

6th REGIONAL AFRICAN WATER LEAKAGE SUMMIT 2016
 DBSA VULINDLELA AUDITORIUM, MIDRAND
 GAUTENG, SOUTH AFRICA
 23 - 24 AUGUST 2016

Lean Smart Solutions
 Presented by: Mark Shamley

Participating and supporting organisations:

Water Metering Basics

"To measure is to know" – Lord Kelvin

Every drop of water should be counted
 Because every drop counts.

"To measure **accurately** is to know" – Honeywell

What metering investments provide best value?

- Reliable and accurate basic metering and
- Financially feasible solutions that add value

Water meters are the cash registers for water suppliers

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Smart Meters

- Everyone wants "Smart" meters.
- Word "Smart" loosely used as a marketing term (not technical term) to promote a silver bullet "solution to all utility problems".
- No clear definition of a "Smart" meter in Water Industry.

Smart Metering
 requires reliable power sources

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Smart Meters

"SmartMeter" is an Elster Water Trade Mark

Elster Q200 Electronic Meter

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Simplified Definition of Smart Meters

A Smart Meter is a measuring device that, as a minimum requirement, is capable of communicating data to a remote interface at regular intervals.

In it's basic form, smart metering is Automatic Meter Reading (AMR).

"Continuous" AMR → Logging

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Latest in Smart Metering - LoRa Technology

LoRa™ RF technology is a long range and secure, bidirectional communication.

Features:

- Low Power WAN
- Ideal for Internet of Things (IoT), metering, security, asset tracking, and machine-to-machine (M2M) applications
- Honeywell piloting LoRa in SA (water meters) – 10.7km LoS

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Smart Meter Financial Feasibility

Cost Comparison: Smart Metering Vs Basic Metering *			
Number of Units	10 000	100 000	
Additional Smart Cost	R 7 285 091	R 70 671 103	
Smart Costs : Basic	2.5	2.5	

- * Product cost only
- * Smart costs for basic Walk / Drive-by-AMR

Is there another financially feasible solution that can eliminate or minimise the challenges that Utilities face?

“Lean Smart” Metering (Do more with less)
 – Smarter solution that excludes the high costs associated with “smart” electronics added to each meter
 e.g. 100,000 meters require an additional ZAR 70.7M to upgrade good meters to become basic “smart” meters.
 – Smart meter projects are not always financially feasible.

Lean Smart Metering Solution Meter Reading and Billing Smart Phone App

Meter Reading and Billing Smart Phone App

- Seamless digital meter reading solution that uses affordable smartphones to collect meter information, readings, pictures and GPS co-ordinates for water or electricity connections.
- Meter Reader or Consumer inputs meter reading into smart phone App, data read by online platform.
- Automated message sent to consumer with:
 - Opening Reading
 - Closing Reading
 - Water / Electricity usage in period
 - Invoice amount / Bill
- Online payment option via separate App (integration into App planned).
- Replaces paper forms and adds functionality such as time-stamped pictures of the meter reading and GPS co-ordinates.
- Mobile App can be complete in 4 weeks.



Meter Reading and Billing Smart Phone App

Lean Smart Metering can solve the majority of challenges experienced by utilities:

Utility Challenges	Smart Meter	Lean Smart Metering
Accurate Meter Reading	✓	✓
Management of FBW		✓
Billing Issues		✓
Revenue Generation		✓
Visual Check - Tamper		✓
No costly “smart” device		✓
Retention of reader jobs		✓



* Assumes that reliable and accurate meter is used

The Challenge And the Opportunity

Water is very Cheap

Description	Cost	Cost per lt
Tap Water 1kl *	R13,91	1,39c
Bottled Water 500ml	R7,00	R14,00
Coca Cola 2lt	R17,00	R8,50

Difference
> 1,000 X
> 600 X

* Average consumer cost of water, JW rates, 30kl consumption per month

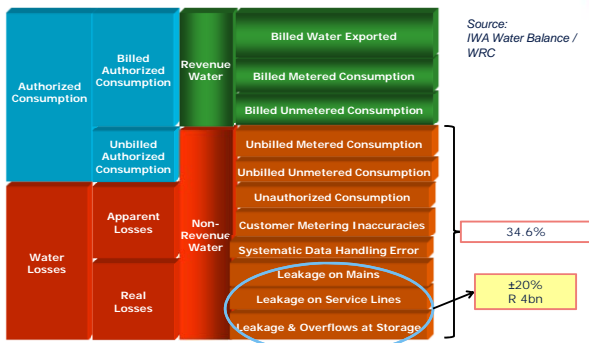
Water Is very Cheap



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IWA Water Balance

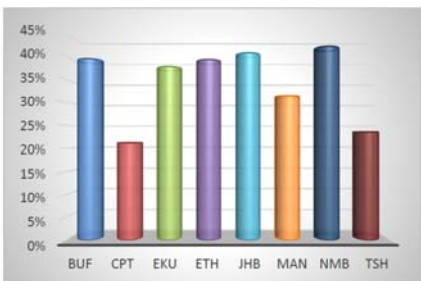


Source: IWA Water Balance / WRC

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Non-Revenue Water (NRW) - Met



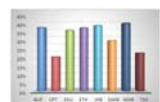
Metro NRW weighted average = 34.5%
Water scarcity is **not** the only real problem

Source: DWS 2015 No Drop Report

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High NRW = Opportunity!



NRW in Tokyo = 3%, Sydney = 12%
High NRW in SA is a problem but also an opportunity.

Reducing NRW to 25% can reduce system input volume (SIV) by 10% and can generate an additional ZAR 2bn. (And equates to more than one month's additional water every year)

Minimise water losses:

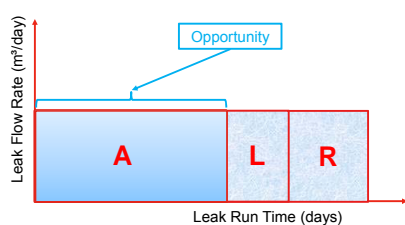
- Pressure management,
- Active leakage control,
- Asset management,
- Speed and quality of repairs

Source: DWS 2015 No Drop Report

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Impact of Leak Run Time



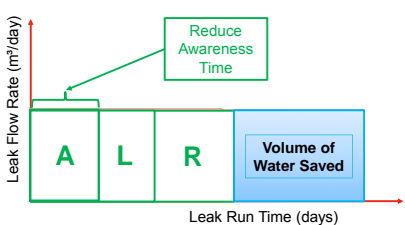
A Awareness Time
L Location Time
R Repair Time

Leak Run Time x Flow Rate = Volume of Water Lost
 $(A + L + R) [d] \times \text{flow rate} [m^3/d] = \text{Water Lost} [m^3]$

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Impact of Leak Run Time

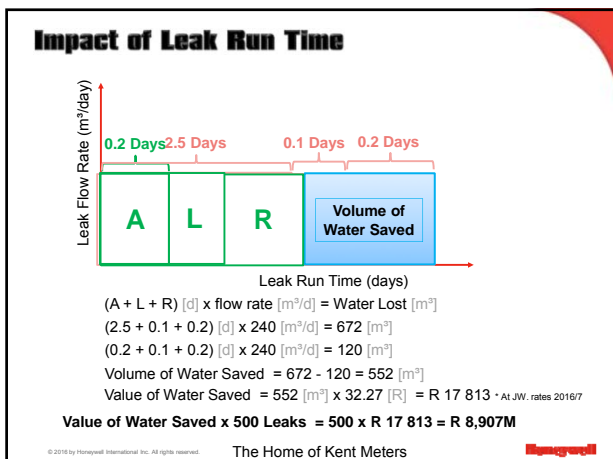


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War on Leaks

President Jacob Zuma announced at the State of the Nation Address (SONA) 2015:

"Let me Honourable Speaker and Chairperson urge all in the country to conserve water. Every drop counts. The country loses seven billion rand a year to water losses. To mitigate this challenge, Government through the Department of Water and Sanitation will train fifteen thousand artisans and or plumbers who will fix leaking taps in their local communities."

Phase 1 - September 2015 with 3000 trainees - plumbing, instrumentation, fitter and turner, electrical, welding and water agents.
 Phase 2 - 7000 trainees on the 10th of August 2016.
 Phase 3 - 5000 trainees.

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Lean Smart Solution Water Incident Reporting Smart Phone App

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Water Incident Reporting Smart Phone App

High volume of water leakage (NRW = 36.8%) - also opportunity

How can leakage be reported as soon as possible to minimise water losses (reduce Awareness Time)?

22.8M South Africans carry with them a sophisticated tracking device - smart phone (PwC 2014).

Solution - Water Incident Reporting App.

Allow anyone to actively report water issues via the App e.g. water leaks, water quality, pressure problems, infrastructure theft, etc. instantly and conveniently - from their phones, from wherever they may be.

To report leak, open App, one tap - will allow for reporting of leak (or other water issue) and pin point position utilising GPS co-ordinates.

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Water Incident Reporting Smart Phone App

Allows the Utility to dynamically respond to the issue logged (quickly respond to leaks and reduce water lost due to leaks), and Plot and record water issues against geographic locations.

This framework could tightly integrate the water utility's core operations (possibly including War on Leaks Teams)

Convenient, easy to use, cost-effective tool to reduce water wastage.

Raise awareness of water use by engaging and empowering citizens. Smart Citizens = Smart City.

Mobile App can be complete within 4 weeks!

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Lean Smart Solutions - Conclusions

Do smart metering projects have a reasonable and feasible financial payback?
 It's been financially a very bumpy ride for many smart metering projects

There is "no one size fits all" solution in metering or Smart metering:

- A Reliable and Accurate meter: Informed and optimised data management analysis and decisions can be made and Accurate billing and enhanced revenue collection
- Focus on selecting the right investment
- Also consider tools and technologies to do more with less ("Lean Smart Solutions")

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