## Prepaid Water in Maseru: Case Study

### Overview
Maseru, the capital of Lesotho, has a population of 400,000, and just over 60,000 water connections. Maseru first introduced prepaid meters on standpipes and individual connections in 2004, and currently has about 3,500 prepaid individual connections and 180 prepaid standpipes serving peri-urban settlements (Photo 1).

WASCO, Lesotho’s Water and Sewerage Company, struggles to secure payment from customers who are in arrears, and carries substantial long-term debt as a result. It singles out middle- and high-ranking civil servants living in subsidized government housing for special mention. The utility has the staff resources to disconnect only a third of the customers each month who warrant disconnection, and finds prepaid meters an effective alternative for improving payment. But it is not convinced that prepayment is the solution, because prepaid meters require extensive maintenance support, particularly when they freeze and malfunction in Maseru’s subzero temperatures.

Because of its decade-long experience with prepaid metering, WASCO has hosted secondments of technical, finance, and credit management staff from utilities in Zambia and Malawi that wanted to gain practical experience before implementing prepayment themselves.

### Lessons
Prepaid meters are just one component of the cost of prepayment. Vending, management software, and maintenance are major costs that are often underestimated. Higher collection rates from individual prepaid meters are offset by lower consumption and lower revenue.

Ensure that meters have been accredited by the relevant standards authority and have been tested under local conditions. Maseru’s prepaid meters carry the necessary accreditation for South Africa, but Lesotho’s extremely cold winters are more demanding than the meters were designed to tolerate. The meters often shut down in subzero temperatures, inconveniencing customers and adding to the utility’s maintenance burden.

### Why prepayment was introduced
WASCO introduced prepayment to

- **Improve payment levels**, in line with a performance agreement signed with the World Bank as part of funding for a sector improvement program in 2004;
- **Reduce the number of disconnections**, which are unpleasant for customers and the staff who execute them; and
- **Reduce billing queries related to meter-reading errors and estimates.**

### Implementation
Prepaid meters were first introduced in 2004 as part of a drive to improve payment levels on individual connections and at shared taps managed by community committees.

The first individual meters performed poorly, with problems with the smartcard, valve, and battery, and the supplier went out of business. All 100 were removed within a year. Despite
these technical problems, a WASCO customer satisfaction survey conducted at the time showed strong demand for more prepaid water meters.

In 2007, WASCO introduced about 3,200 meters of a different type on individual connections, and additional prepaid standpipes. The new household prepaid meters performed better, and had the advantage of being reparable by WASCO staff, although the technicians that readily obtaining spares from the supplier isn’t easy.

Lesotho is known as the mountain kingdom, and extremely cold weather in winter raises the maintenance load significantly for WASCO staff when the prepaid meters ice up inside and shut down. There are up to 60 call-outs a day in subzero temperatures. WASCO technical staff prepare refurbished meters in advance to swap in and out within five minutes to minimize the inconvenience to customers. The utility bears the full cost of all maintenance.

In 2011, the utility introduced 300 meters of a different type that were designed to cope with subzero temperatures. Programming the software on the new meters to meet WASCO’s needs presented challenges that could not be resolved. WASCO wanted to be able to track whether customers were buying credit each month, as a way of identifying possible tampering or bypasses; but instead the meters cut off supply entirely if no credit was bought within a 30-day period. This inconvenienced customers and created extra work for utility staff, so after 18 months WASCO removed them all and replaced them with more of the frost-sensitive type. This has resolved their vulnerability to low temperatures by mounting them inside a robust plastic container below ground.

WASCO is currently exploring smart metering with automatic meter reading, with a strong emphasis on data analysis to inform better demand management. The system being piloted offers the option of pre- or postpayment with Automatic Meter Reading (AMR) systems—used to collect consumption data from individual meters—but WASCO’s management team is unresolved about whether or not to upscale prepaid water metering in Maseru. The Managing Director feels that prepaid meters are good for optimizing revenue collection, and are what customers want—they are in control and can manage their consumption in line with what they pay upfront. The operations director feels that prepaid meters are unreliable and require high maintenance, particularly in winter. The finance director acknowledges the cash flow benefits of prepayment, but says prepayment constrains sales. He is concerned about the high cost and the system’s vulnerability to tampering. He highlighted instances in which customers buying modest amounts of credit regularly mask bypasses and tampering with the valve.
The senior technician who leads the three-person team dedicated to maintaining the prepaid meters said he enjoys his work, even though providing a same-day repair service is demanding, because customers really like the prepaid meters. They are used to prepaid electricity, they trust the readings of the prepaid meter more than their bills, and they like being able to manage their consumption according to what they pay upfront.

**Vending**

All prepaid meters on individual connections and standpipes now run off the same proprietary software. This means the utility no longer needs to run two separate proprietary vending systems, once for a system that uses a Dallas iButton and one for a remote key with an infrared beam (Photo 2). There are six vending sites serving about 7,500 token holders; four at petrol stations are open 24/7, but most customers have to travel well over a kilometer to buy credit.

WASCO pays vendors a 7 percent commission, and supplies the handheld devices and training.

**Monitoring**

WASCO does not monitor the prepaid meters routinely, and is concerned about the likelihood of a significant incidence of bypasses. The utility’s credit department analyzes sales data periodically and then follows up on customers who have not bought credit for some time to establish if there is a technical or other reason for no purchases. Concerns about bypasses and faulty meters are reasons why the utility is exploring automatic meter reading as a possible add-on for prepaid and postpaid meters.

**Funding, finance, and revenue**

WASCO’s investments in prepayment have been funded with commercial loans.

Prepaid standpipe users pay a lifeline tariff. Prepaid customers with individual tariffs pay a rising block tariff. WASCO notes that consumption by customers with individual connections who prepay is lower than those that receive a bill after consumption, but because prepaid customers currently comprise less than 10 percent of the total, the impact on revenue is not significant.

**Summary**

Ten years after introducing prepaid meters, Lesotho’s utility is not yet convinced that prepaid metering is the best technology to meet local residents’ needs. The 3,500 individual meters, in particular, require frequent maintenance in extremely cold weather, and better payment levels are offset against higher costs and lower revenue. The utility wants to be able to manage demand better, perhaps with the option of remote disconnection, and believes smart metering may be more cost-effective than a prepaid system.