Alliance to Save Energy
WATERGY CASE STUDY
Mogale City, South Africa

BACKGROUND

The Kagiso township is a previously disadvantaged, low income area located in Mogale City (previously known as Krugersdorp). This area consists of approximately 20,000 properties with primarily low income housing. The Kagiso area over the past decade has witnessed rapid population growth without a corresponding increase in sound water service delivery or staff expertise in water management. Various socio-political and socio-economic factors coupled with poor infrastructure have resulted in a lack of metering and inadequate accounting of water services provided. Another key consequence of local factors is the entrenched culture and mindset among Kagiso residents of not paying for water. Payment levels were recorded at 10% of total supply and, by 1996 when an earlier metering project was conducted, total unpaid dues to the municipality had reached R1.5 million (about $250,000).

Key Results

- Successful application of conventional and pre-payment metering where prior strong public opposition to payment for water existed.
- Annual projected cost savings: US$ 3.5 million
- Annual projected energy savings: 15.4 million kWh
- Annual projected water savings: 6 million kL
- Annual potential GHG emissions avoided: 13,700 metric tonnes of CO_2

THE SOLUTION

The Kagiso solution is two-pronged, with a technical approach that established an effective water demand management program with improved infrastructure and staffing capabilities, coupled with a focus on instilling a responsibility among residents to pay for the water they consume and to maintain their meters and connections. The Alliance to Save Energy has been providing key technical support since 1999, including planning, creating financial models to assess project feasibility, training on the use of equipment, and drafting documentation. Project management support was provided to the municipality's water services department.

Conventional Metering

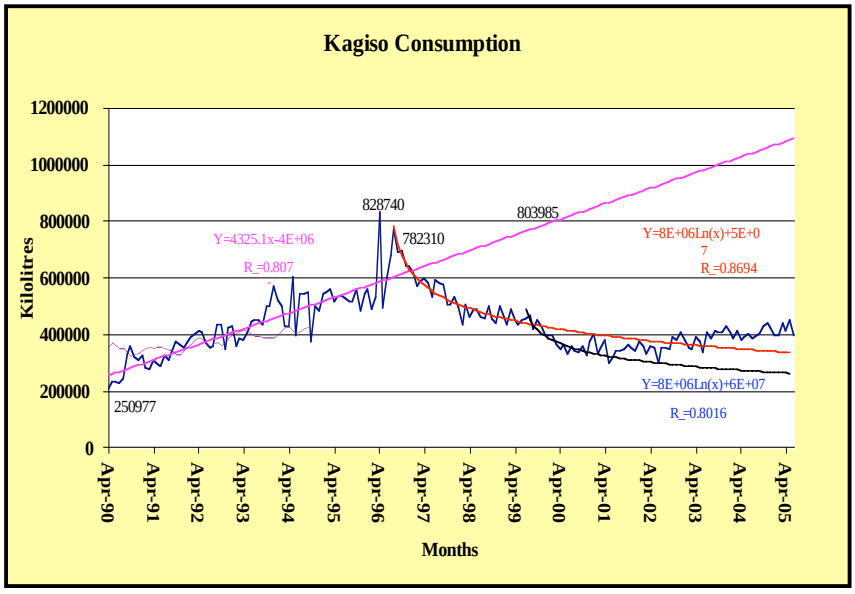

Figure 1: Kagiso Water Consumption over 15 years

The first step in the project was to establish a metering system to monitor all existing water connections and realistically account for the amount of water supplied to the residents. Conventional meters were installed and pressured yard connections were fixed in each property in the township. Select leak repairs were also conducted on households. Additional staff was hired to monitor billing operations, individual property accounts and to maintain the new systems. **Figure 1** at left illustrates the impact of water demand management efforts in Kagiso. Actual water consumption is shown by the blue line, with the pink line extrapolating the consumption trend in the absence of

interventions. The initial sharp drop in consumption in the center of the graph is the result of an earlier project at the end of 1996 and beginning of 1997, including metering and select leak repairs. The black line on the right half of the graph shows the dramatic drop in water consumption as a result of prepayment metering. The resulting savings in water costs paid for the conventional meters.

Key Policy Decision for Prepayment Metering

1. All new standard sized water connections (15 mm) will automatically receive a prepayment meter without requiring the consent of the owner.
2. Any existing customer can apply for a prepayment water meter. Except for new connections, no existing consumer will be forced into prepayment.
3. Retrofitting will be free of charge. Customers with new connections will pay the normal fee.
4. Meters are installed inside the property to encourage ownership.
5. Prepayment customers will not pay a premium for water. The same tariff structure will be used for both prepayment and conventional meters.
6. Capital cost of prepayment water will be subsidized by the Council.

Pre-payment Metering

The limitation of conventional meters is that they do not ensure that residents pay for water consumed, resulting in difficulties in establishing a credit control system that holds customers responsible for water payment. There are several types of interventions a municipality could implement. For example, a policy could institute limits on the level of water residents may consume. In Kagiso, inability to pay for water resulted in the termination of thousands of water connections, which was not only a significant burden on the affected households, but was a cost-intensive process for the municipality. Pre-payment metering was introduced to resolve these issues by allowing customers to pay the municipality a subsidized fee in advance for the consumption of a specific amount of water over and above their "Free Basic Water" allocation. Waste is avoiding because customers will use only that quantity of water for which they have paid. The "pay before you use" paradigm was a shift from the entrenched culture that advocated the free use of water with no limitations. To overcome this, the municipality carefully marketed the pre-payment concept through several key policy decisions, outlined in the box above. Kagiso began installing prepayment meters in 1999 and the system was rapidly accepted by most residents. By 2001 13,500 yard connections had been established and payment levels rose from 10% to 95%.

RESULTS

The installation of both conventional and prepayment metering has resulted in significant savings. Total water savings from both projects is approximately 6 million kL every year, with an associated annual cost savings of US$3.5 million and energy savings of 15.4 million kWh. This project demonstrated that metering is essential to the cost effective supply of water, allowing less monitoring and management and increased credit control. The Kagiso metering project serves as successful model that can be replicated in other municipalities, not only in South Africa but around the world wherever there is a need to ensure sustainable and affordable delivery for disadvantaged and under-served communities.

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