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FINAL REPORT
MANAGEMENT SUPPORT ACTIVITIES
(IDEA, INC.)
USAID/ENI/EEUD/EI
CENTRAL ASIAN REPUBLICS

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This report describes activities in the energy sector performed in support of the USAID Mission for the Central Asian Republics (CAR) under International Development and Energy Associates (IDEA), Inc.'s contract Number CCN-002-C-00-3128-00 with USAID/ENI/EEUD/EI.

I. OBJECTIVE

The objective of the work was to provide technical management support to the USAID Mission in Almaty, Kazakhstan.

II. SCOPE

The assignment in Central Asia started in October of 1993 and ended two years later. During that period, assistance was provided to:

- define and implement strategies and tasks for development of market-oriented energy policies;
- devise strategies and projects to improve public welfare by increasing energy efficiency and reducing health risks;
- direct, coordinate, and support relevant projects being performed by contractors;
- provide liaison and dialog with the appropriate counterpart authorities;
- perform special assignments as requested by the USAID Mission.

Most of the work was performed in the Republics of Kazakhstan (17 tasks) and Kyrgyzstan (11 tasks). Regional tasks also occasionally included coordination with the energy authorities of the other three CARs (Uzbekistan, Turkmenistan, and Tajikistan) and special assignments were undertaken to assist the development of hydroelectric projects in Tajikistan.

Early strategies worked out by USAID for the area focussed mainly on the electric power and district heating sectors including work with the coal industry. One project dealt with the oil refining sector. The work was directed toward the development of competitive, privately owned utilities; restructuring to market-efficient organizations; adoption of efficient fuel use policies; and preparation of schedules and cost analyses for meeting future electricity demand in league with environmental protection.

III. ACCOMPLISHMENTS 1993-1995

The accomplishments of this assignment are the result of cooperation and work of many co-workers. I would like to single out the effective and constant support of Dr. Barry Primm, Energy, Environment and Agriculture Officer USAID CAR Mission and his assistant Irina Alexeeva. The entire CAR Mission staff provided a consistent activity base. The entire energy program in Central Asia was sympathetically and effectively supported by Gordon Weynand, USAID/Washington.

Many of the contractor representatives worked as part of a single team and most counterpart associates in Kazakhstan and Kyrgyzstan helped the program.

Office and Staffing

- An IDEA field office was established and a staff including the office manager (Dinara Rashitova), an engineer (Gennady Doroshin) and driver/assistant (Yuri Petrov) was employed in Almaty. An auxiliary office was set up in Bishkek.
- The IDEA office facilities also provided logistics/communication support and working space for visiting contractor teams throughout the contract duration period.
- The IDEA office provided information and arranged meetings for energy contractors and U.S. industry representatives with counterpart authorities, as appropriate.

Kazakhstan

Policy

- Consulted for drafting of national decrees to move the energy sector away from a monolithic centralized structure into subdivisions which may be more amenable to eventual, gradual privatization.
- Fostered movement to form an independent regulatory agency.
- Supported private industry with background investment data.
- The Government of Kazakhstan (GOK) accepted the USAID-sponsored plan for a 25-year National Energy Savings Program. An Energy Savings Decree was also prepared for consideration by the Council of Ministers.
- Principles for price and tariff setting were adopted by the GOK and IMF.

Efficiency

- Identified energy savings measures by key industries to be used by the GOK in decrees.
- Identified and priced energy savings measures specific to oil refineries used by potential private investors.
- Identify costs of coal quality improvement, coal handling, and mining safety measures.
- Analysis of priorities and realistic costs for repowering the existing major power plants initiated.
- Initiate an analysis of options and costs to establish environmental controls at power plants completed.

Intellectual Exchanges

- Partnerships between CINergy and KazakhstanEnergy and KazakhstanAlauGaz resulted in management structure reforms in the latter.
- Mid-level executive training in utility management initiated.
- The GOK participated positively in the First Regional Energy Conference on Energy Savings (July 1995).
- Co-sponsorship of Second Regional Energy Conference for Central Asia on Energy Trading accepted by the GOK.

Kyrgyzstan

Policy

- Established concept of an independent regulatory agency.
- Principles for price and tariff setting accepted by the Government of Kyrgyzstan (GOKR) and IMF.

Efficiency

- Analysis of electric power demand growth indicated emphasis on hydroelectric power generation for economic and environmental reasons. Analysis also identified need for a regional power market study.

- Tariff collection increased slightly by installation of meters and rate payment structures.
- Siting and conceptual design of a new 2300-MW hydroelectric station was completed.
- Established cost and engineering basis for an international bank loan to reconstruct the Bishkek district heating system.
- Established cost and engineering basis for an international loan to reconstruct the electrical transmission system.
- Completed survey of coal resources and use.
- An analysis of the impact of adding hydroelectric power generation on regional water usage was initiated.

Intellectual Exchanges

- Partnership of KyrgyzGosEnergo with Washington Water Power established. Interchanges affected changes in Kyrgyz management practices.
- Training of mid-level utility executives in progress.
- First Regional Energy Conference on Energy Savings was co-sponsored by the GOKR.

Tajikistan

- Analyses were done on the funding of Rogun Hydro Station and Pamir One Hydro Station.

Uzbekistan and Turkmenistan

- Working basis for regional energy cooperation established.

IV. STRATEGY DEVELOPMENT

Several tasks were in progress before the start of the IDEA activities in Almaty in October 1993. In Kazakhstan, these included an analysis of electricity costs/tariffs by International Resources Group Limited (IRG Ltd.), an engineering study to effect efficiency increases in oil refineries (by John Brown Co.) and a program to improve the operation of the Karaganda coal mines (PIER). In Kyrgyzstan there was a similar cost/tariff analysis by IRG and a feasibility analysis for a new hydroelectric generating station at Kambarata (by HARZA). The

results and status of these tasks will be summarized in the following section.

Visits and consultation with counterpart agencies provided "wish lists" for both Kazakhstan and Kyrgyzstan. Project implementation documents for work to be conducted by prime contractors Hagler Bailly and Company and Burns & Roe, as well as by cooperative agreements (US Energy Association, PIER, and Institute for International Education), were prepared in January 1994 for review and approval by USAID in Washington.

The USAID Mission in Almaty formed a Task Force to prepare a Strategies Energy Plan for Central Asia for 1994 and 1995. This plan, approved by the Mission Director in July 1994, provided the rationale, indicators, budget and donor coordination directions for the region. The Task Force Strategic Plan retained most of the tasks proposed in January. Four originally proposed tasks were dropped due to budget constraints (Feasibility Analyses of Kazakhstan's East-West Oil and Natural Gas Pipelines, Formation of an Environmental Control Technology Center and Preparation of Environmental Legislation). A highly significant new task was added, which was the consideration of Regional Energy Issues.

Later, at the insistence of the Kazakh Ministry of Energy and Coal (MOEC), another task, the Least-Cost Power Supply Analysis for South Kazakhstan, was dropped.

The final list of individual projects comprised 13 tasks in Kazakhstan, nine in Kyrgyzstan and one of regional scope (Attachment A). The funding split coincidentally echoed this division (59%, 39%, and 2%, respectively).

V. TASK DESCRIPTIONS AND STATUS

A. Kazakhstan

1. Policy and Investment Support (Hagler Bailly)

Task Scope: Assistance is being provided in the preparation of three "laws" (the Kazakhstan term; a better term would be "decrees"):

- o the Electric Power Law (being prepared by Latham & Watkins, a Hagler Bailly subcontractor) to allow restructuring of the power sector to allow competition and privatization;
- o the Coal Law (Pepper, Hamilton and Scheetz) to allow eventual privatization of coal suppliers; and

- the Energy Savings Law (Latham & Watkins) to translate into law the provisions presented in a separate Energy Savings Plan (see below).

Task Status: Concepts and drafts of all three laws have been submitted to the MOEC.

The proposed Energy (Electric Power) Law emphasized the need for an independent regulatory agency and provided a framework for privatization. The MOEC decided to prepare its own, very different, version for submittal to the Council of Ministers, but requested that advisory USAID support be continued.

In the meantime, the Council of Ministers of the Government of Kazakhstan signed a Restructuring Decree which:

- reconfirms the central authority of KazakhstanEnergo for the larger power plants and all of the transmission network;
- creates nine other Energos (separate Holding Companies each directly administered by the Ministry of Energy and Coal Resources). One of these separated Energos has substantial generating capacity, others were created to respond to local political needs, and another entity includes the hydro stations. These "baby" Energos answer to the MOEC (not KazakhstanEnergo). The decree does not allow for privatization at this point, but does not rule it out down the road. According to Kazakh insiders, this means one to five years. It is my opinion that the first attempt at partial privatization of an existing Energo is at least one year away.
- permits Independent Power Producers (IPPs) to feed into the national network.

The language describing rate setting is fuzzy - the MOEC clearly wants to continue to calculate costs and fix surcharges, but must yield ultimate authority to the Anti-Monopoly Committee.

The power pyramid starts from President Nazerbaev, the Once and Future President, to Prime Minister Kashigeldin and thence to his ambitious Deputy Mette. Mette runs the Council of Ministers which, in the absence of a Parliament, makes legislation. Mette needs allies and will not antagonize the MOEC at this point. Together this whole power structure will not make sudden, voluntary, major changes; the body of Gorbachev twists slowly in the wind. There is also a strong,

understandable nationalistic feeling that Kazakhstan must not be led by foreigners; and yet they are not sure how to solve the money shortage problem without losing absolute, central control. In my opinion, there is now sufficient foreign entrepreneurial interest that, combined with need and greed, will result in private generation. If this privatization occurs at the Oblast level, then distribution will be privatizable.

There are several problems to overcome. One is the reduction of risk to the investor through electricity/heat purchase guarantees and guaranteed fuel supply prices. Both require stability; it is therefore essential that prices/tariffs be regulated by an independent agency.

Recommendations: (Hagler Bailly) Support should be provided to the Anti-Monopoly Committee in their campaign to become a truly independent regulatory agency. Currently they respond directly to the Council of Ministers through their very able and respected President Svoik. The crossroads function is the authority to set prices/tariffs which requires the ability to account for all costs so that real busbar costs and surcharges can be calculated. The direct, unencumbered accomplishment of this goal requires clear and open cooperation and coordination among USAID contractors whose functions may overlap in this area.

It may be advantageous to station an in-house resident utility economic advisor in the Ministry for consultation, including the preparation of specifications, proposal evaluations, and liaison. With the support of specialists, this "Counselor" could also help to set up a NERC-type function and to assist in the organization of Technical Institutes. [NERC (North American Electric Reliability Council) collects power plant failure data; utilities and power plants use this information to make maintenance and replacement plans which are cost and schedule efficient.] In addition, it is essential to maintain close coordination between the legal effort and the energy efficiency work being conducted within the different tasks.

On the Coal Law, concepts were submitted to the MOEC and comments from various sources were received by Pepper, Hamilton and Scheetz.

The coal industry is a bipolar affair in Kazakhstan with the coal "Joint Stock Holding Companies" at Karaganda and Ekibastuz, which are like "feudal states" at one pole and the central government at the other pole. Karaganda produces a variety of coal qualities ranging from uneconomically mined,

high-ash steaming coal to essential metallurgical coal (for the currently sick steel industry). The inefficient and dangerous underground mines at Karaganda need to be shut down creating a social safety net problem for perhaps 20,000 mine employees and all the dependent services. Karaganda's domestic (Karaganda Power Station) and foreign customers (mainly the thermal plant in Bishkek) can still be supplied or supply can be shifted to Ekibastuz. Ekibastuz produces a very high-ash coal (50%) much more economically in open pit mines, although health, safety and environmental problems exist. The Ekibastuz coal is used extensively at mine-mouth power plants (Ekibastuz, Yermanski, and Pavlodar) and for export (both coal and the electricity products to Russia).

Recommendations: (Hagler Bailly) Cooperation with the MOEC in the development of coal industry legislation should be continued. The MOEC is preparing its own version of a Coal Law and will compare the two. The likelihood, or desirability, of coal production privatization in the short run is doubtful. The objectives, however, should be to assure that private power producers can obtain secure and financially sound long-term coal supply contracts. Another avenue is to privatize some of the more efficient small coal mines sprinkled throughout northeast Kazakhstan.

A separate USAID task (see below) strives to demonstrate coal cleaning processes which would result in significant reduction of the mine-mouth ash content. This would reduce coal transportation costs, widening the market and increasing generation capacity of the existing boilers. It will be important to keep these two tasks integrated.

The Energy Savings Law draft has been well received. Again, I expect that the MOEC will draw up its "own" version. The reason for the more favorable reception has been that we are working under the lead and in support of a local, well-connected firm and that the Law is integrated with a separate USAID-supported task called the Development of an Energy Savings Plan (see below).

Recommendation: Proceed to refine the draft law in light of comments.

2. Energy Efficiency Improvement (Burns and Roe)

Task Scope: The objective of work in this sector is to improve public welfare through assurance of the availability of safe, reliable and inexpensive electricity and heat.

The Kazakhstan power sector has seen steep degradation of its electricity and heat-generating capacity over the last four years due to the collapse of domestic and inter-republic trade, and therefore, flow-back of maintenance funding. This decline in energy production capacity has been more than compensated for by a decline in demand. Even pessimists expect demand to resume growing in three to five years. A realistic estimate is three percent annual growth starting after a couple of years. At that point, if no action is taken now, a serious energy shortage will curtail economic growth. This can be prevented by undertaking a series of concurrent campaigns as illustrated in Attachment B. In order of least cost (see attachment C):

- 10-15% of the shortage can be made up through energy savings in generation, end use, and demand-side management;
- about 50% of the shortage could be made up by reconstruction/repowering of existing plants;
- the balance could be made up by a combination of new construction of coal and hydro plants by independent producers, co-generation or increased power imports.

Task Status: The USAID-funded portion of the Kazakhstan National Energy Savings Plan has been completed by Burns and Roe and is a part of the overall plan which will be submitted to the Council of Ministers later this year.

Site visits to four large power stations (Yermanski, Pavlodar, Karaganda and Ust-Kamenogorsk) were completed by a Burns and Roe team (see Attachment D). The reports showing reconstruction priorities, costs, and schedules will be submitted to the GOK authorities in the near future.

Tests to clean coal from the usual 50% ash level to at least 38% (the maximum boiler design specification limit) are underway by Burns and Roe. Tests with one sampling of Karaganda coal showed that low-cost cleaning would be successful. Coal cleanability test equipment is being purchased for delivery to the Kazakhstan counterparts. Kazakhstani technical experts were trained to work proficiently with the test equipment.

Recommendations: (Burns and Roe) These tasks should be completed and the results disseminated to potential investors. Preparation of specifications and bid packages should be supported for upgrading the power plants.

3. Energy Environment Improvement (Burns and Roe, PIER)

Task Scope: To improve the control of environmental emissions of power plants and to increase safety and health conditions at coal mines.

Task Status: This Burns and Roe task is a companion to their analysis of the extent and cost of reconstructing power plants in Kazakhstan. It is a highly appreciated task in Kazakhstan and will involve the cooperation of at least three ministries (Energy, Ecology, and Economy), a significant milestone on its own. At the time of the writing of this report, the contract had not yet been issued by USAID after almost two years of initiation of scoping, including six months of waiting for final action by the Contracts Office.

PIER has worked to improve the understanding by Kazakhstan coal industry officials, both in the coal mine regions and in the Ministry of Energy and Coal Resources, of modern management and efficient mine management processes. PIER also has worked effectively at Ekibastuz to improve health and safety conditions. The PIER task (Coal Mine Efficiency) ended when its contract duration period was reached. Due to innumerable changes and delays in project implementation as well as changes in the GOK response, many of the planned activities could not be completed.

Recommendations: (Burns and Roe) The power plant-related work should be completed as soon as possible after a contract is finalized.

4. Training (USEA, IIE, DOE)

Task Scope: To train utility staff in preparation for restructuring to a market-led utility sector.

Task Status: USEA has conducted a number of staff exchanges and cross-training exercises between CINergy and its "partners" Kazakenergo and Alaugas (the National Gas Distribution Company). IIE is completing an 18-week training course for mid-level utility executives. It is difficult to assess the long term impact of these training efforts, but some of the trainees will become leaders in the field in the future and are likely to accept new concepts.

A DOE energy conference, which potentially would present state-of-the-art information on oil/gas recovery technology as well as a clean coal technology program, was discussed but has not materialized. The aim of such a conference would presumably be to foster relations between the Kazakhstan and

US technical communities.

Recommendations: (USEA) Continue the training work on a moderate level.

B. Kyrgyzstan

1. Policy and Investment (Hagler Bailly, Burns and Roe), and
2. Energy Efficiency Improvement (Burns and Roe, USGS)

Task Scope: Hagler Bailly provided assistance in restructuring the utility sector into a competitive, market-led mode. The Burns and Roe task will determine the market potential for new hydroelectric generation in Kyrgyzstan and for export to other Central Asian Republics. The USGS (US Geological Survey) performed a survey of the coal resource and an analysis of future coal utilization. The NRECA (National Rural Electrification Cooperative Association) performed field studies to increase collection of electricity dues.

Task Status: The appearance of greater progress toward a market economy in Kyrgyzstan is somewhat misleading. It is a smaller country with considerably less natural resources than its neighbors and is therefore more encouraging to foreign assistance. This is leading to more openness toward privatization (e.g. gold mining) but not, thus far, in the energy sector.

The Government of Kyrgyzstan concluded about two years ago (1992) to encourage growth of hydroelectric resources (cheap, clean, unique) and to deemphasize coal fuel. The USGS coal resource survey confirmed that the available coal resources in Kyrgyzstan were plentiful and still partially unexplored, but that coal quality was generally poor and the mine locations were far from the use sites. A final report of the USGS activity is being issued.

To succeed with implementing its hydro power expansion plans, the Kyrgyz power company needs to increase domestic consumption bill collection, export and, most important, to overcome the concerns regarding water supply and its cost by its neighbors. Kyrgyzstan also needs to upgrade the transmission and distribution system which is falling apart. Renovating the existing district heating system is also required. Burns and Roe is performing analyses to determine:

- o The potential market for additional hydroelectric power. HARZA completed a hydroelectric station sizing and siting study in 1993. The conclusion, which was accepted by the

Kyrgyz authorities, was that a new 2,300-MW unit at Kambarata would be effective and feasible. Burns and Roe is planning to conduct a power market analysis to determine the market for new generated electricity in Kyrgyzstan and in the region.

- o The cost and priorities for rebuilding the transmission and district heating systems. This information was developed in cooperation with the World Bank, the Asian Development Bank and the GOKR in order to facilitate a loan to accomplish these reconstruction tasks. An \$85/million loan is now in the advanced negotiation stage. Some of the work on the district heating system renovation planning was accomplished in close cooperation with an EU TACIS project in Kyrgyzstan.

The USAID tasks performed by Hagler Bailly have been directed at the formation of an independent regulatory agency. Concurrently, a new Energy Law was drafted under the EU TACIS aegis. The draft law does not identify the need for such an independent entity. Hagler Bailly has, thus far, made significant converts among the Kyrgyz counterparts for the independent regulatory agency but the formation of such an agency is far from being accepted by the old rank-and-file. The USAID effort is greatly aided by the strong support of the World Bank, which has declared that the completion of a loan agreement depends on the actual formation of an independent regulatory agency by the GOKR.

Recommendations: The effort by Hagler Bailly to form a regulatory agency and to assist in restructuring of the sector are key goals and should be supported. Privatization efforts are made difficult by the often overlapping activities of USAID contractors engaged in "privatization" and legal issues and certainly by the competitive atmosphere with other donor organizations (such as TACIS). The World Bank has taken a leading role in coordinating the donors and should be supported in this respect. The coordination of USAID contractors in this area needs to be strengthened.

The efficiency improvement plans (district heating and transmission systems) are nearing completion and will hopefully result in reconstruction of these systems. Continued coordination with the international banks is essential.

The power market analysis is the first step towards developing the hydro resources, which is a key to the economic advance of the country and perhaps the region. The issues of water usage rights, water pricing, electricity costs, and cost guarantees

are sensitive and difficult to address and solve. An initial approach should be made through regional energy conferences. The USAID contractors working in the "Energy" and "Environment" sectors should coordinate their resources and strategies. The potential rewards in welfare and stability of the region are high.

3. Training (USEA, IIE)

In Kyrgyzstan, as in Kazakhstan, training activities have been conducted by USEA and IIE. The USEA-supported partnership is between KyrgyzGosEnergo and Washington Water and Power. IIE is just completing the training of about 25 mid-level utility executives aged less than 40 years. It is difficult to assess the immediate impact of this 18-week training period, however the trainees will undoubtedly form a cadre for future modernization of the management structure.

No DOE conference has been planned for Kyrgyzstan.

C. Regional Activities

Task Scope: To promote accord on regional energy issues.

Task Status and Recommendations: A Regional Energy Conference was conducted in Kyrgyzstan in July 1995. The Conference was co-sponsored by KyrgyzGosEnergo and the arrangements were made through USEA. High-level representatives from each of the five Central Asian Republics attended. Total attendance was close to 100. The objective of the first conference was to initiate dialog on common energy issues and to identify issues to be addressed in subsequent regional actions. A topic of universal interest, Energy Savings, was selected for the first meeting. Groundwork was laid for the next meetings. Although each republic strives to become energy independent, the essential flow of fuel and electricity across borders will continue. No individual state/republic has all the resources necessary for its well-being within its borders (Attachment E). Currently the energy trade among the CARs is on a case-by-case basis and transactions are carried out by barter. Pricing, contracting, and accounting procedures vary and no central "trading house" exists. Moreover, the insistence on national self-sufficiency in energy does not tend to result in the least-cost solutions and retards the economic development of the region.

Some of the issues, such as

- optimal dispatch of electricity,
- least-cost energy use,
- distribution of water for electricity generation and

- agriculture,
- transportation of fuels,
- environmental improvements,
- standardization of costing and contracting

are subsets of the regional concerns, but also lend themselves to focussed, singular attention. Privatization, restructuring or changes in laws are not recommended subjects for these conferences due to the political differences and sensitivities of these topics in some of the Central Asian Republics.

It was the consensus of the CAR delegates that the next (second) regional conference should address Energy Trade issues and be held in Almaty, Kazakhstan. The third conference should address Energy, Environment, and Water Usage and be held in Tashkent, Uzbekistan. It would be rightly desirable that the next conference is preceded by serious efforts to get pre-conference consensus on an agenda and the likely outcomes. Delegations from each republic should be limited (perhaps three each) and should be at the level of Presidential Advisor, Minister, or Deputy Minister.

Integration of collateral activities is necessary. For example (1) Energy Union, an organization dating back to the USSR days, has been revived recently. EU TACIS appears to be a participant in coordinating the dispatch of electricity through the Tashkent Dispatch Center. Hagler Bailly plans to lead a Regional Electricity Trade task in 1996; (2) environmental contractors, such as CH2M-Hill, are active in the water usage and environmental area; (3) Burns and Roe will be performing a water usage study as part of its Kyrgyzstan Power Market Analysis; (4) an energy trade approach to meeting future energy shortages at least-cost (see Attachments) can be strengthened. At present, it may be advisable to avoid participation by Russia, although it is part of the energy trade balance and some delegates to the conferences may recommend it. Russia has not shown interest in hegemony in the Central Asian Republics area, especially if sponsored internationally.

This regional activity is one of the foremost areas in which continued USAID support can be most productive in terms of long-term economic and public welfare advances in Central Asia.

VI. CONCLUSIONS

- Most of the Central Asian Republics' energy problems are not unique to the region, but are similar to those of the other NIS. The main difference is the richness of natural resources combined with the absence of unrestricted export routes.

- The shift of the energy sector from a government-controlled to a market-led system is slow and cannot be expected to occur in a sudden jump. The expectation of a short-term shift is unrealistic.
- All of the Central Asian Republics want to be energy independent but will always be interdependent. Regional accord is essential to provide least-cost, reliable energy to the public.
- The lack of cooperation between agencies or organizations within a republic is often a major retardant to economic advance. For example, in Kazakhstan there is little cooperation, in fact, constant confrontation, between the Ministry of Energy and Coal Resources and KazakhstanEnergo, the joint stock holding company. There is even less cooperation with the management of the two major coal companies (Karaganda and Ekibastuz). In addition, there is no common forum for planning and coordination between the MOEC and other Ministries (Economy, Finance, Justice, or Ecology).
- The lack of coordination between donor organizations, particularly USAID and EU TACIS, is a serious problem. Agreement on future plans and coordination should be reached between the Washington and Brussels headquarters of these organizations, and adhered to by the field offices.
- The most effective approach to develop and implement policy and energy efficiency tasks is to work in close cooperation with local, well-established and effective specialized entities. Roles of donors and local counterpart private, as well as, government entities must be specified clearly.
- The management support provided by IDEA was reasonably effective in the CAR due to the support, confidence, and delegation of responsibility by the USAID Mission. However, this required constant interaction and coordination with USAID, the contractors, and the counterparts. This, in turn, required the ability to rapidly respond to situations on site. The lack of authority and the often long communications pathway between the support office, which is in "the trenches", to the Mission, to USAID Washington, and back, sometimes hindered, or prevented, progress to be made at the appropriate time.
- The primary technical management responsibility should be in the field. There should be frequent meetings between Washington and the field, no more than three-months apart in order to effectively communicate and coordinate, and to report progress, problems, and changes.

VII. USEFUL CONTACTS

KAZAKHSTAN

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KAZAKHSTAN (con't)

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USAID - Sponsored Energy Activities in Kazakhstan

Policy and Investment

- Task 1. Law and Regulation
- Task 2. Energy Pricing and Tariffs
- Task 3. Restructuring and Privatization
- Task 4. Investment

Energy Efficiency Improvement

- Task 5. Energy Savings Plan
- Task 6. Heat and Power System Efficiency Improvement
- Task 7. Coal Cleaning

Energy Environment Improvement

- Task 8. Power Plant Environmental Improvement
- Task 9. Coal Mining Safety and Health

Training

- Task 10. Short-Term Training
- Task 11. Long-Term Training
- Task 12. DOE Conference
- Task 13. Management Support

USAID - Sponsored Energy Activities in Kyrgyzstan

Policy and Investment

- Task 1. Regulatory/Legislative Reform
- Task 2. Corporatization/Privatization Support
- Task 3. Accounts Receivable
- Task 4. Power Market Analysis

Energy Environment Improvement

- Task 5. District Heating System Improvement
- Task 6. Transmission System Improvement
- Task 7. Coal Resource Assessment

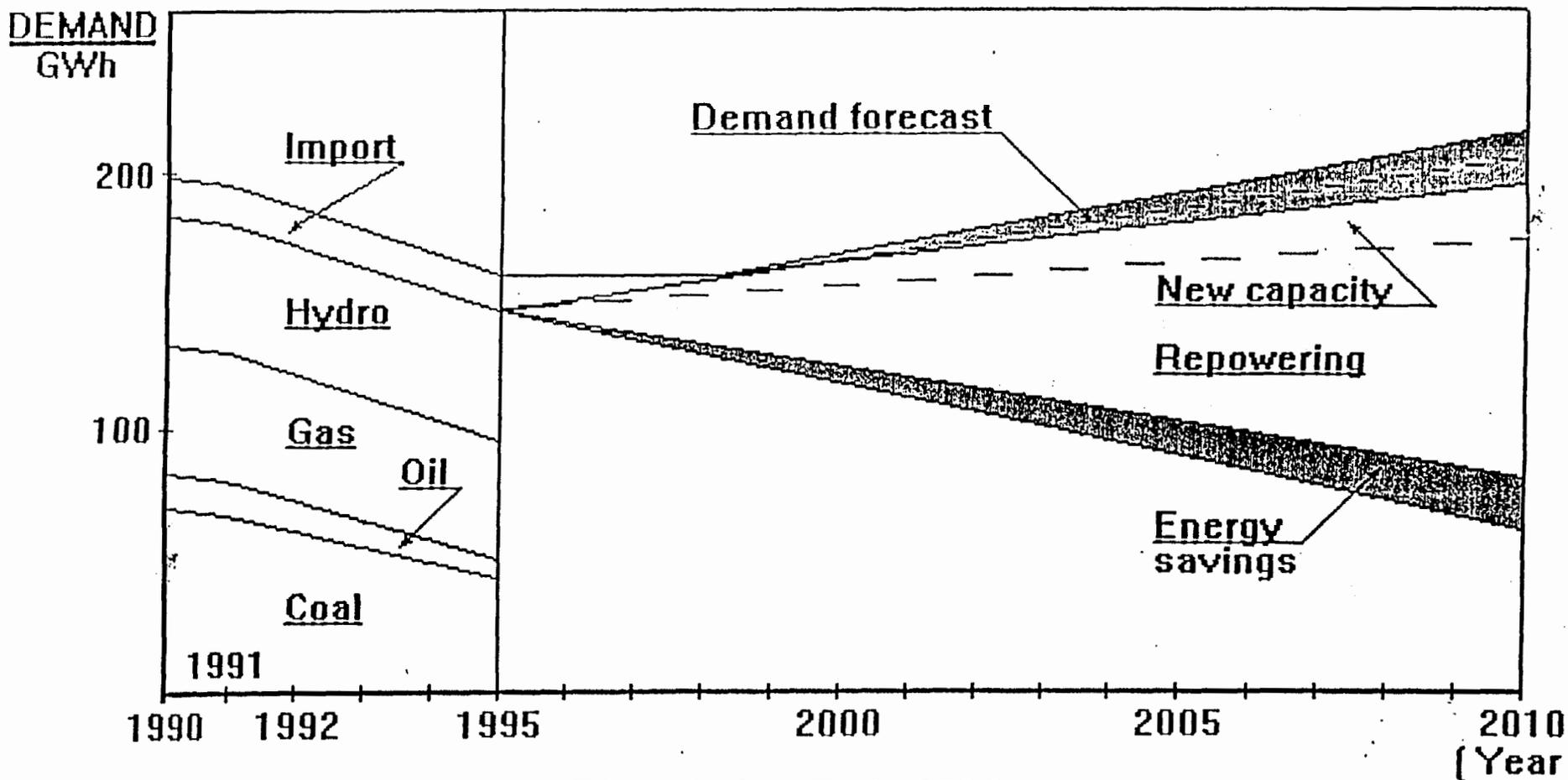
Training

- Task 8. Short-Term Training
- Task 9. Long-Term Training

REGIONAL COOPERATION IN CENTRAL ASIA

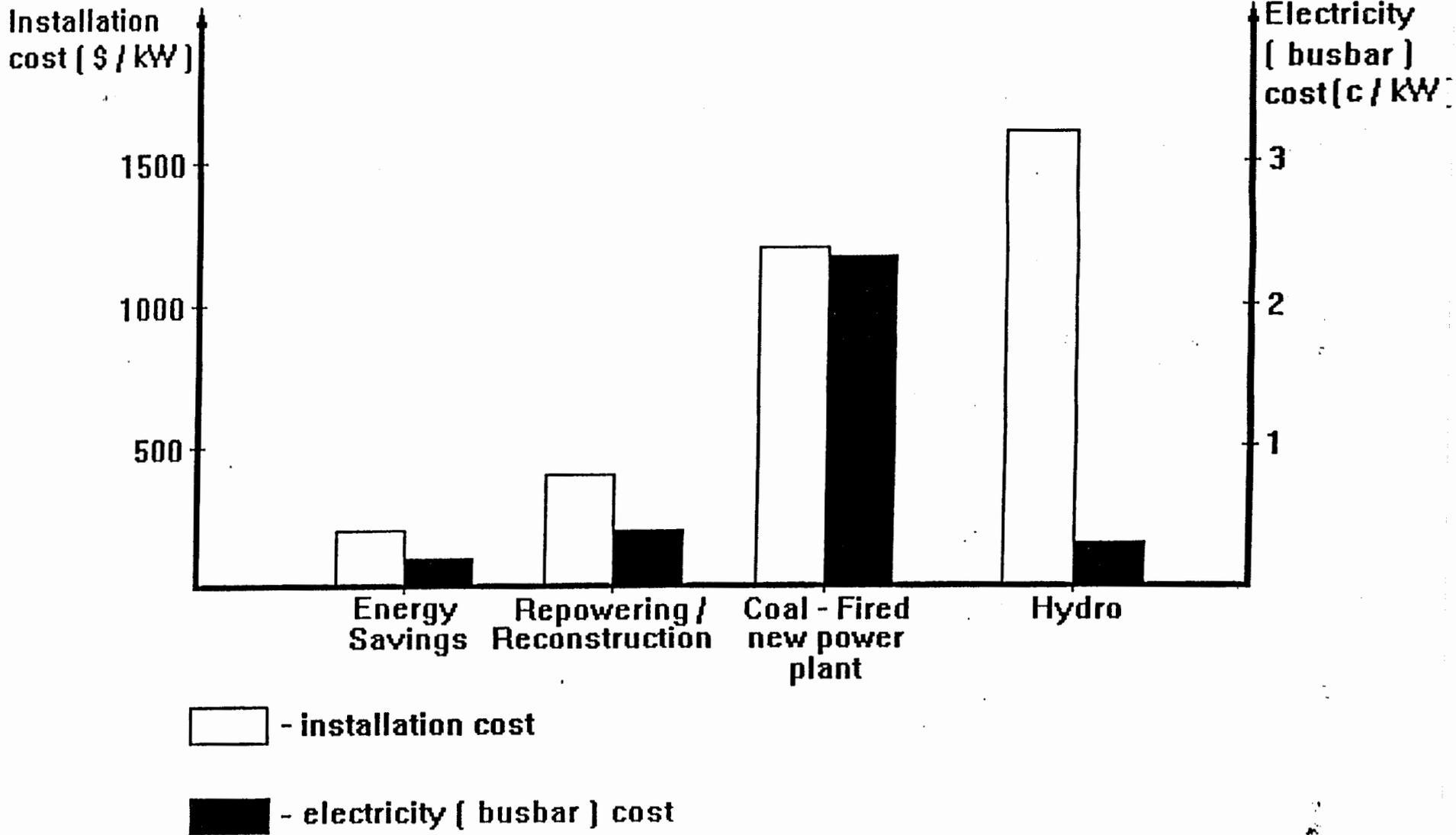
- Task 1. Energy Training - Regional Cooperation

REGIONAL DEMAND STRATEGY



* 1991-1992 Data from IEA statistics. Paris 1994

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KAZAKHSTAN
ENERGY SECTOR REVIEW
LIST of POWER STATIONS UNDER OPERATION

A.	Thermal Power Stations	Capacity MW	Heat Capacity Coal/h	Fuel	Commission Dates
1	Ekibastuz (1)	4,000 (8x500)	--	coal	1980-1984
2	Ekibastuz (2)	500	--	coal	1990
3	Irmak	2,400 (8x300)	--	coal	1968-1975
4	Djambul	1,230	--	gas/fuel oil	1967-1976
5	Alma Ata	173	--	fuel oil/gas	1962-1964
6	Karaganda (1)	164	324	fuel oil/gas	1942-1955
7	Karaganda (2)	648	300	fuel oil/gas	1962-1964
8	Alma Ata CHP (1)	145	1,060	fuel oil/gas	1960-1969
9	Alma Ata CHP (2)	510	879	coal	1980-1991
10	Tekel CHP	24	92	coal	
11	Ust-Kamanogorsk CHP	242	596	coal	1951-1966
12	Leninagorsk CHP	57	329	coal	
13	Borgrin CHP	50	314	coal	
14	Atirau CHP	227	596	fuel oil/gas	1962-1970
15	Aktiubinak CHP	83	697	fuel oil/gas	1943-1987
16	Uralsk CHP	28	622	fuel oil/gas	
17	Karaganda CHP (1)	32	460	coal	1943-1950
18	Karaganda CHP (2)	435	1,200	coal	1973-1976
19	Karaganda CHP (3)	440	700	coal	1977-1978
20	Bolkhash CHP	120	250	coal	1937-1963
21	Djeskazakan CHP	177	409	coal	1955-1962
22	Tentek CHP	18	202		
23	Kustanai CHP	12	496	fuel oil/gas	
24	Rudni CHP	131	805	fuel oil/gas	
25	Arkalik CHP	6	401	fuel oil/gas	
26	Pavlodar CHP (1)	350	1,350	coal	1964-1975
27	Pavlodar CHP (2)	110	430	coal	1960-1962
28	Pavlodar CHP (3)	440	1,250	coal	1972-1978
29	Petropavlovsk (2)	380	1,225	coal	1961-1983
30	Tselinograd CHP (1)	26	765	coal	
31	Tselinograd CHP (2)	240	540	coal	1979-1983
32	Ekibastuz CHP	12	770	coal	
33	Semipalatinsk CHP	6	275	coal	
34	Djambul CHP (4)	60	554	coal	1963
35	Tchimkent CHP (1\$2)	42	462	fuel oil/gas	
36	Tchimkent CHP (3)	160	556	fuel oil/gas	1981-1983

ATTACHMENT D
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		Capacity MW	Heat Capacity Coal/h	Fuel	Commission Dates
A.	Thermal Power Stations (con't)				
37	Kizil-Orda	146	378	coal	1964-1975
38	Kientau CHP	29	189	coal	
B.	Hydropower Stations				
1	Kapchagai	434	--	--	1970-1971
2	Buhtarmin	675	--	--	1960-1966
3	Ust-Kamenogorsk	331	--	--	1952-1959
4	Shulbinsk	585	--	--	1987-1991
5	Alma Ata	45	--	--	1943
6	Small Hydro	8	--	--	
C.	Nuclear Power Stations				
1	Actac LMFBR	150 (3x50)	100	--	1973
D.	Other	1,100	1,500		
	TOTAL :	17,060	21,150		

ENERGY EXPORTS/IMPORTS

