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Regional Activity Centre for Cleaner Production

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Reduction of water losses

Company	Water and Sewage Utility, Konjic, B&H.
Industrial sector	Water distribution and sewer systems management.
Environmental considerations	The Konjic Water Utility manages the water distribution and sewer systems in the city of Konjic, as well as in three other separate water networks in nearby villages. The city utility serves 15,000 customers, including residential, industrial and commercial clients as well as public institutions, through a main pipeline approximately 5 km long and half a meter in diameter. The Konjic Water Utility is faced with a high volume of unaccounted-for water loss (UFW), defined as the difference between water delivered to the distribution system and water sold. UFW includes two basic components: physical losses and commercial losses. Physical losses include water lost from pipe leaks in distribution systems, in house connections, and from overflows in distribution tanks. Commercial losses include water used but not paid for (i.e. from illegal connections and inaccurate metering). Prior to project implementation, unaccounted-for water in the Konjic Water Utility system averaged 60-70% of total water production.
Background	Before the implementation of this EcoLinks-funded project, the Konjic Water Utility had a limited understanding of how to approach the problem of unaccounted-for water losses. The Utility was unfamiliar with demand-side management practices and how to apply these practices to reduce UFW, while simultaneously meeting an increasing demand for water. The aim was to reduce unaccounted-for water to develop improved water supply system management practices. The Project Team developed a framework for improving the Utility's organisational structure and operating practices, including record keeping, data collection and analysis, use of computer software to monitor water supply, improved customer service and training for the Konjic Water Utility's staff.
Summary of actions	The goal of this project was to build the Utility's capacity to reduce unaccounted-for water losses and to develop improved water supply system management practices. Project Activities included the following: 1. Establishment of an unaccounted-for water reduction task force to coordinate and monitor the implementation of project activities. 2. Developing and implementing improved monitoring and record keeping. The results were: an updated list of consumers in the project pilot zone and information on the technical specifications of meters and their locations; a consumer database compatible with global information system (GIS); and, guidelines on water intake metering, effective water consumption metering, meter reading, identification of non-metered and unauthorised losses.

3. Improving water supply management and reducing physical losses:
   3.1. Creating a model for calculation of water losses in the network.
   3.2. Water distribution modelling software purchased and adapted to local conditions that lead to the creation of guidelines for pilot zone metering and a database of water meters and leak repairs records.
   3.3. Training of the staff for the new positions and tasks.
   3.4. Reconstruction of the pilot zone network to enable measurements of total water flow. All consumers in the zone were provided with water meters and water consumption was measured through regular meter readings.
4. Developed UFW Reduction Plan (2003-2008) with annual targets, goals and actions.

Outline of the process

Balances

Capacity building benefits

Utility staff was trained on various organisational, technical and administrative methods to reduce UFW and improve water management. Consumers, both companies and individuals, were also informed on the market value of water and the importance of water resource conservation through good housekeeping measures. A deeper understanding of water conservation issues was passed on to other stakeholders through several meetings and workshops which presented project findings.

Environmental benefits

The environmental benefits from the project are derived from reduced water losses. It is anticipated that unaccounted-for water losses will be reduced by a total of 70,000 m^3 during the first year of implementation of the UFW Reduction Plan, and by 35% (approximately 2 million m^3 per year) by the end of the five years.

Economic benefits

Many economic benefits are generated with the implementation of project recommendations. These include:

- reduced operational costs (as a result of reduced water treatment) equalling approximately 2,000 USD/year;
- increased revenues from water sales equalling 600,000 USD/year (as a result of billing industrial customers for actual water consumed, rather than lump-sum billing);
- increased revenues through the registration and metering of all consumers;
- reduced capital needs of approximately 10,000 USD/year (through avoided investments to extract an additional 20,000 litres per second to meet the demand).

Conclusions

This project provides a first step in adopting market-based practices of operation for water utilities which, in the CEE/NIS region, have long been subsidised or subject to unrealistic water pricing.

NOTE: This case study seeks only to illustrate a pollution prevention example and should not be taken as a general recommendation.

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