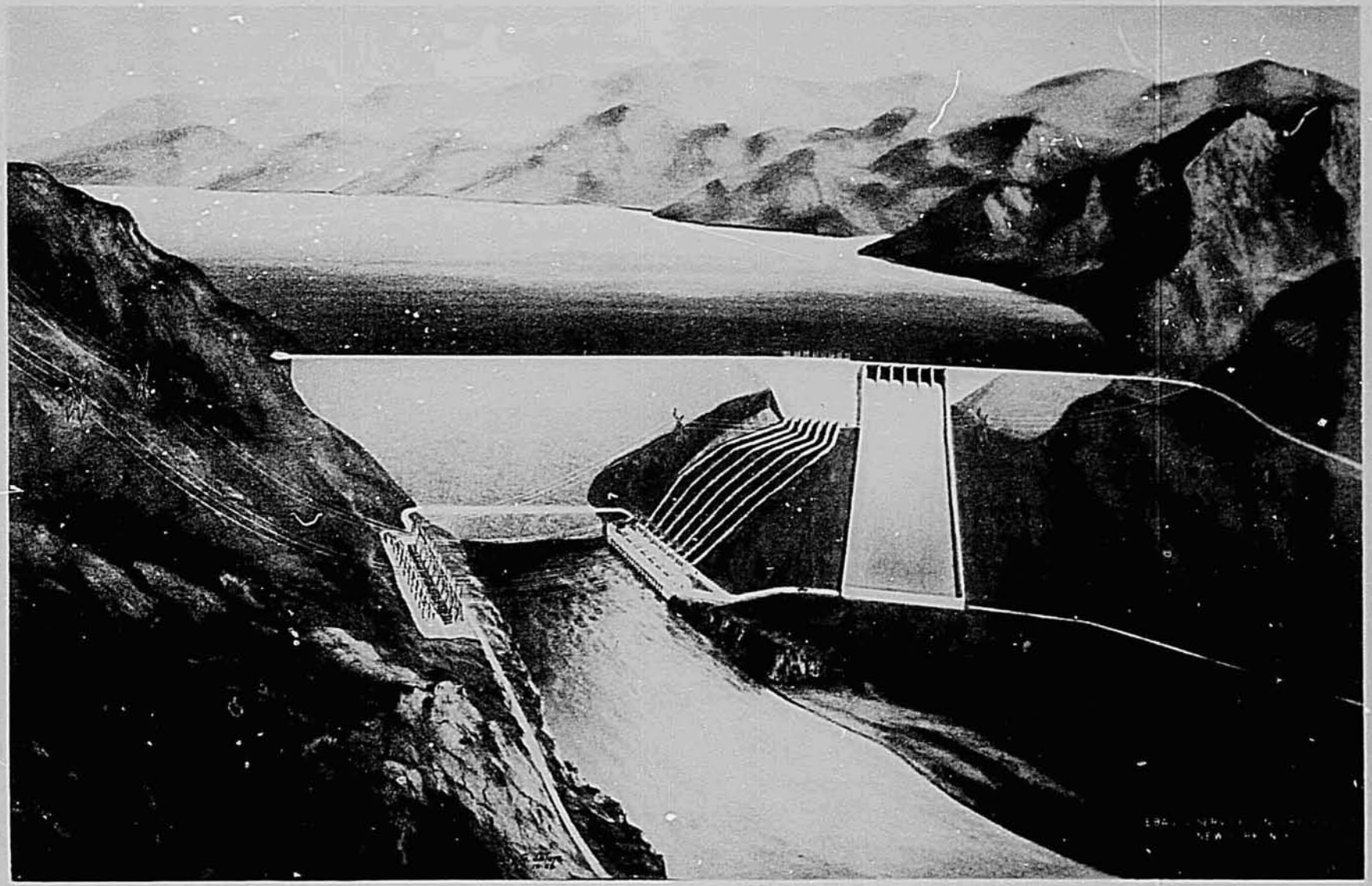
SUBJECT: Turkey - Keban Hydroelectric and Transmission Line Project

Attached for your review are the recommendations for authorization of a loan in an amount not to exceed $40,000,000 to the Government of Turkey to assist in financing the costs of design and construction of a dam and hydroelectric power plant at Keban on the Euphrates (First) River in Eastern Turkey, related substations and transmission lines, and the acquisition and importation of equipment, materials, services and general commodities in connection therewith.

This loan proposal is scheduled for consideration by the Development Loan Staff Committee at its meeting on June 25, 1965.

Helen E. Nelson
Secretary
Development Loan Committee

Attachments:
Summary and Recommendations
Project Analysis
Annexes I-IV



KEBAN DAM AND HYDRO-ELECTRIC POWER PLANT
ON THE FIRAT RIVER, TURKEY
1,085,000 KW

AID-DLC/P-353

TURKEY

KEBAN DAM AND HYDROELECTRIC POWER PROJECT

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AID-DLC/P-353
June 22, 1965

SUMMARY AND RECOMMENDATIONS

KEBAN DAM AND HYDROELECTRIC POWER PROJECT

1. APPLICANT: The Republic of Turkey

2. AMOUNT: $40,000,000, of which up to $10,000,000 will be for general commodity imports.

3. LOAN: Term of forty years including ten year grace period. Interest of one percent on outstanding principal during grace period; thereafter interest of two and one-half percent per annum.

4. TOTAL COST OF ACTIVITY: The total cost of the project is estimated at $331.8 million, of which $79.9 million will be foreign exchange and $251.9 million will be local currency. Pledges by the financing Syndicate (including the U. S.) total $135 million equivalent in foreign exchange. While some of this pledge fund is earmarked for local currency generation, there are sufficient pledges available from the Syndicate members to assure full coverage of all foreign exchange costs. All additional foreign exchange and local currency to complete the project will be provided by the GOT.

5. DESCRIPTION OF ACTIVITY: Construction of the Keban Dam and620 MW hydroelectric power plant on the Euphrates (Firat) River and approximately 1275 miles of high voltage transmission lines.

6. PURPOSE OF ACTIVITY: Improving and increasing electric power service in the national grid.

7. BACKGROUND OF ACTIVITY: AID has assisted the electric power sector in Turkey with several loans in the past. This loan is the result of agreement reached among the Government of Turkey, AID, and other lenders who have formed a lenders Syndicate and have agreed upon a financing plan for the project.

8. EXPORT-IMPORT BANK INTEREST: On June 9, 1965 the Export-Import Bank stated that it was not prepared to consider this loan.

9. MISSION VIEWS: The Mission recommends approval of this loan.

10. STATUTORY CRITERIA: All applicable criteria have been met.

11. ISSUES: Present lack of agreement among the prospective lenders regarding management of the lenders' interest in the project.

12. RECOMMENDATION: Authorization of a loan to the Republic of Turkey of an amount not to exceed Forty Million Dollars ($40,000,000) for the purposes stated above, subject to the following terms and conditions:

a. Repayment in United States dollars.

b. Term of Forty (40) years from date of first disbursement, including a ten (10) year grace period.

c. Interest of one percent (1%) per annum during grace period, two and one-half percent (2½%) per annum thereafter.

d. Procurement with the loan funds shall be of United States source and origin.

e. AID shall receive appropriate assurances that:

(1) The funds other than the loan authorized hereby necessary for the project shall be available when and as needed.

(2) The engineering and consulting services necessary for the project shall be employed by the Government of Turkey.

(3) An expert board of consultants shall be employed to provide assistance as needed with respect to design and construction of the dam.

(4) The riparian rights of Syria and Iraq shall be provided for in a manner satisfactory to A.I.D.

(5) The necessary reforms in the structure and operation of the Turkish power industry will be affected in a manner satisfactory to A.I.D.

f. Prior to the execution of the loan agreement for this project, A.I.D. shall receive appropriate assurances that:

(1) Satisfactory arrangements have been made for management of the Keban lenders' interest in the project.

(2) Agreement has been or will be reached concerning the preference, if any, to be given to the procurement of Turkish goods and services.

(3) Agreement has been or will be reached among the Keban lenders and with the Government of Turkey with respect to the disbursement of loan funds for Part II (turbines and generators) and Part III (transmission lines) of the project.

AID-DLC/P-353
June 22, 1965

Capital Assistance Committee:

Loan Officer:	MMPehl, NESA/CDF
Engineer:	JEStephenson, NESA/ENGR
Counsel:	JAWestberg, NESA/GC
DESK:	RCChase, NESA/GTIC

Drafting Officers: Micou, Stephenson, Chase, Westberg, and Pehl

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I. HISTORY AND BACKGROUND

When the Republic of Turkey was established in 1923 the use of electric power in Turkey was minimal. The city of Istanbul had enjoyed electric service since 1913, but in 1923 the total installed generating capacity in Turkey was only 33,000 kilowatts. The new Republic granted franchises to foreign financial organizations to build and operate electric systems. This was not an entirely successful method of power development and the installations were purchased by the government and turned over to municipalities for operation. Still, expansion of generating capacity of these plants did not keep pace with the rising demand for power by new industries, with the result that many of these industries installed generating facilities for their own needs.

By 1945, at the close of World War II, the total installed capacity was 246,000 kilowatts, much of it in isolated small units. Since 1945 Turkey has been engaged in a program of expansion and improvement of facilities for production, transmission and distribution of electric power. By 1962, the generating capacity of all plants had increased to 1,330,000 kilowatts, of which 95 per cent was owned or operated by agencies of the National government or municipalities.

With the electric power industry under government control, the number of agencies involved proliferated over the years, until the organization grew unwieldy. No one Ministry was responsible for electric power. Since the 1964 reorganization of the institutions concerned with power development, the newly organized Ministry of Energy and Natural Resources controls the Electrical Survey and Development Administration (EIE), Etibank and its subsidiaries and the State Hydraulic Works (DSI). The second step in the reorganization of the power sector will be the passage of legislation establishing an electricity Authority. Such legislation is before the National Assembly. The Authority, under the Ministry of Energy and Resources, will gather all the existing organizations now concerned with electric power studies, planning, design, construction, operation, maintenance, financing and sale of electric power including the municipal power functions of Iller Bank (The Bank of the Provinces).

The forecasts of load growth in Turkey establish the need for additional generating capacity beyond the plants now under construction, such as Gokçekaya, Anbarli (Istanbul) and Sariyar. The Government of Turkey is now seeking financing for its largest hydroelectric power project, the Keban Dam and Hydroelectric Plant and associated transmission system. In the

eyes of the Turkish Government, the Keban Project is the single most important project in their development plan. Keban is the only new project singled out by name in the Five Year Plan. There is strong political backing for the project throughout the Turkish Government, partly because Keban is located in south-east Turkey which is far less-developed than other regions. The Government has announced its determination to build the Keban Dam on many occasions.

Keban is located twenty-eight miles northwest of the city of Elazig on the Euphrates (Firat) River. The Euphrates rises in east central Turkey and flows southwards through Syria to Iraq and the Persian Gulf. It represents the largest untapped reserve of hydroelectric power in Turkey. The site chosen for the Keban Dam is the first site suitable for hydroelectric development below the confluence of the Firat and Murat Rivers.

By Turkish standards the project is immense. The dam will be rolled rock fill construction, the first major dam of this type in Turkey. The height of its crest above the river bottom will be 155 meters (510 feet), almost a third higher than any existing dam in Turkey; and its length will be about two-thirds of a mile. Four generating units of 155 mw capacity each will be installed, with provision for an ultimate installation of eight units having a capacity of 1,240,000 kw. This is a vast amount of power and probably equals the total electric generating capacity in all of Turkey as late as 1960. The transmission facilities will consist of two 380 kv lines from Keban to Ankara and Istanbul, and two 154 kv lines, one to Elazig and one to Malatya.

The Keban Dam and Hydroelectric Project and related transmission system were studied by Ebasco Services Incorporated and their Report to Elektrik Işleri Etut Idaresi of October 1963 recommends construction of the project. Their Report is the basis for the loan application dated March 1964. The Ebasco Report contains load forecasts which indicate the need for electric power from Keban. The load forecasts in the Ebasco Report were reviewed by the Battelle Memorial Institute and it prepared independent forecasts of load growth in Turkey. A team of engineers from the New England Division of the U.S. Army Corps of Engineers visited the Keban Project site in March, 1965 and, after reviewing the Ebasco Report, gave their opinion on the design and construction of the dam. These reports are all discussed further in the Engineering Analysis and Economic Analysis Sections of this papaer.

In March of 1964 AID was informally asked to finance the total foreign exchange costs of the project. For the history of the financing developments since then see Section V Financial Analysis.

II. The Borrower and Executing Agencies

The Borrower of this loan will be the Republic of Turkey, acting through the Ministry of Finance. Many other Ministries and Directorates will have responsibilities in the Keban Project. In 1964 the Turkish Government established a special Keban Coordinating Committee which prepared an integrated work schedule for the various activities. This work schedule was approved by the High Planning Council, which includes the Prime Minister. The complexity of the work to be done and the responsibility of each Turkish agency can best be explained by a table. A discussion of the three principal agencies follows the table.

Table of Responsible Agencies

Portion of Keban Project	Responsible Agency	Cooperating or Interested Agency
1. Final Designs of Dam and Power Plant	E.I.E.	D.S.I.
2. Design of Transmission Lines	E.I.E.	Etibank
3. Employment of Consulting Engineering Firm	D.S.I.	Ministry of Finance
4. Construction of diversion tunnels	D.S.I.	Ministry of Finance
5. Mapping reservoir area	D.S.I.	Maps General Directorate
6. Survey of land to be expropriated	D.S.I.	General Directorate of Land & Settlement
7. Main dam construction	D.S.I.	Ministry of Finance
8. Construction of Hazar power plants	Etibank	Ministry of Finance
9. Hazar - Keban transmission lines for power during construction	Etibank	Ministry of Finance & D.S.I.

Table of Responsible Agencies (Con't)

Portion of Keban Project	Responsible Agency	Cooperating or Interested Agency
10. Keban - Ankara transmission line	Etibank	E.I.E. & D.S.I.
11. South - East Anatolia transmission line	Etibank	E.I.E.
12. Elazig-Keban Access Rd. construction	State Highways Department	D.S.I.
13. Construction of Kuluskur Bridge	State Highways Department	Ministry of Railroads Construction Department
14. Relocation of roads to be inundated	State Highways Department	D.S.I., E.I.E.
15. Relocation of railroads to be inundated	State Highways Department	Ministry of Finance, D.S.I. Karabuk Iron & Steel Works
16. Removal of Elazig Sugar Factory from reservoir site	Sugar Factories	D.S.I. Highways Department Railway Department
17. Material flow to main construction	State Planning Organization	DSI, EIE, Etibank Highways, Railways
18. Removal of inhabited places which will be inundated	Ministry of Reconstruction	Ministry of Rural Affairs, DSI, SPO
19. Removal of telephone & telegraph lines which will be	P.T.T. General Directorate	D.S.I., E.I.E.

Design of the Keban Dam project is the responsibility of the Electrical Survey and Development Organization (EIE). This organization is the General Directorate which prepares all plans for the government owned electrical systems. On AID financed hydroelectric projects DSI has employed U.S. consulting engineers as design contractors. On Keban, EIE has employed Ebasco Services Incorporated to provide engineering services for preparation of detailed construction and equipment specifications, layout of construction plant and such other engineering services as may be required for taking of bids and awarding of contracts for construction.

Construction of the Keban Dam is the responsibility of the State Hydraulic Works (DSI), a General Directorate under the Ministry of Energy and Natural Resources. Its duties include irrigation and drainage projects, flood control projects and construction and operation of hydroelectric power plants. DSI has been operating power plants since 1953. At present DSI operates three major dams and hydroelectric power plants and two major hydroelectric plants are under construction. One major hydroelectric project (Çukurova) was built and operated for a short period by DSI before it was turned over to a private company. On the Keban Project DSI will select contractors, let construction contracts and supervise construction, with the assistance of a foreign consulting engineering firm.

Purchase of dam and power plant equipment, and its inspection during manufacture, will be the responsibility of DSI, using purchase specifications prepared by Ebasco.

Ownership and Operation of the dam and power plant after construction will be by DSI. The number of hydro plant operating personnel presently employed by DSI is more than necessary for the efficient operating of present DSI hydroelectric power plants. This large number of operators has been maintained in order to train the personnel required for the hydro plants now under construction. It is understood that this training program will continue so that when the Keban Project goes into operation skilled personnel will be available from the DSI staff. Further, the plant operating staff to be assigned to this power station will participate in the installation of the main generating and auxiliary station equipment in order to be thoroughly familiar with all details of operation when the plant goes into service.

Construction, ownership and operation of the high tension transmission lines from the station switchyard to terminal substations will be by Etibank. Etibank is a state owned industrial bank charged with mining of copper, chrome, sulphur, lead and zinc generation of thermal power and transmission and distribution of electric power. It has been the recipient of several DLF and AID loans for electric power thermal generation and transmission and distribution lines. A full discussion of Etibank's operations and financial situation is contained in the loan paper for AID Loan 277-H-059, authorized April 30, 1965. Etibank has been operating transmission systems since 1948 and the total length of lines now operated by Etibank exceeds 2597 kilometers. Etibank is about to begin construction of the first 380 kv transmission line from the Gokçekaya Plant to Istanbul and Ankara and with the experience gained from the Gokçekaya Project should be entirely capable of constructing the balance of the 380 kv lines from Keban to Ankara and Istanbul. Etibank has stated that there will be sufficient trained transmission line operators to efficiently operate the new lines when the extended transmission system is complete. In addition the project committee has included a $500,000 equivalent budget item in the cost estimate for extra high voltage operator training. Etibank will engage a foreign engineering firm to assist it in supervision of transmission line and substation design and construction.

III. ENGINEERING ANALYSIS

1. Feasibility Studies

Elektrik Isleri Etut Idaresi (EIE), the Turkish Government agency responsible for planning power resource development entered into a contract with Ebasco Services Incorporated in December 1962 under which a comprehensive feasibility study was made for the Keban project. The details of the study were presented by Ebasco in a Report dated October 1963 and a Supplement (at AID request) dated January 1964. This Report, bolstered by subsequent economic and technical review studies made respectively by Battelle Memorial Institute and the U.S. Corps of Engineers, amply demonstrates the soundness of the Project. The Ebasco study clearly proves the superiority of Keban development in comparison with feasible alternates and this determination was made consistent with the requirements of Senate Document No. 97 relating to water and land resource projects.

2. Present Electric Service

The Ebasco study reviewed the power situation in 45 of Turkey's 67 provinces. This area comprises 70% of the total area of the country and contains 78% of the total population. The study area essentially covers the Northwest, West and East Anatolia power systems; the sparsely settled eastern provinces near the USSR and Iran are not included in the study area. After the study was completed, it was concluded that the Cukurova area (Adana) and Hatay province would have ample capacity to meet their own requirements to the end of the forecast period and have therefore not been included as a part of the proposed interconnected system.

The area under study is supplied with electricity by various electric systems operated by Etibank, DSI, industrial auto-producer plants, municipal generating systems, and the Cukurova Electric System. The largest of these systems is the Etibank Interconnected System serving Northwest and West Anatolia.

The general use of electricity is low. Many of the isolated municipal generating plants are old and inadequate to meet demand. In many of the other power systems generation facilities have not kept up with area growth and the use of electricity has to be curtailed.

In late 1962 the systems in Northwest Anatolia and Western Anatolia were linked with a 154 KV tie line. Several other smaller systems are being developed and the plan is that all of these systems eventually will be tied together to make one large interconnected system.

At the end of 1962 electric service was available to about 1/3 of the population in the study area. Of this group about 1/2 were served by

the Northwest and West Anatolia Interconnected system which accounts for almost 80% of gross power production in Turkey.

Distribution of electricity in cities, towns, and villages, with few exceptions is by the municipality or village council. The electric systems sell electricity to the municipalities, villages, and to industrial customers. Frequently the municipal distribution systems do not cover the entire municipal area and are inadequate to supply the area they serve.

Inadequate distribution systems are a problem in most places offering electric service. Efforts are being made to correct this situation but generally it is a great deterrent to the use of electricity. (AID Loan No. 277-H-059 was recently authorized in the amount of $6,400,000 to connect 32 municipal loan areas to the interconnected system. In 1959 DLF Loan No. 98 in the amount of $7,000,000 was authorized to improve distribution in 15 cities.)

3. Power Load Forecasts

The load forecast is based upon a plan for orderly expansion of the existing electric utility systems. For the period 1963 through 1967 the expansion is in accordance with the Development Plan, First Five Years, of the Republic of Turkey State Planning Organization. For the years 1968 through 1973 the forecast is based on a plan prepared by EIE. Further, mindful of factors that presently limit use of electricity in Turkey, the forecast is based on the following assumptions:

a. That the distribution systems in the present cities, towns and villages connected to the systems will be rebuilt and extended to provide adequate capacity to supply the needs of these communities.

b. That adequate distribution facilities will be built in other cities, towns, villages, and rural areas when they are connected to the system.

c. That provision will be made for the municipalities or some other organization to provide electric service to villages near the municipalities when electric service is supplied from the interconnected system.

d. That electric rates to the ultimate consumer will be reasonable and low enough to encourage large industrial customers to purchase rather than generate.

e. That service from the system will be reliable so that critical industries will be willing to take utility service.

f. That a sufficient supply of reasonably priced appliances, motors and other electrical utilization equipment will be available.

g. That the extension of electric service to all areas will be in accordance with the Development Plan, First Five-Years, of the Republic of Turkey State Planning Organization and with the plan prepared by EIE for later years.

Concerning the need for legislation and the establishment of an efficient Electricity Authority to establish accountability and appropriate standards of service, see Section V.

In making the load forecast, Ebasco used the classic method of dividing the total area into smaller geographic areas -- provinces, cities, towns, and villages -- and forecasting loads by customer classifications, which in Turkey are: Domestic and Commercial; Government; Street Lighting; and Industrial. Visits were made to all major load centers by a Market Analyst; interviews were held with operators of utility systems, industrialists, civil officials and Chambers of Commerce, contacts were made with various governmental and industrial organizations; and historical data on the use of electricity maintained by EIE was analyzed.

The table included in Annex II as Exhibit A shows the forecast of the study area's load growth from 1963 to 1973 in terms of number of customers, energy sales (kwh) and demand (KW).

The chart included in Annex II as Exhibit B indicates graphically by class of service the actual load 1950-1962 and estimated load growth 1963-1973.

It is interesting to note that the actual growth 1950-61 represents an average annual growth rate of about 14% and that the 1962-1973 projections average to a similar rate. An independent appraisal conducted by Battelle Memorial Institute in November and December of 1964 confirmed that these estimates were reasonable.

4. Power Generating Capacity

a. Existing

In the study area, existing generating stations have a total dependable generating capability of 698 MW. Those resources which are presently serving the interconnected system have a firm capacity of 656 MW. Under the expansion program, seven small hydro plants totaling 39 MW capacity now serving isolated systems will be brought into the interconnected system. The following tables give the dependable capacity of existing plants, hydro-electric and thermal:

EXISTING HYDROELECTRIC

PLANT	FIRM CAPACITY MW	
Plants Now Connected to System		
Sariyar	75	
Hirfanli	93	
Demirkopru	69	
Kemer	48	
Subtotal	285	
Plants to Be Connected to System Within Study Period		
Kayakoy	4	
Yerkopur	8	
Bunyan	2	
Sizir	7	
Durucasu	1	
Derme	4	
Hazar	13	
Subtotal	39	
Total All Hydro		324

EXISTING THERMAL ELECTRIC

PLANT	FIRM CAPACITY MW
Silahtar	100
Catalagzi	106
Tuncbilek	60
Bursa	5
Izmit	7
Karabuk	8
Ankara	15
Soma	40
Izmir	30
Subtotal	371
Maden*	3
Total	374

*Not presently tied to the interconnected system.

b. Generating Capacity Under Construction

Hydroelectric capacity under construction is as follows:

PLANT	FIRM CAPACITY MW
Sariyar Extension	75
Kesikkopru	76
Almus*	15
Hazar II*	10
Total	176

*Will not be tied to interconnected system at time of initial operation.

Thermal capacity under construction is as follows:

PLANT	FIRM CAPACITY MW
Tunchilek Extension	60
Anbarli (Istanbul)	220
Total	280

c. Scheduled Capacity Additions

The following hydroelectric projects are planned for construction to provide power and energy resources to meet increased loads in the forecast period:

PLANT	FIRM CAPACITY MW
Gokçekaya (Ciceroz)	300
Keban*	620 (4 units)*

*Provision made in design and construction for expansion by additional four 155 MW units as load growth and system operation require.

5. Peak Demand and Firm Capability of System Resources

The chart included in Annex II as Exhibit C shows graphically the scheduled capacity additions as developed by the Ebasco study and estimated peak loads to be met by the systems. The conclusion is inescapable that Keban (or similar capacity) will be required from 1970 to meet load growth requirements of the interconnected system. Actually, delayed construction starts to date have shown the time schedule developed for major capacity additions -- Istanbul (Anbarli), Ciceroz, and Keban -- to be optimistic by one to two years. This indicates that the current tight load versus capacity situation will continue through 1971 with some curtailment of demand unless other sources of generation are provided.

6. Keban Project Description

The project comprises a 620 MW hydroelectric development on the Firat (Euphrates) River in east-central Turkey with associated transmission facilities. Principal features of the project are a 510-feet high (above river bed) rockfill dam; a power plant with four 155 MW turbogenerator units installed initially, and provision for four future units; and an extra-high

voltage (380 kv) "back-bone" transmission line traversing two-thirds of the length of Turkey.

a. Dam and Power Plant

(See artist's perspective rendering, Frontispiece)

1) The Site - The Keban dam site is on the Firat (Euphrates) River at the upstream end of the Keban gorge a short distance below the confluence of the Firat and Murat Rivers. It is approximately 28 miles northwest of the town of Elazig and 320 miles east of Ankara. The Firat River above the dam site drains approximately 25,000 square miles of mountainous sparsely covered area in a basin about 265 miles long and 95 miles (average) wide.

2) The General Layout - The main dam section of rolled rockfill extends from the rock hillside on the right abutment to a high point on the left abutment a distance of about 2200 feet where it joins with the concrete intake structure. The intake structure which will accommodate an ultimate installation of eight penstocks lies between the main dam rockfill section and the spillway. The spillway structure is of concrete, with six openings for discharge of flood waters, each closed by a tainter (radial) gate. Water discharged through the spillway openings will flow downslope in a concrete lined channel to a flip-bucket and thence to the river. The space from the spillway structure to the left abutment is closed by a compacted earth fill section designed to function as a fuse plug (emergency spillway) in the event a flood of unanticipated volume occurs.

The powerhouse is located on the left bank just below the downstream toe of the dam.

The switchyard is located on the right bank of the river, opposite the powerhouse.

3) Dam - The main dam section will have a maximum height of 510 feet above river bed. The outside shells of the dam will be rolled rockfill. The central core will be of impervious material extending from bed rock beneath the river channel to the crest. Between the impervious core and the rockfill will be transition zones of selected filter material.

The intake section will be a concreate gravity dam with formed penstock entrances for an ultimate 8-unit installation. Steel roller gates and hoists will be provided for closure of the penstocks serving the four units to be initially installed.

Each generating unit will be served by an individual steel penstock of 17-feet diameter. Four penstocks will be laid on the surface between intake structure and powerhouse to provide for the initial installation. Bulkheaded steel stubs will be provided through the intake section to accommodate the future four units.

The spillway has been designed for a discharge capacity of 420,000 cubic feet per second (cfs) provided by six openings, each closed and regulated by a tainter gate with individual hoist. The gates are 40 feet high by 52.5 feet wide.

The fuse plug will be compacted earthfill with a central impervious core extending to a concrete cut-off wall. In event of a flood beyond the capacity of the spillway, the fuse plug will be breached and provide additional discharge capacity of 194,000 cfs. After passage of the flood, the fuse plug will be rebuilt.

4) Power Plant - The "semi-outdoor" powerhouse located on the left bank of the river below the dam consists of a concrete structure with individual steel hatch covers in the deck for access to each of the four turbogenerator units in the initial 620 MW installation. Provision is made for planned expansion to a seven-unit, 1085 MW installation with an eighth unit for peaking service not precluded.

The turbogenerator units consist of four Francis turbines each operating at 166.7 RPM under 427 feet net head developing 220,000 hp and connected to four 175,000 KVA, 3-phase, 50-cycle, 14,400-volt generators.

The switchyard will be located on the right bank of the river opposite the powerhouse. It will consist of 14 bays at 380 KV, three bays at 154 KV and six bays at 15 KV. The initial installation will accommodate two 380 KV transmission lines going out to Ankara (and thence to Istanbul) and two 154 KV lines going out to Elazig and Malatya respectively.

b. Transmission Facilities

(See Transmission Map of Turkey, Annex II, Exhibit D)

1) Line Location and Voltage

The bulk of Keban generation will flow westward to Ankara and Istanbul through two extra high voltage (380 kv) lines. Both lines will be routed Keban-Ankara-Istanbul with one of the lines "looping" via Ciceroz between Ankara and Istanbul. The transmission line distance from Keban to Ankara is approximately 375 miles; and from Ankara onward to Istanbul, 224 miles. (Although considered an integral part of the Keban transmission

system, financing for the single Ankara-Ciceroz (Gokçekaya)-Istanbul 380 KV line - designated the Ciceroz (Gokçekaya) loop - is covered under a prior loan authorization dated May 28, 1965.)

In addition to the 380 KV "backbone" system, a lower voltage system will serve the area east and south of Keban. This will consist of single circuit 154 KV lines aggregating about 300 miles in length serving Elazig-Hazar-Maden and Malatya-Adiyaman-Gaziantep-Urfa.

2) Substations

380/154 KV substation additions to facilities already provided for in connection with Ciceroz transmission financed under a prior AID Loan will be required at Ankara and Istanbul. 300 MVA will be required at Istanbul; protective and auxiliary equipment will be installed at Ankara.

154 KV stepdown substations totaling 230 MVA will be required at Elazig, Hazar, Maden, Malatya, Adiyaman, Gaziantep, and Urfa.

7. Power and Energy from Keban

Determination of the primary and secondary energy available at Keban were made for several alternative dam heights in order to select the economic height of dam and to choose the proper capacity installation. The energy determinations were based on stream flows recorded at the dam site in the 26-year period 1937-1963 with appropriate reductions for effect of evaporation from the reservoir surface and assuming a full reservoir upon plant commissioning. (See paragraph 10 d.1 following for discussion of downstream riparian rights and possible effect on initial reservoir filling schedule.) The principal dimensions and available energy for each of the alternative dam heights studied are as follows:

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Project Elevations - Meters					
Top of Dam	814	833	843	848	853
Top of Power Pool	811	830	840	845	850
Bottom of Power Pool	770	779	804	813	826
Average Tail Water	693	693	693	693	693
Reservoir Volumes - Million of Cubic Meters					
Power Storage	9 300	16 200	16 400	16 300	15 100
Dead Storage	3 800	5 400	11 000	14 300	19 100

	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5
Project Continuous Power-Megawatts	370	487	532	554	569
Project Annual Energy - Millions of Kilowatt-Hours					
Primary	3 241	4 266	4 660	4 853	4 984
Average Secondary	1 012	948	1 000	1 018	1 058
Average Annual	4 253	5 214	5 660	5 871	6 042
Project Net Firm Capability at Time of System Peak - Megawats	770	980	1 050	1 085	1 120
Primary Capacity Factor - Percent	48	50	51	51	51

Comparative studies of potential energy benefits with the cost of constructing the dam to alternative heights (determination of type and height of dam covered in a succeeding section) led to selection of Alternate 4 in the above tabulation. Thus the primary output for the project at Keban is equal to 554 continuous megawatts. Firm capability at time of system peak is equal to 1085 MW which gives a primary capacity factor of 51%.

Generating units of 155 MW each were chosen for the plant because they approach the maximum in weight and physical limitations that can be accommodated by transportation limitations and because units of this size are approximately equivalent to annual load growth on the system.

The Keban project has been recommended for ultimate development of seven units, all of which would be installed by 1979 based on load projections. At that time the capacity factor of 51% will be less than the estimated system load factor of 60% which suggests the system's eventual dependence on thermal energy to meet base requirements.

Against future peaking requirements, provision has been made in the intake section for a possible eighth unit. This provision can be made now at a reasonable cost -- less than one-half of one percent of project cost. Limitations of project layout preclude provision of more than eight units.

8. Cost of Energy from Keban

a. Project Cost Estimate

The estimated project cost exclusive of taxes and duties for an initial 4-unit 620 MW hydroelectric development at Keban with associated 380 KV and 154 KV transmission lines and substations is $79.9 million in foreign exchange and $230.4 million in Turkish lira for a combined total of $310.3 million. Summary cost estimates for the dam and power plant and for the transmission facilities are included as Exhibits E and F in Annex II.

b. Annual Costs

1) Operation and Maintenance

The annual cost of operation and maintenance of the dam and power plant is estimated to be $250,000 equivalent. Of this total about one-half represents maintenance supplies and materials. Major spare parts expected to be utilized during the life of the project will be purchased with the major equipment and capitalized as part of the Project initial investment.

Operation and maintenance costs for the transmission lines and substations are based on Ebasco estimates and Etibank standard practice. The annual costs are calculated as a percentage of capital investment, 0.3 percent per year for the transmission lines and 1.25 percent per year for the substations.

2) Interest and Depreciation

In the application and feasibility study interest on the foreign exchange component has been calculated at 3.5 percent per year and on the Turkish lira component at 6 percent per year. The amortization period has been assumed as 50 years, in accordance with prevalent U.S. practice, giving respectively interest plus depreciation factors of 0.04263 and 0.06344.

3) Taxes, Insurance, and Administration

Keban Hydroelectric Station will be owned and operated by DSI which is not subject to taxes of any kind. The transmission system will be owned and operated by Etibank which is subject to property and ad valorem taxes. However, since Etibank is a government-owned enterprise, taxes are omitted as a part of project economic cost.

For insurance and administrative expense, a nominal annual charge of 0.02 percent and 0.01 percent of investment have been allowed respectively.

c. Cost per KWH

The calculation for cost per kwh at station bus and at the end of the transmission system is shown in Annex II, Exhibit G. The transmission cost includes the Ankara-Istanbul "Ciceroz Loop" which was authorized under a prior loan. The average cost per kwh at the station bus is 0.268 cent. Average cost at point of delivery from the transmission system, after deducting transmission losses, is 0.378 cent (taxes excluded) and about 0.425 cent including taxes. These may be compared with the 1962 average wholesale price of Etibank of 0.99 cent.

9. Economic Justification of the Project

Once the need for the project's output -- in this case, a quantum of electric energy -- has been established, economic justification of the project from the engineer's point of view involves two basic considerations:

i) Project components must be designed for lowest cost within technical soundness limits.

ii) The project as a whole must provide benefits at less cost than feasible alternatives.

This section will therefore deal with the economic determinations of principal project features and benefit-cost comparisons of the entire project with alternative developments.

a. Type and Height of Dam

Three types of dam were studied in detail for the site -- concrete gravity, concrete arch, and rolled rock-fill -- with the rolled rock-fill found most suitable from a technical and cost standpoint at the optimum height.

The economic height of dam was arrived at by comparing benefits to be obtained from increasing energy and capacity potentials with increasing costs of construction, relocations, etc. as the height of dam increased. Complete estimates were made for five different reservoir elevations. These various installations were compared with reasonable thermal alternatives to determine the reservoir level at which incremental cost becomes greater than incremental benefit. Optimum development of Keban was indicated at a power pool elevation of 845 meters which is that selected for the project.

b. Determination of Transmission Line Voltage and Conductor Size

1) The Ebasco Report included a comprehensive study of transmission line voltage and conductor design. The Keban installation together with long range forecasts of capacity and loads in the interconnected area were studied at 287 KV, 380 KV, and 500 KV. 380 KV was selected on a comparative annual cost basis.

2) After the voltage level was set, an evaluation was also made of most suitable conductor size. This study included ACSR conductor size 795 MCM, 954 MCM, 1033 MCM and 1272 MCM. A phase bundle of two 954 MCM ACSR was selected for project design on a comparative annual cost basis.

c. Comparison of Keban site with Alternative Hydro sites

Detailed studies by Ebasco which compared Keban with various potential hydroelectric development sites in Turkey led to the following conclusions:

1) No other single hydroelectric project nearer to the Northwest Anatolia system load area than Keban can provide the large amount of base load prime power that is required to meet the forecast demand.

2) No combination of projects on a river system nearer to load centers than the Firat can provide the required power.

3) Reconnaissance studies of hydroelectric possibilities in other river basins show the Western Mediterranean, Ceyhan and Yesilirmak basins to be most promising. Of these, the Western Mediterranean has the most power potential and is closest to load centers.

4) The maximum potential for projects in the Western Mediterranean basin is 3,180 million kwh average per year in 19 projects, which may be compared with 5,871 million kwh average at the single Keban Project.

5) Comparison of the eight best Western Mediterranean projects, at reconnaissance estimates of cost, indicates a potential energy output less than half that of Keban at a cost almost twice as great.

d. Comparison with Alternative Projects - Benefit/Cost Analysis

The comparison of the Keban Project with alternative resources was made by Ebasco on a number of bases in a manner consistent with criteria set forth in the Memorandum of the President date May 15, 1962.

At AID request, comparisons were made excluding taxes, import and custim duties. Further, taking into account potential projects in the West Anatolia (Izmir) load area and the area around Elazig, AID requested that supplemental studies be made excluding these load areas.

A summary of the more significant alternatives studied to establish benefit-cost comparisons on the above basis are as follows:

1) A direct comparison of a three-unit installation at Keban with a three-unit thermal plant, all transmission costs being charged to Keban.

2) A direct comparison of a four-unit installation at Keban with a four-unit thermal plant, all transmission costs being charged to Keban.

3) Plan CK-1, which phases Ciceroz hydro and Keban plus Izmit thermal units, and appropriate transmission.

4) Plan T-1, an alternative thermal plan including a third unit at Istanbul followed by units at Izmit, and appropriate transmission.

5) Plan CTK-1, delaying Keban by three years, meeting the intervening demand by a third unit at Istanbul followed by a thermal unit at Izmit, with appropriate transmission.

6) Plan TK-1, in order to determine Ciceroz benefits, consisting of 2 units at Istanbul followed by Keban, with appropriate transmission.

7) Plan CEK-1, with completion of Keban accelerated by one year with appropriate transmission.

8) All of the above comparisons but giving effect to the taxes, etc., that actually will be charged on thermal investment, transmission line and substation investment, operation and maintenance, and on imported fuel oil. All schemes have the same basic letter designation as above with the suffix "T". The loading schedules were revised to increase load on the plants burning indigenous fuels which, in this case, are cheaper than plants burning imported oil.

In order to make meaningful comparisons with a high initial investment project as large as Keban, it was necessary to establish the probable schedule of installation of each unit in a growing system load and to compare this with an alternative thermal installation (because of limited energy produced at existing and potential future hydro installations) whose investment could be better timed to fit the load requirements. Similarly a series of preliminary power flow studies were made to form the basis for transmission investments associated with each of the alternative plans for capacity additions.

Exhibit H of Annex II shows a direct comparison of annual costs between Keban initial 4-155 MW installation and an alternative thermal installation.

Exhibit J of Annex II shows Load and Capacity Schedules developed for comparison of alternatives described above.

Exhibit K of Annex II shows Present Worth of Investment and Levelized Annual Costs developed for comparison of alternatives described above.

Exhibit L of Annex II shows Benefit-Cost Comparisons <u>without</u> Taxes on Investment and Fuel.

Exhibit M of Annex II shows Benefit-Cost Comparison with Taxes on Investment and Fuel.

By comparing the above alternatives, a number of significant conclusions may be drawn:

1) The Keban Project is economically justified when based on the rigorous load area criteria mentioned above, the benefit-cost ratio comparison with the best thermal alternative being 1.483 to 1 in favor of Keban.

2) Addition of other load areas such as West Anatolia (Izmir) and the local area around Elazig are not necessary to demonstrate Keban feasibility; however, they will serve to accelerate installation of its ultimate capacity.

3) Even when the entire cost of transmission to load centers is charged against the Keban project, it is economically more favorable than equivalent thermal capacity without charging any transmission against them.

4) The effect of delaying Keban will increase the cost of power.

5) Acceleration of the Keban schedule would benefit the system.

IN SUMMARY, BENEFIT-COST EVALUATIONS MADE IN ACCORDANCE WITH THE REQUIREMENTS OF SENATE DOCUMENT NO. 97 FIRMLY ESTABLISH THE ECONOMIC FEASIBILITY OF KEBAN PROJECT.

e. Secondary Project Benefits

There is great potential for irrigation and hydroelectric power in the reaches of the river below Keban. For example, a study made of land areas in the lower Firat basin susceptible to benefits from irrigation indicates that there are about 900,000 hectares of potential irrigable area which upon 70% development could contribute some 1400 million TL annually to net national agriculture income. Future water resource projects such as Karakaya and Karababa in Turkey, and Tabka in Syria, will benefit substantially from the storage and firming of stream flow provided by Keban. However, since Keban is the first major improvement in the basin and it is uncertain when further development will come to fruition, no economic value has been assigned Keban project for such secondary benefits.

A review was made of other possible project benefit items such as navigation, flood control, recreation, wildlife and fisheries; however, economic value deriving from such benefits was considered too marginal

for inclusion in benefit-cost computations. Further, as noted in Section IV, Keban is likely to stimulate significant development in the industrial sector.

10. Technical Soundness of Project

From the engineer's point of view, the Keban project presents no unique technical problems; in the context of its construction and operation in Turkey. Keban is an extraordinary undertaking which for orderly accomplishment will require careful attention throughout design, construction and initial operation stages.

a. Design

1) Dam and Power Plant

The detail design of the dam and power plant has been prepared by Ebasco Services, under an engineering services contract with EIE. Further, under sponsorship of AID, a technical study team of the U.S. Corps of Engineers reviewed the project for technical soundness and adequacy of cost estimates. Recommendations with respect to foundation treatment and dam design details which evolved from this study are being incorporated in the final design and have been included in the cost estimates. Supplementary flood hydrology studies recommended by the Corps of Engineers have been undertaken by EIE and Ebasco. Upon completion, these studies will be referred to the Board of Consultants (a recommended condition to this Loan) for consideration and resolution of outstanding questions with respect to project design flood determination and associated spillway capacity.

2) Transmission

Preliminary transmission design was made by Ebasco as a part of the project feasibility study. Final detail design will be made under an engineering services arrangement subject to AID approval.

b. Construction

1) Dam and Power Plant

DSI will be the Turkish agency responsible for construction. The work will be done primarily through construction contractors; major permanent equipment - turbines, generators, etc. - will be procured under supply contracts. A consulting firm satisfactory to AID will provide engineering and construction management services to DSI during the construction phase of the project. A Board of Consultants will also make periodic examinations of the work and be available for consideration of special problems that may arise.

2) Transmission

Etibank will be the Turkish agency responsible for construction. Work will be accomplished primarily through construction contractors. Engineering and construction management services will be provided to Etibank under an engineering services arrangement satisfactory to AID.

c. Operation

1) Dam and Power Plant

DSI has had considerable hydroelectric experience and should have no difficulty with operation of Keban after initial start-up "bugs" are overcome. An engineering construction management contract with a qualified firm will provide start-up specialists to assist in this phase. Timing of initial operation is closely related to the question of international riparian rights downstream and consequent effect on the reservoir filling plan. This situation is discussed at some length at the end of this section under "Difficulties Foreseen".

2) Transmission System

Etibank has no experience in the operation and maintenance of 380 KV facilities although a beginning is expected to be made by 1970 with the Ciceroz loop portion of the line initially serving only the Ciceroz (Gokçekaya) Hydro station. Provision will be needed for an extensive training program to include reactive switching, radio interference and corona measurements, conductor handling, dispatching, insulator cleaning, and other operation and maintenance techniques. Turkish engineers will need to be trained in foreign countries and foreign experts will be needed to direct the initial efforts of these trained engineers in Turkey. Provision has been made in the cost estimates for these services.

d. Difficulties Foreseen

1) Downstream Water Rights and Reservoir Filling Plan

The proposed reservoir filling plan has been tested against such data on downstream water requirements as are available to AID. These data indicate that while there is some consumptive use (irrigation) in Syria, it will not be affected to a large extent by the Keban filling operation.

The major downstream useage is in Iraq which receives residual water after Syrian uses have been met. A report prepared for the Iraq

Government by the consulting engineering firm Knappen-Tippetts-Abbott and McCarthy in 1952 showed that the then existing consumptive use was on the average of six billion cubic meters of water per year with heaviest requirements in the spring months. A proposed level of development known as "Plan A" projected a future annual requirement of around twelve billion cubic meters per year and a "Plan B" of around 15 billion cubic meters. In effect, AID has tested the proposed filling schedule against a water requirement of something more than the six billion requirement and something less than the twelve billion requirement. This is on the presumption that there has been an increase in water requirements in Iraq since 1952 but that the level of "Plan A" has not yet been reached.

During the period when the Keban Reservoir is being filled, the Government of Turkey plans to release downstream natural flows up to 350 cubic meters per second. All flows above 350 cubic meters per second would be retained in storage. On this basis and with average stream discharge, the reservoir would be filled during the third spring runoff after closure. During prolonged periods of low runoff, the filling of the reservoir would be delayed somewhat; during period of high runoff, the reservoir would almost fill in a single year.

A review of the information available indicates that the probability of being able to fill Keban reservoir in accordance with the GOT announced filling plan, without adverse effect on the water users in Iraq, is about two out of three. This probability is considered as very approximate as it is dependent on the amount of use in Iraq and available information is not very definitive. More important, in the event of a low runoff year such as 1951 the filling plan would have serious consequences in Iraq. It would virtually dry out the river for a short time and would create a serious water shortage in every month of the year, even with the lowest reasonably assumed amount of water use in Iraq.

Under low runoff conditions, the Keban reservoir would fill rather slowly under the GOT plans. The records in the Ebasco report of January 1964 indicate that 1961 was the driest year of the 27 years of record at Keban. In that year only 6 billion cubic meters of water would be retained by the GOT under its proposed filling schedule. This is only one fifth of the capacity of the reservoir. This may be compared with 10 billion cubic meters retained in an average year.

Under conditions such as those of 1950-51, the records indicate a loss of water between Keban and Hit (in Iraq) in most months. Analyzing the GOT filling plan, the 1950-51 data indicate that in nearly every month there would have been serious deficiencies in the supply in Iraq and the stream would probably have dried-up entirely at Hit during March.

The year 1937 was the ninth driest year of the 27-year record at Hit. Using the requirements of "Plan A" (12.1 billion cubic meters) it was found that the filling plan proposed for Keban would just barely allow for the irrigation uses in Iraq. Therefore, it may be concluded that if the useage amounts to about 12 billion cubic meters per year, the filling of Keban as proposed would present problems. The probability of occurrence of such a year based on the available record is about one year out of three.

Examination of the Keban power operation studies in the Ebasco report of January 1964, indicate that Keban reservoir will not interfere with downstream uses after the reservoir goes into full operation if the uses in Iraq do not exceed the 12 billion cubic meter level. The possible exception to this might be in rare instances of extreme drought (worse than available records show) when the releases for power from Keban might be relatively small and the steam would be losing water.

In summary, it must be recognized that there are factors affecting the filling of the reservoir, and hence the schedule for initial delivery of power benefits from the project, which are not subject to precise control. In the final analysis, the time required to fill the reservoir will depend to large degree on the vagaries of nature and the scale of water releases required for Turkey to meet its obligations to downstream water users which the IBRD expert mission, discussed in section VII, will help determine. In any event, the basic soundness of the project will not be compromised.

2) Management of the Project

With multiple-source financing and two owners for the project - DSI for dam and power plant; Etibank for transmission - such ordinarily commonplace matters as review and approval of tender invitation documents, technical standards, contract approvals, etc., may become difficult to handle in an orderly fashion. The details of how the project is to be operationally managed - technical and financial - through completion of construction remain to be worked out with the Turkish agencies and financial donors involved. This is a matter of utmost importance to orderly implementation of the project and it is recommended that development of a "modus operandi" satisfactory to AID be a condition of this Loan.

3) Technical Coordination

Many and diverse engineering, procurement and construction operations involving two owners and spread over a large geographical area must be meshed to assure concurrent progression toward overall project completion. It is considered essential that a highly qualified and experienced engineering services firm be employed to assist the owners in

maintaining control of the multiple operations involved in overall project implementation.

11. Conclusion

The project is technically sound and economically feasible and the estimate of construction cost is reasonably firm. Areas of likely difficulty during construction and initial operation have been identified and are judged capable of resolution.

AID-DLC/P-353
June 22, 1965

IV. ECONOMIC ANALYSIS

Other parts of this paper deal with the two primary economic considerations involved in appraising this project: the expected rate of growth in energy and power demand, principally from industrial consumers and whether or not the Keban project, at the proposed time, scale, and technology, represents the soundest investment in power facilities to meet the demand. There are other economic dimensions to the project, however, the principal of which will be treated here. They are (A) the impact of the project on the development of the industrial sector, with particular reference to the Turkish balance of payments, (B) its effect in upgrading standards of living, and its particular impact on the development of Eastern Turkey, and (C) the local currency burden of the project on the Government of Turkey's budgetary resources.

A. Industrial Growth

Fundamentally, Keban is proposed as a necessary response to the needs of a growing industrial sector; it should be viewed as a stimulus to economic development as well as a response, however. In the first instance, the provision of an ample, dependable supply of electricity will have a direct impact on the level of industrial production and productivity. In their discussions with managers of manufacturing plants around the country, the technical economists working on the Battelle study found repeated examples of cases in which power failures or the slippage of voltage below acceptable tolerances, stopped production and involved delays and expense in startup operations upon the return of power. The manager of one tire manufacturing plant indicated that a 3-minute power loss can cost 20,000 TL ($2.2 thousand), because very often the material in the molds at the time of failure has to be scraped out before production can resume. Similar complaints were heard from a private plywood factory in Istanbul. The manager reports that fluctuations in line voltages made operation of electric motors more difficult, and that interruptions in the flow of electricity caused glue to act in the pots and applicators. The nitrogeneous fertilizer plant at Kutaya is also a victim of irregularities in the availability of power. From the beginning of 1962 through June '64, Battelle reports that almost 2000 tons of ammonia worth 9.1 million TL were lost because of power interruptions. In addition to these direct economic costs of power shortage, there are also the indirect costs in the form of extraordinary "standby" generating units that industries must maintain to protect themselves against power failures.

The presence of firm, reliable power from Keban will add to the attractiveness of Turkey to private investors interested in industrial ventures. Investment in alternative generating facilities might also satisfy this requirement, but from an economic viewpoint what distinguishes Keban is the low price at which it can produce energy and deliver it to major load centers. Ebasco Services, Inc. estimates that with four units installed, electric energy in Istanbul would cost about 3.67 kurus, (0.41 cents) per Kwhr. This was about one-third of Etibank average wholesale price in 1962.

The effect of this low cost energy in stimulating industrial expansion will vary widely according to the type of industry. Many industries such as textiles and food processing would be affected only marginally. Energy costs are usually only under 5 percent of their total costs. Other industries such as tire, and cement manufacturers, would be assisted significantly by the availability of a large bloc of inexpensive energy, but are likely to give only secondary weight to this factor in making investment decisions. There are industries, however, where the availability of substantial loads of low cost power is one of the controlling factors in determining the scale and technology of new facilities, as well as whether to make the investment at all. This is particularly true in the field of electrical metallurgical operations where the cost of electricity can constitute 20 percent or better of the value added at that stage of processing. The Battelle report identifies six prospective industrial projects in which the cost of electric power will significantly influence the feasibility of the enterprise. Although other considerations may eventually control the investment decisions, Battelle suggests that the project could not even be considered unless adequate, reliable, low-cost electricity were available. They are:

(1) Maden area iron and steel operation(electric reduction)

(2) Guleman area ferrochromium plant

(3) Ergani area electroeytic copper refinery

(4) Maden area superphosphate plant

(5) Seydisehir area alumina and aluminum reduction plant

(6) Black Sea area copper smelter/refinery

Industries, such as the above will play a key role in Turkey's future development. These projects are consistent with the Government of Turkey's intention to further the industrialization of the country by exploiting more fully its primary resources and encouraging the development of related industries. In the past few years, assisted by U.S. technical and capital assistance, an extensive program of mineral exploration has revealed that Turkey is endowed with deposits of various minerals of sufficient size and quality to justify commercial exploitation. Wherever feasible, the GOT plans to process these resources into materials that can be directly used in the fabrication of final goods,rather than exporting them to be refined by and for the benefit of more developed economics.

For example, although Turkey has the raw materials for producing iron and steel, its productive capacity for these metals has lagged behind its internal demand and in recent years, Turkey has exported both iron ore,and bituminous coal, while importing finished steel. In this process, Turkey has paid the "middle man," the more highly developed steel-producing countries which have reaped the benefits of the value added at this stage of production, which can be considerable. For example, in the process of reducing alumina to aluminum ingots, the value of the material is increased by almost 400%.

These finished metals will be needed to meet the increasing domestic demands for materials used in the manufacture of the variety of industrial and consumers goods required by an increasingly complex economy. In addition, increased production of these metals will contribute to the goal of quickened relief from Turkey's chronic balance of payments difficulties. The USAID's Assistance Completion Plan poses certain assumptions about the rate and direction in Turkish growth which would lead to an elimination of Turkey's dependence on external concessional financing by the early 1970's. By broad commodity category, the Mission projection sets forth illustrative targets for 1973 for exports. It suggests a shifting pattern of exports from agricultural to industrial products, thus reflecting the belief that a healthy trade position will depend in greater and greater measure upon Turkey's ability to produce such goods at competitive quality standards and prices. The projection suggests that export of minerals and metals should climb from $27 million in 1964 to $95 million in 1973, an increase of more than 250%. Under these assumptions, in 1973 exports of these products would constitute 12% of the total exports rather than 7% as they did in 1964 and manufactured goods would rise from 1% of exports in 1964 to 14% in 1973. Underlying these export figures, it is assumed that major strides would be taken to develop the mineral and metallurgical industry. If Turkey is to maintain an adequate increase in

the growth in value of her exports, these steps will have to be taken since non-agricultural goods show more potential for export expansion that Turkey's traditional goods. A wider variety of exports will also provide a greater measure of security against serious fluctuations in export income.

American Companies considering investment in the Turkish aluminum industry told the Battelle team that the difference between 2-$\frac{1}{2}$ and 3-$\frac{1}{2}$ Kurus per Kwhr could mean a difference of $20 per ton of pig aluminum. This could make or break a plant selling internationally. Turkey is going to have difficulties enough in meeting international price and quality standard for metals and manufactured goods; every factor that can contribute to the reduction of these costs should be cultivated. In the metallurgical industry where the price of energy is a significant cost item, Keban will offer Turkish producers a comparative advantage in this one area.

The level of Turkish imports as well as of exports will be closely related to the expansion of the industries which have the greatest relative need for power at reasonable rates. A specific example of a project with significant import substitution implications is the superphosphate plant mentioned above as one of an illustrative six that will be influenced by the cost of power. The GOT now recognizes that increases in agricultural productivity can be accelerated by a major increase in the application of fertilizer, but at present and in the next few years, increased consumption implies substantial increases in imports.

B. General, and Regional Development Impact

Assuming that the benefits of this cheap power will be passed on to the consumer, it is clear that Keban will directly enhance the standard of living of Turkish citizens who will have electricity for radios, lights, and appliances at more reasonable rates than currently apply. Another of Keban's effects will be its impact upon Eastern Turkey. By all indices, this region lags seriously behind the more advanced industrial and agricultural regions of Western Turkey.

Among the ways in which the effect of Keban on this region will be felt are the following:

1. The very size of the investment insures an appreciable direct impact upon the level of economic activity in the immediate region. Various associated capital investments will have to be made, including roads, airports and cement factories, as well as

schools and hospitals for the many thousands of technicians and laborers who will be involved in the project before it is completed. The market for consumer goods will also be greatly stimulated by this influx of people.

2. Electricity will be available to regions that previously had none available. In addition to directly benefiting the people in Eastern cities, the availability of cheap power in this region may attract industry which would otherwise tend to locate in Istanbul. Now, more than 50% of the value of Turkish manufactured goods is produced in or around Istanbul. Turkey's mineral wealth is located primarily in the East and, as noted earlier, the cheap power from Keban is likely to enhance the feasibility of processing these minerals within Turkey. It will normally prove wiser to undertake these metallurgical operations near the mine head rather than pay the transport costs for the raw mineral to processing facilities in cities in Western Turkey.

C. The Local Currency Burden

Within the national budget, which may exceed 17 billion TL in 1968, there are ample funds to finance this project without seriously displacing other important investments or current expenditures. Assuming an annual increase in GNP of 6% (rather than the 7% called for by the Plan) and a growth rate in government investment expenditures consistent with recent experience, the government outlay for Keban will constitute only 6% of public investment in the peak year for local expenditures, 1968. In their report, the Battelle team suggests that the domestic capital needs for Keban will represent approximately the same proportion of total national investment in 1968 as Eregli did in 1963.

While there is no question that Turkey will have the capacity to cover the local currency cost of this project, with regard to the financing of the project, the real question is one of the Government's willingness in later years to accord this project the priority it now assumes. Strictly speaking, this is more a consideration growing out of our concern for the effective implementation of the project than it is an economic consideration. That concern is that implementation of the project not falter because sufficient local currency cannot be made promptly available when needed.

In fact, for several reasons, our judgement is that there will be few difficulties in this regard. Not the least of these is the importance

that this project has assumed for the Turkish public. As the only single project mentioned in the first Five-Year Plan, it is that country's symbol of development. Both the Inonu and present Administrations have made clear through diplomatic representations that this project carries a high political value. Nor is this a matter for partisan politics; in June, 1964, the Turkish Parliament unanimously gave its blessing to the project and, for future reference, the public power "lobby" is known to be among Turkey's most effective.

Three other factors help allay concern on this question: (1) The GOT's anticipated written assurance that it will cover any and all overrun costs--either lira or foreign exchange, (2) Because Keban is in the public domain, there will be no confusion--as there has sometimes been in the case of Eregli--as to the responsibilities of the government in providing lira financing. (3) The construction, management, and financing of Keban will be monitored for the Syndicate probably by IDA. We believe this institution, by virtue of its reputation for fairness and competence, but more importantly because of its apolitical nature, will be particularly effective in getting the Turks to meet their financing responsibilities if such a need arises.

As a result of these above considerations, we are not inclined to doubt the willingness of future Turkish governments to make sufficient financing available. However, there are bureaucratic reasons why the Turkish government--always in a bad liquidity situation with regard to financial resources and with a particularly inflexible budgetary system--might have difficulty in making lira or foreign exchange available on a prompt "as needed" basis for unforeseen contingencies. For this reason, we intend to discuss with the GOT and with the other lenders, the desirability of establishing a special lira holding account from which funds could be made available for costs not anticipated at the time that decisions were made on the annual budget.

D. Effect of Loan on Private Enterprise in Turkey

Of the total amount of money being loaned, it is estimated that:

1. None is being loaned directly to private enterprise.

2. None is being loaned to intermediate credit institutions for relending to private enterprise.

3. Three dollars of every four disbursed for this project will be for direct project costs. None of these funds will be used to finance imports by private enterprise or for the use of private enterprise in Turkey. For every three dollars of direct project costs one dollar will be made available to the GOT to finance the import of program commodities from the U.S. It is estimated that more than half of this amount will be imported or used by private enterprise in Turkey.

4. None is being loaned to the Turkish Government to finance project work (including procurement) done under contract by Turkish private enterprise.

5. None is being loaned to a mixed enterprise. This loan is being made to the Government of Turkey.

6. None is being loaned to the Turkish Government for the direct purchase by the government for its own use of goods from Turkish private enterprise.

As described in this section IV, this loan should have a considerable, though indirect, impact on the development of private enterprise in the host country.

V. FINANCIAL ANALYSIS

A. Financing Plan - Background

As part of an overall effort in the Turkey Consortium to obtain greater support for Turkey's Development Plan on the part of other members, the U.S. sought participation in Keban financing by other lending agencies. Germany expressed an early interest and set aside $20 million. IDA at first considered only a token contribution but later, having reassessed its role in Turkey, decided to make available $25 million. EIB, which is committed to lending $175 million over a five-year period, became interested in making $50 million available for Keban.

On this basis, the U.S. sought a meeting of interested countries and persuaded the IDA to call it. Chaired by Mr. Raymond Cope, Director Europe and Middle East of IDA, the first meeting was held in Paris on March 18, 1968 and was attended by France and the U.K., in addition to the lenders mentioned above. France indicated a pledge of $10 million on hard terms. A practical formula for mixing EIB and its members' funds proved difficult because of the absence of Italy. Also the U.S. was not prepared to let Italy bid with EIB funds and perhaps win the prime construction contract without a bilateral contribution. Nor were we and Germany prepared to accept the hard terms offered by France. The group tentatively decided to form a "syndicate" for Keban and agreed to meet again for further consideration of a financing model since there was not agreement in the first meeting.

A second meeting of the syndicate was held in Paris, April 12 with Italy attending and indicating a pledge of $10 million. Again, EIB and its members had not worked out a formula. The main problem was the French terms since Germany was not willing to give French bidders equal access to EIB funds in face of a French contribution on hard terms. A bid evaluation formula to take into account financing terms was considered but no agreement was reached. Mr. Cope proposed that France reconsider its terms and asked the U.S. to retreat from its position that no funds should be provided at terms harder than 3% with 25 years maturity including a seven-year grace. He proposed 4% with 15 years maturity including a five-year grace.

The third meeting, held in Paris April 28, this time also attended by Austria and Switzerland, finally agreed on a financing model made possible by a liberalization of French terms to meet the compromise suggested by Mr. Cope. A copy of the model is attached as Annex I.

B. Financing Plan

Subsequent to the last meeting of the Keban Lenders' Syndicate in Paris on April 30, 1965, the International Development Association (IDA) sent out to the prospective lenders a letter dated May 29, 1965 attaching a "Financing Model-III" and requesting agreement in principle to proceed with the financing. As of 18 June 1965 affirmative responses have been received by IDA from the European Investment Bank (EIB) and the German and French governments. Copies of all of these documents are reproduced in Annex I. A copy of the reply the U.S. is sending is also reproduced therein. A favorable response is also anticipated from the Italian Government. Additional small pledges by Austria, Switzerland and Canada and possibly Sweden and the UK may be forthcoming but for purposes of this paper we are not assuming any financing from these countries.

AID has requested and expects to receive before this proposed loan authorization is acted upon from the Government of Turkey a statement of willingness to provide the balance of the local currency and any additional foreign exchange required for completion of the project.

It should be noted that the total financing in all currencies exceeds the total project cost estimate of $331.8 million, by $9.4 million. This is the amount of extra foreign exchange financing over estimated requirements. Actually, depending on the local availabilities of some construction material and permanent equipment, the degree of protection afforded local production in the bidding scheme and the estimate of the situation by the successful bidders some fairly significant cost items could shift from a local to a foreign exchange cost. There are also costs for indirect imports required for relocating railways and roads for the project, part or all of which may be financed by the lenders from their loans. Not only is there the above $9.4 million of foreign exchange to finance such additional costs, but use of the IDA pledge is flexible as between financing local and foreign costs.

As can be ascertained by comparing the figures in the proceeding table all bilateral lenders and the EIB have agreed to disburse $1 equivalent for local currency costs for every $3 equivalent disbursed for foreign exchange costs. The background and justification for this arrangement and the release mechanism for the U.S. portion are discussed in section VI below.

The bilateral plus EIB funds for direct project costs will be available for the construction of the dam and powerhouse and then the purchase of the turbines and generators. Bilateral and EIB funds remaining, plus any additional required (which would be obtained from the IDA pledge), will be utilized to import other permanent equipment for the dam and powerhouse, equipment and services for the transmission lines, and either directly or indirectly possibly equipment and services for relocating railways and roads.

Further details including as yet unresolved problems of implementing and coordinating the financing plan are given in section IX below.

C. Cost of Production and Revenues From Sale of Project Energy

The Feasibility Report has determined the cost of energy from the Keban Dam and Hydroelectric Project at the station bus and at load center for a 4-unit 620 MW installation. Further studies have been made by Ebasco to determine the cost of energy over a long range projection for an ultimate 7-unit installation. The studies also include a comparison of the cost of project power with the revenues to be received by Etibank in its sale. They show that project revenues under existing rates will be greater than twice the cost of production and transmission.

The following table shows the long range cost of energy production at Keban Dam and Hydroelectric Project plus the cost of 380 kv and 154 kv transmission to load centers. It also shows the revenues that will be

received for Keban power and energy, assuming that Etibank rates in effect in 1964 will be applied.

The production and transmission costs have been determined as shown by the table. Project revenues are based on actual Etibank experience for 1962 which, giving effect to established discounts, resulted in an average annual revenue from the demand charge of TL 151.70 ($16.80) per kw per year and an annual revenue from the energy charge of krs 6.03 (0.67 cents) per kilowatt-hour.

The outline of the financing plan as developed by the Capital Assistance Committee is as follows:

KEBAN PROJECT FINANCING PLAN & TOTAL COST

($ Million equivalent)

	Total	Direct Project Costs	Local Currency Costs
United States	$40.0	$30.0	$10.0
Germany	20.0	15.0	5.0
France	10.0	7.5	2.5
Italy	10.0	7.5	2.5
European Investment Bank	30.0	22.5	7.5
International Development Assn	25.0	-	25.0
Sub-total	135.0	82.5	52.5
Turkey	206.2	6.8**	199.4
Total	341.2	89.3	251.9
Keban Dam and Power Plant	241.7	51.8	189.9
Keban Transmission Facilities	90.1	28.1	62.0
Total Project Cost Estimate*	331.8	79.9	251.9

* Includes contingencies, taxes, duties, and interest during construction.

** Interest on foreign debt during construction.

KEBAN DAM AND HYDROELECTRIC PROJECT
COMPARISON OF PRODUCTION COSTS
WITH REVENUES*

	With Taxes a/ ($ - 000's)	Without Taxes ($ - 000's)
CAPITAL INVESTMENT		
Generating Station		
Foreign Exchange	58 690	58 690
Local Currency	194 715	194 715
Transmission System b/		
Foreign Exchange	53 004	53 004
Local Currency	58 784	30 049
ANNUAL COST		
Fixed Charges	20 952	19 120
Generating Station		
Foreign Exchange 4.293%	2 519	2 519
Local Currency 6.374%	12 411	12 411
Transmission System		
Foreign Exchange 4.293%	2 275	2 275
Local Currency 6.374%	3 747	1 915
Operation and Maintenance, Taxes	1 335	574
Generating Station	250	250
Transmission System	1 085	324
Total Annual Cost	22 287	19 694
Annual Project Revenues c/	48 250	48 250
Ratio of Project Revenues to Costs	2.16	2.45

Notes:

a/ With taxes that Project actually will incur, including import duties and property taxes.

b/ Total cost of 380 kv transmission system Keban-Ankara-Istanbul and 154 kv local system included in the Report entitled "Engineering and Economic Feasibility of Keban Dam and Hydroelectric Project."

c/ Gives effect of reduced capacity values until all units installed.

* Based on present worth of total capital investment (1085 MW plus additional transmission) as projected through 1979 and present worth of levelized annual revenues.

In Appendix II, there is a financial forecast for the years 1963-1973 prepared by Ebasco in 1963 for the Northwest, West and East Anatolia Interconnected Systems. It shows the net profit before income taxes for the system just about nil on a cumulative basis through 1969. (Actually, Etibank Electric Operations Directorate is apparently continuing to lose money and this loss is in effect being made up by transfers from Etibank's profitable mining operations.) The 1963 Ebasco forecast, however, indicates a significant profit before taxes position beginning in 1970 when the projection shows Keban power starting to become available. The following section describes some solutions to the financial problems of the Turkish electric utility industry.

D. Financial Considerations Re Institutions Producing and Transmitting Keban Power

A.I.D. has made a number of loans for development of the power industry in Turkey over the past several years and has been concerned with the structure and operation of the GOT's power generating and distributing agencies. These is a similar concern within the GOT as indicated by the fact that remedial legislation has been prepared and presented to the Parliament. This legislation, which is commonly referred to as the "TEK legislation", would provide for the establishment of a central Turkish Electric Authority which would operate along the lines of a private utility in developing the electrical power industry of Turkey.

AID has also been concerned with the financial practices of DSI and Etibank, the two government agencies that will have responsibility for executing this project and, under the existing legislation, also for operating the resulting facilities. The relevant material in Annex II, Exhibit R, indicates that as an instrument of the Turkish government concerned with the development of the nation's water resources, DSI's activities are financed largely through appropriations from the annual budget. It appears that its generating plants operation should be separately accounted for and if not already self sustaining perhaps should be put on that basis.

Etibank will be the executing agency for the transmission lines portion of the project and would also be the operator-owner of the completed transmission line system. Etibank's financial situation is dealt with in as much detail as is presently available in Pages 13 through 21 of the recent loan paper for A.I.D. Loan 277-H-059, Overhead Transmission Lines to 32 Load Centers, authorized April 30, 1965. In that loan paper, it is pointed out that Etibank, which operates banking, mining, and other activities as well as power distribution facilities and limited power generating facilities maintains a basically sound capital structure with borrowed and owned long-term resources in a stable and healthy relationship of 1.5 to 1.0. It is also pointed out, however, that

Etibank's overall profitability is declining, mainly due to rising costs of sales, increasing interest and commercial expenses and loss write-offs. Its liquidity has suffered as a result, with new investments in fixed assets (buildings, plants, equipment) placing further demands on current financial resources. Etibank's power distribution arm, the Etibank Electric Operations Directorate (EEIM), has been suffering from the profit squeeze with the rest of the organization. Its costs, mainly for the purchase of power, are increasing more rapidly than income from the sale of electricity. A 10% increase in the selling price of electric power is projected for 1965, but it is expected that this will be insufficient to wipe out an expected loss this year of TL 11.7 million.

On the basis of the presently available information, a number of reforms can be suggested. For Etibank as a whole, initial steps would include the adoption of a new accounting system, the establishment of better financial controls, and the establishment of profit centers with clear performance responsibility. As for EEIM alone, initial corrective measures might include (a) the separation of EEIM into a financial entity with its own capital and operational resources; and (b) the establishment of clearly determined profit responsibility and one control account showing individual profit transfers. In addition, in an effort to improve EEIM's profit picture, a thorough investigation should be made of (a) rising production costs, particularly for outside power, and (b) the present electric sales tariff, its impact on industrial and individual consumers, and the effects of its further upward revision.

However, the pinpointing and carrying out of specific measures will require further study and the assistance of experts with knowledge of modern financial, accounting, and operational techniques. The GOT has been endeavoring to obtain such assistance and arrangements are now being made with the IBRD for a team of utility experts to provide the needed assistance over a 2-year period beginning later this year. It is evident, therefore, that it would not be fruitful at this time for AID to attempt to define specific reforms to be effected in connection with this loan. However, it is recommended that a condition or covenant be included in the loan agreement for the purpose of assuring AID that the GOT will continue its effort toward ultimate effectuation of the necessary reforms. The exact format of such a provision would be discussed by the Capital Assistance Committee with IDA but it is presently contemplated that a condition to continued AID disbursements will be proposed which will provide for the periodic submission of reports indicating in reasonable detail the progress made toward implementation of the interim and final recommendations of the team to be financed by the IBRD. The condition would be phrased so as to entitle AID to terminate disbursements or accelerate repayment of the AID loan in the event the progress is determined unsatisfactory.

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E. Disbursement Scheduling

As indicated in the General Schedule, See Annex II, Exhibit N, all aspects of the project have been costed by the GOT on an annual basis both for foreign exchange and local currency anticipated expenditures. Responsibilities have been assigned to the concerned agencies of the Government for implementing necessary actions on schedule. For a discussion of the likelihood of funds from the Turkish budget being made available to permit orderly implementation, see section IV.

VI. PROGRAM LOAN ELEMENT

A. Background and Justification

Throughout the negotiations with other lenders, AID's target was a level of pledges sufficient to cover all likely direct foreign exchange costs of the project. In addition, however, we sought pledges for as much local currency financing as possible. Such financing helps in a small way to defray the heavy local currency burden to be placed on the Turkish budget. More significantly, the proposed local currency financing formula places additional needed foreign exchange at the disposal of the Turkish government. This foreign exchange will be helpful in meeting the cost of imports not directly attributed to the project in the rack-up of direct project costs, but which will be required in the process of its construction. For example, it has been estimated by the GOT that $11.1 million in indirect charges will be incurred for the importation of equipment and materials needed to relocate transport facilities which are now in the reservoir area.

Other foreign exchange costs will be induced by the project. This impact will be felt in a variety of ways but perhaps the principal identifiable cost in this category is the requirement for imported aluminum ingots. It is expected that Turkkablo, a joint Kaiser-Etibank-Finnish enterprise established in 1963 will supply the aluminum cable for the transmission lines. The direct project cost for this element is estimated at $18 million in Turkish lira to be provided by the GOT, but $7.8 million will be required in U.S. dollars to import the ingots used to fabricate that cable. The foreign exchange for such general imports must be supplied from the hard currency availabilities of the GOT, which the local currency financing formula for Keban will help to support.

To help meet such costs, the Syndicate members at their meeting on April 29 agreed to a formula by which each lender would provide a portion of its pledge in the form of local currency financing. As expressed in the IDA's understanding of that agreement, to which we are concurring:

> "All bilateral lenders and the European Investment Bank (EIB) will disburse a minimum of the equivalent of $1 on account of local expenditure for every $3 equivalent disbursed for foreign exchange expenditure. Thus, the amount of bilateral aid available for purchases from any lending country will equal 75% of its pledge. Financing of local expenditure by the United States will be in the form of local currency generated by the import of goods from the United States. The arrangements for the financing of local expenditure by IDA will be determined in connection with the disbursement procedure for Part III of the project. IDA does not, however, contemplate placing any specific limit on the proportion of local expenditure which it will finance."

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The following table illustrates the range of financing available for local currency and foreign exchange financing under this formula:

	Total Pledge	Project Financing	Local Currency Financing
U. S.	40	30	10
Germany	20	15	5
France	10	7.5	2.5
Italy	10	7.5	2.5
EIB	30	22.5	7.5
IDA	25	0 - 25	0 - 25
	135	82.5 - 107.5	27.5 - 52.5

Local currency financing available to the GOT in the above amounts will help relieve the pressure on Turkey's overall availabilities of foreign exchange, and will allow it to finance the above indirect and induced costs under its regular import program without cutting back on other needed imports. In the same fashion, credits made available as local currency financing will be available to the GOT to pay for any direct project imports required above and beyond the maximum of $107.5 million in foreign credits available for this purpose under the present 3-1 matching formula. We expect to receive a letter from the GOT in which they agree to assume any possible direct foreign exchange costs above that amount. But even if this were to prove necessary it can be said that the lenders have made sufficient total financing available to the GOT in the Keban financing package to cover any likely overrun.

B. Release Mechanism

Other lenders will fulfill their local currency commitment by purchasing with their national currency Turkish lira that can be made available for the project. The national currency will then be available to the Turkish Government for overseas procurement. The exact mechanics by which the various lenders will implement this pledge have yet to be worked out.

For its part, AID intends to fulfill its commitment in the following fashion: Thirty million dollars of the 40 million herein proposed would be available for Turkey to import U.S. goods and services forming all or part of contracts awarded to bidders in accordance with the tendering system applicable to that section of the project. Letters of commitment in the

amount of $30 million would be established at United States banks and would be drawn down according to our regular disbursement procedures for project loans.

Letters of commitment for the remaining $10 million of our $40 million would be issued on a $1 - $3 parri passu basis as the letters of commitment for the above $30 million are established. These funds would be available as a program loan to the GOT for categories of commodity imports agreed to in accord with our normal procedures. The flow of Keban program funding will be taken into account in determining the overall requirement for program lending to be met by the Consortium. No attempt would be made to earmark these funds for imports indirectly supporting or to be induced by Keban.

This program loan increment will generate local currency available to the GOT, and by bolstering their overall budgetary position will facilitate allocations to Keban. The local currency would be handled by the GOT fiscal authorities in the same way as the regular program loan generations.

VII. International Riparian Matters

The Keban Dam is being built primarily to meet Turkey's power needs. Although at later stages of water resource development in Turkey Keban will be an important control structure in the conservation, control, and utilization of the Euphrates, the dam itself will not be used for irrigation diversions and thus will involve no consumptive use of the Euphrates' waters. However, the plans for storing and releasing water for the generation of power will involve a new regimen of water available to the downstream riparians, Syria and Iraq. In the long run, by leveling out the annual stream flow, this new pattern of availabilities will have a beneficial effect on downstream projects both in Turkey and in the riparian states. In the short run, however, these new flow patterns may be troublesome until adjustments in use patterns have been accomplished. This is particularly true in Iraq, where the irrigation system and agricultural practices are adapted to wild floods in the spring and relatively meager availabilities thoughout the remainder of the year. It was with this in mind that AID representatives, early in our discussions with the Turks on this project, informed them that we would expect the Turkish government to take the initiative in seeking agreement among the three countries on their proposed release schedule.

In June 1964, negotiations with a delegation of Iraqis took place and these were followed by negotiations in September 1964 with representatives from Syria. The meeting with the Iraqis was not fruitful. Progress toward agreement foundered on an Iraqi claim for a monthly pattern of established water uses that in some months exceeded by a significant degree what would be available to Iraq under the Turkish water release proposal. The Iraqis have also attempted to tie an agreement on Keban to a larger agreement on future distributions of the Euphrates River water but the Government of Turkey has insisted that such an agreement would require thorough advance examination of all the relevant historical data as well as the plans for future uses.

The meeting with the Syrians in September was more productive. Following the meeting, a proces verbale was signed containing a joint finding that the Keban project would have beneficial effects on downstream projects in Turkey and in Syria, "if operated in accordance with the operation rules for power generation stated in the project report which has been previously sent to the Syrian Government."

In view of the importance of the question of water releases with respect to the Keban project and the possible lack of a timely agreement voluntarily reached among the three riparian countries, the IBRD has undertaken to perform a study of the relevant considerations. Both the Governments of Iraq and Syria have already indicated their willingness to make the relevant information on water uses available to a three-man team of experts now being recruited by the IBRD. It is expected that the results of this study will be available some time late in 1965 or early 1966.

The Project Committee with the advice of members of the State Department intends to assure that a satisfactory resolution of this question will ultimately be acheived. To this end, it is contemplated that a covenant or condition precedent to disbursement will be included in the loan agreement assuring that the Government of Turkey will continue to exert its best efforts to obtain an agreement with the Governments of Syria and Iraq on the water release question and failing that, it will agree to a release schedule, determined by AID to be satisfactory. We will expect to be guided by the recommendations of the IBRD study team in this regard.

VIII. PHYSICAL IMPLEMENTATION PLAN

The orderly construction of Keban project will require a high order of integration and coordination of many activities. Treated herewith are the physical considerations and activities required apart from the purely technical and financial aspects covered in Sections III and V above.

1. Ownership and Responsibility

The project as a whole will have two owners with responsibility for discrete components: DSI for the dam and power plant; Etibank for the transmission facilities. Each of these organizations have had considerable experience in their respective spheres and are believed capable of discharging their responsibilities. However, it is expected that:

a. DSI will receive assistance from an engineering services firm during the construction phase of the dam and power plant.

b. Etibank will have outside engineering assistance in the design and construction of the EHV transmission system.

c. The GOT will obtain assistance in the engineering management and coordination aspects of the overall project.

2. Engineering

Detail design drawings and technical specifications for the dam and power plant have been prepared by Ebasco Services Incorporated under a contract with EIE. Further engineering services will be secured by DSI for engineering and construction management during the construction phase of the dam and power plant. Etibank will secure outside engineering services (satisfactory to AID) for both design and construction phases of the transmission facilities.

3. Construction

a. General Construction Program

Construction of the dam, power plant, and transmission system will be carried out by qualified construction contractors. In addition to the construction and equipment contracts for the project proper, many supplementary but nonetheless vital activities are required. These include access roads to the site; construction power; rail, road and harbor facilities for moving project equipment and material; land acquisition and resettlement; relocation of roads, railroads and communications in the reservoir area. The Government of Turkey has indicated an awareness of the importance of these activities and has initiated action toward their accomplishment. The GOT general planning schedule is included as Exhibit N in Annex II.

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b. Construction Schedule

The construction schedule prepared by Ebasco is included in Annex II as Exhibit P. It is based on construction of river diversion tunnels beginning November 1964 and initiation of construction under the main dam contract by December 1965. On this basis, trial operation of the first generating unit based on average year stream flow was scheduled for January 1970. Though the programming of the various construction features is considered realistic, delay in construction starts (diversion tunnel work just now getting underway; main construction contract tender invitations held up pending financing) indicates the first half of 1971 as the earliest attainable date for initial operation of the first unit. It is emphasized however that this is predicated on early resolution of all financial and management questions, that delay timely placing of contracts for construction work and equipment procurement.

c. Construction Materials

The rockfill for the main dam will be composed of limestone-marble taken from quarries on both banks within a short haul radius. Core and filter materials for the main dam are also located within reasonable haul distances of the site. Coarse and fine aggregate for concrete will be processed from quarried limestone.

Most common heavy construction materials are available in the required quantities in Turkey. Cement will come from the nearby plant at Elazig where capacity is being expanded to meet the rate of use at Keban. Lumber products for forms, tunnel supports, etc., are available from several timber areas and may be shipped by rail to Elazig or by boat to Iskenderun. Most project steel requirements will be available from the plants at Karabuk and Eregli. ACSR conductor is expected to be produced at Turkkablo. Dynamite is manufactured in quantity in Turkey -- consideration is also being given to the use of blasting grade fertilizer-type nitrates which would likely be imported.

d. Labor Supply

The present supply of a trained force of construction personnel and mechanics in Turkey is limited,but there is a nucleus of competent workmen from other construction projects around which the necessary labor organization can be built.

e. Transportation of Major Permanent Equipment

The facilities for handling the heavy and bulky items of imported equipment has been investigated at some length. Large loads such as turbine and generator components, transformers, etc., will be shipped to the job site via the port of Iskenderun and onward by road. Off-loading of the heaviest items at Iskenderun will probably require the use of ships with heavy-lift booms.

4. Operation

Both DSI and Etibank have had sufficient previous experience to operate the completed project satisfactorily. Some outside technical assistance with respect to power plant start-up and initial operation of the extra high voltage transmission system will be required as discussed in Section III, paragraph 10c.2.

As set forth in Section III, paragraph 10 d.1, some difficulty may arise with respect to initial reservoir filling while maintaining a required schedule of downstream water releases. For efforts by the IBRD toward resolving the matter of downstream water rights as it may affect project operation refer to Part VII above.

IX. COORDINATION OF FINANCING

It is generally agreed between the GOT and among the lenders that the civil works construction contract for the dam and powerhouse will be tendered first and that the foreign currency availabilities indicated to the bidders will come from the bilateral and the EIB loans. (See Annex I Financing Model III) Procurement under these loans is tied to the source country or in the EIB's case to its six members--Germany, France, Italy, Belgium, the Netherland and Luxemburg. Thus deducting from the nominal $30 million US foreign exchange pledge the approximately $5.5 million which engineering both the dam and transmission line portions is estimated to cost (since the GOT apparently plans to use US firms and seek US financing), and taking into account that both Germany and EIB wish to reserve $10 million from their pledges for use in later parts of the project; the foreign currency availabilities for the civil works contract are as follows:

	$ million equivalent
United States	24.5
Germany	7.5
France	7.5
Italy	7.5
European Investment Bank	15.0
	62.0

AID's estimate of the foreign exchange costs of this civil works is approximately $23 million. The value of supply of goods and services from any one country would have to come within the maximum currency availability from that source.

Funds left over after the first bid award would be available for financing the foreign exchange cost of subsequent elements of the project. Details of the arrangements for financing the remaining major elements of the project are yet to be worked out among the lenders and with the GOT. It is anticipated that a meeting of the syndicate will be held soon for this purpose.

The leadership of the lenders' group has developed into something of a problem which is discussed below in section XII-Issues.

X. REPAYMENT PROSPECTS

We believe the repayment prospects for this loan are satisfactory. For more than a decade, the Republic of Turkey has been troubled by serious balance of payments difficulties in which a chronic deficit on current account has been agravated by a debt servicing burden that in 1964 accounted for more than 40% of her export earnings. The heavy repayment burden falling due in the years 1965-1967 precipitated a Consortium sponsored debt rollover exercise in the spring of 1965 which extended payments due in this critical period and leveled out the country's repayment obligations over the next ten years.

The longer run prospects for Turkey to repay its international obligations and maintain a sufficient import program without relying on such extraordinary relief look far more promising, however. The trade balance should show increased improvement as Turkey feels the effect of its current efforts to exploit the export potential of its significant mineral resources and develop its manufacturing sector. Significant invisible earnings can be expected as Turkey's program to develop its tourism sector bears fruit, and as remittances from Turkish workers in Europe increase (up to $30 million expected in 1965). The country will start feeling the import substitution effect of its expanded steel producing capacity at Eregli in 1965 and the important recent strikes of high grade petrolem give promise of self-sufficiency in major petroleum products by as early as 1968. In short, the Turkish intention to achieve viability in its external accounts by the early 1970's looks increasingly possible. Throughout this period, the country will need continued external capital assistance to meet its development objectives, and the target of viability by the early 1970's will be enhanced if the maturity, grace period, and rate on this assistance is at development terms. The terms which lenders have agreed to meet for this Keban Project contribute to that objective.

XI. IMPACT ON THE U.S. ECONOMY

The loan will have a favorable effect upon the U.S. economy as all of the loan funds disbursed for direct project costs will be spent in the U.S. for such items as engineering services, construction equipment and permanent equipment for the project. There may be a continuing demand for spare parts and replacements of equipment, depending upon what equipment portions of the project are awarded to U.S. suppliers after competitive bidding. The program loan element will also be limited to procurement of commodities from the U.S. Here again the effect on the U.S. economy will be favorable.

XII. ISSUES

The nature of the project and the fact that it is being multilaterally financed will doubtless raise a number of unusual problems over the course of the implementation period. The Project Committee is thus concerned that a workable arrangement be established by the lenders for management of their interest in the project. To this end, preliminary indications of agreement were obtained at the Paris meeting on April 30, 1965 to an arrangement whereby IDA would be designated chairman of a coordinating committee comprised of one delegate from each of the lenders. Under this arrangement, it was contemplated that IDA would act as a single point of contact with the Government of Turkey with responsibility in appropriate cases to consult with or refer to the respective lenders the various problems as they arose. These would include problems relating to the review and approval of tender documents, award of contracts, disbursement of funds, and the monitoring of actual construction of the project through inspections and progress reports. At this meeting the EIB made clear its wish to assist IDA in forming a "secretariat" to conduct the Syndicate's business but they were given no encouragement by the Syndicate collectively.

Since the Paris meeting, the EIB has indicated that it wishes to consider further the arrangements for management of the lenders' interest in the project. It appears that the EIB is considering an arrangement under which it would share with IDA the responsibility for representing the lenders but it is not clear at this time as to what kind of arrangement it has in mind. To determine what if any new arrangement the EIB is considering, the IDA has sent representatives to Brussels for discussions starting 22 June.

Because of the effect the ultimate arrangements will have on the smooth implementation of the project, the Project Committee considered whether authorization of the loan should be deferred until this matter is resolved. It was concluded that it is reasonably certain that an arrangement will be agreed to in the near future which will be acceptable to all of the lenders and that authorization of the loan need not be delayed. However, it is recommended that the loan authorization contain a condition that prior to execution of the loan agreement the arrangement for management of the lenders' interest in the project be resolved in a manner satisfactory to A.I.D.

XIII. CONDITIONS AND COVENANTS

It is contemplated that the usual conditions and covenants for hydroelectric and transmission lines projects will be set forth in the loan agreement. In view of the other lenders' interest in loan agreement conditions, however, the Capital Assistance Committee will work with IDA and, where appropriate, the other lenders to formulate the wording of actual provisions. It is contemplated that either conditons precedent to A.I.D. disbursement or covenants will be included to cover the following matters:

(a) Arrangements for the necessary engineering and construction management services for the dam and power plant, for the transmission facilities, and for overall project coordination;

(b) Establishment of a board of consultants to provide expert advice with respect to design and construction of the project;

(c) Arrangements for the training of personnel to operate and maintain the power plant and the extra high voltage transmission system;

(d) Conclusion of loan agreements with each of the lenders;

(e) Provision by the GOT of such additional foreign exchange and Turkish Lira financing as may be needed to complete the project;

(f) Resolution of the riparian rights question referred to in Section VII;

(g) Effectuation of the necessary reforms in the Turkish power industry as referred to in Section V;

(h) Relending or other financial arrangements for making the loan funds available to D.S.I. and Etibank as the executing agencies.

In addition to the foregoing points which would be covered in the loan agreement, there are three threshold matters which the Capital Assistance Committee expects will be resolved in the near future and in any event before the loan agreement is signed. These three matters are as follows:

(a) Final agreement has not been reached among the lenders as to the arrangements to be made for management of the lenders' interest in the project. This is dealt with in more detail in Section XII.

(b) As indicated in sections V and IX above, it is contemplated that a large measure of the procurement of raw materials and goods for the project will be done by the contractors who will plan their procurement in accordance with the available financing at the time they prepare their bids. Some of the raw materials and goods will be available in Turkey including cement, reinforcing steel, structural steel, and lumber. In view of the benefits that would accrue the Turkish economy from maximum procurement of these items in Turkey, consideration is being given to devising a formula or other means pursuant to which procurement in Turkey by the contractors of these items would be preferred over procurement of such items elsewhere. This would be in accordance with A.I.D. but whether such a formula will be used, and if so, what its specific format will be is yet to be resolved.

(c) As referred to in section IX, the financing model, which served as a basis for the pledges of the foreign financing, left open for subsequent resolution the question of how the foreign financing would be disbursed for Parts II (Turbines and Generators) and III (Transmission Lines) of the project. A meeting of the lenders will be held in the near future to dispose of this matter.

To assure that the foregoing three matters are disposed of before A.I.D. funds are obligated for the project, it is recommended that the loan authorization provide that each of these problems be resolved before the loan agreement is signed.

Annex I
Exhibit A
AID-DLC/P-353

May 29, 1965

Dear ,

I am enclosing a draft of a new Financing Model (Model III) for the Keban project which reflects the agreement which was reached at the meeting of the syndicate in Paris on April 30, 1965. I also enclose a draft of a letter which I propose to send to the Turkish Government informing it of the results of the syndicate meetings so far held. If therefore you are in agreement with the proposed Model, I would suggest that you send me a letter indicating your agreement in principle to proceed with the financing on the basis of the Model. The letter could, of course, contain any formal reservations which you might feel it necessary to make. These letters would provide an assurance to the Turkish Government concerning the availability of funds, on the basis of which they would be able to call for bids for the civil works. Finally, I enclose for your approval a draft of a note on "Financing" giving the points which should be covered in the tender documents in order to inform bidders of the funds which are available to meet the foreign exchange costs of the civil works contract. If, before the tender documents are issued, any other countries agree to make funds available, they will be added to the list. I hope you will be able to reply without delay since the tender documents should be issued as soon as possible.

There is one point on the Financing Model on which I should like to comment and this relates to the brief discussion at our last meeting regarding payment of the civil works contractor's profit. As is customary there will be no separate item for the contractor's profit but the payments against civil works will include amounts on account of the contractor's overhead, profit and cost of foreign personnel assigned to the construction. It should be realized that this part of the civil works contract will be in the currency of the country of origin of the contractor and it should therefore be possible to utilise the pledge of that country for disbursement relating to these costs. If this is likely to create a problem for you I should appreciate it if you would let me know.

Once the way has been cleared for the Turkish Government to issue the tender documents for the civil works contract I would hope we could take up the question of the bidding and disbursement arrangements for Parts II and III of the project. It may be desirable to hold another meeting of the syndicate for this purpose, perhaps during the first half of June.

Yours sincerely,

S. R. Cope
Director
Europe and Middle East

Enclosures

66

Annex I
Exhibit B
AID-DLC/P-353

DRAFT

Keban Syndicate/65/3a

May 29, 1965

TURKEY - Keban Syndicate

Financing Model - III

1. The financing arrangements for the Keban Project will conform to the following general principles:

a) The terms of loans for Keban will be not harder than 15 years, including five years grace, with interest at an average rate of 4%.

b) All bilateral lenders and the European Investment Bank (EIB) will disburse a minimum of the equivalent of $1 on account of local expenditure for every $3 equivalent disbursed for foreign exchange expenditure. Thus, the amount of bilateral aid available for purchases from any lending country will equal 75% of its pledge. The disbursements for local expenditure will be made roughly pari passu with disbursements for foreign exchange expenditure. Financing of local expenditure by the United States will be in the form of local currency generated by the import of goods from the United States. The arrangements for the financing of local expenditure by IDA will be determined in connection with the disbursement procedure for Part III of the project. IDA does not, however, contemplate placing any specific limit on the proportion of local expenditure which it will finance.

c) All amounts made available by lenders for any part of the project will remain available for all subsequent parts of the project. (If, for example, a country pledged a certain amount for Part I of the project and did not receive any orders in respect of this part the pledge would remain available for Part II and thereafter for Part III to the extent it had not been used for Parts I and II)

d) For the civil works contract, expenditure in France, Germany and Italy will be financed to the maximum extent possible, in equal shares by the EIB and the country concerned. The extension of this principle to Part II (turbines and generators) has still to be confirmed. Arrangements for Part III (including transmission lines) have to be agreed later.

2. The following lenders have indicated that they are willing to provide the amounts shown below, and for the parts of the project shown later, subject to the negotiation of definitive loan agreements and to whatever further appraisal or procedural or statutory approvals may be necessary for each lender.

Lender	Amount ($ million equivalent)
United States	40
Germany	20
France	10
Italy	10
European Investment Bank	30
International Development Association	25
Total	135

It is possible that additional amounts will be forthcoming from other countries.

PART I - Civil Works Contract

3. Estimated foreign exchange required - $35 to 40 million.

4. Of the amounts listed in paragraph 2 above the following amounts will be available for the direct foreign exchange requirements of the civil works contract. (Germany and the EIB each wish to reserve $10 million of their pledge for use in later parts of the project).

	$ million equivalent
United States	30.0
Germany	7.5
France	7.5
Italy	7.5
European Investment Bank	15.0

5. The amounts provided by the countries listed are available only for expenditure in the country in question. The amount provided by the EIB is available for expenditure in any of its member countries. If any other countries (EIB members or others) make pledges they will be added to the list.

6. The main contract must be placed with a contractor, or group of contractors, from an EIB member country, from the United States or from any other country which makes a pledge. Bidding arrangements will provide that any contractor, or group of contractors, will be able to make purchases of materials, equipment and obtain services from the various eligible countries up to certain limits. For all countries not members of EIB the limit will obviously be the amount of the pledge available for foreign exchange expenditure. For Belgium, Holland and Luxembourg the limit would be $15 million for the three countries combined. For France, Germany and Italy the maximum amounts available must fall within the following limits:

a) For any one country	$22.5 million (i.e., $15 million from EIB plus $7.5 million from the country concerned).
b) For any two countries taken together	$30 million (i.e., $15 million plus twice $7.5 million).
c) For all three countries	$37.5 million (i.e., $15 million plus three times $7.5 million).

7. Finally, if any EIB funds are spent in Belgium, Holland or Luxembourg the amount so spent must be deducted from the above maxima.

8. The amounts which have been given in the preceding paragraphs are the maximum amounts which are available for expenditure in the countries concerned. However, the total amount of money which will be disbursed to Turkey in connection with the civil works contract will, of course, depend upon the actual foreign exchange expenditure which the contract requires. Turkey will receive this latter amount plus one-third of this amount on account of the related local expenditure.

9. For expenditures in the United States (or any other non-member country of EIB who may pledge funds) all disbursement will be out of bilateral aid. For purchases in France, Germany and Italy disbursement will be made 50% from bilateral aid and 50% from EIB funds. In certain contingencies the 50:50 rule would have to be modified. If, for example, purchases in any of these countries exceeded $15 million, thus using up all the available bilateral aid of $7.5 million from the country concerned, the excess would be paid for wholly out of EIB funds.

PART II - Turbines and Generators

10. Estimated foreign exchange required

	$ million equivalent
Turbines	4.5
Generators	6.0

PART III - Remainder of Project

11. This can be regarded as made up of:

		Foreign Exchange Required ($ million equivalent)
(a)	Other permanent equipment	7
(b)	Equipment for relocating railways and roads	11
(c)	Transmission lines	39
	Total	57

12. The basis of disbursement for expenditures on Parts II and III of the project will be determined later.

Annex I
Exhibit C
AID-DLC/P-353

Ministerialdirektor Dr. G. Keiser
DER BUNDESMINISTER FÜR WIRTSCHAFT

BONN, den June 4th, 1965

Fernsprecher: 306.2174 oder 3061
Fernschreiber: 6-86 747
Telegrammadresse: Bundeswirtschaftsminister

Gesch.-Nr. Abt. V
(Bei Antwort bitte angeben)

Air Mail

Mr. S. R. Cope
Director of Dept. Europe and Middle East
International Development Association
1818 H Street, N.W.
Washington, D.C. 20433, USA

Dear Mr. Cope,

I thank you for your letter of May 29th with the attached 3 drafts. I am glad that I can confirm you my agreement in principle to proceed with the financing on the basis of the Model as laid down in your draft. I have only one objection which refers to the following sentence in paragraph 1 b): "Financing of local expenditure by the United States will be in the form of local currency generated by the import of goods from the United States." You will remember that I defended the setting aside of 25 per cent of each pledge for disposal by the Turkish Government not only because of the high Turkish burden of local costs but also because of the indirect foreign exchange costs involved in such a big project. I admitted only hesitately that the American participation in this exercise might be in the form of procurement authorisations under the usual AID program aid system. Your formulation would allow the United States to make available counterpart fonds from P.L. 480 deliveries, which is not the same thing. I think all the other members of the Syndicate which make available freely converted currency for this 25 per cent understood these concessions to the Americans in the same way as I do.

One other remark: Under 1 d) you state that arrangements for Part III have to be agreed later, and this, of course, for the moment is a correct statement. Part III includs also the equipment for relocating railways and roads and this is an investment which in its timing coincides with the construction of the Dam. I can only repeat my desires and that of my Government that this investment should be financed by IDA and I think it would facilitate very much the acceptance of our positions by the Turks if we could come to an understanding in this matter rather soon.

With a regard to your draft letter to the Turkish Minister of Finance I wonder whether it is not necessary to make it clear in this letter that the understanding of the Keban Syndicate on the Financing Model is based on the assumption that the terms of the individual contributions will in no way influence the decision on the several tenders. By the way, we have still to make up our mind whether in the framework of this decision on the tenders it is only the total price offered which counts or also the requested foreign exchange part of this price.

In your letter you asked me finaly whether the inclusion of the contractor's profit in the foreign exchange costs requested create a problem for me. On the contrary, I was always of the opinion that the contractor's profit also as far as it is related to local expenditure in Turkey has to be counted as part of the foreign exchange costs, which the members of Syndicates have to finance. This applies in my view also to the costs of the Consulting Engineering Firm to be entrusted with the supervision of the whole exercise, an item which, by the way, has still to be added to Part III, but to be settled rather early.

I assume that you will address the Turkish Government as soon as you have the agreement of all members of the Syndicate. I agree with you that we should as soon as possible try to tackle the remaining questions with regard to Part II and III of the project. But as this is not particularely urgent I wonder whether we should not wait for our next meeting until we have the reaction of our Turkish friends to our suggestions for Part I.

Yours sincerely,

G. Keiser

(Dr. G. Keiser)

Annex I
Exhibit D
AID-DLC/P-353

MINISTÈRE DES FINANCES

DIRECTION DU TRESOR
~~DIRECTION DES~~ FINANCES EXTÉRIEURES

Paris, le 10 JUIN 1965

DC/JS • Bureau

Par Avion

TRANSLATED
JUN 17 1965
I.B.R.D.

N° 004303

Monsieur le Directeur,

Par lettre en date du 29 Mai, vous avez bien voulu me faire parvenir les projets de lettre et de modèle financier n°3 que vous vous proposez d'adresser à M. le Ministre des Finances turc au sujet des modalités de financement du barrage de Keban. Ces modalités sont celles qui ont été arrêtées par le syndicat financier en voie de constitution, lors des récentes réunions tenues à Paris sous votre présidence. Vous me demandez de vous donner mon accord sur ces textes.

J'ai l'honneur de vous faire connaître que les projets que vous m'avez transmis me paraissent refléter de façon exacte les conclusions auxquelles sont parvenus les représentants des divers pays et institutions internationales ayant participé à la dernière réunion du 30 avril 1965. Dans ces conditions, je n'ai pas d'objections à ce que vous les adressiez aux autorités turques compétentes.

Le gouvernement français pour sa part a donné son accord pour que la contribution qu'il a accepté de réserver au financement du barrage, par imputation sur les fonds précédemment consentis à la Turquie au titre du consortium de l'O.C.D.E., satisfasse aux conditions générales prévues dans le modèle financier n°3. Il est prêt à négocier avec les autorités turques aussitôt qu'elles en feront la demande, les modifications à apporter aux accords financiers actuellement en vigueur.

.../...

Mr. S.R. COPE
Directeur pour l'Europe
et le Moyen Orient
ASSOCIATION INTERNATIONALE
DE DEVELOPPEMENT.
WASHINGTON

En ce qui concerne la mise en oeuvre du financement international qui a été décidé pour cet ouvrage, je pense, comme nous en étions convenus à la réunion du 30 avril dernier, qu'il appartient à l'Association Internationale pour le Développement et à la Banque Européenne d'investissement, d'en définir en commun les modalités dans les meilleurs délais.

Je vous prie d'agréer Monsieur le Directeur, l'assurance de mes sentiments les meilleurs.

Pour le Directeur
Le Directeur-Adjoint,

C. Pierre-Brossolette

Signé: CLAUDE PIERRE-BROSSOLETTE

FORM No. 3370
(12-61)

Mr. Collier
Room 646

Ministry of Finance
Department of Treasury

10 June 1965

Mr. S.R. Cope,
Director for Europe and
the Middle East,
I.D.A.

In your letter of 29 May you sent me the drafts of a letter and financial model No. 3 which you propose to send to the Turkish Minister of Finance on the terms of financing for the Keban dam. These terms were drawn up by the financial syndicate in process of formation at recent meetings over which you presided in Paris. You ask me to approve these texts.

I have the honor to inform you that the drafts that you sent me appear to reflect accurately the conclusions arrived at by the representatives of the various countries and international institutions which took part in the meeting of 30 April 1965. Under the circumstances, I have no objection to your sending them to the competent Turkish authorities.

The French Government has agreed that the contribution that it has agreed to set aside for the financing of the dam out of the funds previously granted to Turkey under the OECD consortium will meet the general conditions set forth in Financial Model No. 3. It is prepared to negotiate with the Turkish authorities, as soon as they request it, the amendments to be made in the financial agreements now in effect.

As regards the implementation of the international financing that has been decided on for this project, I believe, as we had agreed at the meeting of 30 April last, that it is up to the IDA and the European Investment Bank jointly to define the terms as soon as possible.

Very truly yours,

For the Director
the Deputy Director

S/CLAUDE PIERRE BROSSOLETTE

TRANSLATION SECTION 931/65

Annex I
Exhibit E
AID-DLC/P-353

EUROPEAN INVESTMENT BANK

Brussels, June 4, 1965.
PA/n° 5.517

Mr. S.R. COPE
Director of Operations
Europe
International Bank
for Reconstruction and Development
1818 H Street N.W.
Washington 25 D.C.

U.S.A.

Dear Mr. Cope,

We would like to refer to your letter of May 29 and to the draft documents annexed it.

We feel that the Financing Model III reflets very well our agreement in Paris and we are pleased to confirm our agreement to it.

We are however convinced that progress should soon be made on Part II and III of the model. In particular we think that technically the relocation of railways and roads should be treated separatly, after the dam and before bidding for the Power House equipment.

These documents deal only with general principles for financing the project. You will certainly be aware that a number of related problems still have to be settled, as for example the definition of direct foreign exchange requirements dealt with in § 4 of Financing Model III : (will they include interests during construction, profits ..?) procurements methods for mobile equipment for the dam, and so on. For all these questions - and especially for the payment of the civil work contractor's profit - we feel that our discussion with the turkish engineers will certainly enable us to precise our position.

We hereby confirm that we intend to grant units of account 30 million for the Keban project, out of which units of account 20 million would be pledged for the dam, subject to the approval of the Board of Directors of our Bank.

For your information, you will find herewith a draft letter stating our willingness to provide financing for Keban, which we intend to send to the turkish Authorities simultaneously with your communication.

100 MONT DES ARTS, BRUSSELS, BELGIUM : TELEPHONE 13.40.00
TELEX : BANKEUROP-BRUXL 02.721 - TELEGRAPHIC ADDRESS : BANKEUROP BRUSSELS

It would be preferable to this Bank that our respective information to the turkish Authorities should take place only after all matters related to the organization of the syndicate would be settled between us. For that purpose, we would very much appreciate to receive soon your comments on the proposals contained in Mr. Formentini's letter of May 14, 1965.

Sincerely Yours

EUROPEAN INVESTMENT BANK

Encl.

K.H.Drechsler G.Martelli

11, MONT DES ARTS, BRUSSELS, BELGIUM : TELEPHONE 13.40.00
TELEX : BANKEUROP-BRUXL 02.721 - TELEGRAPHIC ADDRESS : BANKEUROP BRUSSELS

Annex I
Exhibit E
AID-DLC/P-353

Projet de lettre à

Monsieur Oğuz GÖKMEN
Ambassadeur, Délégué Permanent de la Turquie
auprès des Communautés Européennes
Bruxelles

Monsieur l'Ambassadeur,

J'ai l'honneur de vous informer qu'à la suite de la demande de prêt que votre Gouvernement a adressée à la Banque Européenne d'Investissement le 7 avril 1965 pour le financement partiel du projet Keban, le Comité prévu à l'article 10 de l'Accord interne relatif au Protocole financier annexé à l'Accord d'Association entre la Communauté Economique Européenne et la Turquie, a émis un avis favorable sur la recevabilité de ce projet par la Banque.

Notre Président a informé le Conseil d'Administration de cette décision et a exprimé l'opinion du Comité de Direction, qui serait disposé à proposer l'octroi d'un prêt à concurrence du montant sollicité par votre Gouvernement.

Au cas où une entreprise des pays de la C.E.E. emporterait le marché, ce prêt serait destiné en premier lieu à la couverture des dépenses du barrage jusqu'à concurrence d'u.c. 20 millions; les déboursements de la Banque seraient effectués pari passu avec le crédit bilatéral du pays dont ressortirait l'entreprise gagnante et ce jusqu'à concurrence d'u.c. 10 millions, le solde du crédit serait affecté au financement des dépenses d'autres travaux afférents au projet.

La décision finale du Conseil d'Administration de la B.E.I. ne pourra être prise que sur la base d'une étude complète du projet et les renseignements communiqués ci-dessus vous sont donnés dès maintenant à l'intention des autorités d'Ankara et à toutes fins utiles.

Veuillez agréer, Monsieur l'Ambassadeur, l'expression de ma haute considération.

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ANNEX I
EXHIBIT E
AID-DLC/P-353

(TRANSLATION FROM FRENCH)

DRAFT OF LETTER TO

Mr. Oguz Gokmen
Ambassador, Permanent Delegate of Turkey
to the European Communities
Brussels

Mr. Ambassador,

I have the honor to inform you that, following the loan application your Government has addressed to the European Investment Bank on April 7, 1965, to cover the partial financing of the Keban project, the Committee established purusant to article 10 of the Internal Agreement between the European Economic Community and Turkey, is favorably disposed toward the consideration of the project by the Bank.

Our President informed the Board of Directors regarding this decision and expressed the opinion of the Management Committee, that it would be disposed to propose granting the loan in the amount solicited by your Government.

Should an enterprise of an EEC country win the bid, the loan will be available in the first instance to cover the cost of the dam, up to U.C. 20 million; the Bank's disbursements would be made pari passu with the bilateral credit of the home country of the winning enterprise, up to U.C. 10 million, and the balance of the loan will be reserved to finance other expenses connected with the project.

The final decision of the Board of Directors of the EIB will only be made on the basis of a complete project study, and the above information is given to you at this time for the use of the authories in Ankara, or for any other useful purpose.

Yours very truly,

Annex I
Exhibit F
AID-DLC/P-353

Draft Keban Pledging Letter

Mr. S.R. Cope
Director, Europe and Middle East
International Development Association
1818 H Street, N.W.
Washington, D. C. 20433

Subject: Keban Hydroelectric and Transmission Lines Project

Dear Mr. Cope:

Thank you for your letter of May 29, 1965 and the draft papers enclosed therewith.

Your draft of the new Financing Model (Model III) for the Keban Project is in accord with out understanding of the agreements reached at the meeting of the Syndicate in Paris on April 30, 1965, but there is some recent information that should be reflected in the model when it is put into final form.

As you know, the Government of Turkey has now indicated that it has selected a United States' firm to be the consulting engineer for the dam and power plant portion of the project. In addition, we understand that there is some possibility that a United States' engineering firm will be selected for the transmission lines portion of the project also. If either or both of these engineering contracts are awarded to United States' firms, the foreign exchange costs would be payable out of the United States' share of the project financing and this means, of course, that the United States' funds available for the civil works

contract and Parts II and III of the project would have to be reduced accordingly. For the benefit of the other members of the Syndicate we suggest that this information be included in the model, perhaps by means of a footnote to the $30 million figure appearing opposite the words "United States" on page 3 of your draft. The foreign exchange cost estimates for the dam and power plant engineering contract and for the transmission lines engineering contract are $4,000,000 and $2,000,000 respectively.

Assuming the foregoing information is included in the financing model when it is put into final form, the Agency for International Development agrees in principle to proceed with the proposed financing on the basis of this model. It should be understood, however, that prior to the actual obligation of funds by the Agency, our legal and procedural requirements will have to be satisfied. These would include completion of satisfactory arrangements for management of the Syndicate's interests in the project, conclusion of an acceptable formula for determining when procurement in Turkey will be preferred over procurement outside of Turkey, assurances that an agreement acceptable to us will be reached among the members of the Syndicate with respect to the disbursement of funds on Parts II and III of the project, and negotiation of a satisfactory loan agreement with the Government of Turkey.

Finally, I should like to amplify the statement concerning the financing of local expenditure by the United States which appears

in subparagraph (b) of paragraph 1 of the draft model. This portion of our financing would be made available through the means of a program loan.

Very truly yours,

William B. Macomber, Jr.
Assistant Administrator
Bureau for Near East and South Asia

List of Exhibits - Annex II

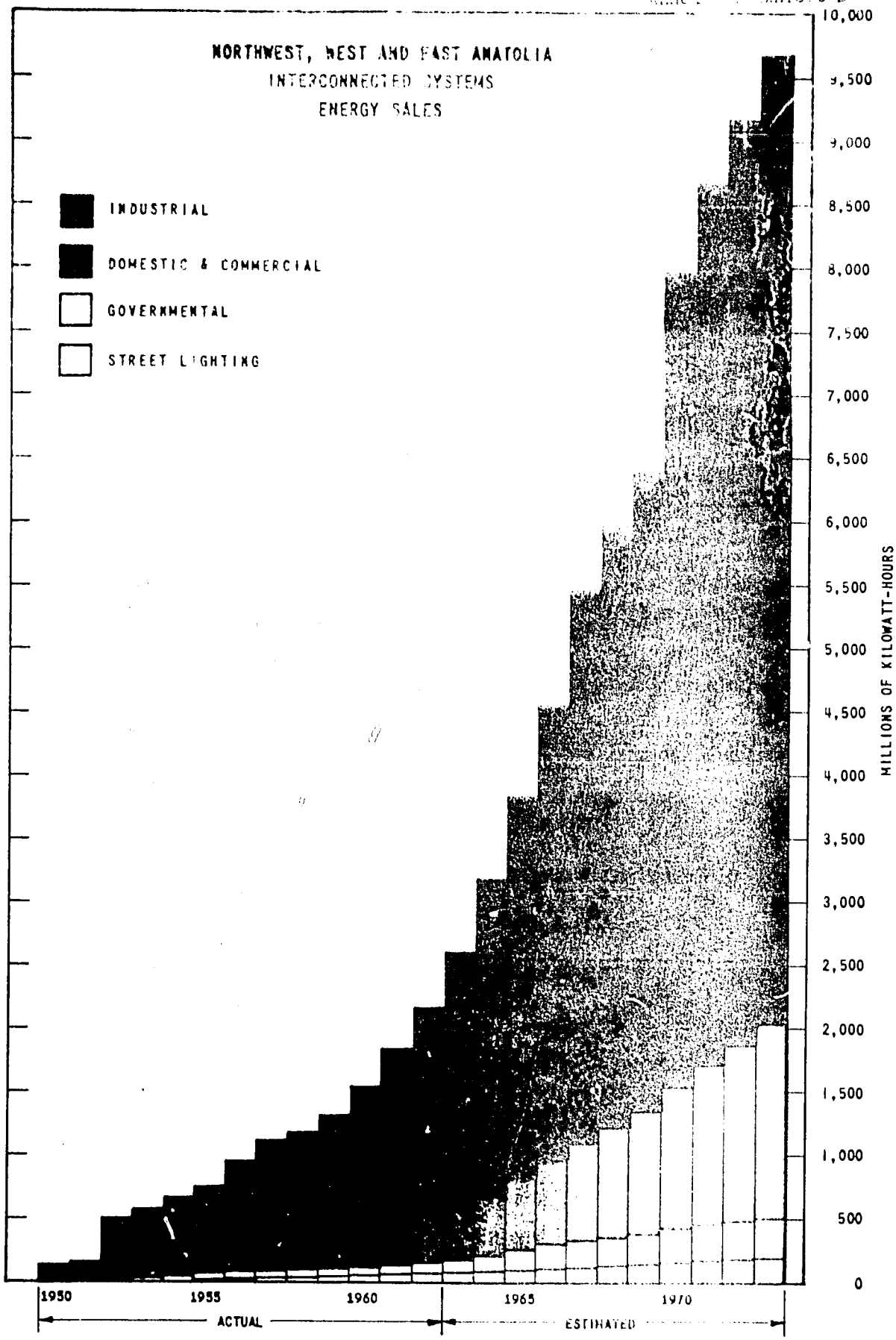
Exhibit	Title
A	Energy and Load Table
B	Energy Sales Projection
C	Demand - Capability Chart
D	Transmission Map of Turkey
E	Cost Estimate - Dam and Power Plant
F	Cost Estimate - Transmission
G	Cost of Energy Calculation
H	Direct Comparison - Thermal Alternative
J	Load and Capacity Schedules
K	Present Worth & Annual Cost Comparisons
L	Benefit/Cost Comparison, w/o Taxes
M	Benefit/Cost Comparison, with Taxes
N	Government of Turkey General Schedule
P	Construction Schedule
Q	Financial Forecast - 1963-1973 - Interconnected Systems
R	State Hydraulic Works (DSI)

Northwest, West and East Anatolia Interconnected Systems

CUSTOMERS, ENERGY SALES AND KW DEMAND

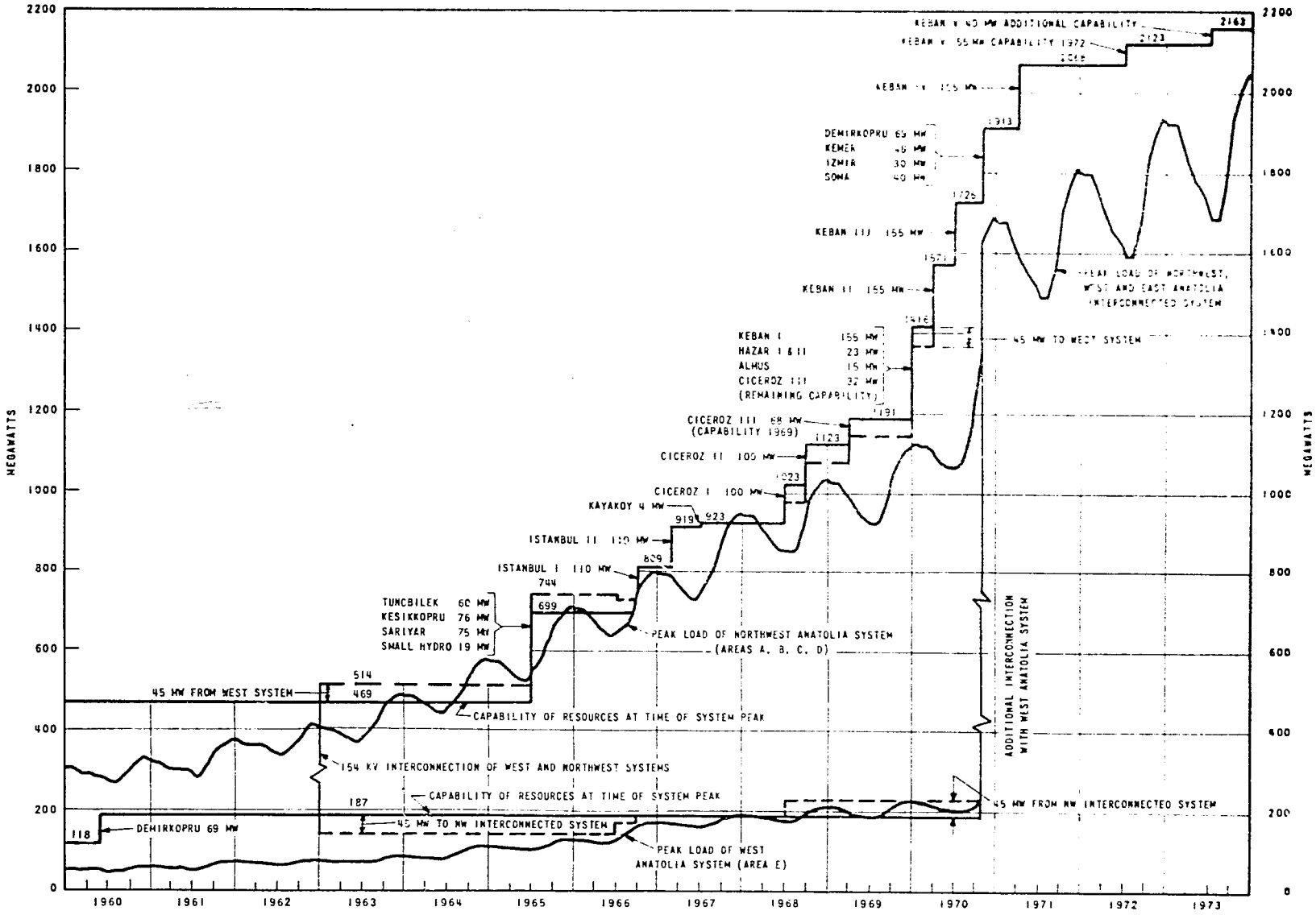
Classification	Actual 1961	Actual 1962	Estimated 1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Customers													
Domestic and Commercial	753 083	801 377	878 512	1 007 092	1 201 462	1 413 162	1 651 242	1 804 912	1 953 772	2 305 722	2 475 242	2 625 812	2 767 342
Governmental	9 229	10 139	11 580	14 390	17 690	22 370	27 390	30 790	34 250	39 790	42 600	45 530	47 950
Street Lighting	54	65	82	243	760	1 496	2 545	3 489	4 456	5 844	6 567	7 093	7 133
Industrial	38 550	41 110	45 570	51 990	62 060	71 840	82 080	89 590	97 380	111 459	119 930	128 040	135 170
Total	800 916	852 691	935 744	1 073 715	1 281 972	1 508 888	1 763 257	1 928 281	2 119 860	2 462 815	2 644 539	2 806 475	2 955 595
Energy Sales (1 000 Kwh)													
Domestic and Commercial	361 400	380 027	434 120	496 660	591 120	681 770	782 910	875 680	980 000	1 135 740	1 264 170	1 400 300	1 548 750
Governmental	80 492	94 620	104 310	132 220	165 470	194 200	211 430	223 900	237 880	275 590	289 330	303 480	316 790
Street Lighting	53 493	56 336	62 230	70 910	84 210	96 950	111 040	121 460	134 070	152 500	164 560	175 910	186 410
Industrial	1 339 976	1 638 440	1 992 740	2 468 500	2 983 960	3 576 990	4 355 720	4 745 120	5 032 000	6 407 920	6 961 150	7 309 880	7 625 520
Total	1 835 361	2 169 423	2 593 400	3 168 290	3 824 760	4 549 910	5 461 100	5 966 160	6 383 950	7 971 750	8 679 210	9 189 570	9 680 500
Kw Demand Based on Kwh Sales	434 810	489 330	580 150	701 490	853 990	1 000 650	1 177 650	1 278 810	1 377 170	1 693 100	1 822 600	1 935 900	2 046 600

Annex II, Exhibit A


NORTHWEST, WEST AND EAST ANATOLIA
INTERCONNECTED SYSTEMS
ENERGY SALES
INDUSTRIAL
DOMESTIC & COMMERCIAL
GOVERNMENTAL
STREET LIGHTING
10,000
9,500
9,000
8,500
8,000
7,500
7,000
6,500
6,000
5,500
5,000
4,500
4,000
3,500
3,000
2,500
2,000
1,500
1,000
500
0
MILLIONS OF KILOWATT-HOURS
1950
1955
1960
1965
1970
ACTUAL
ESTIMATED

NORTHWEST, WEST AND EAST ANATOLIA INTERCONNECTED SYSTEM

PEAK DEMAND
AND FIRM CAPABILITY
OF SYSTEM RESOURCES



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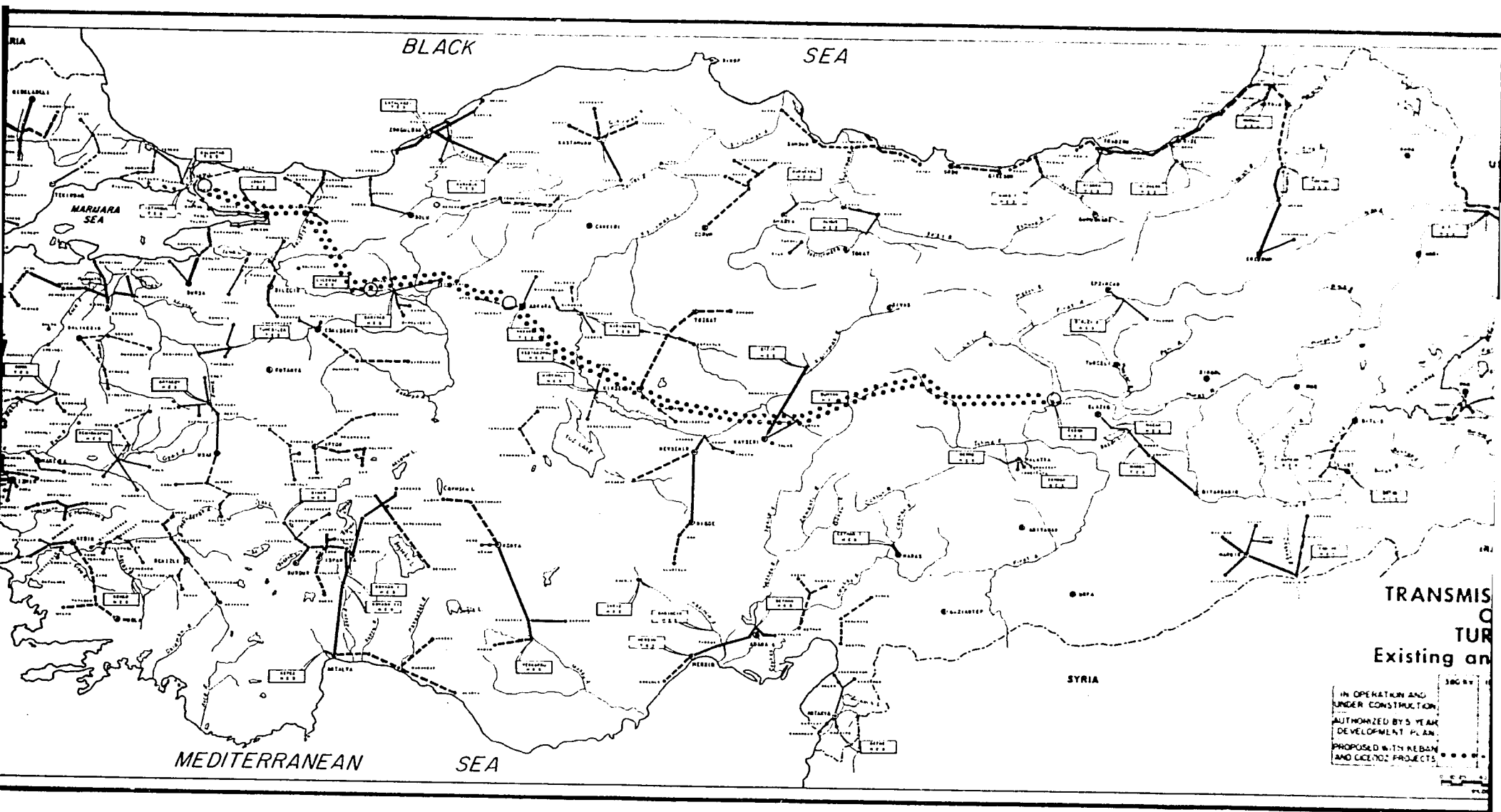
BLACK SEA
MARMARA SEA
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Existing an
IN OPERATION AND UNDER CONSTRUCTION
AUTHORIZED BY 5 YEAR DEVELOPMENT PLAN
PROPOSED WITH KEBAN AND GICEDOZ PROJECTS

SUMMARY COST ESTIMATE

KEBAN DAM & POWER PLANT

All Money $1000

(9 TL - $1.00)

ITEM	LOCAL COST	FOREIGN COST	TOTAL COST
Construction Equipment	1 100	9 800	10 900
Permanent Equipment	3 600	16 700	20 300
Diversion Tunnel	5 000	900	5 900
Main Construction Contract Dam, Power Plant and Switchyard	64 300	10 100	74 400
Engineering Services	2 500	3 200	5 700
DSI Charges [redacted] Relocations, access roads, etc.	75 600	-	75 600
Salvage on Construction Equipment	(-1 700)	-	(- 1 700)
Subtotal	158 400	40 700	191 100
Escalation	3 800	2 000	5 800
Omissions & Contingencies	6 600	4 200	11 000
Subtotal	161 000	46 900	207 900
Interest During Construction	28 900	4 900	33 800
TOTAL	189 900	51 800	241 700

SUMMARY COST ESTIMATE
KEBAN TRANSMISSION FACILITIES

All Money $1000 *
(9 TL = $1.00)

ITEM	Amount Local	Amount Foreign	Total Amount
380 KV Transmission Lines	26 000	14 000	40 000
154 KV Transmission Lines	3 500	2 400	5 900
380 KV Substations	200	2 000	2 200
154 KV Substations	300	2 000	2 300
Engineering Services	3 600	2 200	5 800
EHV Operator Training	200	300	500
Subtotal	33 800	22 900	56 700
Escalation	1 500	1 100	2 600
Omission & Contingencies	2 900	2 200	5 100
Subtotal	38 200	26 200	64 400
Interest During Construction	2 300	1 900	4 200
Subtotal (Excl. Taxes and Duties)	40 500	28 100	68 600
Taxes and Duties	21 500	-	21 500
Total (Incl. Taxes and Duties)	62 000	28 100	90 100

*NOTE: DIVISION OF COST BETWEEN FOREIGN AND LOCAL CURRENCY BASED ON TURKISH STEEL AND ACSR CONDUCTOR.

KEBAN DAM AND HYDROELECTRIC PROJECT

COST OF ENERGY

		Initial Installation 4 Units at 155 Mw
		$000
CAPITAL COST		
Dam and Power Plant		
Foreign Exchange		51 800
Local Currency		189 900
Transmission System (Incl. "Ciceroz Loop")		
Foreign Exchange		35 700
Local Currency		48 900
Total		326 300
ANNUAL COST		
Dam and Power Plant		
Fixed Charges		14 320
Operation and Maintenance		250
		14 570
Transmission System		
Fixed Charges		4 650
Operation and Maintenance		324
		4 974
ANNUAL ENERGY PRODUCTION		
Primary	kmwh	4 853
Average Secondary	kmwh	577
Total at Station Bus	kmwh	5 430
Transmission Losses	kmwh	270
Net at Load Center	kmwh	5 160
COST PER KWH		
At Station Bus - Cents		0.268
At Load Center		0.378

KEBAN HYDROELECTRIC PROJECT

DIRECT COMPARISON WITH THERMAL ALTERNATIVE

WITHOUT TAXES

		Keban HE Project Initial Installation 4 Units at 155 MW		Alternative Thermal 4 Units at 150 MW
		$000		$000
CAPITAL INVESTMENT				
Generating Station				
Foreign Exchange		51 800		53 500
Local Currency		189 900		23 000
Transmission System (Incl. "Cicero's Loop")				
Foreign Exchange		35 700		-
Local Currency		48 900		-
ANNUAL COST				
Fixed Charges		18 970		4 261
Generating Station				
Foreign Exchange	4.293%	2 220	5.000%	2 675
Local Currency	6.374%	12 100	6.897%	1 586
Transmission System				
Foreign Exchange	4.293%	1 530		
Local Currency	6.374%	3 120		
Operation and Maintenance		574		22 307
Generating Station	5160 kmwh		5160 kmwh	
Labor and Material		250		635
Fuel		-	4.2 mills/kwh	21 672
Transmission System				
Labor and Material		324		
Total Annual Cost		19 544		26 568

[redacted]

KEBAN AND CICEROZ DAMS AND HYDROELECTRIC PROJECTS

COMPARISON OF ALTERNATIVES

LOAD AND CAPACITY SCHEDULES - AREAS A, B, C AND D ONLY

			1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
Load Estimate														
Energy at Load Center	-	kmwh	4 942	5 280	5 767	6 186	6 602	6 982	7 500	8 050	8 680	9 330	10 200	10 800
Energy - Net Gen	-	kmwh	5 490	5 860	6 410	6 870	7 330	7 750	8 330	8 950	9 650	10 360	11 320	11 900
Demand	-	mw	1 040	1 120	1 240	1 335	1 435	1 525	1 640	1 765	1 900	2 040	2 190	2 360
Existing Capability	-	mw	923	923	938	938	938	938	938	938	938	938	938	938
Capability Deficit	-	mw	117	197	302	397	497	587	702	827	962	1 102	1 252	1 422
Minimum Reserve (10%)	-	mw	104	112	124	134	144	152	164	176	190	204	219	236
Capability Required	-	mw	221	309	426	531	641	739	866	1 003	1 152	1 306	1 471	1 658
Plan T-1														
Istanbul III	-	mw	150	150	150	150	150	150	150	150	150	150	150	150
Izmit	-	mw	-	150	350	350	550	750	750	1 050	1 050	1 350	1 350	1 550
Net	-	mw	150	300	500	500	700	900	900	1 100	1 200	1 500	1 500	1 700
Plan CK-1														
Ciceroz	-	mw	200	300	300	300	300	300	300	300	300	300	300	300
Keban - At Load Center	-	mw			450	595	595	595	595	735	735	873	873	1 010
Izmit	-	mw									200	200	400	400
Net	-	mw	200	300	750	895	895	895	895	1 035	1 235	1 373	1 573	1 710
Plan CTK-1														
Ciceroz	-	mw	200	300	300	300	300	300	300	300	300	300	300	300
Istanbul III	-	mw			150	150	150	150	150	150	150	150	150	150
Izmit	-	mw				200	200	200	200	200	200	200	200	200
Keban - At Load Center	-	mw						450	595	595	595	735	873	1 010
Net	-	mw	200	300	450	650	650	1 100	1 245	1 245	1 245	1 385	1 523	1 660
Plan TK-1														
Istanbul III - IV	-	mw	150	300	300	300	300	300	300	300	300	300	300	300
Keban - At Load Center	-	mw			450	595	595	595	595	735	735	873	873	1 010
Izmit	-	mw									200	200	400	400
Net	-	mw	150	300	750	895	895	895	895	1 035	1 235	1 373	1 573	1 710
Plan CEK-1														
Ciceroz	-	mw	200	200	200	200	200	200	300	300	300	300	300	300
Keban - At Load Center	-	mw		450	450	595	595	595	595	735	735	873	873	1 010
											200	200	400	400
Net	-	mw	200	650	650	795	795	795	895	1 035	1 235	1 373	1 573	1 710

Annex II, Exhibit J

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CICEROZ AND KEBAN DAM AND HYDROELECTRIC PROJECTS

COMPARISON WITH ALTERNATIVES

PRESENT WORTH OF INVESTMENT AND LEVELIZED ANNUAL COSTS - AREAS A, B, C, AND D ONLY

($ - Millions)

PLAN		CK-1	CTK-1	TK-1	T-1	CEK-1	CK-1-T	CTK-1-T	TK-1-T	T-1-T	CEK-1-T
Present Worth of Investment											
Hydro	- Foreign Exchange	71.826	66.869	53.200	-	72.760	71.826	66.869	53.200	-	72.760
	- Local Currency	206.417	179.691	170.285	-	215.842	217.080	189.326	177.698	-	226.680
Thermal	- Foreign Exchange	20.881	28.425	45.930	106.835	20.881	20.851	28.425	45.930	106.835	20.881
	- Local Currency	8.949	11.455	19.560	44.766	8.949	15.675	20.762	34.234	78.369	15.675
Transmission	- Foreign Exchange	41.490	38.586	40.847	15.072	42.228	41.490	38.586	40.847	15.072	42.228
	- Local Currency	23.805	20.095	23.321	6.421	24.714	46.596	39.811	45.510	14.410	48.236
Foreign Exchange	- Total	134.197	133.880	139.977	121.907	135.869	134.197	133.880	139.977	121.907	135.869
Local Currency	- Total	239.171	211.241	213.166	51.187	249.510	379.351	249.209	257.242	92.775	290.591
	Total	373.368	345.121	353.143	173.094	385.379	413.548	383.089	397.219	214.682	426.460
Levelized Annual Costs											
Fixed Charges											
Hydro		16.296	14.381	13.210	-	16.967	16.973	14.993	13.680	-	17.654
Thermal		2.057	2.111	4.041	9.381	2.057	2.521	2.804	5.053	11.699	2.521
Transmission		3.311	2.919	3.253	1.346	3.541	4.757	4.171	4.591	1.850	4.893
Operating Costs											
Thermal - Indigenous		4.282	4.920	3.250	3.281	3.389	13.035	14.508	13.553	14.512	12.300
Thermal - Oil		14.536	17.295	17.510	37.577	14.178	12.854	16.531	16.089	48.007	12.143
Keban + Ciceroz		0.423	0.387	0.222*	-	0.436	0.422	0.387	0.222*	-	0.436
Transmission O & M		0.269	0.242	0.243	0.153	0.274	0.269	0.242	0.249	0.153	0.274
Total Fixed Charges		21.664	19.411	20.504	10.727	22.565	24.251	21.968	23.324	13.549	25.068
Total Operating Costs		19.510	22.844	21.225	41.011	18.277	26.580	31.668	30.113	62.672	25.153
	TOTAL	41.174	42.255	41.729	51.738	40.842	50.831	53.636	53.437	76.221	50.221

* Keban only.

[redacted]

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KEBAN AND CICEROZ DAMS AND HYDROELECTRIC PROJECTS
BENEFIT/COST COMPARISONS - AREAS A, B, C, D ONLY
WITHOUT TAXES ON INVESTMENT OR FUEL

($ Millions)

	CK-1 versus T-1		CK-1 versus TK-1		(1 versus 2) versus (3 versus 4)		CK-1 versus CTK-1		CK-1 versus CEK-1	
	(1)	(2)	(3)	(4)	K-1	T-1				
Fixed Charges										
Hydro	16.296	Base	3.086	Base	13.210	Base	1.915	Base	Base	0.671
Thermal	Base	7.324	Base	1.984	Base	5.340	Base	0.054	Same	Same
Transmission	1.965	Base	0.058	Base	1.907	Base	0.392	Base	Base	0.230
Operation Cost										
Thermal-Indigenous	1.001	Base	1.032	Base	0.031	Base	Base	0.638	0.893	Base
Thermal-Oil	Base	22.041	Base	2.974	Base	19.067	Base	2.759	0.358	Base
Keban and Ciceroz	0.423	Base	0.201	Base	0.222	Base	0.036	Base	Base	0.013
Transmission O&M	0.116	Base	0.026	Base	0.090	Base	0.027	Base	Base	0.005
Total	19.801	29.365	4.403	4.958	15.460	24.407	2.370	3.451	1.251	0.919
Benefit/Cost Ratio	1.483		1.126		1.579		1.456		1.361	
	Ciceroz and Keban Benefit/Cost versus Thermal Alternative.		Ciceroz Benefit/Cost versus Thermal Alternative		Keban Benefit/Cost versus Thermal Alternative		Keban as Scheduled versus Keban Delayed.		Keban One Year Early versus Keban as Scheduled	

Annex II, Exhibit L

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KEBAN AND CICEROZ DAMS AND HYDROELECTRIC PROJECTS
BENEFIT/COST COMPARISONS - AREAS A, B, C, D ONLY
WITH TAXES ON INVESTMENT AND FUEL

($ - Millions)

	CK-1-T Versus T-1-T		CK-1-T Versus TK-1-T		(1 Versus 2) Versus (3 Versus 4) K-1-T Versus T-1-T		CK-1-T Versus CTK-1-T		CK-1-T Versus CEK-1-T	
	(1)	(2)	(3)	(4)						
Fixed Charges										
Hydro	16.973	Base	3.293	Base	13.680	Base	1.980	Base	Base	0.681
Thermal	Base	11.699	Base	2.532	Base	9.167	Base	0.283	Same	Same
Transmission	2.907	Base	0.166	Base	2.741	Base	0.586	Base	Base	0.136
Operation Cost										
Thermal - Indigenous	Base	1.477	Base	0.518	Base	0.959	Base	1.473	0.735	Base
Thermal - Oil	Base	35.153	Base	3.235	Base	31.918	Base	3.677	0.711	Base
Keban & Ciceroz	0.422	Base	0.200	Base	0.222	Base	0.035	Base	Base	0.014
Transmission O&M	0.116	Base	0.020	Base	0.096	Base	0.027	Base	Base	0.005
Total	20.418	48.329	3.679	6.285	16.739	42.049	2.628	5.433	1.446	0.836
Benefit/Cost Ratio	2.367		1.708		2.512		2.067		1.730	
	Ciceroz and Keban Benefit/Cost Versus Thermal Alternative		Ciceroz Benefit/Cost Versus Thermal Alternative		Keban Benefit/Cost Versus Thermal Alternative		Keban as Scheduled Versus Delaying Keban		Keban One Year Early Versus Keban as Scheduled	

Annex II, Exhibit M

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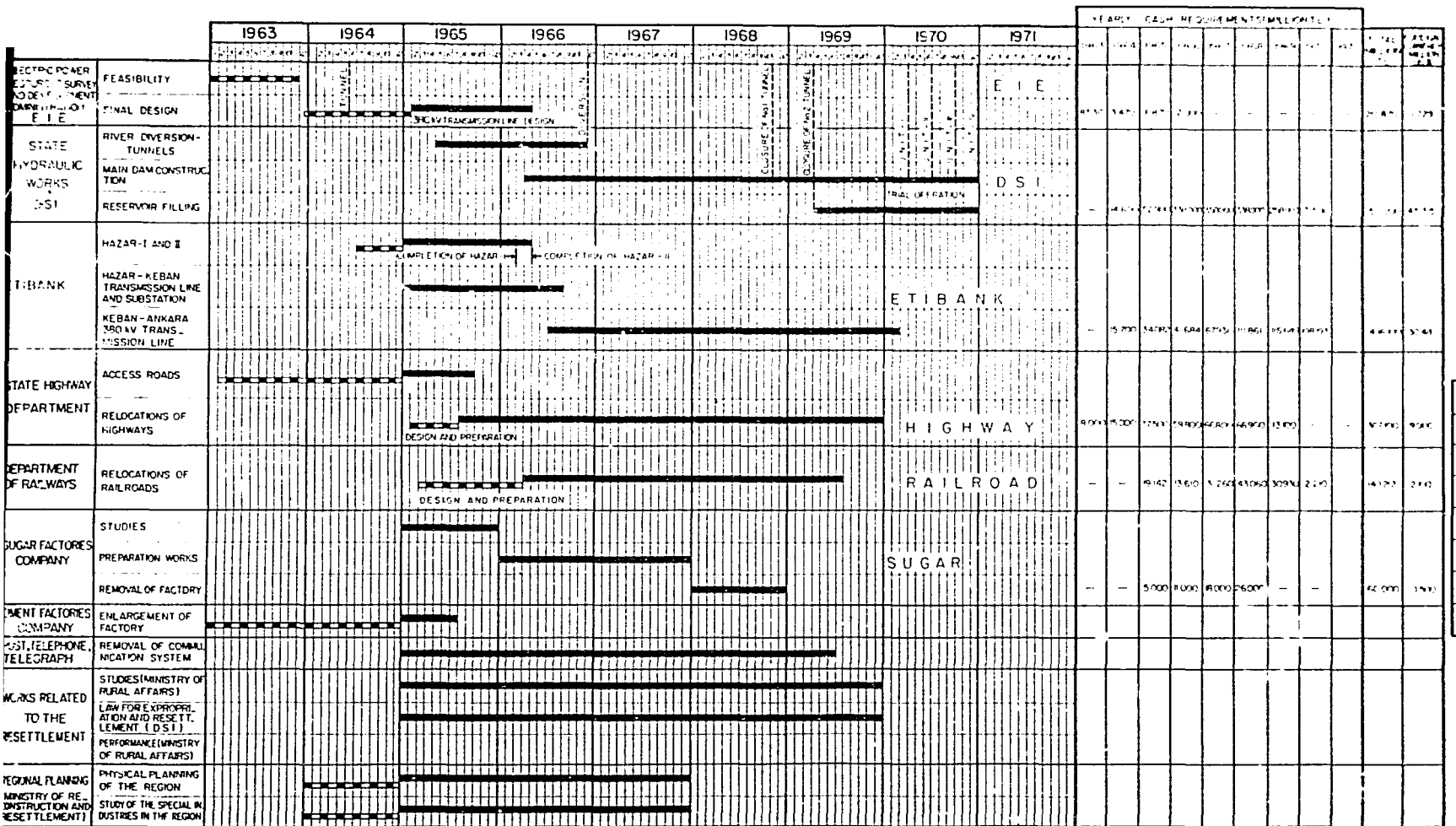
K E B A N



YEARLY CASH REQUIREMENTS (MILLION TL)

E I E	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
D S I	–	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
ETIBANK	–	15 700	34 [illegible]	4 684	6 [illegible]	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]
HIGHWAY	8 000	15 000	[illegible]	[illegible]	[illegible]	[illegible]	13 000	–	–	[illegible]	[illegible]
RAILROAD	–	–	19 142	13 610	[illegible]	43 062	30 [illegible]	2 [illegible]		[illegible]	2 [illegible]
SUGAR	–	–	5 000	8 000	8 000	26 000	–	–		62 000	[illegible]
YEARLY TOTALS	6 530	48 7[illegible]	95 [illegible]	46 609	54 199	265 821	418 67[illegible]	38 90[illegible]		2 555 280	89 625
CUMULATIVE TOTALS	6 530	65 300	76 79[illegible]	726 [illegible]	2 68[illegible]	854 70[illegible]	2 273 [illegible]	[illegible]	[illegible]	3 555 280	

INTEREST DSI	24 406	4610
INTEREST ETIBANK	6 352	1588
TL EQUIVALENT OF FOREIGN CURRENCY INTEREST	55 032	
TOTAL	3 879 732	94 83
TAX ETIBANK	160 900	
TOTAL	3 039 632	

NOTE: TL EQUIVALENT OF FOREIGN CURRENCY IS INCLUDED IN TL EXPENDITURES

YEARLY DISTRIBUTION OF FOREIGN CURRENCY

1 E I E	[illegible]	[illegible]	[illegible]	[illegible]		
2 D S I		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
3 ETIBANK		[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
4 HIGHWAYS			[illegible]	[illegible]	[illegible]	[illegible]
5 RAILROADS					[illegible]	
6 SUGAR FACTORIES			–	–	[illegible]	–
YEARLY TOTALS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
CUMULATIVE TOTALS	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]

GENERAL SCHEDULE

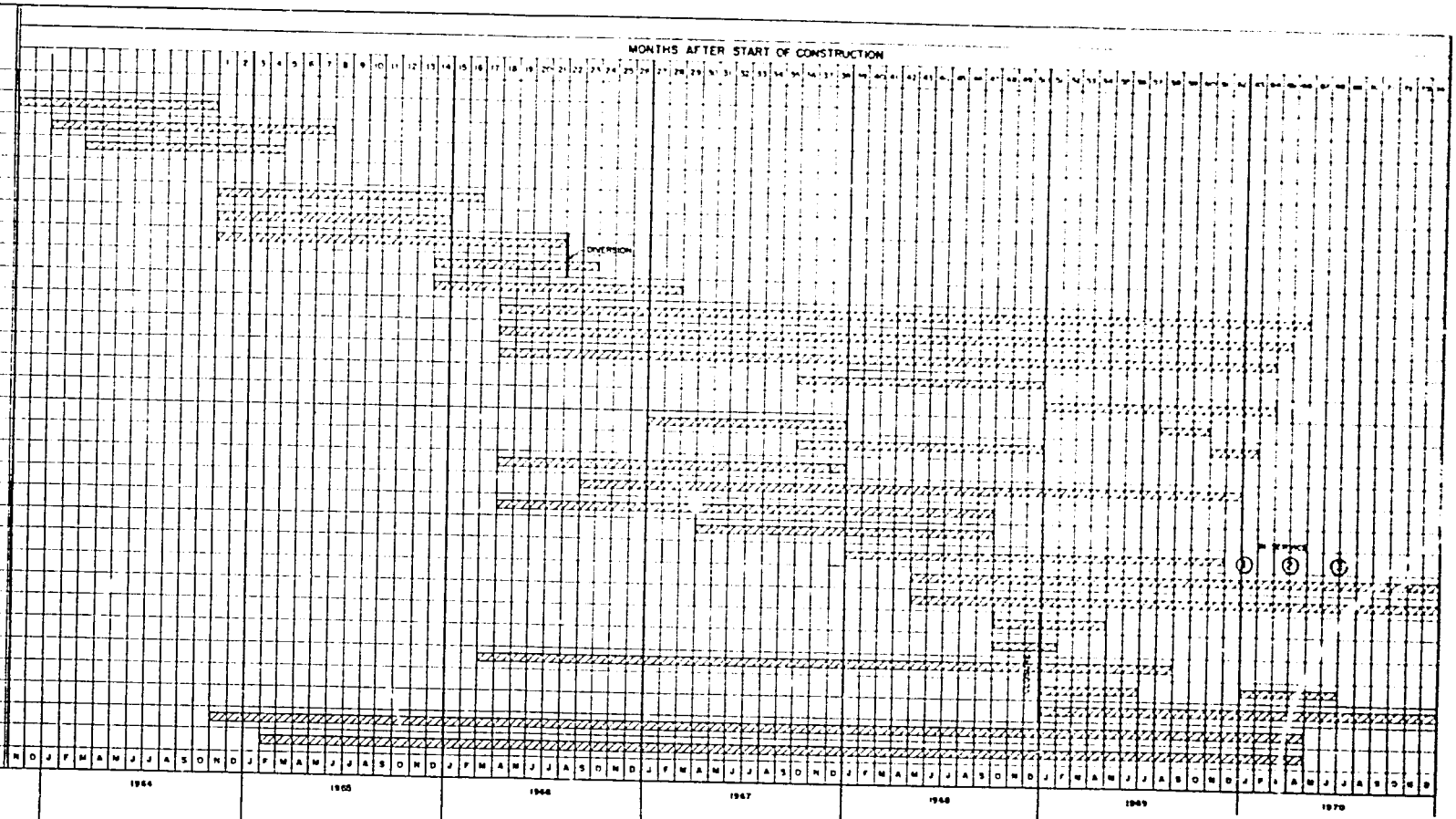
-175803

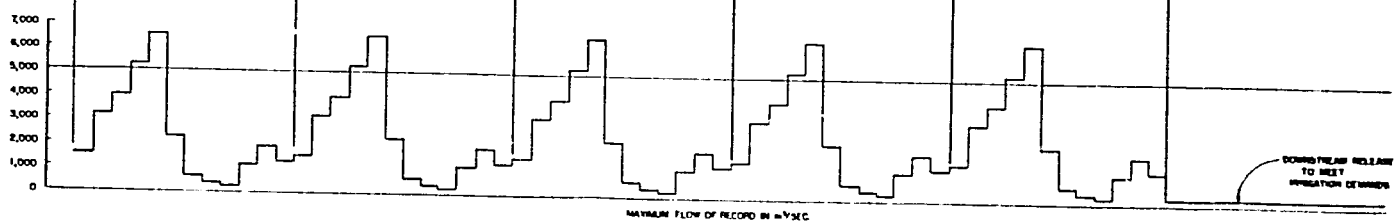
Annex II, Exhibit 6
AID-DLC/I-351

KEBAN DAM AND HYDROELECTRIC PROJECT

CONSTRUCTION SCHEDULE

ITEM NO	DIVISION OF WORK	QUANTITIES
	PREPARATORY WORK	
1	PROJECT DESIGN	
2	MAIN ACCESS ROAD	
3	CAMP, VILLAGE & SERVICES	
	PROJECT CONSTRUCTION	
4	SITE ROADS	
5	CONSTRUCTION PLANT & SERVICES	
6	RIVER DIVERSION - TUNNELS	417,000 M³
7	- COFFERDAMS	750,000 M³
8	MAIN DAM - EXCAVATION	375,000 M³
9	- ROCKFILL	9,930,000 M³
10	- FILTER	1,050,000 M³
11	[illegible]	1,970,000 M³
12	FUSE PLUG [illegible]	62,100 M³
13	[illegible]	162,700 M³
14	[illegible]	601,000 M³
15	[illegible] CRETE	295,900 M³
16	GROUTING - ADITS	3,000 LIN M
17	- DRILL & GROUT	500,000 LIN M
18	INTAKE	307,000 M³
19	PENSTOCKS	
20	POWERHOUSE	
21	TURBINES & GENERATORS	
22	MECHANICAL & ELECTRICAL	
23	TUNNEL CLOSURE	20,000 M³
24	BOTTOM OUTLET	
25	ROAD, RAILROAD & OTHER RELOCATION	
26	RESERVOIR FILLING	
27	SWITCHYARD	
28	TRANSMISSION LINES	
29	SUBSTATIONS	
		MONTHS





FINANCIAL FORECAST - 1963-1973 - INTERCONNECTED SYSTEMS

The following data relate to the Northwest, West, and East Anatolia Interconnected Systems. As EEIM operates the present interconnected system, its financial data has been used as a base for this forecast.

1 - Annual Generation Requirements and Source of Supply

A projection made by Ebasco for the years 1963 through 1973 of power generated by the major plants supplying the interconnected system is shown in Table 1 on page 3. The projection is based on in-service dates for new generation plants as set forth below and assumes average water conditions. While subsequent events have shown these project completion dates to be optomistic, the conclusions to be drawn from the financial projection based on this schedule are valid though set back in time.

The two hydroelectric plants under construction by DSI will be completed in this period. Kesikkopru, to be in service in 1965, and Almus, to be completed in 1965, will be connected to the system in 1970.

The new Istanbul Thermal Plant (Anbarli) being built by Etibank will be placed in service during 1966 and full capacity will be available in 1967.

The Ciceroz (Gokçekaya) Hydroelectric Plant is expected to be completed during 1968 with full capacity available in 1969.

The initial construction of three units of 155 mw at the Keban Plant is expected to be completed in 1970 and full energy from these units available in 1971.

2 - Financial Projection

A projection made by Ebasco of revenues and expenses for the years 1963 through 1973 appears in Table 2 on page 4. This projection reflects the load and generation shown in Table 1 on page 3.

Annual energy sales for the interconnected system are correlated to the market survey data shown in section III of this report. The unit sales price has been maintained at 0.09 TL per kwh, approximately the rate received by EEIM in recent years (0.08938 in 1962).

Fuel costs, the major item of expenses, have been continued at the 1962 rate per kwh for existing plants. The new Istanbul Plant is expected to burn imported fuel oil which has a high import duty which will sharply increase fuel costs when this plant goes into operation. Other operating expenses have been assumed to increase gradually.

The cost of power purchased from DSI in 1962 is based on the planning figure of 3 kurus per kwh used by EEIM. For the years 1963 through 1973 power costs for energy from the present DSI Plants have been calculated at the rates assigned to each plant by DSI. The energy costs for power from the two plants now under construction by DSI have been calculated on the basis of 8 percent amortization rate to provide for full operating expenses. Cost of power from the Kesikkopru Plant is figured at 4.4 kurus per kwh. At the Almus Plant, 60 percent of the investment is assigned to power, and the cost is estimated at 8 kurus per kwh.

Power costs for energy from the Ciceroz Plant have been calculated on the basis of sinking fund amortization of the investment on a 50-year life and 6 percent interest for local investment and 3-1/2 percent for foreign funds, plus operation and maintenance expenses. The same basis is used in the case of Keban power. No taxes have been included in these power costs.*

The costs of the Ciceroz-Keban transmission and substations have been calculated on the same basis as the power plants, except that taxes have been included both on investment and operations.*

Amortization is assumed to continue at the present rate until new facilities now under construction or authorized are placed in service. It is assumed that these new facilities will be amortized on a sinking fund basis over their estimated lives, and the annual amount in excess of interest charges has been included as amortization.

* Note DSI is not subject to import duties and taxes while Etibank is.

Table 1

Northwest, West and East Anatolia Interconnected Systems

ANNUAL GENERATION REQUIREMENTS AND SOURCE OF SUPPLY

(In Millions of Kilowatt-Hours)

	Actual	1963-1973 Average Water Conditions										
	1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
1. Output												
Northwest Anatolia	1 855	2 210	2 625	3 197	4 485	4 485	4 942	5 281	5 767	6 186	6 602	6 983
West Anatolia	327	383	499	567	774	858	928	997	1 369	1 545	1 728	1 821
East Anatolia	12	56	68	80	106	108	132	134	835	846	862	875
Transmission and Distribution Losses	232	291	348	416	507	599	658	708	869	941	1 008	1 061
Total Net Output of Systems	2 426	2 940	3 540	4 260	5 090	6 050	6 660	7 120	8 840	9 620	10 200	10 740
2. Allocation of Load to Plants *												
a. DSI Generating Plants	393	670	670	885	885	885	885	885	969	969	969	969
Hirfanli HEPP	167	315	315	315	315	315	315	315	315	315	315	315
Demirkopru HEPP	87	190	190	190	190	190	190	190	190	190	190	190
Kemer HEPP	139	165	165	165	165	165	165	165	165	165	165	165
Kesikkopru HEPP				215	215	215	215	215	215	215	215	215
Almus HEPP									84	84	84	84
b. Etibank Generating Plants	1 487	1 758	2 090	2 512	2 996	4 190	4 410	4 608	3 443	2 773	2 803	3 343
Sariyar HEPP	270	402	402	420	420	420	420	420	420	420	420	420
Hazar I and II HEPP	12	56	68	80	106	108	132	134	80	80	80	80
Catalagzi TEPP	771	820	850	850	850	850	850	850	850	850	850	850
Tuncbilek TEPP	328	360	470	862	950	890	950	1 000	720	720	720	720
Soma TEPP	106	120	300	300	350	280	318	344	280	280	280	280
New Istanbul TEPP					320	1 642	1 740	1 830	1 093	423	453	993
c. Other Generating Plants	546	512	780	863	1 209	975	1 065	1 065	816	216	216	216
Other HEPP				123	123	135	135	135	76	76	76	76
Silihtar TEPP	474	484	640	600	790	700	790	790	600			
Ismir and Ankara TEPP	72	28	140	140	296	140	140	140	140	140	140	140
d. Proposed Generating Plants							300	562	3 612	5 662	6 212	6 212
Ciceroz HEPP							300	562	562	562	562	562
Keban HEPP									3 050	5 100	5 650	5 650
3. Total Interconnected Systems	2 426	2 940	3 540	4 260	5 090	6 050	6 660	7 120	8 840	9 620	10 200	10 740
Total Hydro	675	1 128	1 140	1 508	1 534	1 548	1 872	2 136	5 157	7 207	7 757	7 757
Total Thermal	1 751	1 812	2 400	2 752	3 556	4 502	4 788	4 984	3 683	2 413	2 443	2 983
4. Total Generation To Be Transmitted by Etibank (Total of 2a, b and d)	1 880	2 428	2 760	3 397	3 881	5 075	5 595	6 055	8 024	9 404	9 984	10 524
Transmission Losses	101	129	146	180	206	270	296	321	425	498	529	558
5. Sales by Etibank	1 779	2 299	2 614	3 217	3 675	4 805	5 299	5 734	7 599	8 906	9 455	9 966

* Net Generations

Table 2

Northwest, West and East Anatolia Interconnected Systems

FINANCIAL PROJECTION

1963-1973

(Millions of Turkish Lira Except as Noted)

	Actual 1962	1963	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973
Earnings From Operations												
Revenues												
Annual Sales - 10^6 Kwh	1779	2299	2614	3217	3675	4805	5299	5734	7599	8906	9455	9966
Unit Sales Price - TL/Kwh	0.089	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09	0.09
Gross Revenues From Sales	159.0	206.9	235.3	289.5	330.8	432.5	476.9	516.1	683.9	801.5	851.0	896.9
Cost of Production												
Operating Expenses												
Fuel	55.0	58.6	73.0	86.1	114.4	181.1	186.4	200.7	143.3	106.5	108.2	137.8
Material	4.8	6.0	7.0	8.0	9.0	10.0	11.0	12.0	13.0	14.0	15.0	16.0
Labor	12.4	14.0	15.0	17.0	20.0	21.0	23.0	24.0	27.0	28.0	29.0	30.0
Personnel (Direct)	6.7	7.0	7.5	8.5	10.0	10.5	11.5	12.0	13.5	14.0	14.5	15.0
Maintenance and Repairs	1.6	2.2	2.5	3.0	3.5	4.0	4.0	4.5	4.5	5.0	5.0	5.5
Miscellaneous	2.9	3.0	3.0	3.5	3.5	4.0	4.0	4.5	4.5	5.0	5.0	5.0
Total Operating Expenses	83.4	90.8	108.0	126.1	160.4	230.6	239.9	257.7	205.8	172.5	176.7	209.3
Purchased Power (DSI)	11.8	45.9	45.9	55.4	55.4	55.4	55.4	55.4	62.1	62.1	62.1	62.1
Ciceroz Power Costs	-	-	-	-	-	-	15.0	29.7	29.7	29.7	29.7	29.7
Keban Power Costs	-	-	-	-	-	-	-	-	75.0	125.0	130.2	130.2
Ciceroz-Keban Transmission and Substation Costs	-	-	-	-	-	-	10.0	20.3	45.0	62.5	62.5	62.5
Fixed Charges												
Amortization	28.3	28.3	28.3	28.3	30.4	39.4	39.9	40.7	44.2	45.2	46.0	46.9
Taxes and Duties	4.1	4.1	4.1	6.3	10.7	10.7	12.9	12.9	12.9	12.9	12.9	12.9
General Administrative	8.3	9.0	9.5	10.0	10.5	11.0	11.5	12.0	12.5	13.0	13.5	14.0
Total Fixed Charges	40.7	41.4	41.9	44.6	51.6	61.1	64.3	65.6	69.6	71.1	72.4	73.8
Total Production Costs	135.9	178.1	195.8	226.1	267.4	347.1	384.6	428.7	487.2	521.6	533.6	567.6
Less: Capacity Charge	3.7	4.0	4.4	4.8	5.3	5.8	6.3	7.0	7.6	8.5	9.2	10.0
Net Production Costs	132.2	174.1	191.4	221.3	262.1	341.3	378.3	421.7	479.6	513.1	524.4	557.6
Total Utility Operating Income	26.8	32.8	43.9	68.2	68.7	91.2	98.6	94.4	204.3	288.4	326.6	339.3
Other Electric Income	2.4	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Profit and Loss												
Net Income Before Interest	29.2	35.3	46.4	70.7	71.2	93.7	101.1	96.9	206.8	290.9	329.1	341.8
Interest Excluding Interest Charged to Construction	40.1	40.1	40.1	40.1	53.9	95.7	95.1	94.4	119.3	118.4	117.5	116.7
Net Profit Before Income Taxes	(10.9)	(4.8)	6.3	30.6	17.3	(2.0)	6.0	2.5	87.5	172.5	211.6	225.1

( ) Indicates red figure.

STATE HYDRAULIC WORKS (DSI)

A - Invested Capital

State Hydraulic Works (DSI), an agency of the National Government, does not prepare balance sheets. The cost of investment (Turkish lira and U.S. dollars) in hydroelectric dams, power plants and auxiliary facilities is shown below for each major installation:

Plant	Expenditures		U.S. Dollars c/ Equivalent of Turkish Lira Expenditures
	U.S. Dollars	Turkish Lira	
Hirfanli	25 311 150	202 126 793	22 383 461
Demirkopru	28 902 618	219 140 389	24 280 755
Kemer	23 933 793	147 487 937	16 341 663
Seyhan a/	22 844 000	107 736 763	11 937 233
Almus b/	1 950 046	126 653 004	14 033 152
Kesikkopru b/	5 018 550	67 789 357	7 511 608

a/ Built by DSI.
b/ Under construction by DSI. Figures above represent total costs to conpletion.
c/ Coverted at 9.0252 T. L. = $1.00

The percentage of cost of multipurpose installations assigned to various classifications is as follows:

Classification	Kemer	Demirkopru	Hirfanli
Irrigation	19.1%	25.5%	7.2%
Flood Control	26.0	18.8	8.8
Energy	54.9	55.7	84.0
Total	100.0%	100.0%	100.0%

B - Statement of Income

A comparative statement showing the source of income of the State Hydraulic Works (DSI) for the fiscal year ended February 28, 1963, and an estimate for the year ending Febraury 28, 1964, expressed in Turkish lira and U.S. dollars is shown below:

Source of Income	(000) Turkish Lira Actual 1963	Turkish Lira Estimate 1964	U.S. Dollars a/ Actual 1963	U.S. Dollars a/ Estimate 1964
DSI Operated Projects b/	568	300	63	33
Transfer of Installations	50	5 700	6	632
Hydroelectric Plants c/	-	30 000	-	3 324
Collected From Users as Amortization and Operation Fees	7 721	13 000	855	1 440
Rentals and Sale of Property	590	1 000	65	111
Indemnities Received From Contractors and Revenues From Performance Bonds	990	1 000	110	111
Equipment and Land Sold to Contractors	216	4 500	24	499
Laboratory and Other Income	2 277	3 000	253	332
From the National Budget	626 538	669 578	69 420	74 189
Total	638 950	728 078	70 796	80 671

a/ Conversion Rate - 9.0252 T.L. = $1.00.
b/ Includes income from small hydroelectric plants.
c/ See subsequent section relating to sales to Etibank.

C - Statement of Expenditures

A comparative statement of actual expenditures for principal items pursuant to the current and the investment budgets of State Hydraulic Works (DSI) for the fiscal year ended February 28, 1963, and an estimate for the fiscal year ending February 28, 1964, expressed in Turkish lira and U.S. dollars is shown below.

Expenditures	Turkish Lira Actual b/ 1963	Turkish Lira Estimate 1964	U.S. Dollars a/ Actual b/ 1963	U.S. Dollars a/ Estimate 1964
Current Budget				
Salaries	4 121	6 100	457	677
Wages	12 545	16 989	1 390	1 883
Pension Fund Contributions	1 112	1 638	123	181
Rent	1 700	2 000	188	222
All Other	6 028	7 801	668	863
Total Current Budget	25 506	34 528	2 826	3 826
Investment Budget				
Expropriations and Purchase of Land	58 278	50 000	6 457	5 540
Construction	302 323	326 809	33 497	36 211
Repairs	22 525	24 000	2 496	2 659
Purchase of Machines and Vehicles	80 873	108 650	8 961	12 038
Survey Expenses	52 750	74 800	5 845	8 288
Contributions to Villages for Drinking Water Installations	64 218	70 000	7 115	7 756
All Other	36 562	39 291	4 051	4 353
Total Investment Budget	617 529	693 550	68 422	76 845
Grand Total	643 035	728 078	71 248	80 671

a/ Conversion Rate - 9.0252 T.L. = $1.00
b/ Represents budget figures. Funds appropriated are 4 085 T.L. ($453) less than budgeted

D - Transactions with Etibank

The output of the three major generating plants of DSI is delivered to Etibank for transmission to ultimate consumers. Until recently there had been no contractual arrangements between the two parties regaring the price of power. It has been decided, according to information received orally from Mr. Turgut Ozal, Assistant General Director of EIE, that unitl a pending National Cabinet decision is signed (expected according to Mr. Ozal this summer or soon after a new Government comes into power after the electrons scheduled for this fall) Etibank will pay 3 urus (0.33¢) per kwh and thereafter 7 urus (0.77¢) per kwh. According to Mr. Ozal Etibank's rate structure has already been adjusted upward to cover the increased payments which will soon be due to DSI.

TURKEY
KEBAN HYDROELECTRIC
AND TRANSMISSION LINES PROJECT

STATUTORY CHECKLIST

1. FA Sec. 102. Precautions that have been or are being taken to assure loan proceeds are not diverted to short-term emergency purposes (such as budgetary, balance of payments, or military purposes) or any other purpose not essential to the country's long-range economic development. -- Loan proceeds will be used for the project as discussed in the Capital Assistance Paper, some of which will be used to enable the GOT to import raw materials and equipment needed for long-range development in Turkey.

2. FA Sec. 201(b) Manner in which loan will promote country's economic development, emphasizing help for long-range plans and programs designed to develop economic resources and increase productive capacities. -- Covered in Section IV entitled "Economic Analysis".

3. FA Sec. 201(b)(1). Information and conclusion on availability of financing from other free-world sources, including private sources within the United States. -- The Export-Import Bank is not prepared to consider the loan application. No private sources in the U.S. would be willing to provide funds required on these terms and conditions. A large portion of the foreign exchange needed for the project is being furnished from other free-world sources.

4. FA Sec. 201(b)(2). Information and conclusion on activity's economic and technical soundness, including the capacity of the recipient country to repay the loan at a reasonable rate of interest. -- Covered in Sections III, IV and V. Turkey's financial situation is discussed in the CAP.

5. FA Sec. 201(b)(3). Information and conclusion on existence of reasonable promise activity will contribute to development of economic resources or increase of productive capacities. -- Covered in Section IV entitled "Economic Analysis".

The following abbreviations are used:

FA Foreign Assistance Act of 1961, as amended by the Foreign Assistance Act of 1964.

App. Foreign Assistance and Related Agencies Appropriation Act, 1965.

6. FA Sec. 201(b)(4). Information and conclusion on activity's relationship to other development activities, and its contribution to realizable long-range objectives. -- Covered in Section IV entitled "Economic Analysis".

7. FA Sec. 201(b)(5). Country's self-help measures, including institution of Foreign Assistance Act investment guaranty program. -- Discussed in LAS. Turkey has an agreement with the U.S. on Investment Guaranties.

8. FA Sec. 201(b)(6). Information and conclusion on possible effects on U.S. economy, with special reference to areas of substantial labor surplus. -- The project will have a favorable effect on the U.S. economy since all procurement out of the loan funds will be from U.S. sources. No information is available as to whether any specific labor surplus area will be benefited.

9. FA Sec. 201(b). Information and conclusion on reasonable prospects of repayment. -- Covered in Section X entitled "Repayment Prospects".

10. FA Sec. 201(d). Information and conclusion on legality (under laws of the country and the U.S.) and reasonableness of lending and relending terms. -- Similar loans have been made and this loan would be made in compliance with U.S. and Turkish laws. The LAS justifies the development loan terms.

11. FA Sec. 201(e). Information and conclusion on availability of an application together with sufficient information and assurance to indicate reasonably that funds will be used in an economically and technically sound manner. -- An adequate application and other sufficient information have been received, as described in Sections I, II, III, and IV.

12. FA Sec. 201(f). If a project, information and conclusion whether it will promote the economic development of the requesting country, taking into account the country's human and material resource requirements and the relationship between the ultimate objectives of the project and the country's overall economic development. -- Covered in Section IV entitled "Economic Analysis".

13. FA Sec. 201(f). If a project, information and conclusion whether it specifically provides for appropriate participation by private enterprise. -- U.S. private sources will supply equipment, material and services .

14. FA Sec. 202(a). Total amount of money under loan which is going directly to private enterprise, etc. -- See Section XI entitled "Impact on U.S. Economy".

15. FA Sec. 601. Information and conclusions whether loan will encourage efforts of the country to: (a) increase the flow of international trade; (b) foster private initiative and competition; (c) encourage development and use of cooperatives, credit unions, and savings and loan associations; (d) discourage monopolistic practices; (e) improve technical efficiency of industry, agriculture, and commerce; and (f) strengthen free labor unions. -- (a) The loan would encourage the flow of international trade by providing for the export of the machinery, equipment, materials and commodities to Turkey from the U.S., (b) private initiative and competition would be fostered through the availability of low cost electrical power, (c) the loan would have no direct effect on the development and use of cooperatives, credit unions, and savings and loan associations, (d) the loan would have no measurable effect on monopolistic practices, (e) the project would improve the technical efficiency of industry, commerce and agriculture through the availability of low cost and reliable electrical power, and (f) the loan would have no direct effect on the strengthening of free labor unions.

16. FA Sec. 601(d). Conclusion and supporting information on compliance with the Congressional policy that engineering and professional services of U.S. firms and their affiliates are to be used in connection with capital projects to the maximum extent consistent with the national interest. -- Engineering and professional services will be required by the Loan Agreement and it is expected that they will be obtained from private sources in the U.S.

17. FA Secs. 601, 602. Information and conclusions whether loan will (a) encourage U.S. private trade and investment abroad; (b) encourage private U.S. participation in foreign assistance programs (including use of private trade channels) and the services of U.S. private enterprise; and (c) permit American small business to participate equitably in the furnishing of goods and services financed by it. -- (a) U.S. private investment in Turkey should be encouraged by the availability of low cost and reliable electrical power which will be made possible by the loan, (b) private U.S. participation in the foreign assistance program to Turkey would be encouraged through the furnishing of the goods and services to be financed under the loan, (c) the implementation documents would contain appropriate provision for affording American small business an opportunity to bid on the contracts to be financed with the loan funds.

18. FA Sec. 604(a). Compliance with restriction of commodity procurement to U.S. except as otherwise determined by the President and subject to statutory reporting requirements. -- Procurement will be limited to the U.S.

19. FA Sec. 604(b). Compliance with bulk commodity procurement restriction to prices no higher than the market price prevailing in the U.S. at time of purchase. -- The Loan Agreement will contain a provision covering this point.

20. FA Sec. 604(d). Compliance with requirement that marine insurance be purchased on commodities if the participating country discriminates, and that such insurance be placed in the U.S. -- This will be required by the Loan Agreement.

21. FA Sec. 611(a)(1). Information and conclusion on availability of engineering, financial, and other plans necessary to carry out the assistance and of a reasonably firm estimate of the cost of the assistance to the United States. -- As set forth in Section V entitled "Financial Analysis", a financing plan covering the estimated costs of the project has been agreed to by the foreign lenders and the Government of Turkey. Accordingly, the $40,000,000 to be made available under the proposed loan constitutes a reasonably firm estimate of the cost of this project to the U.S. As set forth in Section III entitled "Engineering Analysis", the engineering plans necessary to carry out the project have been completed. As set forth in Sections V and IX entitled "Financial Analysis and Coordination of Financing", respectively, the financial plans necessary to carry out the project have been made and to the extent additional planning may be required, such will be completed before the loan agreement is signed as suggested in Section XIII entitled "Conditions and Covenants".

22. FA Sec. 611(a)(2). Necessary legislative action required with recipient country and basis for reasonable anticipation such action will be completed in time to permit orderly accomplishment of purposes of loan. -- No necessary legislative action is required, however, it is expected that desirable legislation will be enacted with respect to the power industry in Turkey as mentioned in Section I entitled "History and Background".

23. FA Sec. 611(b); App. Sec. 101. If water or water related land resources construction project or program, information and conclusion on benefit-cost computation. Covered in Section III entitled "Engineering Analysis".

24. FA Sec. 611(c). Compliance with requirement that contracts for construction be made on competitive basis to maximum extent practicable. -- Appropriation provision for this requirement will be made in the loan agreement.

25. FA Sec. 619. Compliance with requirement that assistance to newly independent countries be furnished through multilateral organizations or plans to maximum extent appropriate. -- Although Turkey is not a "newly independent country", assistance to Turkey is based on consortium meetings, in which participants include international lending agencies, and this project is being multilaterally financed.

26. FA Sec. [illegible]; App. Sec 107. Compliance with prohibitions against assistance to Cuba and any country (a) which furnishes assistance to Cuba or fails to take appropriate steps by February 14, 1964 to prevent ships or aircraft under its registry from carrying equipment, materials or supplies from or to Cuba; (b) which sells, furnishes or permits any ships under its registry from carrying items on the Battle Act List, or other items of primary strategic significance, or items of economic assistance. -- Turkey is not in violation of this Section.

27. FA Sec. 620(b). If assistance to the government of a country, existence of determination it is not controlled by the international Communist movement. -- Turkey is not controlled by the international Communist movement.

28. FA Sec. 620(c). If assistance to the government of a country, existence of indebtedness to a U.S. citizen for goods or services furnished or ordered where such citizen has exhausted available legal remedies or where the debt is not denied or contested by such government or the indebtedness arises under an unconditional guaranty or payment given by such government. -- Turkey is not ineligible under this Section.

29. FA Sec. 620(d). If assistance for any productive enterprise which will compete with U.S. enterprise, existence of agreement by the receipient country to prevent export to the U.S. of more than 20% of the enterprise's annual production during the life of the loan.-- Not applicable.

30. FA Sec. 620(e). If assistance to the government of a country, extent to which it (including government agencies or subdivisions) has, after January 1, 1962, taken steps to repudiate or nullify contracts or taken any action which has the effect of nationalizing, expropriating, or otherwise seizing ownership or control of property of U.S. citizens or entities beneficially owned by them without taking appropriate steps to discharge its obligations. -- Turkey is not ineligible under this Section.

31. FA Sec. 620(f). Compliance with prohibitions against assistance to any Communist country. -- Turkey is not a Communist country.

32. FA Sec. 620(g). Compliance with prohibition against use of assistance to compensate owners for expropriated or nationalized property. -- Not applicable.

33. FA Sec. 620(h). Compliance with regulations and procedures adopted to insure against use of assistance in a manner which, contrary to the best interests of the U.S., promotes or assists the foreign aid projects or activities of the Communist-bloc countries. -- The Loan Agreement will contain a provision on this point.

34. FA Sec. 620(i). Existence of a determination that the country is engaging in or preparing for aggressive military efforts. -- No such determination under this statute has been made.

35. FA Sec. 620(k). If construction of productive enterprise where aggregate value of assistance to be furnished by U.S. will exceed $100 million, identification of statutory authority. -- Not applicable.

36. FA Sec. 620(l). Compliance with prohibition against assistance after 31 December 1965 for the government of a country which fails to institute investment guaranty program. -- Turkey has agreed to an Investment Guaranty Program.

37. FA Sec. 636(h). Appropriate steps that have been taken to assure that, to maximum extent possible, country is contributing local currencies to meet the cost of contractual and other services and foreign currencies owned by the U.S. are utilized to meet the cost of contractual and other services. -- The GOT will furnish a large share of the necessary local currency. U.S.-owned Turkish Lira is used for all administrative and program costs in lieu of dollars, to the maximum extent possible.

38. App. (Sec. Unnumbered). Use of funds to carry out FA Sec. 205, which pertains to IDA. -- Not applicable.

39. App. Sec. 102. Compliance with requirement that payments in excess of $25,000 for architectural and engineering services on any one project be reported to Congress. -- Any such payments will be reported.

40. App. Sec. 104. Compliance with bar against funds to pay pensions, etc., for military personnel. -- Funds will not be used for such purposes.

41. Appr. Sec. 111. Compliance with requirement for security clearance of personnel under contracts for services. -- Appropriate provision for such clearances will be made in the loan agreement.

42. App. Sec. 112 Compliance with requirement for approval for contractors and contract terms for capital projects. -- Appropriate provision for such approvals will be made in the loan agreement.

43. App. Sec. 114. Compliance with bar against use of funds to pay assessments, etc., of U.N. member. -- Funds will not be used for such purposes.

44. App. Sec. 117. Compliance with regulations on employment of U.S. and local personnel for funds obligated after 30 April 1964. -- In view of the multilateral nature of the financing of this project, an appropriate waiver of these regulations is contemplated.

45. App. Sec. 401. Compliance with bar against use of funds for publicity or propaganda purposes within U.S. not heretofore authorized by Congress. -- Funds will not be used for such purposes.

AID-DLC/P-353
Annex IV
June 22, 1965

Draft for Loan Paper

CAPITAL ASSISTANCE LOAN AUTHORIZATION

(Provided from Development Loan Funds)

(Turkey: Keban Hydroelectric and Transmission Line Project)

Pursuant to the authority vested in the Administrator of the Agency for International Development (hereinafter called "A.I.D.") by the Foreign Assistance Act of 1961, as amended, and the Delegations of Authority issued thereunder, I hereby authorize the establishment of a loan pursuant to Part I, Chapter 2, Title 1, the Development Loan Fund to the Government of Turkey of not to exceed forty million dollars ($40,000,000) to assist in financing the costs of design and construction of a dam and hydroelectric power plant at Keban on the Euphrates (Firat) River in Eastern Turkey, related substations and transmission lines, and the acquisition and importation of equipment, materials, services and general commodities in connection therewith. This loan is to be subject to the following conditions:

1. Interest Rate and Terms of Repayment.

This loan shall be repaid by the Government of Turkey within forty (40) years after the date of first disbursement thereunder, including a grace period of not to exceed ten (10) years. The interest on the disbursed balance of the loan shall be at the rate of one percent (1 %) per annum during the ten (10) year grace period and at the rate of two and one-half percent (2-1/2%) thereafter.

2. Currency of Repayment.

Provision shall be made for repayment of the loan and payment of interest in U.S. dollars.

3. Local Currency Costs.

U.S. dollars utilized under the loan for general commodity imports and to generate local currency shall be made available to the Government of Turkey or its designee through appropriate procedures and shall be used only for procurement in the U.S.

4. Other Terms and Conditions.

4.1. Commodities, materials, equipment and services directly financed under the loan shall be of U.S. source and origin.

4.2. A.I.D. shall receive appropriate assurance that:

4.2.1. The funds other than the loan authorized hereby necessary for the project shall be available when and as needed.

4.2.2. The engineering and consulting services necessary for the project shall be employed by the Government of Turkey.

4.2.3. An expert Board of Consultants shall be established to provide assistance as needed with respect to design and construction of the project.

4.2.4. The riparian rights of Syria and Iraq shall be provided for in a manner satisfactory to A.I.D.

4.2.5. The necessary steps toward reform of the structure and operation of the Turkish power industry will be effected in a manner satisfactory to A.I.D.

5. Conditions Precedent to Execution of the Loan Agreement.

Prior to the execution of the loan agreement for this project, A.I.D. shall receive appropriate assurances that:

5.1. Satisfactory arrangements have been made for management of the Keban lenders' interests in the project.

5.2. Agreement has been or will be reached concerning the preference, if any, to be given to the procurement of Turkish goods and services.

5.3. Agreement has been or will be reached among the Keban lenders and with the Government of Turkey with respect to the disbursement of loan funds for Part II (turbines and generators) and Part III (transmission lines) of the project.

6. This loan shall be subject to such other terms and conditions as A.I.D. may deem advisable.

David E. Bell
Administrator

Date