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PROJECT PERFORMANCE ASSESSMENT REPORT

BULGARIA

**WATER COMPANIES RESTRUCTURING AND MODERNIZATION PROJECT
LOAN 3739-BUL**

April 7, 2005

*Sector, Thematic and Global Evaluation Group
Operations Evaluation Department*

Currency Equivalents (annual averages)

Currency Unit = Bulgarian leva (BGN)

1991	US\$1.00	BGN Leva 18.60
1992	US\$1.00	BGN Leva 23.00
1993	US\$1.00	BGN Leva 28.00
1994 (March)	US\$1.00	BGN Leva 45.67
2003	US\$1.00	BGN Leva 1.868

Abbreviations and Acronyms

CAS	Country Assistance Strategy
DH	District Heating
DHC	District Heating Company
EBRD	European Bank for Reconstruction and Development
EU	European Union
GDI	Gross Domestic Income
GDP	Gross Domestic Product
GOB	Government for Bulgaria
ICR	Implementation Completion Report
MEER	Ministry of Energy and Energy Resources
MOE	Ministry of Environment
MRD	Ministry of Regional Development and Construction
OED	Operations Evaluation Department
PMU	Project Management Unit
PPAR	Project Performance Assessment Report
PSP	Private Sector Participation
RWC	Regional Water Company
UfW	Unaccounted-for-Water

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OED Mission: Enhancing development effectiveness through excellence and independence in evaluation.

About this Report

The Operations Evaluation Department assesses the programs and activities of the World Bank for two purposes: first, to ensure the integrity of the Bank's self-evaluation process and to verify that the Bank's work is producing the expected results, and second, to help develop improved directions, policies, and procedures through the dissemination of lessons drawn from experience. As part of this work, OED annually assesses about 25 percent of the Bank's lending operations. In selecting operations for assessment, preference is given to those that are innovative, large, or complex; those that are relevant to upcoming studies or country evaluations; those for which Executive Directors or Bank management have requested assessments; and those that are likely to generate important lessons. The projects, topics, and analytical approaches selected for assessment support larger evaluation studies.

A Project Performance Assessment Report (PPAR) is based on a review of the Implementation Completion Report (a self-evaluation by the responsible Bank department) and fieldwork conducted by OED. To prepare PPARs, OED staff examine project files and other documents, interview operational staff, and in most cases visit the borrowing country for onsite discussions with project staff and beneficiaries. The PPAR thereby seeks to validate and augment the information provided in the ICR, as well as examine issues of special interest to broader OED studies.

Each PPAR is subject to a peer review process and OED management approval. Once cleared internally, the PPAR is reviewed by the responsible Bank department and amended as necessary. The completed PPAR is then sent to the borrower for review; the borrowers' comments are attached to the document that is sent to the Bank's Board of Executive Directors. After an assessment report has been sent to the Board, it is disclosed to the public.

About the OED Rating System

The time-tested evaluation methods used by OED are suited to the broad range of the World Bank's work. The methods offer both rigor and a necessary level of flexibility to adapt to lending instrument, project design, or sectoral approach. OED evaluators all apply the same basic method to arrive at their project ratings. Following is the definition and rating scale used for each evaluation criterion (more information is available on the OED website: <http://worldbank.org/oed/eta-mainpage.html>).

Relevance of Objectives: The extent to which the project's objectives are consistent with the country's current development priorities and with current Bank country and sectoral assistance strategies and corporate goals (expressed in Poverty Reduction Strategy Papers, Country Assistance Strategies, Sector Strategy Papers, Operational Policies). *Possible ratings:* High, Substantial, Modest, Negligible.

Efficacy: The extent to which the project's objectives were achieved, or expected to be achieved, taking into account their relative importance. *Possible ratings:* High, Substantial, Modest, Negligible.

Efficiency: The extent to which the project achieved, or is expected to achieve, a return higher than the opportunity cost of capital and benefits at least cost compared to alternatives. *Possible ratings:* High, Substantial, Modest, Negligible. This rating is not generally applied to adjustment operations.

Sustainability: The resilience to risk of net benefits flows over time. *Possible ratings:* Highly Likely, Likely, Unlikely, Highly Unlikely, Not Evaluable.

Institutional Development Impact: The extent to which a project improves the ability of a country or region to make more efficient, equitable and sustainable use of its human, financial, and natural resources through: (a) better definition, stability, transparency, enforceability, and predictability of institutional arrangements and/or (b) better alignment of the mission and capacity of an organization with its mandate, which derives from these institutional arrangements. Institutional Development Impact includes both intended and unintended effects of a project. *Possible ratings:* High, Substantial, Modest, Negligible.

Outcome: The extent to which the project's major relevant objectives were achieved, or are expected to be achieved, efficiently. *Possible ratings:* Highly Satisfactory, Satisfactory, Moderately Satisfactory, Moderately Unsatisfactory, Unsatisfactory, Highly Unsatisfactory.

Bank Performance: The extent to which services provided by the Bank ensured quality at entry and supported implementation through appropriate supervision (including ensuring adequate transition arrangements for regular operation of the project). *Possible ratings:* Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

Borrower Performance: The extent to which the borrower assumed ownership and responsibility to ensure quality of preparation and implementation, and complied with covenants and agreements, towards the achievement of development objectives and sustainability. *Possible ratings:* Highly Satisfactory, Satisfactory, Unsatisfactory, Highly Unsatisfactory.

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Principal Ratings

	ICR	ICR Review*	PPAR
Outcome	Satisfactory	Moderately Satisfactory	Moderately Satisfactory
Sustainability Institutional Development Impact	Substantial Likely	Non-evaluable Modest	Likely Modest
Bank Performance	Satisfactory	Satisfactory	Satisfactory
Borrower Performance	Satisfactory	Satisfactory	Satisfactory

* The Implementation Completion Report (ICR) is a self-evaluation by the responsible operational division of the Bank. The ICR Review is an intermediate Operations Evaluation Department (OED) product that seeks to independently verify the findings of the ICR.

Key Staff Responsible

Project	Task Manager/Leader	Division Chief/ Sector Director	Country Director
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Preface

This is the Project Performance Assessment Report (PPAR) for the Water Companies Restructuring and Modernization Project, estimated (at appraisal) to cost US\$131.0 million. The project was approved in May 1994 for an IBRD loan of US\$98.0 million that covered 74.8 percent of the total costs. The Government of Bulgaria (GOB) covered US\$11.4 million (8.7 percent), and participating water companies US\$21.6 million (16.5 percent). In April 1997, the project was restructured after the GOB requested the cancellation of US\$41.0 million of the loan due to a serious economic setback that made the loan unaffordable. In the process, a district heating component costing US\$17.1 million was added to the project with an allocation of US\$12.0 million of the loan. US\$45.0 million (of the reduced loan of US\$57.0 million) was earmarked for the original water supply and sewerage components. The project closed in December 2002, six months behind schedule.

This report is based on the Implementation Completion Report (ICR, dated June 27, 2003) prepared by the Infrastructure and Energy Sector Department in the Europe and Central Asia Region, the Memorandum and Recommendations of the President, Staff Appraisal Report (SAR, dated May 5, 1994), loan documents, project files (both at the World Bank headquarters and in the Sofia Country Office), and discussions with Bank staff. An Operations Evaluation Department (OED) mission visited Bulgaria in June 2004 to discuss the effectiveness of the Bank's assistance with the government, development partners, and representatives of selected project participating/implementing regional water and district heating companies. The cooperation and assistance of central government officials, management and staff of visited companies, and other interested parties are gratefully acknowledged.

This PPAR is part of a series of assessments of water and sanitation projects in ECA, including similar projects in Albania, Croatia, Bosnia and Herzegovina and the Baltic States. It provides an assessment of the outcome of the Bank's assistance that sought to enable Bulgaria to reform water and wastewater utilities and improve environmental conditions in urban areas.

Following standard OED procedures, copies of the draft PPAR was sent to the borrowers and agencies for their review and comments, but none were received.

Summary

The Water Companies Restructuring and Modernization Project was among the early World Bank interventions to support major reforms during Bulgaria's transition to a market economy. The project, costing at US\$131.0 million, was approved in May 1994 for an IBRD loan of US\$98.0 million. The objectives of the project focused on the strengthening of regional water companies (RWCs) (through increased autonomy, commercial orientation, and better management accountability to local authorities), improving health and environmental conditions in urban areas, conserving water resources, improving operating efficiency and cost recovery, and introducing transparent procurement procedures and efficient contract management.

The project partially achieved its objectives, but at a reduced scale because a large portion of the loan was cancelled when the country's economy encountered severe setbacks in 1997. The project was formally restructured in April 1997, a district heating component was added and the project objectives were revised accordingly.

Many of the water entities that participated in the project are on their way to become efficient operators, service restrictions have been nearly eliminated, and the reliability and quality of service are improved. However, scaled back expansion of sewage treatment curtailed achievement of major environmental benefits. The district heating component was satisfactorily implemented.

The project's outcome is rated as **moderately satisfactory**. The project's institutional development impact is rated as **modest**. Even so, sustainability of project benefits is rated as **likely**, provided that vigorous efforts continue to improve the finances of the operating water companies.

Both the Bank and borrower performance is rated as **satisfactory**.

This project performance assessment supports three lessons for broader application:

Lesson 1. *The timeframe of water sector reforms and sequencing of various steps should be designed carefully to take full account of their links with economic, legal, and other reforms upon which they depend.*

The restructuring of Regional Water Companies was linked with the legal issue of asset transfer, which was delayed because the new water law to cover the ownership of assets had not been enacted. Similarly, decisions on tariffs and other financial matters depend on the autonomy of the entity and the steps it must take to improve its finances. RWCs are still subject to political pressure, which tends to delay decisions on critical financial issues.

Lesson 2. *The project components should be in line with project objectives, scale of operation, goals, and funding; components should be clearly defined and have concrete, measurable targets.*

The objectives of this project were rather broad, emphasizing system-wide operational improvements. The project components, on the other hand, were designed to initiate many of the improvements in different zones on a pilot scale with corresponding limited funding. At the time project funding was cut-back, the scope of the project's water components were not adjusted to reflect significantly reduced funding. As a result, achievements do not fully meet the set objectives and goals, although they are quite reasonable if compared to the limited scope of activities and respective volume of funding.

Lesson 3. *Simple, straightforward components often produce results efficiently.*

The district heating component of the project is an excellent example of a clear and practical design of a project component. It was well defined, highly relevant and was implemented through an effective operator within the given period, and with some cost savings (used for necessary extensions). The benefits are substantial. The overall impact of this component on the development of the district heating sector is high.

Ajay Chhibber
Acting Director-General
Operations Evaluation

1. Background

Economic Situation

1.1 Until 1997, Bulgaria was among the poorest performing economies in Central and Eastern Europe. During the early years of transition, reform efforts were slow.¹ The problems culminated in a severe financial crisis in 1996-97 (decline of GDP, decline of per capita income, increase of poverty).² In July 1997, after a short period of financial chaos and the general elections in April 1997, a Currency Board Arrangement (IMF) was put into effect. Thereafter, conservative fiscal policies have been followed and structural reforms have accelerated. By September 1999, the economy had stabilized, and the growth and per capita income began to recover. As a result, Bulgaria was invited to initiate negotiations on EU membership with an aim to join the Union in 2007. After five years of sound macroeconomic management and accelerated structural reforms, economic growth has been restored, thus improving public and investor confidence. Structural reforms focus on completion of privatization and restructuring of the energy, railway, telecommunications, and water sectors. The Bank supports these efforts through a series of programmatic adjustment loans (PAL); the second PAL is currently under implementation.

1.2 When the Water Companies Restructuring and Modernization Project was being appraised in 1993, Bulgaria's population was estimated to be about 8.5 million. Although the population was reported to have decreased to 7.9 million by 2002, the share of the urban population is growing and is currently about 70 percent. Unemployment rate has come down from 18 percent in 2001 to 14 percent in 2003, but the poverty rate remained high at 12.8 percent (in 2001). In 2002, the GNI per capita was US\$1,790.³ In the past five years, the growth rate has been between 4 and 5 percent.

Sector Background

1.3 Access to improved water supply in Bulgaria is reported to be nearly 100 percent, but the quality and reliability of service is in question in many Bulgarian cities.⁴ The Ministry of Regional Development and Construction (MRD) is a policymaking body that also oversees the operations of the various water and sewerage systems. Today, 29 Regional Water Companies (RWC) shoulder the responsibility of providing water supply and sewerage services to about 74 percent of the population; the remaining 26 percent are served by 20 municipal water and sewerage utilities.⁵

1. Most of the economic data in this section is from the "Program Document for A Proposed Second Programmatic Adjustment Loan," The World Bank, May 4, 2004.

2. This was also a critical period for the assessed project as its implementation was just getting under way.

3. Still well below the ECA average GNI per capita of US\$2,160.

4. Information in this section was obtained through discussions during the assessment mission in June 2004 and from "Financing the Water and Wastewater Sector, Implementation of Strategy (Draft)," The World Bank, June 30, 2004.

5. The total number of water and wastewater utilities, in Bulgarian Vodocanal i Kanalizacia (ViK), is 50, i.e. 29 RWCs, 20 municipally owned WS&S utilities, and Sofia ViK. Of the 29 RWCs, 13 are fully state-owned

1.4 About two-thirds of all raw water comes from surface water sources, dams, and catchments and the remaining one-third from groundwater wells. Water supply systems cover nearly the entire population, especially in towns serviced by RWCs. In the 1990s, however, many of them had to resort to supply restrictions due to water shortages. Many improvements have been implemented since the onset of the assessed project,⁶ but still about half a million people are without a 24-hour supply of safe domestic water today. Moreover, only some 35 percent of the wastewater collected undergoes some form of treatment, although not up to the standard stipulated in the EU directives.

1.5 As part of the EU-membership negotiations, Bulgaria has agreed to meet EU's environmental directives on water supply and wastewater treatment. This commitment was realized in the endorsement of the *Strategy for Water Supply and Sewerage Management and Development in the Republic of Bulgaria* (Strategy) in March 2004. The Bank has assisted the GOB in preparing the financing and strategy implementation plan (see footnote 4) with the following priority objectives:

- Provision of water supply service on a 24-hours-per-day basis.
- Treatment of wastewater in line with the EU directives.
- Rehabilitation of water and wastewater networks to improve efficiency and reduce health risks.

1.6 Between 2004 and 2014, the overall financing need is estimated at €9.0 billion⁷ and is envisaged to significantly depend on private capital. Thus, private sector participation (PSP) will be an important aspect of the sector development in the near future. The government strategy seeks to improve efficiency, reduce losses, and close the funding gap through effective use of PSP. The Bank is involved in this process through the ongoing PAL loan, and will potentially continue this support in the future. The Water Companies Restructuring and Modernization Project (the evaluated project) was selected for the performance assessment (i) to fill some gaps in the ICR, (ii) to be part of a regional assessment of water and sanitation projects in transition economies, and (iii) to verify the rating of the project.

2. Project Design and Implementation

Objectives

2.1 The project objectives, as specified at appraisal,⁸ were to help the government to: (i) increase the corporate autonomy and commercial orientation of RWCs and make their management accountable to local authorities; (ii) improve health and environmental

and 16 are jointly owned by the state (51 percent) and municipalities (49 percent). A concessionaire serves the city of Sofia.

6. The assessed project was one of the early Bank interventions in Bulgaria.

7. The total funding need includes €6.9 billion for direct investments and €2.1 billion for the debt service.

8. The four objectives of the original project.

conditions in urban areas and conserve water resources; (iii) increase operating efficiency and cost recovery in RWCs; and (iv) demonstrate the feasibility and benefits of introducing transparent procurement procedures, efficient contract management, and competition for supply of goods, works, and services.

2.2 At the time of project appraisal in 1993, the Bank's Country Assistance Strategy (CAS) aimed at providing investment support to, among other things, ensure that the necessary infrastructure was in place to support economic growth. The Water Companies Restructuring and Modernization project was to contribute to the improvement of water and sewerage service through RWCs. The Bank involvement was specifically envisaged to encourage the adoption of a coherent strategy for the sector, focusing on commercial viability, demand orientation, and sustainability.

Project Components

2.3 Project components were divided into two main categories:

- **Institutional strengthening**, with 7 percent of the total base line costs, i.e., US\$7.5 million equivalent (para. 3.1).
- **Priority water and sewerage investment**, with 93 percent of the total baseline costs, i.e., US\$98.0 million equivalent (para. 3.9).

2.4 The total project costs were estimated at US\$131.0 million (base cost US\$105.5 million) to be financed by a Bank loan of US\$98.0 million (74.8 percent), and the rest by the government of Bulgaria, US\$11.4 million (8.7 percent), and by the participating RWCs, US\$21.6 million (16.5 percent).

2.5 In 1997, the project was restructured after the GOB requested the cancellation of US\$41.0 million of the loan (in December 1996). This was caused by a serious economic setback (para.1.1) which made the loan unaffordable to the government and especially for the RWCs. In the process, the reduced loan of US\$54 million was split between the original water supply and sewerage components the project (Parts A and B) and a new component was added: a district heating (DH) component (Part C) with an allocation of US\$12.0 million from the loan.⁹ After the restructuring, the objectives as well as the scope of the water supply and sewerage components remained unchanged - even though the financing for these components had been reduced by more than half.

2.6 The objective of the district heating component¹⁰ was to improve the efficiency of the system and help identify future investments needed for its improvements. This was to be achieved through provision of more accurate information to the providers and users of district heat on the location of heat consumption in the district system.

9. The respective amendment of the loan agreement was signed on April 17, 1997.

10. The additional objective 5.

2.7 The district heating component included the procurement and installation of heat meters in buildings in 15 district heating systems.¹¹ This component was envisaged to cover the entire population being served by the respective District Heating Companies (DHC). In 1997, only about 10 percent of the sub-stations had meters to measure the heat consumption in buildings. This did not provide an adequate database for appropriate demand management. The project also included the purchase of 22,000 heat meters and 6,000 regulators.

Implementation

2.8 The overall responsibility for project implementation rested with MRD. A special Project Management Unit (PMU) was established within MRD to carry out procurement, hire consultants, and supervise all field activities. The respective RWCs implemented the project at the regional level. Project implementation was slow. Initially, all 29 RWCs were identified as potential participants, but only 21 eventually decided to join the project program. Each RWC had to sign a sub-loan agreement with MRD. This turned out to be a time-consuming process; six RWCs signed up between 1996 and 1998 and the remaining 15 RWCs signed their sub-loan agreements in 1999. As a result, the bulk of the work under various sub-loan agreements was carried out several years after the effectiveness of the loan, which was delayed by one year (October 1995).

2.9 In Stara Zagora and Kardjali, which the assessment mission visited, the bulk of the actual implementation took place between 1999 and 2001. Project supervision reports indicate that the technical preparation of most sub-projects took some three years beyond loan effectiveness.

2.10 The implementation of the district heating component was the responsibility of the Ministry of Energy and Energy Resources (MEER) assisted by the PMU; the respective DHCs carried out the actual field activities.

2.11 Actual project costs are not known¹² and, despite efforts by the assessment mission to discover them, the MRD representatives were not in a position to provide data to roughly estimate the overall total costs. Table 1 is an educated guess on the actual project costs using the disbursement rates applied on various funding categories in the project as per the ICR Annex 2.

11. There are 20 district heating companies in Bulgaria in total.

12. The ICR is silent on this aspect of the project, but presents the breakdown of the loan amount (Annex 2 of the ICR) for (i) the restructured project as of May 1997, and (ii) the actual used amounts as of June 1, 2003.

Table 1: Project Costs; SAR, Revised as of 1997 and Actual (estimated)

<i>Part of the Project</i>	<i>Description of components</i>	<i>Costs in US\$ million</i>			<i>Notes</i>
		<i>SAR</i>	<i>1997 revision</i>	<i>actual ¹</i>	
Part A	Priority water and sewerage investments; completion of ongoing works, rehabilitation and upgrading, and reduction of UfW	98.0	47.7	32.5	Disbursed at 70%; equipment, materials, civil works
Part B	Institutional strengthening; technical assistance, training, study on WRM, and operation of Project Management Unit	7.5	4.0	5.1	disbursed at 100%; consultants, training, equipment, vehicles
Part C	District heating improvements; heat meters and regulators		17.1	20.7	disbursed at 70%, included only supply of meters
	Interest and other charges	5.6	2.6	2.6	
	Unallocated/exchange rate variations	19.9	5.0	6.9	
	Total project costs	131.0	76.4	67.8	US\$5.2 million of the 1997 loan was cancelled by project closing
	Total loan amount	98.0	57.0	51.8	

1. Source OED, actual are estimates only.

2.12 Eventually, 91 percent of the revised loan amount estimated in 1997 was disbursed. The actual project costs were 89 percent of the costs estimated in 1997, but only 52 percent of the 1994 appraisal cost estimates (US\$131.0 million). It is surprising that, despite this significant reduction in project costs, no change was made in project objectives or scope in the restructuring process, indeed an additional component was added.

3. Evaluation of Results

Institutional Strengthening

3.1 *A number of important sector issues were covered, but the expected impact is yet to materialize.* The main components to address the institutional strengthening (objective 1) were RWC capacity building through in-country training and TA, carrying out a Water Resources Management study, project implementation through assistance for the PMU (investment planning and project implementation). The achievements are assessed as follows:

Objective 1: increase the corporate autonomy and commercial orientation of RWCs and make their management accountable to local authorities.

3.2 The project assisted the government in restructuring RWCs to make them autonomous and to strengthen capacity to plan and implement investments. For this purpose, PMU engaged specialist consultants and provided limited training in project and utility finance and management of operations. Ex-post, 15 of the 21 RWCs - or over 70 percent of the participating RWCs - are jointly owned by the state (51 percent) and by the municipalities they serve (49 percent) compared with the ex-ante situation in which all RWCs were fully state-owned. This development has enhanced local involvement in the day-to-day operations of these water companies and is likely to improve the service to better respond to local aspirations. The remaining six RWCs have not yet completed the transfer of their share of the assets, including the valuation of assets, and subsequent registration. This partial autonomy does not yet include the right to set tariffs which continues to be a politically difficult issue.

3.3 Other significant actions for achieving corporate autonomy of RWCs were the development of a new water law and establishment of an independent regulator for its enforcement, approved by the council of ministers. The new law is awaiting enactment by the parliament (expected in September 2004). If this occurs, the regulator could be established in 2005. The role of the regulator is to ensure that the water companies, public and private alike, will operate in a proper business environment, with appropriate pricing of water, and adequate cost recovery. The regulator will operate under the council of ministers and will have a central office and four district offices. The enactment of the new water law and the subsequent establishment of the regulator are the final steps required to complete the conversion of RWCs into *operating companies* to be contracted by the owners as per the original goal. The goal also involves the companies to operate according to commercial principles. To this effect, training in financial management, several tariff increases (although not yet sufficient for the full cost recovery) throughout the life of the project, and the introduction of annual auditing of the RWC accounts have been effective preparatory efforts.

3.4 The water resources management study was completed in November 1997. It proposed (as an option) a river basin approach to the future water resources management and guidelines on charges for water usage and wastewater treatment. These proposals are now part of the government's water strategy and important factors in the government's dialogue for EU-accession.

3.5 A large part of the funds allocated for institutional strengthening were used for hiring consultants to prepare sub-projects and assist the PMU in carrying out procurement and regular project supervision. This was a valuable experience and training opportunity for many in-house staff of MRD and PMU as well as for local consultants. The capacity to prepare project investment plans, project designs, and tender documents was substantially enhanced. Some of the ex-PMU staff is now working on the preparation and implementation of EU-funded projects (ISPA Program) within the MRD, thus utilizing this experience for further development of the sector.

3.6 During the project implementation, private sector participation (PSP) became a new approach for widening sector funding options and improving operational efficiency. As a result, concession contracts were developed for Shumen and Varna. Eventually, neither one was completed due to the less than satisfactory quality of the relevant

documents and incomplete understanding of the related risks and benefits, thus lowering the political will to contemplate this new concept. Although this effort, as an afterthought, did not work out as expected it helped to advance the PSP concept in Bulgaria. For example, the preparation of the Sofia concession contract benefited from the work done for Shumen and Varna.¹³

Priority Water and Sewerage Investment

3.7 The priority investments (rehabilitation and completion of ongoing projects) were aimed at improving health and environmental conditions in urban areas and conserve water resources (objective 2) and at increasing RWC's operating efficiency and cost recovery (objective 3).

Objective 2: improve health and environmental conditions in urban areas and conserve water resources.

3.8 Selected indicators (shown in Annex B1)¹⁴ highlight the progress in service provision between 1996 and 2003 as follows:

- *Population with 24-hour service:* the number of customers with 24-hr service has not risen at all for all practical purposes, but many operational improvements indicate that the water service is now more reliable than before the project: restrictions in water distribution have been nearly eliminated in many cities.
- *Water quality testing:* in all but four¹⁵ RWCs bacteriological safety of water samples is well over 90 percent (average is 92 percent). This indicates that water is safe for human consumption. There are, however, no health statistics to confirm the impact of this change.
- *The share of the population connected to public sewerage:* data from all participating RWCs show that some 56 percent of the total population is connected to sewerage systems; this is up from 18 percent in 1996. The project provided rather insignificant funds for the extension of the sewerage systems, but it is possible that some critical bottlenecks were removed, thus effectively increasing the sewerage coverage. It may also have encouraged RWCs to fund

13. The Sofia water supply and sewerage service is now run by a concessionaire, *Sofiyska Voda*. Its shareholders are EBRD (29 percent), the city of Sofia (20 percent), and a private operator (51 percent). The experience from this PSP operation is expected to become a substantial demonstration case in scaling up PSP operations among RWCs and other utilities. It may be noted (as was reported to the mission) that assets registration has progressed well, collection rate is satisfactory at 91 percent, and a long-term investment plan is being drawn up. Improved service reliability has been widely reported. A critical issue in negotiating the first concession contract for Sofia was the weak asset database and the lack of reliable operational indicators (i.e., lack of benchmarking). During the early years of the contract, this problem was eliminated and the database will serve future plans for investment priorities and operational improvements. For instance, it has been established that unaccounted-for water (UfW) is still at 60 percent, but a realistic rehabilitation program aims at reducing UfW to 30 percent in 10 years.

14. The data in Annex B1 was collected by the assessment mission, with the help of MRD, to update the data given in ICR.

15. There is no data on this from Dobrich; Lovech, Pernik, Smolian, and Yambol report test results between 70 percent and 84 percent.

parallel extensions from their revenue base and/or from other donor assisted programs.

- *Share of collected sewage treated*: the average share reported by RWCs is 34 percent; this is a slight improvement in terms of percentage treated (33 percent in 1996), but is in any case a significant step forward in improving environmental as well as health conditions given the tripling in the volume of sewage collected since 1996.¹⁶

3.9 Overall, although the health and environmental results attributable to the project are not substantial in quantitative terms, they represent a positive trend and form a good base for achieving more concrete results in future projects. The base data is now more reliable than before the project and this may make preparation for future physical investments and capacity building projects, through public or private operations, much clearer and more realistic.

3.10 The information on the actual scope of water sub-projects, extent and details of physical achievements, and their respective actual costs is superficial at best in the ICR. The assessment mission paid particular attention to this issue in its discussions with the officers of the four visited RWCs.¹⁷ The situation concerning the four RWCs, as case utilities, is presented in Table 2 below. The sub-projects in Table 2 represent the typical scope of all sub-projects with minor variations, such as completion of unfinished water sources (see Kardjali) and rehabilitation of wastewater system (see Gabrovo) that were not common in other sub-projects. The main findings are:

- Although most RWCs carried out leak-detection and respective rehabilitation of the system in pilot areas, impact was rarely recorded; Kardjali with its less than 20 percent UfW in the pilot area was an exception in this regard. Similarly, several pilot zones for leak-detection and rehabilitation were created in Gabrovo; the results show a reduction of UfW from 86 percent to 44 percent in these pilot zones.
- Furthermore, all RWCs report that large numbers of pipe bursts were repaired annually, often numbering in thousands; the reported number of repairs in 2001 range from about 800 to nearly 6,000.¹⁸
- Rehabilitation of pump stations (with replacement of old inefficient units) has proven to be an effective way to increase operational efficiency; for instance an analysis in Kardjali shows that energy costs have gone down by 20 percent. Automated operation has further reduced energy costs as the bulk of pumping (i.e., filling up reservoirs) takes place at night, when tariffs are reduced.

16. Due to the lack of baseline indicators, no realistic analysis of ex-ante/ex-post situations can be carried out.

17. The RWCs were selected on the basis of the scope of sub-projects as typical examples of the overall project, their known analysis of project results, and proximity to Sofia (due to time limitations of the mission).

18. Some recorded burst repairs in 2001: Smolian 795, Dimitrograd 820, Sliven 1,399, Kardjali 2,456, Targoviste 4,051, and Shumen 5,792; in 2000, 6,718 bursts were repaired in Pernik.

Table 2: Scope and Costs of the Water and Sewerage Components in four case RWCs; Parts A and B

RWC	Summary of sub-project scope	Sub-project costs (US\$ million)		Notes on reported results
		Visited case RWCs	Estimated	
Gabrovo	Leak-detection and rehabilitation in five pilot zones, and zonal water meters	0.81		Reduced UfW from 86% to 44%
	Rehabilitation of water supply network and treatment plant improvements	1.09		Large number of bursts repaired
	Rehabilitation of wastewater system	0.61		Increased coverage
	Vehicles, excavators, workshop tools, supervision/contingency	0.93		Shorter response time to repairs
	Gabrovo sub-project total	3.44	n.a.	No breakdown of actual costs
Kardjali	Leak-detection and rehabilitation in pilot zones			UfW <20% in pilot zones
	Rehabilitation of transmission and distribution mains, completion of old/unfinished supplies			Local rationing discontinued
	Rehabilitation of pumping stations/improved disinfection			Improved efficiency and quality
	Automated network operation/control system w/computers			25% reduced kWh/m ³
	Water meters, spares, valves/regulators, equipment and vehicles			Shorter response time to repairs
Kardjali sub-project total	2.21	1.69	No breakdown of costs available	
Pernik	Leak-detection and rehabilitation in pilot zones			No specific results recorded
	Rehabilitation of transmission and distribution mains			Bursts reduced significantly
	Replacement of pumps and valves			Service reliability improved
	Water meters and construction equipment			1,300 meters installed
Pernik sub-project total	n.a.	n.a.	No cost data available	
Stara Zagora	Rehabilitation of transmission mains and pumping stations			No service rationing necessary
	Rehabilitation of distribution networks			Large number of bursts repaired
	Bulk and consumer water meters with accessories			More reliable service/O&M data
	Workshop equipment/tools, leak detect. equipment, vehicles			Shorter response time reported
Stara Zagora sub-project total	2.12	1.77	No breakdown of costs available	
Project total	Water and sewerage components of all sub-projects	105.5		SAR-baseline
			37.6	ICR-PPAR estimates

- As the cost data of improvements are not unavailable, it would be important to carry out a special analysis of relevant costs to establish a reliable basis for future cost estimates of large-scale improvement programs.
- Water production in many RWCs has declined significantly because of reduced industrial activities; since 1996, the total production has been estimated to have decreased by nearly 30 percent. In addition, domestic consumption has declined, mainly due to increased tariffs over the life of the

project. The rehabilitation of the water distribution systems has also had an impact on water conservation, but rather limited as of today. Similarly, expansion of sewage treatment so far has been insignificant. Water conservation and environmental issues need to be addressed in a comprehensive way as Bulgaria prepares for EU accession.

Objective 3: increase operating efficiency and cost recovery.

3.11 **What do the performance indicators from 21 RWCs reveal?** Improved operational management is demonstrated through performance indicators comparing 1996 with 2003 performance (Annex B2):¹⁹

- *Unaccounted-for water:* the 2003 data show that UfW has gone up, on average,²⁰ from 53 percent to nearly 57 percent. The project supplied a significant number of water meters both zonal and consumer meters. This has improved the reliability of the data and one can assume that the data today is more reliable than in 1996;²¹ the main achievement may be, that in the near future, the indicators will allow a more accurate comparison of annual operational results. There are, however, quite promising results from some pilot zone leak-detection and rehabilitation cases; they are discussed later in this section (para. 3.14).
- *Collection rate:* overall performance in financial management of RWCs has worsened; down from 86 percent to approximately 82 in 2003.²²
- *Working ratio:* in this area, some real progress has been made even on an average basis; the average ratio is down from nearly 107 percent in 1996 to about 100 percent in 2003.²³ The results show that most RWCs can, but only just, finance their operation and maintenance costs, a few like Pleven may be able to fund even some minor investments from their own coffers. It is common to find that reaching a working ratio level of well below 100 percent requires more time than just one project cycle, especially in cases where major institutional reforms are necessary at the same time.²⁴
- *Staff index:* the average staff index among the 21 RWCs is still as high as 10 staff per 1,000-connections. Kardjali, Russe, and Sliven have reached a staff

19. The data in Annex B2 was collected by the assessment mission, with the help of MRD, to update the data given in ICR.

20. This is simple average of UfW indicators in various RWCs, not a weighted average of the overall water billed compared with the amount produced.

21. Only 9 RWCs show real, although slight, progress in UfW between 1996 and 2003; Russe is the only RWC with significant reduction of UfW, down from 62 percent to 44 percent.

22. Ten RWCs show some minor, but real progress (or at least a stable situation), the best one is Montana, up from 80 percent to 91 percent.

23. Only three RWCs show a worsening situation; the worst progress has been in Gabrovo, up from 107 percent to 124 percent, and the best is Ispirih, down from 128 percent to 96 percent.

24. Results in several water projects in similar situations (Croatia and Romania, to mention a few) assessed by OED support this finding.

index level of about 5. In Kardjali, which the mission visited, this is likely due to the high degree of automation in the operation of the system and improved maintenance procedures. There are no comparative pre-project data on staff index, but the current situation should be reflected against the EU water industry standard that is 2 to 3 staff per 1,000-connections. The best of the RWCs are now reaching that goal, but many have a long way to go.

3.12 While the foundation and procedures for better performance are being established, overall progress has been modest to date. Managers have a better understanding of relevant issues today, driven by the goal to join the EU, and better progress can be expected in the near future. The project provided rather meager funds for large-scale rehabilitation efforts, and especially after the restructuring, the project spread the limited funds too thinly over a large number of companies. Training, as part of the TA provision, included project formulation, procurement, and most importantly leak-detection of water systems. The effort, however, fell short of the scale required to meet the needs of so many and such large operators.

3.13 Metering of water connections in most RWCs is at or near 100 percent,²⁵ but the reliability of meters is not known. In addition to zonal meters to record bulk supplies, substantial quantities of consumer meters and modern equipment for meter workshops were provided under the project. On this basis, and as observed by the mission during the visits to four RWCs, it is reasonable to assume that the recording of water consumption is now more reliable than before the project.

3.14 ***Pilot UfW activities could not be scaled-up because of financing cut backs and did not lead to reduced water losses system-wide.*** The key finding of the assessment mission is that the leakage rate is high; on average in 2003, the participating 21 RWCs report a rate of over 56 percent. Further to the discussion above (paras. 3.11 and 3.12), two positive exceptions are Lovech and Montana with UfW rates of 26 percent and 24 percent respectively (in 2003); both down from a rate of roughly 30 percent before the project (in 1996). Five more RWCs have reached, or maintained, a rate below 50 percent (Kardjali, Pleven, Russe, Shumen, and Vidin), but the rest of the RWCs are well over the 50 percent level, the highest figures were reported by Dobrich and Gabrovo at over 80 percent in 2003.

3.15 Throughout the project's main construction period (1999-2002), the supervision reports highlight lack of progress on system-wide UfW as a serious shortcoming in project implementation. This issue was also recognized as a point of departure for the approach taken in the design of the project in 1993-94. The strategy for reducing UfW was to initiate rehabilitation of the system in pilot areas and develop a suitable method for expanding the program across the entire network at some later date. The project design, however, defined the performance indicators for the distribution system as a whole. This was not a logical approach at this pilot phase, as no definite timetable for expanded activities was set, nor was adequate funding for their implementation provided.

25. The average metering rate is 96 percent in some 15 RWCs where the data was available.

3.16 The scope of investments was far below what would have been required to expand the system rehabilitation to a reasonably acceptable level. For instance, in Kardjali only some two percent of pipes are replaced annually against the estimated need of about 10 percent. This low rate of replacement of course drastically affects progress in reducing UfW. However, it can be assumed that the largely successful implementation of pilot-scale leak detection and network rehabilitation activities will encourage RWCs to replicate the effort to eventually cover the entire network, thus expected to result in a significant reduction in UfW rates.

3.17 Most Bulgarian urban water systems face a special problem as far as their rehabilitation is concerned; the pipe material used is mostly asbestos cement, from about 60 percent up to even 90 percent in some regions.²⁶ This material is rather sensitive to the quality of the laying of pipes; especially the foundation of the mains is critical. Settling of pipes at joints creates excessive angles in pipe alignment that create potential leakage points—in the worst cases at six-meter intervals.²⁷ In addition, the quality of rubber rings used to seal the joints is also an issue in many cases, as well as the aging of the rings. In field observations, both during the mission and otherwise, gaskets were commonly found to be brittle and are likely to be so, to a large extent, as most of the mains in the distribution networks have been in service for 30 years or more. This problem is likely to cause increasingly widespread leakage in the near future.

***Objective 4:** demonstrate the feasibility and benefits of introducing transparent procurement procedures, efficient contract management, and competition for supply of goods, works, and services.*

3.18 The PMU played a key role in improving procurement procedures. With Bank assistance, PMU prepared all bidding documents; this required heavy support from Bank staff during the early stages of the project, but gradually the quality of the documents improved to meet Bank guidelines. The total number of contracts was 750. Except for one misprocurement case of water meters,²⁸ all contracts were administered effectively and as per the guidelines.

3.19 This project was the first international intervention in the water sector and a good number of sector professionals gained through it substantial experience in international procurement procedures. The PMU manager and procurement specialist received special training (at the Bank in Washington); this was an important factor in this process. At the end, the responsibility of all procurements was handed over to the participating RWCs, and the outcome was satisfactory. The RWC staff became familiar with the international bidding procedures as well as the benefits of competitive bidding for cost control of contracts.

26. An exception is Sofia where the distribution network is mainly of cast iron pipes; the share of asbestos concrete pipes is less than 10 percent.

27. The length of individual pipes is six meters.

28. In this case, unacceptable bid opening procedures were followed.

District Heating Component

3.20 **Objective 5:** The importance and benefits of metering in demand-side management was demonstrated thereby improving the DH sector's efficiency. The sector is fully regulated, and with the help of regular tariff increases, amounting to 35 percent overall since the introduction of metering, the sector is expected to eliminate all operating subsidies by 2005. The 2001/2002 data presented in the ICR – savings in pumping costs (ranging from 10 percent to over 20 percent), better control over water loss, conservation of heat (energy), to mention a few – indicate that this target is realistic.²⁹ Furthermore, the GOB has a firm plan to move ahead with PSP in the DH sector.

3.21 The introduction of heat metering and system regulation facilitated a demand-driven operation that has resulted in substantial savings in water loss and power costs due to reduced pumping requirements. Full metering allowed management to turn-around the district heating sector. Similar activities are under way in Sofia (which did not participate in the project) that accounts for the bulk of district heating in Bulgaria (60 percent).

4. Rating of the Project

Outcome

4.1 The **overall outcome is rated moderately satisfactory** as the project achieved most of its relevant revised objectives. After the loan closing, good progress is being made on the remaining objectives, expected to be fully met in due course. This composite rating is assessed on the basis of the separate rating of relevance, efficacy, and efficiency given below.

Relevance

4.2 The project objectives were relevant to the overall government and Bank strategy as seen at project appraisal (para. 2.2). The restructuring of the project in 1997 took into account the precarious economic situation at the time to better reflect affordability criteria. All major aspects of the objectives, although demanding, were and are relevant for achieving the intended sector reforms and improvements in service quality and reliability.

4.3 There was, however, an imbalance between the rehabilitation of the water distribution network (including leak-detection) on a pilot or demonstration scale and expected system-wide results. As the experience from these pilot/demonstration activities is encouraging, their future replication and scaling-up is expected to bring about significant improvements in UfW reduction provided the necessary investments are secured. The DH objective was highly relevant. Overall, the **relevance is rated as substantial**.

29. Some of this data is based on consumer surveys. The assessment mission reviewed the updated data for 2003 in general with officials of MEER, but the attempt to obtain the records failed.

Efficacy

4.4 The extent to which the project actually achieved its objectives is measured on the basis of selected indicators for service provision and progress made from 1996 until 2003, the year for which the latest full-year results are available; they are presented in full in Annex B1. In summary, while progress is being made and is expected to continue, improvements are somewhat less than envisaged at appraisal. The main achievements are improvement of service reliability, establishing a systematic approach for leak-detection activities and getting these activities effectively under way, albeit on a pilot scale because of reduced financing. The new water quality testing procedures is producing reliable data on this important aspect of water service. Most shortcomings are in the area of sewerage operations, especially in wastewater treatment. The project made almost no contribution to improved treatment of sewage, as expected. The efficacy of the DH objective was substantial. On the above basis, the project's **efficacy is rated as modest.**

Efficiency

4.5 Actual project expenditure for the water supply components were reduced by about 65 percent. Despite this cost reduction, the project's water objectives and components were not significantly scaled down. Considering that the overall benefiting population was of the order of 4.0 million (in 2003),³⁰ the average investment was as low as US\$10.0 per capita. This is extremely favorable when compared to the acceptable cost level of the industry in similar rehabilitation programs, i.e., limited to only the most critical rehabilitation of the system. No financial rate of return was calculated for the project in either the SAR or ICR. In general, investments in rehabilitation tend to generate a high rate of return, and therefore in this case, rehabilitation was the least cost and a definite priority alternative for the project. In addition, replacement of worn out, inefficient pumps have generated significant cost savings through reduced power consumption as observed, for instance, in Kardjali.

4.6 Key performance indicators (in Annex B2) reveal that there has been slight improvement in the operation of the water and sewerage systems of the participating RWCs (after the project in 2003) compared with indicators for the pre-project situation (1996). The working ratio has come down to the level at which RWCs are likely, but only just, to meet their operating and maintenance costs. The other performance indicators (UfW, collection rate, and staff index) do not show clear efficiency improvements, but indicate that trends are moving in the right direction and system operations are stabilizing (see also discussion in paras. 3.11 - 3.17). Substantial benefits have been, or are expected to be achieved with regard to other objectives of the water components, i.e. *objectives 1, 2, and 4*. The efficiency of the DH objective was substantial.

4.7 On the above basis, the project's **efficiency is rated as substantial.**

30. This is roughly estimated on the basis of incomplete population data obtained from various project reports, chiefly supervision reports; the SAR states that RWCs serve about 85 percent of the population, today this figure is reported to be 74 percent, i.e., 5.8 million; a pro-rata estimate (21/29) gives a served population of 4.2 million for the project RWCs.

Institutional Development Impact

4.8 The project achieved its original institutional objectives, but with some limitations. The restructuring process did not reach all participating RWCs and was not carried through all the way. Therefore, the project's impact on the autonomy of RWCs is not as substantive as expected. The project helped to improve the quality of investment planning, and project preparation and supervision, at the central level (PMU) as well as within RWCs. In addition, a noticeable start was made in improving operational procedures, thus helping to achieve better efficiency; this, however, holds true in some RWCs only, which now will serve as good demonstration cases for others to follow.

4.9 At the central level, the project was helpful in getting the new water law enacted, the key issue in completion of the restructuring process of RWCs. The law also lays the basis for establishing a regulator for the sector, to be finalized in 2005. In addition, the project became involved in advancing the PSP approach to accelerate measures to achieve efficient operation and close the finance gap for urgent investments. Although the Varna and Shumen cases did not materialize, the experience gained and documents produced are helpful for taking the necessary steps in the near future, as spelled out in the government's new water strategy.

4.10 On the above basis, the project's **institutional development impact is rated as modest.**

Sustainability

4.11 The four RWCs that the assessment mission visited provide some relevant data in assessing the resilience to risk of benefits achieved through the project. As analyzed in above discussions on indicators, the flow of service benefits is ensured only if the positive trend demonstrated in many RWCs continues uninterrupted over years to come. The government's goal to meet EU accession requirements by 2007 is likely to ensure that RWCs will become fully autonomous and that they receive all necessary support in their efforts to further improve operations and reliability of service. The benefits of district heating improvements are fully sustainable. With this reservation on water and sewerage components, the overall **sustainability is rated as likely.**

Bank Performance

4.12 The Bank was quite effective during both project appraisal and implementation. Supervision was especially effective, and flexible when called for; the project assisted the government in carrying out the restructuring of RWCs as well as developing the new water law and establishing a regulator for the sector. The Bank was particularly determined to advise the participating RWCs on activities to reduce UfW and related rehabilitation of the system. The Bank has continued to support the efforts initiated under the project through helping the government to prepare a new water sector financing strategy. This assessment applies to the district heating activities as well. Overall, the **Bank performance is rated satisfactory.**

Borrower Performance

4.13 Borrower ownership, both at the central level and among the participating RWCs, was satisfactory. The borrower established a PMU within MRD that was instrumental in carrying out the project activities after the hiatus created by the economic crisis of the mid-1990s was overcome. Apart from some procurement issues that arose during project implementation, shortcomings in achieving some of the project's objectives were more due to the design of the project and the economic situation than the lack of performance on the borrower's part. The borrower carried out the district heating activities fully satisfactorily. **Borrower performance is rated as satisfactory.**

5. Lessons

5.1 The assessed project was initiated at a time when major reforms in the economy were under way and steps were taken in various sectors to support economic growth. In this situation, the project's objectives were understandably broad and perhaps somewhat optimistic regarding the timeframe within which the reforms would be accomplished. This project performance assessment supports three lessons for broader application:

Lesson 1. *The timeframe of water sector reforms and sequencing of various steps should be carefully designed to take full account of their links with economic, legal, and other reforms upon which they depend.*

5.2 The restructuring of Regional Water Companies was linked with the legal aspects of asset transfer. This was delayed because the new water law to cover the ownership of assets had not been enacted. Similarly, decisions on tariffs and other financial matters depend on the autonomy of the entity and the steps it must take to improve its finances. RWCs are still subject to political pressure, which tends to delay decisions on critical financial issues.

Lesson 2. *The project components should be in line with project objectives, scale of operation, goals, and funding; components should be clearly defined and have concrete, measurable targets.*

5.3 The objectives of this project were rather broad, emphasizing system-wide operational improvements. The project components, on the other hand, were designed to initiate many of the improvements on a (pilot) zonal scale with corresponding limited funding. At the time of scaling down the project funding (in 1997), the designs of the project's water components were not adjusted to reflect the significantly reduced funding. As a result, achievements do not fully meet the set objectives and goals, although they are quite reasonable if compared to the limited scope of activities and respective volume of funding.

Lesson 3. *Simple, straightforward components often produce results efficiently.*

5.4 The district heating component of the project is an excellent example of a clear and practical design of a project component. It was designed for a clearly defined and

relevant purpose together with a reasonably effective operator. The project was implemented within the given period, with some cost savings (used for necessary extensions) and the benefits are substantial. The overall impact of this component on the development of the district heating sector is high.

Annex A. Basic Data Sheet

BULGARIA WATER COMPANIES RESTRUCTURING AND MODERNIZATION PROJECT (LOAN 3739-BUL)

Key Project Data (amounts in US\$ million)

	Appraisal estimate	Actual or current estimate	Actual as % of appraisal estimate
Original commitment	98.0	51.8	52.9
Total cancellation	-	46.2	-
Total project cost	131.0	67.8 ¹	52.8

¹/ PPAR estimate; the actual total project cost is not presented in ICR.

Project Dates

	Original	Actual
Departure of Appraisal Mission	06/03/93	-
Negotiations	03/94	-
Board approval	05/26/1994	-
Effectiveness	10/01/94	10/10/95
Closing date	6/30/2002	12/31/2002

Staff Inputs (staff weeks)

	Actual Cost
	US\$('000)
Appraisal/Negotiation	583,854
Supervision	769,443
Total	1,353,297

Mission Data

	Date (month/year)	No. of persons	Specializations represented	Rating trend Types of problems	
				Implementation Progress	Development Objective
Appraisal/Negotiation	6/3/93	2			
Supervision	12/16/94	3	Project Officer, Senior Sanitary Engineer	S	U
Supervision	9/12/95	3	Economist, Engineer, Financial Analyst	S	U
Supervision	2/19/96	3	Economist, Engineer, Financial Analyst	S	U
Supervision	5/3/96	3	Financial Analyst, Engineer, Project Officer	S	U
Supervision	12/11/96	3	Financial Analyst; Engineer, Project Officer	S	U
Supervision	5/28/97	3	Financial Analyst, Engineer Project Officer	S	U
Supervision	11/21/97	3	Engineer, Financial Analyst, Project Officer	S	U
Supervision	10/29/98	4	Operations Officer, Financial Analyst, Sanitary Engineer, Operations Assistant	S	S
Supervision	3/4/99	4	Task Team Leader, Engineer, Privatization Specialist, Projects Officer	S	S
Supervision	7/3/99	2	Task Team Leader, Project Officer	S	S
Supervision	11/17/2000	4	Team Leader, Procurement Analyst, Engineer, Procurement Specialist	S	S
Supervision	7/20/2001	2	Team Leader, Procurement Analyst	S	S
Supervision	12/15/2001	4	Team Leader, Senior Water and Sanitation Specialist, Procurement Analyst	S	S
Supervision	3/8/2002	3	Team Leader, Senior Water and Sanitation Specialist, Operations Officer	S	S
Supervision	10/6/2002	4	Task Team Leader, Utility Finance, Water and Waste Water, Operations; Procurement	S	S

Other Project Data

Borrower/Executing Agency:

FOLLOW-ON OPERATIONS

Operation	Credit no.	Amount (US\$ million)	Board date
None			

Annex B1: Progress in Service Provision from 1996 to 2003

RWC	population with 24-hr service		samples testing safe		population with sewerage		collected sewage treated	
	1996 ^a	2003	1996 ^b	2003	1996 ^c	2003	1996 ^d	2003
Gabrovo		97.9%		96.5%		65.1%		75.8%
Dobrich		99.8%		n.a.		66.5%		100.0%
Kjustendil		99.1%		95.1%		59.2%		92.9%
Lovech		99.2%		84.7%		44.2%		0.0%
Varna		99.6%		95.2%		83.9%		98.3%
Isperih		100.0%		95.9%		0.0%		0.0%
Vratsa		99.5%		98.0%		53.5%		57.2%
Dimitrovgrad		99.7%		96.0%		71.1%		0.0%
Kardjali		85.1%		97.6%		40.4%		0.0%
Sliven		99.9%		96.7%		60.7%		94.7%
Stara Zagora		99.5%		93.8%		59.0%		26.8%
Shumen		99.8%		98.0%		58.9%		0.0%
Vidin		97.1%		95.1%		49.3%		0.0%
Montana		96.4%		95.1%		55.7%		7.2%
Pernik		97.2%		79.5%		76.3%		93.8%
Pleven		100.0%		95.3%		54.1%		71.2%
Russe		100.0%		96.4%		64.3%		0.0%
Silistra		100.0%		95.7%		45.9%		0.0%
Smolian		90.5%		72.0%		60.0%		0.0%
Targoviste		99.1%		95.7%		50.0%		0.0%
Yambol		100.0%		70.6%		63.6%		0.0%
Average	98.0%	98.1%		92.1%	18.0%	56.3%	33.0%	34.2%

a. SAR states that on average 98% of population was connected to water supply network (1994); year-round and seasonal water shortages were common.

b. Water quality testing was not common practice in the past.

c. On average 18% of population was connected to sewers (ranging from 4% to 75%) based on 1994 study that surveyed 70% of connections.

d. Only about 33% of sewer systems had primary or secondary treatment: 25% of plants did not operate as per design standards.

Annex B2: Key Performance Indicators for 1996 and 2003

RWC	unaccounted water		collection rate ¹		working ratio ²		staff index ³	
	1996	2003	1996	2003	1996	2003	1996	2003
Gabrovo	65.0%	81.4%	97.0%	79.0%	107.0%	124.0%		13.0
Dobrich	76.0%	81.7%	88.0%	89.0%	141.0%	133.0%		12.6
Kjustendil	66.0%	52.0%	76.0%	54.0%	121.0%	99.9%		8.6
Lovech	30.0%	25.9%	86.0%	88.0%	108.0%	95.2%		6.7
Varna	60.0%	66.9%	84.0%	78.0%	101.0%	98.8%		21.0
Isperih	50.0%	60.5%	91.0%	87.0%	128.0%	95.6%		6.2
Vratsa	50.0%	71.2%	88.0%	88.0%	95.0%	97.3%		9.8
Dimitrovgrad	53.0%	54.8%	87.0%	71.0%	112.0%	99.1%		10.6
Kardjali	41.0%	43.0%	85.0%	85.0%	102.0%	99.7%		5.0
Sliven	54.0%	66.1%	86.0%	64.0%	96.0%	98.2%		5.6
Stara Zagora	53.0%	67.6%	87.0%	85.0%	97.0%	98.2%		13.6
Shumen	53.0%	47.5%	81.0%	80.0%	106.0%	99.0%		9.3
Vidin	57.0%	46.7%	87.0%	94.0%	101.0%	97.0%		8.8
Montana	27.0%	24.1%	80.0%	91.0%	102.0%	98.0%		10.1
Pernik	40.0%	76.4%	87.0%	64.0%	105.0%	97.4%		11.3
Pleven	46.0%	48.2%	82.0%	86.0%	106.0%	90.5%		13.5
Russe	62.0%	44.4%	96.0%	96.0%	94.0%	96.4%		5.2
Silistra	62.0%	59.5%	85.0%	85.0%	103.0%	99.4%		8.8
Smolian	33.0%	51.0%	92.0%	93.0%	105.0%	96.3%		18.5
Targoviste	71.0%	68.7%	86.0%	86.0%	113.0%	99.3%		10.4
Yambol	63.0%	56.0%	79.0%	76.0%	100.0%	98.5%		11.1
Average	53.0%	56.8%	86.2%	81.9%	106.8%	100.5%		10.5

Definitions:

1. collection rate = revenue collected as a percentage of the total water billing.
2. working ratio = total operational costs as a percentage of total revenue.
3. staff index = number of staff per 1000 connections.

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