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POLICY AND INSTITUTIONAL ANALYSIS REPORT

ENERGY EFFICIENCY IN THE DISTRICT HEATING SYSTEM OF ALMATY

International Resources Group, Ltd.
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KAZAKHSTAN

ENERGY EFFICIENCY IN THE DISTRICT HEATING SYSTEM OF ALMATY

POLICY AND INSTITUTIONAL ANALYSIS

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TABLE OF CONTENTS

Page

EXECUTIVE SUMMARY 1

INTRODUCTION 7

I. BACKGROUND: STATE OF THE ECONOMY 9

II. ENERGY EFFICIENCY: ROLE OF THE GOVERNMENT 13

- A. Pricing 14
- B. Financing 21
- C. Prospects for Foreign Investment 22
- D. Energy Efficiency Labelling and Standards 23
- E. Privatization 23

III. ENERGY EFFICIENCY IN THE DISTRICT HEATING SYSTEM 25

- A. Structure of the District Heating System 25
- B. Energy Pricing 28
- C. Lack of Adequate Technology and Systems 28
- D. Planning and Decision-Making 29
- E. Energy Efficiency Awareness and Programs 30
- F. Energy Efficiency Industry and Services 37

IV. RECOMMENDATIONS 39

TABLES AND FIGURES

Page

TABLE 1: Status of Agreements: Kazakhstan - U.S. 11

TABLE 2: Heat Tariffs for Almaty 17

TABLE 3: Electricity Tariffs for Almaty 19

FIGURE 1: Almaty Heat Tariffs 18

FIGURE 2: Almaty Electricity Tariffs 20

FIGURE 3: Structure of the District Heating System 25

ACRONYMS AND ABBREVIATIONS

AAE	**Alma Ata Energo**
AHSE	**Alma Ata Heating Systems Enterprise**
AGTKE	**Alma Ata Gorteplokommunenergo (City Commnal Heat Supply)**
b/d	**barrels (of oil) per day**
bcm	**billion cubic meters (of natural gas)**
CIS	**Commonwealth of Independent States**
IRG	**International Resources Group, Ltd.**
kWh	**kilowatt hour**
m^3	**cubic meters (of natural gas)**
MW	**megawatt**
NIS	**Newly Independent States (of the former Soviet Union)**
TES	**Thermal Energy Station**
USAID	**United States Agency for International Development**
USD	**U.S. dollar**

Note: Although the name of the capital of Kazakhstan was changed to Almaty during the course of the project, the proper names of organizations have not yet changed and retain the former version of "Alma Ata."

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EXECUTIVE SUMMARY

After the collapse of the Soviet Union in December 1991, long-standing inter-republic supply arrangements for energy inputs were disrupted, and the economies of the Newly Independent States (NIS) steadily deteriorated. As a result, during the winter of 1991-1992, a number of energy enterprises failed, causing tens of thousands of people to go without heat or electricity for significant periods of time. In order to provide immediate technical assistance to alleviate the problem, the United States Agency for International Development (USAID) agreed to fund an initiative to improve the performance and efficiency of selected facilities within the district heating system of Almaty. International Resources Group, Ltd. (IRG) of Washington, DC was chosen to serve as the contractor to USAID for the *Energy Efficiency and Market Reform Project* in Kazakhstan.

The project entailed two components: (a) the technical auditing task was designed to combine in-plant, on-the-job training with the identification and implementation of low-cost or no-cost energy efficiency initiatives, and; (b) the second effort involved developing recommendations for policy and institutional reforms to enhance energy efficiency management and investment decision-making at the enterprise-level, and to promote the development of national initiatives and legislation which foster energy efficiency. This analysis addresses the second of these tasks.

Energy and Economic Situation

The economy of Kazakhstan is in substantial decline and increasingly exhibits considerable instability. In the first nine months of 1992, industrial production plummeted 15 percent from the same period in the previous year, and industrial energy demand continues to decline. Inflation is soaring to hyper-inflation levels and the ruble is undergoing steady, massive devaluation, all resulting in real income deterioration and erosion in the standard of living. In addition, the breakdown of historic trading networks within the former Soviet Union (FSU) has disrupted the traditional supply patterns of critical raw materials, industrial goods, agricultural

products, capital, and energy.

Despite these difficulties, its sheer size, strategic geographic location, cheap and skilled labor force, and abundant natural resources provide a strong base upon which to build economic (and energy) self-sufficiency, as well as offer an attractive opportunity for foreign investment.

Within the NIS, Kazakhstan is the second largest producer of oil (530,000 b/d) after Russia, and the third largest producer of coal (130 metric tons/year) after Russia and Ukraine. Despite its prodigious oil resources, under the FSU the economy of Kazakhstan was heavily dependent upon Russia. This anomaly arose from the fact that while Kazakhstan's oil production is concentrated in the western part of the Republic, the bulk of its energy consumption is in the east where the major oil refineries are located. As a result of the lack of west to east oil pipelines, most of Kazakhstan's own petroleum production is exported while it imports crude oil from the western Siberian oil fields of Russia to meet the feedstock requirements of its refineries. Thus, it was realized early on that foreign investment would be the key to provide the infusion of western capital and technology needed to develop vast indigenous oil deposits and establish export pipelines to international markets. To date, three major, long-term agreements have been signed with western companies (including U.S.-based Chevron) to exploit oil fields in northwestern Kazakhstan.

Energy Efficiency: The Role of Government

Senior government policy-makers recognize that energy efficiency must be a national policy and that specific mechanisms to promote the rational use of energy need to be developed. Toward this end, national energy legislation is being developed which will specifically incorporate a commitment to improve and promote energy efficiency. This legislation will be submitted to Parliament for review in June 1993 and will incorporate many Western concepts, including regulations which provide incentives for investment in efficiency programs and equipment rather than large-scale construction of new generation facilities.

Energy Pricing

Thermal and electricity tariffs for all classes of consumers have been raised five times since February 1992. These increases were made in an attempt to cover increasing costs of generation, including inflation, labor, materials, and spare parts. In addition, one of the most important variables in recent thermal and electricity price increases is the cost of primary fuels such as coal, natural gas, and mazut, all of which have increased in price several times the levels of early 1992.

The Government has made a deliberate decision to raise thermal and electricity tariffs on industrial customers at a faster pace and to higher levels than on residential and commercial consumers in an effort to continue subsidies for households, thus cushioning the impact of rising prices on the average consumer and limiting potential social and political backlash. Tariffs for commercial customers remain lower than industrial tariffs owing to the fact that most public buildings are state-owned institutions or facilities and traditionally have been entitled to subsidized services from all utilities.

Despite increases in all consumer categories, tariffs for thermal energy and electricity remain well below production costs and even below the costs of primary fuels. Although industrial customers are increasingly recognizing the importance of energy efficiency owing to higher energy costs, there is an urgent need to raise all tariffs, especially in the commercial and residential sectors, to provide market incentives for investments to improve the rational and efficient use of energy. Finally, the policy of virtually free energy service to state-owned institutions and public buildings needs to be ended as soon as possible.

Financing and Foreign Investment

Prospects for financing projects to improve energy efficiency are not promising. Tariffs are insufficient to provide the necessary capital to finance such activities from internally generated capital, and loans from commercial banks have extremely prohibitive interest rates. In addition, there is a 20 percent value added tax (VAT) and other import duties, both of which

raise the price of imports of energy efficiency equipment. There are no government programs such as grants for technology demonstration or audits, subsidized interest loans, loan guarantees, or tax-related incentives for energy efficiency investments. However, legislation is being developed which may incorporate some of these financing mechanisms.

There are obstacles to foreign investment in Kazakhstan such as ruble inconvertibility and the uncertainty surrounding the repatriation of profits. Nevertheless, there are considerable opportunities for foreign participation. A joint venture law has been established and considerable interest has been expressed in Kazakhstan for establishing joint ventures for the supply and/or manufacture of meters and other energy efficiency instrumentation and equipment. In addition, there is a strong commitment to liberalization and privatization of the economy: the Government has issued a formal program governing denationalization and privatization for the period 1993-1995. Clearly, greater decentralization and managerial autonomy at the enterprise level will promote market-oriented decision-making, and thus enhance the prospect for energy efficiency investments which improve competitiveness and productivity. It remains to be seen, however, how fast this process will move, and indeed if it will include a significant number of high energy consuming enterprises.

Energy Efficiency in the District Heating System

The system as a whole is inefficient; government ownership, energy price subsidies, and centralized planning and control have, on the institutional level, resulted in a general lack of concern for the significance of energy efficiency. In addition, many enterprise managers are unaware of their real costs given the fluidity of the economy (ie., constantly changing prices, inflation, and exchange rates). Moreover, inadequate and/or lack of modern equipment and systems allows tremendous scope for energy savings. The IRG Audit Team estimated that on the production side alone, efficiency improvements resulting from the installation of modern instrumentation and controls has the potential to achieve savings as high as 20 percent. On the demand side, the removal of energy price subsidies together with the institution of rational billing have the potential to achieve 30 percent energy savings.

There is a need to upgrade the skills of plant management in cost accounting procedures, business management, and the economic and financial evaluation of potential projects, including training in concepts such as return on investment, net present value and discounted cash flow. In addition, there is also a need to create formal energy management teams and to increase awareness of energy efficiency in all district heating facilities as well as in all other industrial enterprises. The lack of an indigenous energy efficiency industry and other organizations which provide services also limits the promotion and widespread adoption of energy efficiency equipment and practices. One exception is *Interenergiya*, a 50 percent privately-owned company established to provide energy efficiency services and equipment to enterprises throughout Kazakhstan through joint ventures with foreign equipment suppliers and manufacturers.

Recommendations

It is clear that as long as thermal energy and electricity prices remain subsidized, there will be little incentive for energy efficiency. Thus, there is a pressing need for the continued removal of energy price subsidies.

The Government needs to examine the viability of implementing various financial incentives for energy efficiency, specifically: (a) reduction or elimination of the VAT and other duties on imports of energy efficiency equipment; (b) granting of priority access to foreign exchange for industries making efficiency investments; (c) various funding programs such as grants/no-risk loans, subsidized interest loans, loan guarantees, or revolving credit funds, and; (d) tax-related incentives.

Experience in other countries indicates that one of the most important ingredients in promoting energy conservation and implementing a successful national program is a demonstrated commitment at the highest political levels of government. Legislation and regulations should be enacted and enforced under a coordinated national energy plan administered by a separate governmental energy efficiency institution. Specific policies include

mandatory energy efficiency standards and regulations for enterprises; energy efficiency labeling and standards for energy-using equipment such as electric motors, HVAC systems, boilers, and household appliances, and; energy efficiency building codes.

At the plant-level, enterprises should develop incentives and awareness-building programs to promote worker productivity and improve overall energy efficiency. In addition, greater decision-making autonomy will assist in the move toward operating as profit- and market-oriented businesses. Continued decision-making decentralization is required to increase in-house energy efficiency capabilities at all levels. Also, there is a strong need to establish training programs for enterprise managers in the technical aspects of energy efficiency improvement, the basics of business management, and free market principles.

A massive influx of equipment and technology is required to assist individual enterprises to rebuild and become competitive. Most energy efficiency technologies/practices are inadequate or simply absent. Equipment needed includes small-scale, low-cost, no-cost, fast payback instrumentation and control systems such as microprocessors, gas analyzers, flow meters, flue gas oxygen analyzers, heat meters and thermostatic controls, automated PC-based control and monitoring systems, infrared and contact thermometers, and pipeline insulation. Rational billing systems and steam traps are other examples of systems/technologies which can be inexpensively and quickly implemented with fast paybacks.

Finally, there is the need to develop a domestic energy efficiency industry. The Government and USAID should encourage the creation of joint ventures between U.S. firms and Kazakh enterprises, whether to form an energy efficiency company to provide services, training and market support, and promote private sector investment, or to establish a joint manufacturing capability.

INTRODUCTION

In the aftermath of the collapse of the Soviet Union, the former republics are faced with a host of problems in the energy sector, which historically has been plagued by inefficiencies resulting from subsidized energy prices, lack of instrumentation and control for energy inputs, lack of investment, and the overall aging of the energy infrastructure. During the past few years this situation has been aggravated by steadily deteriorating economic conditions, resulting in decreased industrial output. Moreover, with the dissolution of the Soviet Union, long-standing inter-republic supply arrangements for energy inputs have been disrupted, leading to production and distribution bottlenecks in the process of procuring raw material inputs (especially coal and natural gas) for electricity and heat generation. Simultaneously, it has become necessary for most republics to pay for energy supplies with scarce hard currency or through barter. As a result of these developments, during the winter of 1991-1992, a number of energy enterprises failed, causing tens of thousands of people to go without heat or electricity for significant periods of time.

Project Origin and Rationale

Recognizing the critical nature of the energy problems confronting the NIS, the Energy Working Group of the Washington Coordinating Conference of January 1992 developed an action plan for addressing the energy problems of these now sovereign countries. The Coordinating Conference was a meeting of representatives from over 50 countries and international donor organizations to develop an assistance plan for the region. As part of this plan, USAID agreed to fund a technical assistance initiative designed to improve the performance and efficiency of selected district heating systems in the NIS. This initiative is the *Energy Efficiency and Market Reform Project.*

In each newly independent state, one or two district heating networks were selected as target systems for audits. Systems were selected on the basis of potential for significant energy savings, the applicability of results to similar plants in the NIS, and the importance of the system

in the overall context of the country's economic development.

Project Description

IRG of Washington, DC was chosen to serve as the contractor to USAID for the *Energy Efficiency and Market Reform Project* in Kazakhstan. The IRG Audit Team visited the Republic of Kazakhstan in March 1992 to discuss energy-related needs with development officials, and to develop the scope of the project, which is the initial energy activity under the new U.S. Economic Assistance Program for the Commonwealth of Independent States (CIS).

In Kazakhstan, the IRG Audit Team chose to audit the Alma Ata Heating Systems Enterprise (AHSE) and its distributor, the Alma Ata City Communal Heat Supply (AGTKE). Within the system, the IRG Team conducted audits of generation, transmission and end-use facilities. The technical auditing phase of the project is designed to combine in-plant, on-the-job training with the identification and implementation of low-cost or no-cost energy efficiency initiatives. The specific goals of this phase are to:

1) foster improved management of energy use in the heating plants by identifying and implementing cost effective "low-cost/no-cost" energy efficiency improvements;
2) transfer energy auditing and management techniques including financial and technical analysis techniques;
3) provide equipment support to implement low-cost options, improve monitoring and energy management; and
4) identify additional energy efficiency opportunities.

This project also includes a Policy and Institutional Analysis component, which is the subject of this report. It seeks to:

1) describe the role of government entities, including district heating organizations, in influencing the investment decision-making process for energy efficiency;
2) review possible reforms under consideration;
3) examine management and investment decision-making practices for energy efficiency at the enterprise and plant-level; and,
4) identify options for enhancing energy efficiency management and the investment climate at the national and plant levels.

I. BACKGROUND: STATE OF THE ECONOMY

The economy of Kazakhstan, like that of the other countries of the NIS, is in substantial decline. According to the State Committee for Statistics, Gross Domestic Product decreased 16.7 percent in Kazakhstan during the first nine months of 1992, as compared with the first nine months of 1991. Industrial output showed a slightly lower decline of 14.8 percent. Equally troubling is the very sharp rise in mutual debts, or the sums which enterprises and organizations owe each other, to 48 billion rubles.[1]

This decline in economic activity has been accompanied by rates of inflation reaching almost hyper-inflation proportions. State controls on the prices of most goods were removed in early January 1992. At the end of October 1992, for example, the average cost of a basket of basic food items was 1,470 rubles (calculated on a monthly basis), or nine times the cost in December 1991. In the capital city of Almaty, this same food basket cost 2,396 rubles.

At the same time, wages have not kept pace with inflation, resulting in a decrease in the standard of living. Sales of basic food items are down, as the consumer has to make the difficult choice of what not to buy against the background of reduced real income.

Yet Kazakhstan, despite these financial pressures, offers a semblance of stability not present elsewhere in the CIS. The President of Kazakhstan, Mr. Nursultan Nazarbayev, has demonstrated a strong commitment to economic reform and is moving, albeit slowly, towards privatization. In addition, its sheer size, strategic geographic location, cheap and skilled labor force, and abundant natural resources make Kazakhstan an attractive target for foreign investment.

[1] This figure is an estimate as of December 1992. The exchange rate at that time was 400 rubles/USD.

Kazakhstan produces 19 percent of all the coal mined in the former Soviet Union, and its oil production averages around 532,000 b/d. Although Kazakhstan's proven oil reserves are believed to be 1.6 - 2.1 billion barrels, most observers believe this number will rise substantially in the future, presaging the nation's emergence as a significant actor in the world petroleum market.

In terms of energy consumption, the energy economy is dominated by coal which accounts for about 56 percent of total consumption. Oil accounts for 25 percent, followed by natural gas (16 percent) and electricity (5 percent). Distribution of fuel consumption by economic sector is well balanced among industry (31 percent), transportation (28 percent) and municipal requirements (26 percent). In the electric power sector, industry consumes 72 percent of all power generated, agriculture 13 percent, and the residential sector 10 percent.

Kazakhstan, despite its size, is not a large producer of electric power, accounting for 4.8 percent of total electric power production of the former Soviet Union. Power generation in 1991 totalled 81 billion kilowatt-hours (kWh), down 3.6 percent from 1990. There is one nuclear power station, at Shevchenko on the Caspian Sea, consisting of one 350 MW fast breeder reactor built for water desalination. This reactor is scheduled to be shut-down in 1992-1993, when it will reach the end of its 20-year life. Current public opinion is strongly against the further development of the nuclear industry, owing to the extensive environmental damage the country suffered as a result of hundreds of nuclear weapons testing exercises in the past.

Despite the fact that the production of energy exceeds domestic requirements by 19 percent, largely for reasons of geography Kazakhstan is engaged in major inter-republic exchanges of energy.[2] For example, all of the oil production is concentrated in the western part of the Republic, while demand is centered in the eastern regions where the major refineries are located. Thus, Kazakhstan has become heavily dependent on crude oil from Western Siberia

[2] Also, Kazakhstan is a supplier of raw materials and an importer of finished products.

to meet the requirements of these refineries, while most domestic crude oil production is exported. There are no west-to-east oil pipelines, a major deficiency in the infrastructure of the economy. More importantly, as crude oil production continues its sharp decline in Western Siberia, Kazakhstan may find its refineries short of feedstock. In addition, West Siberian producers may offer what they have to sell at world market prices, with payment required in hard currency.

The Government is moving to reduce the overwhelming linkages with Russia and the other republics, but economic independence has been more difficult and time-consuming to achieve than political independence. It was realized early on that foreign investment would be the key to economic self-sufficiency, and there would be no better attraction for foreign investment than the very rich oil resources of the Republic. Considerable success has been achieved in this regard, in part because of the country's comparative economic and political stability, but also because of Kazakhstan's willingness to understand the need to link investment risk and rates of return. Furthermore, American companies in particular have found it easier to negotiate with Kazakhstan than with Russia, for example, because in Kazakhstan there is no question as to where the decision-making authority rests. Not so in Russia, where the multiplicity of interests has complicated foreign participation in the energy sector.

TABLE 1

STATUS OF AGREEMENTS: KAZAKHSTAN - U.S.
(as of May 1993)

Agreement	Status
Trade Agreement	Yes
Most Favored Nation	No
Generalized System of Preferences	No
Overseas Private Investment Corporation	Yes
Export-Import Bank lending	Yes
Investment Treaty	Yes

TABLE 1 indicates significant progress in facilitating trade and investment between the United States and Kazakhstan, and foreign companies are reasonably confident that the authorities understand what is needed to attract and keep the investor. The conclusion of three major oil and gas projects is evidence of these developments. Chevron signed a deal in April 1993 to develop the Tengiz and Korolev fields, located to the Northeast of the Caspian Sea. Tengiz at its peak should produce around 800,000 b/d, but development will be technologically challenging and expensive, and peak output likely will not be reached until later this decade. British Gas, together with the Italian firm Agip, will develop the Karachaganak gas field, while French Elf Aquitaine will explore in Northwest Kazakhstan.

This open attitude to foreign investment could double oil production to 1 million b/d by the late 1990s and gas production could triple to 27 bcm/yr by 2000. Moreover, these regions will benefit from Western involvement, as oil and gas development will provide employment, higher living standards and greatly improved local infrastructure. The Republic also will benefit from higher hard currency earnings as exports rise over time.

Bringing these major projects to fruition will take time and economic uncertainty will continue for the next several years, which implies a delay in attaining energy independence. Given this likelihood, reform in Kazakhstan will largely continue to track reform in Russia for the foreseeable future. These close economic ties will affect the pace of economic reform in Kazakhstan.[3]

[3] A more complete examination of the relationship between the two economies is beyond the scope of this report. However, for a more detailed discussion of the linkages with the Russian economy, especially in regard to pricing, see IRG's *Kazakhstan Energy Pricing and Taxation Study: Petroleum, Gas and Coal Pricing and Taxation*, also sponsored by USAID and produced in collaboration with the World Bank.

II. ENERGY EFFICIENCY: ROLE OF THE GOVERNMENT

In terms of energy efficiency, Kazakhstan's annual per capita requirement of primary energy amounts to 3.6 tons of oil equivalent, while per capita electricity consumption is 6,000 kWh. These high levels of consumption place Kazakhstan on a par with countries with a far higher per capita income and suggest a tremendous scope for energy conservation and a vast market for energy efficiency equipment.

The Government has not formally articulated an overall energy efficiency policy, or adopted specific programs and laws designed to provide incentives for energy conservation activities or investments. However, senior government policy-makers recognize that energy efficiency must be a national policy and that specific mechanisms to promote the rational use of energy need to be developed. Indeed, this process has already begun. National energy legislation is being developed which will specifically incorporate a commitment to improve and promote energy efficiency. This legislation is being prepared primarily by Kazakhstan Energo and will be submitted to Parliament for review in June 1993. In the field of energy efficiency this legislation will incorporate many Western concepts, including regulations which provide incentives and allocate funds for energy efficiency programs and equipment rather than large-scale construction of generation facilities. Self-financing programs, tax incentives, promotion of foreign investment in energy efficiency and other programs also are expected to be proposed.

Previously, the Government's role in energy conservation consisted of the centrally planned system supervising the "rational" utilization of energy. For each enterprise, the state estimated what it considered to be an "appropriate" level of energy consumption over a certain period of time. If the enterprise surpassed this level, then the state energy supplier shut-off, or cut-back service. Thus, energy conservation was achieved by limiting supply -- the enterprise couldn't consume what it didn't have.

Under the previous system, if an individual enterprise sought to undertake an investment to improve plant/equipment efficiency, the state conducted its own review or feasibility study to determine if the investment was necessary. Everything was centrally-controlled -- even the decision to make a plant-level energy efficiency investment.

Officially, this policy has changed. If an individual enterprise wants to make such an investment out of its own profits, it is free to do so. Enterprises are free to enter into joint-stock or joint venture arrangements with foreign investors, which in turn can assist with equipment, funds, and/or expertise. As detailed throughout this report, however, improvement has been slow in practice.

A. Pricing

In a free market environment energy pricing is the primary force that encourages producers and consumers to use energy efficiently. Energy prices should reflect the full cost of extraction, production/conversion, transportation and distribution, including the cost of capital for additional supplies of energy. Officially, the Government is committed to the gradual liberalization of all prices but most energy is still priced below cost.

Proposals for revising prices for steam and heat are first developed by the planning and economic department of Alma Ata Energo (AAE), with input from senior personnel of AHSE, to reflect changes in the cost of generation.[4] This proposal is then submitted to Kazakhstan Energo and then to the State Pricing Committee, which administratively is under the Cabinet of Ministers. At the level of AAE and AHSE, managers are attempting to develop tariffs which cover their rising costs such as primary fuels, inflation, maintenance, and construction. At the higher levels of the governmental review process, however, political considerations often result in the proposed tariffs being lowered, resulting in final price levels always lagging actual

[4] AGTKE, the residential distributor for AHSE, purchases hot water and steam from AHSE at wholesale and then distributes to the residential sector at prices below its wholesale cost. It also sells steam to industrial customers above cost. It has no role in the development of price proposals.

generation costs.

Despite the considerable political resistance to rapidly increasing price levels, it is clear that eventually moving to prices based on long-run marginal costs is important to the district heating sector if it is to attract needed capital investment for modernization and supply expansion. Nevertheless, given the severe impact that economic instability and rising prices are having on the average citizen, political considerations in the setting of prices remain dominant.

Although steam and heat prices have been increased steadily since January 1991, (See TABLE 2 and FIGURE 1) including five times between January 1992 - February 1993, prices are still below production costs for residential consumers. In December 1992, AHSE estimated the cost of heat production at 600 rubles/Gcal, and the cost of steam generation at 800 rubles/Gcal. However, by May 1993, costs had increased three times these levels. Further complicating the estimation of prices and costs are the inflation and exchange rates. In November 1992 inflation was estimated at 20 percent/month, but increased to 40 percent/month by early 1993. Over the same period, the ruble decreased in value from 400 rubles/USD to 800 rubles/USD. Assuming a monthly inflation rate of 20-30 percent in the period November 1992 - February 1993, thermal energy tariffs were increased sufficiently in February to match inflation, but keeping pace with continually rising costs is problematic as tariff increases in the commercial and residential sectors have not kept pace with the increase in total costs. The Government hopes to offset this trend by increasing thermal energy prices to eight times current levels by the end of 1993.

Managers responsible for the production of heat and steam complain that the upper echelons of the pricing review process consistently fail to raise tariffs to cover costs. In addition, wages always lag price increases resulting in decreased buying power for the average consumer, including employees in the district heating system. Nevertheless, there has been no labor unrest among the workers in the district heating system, no doubt partly owing to the fact that it is illegal for them to strike.

One of the most important variables in recent heat and steam price increases is the cost of primary fuels, estimated at 30 percent of total generation costs. AHSE estimated that over the period January 1991 - January 1993, the price of coal increased from 11 rubles/ton to 5,500 rubles/ton, and mazut increased from 34 rubles/ton in 1991 to 5,300 rubles/ton by the Fall of 1992. By May 1993, mazut reached 19,700 rubles/ton. In addition, natural gas prices rose sharply in 1992 and again in early 1993 owing to increases in the cost of gas from Turkmenistan and Uzbekistan. Kazakhstan is at the end of the pipeline for these deliveries and thus bears the brunt of increased duties and transit fees leading to higher prices for AHSE. As of May 1993, natural gas from these sources is 19,050 rubles/1000 m^3, several times higher than in the previous year. These prices reveal a significant burden considering that of total thermal energy generation, approximately 25 percent is natural gas-based, and 75 percent is mazut-based. Electricity generation is almost entirely coal-fired, with a small peaking capacity based on mazut.

The Government has made a deliberate decision to raise thermal tariffs on industrial consumers to a higher rate than on residential end-users, in an effort to continue subsidies for households and to maximize revenues. Nevertheless, large industrial consumers currently require less energy than previously since their output is declining owing to the decrease in economic activity. Conversely, the relative share of heat and hot water usage by smaller industrial and commercial consumers is increasing, as their commodity output has been holding constant. Tariffs for commercial customers remain low (even below residential price levels) owing to the fact that most buildings are state-owned institutions or facilities and traditionally have been entitled to subsidized services from all utilities.

Although managers estimate that industrial tariff levels cover costs of production, it is unlikely that current price levels for any end-user actually cover hot water and steam production costs. According to senior district heating managers and other government officials, high rates of inflation and rapidly changing prices and costs throughout the economy prevent any precise determination of whether current tariffs are adequate. Indeed, senior decision-makers clearly do not believe that their costs are being recovered. Thus, in sum, district heating profits are

TABLE 2

HEAT TARIFFS FOR ALMATY[5]
(January 1991 - February 1993)
Rubles/Gcal

Date	Industrial	Commercial	Residential
Before January 1991	11	6	n/a
January 1991	16	14	9
February 1991	23	14	15
March 1991	42	16	13
July 1991	34	14	22
January 1992	146	60	90
February 1992	182	71	87
May 1992	406	71	75
June 1992	1316	110	170
November 1992	2106	220	n/a
February 1993	6320	490	1860

Numbers are rounded. n/a = not available

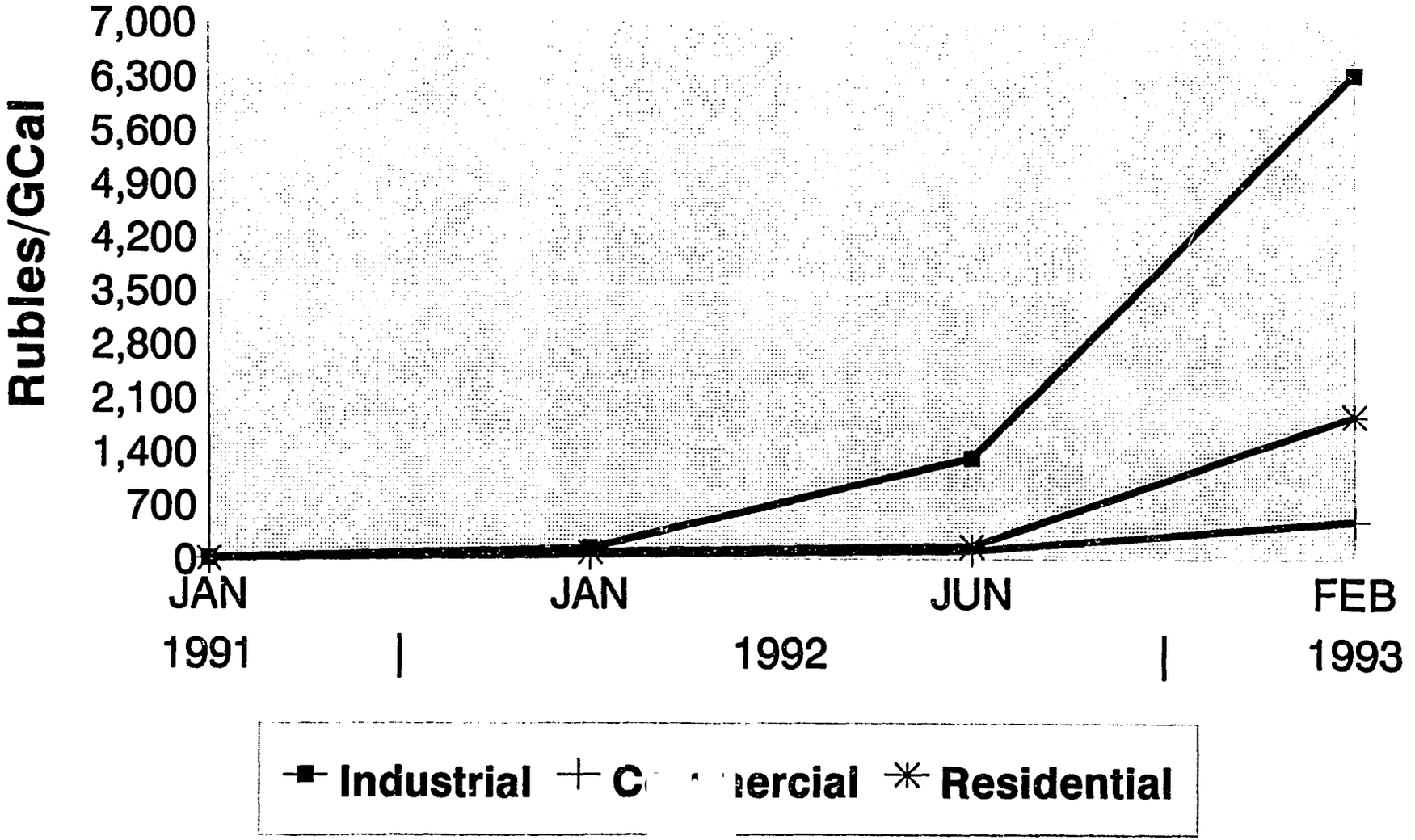
[5] Sources: AAE and AHSE.

Industrial tariffs are for hot water and bled steam. Other categories of steam have slightly different tariffs which, for example in February of 1993 ranged from 5460 - 7000 rubles/Gcal.

Kazakhstan's consumer tariff categories do not fit into conventional Western definitions of Commercial and Residential. Therefore, here we have used a composite of the following categories to provide an indication of how prices are moving: "Commercial" includes housing construction cooperatives, bathhouses, laundry facilities, and hotels; "Residential" includes housing organizations and the wholesale rate charged to AGTKE.

FIG _ E 1

ALMATY
Heat Tariffs
January 1991 - February 1993



declining. Whereas it is estimated that a profit level of around 10 percent is needed to generate adequate new capital for AHSE, the profit level at the end of 1992 was 3 to 5 percent of revenues.

Electricity Tariffs

Tariffs for electricity also have increased five times since the beginning of 1992, and most recently in February 1993 (See TABLE 3 and FIGURE 2). Industry continues to pay much higher tariffs, while the agriculture, urban and rural residential sectors remain politically-preferred customers. While tariffs have been raised for agriculture and residential consumers, they remain

TABLE 3

ELECTRICITY TARIFFS FOR ALMATY[6]
Kopecks/kWh*
(1991 - February 1993)

Consumer Class	1991	Feb 92	May 92	Jun 92	Nov 92	Feb 93
Industrial						
A. > 750 kVa	3.67	35	44	114	310	770
B. < 750 kVa	6.08	70	90	235	520	1150
Agriculture	1.63	8	8	32	135	540
Residential						
A. Urban	3.92	12	12	24	48	130
B. Rural	.99	8	8	16	32	100

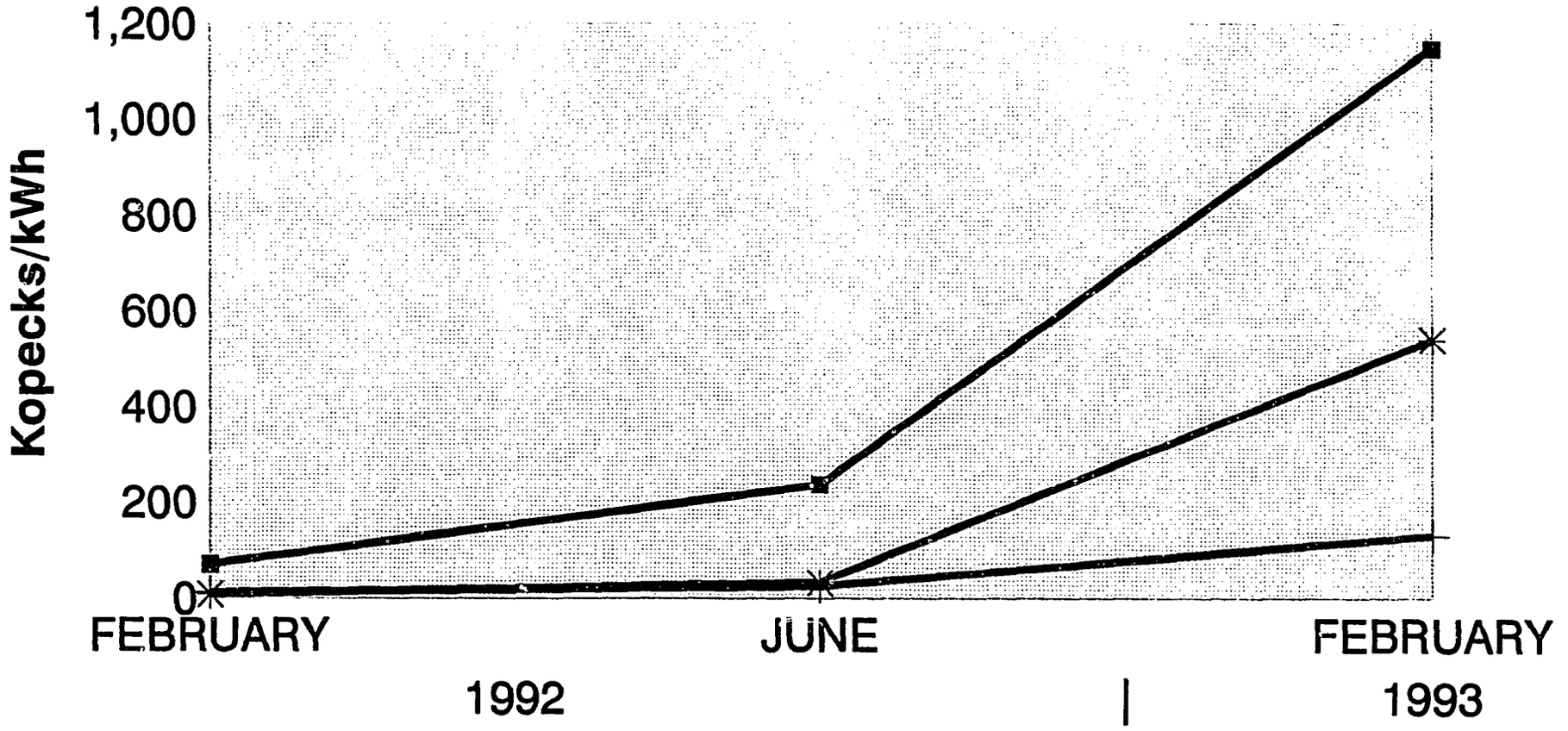
* There are 100 kopecks/ruble.

at or well below generation costs. In December, it was estimated that the average cost of generation of electric power was about 94 Kopecks per kilowatt-hour. As with costs for thermal power production, electricity generation costs increased several times by May 1993 to 5 rubles/kWh. One official commented that his electric power bill for a month was equal to no more than the cost of 3 loaves of bread or a pack of cigarettes. Under such circumstances, there can be no incentive to save energy. Indeed, such low tariffs are conducive to the use of electric power far beyond normal needs, and wastage is high.

[6] Source: AAE

FIG E 2

ALMATY
Electricity Tariffs
February 1992 - February 1993



Industrial* Urban Res ential Agriculture

* C y 1, c c to ≤ 750 kVa.

B. Financing

Prospects for financing projects to improve energy efficiency in district heating operations are not promising. Tariffs are not high enough to provide the necessary new capital and domestic commercial banks, to the great displeasure of the authorities, charge 70-80 percent interest for loans. The banking system has come under severe criticism for such practices. However, considering that the inflation rate is averaging 40 percent per month, banks' interest rates could be significantly higher in an attempt to match soaring inflation. In addition, Kazakhstan may benefit from proposed efforts by Russia's central bank to lower the interest rates charged by its commercial banks. Since interest rates in Kazakhstan closely track those in Russia, rates in Kazakhstan also could come down.

In addition, there is a value added tax (VAT) on imported goods which raises prices to potential buyers of energy efficient equipment in Kazakhstan. Thus, any metering or other control equipment purchased by Kazakh companies from suppliers in Russia or other NIS countries would have to pay the VAT. Some relief was granted beginning January 1, 1993 when the VAT was reduced from 28 percent to 20 percent.

Similarly, Kazakhstan also imposes import duties on most goods, including energy efficiency equipment, posing significant physical and financial barriers in obtaining such technology. Import duties on equipment could be reduced or eliminated, leading to more efficient energy utilization since importing such equipment would be cheaper and more easily accessible. The revenue from such duties undoubtedly is limited and the loss of revenue could easily be recouped through conservation and enhanced energy efficiency. In addition, granting priority access to foreign exchange for industries making energy efficiency investments can help enterprises in procuring equipment.

There are no government programs such as grants for technology demonstration or audits, subsidized interest loans, loan guarantees, insurance programs for project technical performance, or revolving credit funds. Currently, there are no tax-related incentives for energy

efficiency investments, such as tax credits, tax holidays, performance-based credits, or accelerated depreciation of conservation investments. Conversely, there are no tax-related penalties. As indicated, legislation is being developed incorporating some of these financing mechanisms.

C. Prospects for Foreign Investment

If new investment capital cannot be generated internally in the short-term, then much will depend upon attracting the foreign investor. As noted, Kazakhstan is viewed by American companies as providing a more stable investment climate than Russia. U.S. Export-Import Bank lending and project insurance from the Overseas Private Investment Corporation (OPIC) are available, and a trade agreement is in place, but a number of obstacles remain:

1) a bilateral tax treaty has not yet been ratified;
2) an oil and gas law is not yet in place; and,
3) the ruble is not yet convertible.

Joint ventures for the supply and/or manufacture of meters and other energy efficiency instrumentation and equipment holds considerable promise for the foreign investor. A joint venture law with clear guidelines and documentation requirements has been established and a preliminary IRG estimate indicates that there is a $2 million/year market for steam traps alone. However, how and in what form profits are earned and repatriated is the critical question in any foreign investment. Ruble profits are meaningless for the foreign firm owing to rising inflation and the rapidly declining value of the ruble. Some form of guarantee to protect the foreign investor from inflation would be required.

Rubles may be re-invested domestically in the short-run, but eventually the foreign investor will look to repatriate hard currency profits. Until the ruble is fully convertible, this will prove to be difficult on a large scale. A foreign investor may be willing to take his profits out in kind, using commodities which in turn could be exported to hard currency markets -- Kazakhstan offers much in this regard in the way of raw materials. In addition, if the foreign

investor is engaged in a joint manufacturing venture in Kazakhstan, for example, production of meters, he may be willing to export some of the meters to hard currency markets or, alternatively, barter meters excess to local needs. The foreign investor will need to examine carefully any barter payment arrangement, however, especially with regard to transportation costs, infrastructure logistics, and export restrictions and legalities.

One option to compensate foreign investors is to arrange payment in terms of a percentage of energy savings as a result of equipment installation. This provides an incentive to both the supplier and the enterprise to undertake a project which yields concrete energy savings. Payment, however, is still likely to be in rubles.

D. Energy Efficiency Labeling and Standards

To ensure that energy-using equipment operates efficiently, it should be subject to design and operating standards. Energy efficiency standards and labeling are most cost-effective for large energy- consuming buildings and equipment. Within the former Soviet Union, consumption standards existed for energy-using household appliances such as refrigerators and televisions and design and operating standards were in place for other equipment. However, officials at AAE suggested that standards should be increased and enforced to a greater degree.

Building standards have not been in place, but stricter building codes with minimum thermal efficiency levels are under consideration for construction of new facilities. For example, there are currently eight hotels under construction in Almaty (by Western companies) and the Government has required the installation of energy metering systems. With the long life span of new buildings, strict codes can lead to significant energy cost savings in the long-term.

E. Privatization

President Nazarbayev, as part of his commitment to economic reform, outlined a two-stage program for the privatization of state-owned enterprises (See Annex A for a description of the denationalization and privatization program for 1993-1995). There is a longer-range goal

of privatizing up to one-third of all Kazakh enterprises within the next few years. Thus, the official government policy is to denationalize and demonopolize many industries, and the government is continuing its efforts to develop mechanisms for privatization.

However, privatization in the energy sector is more complicated. A critical issue is determining who should be the owner of vast state energy assets and how to distribute these assets. This is a large-scale problem considering that the value of all of the fixed energy assets throughout the former Soviet Union is estimated at around several trillion rubles. As might be expected, there is some opposition to privatization and thus the Government expects that any privatization efforts in the energy sector will take place in stages over the next several years.

Clearly, greater decentralization and managerial autonomy at the enterprise level will promote market-oriented decision-making, and thus enhance the prospect for energy efficiency investments which improve competitiveness and productivity. It remains to be seen, however, how fast this process will move, and indeed if it will include a significant number of high energy consuming enterprises.

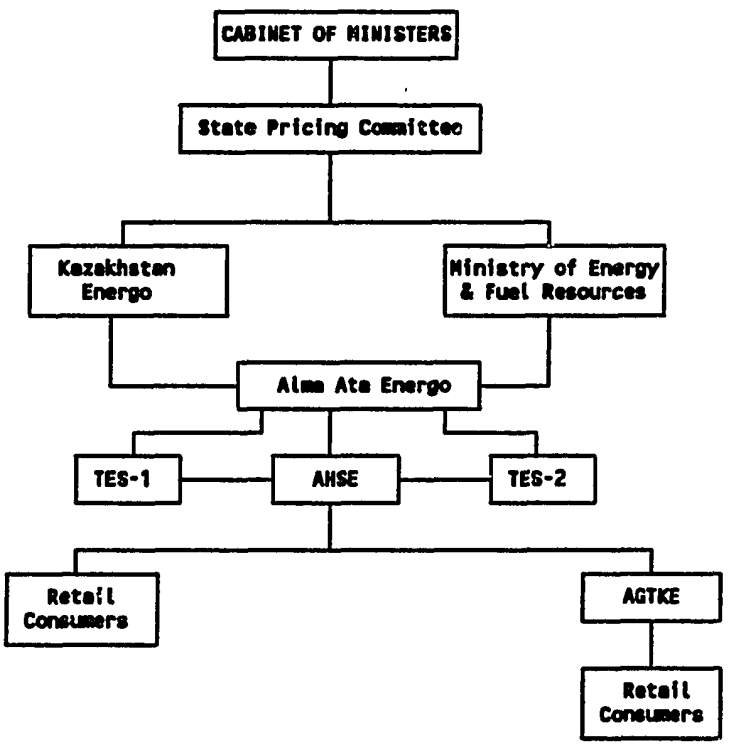
III. ENERGY EFFICIENCY IN THE DISTRICT HEATING SYSTEM

There are a number of key problems in the district heating system serving Almaty which need to be addressed in order to improve overall energy efficiency.

A. Structure of the District Heating System

FIGURE 3 illustrates the operational and technical relationship among the various organizations generating, supplying and consuming heat and steam in the Almaty district heating system.[7]

FIGURE 3.



[7] This report draws on information included in the *Kazakhstan Audit Report for the Energy Efficiency and Market Reform Project*, prepared by the IRG Audit Team. For a more detailed technical summary of the district heating system, please contact IRG.

Two thermal energy stations (cogeneration) stations – TES-1 and TES-2 – supply thermal energy to the central mixing station of the Alma Ata Heating Systems Enterprise (AHSE). TES-1 supplies industrial steam and TES-2 supplies heat in the form of hot water. AHSE also has several of its own district boiler houses which supply thermal energy inputs to the production/mixing of steam and hot water.

The system was established in 1960 and grew over the years as demand for service increased. AHSE started with TES-1, then at the center of the city but, owing to environmental considerations was not developed beyond its initial configuration. As the city grew and new housing and industry was constructed, additional thermal demand was satisfied by the installation of local boiler houses. When the base-load became large enough, TES-2 was built.

AHSE sells steam to industrial consumers and hot water for space heating and domestic consumption (shower, bath, cooking, etc.) to industrial, residential and commercial end-users. Approximately 70 percent of AHSE's hot water is sold wholesale to Alma Ata Gorteplokommunenergo – Alma Ata City Communal Heat Supply – (AGTKE) for distribution to residential customers (AGTKE also sells hot water to some industrial customers). AGTKE thus serves as a distributor for AHSE.

AHSE, AGTKE and TES-1 and TES-2 are part of the administrative enterprise of Alma Ata Energo (AAE). Within AAE, AHSE is one of 13 other operating entities. The operations, management, and decision-making functions of AHSE and TES-1 and TES-2 are separate. AAE serves as a coordinating body for management and operational issues which concern AHSE, AGTKE, and the two generation stations. AAE also oversees many policy issues such as developing new tariff schedules (as described in Section II), as well as financial operations. With regard to the latter, the income derived by AHSE from the supply of industrial steam and hot water to its customers is passed on to AAE, which in turn takes a percentage for administrative, review and technical costs incurred, and then redistributes a reduced sum to AHSE.

Two government entities exist at the Ministry level and loosely oversee the activities of AAE. Kazakhstan Energo is responsible for the development of policy and strategy, including energy conservation, and has input into the development of tariff schedules. The Ministry of Energy and Fuel Resources is primarily concerned with operation, administration and management of energy facilities.

The major institutional barrier to promoting energy efficiency created in this structure is the lack of autonomy in decision-making at individual enterprises. TES-1 and TES-2, AHSE, AGTKE and individual industrial facilities are subject to central control/review in most technical, administrative or financial questions by at least one (or two) levels above. Some level of regulation or oversight may be desired as is the case with many utilities serving the general public in other countries. However, the current system appears not to leave enough flexibility or independence in developing plans and making decisions to improve energy efficiency at the operational level. In other words, senior personnel concerned with making decisions regarding the improvement in energy efficiency at the enterprise level are often hindered by factors and decisions made at another level. In the case of AHSE, one major concern is the inability to control revenue flow. All revenues from sales of steam and hot water are passed on to AAE. This diversion limits the amount of funds that may be otherwise utilized for key energy efficiency investments.

In addition, AHSE maintains contracts with the industrial end-users it supplies for general supervision of facility-level energy questions, including installation of energy equipment, monitoring, and some training. In the past, this arrangement has served the purpose of centralizing technical and policy questions in one supervisory body. Individual industrial consuming entities thus have developed little in-house energy expertise, and many still have no incentive to do so (see more detailed discussion of this topic in Section III-E).

Despite this problem, communication between the various entities in the district heating system appears to be very good. Also, many senior personnel indicated that political and

central control is loosening, leaving organizations with increased independence of action, but a high level of centralization still exists.

B. Energy Pricing

Most senior policy makers and enterprise managers recognize the crucial role of higher energy prices in stimulating increased rational use of energy. AHSE and AGTKE managers are beginning to monitor energy use more closely and identify potential energy efficiency investments. Industrial plant managers also now are experiencing the impact of rising steam, heat, and electricity prices. However, rapidly changing price levels (inflation rates, ruble-dollar exchange rate fluctuation and other input cost factors) are creating a very unstable and uncertain business climate. Many enterprise managers could not identify accurately their energy costs or profit levels owing to the volatile external economic climate.

C. Lack of Adequate Technology and Systems

The district heating system is relatively old, established in 1960. Some of the pipelines have been in operation more than 25 years. There are very few control or measuring devices in evidence for either supply (AHSE), distribution (AGTKE), or end-users (industrial facilities). Little individual metering has been installed and where monitoring instruments are available, few have been utilized on a regular basis. The IRG Audit Team estimated that on the production side alone, efficiency improvements resulting from the installation of modern instrumentation and controls has the potential to achieve savings as high as 20 percent. In addition, pollution monitoring and control equipment are non-existent and there is a lack of replacement parts.

At all levels of the Almaty district heating system, from suppliers to end-users, the lack of energy metering, control and monitoring equipment is identified as the single largest (technical) impediment to the efficient provision and consumption of energy. Without instruments to monitor and record essential variables such as flow rates, temperatures and pressure, it is difficult to make any accurate balance measurements and conduct energy efficiency analyses on which plant performance can be based. This problem is particularly

severe in the residential and commercial sector. Few residences or commercial establishments have meters making it virtually impossible to charge consumers for the heat they actually use. Individual apartments do not have thermostats: customers are charged a fixed rate based on the area to be heated rather the amount used.

Energy accounting systems, cash flow management systems, and billing systems are generally not in place or are inadequate. For example, energy billings to customers have primarily been based on estimated averages over the entire population. Government subsidies and ownership make customers insensitive to such billing. To make customers pay for what they consume, the billing system needs to be overhauled, including the installation of meters and the hiring and training of meter readers. Without a rational billing system in place, it is difficult to implement energy conservation measures. The IRG Audit Team estimated that the removal of energy price subsidies together with the institution of rational billing have the potential to achieve 30 percent energy savings on the demand side.

D. Planning and Decision-Making

Under the centralized economic system, capital investment decisions were made by the government with more emphasis placed on production capacity and meeting absolute output targets rather than productivity or efficiency. Thus, management lacks an understanding of fundamental free market principles. They are unfamiliar with cost accounting procedures and have not been exposed to analyzing the true cost of energy resources and the market price of thermal energy.

There is a significant void at individual enterprises such as AHSE, AGTKE, and end-user industrial facilities in planning, analysis, and general business management skills. There is no experience in strategic planning and thus little understanding of the techniques for evaluating and comparing alternative courses of action. In addition, there is little knowledge of how to conduct economic and financial evaluations of potential energy efficiency projects, incorporating such concepts as return on investment, net present value and discounted cash flow.

Plant management are knowledgeable in the conduct of capital-cost analyses, as indicated by their past emphasis on new construction. There is, however, a serious shortage of performance criteria based on operating costs.

E. Energy Efficiency Awareness and Programs

None of the supply, distribution, or end-user organizations in the district heating system has formal energy management teams dedicated to the review of energy efficiency issues. There is little or no training or other educational efforts aimed at increasing the awareness among staff of the benefits of energy efficiency. No detailed or extensive analyses of energy consumption patterns are conducted. Some energy data is collected and energy use is monitored, but the frequency is limited and computer systems to collect and store data are not common.

There is now greater attention given to environmental factors in operations and potential investments, and the senior staff at the district heating organizations recognize the link between improved energy efficiency and the positive impact on the environment. However, the ability to factor in environmental costs and to formalize an environmental impact review process is absent.

In general, senior personnel at AHSE, AGTKE, and AAE are very aware of the benefits of improving energy efficiency and recognize the importance of transferring this awareness to mid- and junior levels. These personnel are acutely aware of the impact of changing price levels and the need to increase prices to promote greater efficiency in the use of energy. However, while recognizing the political considerations involved in raising prices too rapidly, they understand where the potential for energy efficiency improvements exists, are generally aware of the extent of energy wasted, and are anxious to address specific investment/project ideas. For example, most of the energy losses in district heating systems are mainly due to the following causes:

- water leaks within the system;
- failure to meter usage;

- inadequate insulation;
- throttling of constant speed pumps, and;
- excessive drops.

Senior staff are keen to operate more as businesses and profit-oriented enterprises. AHSE, AGTKE, and AAE managers and senior engineers recognize that they must take action to reduce energy costs and increase overall efficiency. Senior staff fully recognize the potential benefit of increased energy efficiency in the supply of hot water and steam supplanting the need to construct additional large, new generation and distribution facilities.

This focus and awareness on energy problems in general and on energy efficiency specifically at AHSE, AGTKE, and AAE is concentrated primarily at higher levels of management. Even here, this is unusual for Kazakhstan. It must be noted that this is in large part owing to the fact that the central business of these entities is the generation and distribution of energy, so that energy problems and the focus on how to utilize energy more rationally and efficiently is a natural, everyday concern of the management by definition. Most of the senior management of these three organizations have given a great deal of thought to these issues.

A key factor which has served to raise energy efficiency awareness at AHSE and among other senior government officials, and which was cited numerous times during the IRG Team's visit, was the 1992 USAID-sponsored Energy Tour to the United States. This exposure to U.S. energy industries provided tremendous stimulus to thinking about energy conservation issues.

Despite this recognition of the benefits of increasing energy efficiency, senior management at these three organizations agreed that the obstacles described in this section discourage immediate action on energy conservation issues. In addition, however, there is widespread feeling among the IRG Team and host-country senior management that one of the most important preconditions for energy efficiency improvement is a change in attitudes and behavior at all levels of enterprises, especially mid- and lower levels. Generally, personnel at this level are not aware of, or actively involved in, energy efficiency efforts or its benefits.

AHSE

AHSE does have a 4-person team which is responsible for energy issues. However, this team looks only at technical issues, specifically telemechanization. They do not have the requisite skills to conduct strategic planning, economic or financial analyses of energy conservation investments. There is no system in place to examine energy consumption patterns, collect, store and analyze data. In addition, they lack a primary accounting system. However, AHSE is beginning to computerize all types of information, including energy data and it is expected that this will greatly assist in targeting areas for energy conservation.

In mid-1992, AHSE established mandatory weekly classes, but these primarily focus on engineering and equipment issues. They are starting to incorporate instruction in the value of energy efficiency. Many engineers do not want to attend the classes and it has even been reported in other enterprises that workers will destroy equipment deliberately out of fear that increased efficiency and productivity introduced through modern equipment will threaten their jobs. Nevertheless, there was no indication that labor unrest was a problem for enterprise managers.

AHSE has recently (in place for a about one year) approved an employee incentive/bonus program (complete with suggestion box). Bonuses are paid to those employees based on a percentage of energy saved from their ideas. This program reportedly is beginning to show results.

AHSE is starting to look at environmental questions -- particularly related to siting of new structures -- but formal environmental impact analysis is not conducted. The environmental movement in Kazakhstan might be expected some day to take strong exception to the regular practice by AHSE of dumping some 100,000 metric tons (3.1 million gallons) of hot water into the streets every year in order to carry out scheduled repairs of the pipeline network. The discharged hot water, cascading down the open drainage systems in the streets, is responsible for damaging and/or killing trees.

There has been no consideration of AHSE assuming the role of direct distributor to AGTKE's residential customers. This would add a significant administrative burden since AGTKE has 5,000-6,000 personnel. Also, the lack of metering and thermostat controls at the residential building level makes the monitoring of energy use difficult, and thus a major additional technical concern that AHSE dos not necessarily want to assume.

AGTKE

As indicated, AHSE sells hot water wholesale to AGTKE, which serves as the distributor to the residential sector. AGTKE sells retail to households at a lower rate than its wholesale cost from AHSE, but also sells hot water to some large industrial consumers. AGTKE indicated that the residential subsidy is covered by its sales to industrial consumers, providing a slim profit margin. The tariffs charged at each level are determined by the government (Kazakhstan Energo and the State Pricing Committee). AGTKE is independent operationally and administratively from AHSE and has no input into the development of prices (as does AHSE) -- that is, it does not contribute to tariffs proposals developed by AAE.

Customers have a fixed payment -- due monthly -- which they send to the bank. The bank then forwards notification of payment to AGTKE where billing is tracked on a computer program. This computerized process has been in existence for three years and AGTKE appears to be content with it in as far as the tracking aspect. However, the difficult economic environment, especially increasing prices and inflation, has taken its toll on customers' ability to pay. At the end of 1992, its customers owed AGTKE 300 million rubles, and AGTKE, in turn, owed AHSE 250 million rubles.

Management is anxious to improve overall energy efficiency on the supply side. Energy measurements are taken on individual boilers on a monthly basis. Temperature regulation and material consumption is regulated at a centralized source. AGTKE does not have a formal, in-house energy conservation team. Some technical training is conducted for engineers, but it is done once every three years and then only to upgrade and/or maintain certification. This

training does not include specific instruction in energy conservation activities at the plant level. Only minimal economic and environmental analysis is conducted on investments, and these limited skills are concentrated at the senior management level.

On the consuming side, however, there is no incentive for household end-users to consider energy savings -- none of the customers are metered for thermal energy consumption and billed as such. As the primary residential distributor, AGTKE determines how much heat and hot water is provided to individual apartment complexes. However, AGTKE has insufficient metering to monitor heat and hot water consumption at the substation and building level and, as mentioned previously, individual end-users cannot control unit temperatures owing to lack of thermostats. The challenge, therefore, is two-fold: (a) to obtain and install much needed instrumentation, and (b) to educate the customer. They strongly emphasized that these are their most significant problems and are extremely interested in any efforts to address them, including participating in residential demonstration programs.

Pepsi Cola Bottling Plant and Alma Ata Carpet Factory

It is fair to say that few energy efficiency initiatives have been implemented or even considered at industrial facilities in Kazakhstan to date. This is in large part explained by the history of tariff subsidies which have discouraged the conservation of energy. Many commercial customers are institutional entities which are entitled to free services from all utilities, including hot water. Thus, these customers typically have not been concerned with energy issues and overall energy efficiency for these customers is a very low priority.

Both the Pepsi Plant and the Carpet Factory exhibit energy efficiency problems common throughout the industrial sector. As with most of the industrial consumers it supplies, AHSE has a contractual relationship with both of these enterprises to conduct energy engineering work, including the installation of equipment and monitoring/measuring activities. There is no group of in-house energy conservation specialists working at the plants, although there are engineers who supervise general technical operations. There are no in-house energy efficiency awareness

programs or training efforts.

Both facilities consume energy in the form of heat, steam and electricity supplied from AHSE. However, as with most industrial enterprises, there is a severe lack of measuring and control of energy use and what instruments are available are relatively old and crude. AHSE does not have a meter at the "gate" of the Carpet Factory, and billing is based on estimates of consumption. At the Pepsi Plant, steam and hot water are metered at the main receiving station for the entire compound.

Each of these enterprises recently became joint stock companies. This independence together with rising energy prices and costs have increased awareness of the benefits of energy efficiency, especially the importance of energy measuring and controls. This is a typical scenario throughout the country. In Kazakhstan, only 10 percent of the industrial users have orifice-type flow meters to measure hot water/steam flow rates. Senior staff at both plants strongly indicated that installing energy metering and control technology is a very high priority.

Currently, however, most industries are experiencing a deficit and, subsequently, district heating systems are operating at a loss. As a result, the government is subsidizing industry. A real dilemma exists: industrial enterprises want to increase their energy efficiency in light of rising energy prices but any significant steps toward improving energy efficiency entail modernizing facilities and implementing new production processes, since current facilities and production methods are already outdated by Western standards.

In other words, significant capital investment is needed to upgrade industrial operations in order to be competitive in energy efficiency and productivity. Until industry achieves this level of efficiency, it will be difficult to pay for energy costs approaching world market levels. On the other hand, without the existence of world market level energy prices, industry will not attract the substantial capital investment needed in the first place.

Despite the increased awareness of energy efficiency needs, including greater instrumentation at the plant level, each of these enterprises is content for the moment to continue its relationship with AHSE to oversee energy matters since the energy expertise lies with this latter organization and because prices are still relatively low. Although energy costs have risen, there is no perceived urgency to develop their own in-house expertise in these matters.

In fact, although senior Pepsi staff indicated a strong desire to increase instrumentation, they described a scenario in which they would purchase this type of equipment and AHSE would conduct the installation. This raises several additional obstacles to energy efficiency. First, these meters are manufactured in Russia and there is not a high level of confidence in their quality or regular supply. Second, and more importantly, is obtaining the funding for energy efficiency investments in general. Most industrial enterprises have been suffering in the midst of the economic transition. Rising prices and inflation as well as fluctuating exchange rates have dampened consumer demand and led to a decrease in industrial output. As described in Section II, high interest rates are making loans/financing for enterprise-level investments virtually impossible. In addition, there is the 20 percent VAT on the sale of this type of equipment.

It is also clear that many industrial enterprises in Kazakhstan are very interested in joint partnerships with foreign companies to assist them in financing and equipment purchase/upgrading. Although foreign companies have approached industrial enterprises and there are laws on the books governing the establishment of joint ventures, there has been little participation to date, much to the disappointment of the Kazakhs. This is owing to the still unstable economic situation and in particular to the inconvertibility of the ruble. (These problems are discussed in more detail in Section II).

An additional impediment to the efficient supply of heat to the Pepsi Plant is administrative. Heat supply is contracted with the "Drinks" Trade Association which, in turn,

obtains heat from AHSE. Pepsi wants to contract with AHSE directly, believing that this would be technically and administratively more efficient.

Staff at both plants emphasized that estimating energy costs is extremely difficult in the current economic climate -- spiralling prices, inflation, and the increase in many other costs makes it virtually impossible to estimate these figures with any degree of detail or reliable accuracy.[8] Clearly, this is not a climate conducive to investing, including in energy conservation. Thus, improved economic conditions would be one of the prime incentives in promoting energy conservation.

Pepsi staff do conduct market analyses and are aware of other companies' efforts. However, Pepsi enjoys a significant advantage over competitors in name recognition and quality. At the time of the visit, there was no production since there is a shortage of bottles, owing in large part to the disruption of supplies from Russia and Ukraine. Pepsi also expressed that it would welcome the opportunity to become a demonstration plant for energy efficiency.

At the Carpet Factory, several of the shareholders in the new joint stock company are some of their raw material suppliers as well as AHSE, creating an interlocking relationship where all parties have a stake in the success of the enterprise. The business appears strong and the factory is current on its energy debts, ie. payments to AHSE. The plant only exports about 1-2 percent of its product, although management would like to export more. They have a barter arrangement for spare parts with Germany, and also export to Turkey, China and Iran. They have no current interest in foreign share participation.

F. Energy Efficiency Industry and Services

To increase energy efficiency awareness and implementation, an approach successfully implemented in many countries has been to use industry and professional organizations as

[8] Although Pepsi did hazard an estimate that energy costs represent about 10 percent of total final product value.

primary vehicles to promote and disseminate information on energy efficiency options, costs, and returns. However, in Kazakhstan there are no enterprises or Government units that have adequate (or any) equipment to conduct energy audits or to identify and institute energy improvement programs. The IRG Team found no providers of industrial energy efficiency services, nor a network of reliable providers of such equipment. There are no institutes, foundations, or centers for energy conservation which might make engineering specialists, equipment, or services available to stimulate energy efficiency. While overall energy engineering skills and training is good, there is no organized pool of trained energy efficiency specialists to be tapped by enterprises needing such services.

However, one exception to this situation has emerged. An organization, *Interenergiya*, has been formed as a private subsidiary of AAE, which is 50 percent government-owned and 50 percent held by private individuals. The largest government entity in terms of financing provided is AAE and many of the private individuals are members of large state energy enterprises. It is expected that the government share of the company will be bought out by the private investors by the end of 1993. The purpose of the company is to provide energy efficiency services and equipment to enterprises in Kazakhstan through joint ventures with foreign equipment suppliers, manufacturers, and developers.

The energy efficiency equipment industry itself is severely underdeveloped. There are few producers of instrumentation/controls and other equipment. As mentioned, there are several manufacturers of meters in the other NIS countries, but most equipment is outdated and/or unreliable.

IV. RECOMMENDATIONS

The potential benefits of energy efficiency improvement to the district heating system enterprises and industrial end-users, as well as the economy of Kazakhstan in general, are sufficiently great to justify continued action and assistance in this area. The following are the IRG Team's recommendations to be pursued.

1. Continued Removal of Energy Price Subsidies

It is clear that as long as thermal energy and electricity prices remain subsidized, there will be little incentive for energy efficiency. Policy makers recognize this and have made a commitment to raising prices, as illustrated in TABLE 2. However, the burden on average consumers of rising prices cannot be ignored. Therefore, pricing policy should be balanced and attempt to minimize the social and economic impact as government subsidies disappear.

2. Financial Incentives

Rather than specialized financial incentives, perhaps the most beneficial incentive is an overall economic and monetary situation which permits reduction of nominal interest rates to reasonable levels and, on a controlled basis, creation of sufficient liquidity in the financial system to permit long-term lending to borrowers based on enterprises' credit-worthiness and prospective returns from the proposed funds borrowed. Certain specific policies can be helpful, however, and the Government should consider some of the following policies and programs.

A. Reduction or elimination of the VAT and duties on imports of energy efficiency equipment. This will encourage the importation of much needed equipment not found in the domestic market.

B. Grant priority access to foreign exchange for industries making energy efficiency investments. Importing specialized energy efficiency equipment and services has a high foreign exchange component. Facilitating access to foreign exchange can

increase access to these services and equipment.

C. Grants/No-Risk loans for audits and preliminary engineering studies. In order to enhance knowledge of the potential benefits of energy efficiency and to alleviate some of the risk and uncertainty attendant with first time investments, governments can establish grants or no-risk loans for preliminary engineering work or audits. The enterprise would be obligated to repay the loan only if the audit/engineering work identifies energy efficiency opportunities. The overwhelming benefit is that a small amount of government funds can result in significant capital outlay in energy efficiency improvements. These programs are most effective when the loans are interest-free or below market rates. The disadvantage to this program is the increased administrative burden and capital expenditure by the government.

D. Subsidized-interest loans. Under this type of program, the government can make credit available to energy users for energy efficiency investments at a lower cost of capital than could be obtained from financial institutions at market rates. The drawback to this program is that actual capital cost is not lowered, only the financing cost is reduced. In addition, it requires capital expenditure from the government.

E. Loan guarantees. Financial institutions may not be prepared to make loans to enterprises for energy efficiency investments owing to the perceived risk and uncertainty of such projects or concern about the stability of the borrower. A mechanism to address this problem is for the government to guarantee qualifying loans, often 80-90 percent of a loan. These programs tend not to promote marginal projects but can be implemented at relatively low cost to the government. However, in Kazakhstan, where interest rates at local banks are in the range of 70-80 percent, this program would not offset the cost to the

borrower, rather reduce the risk to the lender.

F. Revolving credit fund. This program creates a protected reserve of funds to be used only for energy efficiency project financing and cannot be appropriated for other purposes. Funds are lent through the government and when loans are repaid and/or as additional capital becomes available, it is added to the fund. To attract interest in this type of program, money has to be provided at below-market rates. In addition, there is an increased administrative burden to the government in implementing such a fund.

G. Tax-related incentives. These programs can include tax credits for energy efficiency investments and the production of energy efficiency equipment and instrumentation, accelerated depreciation of efficiency investments, and tax holidays. Tax credits allow an enterprise to reduce its tax burden based on a government-established percentage of the energy efficiency investment, e.g. 10 percent of the expenditure. The disadvantages of these programs is that they will only be effective if the tax code is enforced and they require active administration by the government. In addition, tax-related incentives may strengthen enterprises' inclination to seek capital-intensive solutions to their problems, while most enterprises are not yet implementing low-cost, no-cost actions.

The Government could also exempt from price or profit controls energy supply companies that provide and aggressively market energy efficiency services. This would allow supply companies to use their capital to invest in the provision of energy efficiency services.

3. Formal Government Commitment to Energy Efficiency

Experience in other countries indicates that one of the most important ingredients in promoting energy conservation and implementing a successful national program is a

demonstrated commitment at the highest political levels of government. This priority must be communicated to all relevant government agencies and to the principal energy consumers in the public and private sector. Legislation and regulations should be enacted under a coordinated national energy plan. Several policies designed to establish this commitment are presented below.

A. Mandatory efficiency requirements and regulations for enterprises. This legislation requires enterprises of a certain size or with a certain level of energy consumption to appoint energy managers. These programs also can require firms to implement an energy management service, have energy use patterns examined over fixed periods, or develop fixed-year plans for rational energy use.

B. Energy efficiency standards and labeling. Increasing the design and efficiency standards of energy-using equipment such as electric motors, HVAC systems, boilers, and household appliances promotes efficiency and energy savings. In addition, implementing strict building construction codes (including mandating the use of meters and insulation) to improve thermal efficiency and energy monitoring can enhance significantly rational energy use in the residential and commercial sectors.

C. Creation of a separate energy efficiency institution. Responsibility for promoting energy efficiency is often fragmented throughout the government. Creating a separate institution, with a full-time staff, appropriate authority, technical expertise, and effective communication with other government agencies and the private sector can substantially bolster the government's ability to promote and implement a successful national energy efficiency program. This organization's responsibilities can include analyzing consumption patterns, establishing quantitative conservation goals, collecting data, undertaking special studies, sponsoring research, development and demonstration programs, conducting

public awareness and outreach campaigns to educate the public on the benefits of energy efficiency, developing, enacting, and enforcing regulations and standards, and developing and implementing training programs.

4. Plant-Level Incentives and Awareness-Building

The following practices/efforts are recommended to promote worker productivity and improve overall energy efficiency:

- awarding bonuses to employees for energy-saving suggestions;
- establishing annual goals for energy consumption per unit of product, with monthly monitoring;
- creating "Energy Committees" to identify energy-saving opportunities and implement solutions;
- assigning specific individuals the responsibility for improving energy efficiency;
- holding regular meetings or seminars on energy-saving for all employees;
- completing daily (or weekly) analyses of energy consumption to detect potential problems; and
- scheduling operations to minimize energy demand.

5. Decentralizing Management in an Emerging Market Economy

Despite considerable progress in moving toward a market economy, many managers still cling to the essence of central planning and to multiple layers of bureaucracy. Unnecessary bureaucracy can be removed, costs reduced, and decision-making facilitated.

Entities which generate revenues (and sometimes profits) are unable to raise new capital required for maintenance, repairs, expansion and investment in energy efficiency equipment because revenue flows to other, generally administrative, levels within the hierarchy. What is returned to the operational level is inadequate for these needs. If Kazakhstan is to implement successfully its economic reform programs, more freedom of operation, decision-making, and full access to revenues must be granted to energy enterprises and end-users in the industrial sector. Greater autonomy will assist in the move toward operating as profit- and market-oriented businesses. In short, continued decision-making decentralization is required to increase in-house energy efficiency capabilities at all levels.

6. Technical Assistance in Energy Efficiency

The current USAID program serves to demonstrate the benefits of energy efficiency, particularly the low-cost, no-cost options which will yield rapid returns. This assistance is building support for more far-reaching programs, laying the groundwork for an effective long-term energy efficiency program.

A massive influx of equipment and technology is required to assist individual enterprises to rebuild and become competitive. Additional assistance in conducting basic energy auditing and identification of low-cost and no-cost energy efficiency measures should be intensified. This assistance can be provided by USAID and other international donor agencies, but must be undertaken rapidly. Most required energy efficiency technologies/practices are inadequate or simply absent. Equipment needed includes small-scale, low-cost, no-cost, fact payback instrumentation and control systems such as, microprocessors, gas analyzers, flow meters, flue gas oxygen analyzers, heat meters and thermostatic controls, automated PC-based control and monitoring systems, infrared and contact thermometers, and pipeline insulation. Rational billing systems and steam traps are examples of systems/technologies which can be implemented inexpensively and quickly with fast payback.

Of particular importance for district heating systems in Kazakhstan is assistance in conducting water audits and leak detection. Estimates of the volumes of hot water lost through leakages and accidents are difficult to establish, but is considered to be substantial. While the service life of pipelines is reportedly 25 years, they actually last no longer that 15-20 years. Just 5 kilometers (km) are replaced annually – out of a system that covers a territory 15 km (east to west) by 10 km (north to south) with 232 km of pipelines. Thus, these inexpensive and highly effective measures/technologies can yield very rapid, tangible energy savings.

Larger scale, more capital intensive projects and equipment are also needed to modernize facilities and implement new production processes. For example, there are opportunities to satisfy electric power demand growth within the system through the

cogeneration of electricity. In addition, since most of the hot water boilers in the system are natural gas-fired, they would be suitable for gas turbines with combined cycle capabilities. The long-term outlook for the combined cycle option is very attractive, especially given the expected development of the Tengiz oil/natural gas field in Kazakhstan which promises to yield significant oil and gas supplies. Development of the Aktyube deposit in the western part of the country, being developed by Turkey, also will contribute to this strategy. In addition to help meet demand, increased use of natural gas will assist in reducing pollution especially during the winter heating season which begins October 15. The IRG Audit Team concluded that combined cycle gas turbines are the most attractive alternative for upgrading Kazakhstan's power generation and district heating systems. However, these indigenous gas resources are not likely to be developed to service Almaty in this decade owing to long-lead times for project development/implementation and pipeline construction.

7. Residential Metering Demonstration Program

Residential demonstration projects are needed to illustrate the effectiveness of demand side management at the household end-use level. These programs can involve selecting typical residential and commercial buildings and related substations, and include the installation and operation of heat and flow meters, temperature and pressure gauges, transmitters, thermostatic valves, heat exchangers (if the same hot water source is supplying both space heating and other uses, as in Kazakhstan), recorders and indicators, computer consoles, modems and phone lines. Care must be taken to identify typical buildings with common physical features, such as piping layout, boiler conditions, substation design and set-up, and pipe conditions. In buildings over 30 years old, space heating systems (radiators) are equipped with double pipe systems, while newer buildings have a single pipe system. With a double pipe system it is relatively easy to apply a thermostatic control at each radiator in individual apartments. Single pipe systems require additional plumbing work to regulate and monitor usage. In addition, it should be noted that in comparison to some of the short-term equipment and technical assistance described above, this type of program is likely to be more expensive to implement and have a longer payback period. Nonetheless, it remains an area where significant gains in

energy efficiency are possible.

8. Training

There is a strong need to establish training programs for enterprise managers to assist them in the technical aspects of energy efficiency improvement, the basics of business management, and free market principles. Managers and all levels of technical personnel require training to evaluate new investments, as well as in the installation and operation of energy efficiency instrumentation and equipment. Training is required in the development of energy efficiency programs, and to improve skills in the areas of economic project analysis, investment project evaluation, and long-term strategic planning. One alternative is to present intensive 3-5 day workshops on strategic planning and decision-making to invited executives from all across the district heating and industrial sectors. Other efforts can include utilizing outside experts to provide technical assistance in developing strategic plans at the plant/organizational level and sending key host country executives to training programs in the United States.

9. Development of Domestic Energy Efficiency Industry/Activities

Kazakh district heating enterprises as well as industrial end-use facilities have little access to modern energy efficiency technologies and to companies, particularly U.S. firms, providing those technologies. Virtually all entities contacted by the IRG Team in conducting the policy and institutional analysis expressed a strong desire to establish relationships with U.S. companies in order to improve overall energy efficiency, stimulate domestic activities, and disseminate information and technology concerning the benefits of energy efficiency. IRG highlights several recommendations to USAID that accomplish these goals:

- Assist in the development of private service firms and joint ventures. Although there are few, if any, Kazakh private sector companies manufacturing energy efficiency equipment, AGTKE and several industrial end-users expressed interest in joint partnerships involving capital investment and technology transfer. Industrial end-use enterprises are good candidates for partnerships with American firms. Production oriented partnerships are all the more promising, given that the labor force is highly skilled and relatively inexpensive. The USAID Enterprise Fund could be a potential vehicle in addressing this issue.

- Early Involvement of U.S. Vendors in USAID Technical Assistance. This has proved to be effective in introducing vendors to potential markets. Vendors' participation at an early stage enables them to understand the specific heating systems and experience for themselves various local problems and prepare them for realistic and reasonable solutions.

- Development of an Energy Efficiency Center. This approach has been implemented in other countries. It would establish a non-profit organization dedicated to improving the country's economic development and environmental protection through energy efficiency. Although there are currently no institutes, foundations or centers dedicated to energy and energy efficiency, there is a pool of trained and skilled energy engineers, who are mostly part of government-run organizations. Once energy efficiency awareness improves throughout the country and more and more specialists in energy efficiency are trained, these individuals could form the nucleus of such an Energy Efficiency Center or Foundation. These individuals would provide audits, general services, and training to the district heating and end-user entities in order to disseminate awareness, skills and the benefits of energy efficiency.

10. Formation of a Energy Efficiency Company

A recent idea which has gained much support is to form a company specifically for the purposes of supplying and installing low-cost energy efficiency equipment with high payback. This company would be partly owned by a U.S. energy development firm, a U.S. equipment manufacturer/supplier, and potentially an appropriate government and/or private sector entity in Kazakhstan. The U.S. private sector as well as U.S. government entities such as the Export-Import Bank and OPIC (for example, with the latter, under the *Project Development Program for Central and Eastern Europe and the Newly Independent States of the Former Soviet Union*) could provide some initial capital financing. The goal of such an entity would be to facilitate immediate transfer of much needed energy efficient equipment with high payback and quick impact. The most appropriate technologies for the district heating systems are water audit/leak detection equipment and steam traps. As discussed, the formation of *Interenergiya* is a start in this direction.

ANNEX A

NATIONAL PROGRAM OF DENATIONALIZATION AND PRIVATIZATION

SECOND PHASE 1993-1995

48

THE NATIONAL PROGRAM OF DENATIONALIZATION AND PRIVATIZATION IN THE REPUBLIC OF KAZAKHSTAN FOR 1993-1995 (SECOND PHASE)

Introduction

The national program of denationalization and privatization, hereafter referred to as "The Program", defines the goals, tasks, procedures, and timetable for the conversion of state-owned property in the Republic of Kazakhstan into different forms of private property from 1993 to 1995.

The primary goal of privatization is to create the necessary conditions for a transition from a centralized planned economy to a market economy on the basis of personalizing property rights in the process of returning state-owned property to the republic's population by means of gratuitous and non-gratuitous transfer of industrial plants and other material and non-material assets currently owned by the state.

The realization of this goal will require the accomplishment of the following basic tasks:

- promotion of the emergence of market-oriented business entities by means of converting most state-owned companies into joint stock companies, small-scale and large-scale privatization of state-owned property, and the creation of conditions which will allow all segments of the population to participate in the privatization process;

- development of a stratum of private property owners as efficient managers;

- the implementation of specialized plans for converting large and unique national economic sectors;

- the development of economic organizational structures in which private business will predominate and which will involve the participation of foreign investors;

- the development and consolidation of a system of investment businesses as participants in the securities market;

The Program defines the basic strategies for denationalization and privatization from 1993 to 1995. It defines privatization procedures and categories consistent with the Constitution of the Republic of Kazakhstan and a "Program of Emergency Anti-Crisis Measures and Measures to Advance Social and Economic Reform (for the Period of Economic Stabilization and Transition to a Market Economy)", the prospects for Kazakhstan's social and economic development, the characteristics of different industries, and the place and role of businesses and organizations in social production.

The second phase of the process of denationalization and privatization of state-owned property in the republic will involve the appropriate combination of measures prescribed by the Program.

The list of entities subject to denationalization and privatization in line with the Program itemized for each category of privatization is subject to government approval on an annual basis. Information on these entities will be made public on a regular basis.

All state-owned entities are divided into two categories:

- entities subject to denationalization and privatization;
- entities whose privatization is prohibited by law. The grounds for assigning an entity to one of the above categories include the advisability of maintaining state ownership; the industrial affiliation of the entity; and the social and economic significance of the goods and services it produces.

Entities which are defined as the exclusive property of the Republic of Kazakhstan, including its land, its mineral resources, its water, its air, its flora and fauna, other natural resources, historical and cultural landmarks, the cultural and historical treasures of the people of the Republic, government budget funds, national insurance reserve and other funds, businesses and property which serve to preserve the republic's sovereignty, sustain its social and economic development, and institutions which are financed exclusively with government funds are not subject to privatization.

I. Basic Categories of Privatization

The basic categories of privatization mean combinations of privatization procedures and forms tailored to meet the specific needs of each type of entity subject to privatization.

The criteria for assigning an entity to one category of privatization or another include the economic importance of the entity, its industrial affiliation, the number of employees, and the value of its fixed assets.

Businesses and organizations are conventionally classified as follows on the basis of the number of employees:

- small businesses with less than 200 employees;
- medium-sized businesses with 200 to 5,000 employees;
- big businesses with more than 5,000 employees.

In drafting the annual lists of entities subject to privatization, an entity's classification as a small, medium-sized, or big business may be revised on the basis of its industrial, regional, and other characteristics.

On the basis of size classifications, the Program calls for denationalization and privatization processes to develop in the following directions:

- the privatization of big and unique property agglomerations on the basis of specialized plans;
- large-scale privatization of medium-sized businesses;
- small-scale privatization on the basis of auctions and competitive bidding for small retail and service businesses.

Specialized privatization plans make it possible to provide an optimal organizational structure for important businesses in key sectors of the economy, determine the best possible mix of private and state management, and attract domestic and foreign investors, starting at the state of development of the plan.

Large-scale privatization will provide a solid foundation for the emergence of a broad segment of property owners directly engaged in supplying goods and services to the consumer market.

Small-scale privatization will provide a solid foundation for the emergence of a broad segment of property owners directly engaged in supplying goods and services to the consumer market.

Privatization vouchers which give each resident of the republic the right to acquire a certain share of state-owned property will allow members of all social strata of the Republic to participate in the privatization process.

Two types of privatization vouchers will be used in the second phase of privatization in Kazakhstan:

- privatization vouchers used to purchase housing (housing vouchers);
- privatization investment vouchers.

Housing vouchers, which could only be used to purchase housing in the first phase of privatization, may also be used in the second phase as a means of payment at small-scale privatization auctions and competitive bidding procedures conducted for the purpose of selling small retail and services businesses in addition to (after) their use for purchasing housing. Privatization investment vouchers may be used in large-scale privatization by means of investing

them in special privatization investment funds used to purchase shares of stock in businesses converted into joint-stock companies.

1. Converting State-Owned Businesses into Joint-Stock Companies

The conversion of state-owned businesses into joint-stock companies means converting them into companies in which all the shares are fully owned by the state. This process is an essential initial phase in the privatization of all entities not subject to auction or sale by competitive bidding in the small-scale privatization process.

The conversion of state-owned businesses into joint stock companies will make it possible to:

- change the organizational structure of the management of these companies and make management more efficient by allowing the stockholders (i.e., in state-owned holding companies and joint-stock companies, the government) to appoint the boards of directors of these companies;
- make the boards of directors and management of joint-stock companies personally accountable for the financial condition and legitimacy of all of the company's activity and responsible for submitting annual reports to the stockholders;
- commercialize the activity of converted businesses;
- accelerate the privatization process by having the government transfer its ownership rights to all or a portion of the shares to juristic and natural persons (corporations and individuals) on a non-gratuitous or gratuitous basis;
- lay the ground-work for converted state-owned companies to engage in entrepreneurial activity in foreign markets.

The republic's government will initiate the conversion of state-owned businesses into joint-stock companies, whose shares will be owned by the state and which will be managed by a system of holding companies.

The procedure and conditions for converting state-owned businesses into state-owned stock companies will be established by an appropriate order of the President of the Republic of Kazakhstan. These measures must facilitate the implementation of an effective government investment policy and an orderly procedure for registering the transfer of stock and protecting the interests of the stockholders.

52'

In order to encourage employees of the businesses to support the conversion process, labor collectives (employees) who develop a conversion plan for a business acceptable to a subcommission of the National State Property Commission of the Republic of Kazakhstan will be given the right to acquire up to 10 percent of the charter capital of the converted business free of charge in the form of preferred stock, but not to exceed 12 times the average monthly salary per employee at the business.

After state-owned businesses have been converted into joint-stock companies, the National State Property Commission will be responsible for further privatization of the businesses.

Businesses included on the list of privatized entities subject to government control in the transitional period will be converted into joint-stock companies with varying percentages of government ownership.

If the Commission so decides, government-owned blocks of shares in joint-stock companies partly owned by the government may be transferred to holding companies or holding-type stock companies. These companies shall be established as restricted joint-stock companies which shall operate on a commercial basis and allow the government to maintain effective control of key sectors of the economy.

The establishment of holding companies will involve the successive implementation of the following steps:

- the conversion of state-owned businesses into joint-stock companies;
- determination of a list of businesses which must be coordinated from a single center and have very close economic ties to one another;
- determining the government's controlling block of shares;
- establishing a holding company and transferring rights of ownership, use, and control of the government's controlling block of shares to the holding company.

The implementation of this conversion procedure will make it possible to provide a clear delineation of the functions of government regulation and business management.

Government administrative agencies should be responsible for regulating the activity of the holding companies by appointing their managers (their presidents and members of the boards of directors) and by monitoring the advancement of national interests, including environmental protection, the implementation of government programs, and so forth.

The holding company's board of directors will be responsible for financial oversight over the operations of the holding company's stock companies by including representatives of the

holding company in the companies' governing bodies, analyzing the profitability of the companies over time, monitoring major investments, and so forth.

The companies' managers, which will be appointed by the holding company and report to it, will be responsible for the day-to-day management of the companies' operations.

The most desirable option for the Republic of Kazakhstan would be to establish several specialized holding companies for different industries and give them the opportunity to diversify by developing new operations or acquiring blocks of stock at their discretion. By providing for the concentration of financial resources and targeted investment of these resources, the holding company's organizational structure will facilitate rapid diversification of capitally developing new operations or acquiring existing businesses.

If immediate changes in the management structure of an industry are necessary, holding companies may be established from existing state-owned businesses to be followed by conversion into joint-stock companies.

As soon as the companies become stably profitable and efficient and there is no longer any need for government control of their operations, the state-owned blocks of shares could be sold to private individuals and non-government corporations, including foreign corporations.

If the Commission so decides in consultation with government administrative agencies, the state-owned blocks of shares in the aforementioned stock companies might be replaced by so called "gold stock".

A "gold stock" is a security which is owned by the government and confers veto powers in deciding the following issues: changes in the company's profile, limiting the company's fulfillment of priority government purchase orders, allowing the company to engage in environmentally hazardous operations, and a number of others.

Monopolies will be eliminated and kept from re-emerging by establishing several holding companies in the same industry or diversifying their operations.

The National Privatization Fund established by the Commission will be responsible for organizing auctions of state-owned blocks of shares to privatization investment funds at the behest of the Commission.

Centralized recording and gathering of information on the registration and operations of joint-stock companies will be the responsibility of an information center, which, as it develops, could be converted into a national archive.

2. Privatization on the Basis of Specialized Plans

Specialized denationalization and privatization plans will be developed for especially large and unique facilities and businesses.

Unique facilities means businesses which manufacture products or provide services of special social significance or are natural government monopolies.

Specialized denationalization and privatization plans will be developed under the supervision of the Commission, which will, if necessary, be responsible for the choice of consulting or management firms.

A specialized plan will involve a phased program of action, to include:

- a comprehensive analysis of the operations and competitiveness of the entity and an appraisal of its property;
- a system of proposed organizational, engineering, and other changes in the entity, including steps to demonopolize its operations;
- a choice of privatization forms and procedures.

Privatization plans must be designed in accordance with the requirements of the law of the Republic of Kazakhstan and in consultation with the National Commission for Anti-Monopoly Policy.

One the basis of the evidence provided, the National State Property Commission shall determine the readiness of the entity for privatization, and if its conclusion is in the affirmative, it shall approve the plan and authorize conversion of the entity. Specialized privatization plans might be implemented by the following procedures:

- sale to a specific investor on explicit terms;
- sale by means of auctions or competitive bidding processes;
- the conclusion of a management contract;
- public sale of stock.

The sale of stock to a specific investor on explicit terms involves the sale of stock to corporations and individuals who agree to meet certain conditions (the implementation of investment programs, preserving a certain number of jobs, preserving the current type of operations, improving the quality and competitiveness of the businesses' products, and so forth).

This type of privatization may be used to establish a stable group of potential investors attracted for the purpose of "putting the business back on its fee."

Auctions are public competitive trading sessions at which individuals or corporations can acquire state-owned entities. In this process, purchasers are not required to meet any conditions with respect to the entity, and ownership rights will be transferred to the purchaser offering the highest bid during the auctions.

In a competitive bidding process the purchaser may be required to meet certain conditions with respect to the entity (preserving the businesses' current profile or using the entity for its existing purpose, preserving a certain number of jobs, providing funds for social amenities, and so forth). Competitive bidding processes may be classified as commercial or investment processes.

In an investment competitive bidding processes, state-owned businesses may be sold to purchasers who agree to implement investment programs. The entity will be sold to the purchaser who proposes the best version of the Program as defined by the criteria for the competitive bidding process.

Rules for investment and commercial competitive bidding processes are subject to approval by the Commission.

A management contract is a way of transferring use rights to a corporation or individual. This procedure should be used if privatization of the entity would be economically impractical or premature.

A contract may stipulate the rights and percentage of ownership of the private managers in the event of subsequent privatization of the entity.

The choice of individuals or non-government corporations as contractors may be made on a competitive basis.

The public sale of stock means the sale of stock to corporations and individuals in the securities market.

The Commission may authorize the National Privatization Fund to sell stock intended for sale to the general public at public competitive bidding sessions to privatization funds in exchange for privatization investment vouchers.

On the basis of the national interests of the Republic, the Commission may decide to convert the property of an entity in its entirety without any preliminary structural changes if the process of "putting the businesses back on its feet" will be a difficult and time-consuming process. The aforementioned structural changes would then be carried out within the framework of the operations of the converted entity.

3. Large-Scale Privatization

In large-scale privatization, the general public of the Republic of Kazakhstan will be given the opportunity to acquire property rights by means of exchanging privatization investment vouchers for shares in privatization investment funds which purchase stock in businesses.

Large-scale privatization will offer the participants in the process freedom of choice, competition, openness, speed, and simplicity and will create the conditions for the efficient distribution of property with extensive participation by all segments of the populations.

Large-scale privatization is a phased process designed to last three to four years. Every year, the Commission will draft a list of the businesses to be converted into joint-stock companies with shares transferred to privatization investment funds. The mass media will inform the general public of Kazakhstan of the conditions and schedule for large-scale privatization.

At least 51 percent of the stock in joint-stock companies established from businesses and organizations not included in the small-scale privatization or specialized privatization processes shall be sold to privatization investment funds. All of the shares in businesses(except for employee shares) whose privatization will not require the preservation of government blocks of stock will be open for bidding at large-scale privatization auctions.

The block of stock left after the employees have received their shares (no more than 10 percent of charter capital) and after stock has been sold at auction to privatization investment funds in exchange for privatization investment vouchers will remain state property. This reserve government block of stock will be used for government regulations of the operations of businesses in the transitional period. Government blocks of stock may be put up for sale on the open market as needed.

Large-scale privatization will involve the following actions.

- issuance of privatization investment vouchers to the general public of Kazakhstan
- the establishment of a system of privatization investment funds operating on a commercial basis as brokers between the owners of privatization investment vouchers and businesses.

The issuance, circulation, and use of privatization investment vouchers will be governed by special regulations subject to approval by the President of the Republic of Kazakhstan.

Privatization investment vouchers will be issued by offices of the Savings Bank at the recipient's place of residence on the basis of a list of family members issued by the recipient's housing office and the recipient's passport and will be issued in the form of personal accounts with a balance equal to the total of the investment vouchers. Privatization investment vouchers will be deposited in a separate account for each resident of the Republic of Kazakhstan.

51

A multiplier of 1.2 will be applied to the total value of the privatization investment vouchers issued to residents of the republic living in rural areas.

These vouchers will be credited to separate accounts for children under the age of 16, and the right to dispose of these separate accounts will be transferred to one of the child's parents on the basis of an application submitted by the parents and the child's birth certificate.

The funds contained in privatization investment voucher accounts shall be invested in privatization investment funds within the time frame established by the government. The percentage of the vouchers which may be used in the first phase of the process shall be determined by the government in accordance with the approved list of entities subject to large-scale privatization. The restriction on the number of privatization investment vouchers which may be used in the first phase of the process will be imposed for the purpose of reducing the risk of the voucher's owners in the face of the still uncertain competitiveness of the privatization investment funds. In subsequent phases of the process the owners themselves will be responsible for determining the number of privatization investment vouchers they will use.

The dates for investing privatization investment vouchers will be announced through the mass media.

In each phase of privatization, a voucher owner will have the right to invest his voucher in several privatization investment funds. The choice of privatization investment funds and the number of privatization investment vouchers invested in chosen privatization investment funds are up to the owner of the vouchers.

Voucher owners should invest their vouchers in several privatization investment funds in order to reduce the risk of losses caused by the inefficiency of certain investment funds.

The prohibition against the direct exchange of privatization investment vouchers for shares in privatized businesses was compelled by the desire to avoid excessive speculative demand for stock in certain businesses and protect the vouchers of the republic's residents from unwarranted devaluation.

Privatization investment vouchers will be invested by transferring them from the owner's account to the corresponding accounts of specially established privatization investment funds. Each privatization investment fund will issue stock to be transferred to citizens in exchange for the privatization investment vouchers invested by owners in the fund. Owners of privatization investment vouchers will receive stock in the privatization investment fund which will indicate the number of vouchers they invested. The face value of stock in a privatization investment fund is given as a percentage of the fund's charter capital, not in rubles.

The establishment and operations of privatization investment funds shall be governed by special privatization investment fund charters subject to approval by the Commission.

Non-governmental corporations and individuals may be founders of privatization investment funds. Privatization investment funds shall be established as public stock companies whose stockholders are residents of the Republic of Kazakhstan who have invested their privatization investment vouchers in exchange for stock in the fund. The establishment of private privatization investment funds is compelled by the need for real, and not just formal privatization and for the involvement of full-fledged owners, the stockholders of the funds, in the management of these funds.

The Commission will establish an information center to provide organizational support for large-scale privatization. This center will be responsible for gathering and processing information on the establishment and operation of joint-stock companies, the number of vouchers issued and invested, and the traffic in businesses stock. The information center will have regional departments assigned to regional offices of the National State Property Commission.

The operations of the funds will be governed on the basis of licenses issued by an Interagency Commission specially established by the National State Property Commission. In order to ensure the impartiality of its decisions and provide independent oversight of the operations of privatization investment funds, the Interagency Commission will include representatives of the National State Property Commission, the Ministry of Economics, the Commission for Statistics and Analysis, and the National State Bank. In order to obtain a license, the founders of a privatization investment fund will be required to submit complete and accurate information to the Commission on the founders of the fund, the fund's capital, the terms on which the fund acquires privatization investment vouchers, and the liability of the fund to voucher depositors for any losses it may sustain. The Commission is responsible for regulating the operations of the funds with respect to determining minimum capital requirements and stock investment procedures and the public accessibility and accuracy of the information on the fund's operations. All of the investment fund's property is subject to liability for shareholder claims. Any inaccurate information submitted by an investment fund or violation of the terms under which its license was obtained constitutes grounds for the Commission to revoke the fund's license and liquidate it.

Privatization investment funds accumulate the general public's privatization investment vouchers in exchange for stock in the fund. The National Privatization Fund accumulates government shares earmarked by the Committee for sale within the framework of large-scale privatization, is responsible for announcing auction times, receives applications from privatization investment funds to take part in auctions, and organizes public auctions at which privatization investment vouchers invested by citizens. Plans call for organizing auctions at two levels: auctions to sell stock in national businesses and auctions to sell stock in regional businesses. A list of businesses whose shares will be put on the auction block in exchange for privatization investment vouchers must be published at least 45 days prior to the announced date of the auction and should indicate the number of shares in each entity to be sold at auction, the financial condition of the business, and the minimum amounts (initial bids) of vouchers per share of the business. Privatization investment funds must submit applications to the National

Privatization Fund at least 15 days prior to the announced date of the auction. The application should indicate the number of shares the fund plans to purchase in which joint stock companies and the maximum number of privatization investment vouchers which the fund can offer per share of stock.

Some of the shares in businesses will be sold to the public by the National Privatization Fund in order to determine the market rate of the stock.

Additional (secondary) issuance and investment of stock will be the responsibility of joint-stock companies in accordance with the applicable law of the Republic of Kazakhstan.

Competition between funds at auctions to acquire stock is based on the assumption that they will offer the maximum possible number of investment vouchers for the stock at auction. A particular investment fund may not acquire more than 10 percent of the stock in a particular business at a single auction. A particular investment fund may not hold more than 20 percent of the shares in a particular joint-stock company. Privatization investment funds may sell and acquire stock in joint-stock companies from other investment funds, corporations, and individuals after the auctions of stock for vouchers have concluded.

The success of large-scale privatization will require the organization of information and publicity services involving both the mass media and a system of special courses, question-and-answer sessions, and education with the participation of qualified experts.

At the end of the large-scale privatization process, any unsold share of stock in joint-stock companies will be put on the open market. If no buyers are found, the Commission may transfer the stock on negotiated terms to holding companies or similar entities.

4. Small-Scale Privatization

Small-scale privatization will involve small businesses and organizations with less than 200 employees subject to mandatory privatization.

This privatization category includes most retail and wholesale businesses, public dining facilities, and services. Trucking businesses will be privatized at the same time in order to guarantee the success of small-scale privatization.

Retail outlets and public dining facilities which serve low-income segments of the population will remain under state ownership.

The privatization of company stores owned by agribusiness operations will be carried out within the framework of these operations.

The privatization of an entity will begin with preparing it for auction or competitive bidding by providing timely notification to the business' employees. In certain cases the government

will assume all the liabilities of the business, including debts and obligations to employees. The sellable assets of the business will include only its property, namely its fixed assets (if selling a building would be impractical, long-term leasing rights would be sold), its raw and processed materials, supplies, tools, and so forth.

The Commission will draft lists of businesses subject to small-scale privatization on a quarterly basis in consultation with government agencies. Publication of a list constitutes official notification of the beginning of privatization of the businesses included on the list. Creditors must be given a certain amount of time to file claims against the business in accordance with the established liquidation procedure.

Small-scale privatization shall be carried out by means of auctions or competitive bidding processes involving the participation of individuals and non-government corporations. The procedures for conducting auctions and competitive bidding processes within the framework of small-scale privatization shall be defined by appropriate regulations subject to approval by the Commission. In competitive sales of an entity, preference will be given to citizens of the Republic of Kazakhstan and employees of the entity to be sold under the condition that the latter form their own company. If this company includes more than 50 percent of the employees of the entity, the company will be given a discount of up to 10 percent of the sale price in an auction or competitive bidding process.

Non-competitive auctions or bidding processes are prohibited. The total amount payable by a purchaser for property acquired in an auction or competitive bidding process may consist of 50 percent money and 50 percent housing privatization vouchers acquired by the person desiring to take part in an auction.

Unrestricted sale and purchase of housing vouchers will be instituted for the purpose of facilitating the use of housing privatization vouchers in the small-scale privatization process. Housing vouchers may be bought and sold by means of privatization check books through offices of the Savings Bank.

Citizens have the right to avail themselves of the services of brokers (on a contractual basis) to participate in auctions and competitive bidding processes conducted with housing vouchers as a means of payment.

The use of housing vouchers in small-scale privatization is governed by special regulations.

The procedure for using housing vouchers to purchase housing will remain the same.

II. The Denationalization and Privatization of State Property in Agribusiness

Denationalization and privatization in agribusiness will be carried out on the initiative of the owner in accordance with the Program with allowances for the specific characteristics of the industry's sectors, businesses, and organizations.

Land and other natural resources will remain the exclusive property of the Republic of Kazakhstan and are not subject to privatization but may be leased on a long-term basis for up to 99 years.

State-owned agribusinesses will be privatized in the following basic ways:

- the conversion of state farms and other state-owned agribusinesses into individual proprietor and peasant farms, agricultural cooperatives, small businesses and their associations, and other non-government forms of management;
- the establishment of unrestricted or restricted joint-stock companies;
- the sale of state property in auctions or competitive bidding processes.

The privatization of large poultry and livestock operations and greenhouse conglomerates will be carried out by means of converting them into joint-stock companies or other types of companies or partnerships for which process-related goods producers will be given priority in purchasing stock (shares) under the condition that they maintain uninterrupted production and existing horizontal relationships.

Agribusiness procurement, processing, and service businesses will be privatized by means of converting them into public joint-stock companies with priority purchase rights given to agricultural goods producers with contractual relationships with the converted businesses. Any undistributed and unsold shares will remain government property. The National State Property Commission of Kazakhstan will appoint a trustee for the government block of stock.

The privatization of chronically unprofitable agribusinesses will be carried out by means of the gratuitous transfer of their property to partnerships or joint-stock companies established by the employees of these businesses or, if the employee decline to accept the property, the property may be sold at auction or in a competitive bidding process.

Housing privatization vouchers may be used by individual employees or partnerships formed by employees to purchase the property of state-owned agribusinesses. The vouchers may be used to cover up to 75 percent of the sale price of the property of an agribusiness. The

purchasers of the property of an agribusiness are required to preserve the agricultural profile of the operation. The new owner may use the acquired property at his discretion as long as this use does not violate the terms of the purchase and sale agreement.

All the employees of the privatized business and other citizens residing on the territory of the business may take part in the privatization of state-owned agribusinesses.

All producers of agricultural commodities will be afforded the opportunity to take part in small-scale privatization in cities in competitive bidding processes and auctions.

Some of the revenues derived from the privatization of state property will be used to develop and support market structures in agriculture.

Collective businesses (farms) will be asked to re-register as partnerships or joint-stock companies.

III. The Participation of Foreign Corporations and Individuals in the Privatization Process

Foreign corporations and individuals may participate in all types of privatization processes. Their activity is subject to the applicable law of the Republic of Kazakhstan and international treaties and agreements.

Foreign corporations and individuals may take part in the privatization of state property after their financial capabilities have been reviewed and they have been issued an appropriate license by the National Foreign Investment Agency.

The procedures and conditions by which foreign corporations and individuals may participate in the privatization of state property on the basis of specialized plans shall be defined by the National State Property Commission and the Ministry of Economics in accordance with the applicable law of the Republic of Kazakhstan, unless stipulated otherwise by intergovernmental treaties and agreements.

To the best of its ability, the Ministry of Economics will provide information on the economic and financial capabilities of prospective investors to concerned corporations and individuals.

When foreign corporations and individuals take part in privatization, the entity subject to privatization will be valued (appraised) in the national currency and in foreign currency in accordance with world market prices for similar types of property and types of activity.

IV. The Organizational Framework for Administrative of the Denationalization and Privatization Process

The National State Property Commission and its regional offices will be responsible for the denationalization and privatization of state property in the Republic of Kazakhstan in cooperation with ministries, departments, and local governments.

The privatized state-owned businesses themselves, privatization offices, and non-government commercial organizations duly licensed by the National State Property Commission will perform the preparatory work of appraising property and drafting privatization documents along with offices of the National State Property Commission.

The President of the Republic of Kazakhstan is responsible for monitoring the implementation of the Program. Information on the progress of the Privatization Program will be published on a regular basis in the national and local print media.

V. The Procedure for Receiving and Distributing Funds Derived from the Privatization of State Property

Funds derived from privatization mean all monetary and other revenues from the sale of state-owned property.

Dividends for state-owned blocks of stock and lease payments received by the National State Property Commission and its regional offices will not be included in funds derived from privatization and are to be transferred to the appropriate budget account minus any bank transaction expenses.

According to the Law "Governing Denationalization and Privatization", the funds derived from privatization are the property of the state and shall be deposited in special accounts.

Monies derived from small-scale privatization auctions will be transferred to special accounts after the debts of the privatized entities have been paid.

Funds deposited in a special national accounts will be used to pay the national domestic debt and for other purposes indicated by the government in a submission to the President of the Republic of Kazakhstan.

Funds received by local governments and a portion of the funds from the special national account may be used to provide subsidies and security for needy and socially insecure segments of the population, for unemployment benefits, for personnel training and retraining, and for other purposes.

The procedures for expenditures of these funds are to be determined by the heads of local governments.

The national government is responsible for approving the portion of the funds used to implement the Privatization Program.

VI. Social Security Guarantees

The implementation of the Program must be accompanied by social security guarantees for the republic's population, including:

- guarantees of employment for employees discharged in the privatization process by means of giving them the opportunity to change jobs and occupations through a system of public and private training and retraining facilities; the organization of a system of public works on the basis of regulations approved by the government; financing public works from national and local budgets and the funds of concerned businesses; the establishment of a system of tax concessions for small business development which would utilize the manpower resources left idle by the privatization process and the labor of retirees and disabled persons;

- the establishment of special public, private, and mixed funds to provide subsidies and social security to the needy and socially insecure segments of the population in the amount of 10 to 15 percent of the funds derived from the privatization of state property; the payment of unemployment compensation by deductions from employers and national and local budget funds; voluntary contributions from corporations and individuals; social and economic development of environmental disaster zones by deducting 10 percent of the revenues from the privatization of state property and the voluntary contributions of entrepreneurs.

65