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The World Bank

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Report No: 33154-UA

IMPLEMENTATION COMPLETION REPORT
(SCL-45340)

ON A

LOAN

IN THE AMOUNT OF US\$ 18.29 MILLION

TO

UKRAINE

FOR A

KIEV PUBLIC BUILDINGS ENERGY EFFICIENCY PROJECT

December 6, 2005

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CURRENCY EQUIVALENTS

(Exchange Rate Effective)

Currency Unit = hrivnya, abbr. UAH

UAH 1 = US\$ 0.198

US\$ 1 = UAH 5.05

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

CAS	Country Assistance Program
CO ₂	Carbon Dioxide
DH	District Heating
EIRR	Economic Internal Rate of Return
FIRR	Financial Internal Rate of Return
Gcal	Gigacalorie
GDP	Gross Domestic Product
GHG	Greenhouse Gas
KCSA	Kiev City State Administration
NPV	Net Present Value
OECD	Organization for Economic Cooperation and Development
O&M	Operation and Maintenance
PIU	Project Implementation Unit
Sida	Swedish Aid Agency for International Development
USSR	Union of Soviet Socialist Republics

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UKRAINE
KIEV PUBLIC BUILDINGS ENERGY EFFICIENCY PROJECT

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<i>Project ID:</i> P055739	<i>Project Name:</i> KIEV PB ENERGY EFFIC
<i>Team Leader:</i> Yuriy Myroshnychenko	<i>TL Unit:</i> ECSIE
<i>ICR Type:</i> Core ICR	<i>Report Date:</i> December 13, 2005

1. Project Data

Name: KIEV PB ENERGY EFFIC *L/C/TF Number:* SCL-45340
Country/Department: UKRAINE *Region:* Europe and Central Asia
Region

Sector/subsector: District heating and energy efficiency services (100%)
Theme: Access to urban services and housing (P); Climate change (S);
Municipal finance (S)

KEY DATES	<i>Original</i>	<i>Revised/Actual</i>
<i>PCD:</i> 10/08/1996	<i>Effective:</i> 08/17/2000	08/17/2000
<i>Appraisal:</i> 03/04/1998	<i>MTR:</i> 06/21/2002	06/21/2002
<i>Approval:</i> 01/27/2000	<i>Closing:</i> 06/30/2005	06/30/2005

Borrower/Implementing Agency: UKRAINE/KIEV MUNICIPALITY
Other Partners: Swedish Government through its aid agency, Sida

STAFF	Current	At Appraisal
<i>Vice President:</i>	Shigeo Katsu	Johannes Linn
<i>Country Director:</i>	Paul G. Bermingham	Paul Siegelbaum
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2. Principal Performance Ratings

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HL=Highly Likely, L=Likely, UN=Unlikely, HUN=Highly Unlikely, HU=Highly Unsatisfactory, H=High, SU=Substantial, M=Modest, N=Negligible)

Outcome: S
Sustainability: HL
Institutional Development Impact: SU
Bank Performance: S
Borrower Performance: S

QAG (if available) ICR
Quality at Entry: S
Project at Risk at Any Time: No

3. Assessment of Development Objective and Design, and of Quality at Entry

3.1 Original Objective:

The main development objective of the project was to improve the energy efficiency of key public buildings in the capital city of Kiev through a package of technical improvements and sound heat tariff policies. Moreover, the project was expected to encourage the development of a local energy efficiency market and related service industry, capable of supplying and installing energy efficiency equipment in Kiev with the potential to serve other areas of Ukraine in the future. The project was also expected to further promote public awareness of the need for more efficient use of energy in Kiev. The project built upon policy reforms already implemented in Kiev during the preparation of the Kiev District Heating Improvement Project to allow for heat tariff setting at cost-recovery levels in order to provide the proper economic signals to consumers to conserve energy as well as upon reforms to improve the billing and collection of heat bills.

The project objectives were clearly defined and in line with the Government's Comprehensive State Energy Conservation Program announced in August 1996 and the Bank's Country Assistance Strategy (CAS) of 1998. Ukraine's economy had been one of the most energy intensive countries in the world since the early 1990s. Specifically, at the time of project identification in 1996, the ratio of total primary energy supply to GDP in Ukraine was as high as 0.82, as measured in tons of oil equivalent per thousand US\$ (1995 purchasing power parity), or about four times higher than in OECD countries. The sharp drop of the country's GDP after the break-up of the Union of Soviet Socialist Republics (USSR) in 1991 together with low energy retail prices and lack of energy conservation policies were major causes of the low energy efficiency of the national economy. A few years after 1991, energy import prices started to rise, traditional markets for Ukrainian industrial products began to shrink (ex-USSR and Eastern European countries), and the country started to face challenges imposed by the market environment. The Government of Ukraine recognized the need to improve the energy efficiency of the economy and developed a Comprehensive State Energy Conservation Program in 1996. The Kiev Public Building Energy Efficiency Project was intended to support the Program through improvements in energy use in the building sector in the capital of Ukraine. At the same time, the project supported the sector-related goal in the Bank's CAS to strengthen the public sector through more commercial practices based on cost-recovery tariffs and greater efficiency, leading to the possibility for private sector development.

Given the difficulties in implementing infrastructure investment projects in Ukraine and other energy efficiency projects in ECA countries up to this time, the project design was simplified in a number of ways in order to reduce risks and improve the chances for a successful outcome. In particular, the project was limited to the capital city of Kiev where tariff reforms and payment discipline were the most advanced in Ukraine and where the energy efficiency demand-side measures would be complemented with supply-side investments through the Bank-financed Kiev District Heating Improvement Project. Investments were focused only on public buildings owned by Kiev City State Administration (KCSA) and excluded: (a) residential buildings which had been fraught with difficulties elsewhere due to their mixed ownership, need for formation of building management organizations and establishment of credit lines, and low affordability by households as well as (b) industrial buildings which were being addressed under a complementary EBRD-supported UkrEsco Project. Public buildings under the ownership of state organizations, such as the Ministries of Education and Health, were excluded given their difficulty to contribute counterpart funds from the state budget. Energy efficiency measures were evaluated in advance to determine those which had the highest economic rates of return and easiest and quickest implementation. Implementation was undertaken by creating a body, the Project Implementation Unit (PIU), within KCSA and was designed to be carried out in stages, whereby a limited number of buildings would be retrofitted up front in order to allow for the identification and adjustment for necessary modifications in subsequent phases.

3.2 Revised Objective:

The original project objectives were maintained throughout implementation.

3.3 Original Components:

The project consisted of four components:

- *Energy efficiency improvements in buildings, including heat meters (US\$ 26.2 million).* 1,302 institutional buildings, including healthcare, educational and cultural buildings in Kiev, owned by KCSA, with a floor space of about 5.1 million square meters, were to be retrofitted under the project, utilizing the highest priority energy efficiency measures evaluated.
- *Technical Audits and Designs of the Retrofits (US\$ 1.9 million).* This component included (a) technical audits of the project buildings in order to yield the engineering estimates of the buildings' present energy consumption and to confirm the most feasible energy efficiency retrofit actions to be undertaken; and (b) technical designs of the retrofit measures as well as technical specifications and bidding documents for the competitive bidding of the supply and install contracts to implement the retrofits.
- *Institutional Support Program (US\$ 2.0 million)* including four sub-components:
 - Project Implementation Unit, Management of the Project (US\$ 1.7 million), including consultancy services of foreign and local consultants for managing project implementation and monitoring.
 - Public Awareness Campaign (US\$ 0.1 million), including consultancy services to develop (a) training modules based on packages of energy efficiency measures implemented in school buildings and incorporating modules in teaching programs in schools and (b) a media campaign to promote energy efficiency awareness in the population at large.
 - Training and Equipment (US\$ 0.1 million), including training of PIU managers, public building managers, maintenance personnel as well as training of local consultants conducting technical audits and designs. A training program for the contractors who were bidding for the supply and install contracted issued for building retrofits was also to be included along with provision of office equipment, computers and software for the PIU.
 - Social Assistance Support (US\$ 0.1 million), including consultancy services to design measures to improve means testing, review rules and regulations of the social assistance program, and strengthen computerized communications and automated data exchange operations. Provision of computers and software was also to be included.
- *Financial Audits (US\$ 0.1 million).* The component was to include auditing services for the incremental audit costs of the project for each year of the project period.

The components were closely related to achieving the project objectives and to the capacity of the implementing agency, KCSA, and its PIU. The lessons learned from the Bank's experience in implementing similar energy efficiency projects in Lithuania and Russia were taken into account in the project design, particularly (a) the poor experience with energy efficiency measures in residential buildings which led the project to be focused on public buildings as well as the need for (b) up-front installation of heat meters in order to provide a baseline measure for energy efficiency savings that would follow from the retrofits and (c) agreement with heat utilities to base heat bills after retrofits on heat meter readings, rather than on the prevailing practice of consumption norms. Overall, the components were implemented in a satisfactory manner, with only minor revisions.

The Bank loan was to cover 100% of the costs for the supply and installation of energy saving measures (excluding taxes and duties), the incremental financial audits and the front-end fee. The institutional support program was to be financed by donor funds. All other costs of the project, including supply and installation of heat meters, technical audits and designs, and taxes and import duties were to be financed by

KCSA.

3.4 Revised Components:

No major revisions of project components were undertaken. Some minor changes were made during the project period, as explained below.

Based on the procurement experience in the early phase of the project period, the PIU determined that procurement based on the supply and installation procedure was preferable and more cost effective to procurement based on separate tenders for supply and installation. Therefore, the legal agreements were amended to allow for this more efficient procurement method.

Regarding the institutional support component, the Kiev City social assistance component for low income households to support payment of their housing and communal services was not addressed under the project, because the Bank's social team initiated a dialogue with the Government during the project period on ways to rationalize the larger system of social assistance support on a nationwide basis. KCSA's social assistance program was expected to be consistent with the nationwide approach to be agreed with the Government.

Given the overall satisfactory outcome of the project, KCSA decided to carry out an enhanced public awareness campaign utilizing about \$45,000 of the Bank loan. The campaign, assisted by the Bank's communications specialist, was aimed at information dissemination about the project performance to the central and local authorities as well as the general public, not only in the city of Kiev but also in other parts of Ukraine. The use of the Bank loan for this purpose required an amendment of the legal agreements.

Due to a lack of time for adding additional energy efficiency measures, US\$ 2 million of the Bank loan funds was cancelled on March 7, 2005. It is expected that about US\$ 1 million of the Bank loan will be cancelled at the end of October 2005, when processing of the remaining disbursement applications is completed.

3.5 Quality at Entry:

There was no quality-at-entry review undertaken for this project, which had been prepared during 1997-98. Quality-at-entry of the energy efficiency measures and the institutional support program is judged as satisfactory, for the following reasons.

The component of energy efficiency improvements in public buildings was based on a sound feasibility study funded by a grant from the United States Department of Energy and the United States Agency for International Development and carried out by highly-qualified consultants, Pacific Northwest National Laboratory operated by Battelle, under the guidance of World Bank staff. The work of the consultants was extended to allow them to develop, together with the assistance of the Kiev Research and Design Institute for Residential and Civil Construction (KievZNIIEP) and the Agency for Rational Energy Use and Ecology (ARENA-ECO), a number of items allowing for quick project start-up, including (a) draft energy audit procedures; (b) typical designs for heat substations for buildings; and (c) procedures for measurement and verification of energy savings. Moreover, the early lessons of other infrastructure investment projects being carried out in Ukraine and other energy efficiency investment projects in Russia and Lithuania were taken into account. Last, but not least, in addition to considering the lessons of other projects in the project design, during the preparation phase of the project, a demonstration project was implemented by Honeywell in four typical school buildings in Kiev (school buildings represented about 30% of the buildings included in the project) with funding provided by the United States Department of Energy to determine the expected level of energy savings from selected energy efficiency measures as compared with the estimates in the

feasibility study. The demonstration project confirmed that the feasibility study estimates of savings were likely to be achieved and also helped to promote public awareness about the upcoming project.

The institutional support component was developed considering the capabilities of the implementing agency, the lack of experience in implementing this type of project in Ukraine and the consequent risks. The component included consultancy services, office equipment and a heavy emphasis on training in the early phase of the project to the PIU and assistance in establishing project management routines, finalizing energy auditing procedures, implementing a financial management system, and in procurement preparation including technical specifications and bidding documents. The Swedish Government, through its international development agency Sida, pledged support in the amount up to US\$ 2 million to cover the foreign consultancy requirements. This level of support was sufficient to allow for consultancy assistance during nearly the whole project period. The consultancy included qualified foreign experts in the fields of project management, energy efficiency in buildings, training and public awareness, international procurement, project financial management and disbursement.

The project was consistent with the Bank's CAS for Ukraine, which was discussed by the Board in May 1998, and which called for Bank support for the restructuring of Ukraine's public sector through more commercial practices based on cost-recovery tariffs and greater efficiency, leading to the possibility for private sector development. At the time of project preparation and appraisal, the DH and energy efficiency sector in Ukraine, like in many other former centrally-planned economies, was characterized by high inefficiencies in its buildings and DH systems layouts and operations, high costs, with primary energy inputs (such as gas and mazut) rapidly moving towards world market pricing. In the Soviet period, heat tariffs had been extremely low. When fuel inputs started to approach world market prices in the early 1990s, the Ukrainian Government and local governments made efforts to raise heat tariffs to recover rising costs, but generally fell short of full cost recovery. Consumers, whose incomes did not rise at the same pace, had increasing difficulties to pay and, in some cases, ceased to pay altogether, which increased receivables of the heating utilities significantly. This, compounded by the fact that further needed increases of heat tariffs started to meet political opposition, led to a deteriorating financial situation of the heating companies across Ukraine. Thus, remedial action was only possible through major rehabilitation of heating systems and buildings in order to reduce energy wastage and costs, while simultaneously helping municipalities to raise tariffs to cost recovery levels.

The project was built on an existing Government policy framework calling for cost-reflective tariffs at the municipal level, which, in Kiev, had moved during project preparation towards full recovery of the costs of heating services to ensure proper signals to energy consumers, thereby encouraging energy conservation. Maintenance of cost-recovery heat tariffs was a requirement under the complementary Bank-financed Kiev District Heating Improvement Project and was reinforced under this project. Proper billing and payment discipline was further supported under the Kiev District Heating Improvement Project which would provide heat meters to consumers and support billing of heat services based on meter readings instead of being based on norms. This project further supported improvement of payment discipline of heat bills through requirements to eliminate past arrears of heat bills and to ensure timely settlement of future heat bills by Kiev City. In addition, the Bank's new change initiative on reporting requirements and project accounting helped to strengthen financial management capabilities. The project also supported the Government's Comprehensive State Energy Conservation Program by piloting the reduction of heat consumption in public buildings in Kiev, where KCSA had the financial capacity to implement and co-finance the project.

Furthermore, the project supported the CAS objective of "promoting private sector activities" by encouraging the development of a local energy efficiency market and related service industry. It also followed the recommendation of the 1998 CAS Progress Report, specifically the requirement for

"preparation of only those investment loans capable of providing substantial benefits in an environment of economic uncertainty." Given that several Bank loans had not become effective in Ukraine, the Kiev Public Buildings Energy Efficiency Project, which was well prepared, was viewed as a "test case" to determine if the prior delays and problems could be overcome as a basis for proceeding with future projects.

4. Achievement of Objective and Outputs

4.1 Outcome/achievement of objective:

The overall achievement of the project objectives is judged to be satisfactory. The project has substantially met the key objectives of: (a) improving the energy efficiency of key public buildings in Kiev through a package of technical improvements and sound heat tariff policies; (b) encouraging the development of an energy efficiency market and related service industry, capable of supplying and installing energy efficiency projects in Kiev, with the potential to serve other areas of Ukraine in the future; and (c) promoting public awareness of the need for more efficient use of energy in Kiev.

Improvement of Energy Efficiency of Public Buildings: The heat savings of the public buildings included in the project attained 214,440 Gcal (normalized by degree days in base line year) by the end of 2004 or about 17% compared to the heat consumption of the buildings before the project. The installation of energy conservation measures in the project buildings intensified during the first half year of 2005, and it is expected that the heat savings stemming from the whole project will reach about 26% starting from 2006 and beyond when all the energy saving devices installed under the project will be exploited the whole year.

Heat tariffs for public buildings, along with heat tariffs for other heat consumers, were sufficient to allow the main heat utility, Kyivenergo, to cover O&M costs during the project period. Heat tariffs remained at the level of UAH 57.5/Gcal (on average about US\$ 10.7/Gcal) during 2000-04 but increased to UAH 64.73/Gcal (about US\$ 12.82/Gcal) at the beginning of 2005. Heat tariffs were lower than at appraisal due primarily to the substantial drop, shortly after project start-up, in fuel prices used to produce heat (i.e., from about US\$80/1,000 cubic meters for gas at the time of appraisal) by about 40-50% during the project period, and thus the value of heat savings is less than originally estimated. However, the ongoing gas price increases in Ukraine and the resulting expected future heat tariff increases will increase the value of saved energy under the project.

Development of an Energy Efficiency Market and Related Service Industry: The project had a direct impact in creating in Kiev an energy efficiency market which fostered the development of an energy efficiency service industry. In the early years of the project, only a few domestic energy efficiency suppliers were developed and qualified to participate in the bidding for the supply and installation contracts under the project. However, as time progressed, many more companies were established, some with foreign participation, which manufactured and/or assembled energy efficiency equipment in Ukraine and competed aggressively for the project contracts. In the end, nearly all of the energy efficiency measures were implemented by domestic companies, specifically out of 29 contracts for supply and install of energy efficiency measures implemented under the project there were 27 contracts signed with 13 local companies. In addition, technical audits and designs were carried out by domestic firms and design institutes, some of which were privatized during the project period. These companies are capable of providing services to other areas of Ukraine as well.

Promoting Public Awareness of the Need for More Efficient Use of Energy in Kiev: Promoting energy efficiency awareness was achieved through a variety of means. For one, energy savings materials were prepared for schools and incorporated modules in teaching programs for children. In addition, a media campaign in the form of videos shown on two local TV channels during the end of the heating season after

project benefits were achieved was undertaken to promote energy efficiency awareness. An enhanced public awareness campaign was further undertaken at the end of the project period, with assistance from the Bank, to better disseminate information about the project's success in Kiev as well as in other areas of Ukraine. As a result, the project has become well known by municipalities. A number of other cities in Ukraine have made requests for information about the energy efficiency measures implemented in Kiev and have expressed interest in undertaking similar energy saving projects.

4.2 Outputs by components:

Energy Efficiency Improvements in Buildings, including Heat Meters (Estimated cost at appraisal: US\$ 26.2 million; Actual cost: US\$ 20.51 million).

All 1,302 public buildings were expected to be equipped with heat meters and new heat substations in order to adequately measure and react to the various retrofit measures undertaken. Without new substations, energy saving measures would only result in overheating of the buildings. Additional energy saving measures were to be selected after individual building energy audits were undertaken on the basis of specific building needs and characteristics from among the remaining pre-selected retrofit measures. Other energy saving measures would be considered for inclusion during implementation if these additional measures were shown to be economically justified.

All 1,302 public buildings, as well as some additional buildings, were equipped with heat meters, which were financed by KCSA's own resources, as planned. The heat meters were installed in advance of heat substations in order to provide baseline information about energy consumption, with 981 heat meters installed by the time the first energy efficiency measures financed under the project were installed, i.e., the first 30 heat substations which were installed during 2001. The remaining heat meters were installed during 2001-04, as well as about 80 meters that replaced unsatisfactory meters installed prior to project commencement.

The number of public buildings which were retrofitted with heat substations varied somewhat from the target of 1,302, with 1,173 buildings retrofitted. During the technical audits, 129 buildings were identified as not suitable for modern heat substations because they were connected to small isolated DH systems where the temperature control was performed at the boiler plant, and thus there was no need for regulating equipment in those public buildings.

Regarding the other energy saving measures, radiator reflectors were installed in 940 buildings, as the remaining 362 buildings were not suitable for this measure because the radiator arrangements are such that a radiator reflector could not be installed. Weatherstripping was installed in 1,270 public buildings. The existing windows in the remaining buildings were in a poor physical condition, making the installation of weatherstripping technically infeasible. For some of these other buildings, KCSA proposed to replace windows in places where the application of weatherstripping was not possible, and the Bank supported the proposal. Due to time limitations, in the end, 3 buildings including 254 windows were fully retrofitted with new energy efficient windows.

After conducting 1,200 technical audits, it was determined that there was no scope for low-flow shower heads in hospitals as originally planned. Instead KCSA and the PIU proposed to purchase modern shower units for healthcare buildings, primarily maternity hospitals and general hospitals, and this was supported by the Bank. At project completion, 3,727 sets of modern shower units were installed.

KCSA and its PIU proposed other energy efficiency measures that were not on the pre-selected list of measures for inclusion in the project. The measures proposed were: (a) improved hot water control

equipment at substations installed in kindergartens so that they could fulfill the Ukrainian safety requirements which stipulate that the hot water temperature in kindergartens shall not exceed 37 °C; and (b) modernized shut-off valves and thermal insulation of the heating pipes in the heat substation rooms of 200 buildings, as these improvements would further reduce heat and water losses in the substations and lower maintenance costs of the substations. These proposals were also approved by the Bank. In total, 2,050 water mixers were installed in the kindergartens, and 400 modernized shut-off valves were installed in the heat substations.

Actual cost of this component is lower compared to the cost at appraisal because of a) cost savings stemming from a high competition among suppliers, and b) excluding from the actual cost the cost of meters installed before the project effectiveness (the cost at appraisal included the cost of meters installed by KCSA prior the project effectiveness, i.e., during the period second half 1990s - August 2000).

Technical Audits and Designs (Estimated cost at appraisal: US\$ 1.9 million; Actual cost: US\$ 1.44 million).

Technical audits of the project buildings were expected to yield the engineering estimates of the buildings' baseline energy consumption and confirm the most feasible energy efficiency retrofits to be undertaken. Following the technical audits, the necessary technical designs of the retrofit measures as well as the technical specifications and bidding documents for the competitive bidding of the supply and installation contracts to implement the retrofits were undertaken. The technical audits and detailed designs were carried out for 1,309 buildings in a satisfactory manner by about 25 Ukrainian energy audit companies and design institutes, employing a vast number of subcontractors.

Institutional Support (Estimated cost at appraisal: US\$ 2 million; Actual cost: US\$ 2 million).

The Swedish consultants (SWECO/Hifab), who started their work in January 2000, worked together with the PIU during the project period in a highly satisfactory manner. The consultants were particularly effective in advising on international procurement, financial management, monitoring and verification of energy savings, and in promoting public awareness about energy efficiency. The consultants provided a training program for PIU managers and staff and provided office equipment, computers and software, including the financial management and accounting software, as planned. Ten of the first technical energy audits were conducted with the assistance of the Swedish consultants in order to test and refine the audit procedures.

The Swedish consultants also assisted the PIU to develop a training program in energy conservation issues designed for building managers and district administration officers responsible for operation and management of the new equipment. Furthermore, a training program in Stockholm, Sweden was organized during October 2001 on energy efficiency measures and substation equipment for 4 PIU managers and staff and 2 managers from KCSA. In addition, it was arranged for the supplier (Honeywell, Ukraine) of one of the early contracts for heat substations to train 8 groups of up to 15 persons each, including technical specialists, during one week for each group in the operation and maintenance of energy savings equipment.

Financial Audits (Estimated cost at appraisal: US\$ 0.1 million; Actual cost: US\$ 0.12 million).

The auditing services for the incremental audit costs of the project were financed by the Bank loan for each year of the project period. In all, 6 audits were undertaken.

4.3 Net Present Value/Economic rate of return:

The economic re-evaluation proved that the investments under the project generate robust economic benefits with an economic net present value (ENPV) equal to US\$ 11.224 million and an economic internal rate of return (EIRR) of 26.6%. These results surpass the project economic benefits carried out at appraisal which estimated the ENPV at US\$ 6.2 million and the EIRR at 20.2%. Better economic performance is largely owned to increased economic value of natural gas driven by fuel market price hikes. At appraisal, the economic benefits were estimated to arise from (a) natural gas and mazut savings as a result of the energy efficiency measures and (b) increased consumer willingness-to-pay. Economic costs considered the project capital expenditures.

At the time of project completion, the benefits were revised to reflect the following circumstances: a) companies producing heat in Kyiv stopped to use mazut (that accounted for 15% in the fuel mix of heat producer at the time of appraisal) and switched entirely for the natural gas since it was less expensive; b) benefits associated with the increased willingness-to-pay (WTP) were not accounted because of no available information on how the project affected the WTP and time and budget constraints to conduct a WTP study in order to properly value this benefits. However, the project improved the level of service and therefore generated consumer surplus as it was expected at the time of appraisal; and c) development of the greenhouse gas (GHG) emissions market in recent years and strong prospects for its further growth through 2014 allowed for the inclusion of estimated monetized environmental benefits. The environmental benefits were evaluated at the time of appraisal, but no value was assigned because of absence of emission trade at that time. The cost category was also amended to include the additional O&M costs that arose as a result of the project. The details of the economic analysis are presented in the Annex 3.

The following table summarizes the variants of the economic results with and without environmental benefits that were computed in order to facilitate the comparison with the economic benefits evaluated at appraisal.

Economic benefits of the project re-evaluated at the time of project completion

With Environmental Benefits	ENPV = 11.224 million ERR = 26.6%
Without Environmental Benefits	ENPV = 8.985 million ERR = 23.5%

Quantification of the reduced atmospheric emissions in Kiev at project completion was made under somewhat different assumptions than at appraisal, mainly because heat supply in Kiev during project implementation was generated, and likely to be generated thereafter, almost exclusively from natural gas, whereas, at the time of appraisal, it was assumed that 15% of heat would be produced from mazut and 85% from natural gas. The heat supplying companies, Kyivenergo and UkrCanPower, switched to gas because of the significantly lower price of gas as compared to mazut. The project achieved an annual reduction of CO₂ emissions of 110,108 tons, as a result of reduced consumption of natural gas in district heating plants for the same service levels. The environmental benefits from reduction of CO₂ emissions were calculated based on the very conservative price of US\$ 5/ton of CO₂ emissions, as currently applied by the World Bank Carbon Fund.

Additional non-quantifiable project economic benefits resulted from the positive impacts on health, productivity and education of the public building users stemming from the improvement of the heating service levels in public buildings and from the generation of technical employment for the design, fabrication and installation of project equipment.

4.4 Financial rate of return:

Project Financial Rate of Return. The financial benefits of the project were re-evaluated at the time of the ICR and found satisfactory with an estimated financial net present value (FNPV) of US\$ 1.7 million and a financial internal rate of return (FIRR) of 11.9% at the discount rate of 10%. The results were somewhat less than those estimated at appraisal, at which time the FNPV was estimated at US\$ 3.7 million and the FIRR at 13.1%.

The difference in results is mainly due to the decreased value of monetized energy savings because of lower-than-expected heat tariffs (in US dollar terms) that were in effect during project implementation. The tariffs were lower than expected at appraisal, because the price of natural gas for the heat supplying companies almost halved shortly after project start-up from about US\$ 80/1,000 cubic meters at the time of appraisal to about US\$ 40/1,000 cubic meters during project implementation, thereby requiring substantially lower tariffs to cover costs. It is, however, anticipated that the ongoing worldwide energy price increases will lead to higher gas prices in Ukraine in the near term which will, in turn, require higher heat tariffs, as heat in Kiev is produced almost exclusively from gas and the fuel share in the production cost is in the range of 70-80%. As long as gas prices and corresponding heat tariff increase happen, the FNPV and FIRR would be expected to increase.

Moreover, the difference in results can be attributed to an increase in the financial costs that arose from the need for the district administrations in Kiev to enter into separate contracts with qualified service companies capable of properly operating and maintaining the new, specialized heat substation equipment. These additional costs were not foreseen at appraisal or considered in the appraisal estimates.

On the other hand, project capital costs were lower than estimated at appraisal for several of the energy saving assets on a per unit basis, due to the keen competition among suppliers participating in the project tenders. However, the reduced monetized value of the heat savings and the additional operating and maintenance (O&M) expenses overweighed the benefits stemming from the reduced capital expenditures, leading to a somewhat reduced financial performance of the project as compared to the evaluation at appraisal. If the additional O&M expenses are excluded from this analysis in order to make the comparison with the expected financial performance at appraisal on a consistent basis, the financial performance of the project would have been better than at appraisal, specifically the FNPV would have grown to US\$ 4.2 million and the FIRR to 14.9%. The details of the analysis are presented in Annex 3.

Kiev City Cash Flow Analysis. Moreover, a cash flow analysis for Kiev City was computed at project completion and compared with the analysis carried out at appraisal. The cash flow analysis shows that, under conservative assumptions about the financial savings stemming from the energy efficiency measures and the interest rate that would be applied to the World Bank loan during the remainder of the repayment period, Kiev City and its district administrations would generate sufficient savings on heat bills to cover the annual debt service requirements over a 7-year period after project implementation and the annual operating and maintenance costs. The details of the analysis are presented in Annex 3.

4.5 Institutional development impact:

The project has had a significant institutional development impact in KCSA. The project emphasized the need for full payment discipline and cost recovery tariffs, so that the energy savings from the project investments could be translated into real financial savings. KCSA largely supported these principles. KCSA has regulated heat tariffs for the heating utilities operating within the municipality at levels that allowed the heating companies to recover O&M costs over the project period. The arrears of heat (and other utility) bills by KCSA and its organizations were fully eliminated at project start-up, and KCSA and

its district administrations have maintained full payment performance of heating bills, usually with even some advance payments of heating bills, throughout the project period. KCSA's performance in this regard was truly outstanding in the Ukrainian context and an excellent example for other cities in the country. The project has also increased the awareness of the need for proper arrangements for O&M of the modern energy efficiency equipment, which was of a poor quality prior to the project. KCSA has taken the necessary steps to ensure adequate arrangements for O&M by transferring the heat meters to the ownership of the heating utility, Kievenergo, and the heat substations to the ownership of KCSA's district administrations which are conducting competitive tenders with qualified service companies to ensure proper O&M of the modernized equipment. This performance is expected to continue after project completion. The use of international procurement procedures under the project has also demonstrated the merits of competitive bidding which have now become required practice within KCSA and in the public sector at large.

The PIU was created for the purposes of carrying out the project, and KCSA has decided to maintain the PIU after project completion, when it will be available to continue to monitor the performance of the modernized energy efficiency equipment and thus ensure the intended benefits. Since the PIU was transformed from a municipal budgetary organization into a municipal enterprise during the latter part of the project period, it can also act as a consultant to KCSA in public procurement and/or to other organizations wishing to hire the PIU for similar energy efficiency consulting activities, should demand materialize.

The project has served as a pilot project for other Ukrainian cities with DH systems providing heat to public buildings experiencing huge heat losses and lacking the possibility to regulate heat consumption. The project has demonstrated the institutional and other arrangements and issues that need to be addressed in subsequent projects. As mentioned before, many cities in Ukraine have already expressed interest in undertaking similar energy efficiency projects as a result of the increased awareness of the level of energy savings that can be achieved.

The project has had a wider impact in the country by helping to develop a local, energy efficiency service market capable of competing for contracts for the technical audits of buildings and designs of energy savings equipment and also for energy efficiency equipment supply and installation contracts. At the time of the project appraisal, the market was at an early stage of development and it was assumed that most of the energy saving equipment, including modern heat substations, would need to be supplied from abroad. In the end, the majority of the equipment was supplied by local companies. These companies are continuing to serve customers across Ukraine that seek to improve the energy efficiency of buildings. The Ukrainian energy audit companies and design institutes further developed their capabilities to undertake technical audits of buildings, and this expertise is also expected to be utilized as more cities and agencies seek to improve the energy efficiency of their buildings.

5. Major Factors Affecting Implementation and Outcome

5.1 Factors outside the control of government or implementing agency:

Two factors outside of the control of the government or implementing agency affected performance of the project and the benefits of the building retrofits. One factor was concerned with the commissioning and testing of heat substations which required the issuance of operational acceptance certificates from the relevant heat supply utility (Kievenergo or UkrCanPower) as well as by the state energy inspection agency. In the early years of the project, the operational certificates were not issued in a timely manner. As a result, the completed heat substations could not be transferred to the building owners for ensuring proper operation and maintenance arrangements, and completion of the supply and installation contracts for

substations was held up as the final payment of 10% could not be made until the operational certificates were received. KCSA, its PIU and district administrations held meetings with these agencies in order to speed up the process and some improvement was achieved, but issuance of the required certificates continued at a slower pace than desired throughout the project period. By the end of the project period, all the required operational certificates were received.

Once the first batch of heat substations became operational, Kievenergo undersupplied heat to the new heat substations by installing smaller orifices to limit the flow rate of the district heating water and was not supplying district heating water with temperature levels that met the design temperature levels. As a result, the public buildings were not receiving sufficient heat. All the new heat substations would have operated properly if the flow rate had not been restricted. The inadequate supply of heat created a poor image for the project equipment initially. Again, KCSA, its PIU and district administrations held meetings with Kievenergo in order to resolve the problem. While larger orifices were ultimately installed, the level of heat received by the retrofitted public buildings could be further improved if the orifices were removed altogether, as is the practice in Western European district heating systems.

5.2 Factors generally subject to government control:

Two major factors under government control adversely affected the timeliness of project implementation, but these factors had a limited impact on the final project outcome. Specifically, these factors were concerned with: (a) the establishment and functioning of the special account; and (b) government regulations which required changing the status of the PIU from a municipal budgetary organization to a communal enterprise.

The special account was set up by the Ministry of Finance only 10 months after loan effectiveness, and this slowed down project implementation in the early phase, because the PIU could not process payments in a timely manner for the initial contracts which were of a small value. Later on, at a critical phase in the final year of the project when a number of small payments to contractors were required, the special account became idle because of problems with the Ukrainian bank participating in the special account scheme and responsible for converting US\$ from the loan into local currency. This led to a freeze on disbursements from the special account. The Ministry of Finance could not promptly resolve this issue, and the World Bank had to agree to conduct the remaining payments through the direct payment mechanism in order to release KCSA from the need to finance these payments that were supposed to be financed from the Bank loan under the special account arrangement from its own budget. The inability of KCSA and its PIU to process payments in a timely manner from the special account also led to a delay in submitting the annual audit report for 2002 and 2004 to the Bank, because the auditors refused to finalize the audit when payment had not been received for past audit work.

In early 2004, the State Treasury required that the status of the PIU be changed from a municipal budgetary organization to a communal enterprise, because the PIU was viewed as a revenue generating entity, earning revenue from the sale of bidding documents under the project. The status change took almost 8 months, during which time project implementation was nearly stopped because the PIU did not have a bank account and therefore could not channel KSCA funds for co-financing the project contracts and the 2003 audit contract. Most importantly, salaries of PIU personnel could not be paid, but the personnel continued to work thus preventing total disruption of project implementation. The establishment of the PIU in a form of a communal enterprise was completed in August 2004 and implementation resumed at that time. This slow down in project activity made it impossible for KCSA and its PIU to fully utilize the realized cost savings prior to the loan closing date. As a result, US\$ 2 million of the loan proceeds were cancelled in March 2005 and about another US\$ 1 million is expected to be cancelled upon completing the last disbursement at the end of October 2005.

5.3 Factors generally subject to implementing agency control:

There were no major factors subject to implementing agency control that adversely affected the performance or outcome of the project. KCSA and its PIU exhibited a high level of commitment to the project throughout the implementation period. A high-level Coordinating Committee was established within KCSA to oversee the work of the PIU and to address project issues affecting the various district administrations and city departments (health, education and culture). Project issues were raised in a timely manner, and Kiev City officials sought early resolution through meetings and city resolutions. Staff and managers were highly qualified and successfully coped with the complex logistical tasks involved in implementing energy efficiency measures in more than a thousand buildings located in 10 districts. The capacity of the PIU was strengthened throughout the project through the technical assistance provided by the Swedish Government and executed by the Swedish consultant team, and this also contributed to the successful completion of the project.

5.4 Costs and financing:

The total project cost is currently estimated at US\$ 24.25 million (excluding the cost of the heat meters of US\$ 3.2 million installed in project buildings before the project effectiveness) as compared with the appraisal estimate of US\$30.4 million (including the cost of the heat meters installed in project buildings before the project effectiveness). The costs have not been constraints to project implementation because all of the three project financing sources (Bank Loan, Swedish Government grant, and KCSA funds) were fully sufficient for implementing the contracts envisaged under the project. Furthermore, a high competition among bidders led to lower than expected prices for a sizable portion of contracts financed from the Bank loan. As a result, US\$ 2 million of the Bank loan proceeds were cancelled at the time when it became evident that that amount was no longer needed for financing the envisaged project components and could not be used for financing additional activities because of time constraints. A further balance of about US\$ 1 million of the loan proceeds is expected to be cancelled once the final disbursement application has been received and the loan account closed. While the flow of funds through the special account led to delays, ultimately this did not affect the ability of the implementing agency to complete the majority of the project investments by the original loan closing date.

6. Sustainability

6.1 Rationale for sustainability rating:

The project sustainability is rated as highly likely. The energy savings have resulted in lower heating bills for Kiev City's district administrations, the owners of the retrofitted public buildings. In order to continue to achieve the benefit of lower heating bills, the buildings owners have assumed the responsibility and taken appropriate steps for ensuring the proper functioning and maintenance of the key energy saving equipment (i.e., heat substations and heat meters) in the future. Arrangements for continued monitoring of the energy savings have already been put in place by KCSA through the retention of selected staff in the PIU to monitor that the benefits are continuing to be achieved. The project benefits are expected to be further enhanced as a result of KCSA's plan to rehabilitate the internal heating networks in the public buildings retrofitted under the project, as this should further reduce heat consumption of the buildings and increase heat savings correspondingly. As gas prices are expected to increase in the near future which would require higher heating tariffs, the value of saved energy in the public buildings would increase and thus provide an even greater incentive for building owners to properly maintain their building energy savings equipment for the continuation of the benefits. KCSA has been paying all heating bills of public buildings paid on time throughout the project implementation, and this performance is expected to continue in the future, thereby ensuring that real financial savings will be achieved.

6.2 Transition arrangement to regular operations:

The energy saving assets created under the project have already been integrated into regular operation and

thus transition arrangements are not required. The equipment installed and commissioned under the project has been fully transferred during implementation to the district administrations which are the owners of the buildings retrofitted under the project. The buildings owners have also already made arrangements for ensuring the proper functioning and maintenance of the equipment by entering into contracts with qualified service companies. The operation and servicing of the energy saving equipment beyond the loan closing date will be carefully monitored by KCSA through its PIU.

7. Bank and Borrower Performance

Bank

7.1 Lending:

The Bank's lending performance is rated as satisfactory. The preparation and appraisal teams were appropriately staffed and competent. The Bank team was well equipped with early experiences from the implementation of other energy efficiency projects in the region and also from the implementation of other energy infrastructure investment projects in Ukraine so that the lessons learned from those experiences could be built into the project design. The Bank team insisted on a simple project design focusing on public buildings owned by Kiev City where ownership and commitment levels were high, despite repeated attempts by some officials to include other central government ministries (health, education and culture) which were, in the Bank team's view, judged high risk due to their perceived inability to contribute counterpart funds to the project and to their lower commitment to the project objectives. Given the limited experience in implementing energy efficiency projects up-to-then in the region by international financial institutions and the limited success of such projects, the Bank team required sound feasibility studies undertaken with the assistance of competent consultants working together with Ukrainian design institutes and non-governmental organizations along with a demonstration project in order to provide a solid basis for the project. The Bank team undertook appropriate coordination with donors and Ukrainian counterparts and helped to raise the funding for the feasibility studies. The project was identified in line with the Bank's Country Assistance Strategy and with the Government's Comprehensive State Energy Conservation Program. The project investment activities were linked with specific policy reform measures regarding tariffs and payment discipline in connection with the implementing agency.

7.2 Supervision:

The Bank's supervision performance is rated as satisfactory. The fact that the Bank team did not change significantly over time and continued to be managed by the same task manager from identification almost until completion was very beneficial for the project and its implementation. Furthermore, the Bank's Kiev Office was very helpful to support the dialogue, arrange for missions and meetings and ably follow-up on specific issues, such as financial management and audit issues. The project was regularly supervised 2-3 times per year with competent staff, and visiting missions made it a special point to meet with representatives of the central Government (Ministries of Finance and Economy) to brief them on overall project performance and issues requiring follow-up actions. The Bank team demonstrated a productive combination of flexibility in accommodating the Borrower's requests to make amendments in the project in response to project needs and firmness in ensuring a timely completion of the project and achievement of its objectives. Moreover, the team consistently supported the PIU in areas beyond the PIU's authority by raising project matters with KCSA officials, Ukrainian authorities and relevant Bank departments. The Bank team also properly coordinated with the Swedish Government, which was providing a substantial grant in support of project implementation, as well as with other concerned donors and international financial institutions interested in the project results and outcomes.

7.3 Overall Bank performance:

In light of the above, the overall performance of the Bank is assessed as satisfactory.

Borrower

7.4 Preparation:

The project was prepared by an appropriately-staffed team from the State Committee for Energy Conservation assisted by competent consultants funded by the United States Government in conjunction with Ukrainian design institutes and non-governmental organizations with advice from the Bank team. The project design adequately considered the views of the various concerned agencies within Ukraine as well as the advice of the qualified consultant team. As implementation of the Government's Comprehensive State Energy Conservation Program approved in 1996 was hampered due to a lack of investment funds, there was a strong motivation on the part of the State Committee for Energy Conservation to set common goals for the project and to move forward as quickly and effectively as possible in order to begin the process of undertaking energy efficiency investments.

When it became clear that Kiev City would be the key implementing agency for the project, it quickly demonstrated a high level of commitment and responsibility during project preparation by: (a) appointing a highly-qualified PIU Director and team as well as counterparts within KCSA to work with the Bank team in finalizing the arrangements for the project; (b) adjusting heat tariffs to cost recovery levels in Kiev in 1997, prior to project start-up; (c) resolving the majority of past heating debts of KCSA and its organizations in the amount of UAH 182 million, as well as other utility debts, that had accumulated prior to January 1, 1998, well in advance of the expected Bank loan conditionality; (d) starting to pay new heat bills received during 1998 and 1999 in a timely manner so that there was no further accumulation of debts; and (e) commencing the installation of heat meters prior to project start-up in public buildings that would be included in the project. Overall, the performance of the Borrower during preparation is rated as satisfactory.

7.5 Government implementation performance:

The Government's performance during implementation was generally satisfactory, despite the shortcomings within the Ministry of Finance for allowing timely disbursement of the Bank loan funds and other government bureaucratic procedures and requirements which slowed down implementation. The Government ministries and its energy conservation agencies were actively involved in monitoring the performance of the project which was carried out by KCSA and its PIU, with assistance from Swedish consultants. All parties were committed to ensuring that the project objectives would be achieved and project benefits would materialize.

7.6 Implementing Agency:

The performance of KCSA and its PIU is rated as highly satisfactory. KCSA established an effective mechanism at project commencement in the form of a Committee headed by the First Deputy Mayor to coordinate and resolve issues among the PIU, the various city departments (health, education, and culture) and district administrations. KCSA provided sufficient funds in a timely manner to co-finance the project. KCSA's management proved helpful in facilitating communication and cooperation among suppliers of heat substations, heating utilities, and the energy inspection agency in order to remove barriers and improve the timeliness of commissioning and testing of the heat substations and the operation of the energy efficiency equipment. Continuing delays with commissioning heat substations would have badly affected project performance, since the energy savings were stemming primarily from heat substations. KCSA took actions to ensure that heating bills would be paid by its district administrations and other budgetary organizations on time, even with advance payments in most periods, to the heating utilities. This is judged as an outstanding performance in Ukraine at its stage of economic development.

The PIU was effectively managed and staffed with well-qualified professionals. Most importantly, it demonstrated high commitment to the project objectives throughout the project life. The professional level

and commitment of PIU staff greatly helped to overcome technical, logistical and financial issues arising during implementation. The high level of commitment of PIU staff was clearly demonstrated during 2004 when the PIU's legal structure was being transformed into a municipal enterprise and the PIU's bank accounts were frozen and staff salaries could not be paid for 8 months. The PIU staff continued to work during this period even without remuneration. The PIU performance was significantly strengthened by the technical assistance and training provided by the Swedish Government and carried out by its consultants in the areas of procurement and financial management. This also contributed to the successful completion of the project.

7.7 Overall Borrower performance:

Based on the above, the overall performance of the Borrower is assessed as satisfactory.

8. Lessons Learned

Strong Project Ownership and Commitment to Results

Strong project ownership and commitment to results, along with highly qualified management and staff, by KCSA and its PIU, were critical success factors for this project. Such ownership and commitment have partially mitigated the adverse impacts of the government bureaucratic requirements which led to project delays and the less-than-fully adequate cooperation by outside agencies. KCSA has established a high bar for other Ukrainian cities in the management of its energy efficiency activities, including its exemplary performance in heat bill payment discipline and resolution of utility bill arrears. KCSA and its PIU have created an outstanding example for how future similar projects in the country could be carried out.

Simplified Project Design

The project design was simplified in order to minimize project risks and improve the chances for a successful outcome in the Ukrainian context which had been shown as quite difficult for allowing speedy processing and implementation of prior projects. This simplified approach has contributed to allowing the project to be completed on schedule and within budget, a significant achievement in the Ukrainian context. This approach has further helped to identify the factors for success which can now be utilized in other similar projects in Ukraine. Despite the simplified approach, the project was not immune to difficulties, unforeseen at the time of appraisal, which delayed implementation. An example was the requirement to transform the PIU's legal status to a municipal enterprise during the critical next to last year of implementation and this threatened to interfere with timely completion of project components. In the end, the project was completed within the original time frame, but with about US\$ 3 million of the Bank loan unutilized (thanks to high competition among bidders and resulting from that cost savings) which might otherwise have been fully utilized if such requirement had not arisen. Thus, the lesson learned is to keep the project design as simple and straightforward as possible and allow a cushion in the timetable for unforeseen circumstances that may arise as a result of changing government processes or requirements.

Coordination with Other Agencies

The project required cooperation with a number of other agencies, including the main heating utility in Kiev, for ensuring the speedy commissioning and successful operation of heat substations, but the cooperation was less than optimal. Thus, it is recommended that the project design not only consider the agency requirements for project implementation, but also consider those that will arise during the early operational period of the newly created assets. While the problems encountered under this project were not

foreseen at the time of appraisal, future infrastructure investment projects should try to identify in advance the agencies that are on the critical path to necessary approvals or those which will have some impact on the operation of project investments and seek the necessary agreements and understandings with them in advance of project start-up.

Streamlined Special Account and Disbursement Arrangements

Disbursement arrangements for investment projects in Ukraine have been shown to slow down project implementation and therefore urgently need to be improved. In addition to delays in establishing the special account at the beginning of the project and in resolving the special account issues at the end of the project, processing of disbursement applications by the Ministry of Finance was rather slow throughout the project period for both direct and special account payments. This unfairly put pressure on the PIU for responding to claims of suppliers that were not paid on time according to their contracts and created unnecessary stress over whether the project would be completed on time. Therefore, there is a need to streamline procedures at Ministry of Finance for processing disbursement applications under the Bank-financed projects. The disbursement arrangement should be redesigned in a way that would minimize risks associated with the local bureaucracy. Sharing relevant best practice from neighboring countries with the Ministry of Finance of Ukraine may be helpful for making the processing of the disbursement applications more effective and timely.

Flexibility and Adaptation to Changes in the Project Environment

Flexibility and adaptation to changes in the project environment helped the Bank and the implementing agency overcome impediments, improve the project implementing arrangements and achieve the project development objectives in a more effective way. The Bank's flexible approach to the implementing agency's request to revise the energy efficiency measures to address the current infrastructure situation, adjust the procurement procedures, and amend the legal agreements in response to changes in the project environment have helped to preserve and enhance the project benefits and development impacts.

Importance of Monitoring the Operation of Project Equipment for Ensuring Project Benefits

Properly maintained and operating heat substations and energy measuring equipment is essential for ensuring that energy savings will be continued in the future. KCSA has acknowledged the importance of monitoring to ensure that meters are properly functioning so that heat bills will be based on meter readings rather than on consumption norms and that heat substations will continue to generate energy savings in the public buildings. In this regard, it will continue to utilize its PIU after project completion to ensure proper monitoring of the project energy saving assets and to take the necessary corrective actions as problems arise. In addition, KCSA has required that its district administrations enter into contracts with competent energy service companies to ensure the proper operation and maintenance of the installed equipment. Future energy efficiency projects should include arrangements for monitoring the operation of project equipment and benefits achieved not only during project implementation but also after its completion.

Consideration of the Stage of Development of the Heating Utilities

When it was time to operate the new heat substations in the project public buildings, there were problems to receive adequate heat because the main heat supplier in Kiev, Kievenoenergo, restricted the flow rate and undersupplied heat to the new heat substations by not supplying district heating water with temperature levels that met the design temperature levels. Rationing of heat supply is commonplace in the countries of the former USSR, partly due to the poor payment performance of heating consumers which in turns limits

the ability of the heating utilities to purchase sufficient fuel supplies. Thus, it is important to consider the stage of development of the heating companies and their ability to provide adequate heat supply to the public buildings so that the new heat substation equipment can achieve the full benefits intended.

9. Partner Comments

(a) Borrower/implementing agency:

1. Comments received from Kyiv City State Administration

"Kyiv city state administration has carefully reviewed draft Implementation Completion Report of the World Bank on Kiev Public Buildings Energy Efficiency Project.

We would like to inform you that in general we agree with all stated in the Project ICR. We also would like to express our gratitude to you for productive cooperation during the execution of the above mentioned project and for high evaluation of work of all Kyiv city state administration divisions during its implementation."

2. Comments received from Ministry of Finance

"The Ministry of Finance has reviewed with interest draft ICR on Kiev Public Buildings Energy Efficiency Project. Ministry of Finance supported the project throughout the implementation period and contributed to its timely completion. A draft order "On organization of the work of the Ministry of Finance concerning initiation, preparation and implementation of projects common with International Financial Organizations" was developed in order to simplify processing of withdrawal applications for projects financing, which determines the scheme of payment documents flow within the Ministry.

The Ministry of Finance hopes that positive experience of energy saving measures introduction, which were implemented during this project can be used in the future by other Ukrainian cities."

3. Comments received from Ministry of Economy

"The Ministry of Economy expresses its sincere gratitude for the support of Ukrainian Government's measures on energy sector reform and energy efficiency development in Ukraine through implementation of the World Bank Investment Projects in these directions.

Ministry of Economy has received a report, prepared by the World Bank experts on completion of one of the projects in mentioned direction; this project was designed for the purpose of improvement of energy efficiency in schools, hospitals, kindergartens and administrative and public buildings in Kyiv, development of stable mechanisms for energy efficiency programs implementation.

A special appreciation deserves the suggestion of the World Bank to provide comments on this report by the Ministry which is coordinating from the Ukrainian Government's side cooperation with international financial organizations.

Considering the fact that at the beginning of project implementation it was defined as a pilot for other Ukrainian cities with district I heating systems ensuring heat provision to administrative and public buildings that suffer from huge heat losses and lack of heat regulation equipment, the successful implementation of this project is of special importance for Ukraine.

From the Ministry of Economy's point of view the report contains full information regarding achievement of project objectives as well as detailed description of outcomes on each project component. In addition, the report clearly describes problematic issues which have appeared during project implementation and, unfortunately, caused cancellation of a portion of loan amount. It would be also desirable, from the point of view of Ministry of Economy, to include into this report recommendations of the World Bank experts regarding measures to be taken by Ukrainian side for preventing similar issues in the future.

We would also like to inform you that Kyiv city state administration, as a responsible project executor, is preparing its own version of the project completion that will be provided to the Ministry of Economy for review and then will be approved by the Cabinet of Ministers of Ukraine."

(b) Cofinanciers:

Although specific comments of the SIDA were have not been received for this ICR, the Agency and the project consultant SWECO at several occasions expressed their satisfaction with the project and cooperation with the Bank team.

(c) Other partners (NGOs/private sector):

10. Additional Information

Annex 1. Key Performance Indicators/Log Frame Matrix

Outcome / Impact Indicators:

Indicator/Matrix	Projected in last PSR ¹	Actual/Latest Estimate
Heat savings (Gcal) (during previous year)	298,077	333,423

Output Indicators:

Indicator/Matrix	Projected in last PSR ¹	Actual/Latest Estimate
Number of buildings retrofitted	1,302	1302 with heat meters 1270 with weather stripping 1173 with heat substations 940 with radiator reflectors 260 with 37 C water mixers 200 with shut-off valves 14 with shower units 3 with new windows
Square meters retrofitted	5,060,327	> 5,060,327
Heat tariff (US\$/Gcal)	16.19	12.82

¹ End of project

Annex 2. Project Costs and Financing

Project Costs by Procurement Arrangements (Appraisal Estimate) (US\$ million equivalent)

Expenditure Category	ICB	Procurement Method ¹		N.B.F.	Total Cost
		NCB	Other ²		
1. Works	0.00 (0.00)	1.30 (1.10)	0.00 (0.00)	0.00 (0.00)	1.30 (1.10)
2. Goods	4.90 (4.00)	0.00 (0.00)	1.20 (1.00)	0.00 (0.00)	6.10 (5.00)
3. Services	0.00 (0.00)	0.00 (0.00)	0.10 (0.10)	4.00 (0.00)	4.10 (0.10)
4. Supply and Installation	14.40 (11.90)	0.00 (0.00)	0.00 (0.00)	4.30 (0.00)	18.70 (11.90)
Front-end Fee	0.00 (0.18)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.18)
Total	19.30 (16.08)	1.30 (1.10)	1.30 (1.10)	8.30 (0.00)	30.20 (18.28)

Project Costs by Procurement Arrangements (Actual/Latest Estimate) (US\$ million equivalent)

Expenditure Category	ICB	Procurement Method ¹		N.B.F.	Total Cost
		NCB	Other ²		
1. Works	0.00 (0.00)	0.54 (0.45)	0.00 (0.00)	1.50 (0.00)	2.04 (0.45)
2. Goods	0.00 (0.00)	0.00 (0.00)	0.29 (0.24)	1.52 (0.00)	1.81 (0.24)
3. Services	0.00 (0.00)	0.00 (0.00)	0.13 (0.11)	3.20 (0.00)	3.33 (0.11)
4. Supply and Installation	17.07 (14.20)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	17.07 (14.20)
Front-end Fee	0.00 (0.18)	0.00 (0.00)	0.00 (0.00)	0.00 (0.00)	0.00 (0.18)
Total	17.07 (14.38)	0.54 (0.45)	0.42 (0.35)	6.22 (0.00)	24.25 (15.18)

N. F. B. does not include the cost of heat meters installed by the Kyiv City State Administration prior to the project effectiveness (i.e. during the period second half of 1990s - August 2000).

^{1/} Figures in parenthesis are the amounts to be financed by the Bank Loan. All costs include contingencies.

^{2/} Includes civil works and goods to be procured through national shopping, consulting services, services of contracted staff of the project management office, training, technical assistance services, and incremental operating costs related to (i) managing the project, and (ii) re-lending project funds to local government units.

Project Financing by Component (in US\$ million equivalent)

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Component	Appraisal Estimate			Actual/Latest Estimate			Percentage of Appraisal		
	Bank	Govt.	CoF.	Bank	Govt.	CoF.	Bank	Govt.	CoF.
1. Energy efficiency measures	18.00	0.57	0.00	14.89	0.58	0.00	82.7	101.8	0.0
2. Heat meters*	0.00	3.92	0.00	0.00	1.31	0.00	0.0	33.4	0.0
3. Technical design	0.00	1.33	0.00	0.00	1.20	0.00	0.0	90.2	0.0
4. Institutional support	0.00	0.00	2.00	0.00	0.00	2.00	0.0	0.0	100.0
5. Financial audits and services	0.10	0.00	0.00	0.11	0.00	0.00	110.0	0.0	0.0
6. Taxes and duties	0.00	4.10	0.00	0.00	3.98	0.00	0.0	97.1	0.0
7. Front-end Fee	0.18	0.00	0.00	0.18	0.00	0.00	100.0	0.0	0.0

*The Appraisal Estimate number reflects the the cost of heat meters installed by the Kyiv City State Administration prior to the project effectiveness. The Actual Estimate number excludes this cost (US\$ 3.2 million) for consistency with the project costs used in the ICR economic and financial analysis. Had the cost of the heat meters installed prior to the project effectiveness been included, the Actual Estimate number would have increased to US\$ 4.51 million and Percentage of Appraisal - to 115%.

Annex 3. Economic Costs and Benefits

The economic re-evaluation proved that the investments under the project generate robust economic benefits with an economic net present value (ENPV) equal to US\$ 11.224 million and an economic internal rate of return (EIRR) of 26.6%. These results surpass the project economic benefits carried out at appraisal which estimated the ENPV at US\$ 6.2 million and the EIRR at 20.2%. Better economic results are largely owned to increased economic value of natural gas driven by fuel market price hikes.

At appraisal, the economic benefits were estimated to arise from (a) natural gas and mazut savings as a result of the energy efficiency measures and (b) increased consumer willingness-to-pay. At the time of project completion, the benefits were revised to reflect the following circumstances:

- Companies producing heat in Kyiv stopped using mazut (that accounted for 15% in the fuel mix of heat producer at the time of appraisal) and switched entirely for the natural gas since it was less expensive;
- The benefits associated with the increased willingness-to-pay (WTP) were not accounted because of no available information on how the project affected the WTP and time and budget constraints to conduct a WTP study in order to properly value this benefits. However, the project improved the level of service and therefore generated consumer surplus as it was expected at the time of appraisal; and
- The development of the greenhouse gas (GHG) emissions market in recent years and strong prospects for its further growth through 2014 allowed for the inclusion of estimated environmental benefits. The environmental benefits were evaluated at the time of appraisal, but no value was assigned because of absence of emission trade at that time.

The economic costs at appraisal considered only the project capital expenditures. At completion, the costs were amended by including the additional O&M costs that arose as a result of the project.

The following provides the economic results with and without environmental benefits that were computed in order to facilitate the comparison with the economic benefits evaluated at appraisal.

Variant # 1. With Environmental Benefits* (US\$ million, 1999 prices)

	ENPV
Benefits (+)	
• Natural Gas Savings	23.817
• Environmental Benefit	2.240
Cost (-)	14.833
Project Indicators	
• NPV (10%)	11.224
• ERR	26.6%

Variant # 2. Without Environmental Benefits (US\$ million, 1999 prices)

	ENPV
Benefits (+)	
• Natural Gas Savings	23.817
Cost (-)	14.833
Project Indicators	
• NPV (10%)	8.985
• ERR	23.5%

*The environmental benefit from reduction of CO² emissions was calculated based on the conservative price of US\$ 5/ton of CO² emissions, as currently applied by the World Bank Carbon Fund.

The cost item in the above tables reflects all the project-related costs incurred after project effectiveness. The cost of heat meters installed before that date is not taken into account for the purpose of the economic and financial analysis, because the benefits associated with the heat meters installed before project effectiveness had been realized by that date and could not be accounted in the project. The benefits were stemming from reduced heat bills based on metered consumption versus bills based on consumption norms.

The following table provides fuel price and other data as well as other parameters used for calculating ENPV and EIRR

Fuel Prices and Calculation Parameters

	Unit	2000	2005	2010	2014
Constant 1999 Prices					
Natural Gas Economic Price*	US\$/1000m ³	86	86	86	86
Memorandum Items					
Heat Generation Efficiency	%	88%	88%	88%	88%
DH Network Efficiency	%	80%	80%	80%	80%
Natural Gas Fuel Share	%	100%	100%	100%	100%
Mazut Fuel Share	%	0.0%	0.0%	0.0%	0.0%
Energy Content of Natural Gas (Ukraine)	Kcal/m ³	7,988	8,026	8,013	8,013
Conversion Standard Tons to Gcal	Gcal/t.c.e.	7	7	7	7

* Conservative estimate at consumer point

Financial Costs and Benefits

The financial benefits of the project were re-evaluated at the time of the ICR and found satisfactory with an estimated financial net present value (FNPV) of US\$ 1.6 million and a financial internal rate of return (FIRR) of 11.8%. The results were somewhat less than those estimated at appraisal, at which time the FNPV was estimated at US\$ 3.7 million and the FIRR at 13.1%.

The difference in results is mainly due to the decreased value of monetized energy savings because of lower-than-expected heat tariffs (in US dollar terms) that were in effect during project implementation. The tariffs were lower than expected at appraisal, because the price of natural gas for the heat supplying

companies almost halved shortly after project start-up from about US\$ 80/1,000 cubic meters at the time of appraisal to about US\$ 40/1,000 cubic meters during project implementation, thereby requiring substantially lower tariffs to cover costs. It is, however, anticipated that the ongoing worldwide energy price increases will lead to higher gas prices in Ukraine in the near term which will, in turn, require higher heat tariffs, as heat in Kiev is produced almost exclusively from gas and the fuel share in the production cost is in the range of 70-80%. At such time that higher gas prices materialize, the FNPV and FIRR would be expected to increase.

Moreover, the difference in results can be attributed to an increase in the financial costs that arose from the need for the district administrations in Kiev to enter into separate contracts with qualified service companies capable of properly operating and maintaining the new, specialized heat substation equipment. These additional costs were not foreseen at appraisal or considered in the appraisal estimates.

On the other hand, project capital costs were lower than estimated at appraisal for several of the energy saving assets on a per unit basis, due to the keen competition among suppliers participating in the project tenders. However, the reduced monetized value of the heat savings and the additional operating and maintenance (O&M) expenses outweighed the benefits stemming from the reduced capital expenditures, leading to a somewhat reduced financial performance of the project as compared to the evaluation at appraisal. If the additional O&M expenses are excluded from this analysis in order to make the comparison with the expected financial performance at appraisal on a consistent basis, the financial performance of the project would have been better than at appraisal, specifically the FNPV would have grown to US\$ 4.2 million and the FIRR to 14.9%.

The following tables present the two variants (with and without O&M) of calculating the FNPV and FIRR.

Variant 1. With O&M

Year	Energy Use without Project (Gcal)	Energy Use with Project (Gcal)	Energy Saving (Gcal)	Average Heat Tariff (US\$/Gcal)	Capital Expenditure (US\$ million)	O&M Cost (US\$ million)	Total Cost (US\$ million)	Energy Saving (US\$ million)	Net Benefit (US\$ million)
2000	1,272,317				1.5	0.0	1.5	0.0	-1.5
2001	1,272,317	1,268,409	3,908	10.71	2.3	0.0	2.3	0.04	-2.2
2002	1,272,317	1,208,252	64,066	10.79	5.0	0.3	5.2	0.7	-4.5
2003	1,272,317	1,076,501	195,816	10.79	7.3	0.5	7.8	2.1	-5.7
2004	1,272,317	1,052,878	219,440	10.81	4.1	0.8	4.9	2.4	-2.6
2005	1,272,317		296,329	12.82	4.1	0.9	5.0	3.8	-1.2
2006	1,272,317		333,423	13.13		0.3	0.3	4.4	4.1
2007	1,272,317		333,423	13.44		0.3	0.3	4.5	4.2
2008	1,272,317		333,423	13.76		0.3	0.3	4.6	4.3
2009	1,272,317		333,423	14.09		0.3	0.3	4.7	4.4
2010	1,272,317		333,423	14.43		0.3	0.3	4.8	4.5
2011	1,272,317		333,423	14.78		0.3	0.3	4.9	4.6
2012	1,272,317		333,423	15.13		0.3	0.3	5.0	4.7
2013	1,272,317		333,423	15.50		0.4	0.4	5.2	4.8
2014	1,272,317		333,423	15.87		0.4	0.4	5.3	4.9

Net Present Value (discount rate 10%) = US\$ 1.6 million

Financial Rate of Return = 11.8%

Variant 2. Without O&M (computed for fair comparison with the FNPV and FIRR evaluated at appraisal)

Year	Energy Use without Project (Gcal)	Energy Use with Project (Gcal)	Energy Saving (Gcal)	Average Heat Tariff (US\$/Gcal)	Capital Expenditure (US\$ million)	Energy Saving (US\$ million)	Net Benefit (US\$ million)
2000	1,272,317				1.5	0.0	-1.5
2001	1,272,317	1,268,409	3,908	10.71	2.3	0.04	-2.2
2002	1,272,317	1,208,252	64,066	10.79	5.0	0.7	-4.3
2003	1,272,317	1,076,501	195,816	10.79	7.3	2.1	-5.2
2004	1,272,317	1,052,878	219,440	10.81	4.1	2.4	-1.8
2005	1,272,317		296,329	12.82	4.1	3.8	-0.3
2006	1,272,317		333,423	13.13		4.4	4.4
2007	1,272,317		333,423	13.44		4.5	4.5
2008	1,272,317		333,423	13.76		4.6	4.6
2009	1,272,317		333,423	14.09		4.7	4.7
2010	1,272,317		333,423	14.43		4.8	4.8
2011	1,272,317		333,423	14.78		4.9	4.9
2012	1,272,317		333,423	15.13		5.0	5.0
2013	1,272,317		333,423	15.50		5.2	5.2
2014	1,272,317		333,423	15.87		5.3	5.3

Net Present Value (discount rate 10%) = US\$ 4.2 million

Financial Rate of Return = 14.9%

The main assumptions used for calculating the FNPV and FIRR and explanations to the above two tables are as follows:

Energy use without Project is the heat consumption of the buildings included in the project the year before first energy efficiency measures were installed under the project, i.e., in 2000. The actual consumption was adjusted to normalized degree days in order to eliminate the impact of different outside temperatures and consequently different heat consumption from year to year.

Energy use with Project is the heat consumption of the buildings included in the project starting from the first year when energy efficiency measures were installed and commissioned. The consumption for the period of 2001-2004 is based on actual data; the consumption in 2005 is estimated based on historic data and additional energy efficiency measures installed in 2005. The consumption in 2006 and beyond remains constant since all the energy efficiency measures will have been installed by that time. The consumption was adjusted to normalized degree days in order to eliminate the impact of different outside temperatures and consequently different heat consumption from year to year.

Energy saving is the difference between normalized energy consumption before the project and the normalized energy consumption with the project.

Average heat tariff is the actual heat tariffs for the public sector budgetary organizations in Kiev during the period 2001-2005. The heat tariffs for the budgetary organizations beyond 2005 are assumed to increase by international inflation forecasted at 2.4% per year.

Capital expenditure is the actual project costs expressed in current prices. The heat meters installed before project effectiveness are considered as sunk costs. Moreover, the data on heat savings stemming from the heat meters installed before project effectiveness is not available. Therefore, for the purpose of the financial and economic analysis, neither costs of nor corresponding benefits from heat meters installed before project effectiveness, i.e., August 17, 2000, were included.

O&M cost is the additional O&M cost stemming from installing energy efficiency measures under the project. Similar to the capital expenditure, current prices are used, to make a fair comparison with the FNPV and FIRR calculated at the appraisal. Some energy efficiency measures, such as weatherstripping, reduced the O&M cost, while some others, such as modern individual heat substation, increased the cost. The overall impact has been an increased O&M cost. O&M costs have grown through 2005, driven by the increased O&M costs of the heat substations. The cost is expected to reduce starting from 2006, because KCSA is planning to centralize and thereby lower the costs of servicing heat substations that are currently being serviced by several commercial companies contracted by each city district individually. The centralization of procurement of that service is expected to reduce the service cost to about 3% of the capital expenditure, as demonstrated by international practice. The O&M costs beyond 2005 are assumed to increase by international inflation forecasted at 2.4% per year.

Energy saving in US\$ is the energy saving in Gcal multiplied by the heat tariff in each respective year.

Net benefit is the difference between the monetized energy saving and the total cost, equal to the sum of the capital expenditures and O&M cost.

Kiev City Cash Flow Analysis. Moreover, a cash flow analysis for Kiev City was computed at project completion and compared with the analysis carried out at appraisal. The cash flow analysis shows that, under conservative assumptions about the financial savings stemming from the energy efficiency measures and the interest rate that would be applied to the World Bank loan during the remainder of the repayment period, Kiev City and its district administrations would generate sufficient savings on heat bills to cover the annual debt service requirements over a 7-year period after project implementation and the annual operating and maintenance costs. The following table shows the results of this analysis.

	2005	2006	2007	2008	2009	2010	2011	Total
Sources:								
World Bank Loan	3.2							3.2
Kyiv Municipality (capex)	0.9							0.9
Savings in Heat Bills	3.8	4.4	4.5	4.6	4.7	4.8	4.9	31.7
Total Sources	8.8	4.7	4.8	4.9	5.0	5.1	5.2	38.5
Uses:								
Capex	4.1							4.1
O&M	0.9	0.3	0.3	0.3	0.3	0.3	0.3	2.7
Total Capex+O&M	5.0	0.3	0.3	0.3	0.3	0.3	0.3	6.8
Debt Service:								
Interest-Ministry of Finance	1.1	0.9	0.8	0.7	0.5	0.3	0.2	4.5
Principal- Ministry of Finance	1.7	1.9	2.0	2.2	2.3	2.5	2.7	15.3
Total Debt Service	2.8	2.8	2.8	2.8	2.8	2.8	2.8	19.8
Total Uses	7.8	3.1	3.1	3.1	3.1	3.1	3.1	26.5
Cash Surplus/Deficit	1.0	1.6	1.7	1.8	1.9	2.0	2.1	11.9

numbers are in US\$ million

The assumptions used for computing the project cash flow are the same as those used for computing the FNPV and FIRR.

Annex 4. Bank Inputs

(a) Missions:

Stage of Project Cycle	No. of Persons and Specialty (e.g. 2 Economists, 1 FMS, etc.)		Performance Rating		
	Month/Year	Count	Specialty	Implementation Progress	Development Objective
Identification/Preparation					
	03/06/1997	6	Task Team Leader (1); Dist. Heating Engineer (2); Energy Efficiency Spec. (1); Social Scientist (1); Research Analyst (1)		
	06/20/1997	5	Task Team Leader (1); Dist. Heating Engineer (1); Energy Spec. (1); Social Scientist (1); Research Analyst (1)		
	11/24/1997	7	Task Team Leader (1); Dist. Heating Engineer (1); Energy Efficiency Spec. (2); Energy Economist (1); Social Scientist (1) Research Analyst (1)		
	03/16/1998	5	Task Team Leader (1); Dist. Heating Engineer (1); Energy Spec. (1); Social Scientist (1) Research Analyst (1)		
	06/01/1998	7	Task Team Leader (1); Dist. Heating Engineer (1); Energy Spec. (1); Energy Economist (1); Social Scientist (1); Financial Mgmt Spec (1); Operations Officer (1)		
Appraisal/Negotiation					
	11/2/1998	6	Task Team Leader (1); Dist. Heating Engineer (1); Energy Efficiency Spec. (1); Social Scientist (1); Financial Mgmt Spec (1); Operations Officer (1)		
	04/19/1999	4	Task Team Leader (1); Dist. Heating Engineer (1); Financial Mgmt Spec (1); Operations Officer (1)		
	09/09/1999	5	Task Team Leader (1); Dist. Heating Engineer (1); Financial Mgmt Spec (1) Operations Officer (2)		
	01/17/2000	5	Task Team Leader (1); Dist. Heating Engineer (1); Pvt. Sector Dev Spec (1); Operations Officer (2)		
Supervision					

11/10/2000	3	Task Team Leader (1); Dist Heat & Power Engineer (1); Operations Officer (1)	S	S
06/08/2001	4	Task Team Leader (1); Dist Heat & Power Engineer (1); Financial Mgmt Spec (1); Operations Officer (1)	S	S
07/17/2001	3	Task Team Leader (1); Dist Heat & Power Engineer (1); Operations Officer (1)	S	S
10/16/2001	3	Task Team Leader (1); Dist Heat & Power Engineer (1); Operations Officer (1)	S	S
02/04/2002	3	Task Team Leader (1); Dist Heat & Power Engineer (1); Operations Officer (1)	S	S
06/10/2002	3	Task Team Leader (1); Dist Heat & Power Engineer (1); Operations Officer (1)	S	S
10/21/2002	3	Task Team Leader (1); Dist Heat & Power Engineer (1); Operations Officer (1)	S	S
01/21/2003	5	Task Team Leader (1); Dist Heat & Power Engineer (1); Operations Officer (1); Lead Financial Mgmt Spec (1); Financial Mgmt Spec (1)	S	S
06/19/2003	3	Task Team Leader (1); Dist Heat & Power Engineer (1); Operations Officer (1)	S	S
11/03/2003	3	Task Team Leader (1); Dist Heat & Power Engineer (1); Operations Officer (1)	S	S
05/10/2004	3	Task Team Leader (1); Dist Heat & Power Engineer (1); Operations Officer (1)	S	S
09/20/2004	3	Task Team Leader (1); Dist Heat & Power Engineer (1); Operations Officer (1)	S	S
05/10/2005	2	Task Team Leader (1); Dist Heat & Power Engineer (1)	S	S
ICR				

(b) Staff:

Stage of Project Cycle	Actual/Latest Estimate	
	No. Staff weeks	US\$ ('000)
Identification/Preparation Appraisal/Negotiation	35.17	333,035

Supervision	105.96	462,961
ICR		
Total	141.13	795,996

Note: SAP provides aggregated data on staff time and cost for Identification/Preparation and Appraisal/Negotiations; and Supervision and ICR. The above table provides the staff time and cost breakdown by the same aggregated categories.

Annex 5. Ratings for Achievement of Objectives/Outputs of Components

(H=High, SU=Substantial, M=Modest, N=Negligible, NA=Not Applicable)

	<u>Rating</u>				
<input type="checkbox"/> <i>Macro policies</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input checked="" type="checkbox"/> <i>Sector Policies</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Physical</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Financial</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Institutional Development</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Environmental</i>	<input type="radio"/> H	<input type="radio"/> SU	<input checked="" type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<i>Social</i>					
<input type="checkbox"/> <i>Poverty Reduction</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input type="checkbox"/> <i>Gender</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input type="checkbox"/> <i>Other (Please specify)</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA
<input checked="" type="checkbox"/> <i>Private sector development</i>	<input checked="" type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input checked="" type="checkbox"/> <i>Public sector management</i>	<input type="radio"/> H	<input checked="" type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input type="radio"/> NA
<input type="checkbox"/> <i>Other (Please specify)</i>	<input type="radio"/> H	<input type="radio"/> SU	<input type="radio"/> M	<input type="radio"/> N	<input checked="" type="radio"/> NA

Annex 6. Ratings of Bank and Borrower Performance

(HS=Highly Satisfactory, S=Satisfactory, U=Unsatisfactory, HU=Highly Unsatisfactory)

6.1 Bank performance

Rating

- | | | | | |
|---|--------------------------|------------------------------------|-------------------------|--------------------------|
| <input checked="" type="checkbox"/> Lending | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Supervision | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Overall | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |

6.2 Borrower performance

Rating

- | | | | | |
|---|-------------------------------------|------------------------------------|-------------------------|--------------------------|
| <input checked="" type="checkbox"/> Preparation | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Government implementation performance | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Implementation agency performance | <input checked="" type="radio"/> HS | <input type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |
| <input checked="" type="checkbox"/> Overall | <input type="radio"/> HS | <input checked="" type="radio"/> S | <input type="radio"/> U | <input type="radio"/> HU |

Annex 7. List of Supporting Documents

1. Semi-Annual Progress Reports
2. Annual Audit Reports
3. Project Status Report and Implementation Status Reports
4. Loan Agreement
5. Amendments to the Loan Agreement

