

# Leakage and pressure management:

## reducing non-revenue water loss

Non-revenue water (NRW) is water that has been pumped from a source, but then 'lost' before it reaches the end-customer. Such losses can be 'real' losses (through leaks, sometimes also referred to as physical losses), or 'apparent' losses (e.g. via theft or metering inaccuracies). NRW is quantified as the volume of water 'lost' as a share of net water produced, but can also sometimes be expressed as the volume of water 'lost' per km of water distribution network per day.

### Unbilled Authorised Consumption

Unbilled authorised consumption is the authorised consumption which is legitimate but not billed. All unauthorised use of water like illegal connections, illegal water withdrawal from hydrants, for construction purposes, for example, equates to meter tampering. This consumption puts a strain on the natural resource and does not generate the utility any revenue.<sup>1</sup>

Unbilled Unmetered Consumption

Unbilled Metered Consumption

Unauthorised Consumption

Customer Metering Inaccuracies

### Apparent Losses

Apparent losses is water that is consumed but is not properly measured, accounted or paid for. These losses are also called commercial losses, and include all types of inaccuracies associated with customer metering as well as data handling errors (meter reading and billing), plus unauthorised consumption (theft or illegal use). The losses cost utilities revenue and distort data on customer consumption patterns.<sup>2</sup>

### Real Losses

Real losses are the physical losses of water from the distribution system, including leakage and storage overflows. Essentially, it is the volume of water lost through all types of leaks, breaks and overflows on mains, service reservoirs and service connections, up to the point of user metering. These losses inflate the water utility's production costs and stress water resources since they represent water that is extracted and treated, yet never reaches beneficial use.<sup>2</sup>

Leakage on Service Connections up to point of Customer Metering

Leakage & Overflows at Storages

## There are a number of challenges to reducing high NRW figures, including:



Too few meters in the network - both to measure flow into a zone and consumption by consumers



Inadequate meter management



Poor programs for ensuring continuing governance



Poor quality infrastructure and maintenance



Illegal connections (i.e. theft) leading to high unauthorised use



Limited skills in NRW program development and management

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<sup>1</sup> <http://www.wmi-water.com/WMI/wmi.nsf/web/glossaire.htm&lng=#2U>

<sup>2</sup> <http://www.awwa.org/portals/0/files/resources/water20%knowledge/water20%loss20%control/apparent-real-losses-awwa-updated.pdf>