Public Disclosure Authorized

Public Disclosure Authorized

Document of
The World Bank

Report No: 16432 UA

STAFF APPRAISAL REPORT

UKRAINE

KIEV DISTRICT HEATING IMPROVEMENT PROJECT

APRIL 24, 1998

Energy Department
Europe and Central Asia Region

CURRENCY EQUIVALENTS

Currency unit = hrivnya, abbr. UAH (from September 2, 1996)
US$1 = 1.76 hrivnyas (as of September 1996)
(Prior to September 2, 1996, the currency unit was karbovanet (Krb); US$1 = 176,000 (at August 1996)
US$1 = 2.15 hrivnyas (as of 1998)

WEIGHTS AND MEASURES

atm	atmosphere	MJ	Megajoule (10^6J)
bcm	billion cubic meter	mt	million metric tons
Gcal	Gigacalorie (10^9 cal)	MW	Megawatt (10^6W)
GW	Gigawatt	MVA	Megavolt Ampere
kg	kilogram	PJ	Petajoule (10^{15}J)
km^2	square kilometer	psi	pounds per square inch
koe	kilograms of oil equivalent	t	metric ton
kV	kilovolt	tce	tons of coal equivalent
kW	kilowatt	toe	tons of oil equivalent
kWh	kilowatt hour	TWh	Terawatt hour (10^{12}Wh)
m^3	cubic meter		

CALORIFIC VALUES

1 Unit of Fuel	Gcal
Wood (ton)	2.0
Coal (ton)	5.0
Standard fuel (ton)	7.0
Natural gas (000 m^3)	8.5
Mazut (ton)	9.7
Crude Oil (ton)	10.0
Diesel (ton)	10.2
Gasoline (ton)	10.5
Liquified Petroleum Gas (ton)	10.8

CONVERSION FACTORS

1 Gcal = 4.187 GJ = 3.968 million Btu = 1,163 kWh
1 tce = 7 Gcal and 1 toe = 10 Gcal
1 kWh of hydro and nuclear energy output converted to primary thermal equivalent at 250 grams of oil equivalent.

ABBREVIATIONS

CAS	Country Assistance Strategy
CHP	Combined-Heat-and-Power
DH	District Heating
EBRD	European Bank for Reconstruction and Development
ESMAP	Energy Sector Management Assistance Program
FSU	Former Soviet Union
GDP	Gross Domestic Product
GNP	Gross National Product
GPN	General Procurement Notice
G-7	Group of Seven
HMSAP	Housing and Municipal Service Allowance Program
HOB	Heat-Only-Boiler
ICB	International Competitive Bidding
ICR	Implementation Completion Report
IMF	International Monetary Fund
KMDHC	Kiev Municipal District Heating Company
LPG	Liquified Petroleum Gas
NCB	National Competitive Bidding
NERC	National Electricity Regulatory Commission
PIU	Project Implementation Unit
SOE	Statement of Expenditure

FISCAL YEAR

January 1 - December 31

Vice President: Johannes Linn, ECAVP
Country Director: Paul Siegelbaum, ECC11
Energy Director: Hossein Razavi, ECSEG
Task Team Leader: Carolyn Gochenour, ECSEG

UKRAINE

KIEV DISTRICT HEATING IMPROVEMENT PROJECT

TABLE OF CONTENTS

ANNEXES

1 - Kiev Heat Demand Analysis
2 - Kiev District Heating Improvement Component
3 - Detailed Cost Estimates
4 - Project Implementation Schedule and List of Procurement Packages
5 - Estimated Schedule of Disbursements
6 - Supervision Plan
7 - Performance Monitoring Indicators
8 - Kievenergo Financial Analysis
9 - Kiev Municipal District Heating Company Financial Analysis
10 - Economic Analysis
11 - Social Assessment

CHARTS

1 - Organization of Kievenergo
2 - Organization of Kiev Municipal DH Company

MAP

IBRD 28701 - Kiev[1] District Heating System in the Year 2000

[1] Shown as "Kyiv" on the map, in accordance with official Ukrainian usage.

UKRAINE

KIEV DISTRICT HEATING IMPROVEMENT PROJECT

Loan and Project Summary

Borrower:	Ukraine
Beneficiary:	Kievenergo
Poverty:	Not applicable
Loan Amount:	US$ 200 million
Loan Terms:	LIBOR-based interest rate for US dollar single currency loans with a maturity of 20 years including 5 years grace
Commitment Fee:	0.75% on undisbursed loan balances, beginning 60 days after signing, less any waiver
On-Lending Terms:	As a loan to Kievenergo at the World Bank interest rate plus a mark-up of up to 1% for loan administration to be repaid over 20 years including 5 years grace
Financing Plan:	See para 2.14
Net Present Value:	US$ 160.4 million discounted at the opportunity cost of capital of 10% (20% economic rate of return)
Map:	IBRD Map No. 28701
Project ID:	UA-PA-44832

UKRAINE

KIEV DISTRICT HEATING IMPROVEMENT PROJECT

I. SECTOR BACKGROUND

A. Country Context

1.1 Ukraine, the second largest country in Europe with a population of over 50 million people, is still struggling to transform its flagging post-Soviet economy into one based on market principles, despite more than six years of efforts to that end. Sluggish economic reforms and rampant hyperinflation during the first three years after Ukraine gained independence from the Soviet Union in August 1991, combined with the external shocks of sharply higher energy prices and reduced sales to traditional markets, significantly compounded the economic situation. Despite a considerable degree of price and exchange rate stability achieved in the last three years, the decline in production has only slowed but not stopped. According to official statistics, the Ukrainian economy has slumped by nearly 60% from 1991 to 1997. Living standards have also fallen sharply and poverty became more widespread. Annual per capita GDP has declined from US$ 1,250 in 1995 to US$ 1,020 in 1997. The Government has accumulated over US$ 2.5 billion of wage arrears and debts to the public sector by the end of 1997.

1.2 Nevertheless, there have been indisputable accomplishments in the past three years. The annual level of inflation has been brought down from 8000% at its peak in the Fall of 1993 to 16% in 1997. A new currency, the hrivnya, was introduced in September 1996 and fluctuated by no more than 5% until late 1997 when a wider currency corridor was introduced allowing a modest depreciation of the currency. A significant degree of current account convertibility has been established. The trade regime has also been liberalized. Domestic prices have largely been decontrolled, consumer subsidies reduced and energy prices increased to world levels for non-household users and substantially increased for household users. Further reduction in consumer subsidies is expected after the elections in March 1998. In addition, tax and accounting reforms have been initiated with the introduction of a modern profit tax and adoption of international accounting standards by commercial banks. A radical restructuring of the energy sector is underway, and a mass privatization program is to be completed by the end of 1998. Large-scale privatization has been launched with shares in a number of flagship Ukrainian industrial enterprises and energy and telecommunications companies to be sold at auctions this year.

1.3 However, officially recorded production is still declining, albeit at a much slower pace. In 1997, real GNP fell by 3.2% as compared to 10% in 1996, 12% in 1995 and 23% in 1994. These figures excessively dramatize the production declines since they do not fully account for goods and services produced in the shadow economy, which is estimated at 40-60% of the overall economy. The problem of financing an excessively large budget deficit through borrowing came to a head in the Fall of 1997 when the cost of borrowing in the domestic capital markets shot up due to crowding out and the contagion effects of the East Asian crisis. Faced with repayments due on maturing T-bills and pressures to pay the backlog of wages, the Government of Ukraine has continued to borrow extensively in hrivnyas in the domestic T-bill market and in the international markets at extremely high risk premiums. Nevertheless, the Ukrainian leadership realizes that the only way forward now is to maintain macroeconomic stability while pressing ahead with structural reforms to raise much needed revenues for the state budget, attract investments into the economy and dispose of inefficient state enterprises constantly lobbying Government for subsidies and favors. This will ultimately lead to economic recovery and improved standards of living for the population. The World Bank and the

International Monetary Fund (IMF) support Ukraine in its efforts to implement reform policies. The IMF is working with the Government to develop an Extended Funding Facility. Currently the World Bank is supporting eleven projects totaling more than US$ 2 billion in Ukraine.

1.4 The Bank's overall strategy in Ukraine calls for a graduated expansion of the lending program in line with the intensity of the reform effort. This approach will allow the Bank to respond promptly in support of broader and deeper reforms while avoiding burdening Ukraine with debt that would not contribute to economic recovery and improved creditworthiness. The Bank intends to continue to provide Ukraine with a high level of non-lending services and engage the Government and civil society in an intensive policy dialogue under all scenarios. The energy sector is a very high priority area, given the dramatic price increases which have occurred since independence, the significant dependence on energy imports and the resulting need for energy conservation and improvements in efficiency of energy facilities. A central part of the Bank's strategy will be to continue to support energy sector reforms aimed at creating a market environment conducive for private participation.

B. Overview of the Energy Sector

1.5 **Energy Demand**. Energy demand in Ukraine is characterized by high energy intensity of industrial output and the high share of industry in final energy consumption, due to the low thermal efficiency of energy consumption technologies and high share (about 40% in 1995) of industry (iron and steel, basic chemicals) in GDP. Energy consumption per capita was about 3,000 kilogram oil equivalent (koe) in 1996, which is high compared to Western European standards. Following a modest decline of 11% between 1985 and 1990, the energy intensity of official GDP increased 60% in the 1991-95 period reaching 5.2 koe/US$, a ratio that is several times higher than in developed countries. The true energy intensity of GDP, however, is likely to be substantially lower due to the large size of the shadow economy.

1.6 **Primary Energy Resources**. Ukraine has vast coal resources, important oil and gas resources and significant hydro, wood, peat and uranium resources. Donbass, the main coal mining basin, contains metallurgical coal, anthracite and high grade thermal coals, as well as coalbed methane gas. The unusually difficult geological conditions in central Donbass make the mining of coal costly and labor intensive. Crude oil and natural gas resources are declining, but are still significant. Remaining proven and probable reserves are 190 million tons of oil and 1,400 bcm of natural gas. The shallower and larger, oil and gas pools in the Dnieper-Donetsk and Carpathian regions are rapidly being depleted. These deposits are being replaced by reserves in smaller, deeper and less productive reservoirs, which are more expensive to find, drill-up and produce, to the point that a large part of the reserves appear to be uneconomic. Hydro resources are significant but are almost fully developed, while wood and peat resources appear to have greater potential. Ukraine also has significant uranium reserves and receives nuclear fuel, in exchange for its uranium mined domestically and extracted from warheads of dismantled missiles, for its sizable nuclear electricity generating capacity.

1.7 **Energy Supply**. Domestic energy production, consisting of fossil fuels and primary electricity (hydro and nuclear power), represented 45-50% of consumption in the 1990-97 period (see Table 1.1 below). Domestic energy production steadily declined during the period; most of the decline was due to decreased coal and natural gas output. The main energy import items include crude oil and oil products mostly from Russia, natural gas from Russia and Turkmenistan, and coal from Russia and Poland. The cost of fossil fuel imports reached about US$ 6.2 billion in 1993 and increased to US$ 7.5 billion in 1995 and to US$ 8.7 billion in 1996, creating a demand for foreign exchange that the economy was unable to meet. The difference was financed by payment arrears to Russia and Turkmenistan (the arrears were subsequently converted to debt) and balance-of-payment support from