

# Tackling water losses through improved domestic water bills

J Bhagwan\*, S Slabbert\*\*

\*Water Research Commission, Private Bag X03, Gezina, 0031, South Africa, [jayb@wrc.org.za](mailto:jayb@wrc.org.za)

\*\*BHI 32 (Pty) Ltd, 191 Anderson Avenue, Northcliff, 2195, South Africa, [sarah-s@iafrica.com](mailto:sarah-s@iafrica.com)

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## Abstract

The domestic water bills that municipalities send out to consumers on a monthly basis are a key interface between local government and citizens. Being a legal instrument, as well as a communication medium, the consumers' level of understanding of their water bills and the confidence in the information provided is therefore indicative of their effectiveness. A lack of understanding of bills impacts negatively on customer awareness, billability, participation and the regulation of water services. It also leads to distrust in the integrity or correctness of bills, which, in turn, impacts negatively on consumers' willingness to pay.

The paper reports the findings of a study to develop certain standards or guidelines for domestic water bills, which was funded by the South African Water Research Commission (WRC). The study will give effect to municipalities to optimise their domestic bills for accessibility, individual needs and impacting on consumer behaviour regarding payment and efficient water use. Further, the output will assist in improving users' understanding and confidence in municipal bills, as well as the regulation of water services and managing water usage.

The research assessed current South African and relevant international legislation, regulation and guidelines relating to bills/invoices/bills, with special reference to domestic water bills, as well as current local and international research on the subject. This was supported by a survey of municipalities, as well as a critical analysis of domestic water bills from a representative sample of municipalities across South Africa. (Most municipalities send out a consolidated bill for all their services as well as property tax.)

Findings indicate that many bills score low on user-friendliness, clarity and accessibility, a fact which is exacerbated by the complete lack of standardisation.

This paper provides a status quo of the effectiveness of current municipal water bill practices and indicates the key elements requiring standardisation. A user-friendly, simple, easy to understand and meaningful municipal services bill can be widely applied to make a valuable contribution towards increased consumer awareness and consumer participation in the management and conservation of a country's water resources.

## Introduction

Some of the literature on water loss (Ardakanian, and Bernhardt eds., 2011) defines "water loss" broadly in terms of inefficient use at all levels, also at domestic level.

Other literature in the field of water loss focusses on non-revenue water (NRW). According to Kingdom et al (2006), non-revenue water comprises three components:

- physical (or real) losses;
- commercial (or apparent) losses; and
- unbilled authorised consumption.

All three these concepts are also relevant at domestic level.

Physical losses are leakages. Commercial losses refer to water that consumers have used, but do not pay for as a result of incorrect metering, faulty meters, data-handling errors and theft of water in various forms. Free basic water in South Africa is an example of "unbilled authorised consumption".

At a domestic level, both from the efficiency and the non-revenue perspective, quantifying water loss implies that **consumers know exactly how much water they use or lose (through leakages), and how much this costs.**

Efficient use, however, is a relative and not an absolute concept. Consumers measure an increase in efficiency relative to previous or other uses, or relative to other users. **Therefore consumers need comparative information on use and cost.**

Unless consumers have this information, they are unable to manage and self-regulate water use and the price that they pay for water.

The domestic water bills<sup>1</sup> that municipalities send out to consumers on a monthly basis are a key interface between local government and citizens to provide consumers with this information. As such, municipal bills offer a unique opportunity for municipalities to inform, educate and influence their customers and to establish their communication as clear, accurate and customer friendly.

This paper will argue that domestic water bills, as they are currently produced in South Africa, fail to a large extent to communicate this information to consumers. The paper will also indicate ways to improve this situation.

## A research study

In 2008, the South African Water Research Commission funded a study towards the standardisation of municipal domestic water bills.

The research assessed current South African and international regulation, guidelines and research relating to bills/invoices/statements, with special reference to domestic water bills. This was supported by a survey of current municipal billing practices.

Based on the literature review and current practices, a Tool to Evaluate Municipal Invoices (EMI) was developed. The Tool was workshopped with municipal officials, piloted with consumers and further refined.

Finally, the Tool was tested with a national urban sample of 2500 respondents to test three municipal bills (two actual bills, and one model bill)

In conclusion, the study developed standards or guidelines for optimising domestic bills for accessibility, individual needs and influencing consumer behaviour regarding payment and efficient water use.

The sections that follow will briefly refer to the findings of each of these research components.

## Municipal bill practices

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<sup>1</sup> Most municipalities issue consolidated bills.

The study included a qualitative research component in the form of telephonic interviews with officials from a sample of municipalities to establish the current practices regarding their domestic bills. 21 municipalities responded to the request to participate in the study.

The interviews were conducted with senior municipal officials who deal directly with the municipal domestic bills. The discussion guide covered the following sub-sections:

- Bill development: the software used, improvement cycle, consumer research, and participatory development;
- Bill currently used: information on the bill, customer profile and inclusivity;
- User-friendliness of the bill: perceptions, bill queries, language(s) used on the bill; and
- Cost recovery measures in relation to the bill.

All the participating municipalities issue monthly a consolidated bill of all services that the municipality charges a tariff for, with the exception of Silulumanzi, which only issues water bills. Free basic services are indicated on bills. All metered connections receive bills, including indigents with metered house or yard connections.

Meters are not read every month; estimates are made in between actual readings. One municipality admitted that some meters have not been read for over a year! Accurate meters and accurate meter reading are common problems affecting the integrity of data. Some municipalities give consumers the opportunity to phone or send in their meter readings. Consumers do not receive an incentive for this service. Municipal officials of smaller municipalities admitted that this information is captured by hand and could lead to data errors.

All the municipalities interviewed have either an outsourced or an in-house financial system that generates their bills. A range of software companies sells financial systems to municipalities; the Venus system is used most widely. When interviewed, BCX (supplier of the Venus system) and SAP claimed that their systems are completely flexible and customisable. They also claimed that the municipalities themselves determine the layout, the 'look and feel' of the bill, as well as the nature and level of detail on the bill. However, some systems generate a number of standard options from which municipalities can choose.

Only one municipality reported customer participation in the development of their bill. Also, only one of the sampled institutions did customer research on the municipal bill. Most municipalities had no idea what information their consumers want or need to see on their bills or what their communication preferences are. However, all respondents believed that their bill is user-friendly and easy to understand.

Bills are mailed to households where possible. In rural Unthungulu District Municipality, mail is not delivered to all households and some consumers fetch their bill at a central point, for example a school. For these consumers, the meter number is critical information on their bill.

Electronic bills emailed to consumers are on the increase. Most municipalities admitted problems with their consumer data; thousands of municipal bills never reach their destiny, adding to commercial water losses.

The municipal respondents did not link default in payment with non-comprehension of the bill. Figures for bill queries varied; were not always available and their reliability might be questionable. Yet, it was evident that all the municipalities get bill queries every month and they have to pay staff to deal with these queries. According to the respondents, queries relating to customers not understanding the bill vary from nil to 40%. Queries generally appear to relate to the accuracy of meter readings and the charges for services, but it was not clear whether customers complained because they did not understand the charges or because they did not agree with the charges.

The described municipal bill practices explain why the analysis of the actual bills found a total lack of standardisation in South African municipal bills. It also explains why South

African municipal billing practices are, in most cases, totally out of touch with the needs of their consumers. And why problems with the integrity of the data on municipal bills are rife, as exemplified by the Johannesburg billing crises of the past year.

## **South African and international regulatory requirements for municipal bills**

The laws that regulate municipal bills relate to the information that should appear on bills, as well as the format of bills.

The South African laws that regulate consumer bills in general, and municipal domestic bills specifically, are the Municipal Systems Act 32 of 2000, the National Credit Act 34 of 2005, the Value-Added Tax Act 89 of 1991, Municipal Property Rates Act 6 of 2004 and the Consumer Protection Act 68 of 2008.

According to these laws, domestic water bills must be individualised so that consumers can identify theirs. Bills must also supply the information that consumers need to verify their accuracy, such as a date of sale, a description of the goods or service, the quantity consumed, the unit price and total cost, excluding and including taxes.

Legislation furthermore stipulates that bills must be clear and understandable. Clause 22 of the Consumer Protection Act states that ordinary consumers, with minimal experience of the type of communication, have the right to understand that communication without undue effort.

## **The consumer-friendly bill**

At the core of the development of consumer-friendly municipal bills lies the comprehension or the level of understanding of the particular consumer the bill is addressed to. In this respect, consumer needs vary considerably, creating a challenge for the designer of the bill. In the final instance, the municipal bill must be understandable to both the most and least literate of consumers. For those who do not understand the language of the bill, or whose sight is impaired, other measures should be available to assist.

A survey of international best practice and consumer research (Australia Natural Resource Management Ministerial Council 2006, EDF Energy UK 2009, EELCO 2008, Electrogaz 2008, Garland Utilities 2008, India Ministry of Urban Development 2007) concludes that the following features mark a user-friendly bill, serving consumers:

- The font should be large and of a high resolution type for easier reading;
- The document should guide attention (e.g. bold, or larger font) to the important aspects of the statement;
- Clear and concise bill information;
- Detail that is easy to understand – unnecessary detail that could confuse the consumer should be removed;
- The breakdown of the utility services should clearly be separated;
- Usage charges must be clear and easy to follow;
- Explanatory statements should be in plain language;
- All contact information must be both clear and easy to find on the document;
- Bills should take individual needs into consideration, such as different languages and special messages for specific customers;
- Uncluttered format; and
- Different payment options.

Following industry's best practices and understanding customer needs are essential in creating a flexible format that will incorporate the needs of all customers.

## **An bill that decreases consumers' water footprint**

Research of international best practice, such as the Australian National Water Initiative (NWI)'s National Guidelines for Residential Customers' Water Bills (2006), indicated four measures that can be successfully employed on bills to influence consumers to use water more efficiently and decrease their water footprint:

- Comparative information, for example:
  - How does my household's consumption compare with the municipal average, or similar households? or
  - What did my household's consumption look like over the past 12 months? Unexplainable spikes could be indicating water loss due to leaks or theft;
- Targets;
- Incentives, such as cash or tax incentives; and
- Education.

## **A Tool to Evaluate Municipal Invoices (EMI)**

The survey of local and international regulation, best practice and research led the researchers to identify a set of minimum requirements that domestic water bills must meet to provide consumers with the information they need to manage and self-regulate their water use:

- 1. For any communication to take place, the message must be clear and understandable.**
2. The bill must have a unique reference (e.g. name, address, unique serialised number).
3. The bill must have integrity: It must accurately and verifiably describe the goods and services, the date or period of use, the quantity used, the unit cost and tariff structure, the total amount payable, without and with taxes.
4. Since it is communication that puts an obligation to pay on the addressee, and paying for water services funds a continuous supply of sufficient clean water within a defined distance of a household, the bill must state how much is payable, by when, where and how and what the credit control measures are.
5. It must enable customers to compare their household's consumption with previous months, the municipality's average or similar households.
6. It must set targets, provide a financial incentive for low consumption and payment and educate consumers on how to manage and self-regulate their water use.
7. It must facilitate interaction with the service provider by communicating contact details and assistance procedures.

A Tool for the critical analysis of municipal invoices or bills was developed, based on these requirements and the *Plain English Handbook* (1998), a publication of the Office of Investor Education and Assistance, U.S. Securities and Exchange Commission. The Tool translates qualitative criteria into measurable categories to calculate an index score out of 10, which can be used to assess and compare municipal bills.

The Tool distinguishes five assessment categories:

1. Plain language: clarity and accessibility in language;
2. Plain language: clarity and accessibility in layout and design;
3. Information relating to the bill as a unique obligation to pay for goods and services delivered, as regulated by South African law;

4. Information that addresses the integrity of the bill as required by South African and international regulation; and
5. Information that addresses water conservation and effective water services as required by international examples of regulation.

In each category, a number of assessment criteria apply. In combination, these assessment categories determine an 'ideal' municipal bill that is easy to understand and user-friendly; adheres to policy and legislation; provides enough information to ensure client satisfaction and bill validity; and creates a platform from which water conservation and water management issues can be addressed in a manner that will impact on consumer behaviour.

## Application of the EMI tool

The EMI tool was applied at three levels:

- a. To analyse 36 South African municipal bills and six international best practice bills;
- b. In two case studies (City of Tshwane and eThekweni Metro); and
- c. To test the Tool at a workshop of municipal officials.

The evaluation of 42 bills on the EMI tool showed that, in comparison to the international bills, South African municipal bill scored well on payment information. The other four categories, however, did not yield same positive results.

The City of Cape Town Metro achieved the highest South African score with 7.571 out of a possible 10 points. The City of Cape Town bill is therefore the best practice in South Africa. The new bills of Tshwane Metro and eThekweni Metro also scored above 7.0. Six South African bills scored 5.0 or more out of a possible 10; the rest scored below 5.0 (seven below 3.0, ten between 3.0 and 4.0, and 12 between 4.0 and 5.0).

The SA municipal bills scored very low in the integrity category. Many municipal bills do not comply with legislation, because they do not show how the amounts that consumers are expected to pay for municipal services are calculated. Water meters are not read every month and most bills make no distinction between actual readings and estimations. Corrections of estimations further complicate bills. Bills that lack the basic integrity may lead to reluctance to pay for municipal services, and paying for services is necessary to fund a continuous supply of sufficient clean water and electricity in this country.

South African bills also do very little to reduce our water and energy footprint and lag far behind international best practice in this regard. Customer care and protection have much to improve. South African municipal bills are not standardised at all in terms of language, layout and information.

## Survey

A customer survey was conducted to test the EMI tool and the developed model bill with a national stratified random sample of 2500 urban respondents.

The survey results showed that:

1. The integrity of South African municipal bills is in question. **35% of consumers' doubt the correctness of their municipal bills.**
2. Understanding and ease to find information correlate with trust in the correctness of the information.
3. Although other aspects such as problems with service delivery might have affected the result, the results of the survey prove that, if the clarity of bills improves, consumers' trust in the correctness of the information increases. This could be expected to affect also consumers' willingness to pay for services.

4. **The ordinary South African consumer struggles to find basic information on municipal bills**, such as the amount owed from previous months, the meter reading date, water use and Free Basic Water received:
  - a. It is common practice to use numbers without the unit (R or kl), as well as to include codes that are meaningless to consumers. Consumers have great difficulty to distinguish between numbers without units.
  - b. Consumers, especially those whose home language is not English, find acronyms and abbreviations difficult to decipher.
  - c. Consumers struggle to understand words commonly used on bills, such as *arrears*, *remittance advice*, *rebate*, *consumption*, *opening balance*, *balance brought forward* and *previous*.
  - d. Consumers confuse litres and kilolitres. The survey confirmed that consumers do not understand kilolitre well as a unit.
  - e. Consumers found it very difficult to work out from the sample bills the quantity of water consumed, or the quantity of Free Basic Water that the household received.
5. Consumers in the lower socioeconomic groups require some form of explanation or consumer training to understand their municipal bills.
6. Understanding of the language on the bills correlates with the home language of the reader. The fact that most bills are in English only, impairs understanding for the 90% of South Africans whose home language is not English.
7. Understanding correlates with socioeconomic group. The lower socioeconomic groups have more difficulties to understand their municipal bills than the higher socioeconomic groups.
8. **Simple changes increase consumer understanding of municipal bills significantly.**
9. The analyses on the EMI Tool were confirmed by consumers with two conditions:
  - a. The research confirmed that Information density affects the understanding of a bill negatively, especially if the bill has scored low on language and layout. Readers find a bill where a lot of information is squeezed into a small space, with no white space to guide the reader, very difficult to decipher. If the language and layout is clear, readers are able to find the same information easily. Criteria to this effect will have to be added to the EMI Tool.
  - b. The use of codes, abbreviations and acronyms exacerbates understanding problems, particularly for non-English home language speakers.

## **Towards standards for municipal bills**

As a final output, a standards document or Guide was developed for the standardisation of municipal bills. This document:

- Gives a brief overview of the findings of the study;
- Provide standards for municipalities to improve their bills;
- Explains the EMI Tool and guide municipalities to apply the instrument to their own bills; and
- Provide examples of local and international best practice.

The Guide was sent to all South African municipalities and will be workshopped with municipalities in the follow up project.

## **Conclusions**

This study concludes that municipal bills in South Africa have much to improve on before they will function as a tool to serve consumers and use our water resources effectively.



The results of the study show that the EMI Tool, which was developed to evaluate bills, can be used to effect simple changes that can:

- Make a significant difference to consumers' understanding of their bills;
- Improve bill integrity and consumers' willingness to pay; and
- Save critical resources and decrease our water footprint.

Accurate, clear and understandable bills for consumers are a legislative requirement, but it is also a very important mechanism to improve consumers' trust in the correctness of the information that the municipality has supplied, and the general integrity of municipal bills.

Better understanding will empower consumers to validate the integrity of their bills, which will, in turn, improves consumers' trust in, and support for, their municipalities. Improved consumer trust could have a significant impact on payment.

## Recommendations

It is recommended that municipalities:

1. Assess their bills with the EMI Tool as explained in the Guideline document;
2. Make the necessary adjustments to improve the clarity of their bills as required by legislation, and particularly by the Consumer Protection Act 68 of 2008. Simple changes can drastically increase clarity for the consumer;
3. Do not use a bill that scores less than 7.5 on the EMI Tool;
4. Use the model bills as basis, since it has tested well with a broad spectrum of consumers;
5. Include on their bills comparative consumption information and messages that will encourage consumers to save scarce resources ;
6. Use a two page bill. The results indicate that a two page bill with a summary on the first page and a detailed explanation of tariff structure, meter readings, etc. on the second page, or the back, is a much better option for the broad spectrum of consumers than trying to squeeze all the information onto one page;
7. Provide consumers in the lower socioeconomic groups with education or explanatory information on "how to read your municipal bill". Municipalities should make an explanation of their bill available on their websites and they should also send a hard copy once a year to all consumers.
8. Avoid words that confuse consumers. The study found that many consumers are not familiar with the terminology used on municipal bills, such as 'consumption', 'arrears', Free Basic Water, 'balance brought forward', 'levy' and 'kilolitres'.
9. Provide consumers with municipal bills in their home language or their language of preference; and
10. Test the clarity of bills with consumers. The research has shown that municipal officials who work with bills every day do not know how well the consumers they serve understand these bills.
11. Be discouraged to use colour printing. It is very expensive and does not necessarily contribute to the clarity of the bill. Detail is often lost when these bills are faxed. The use of pre-printed bills is also not recommended, because they tend to misalign row information and column headings.

Printed bills are expensive. New software developments and technology hold exciting possibilities for the design and communication of municipal bills. These distribution technologies extend the unique communication opportunities that municipal bills offer. For example, bills could be generated and distributed via SMS, email and interactive websites; thus saving municipalities thousands of Rands on mailing cost, money which could be used to finance the improved services that citizens are currently demanding.



Accurate metering remains the basis of physical water loss management. And payment for services lies at the centre of commercial water loss. If domestic water users are to become effective in decreasing water loss at domestic level, they should know and understand exactly how much water they are using every minute, and what it costs, so that they can control their use and spending.

Cell phone technology might in the near future integrate real time metering, sales and payment, making bills obsolete and changing reticulated water into a cash commodity.

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