

5th REGIONAL AFRICAN
WATER LEAKAGE SUMMIT



LATEST DEVELOPMENTS IN WATER METER TECHNOLOGY

23 June 2015

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Mark Shamley
Elster Kent Metering

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AGENDA



1. Trends in Water Metering
2. Good Revenue Vs Poor Revenue Meter
3. Developments in Metering Technology
4. Smart Metering

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TRENDS IN WATER METERING



“To measure is to know” – “every drop” of water that is sourced needs to be accounted for throughout the supply chain

Trends - reliable and accurate basic metering and solutions that add value:

- Good Revenue Meters – good volumetric, hybrid C&I, static. Nothing beats getting the basics right - an accurate reading
- Automatic Meter Reading (AMR) – walk-by / drive-by for value and consistent readings, Cellular AMR
- Meter Data Management (MDM) – Smart Metering, Cloud-based, Internet of Things (IoT), Mobile Applications – Billing, Leak Detection, Logging
- Prepayment (STS) – similar system to electricity PP, costs
- Water Management Devices (WMD) – FBW, shut-off valve

But don't underestimate the value of a reliable and accurate good revenue generating meter




Water meters are the cash registers for water suppliers



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IWA WATER BALANCE



Authorized Consumption	Billed Authorized Consumption	Revenue Water	Billed Water Exported
	Unbilled Authorized Consumption		Billed Metered Consumption
Water Losses	Apparent Losses	Non-Revenue Water	Billed Unmetered Consumption
			Unbilled Metered Consumption
	Unbilled Unmetered Consumption		
	Unauthorized Consumption		
	Customer Metering Inaccuracies		
	Real Losses		Systematic Data Handling Error
			Leakage on Mains
			Leakage on Service Lines
			Leakage & Overflows at Storage

Source: IWA Water Balance

±5% of Consumption

36.8% (1.58m³)
R 7.2bn

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METER SERVICE LIFE



- Most local domestic meters are mechanical devices
- Performance (accuracy) is affected by the volume and quality of water passing through the meter



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METER SERVICE LIFE



- Some meters are designed to cope with South African water conditions which contains a relative high degree of suspended solids
- Most competitive meters do not cope well with suspended solids and accuracy is severely impacted design life 6 years



COST EFFECTIVENESS OF QUALITY

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Poor performance of cheaper products

**“Price is what you pay,
Value is what you get”**
Warren Buffett

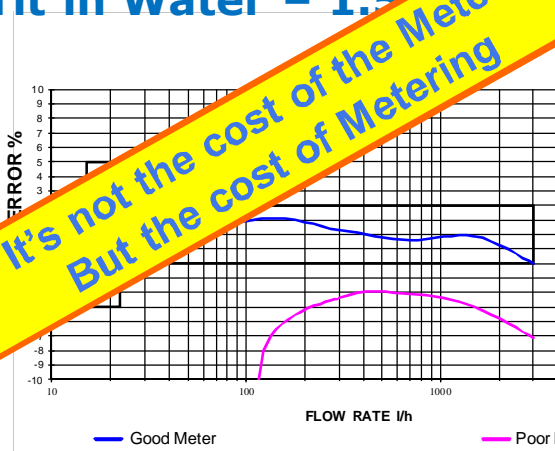
	Meter Error	Actual Usage per Month (kl)					
		10.0	15.0	20.0	30.0	40.0	50.0
Actual Reading p.m. (kl)	-2.0%	9.8	14.7	19.6	29.4	39.2	49.0
Lost Revenue p.a. (R)	-2.0%	R 16.32	R 39.85	R 76.94	R 152.86	R 218.11	R 336.96
Actual Reading p.m. (kl)	-10.0%	9.0	13.5	18.0	27.0	36.0	45.0
Lost Revenue p.a. (R)	-10.0%	R 81.60	R 199.26	R 384.72	R 764.28	R 1 090.56	R 1 684.80
Payback Period (m) at	-10.0%	2.66	1.09	0.56	0.28	0.20	0.13
Cost of Elster Meter		R 208.00					
Cost of Cheap Meter		R 190.00					

* JW Residential Water Tariffs 2015/2016

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GOOD VS POOR REVENUE METER

Accuracy Tests after 500 Hours with Grit in Water – 1.5m/s – C Meter



It's not the cost of the Meter,
But the cost of Metering

At 30m³/month consumer consumption, a 9.95% measuring difference equates to a loss of R760,46 per meter per annum

Payback on R18 meter price difference is 0,28 months

500,000 units – R380m per annum

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GOOD REVENUE WATER METERS

SAMSUNG - 48" FHD LED



* R7,000.00

FONG KONG – 48" FHD LED



R6,000.00
Was: R6,500.00

* DionWired Pricing as at 10 June 2015



METER ACURACY


Prime factor in the control of metering costs:

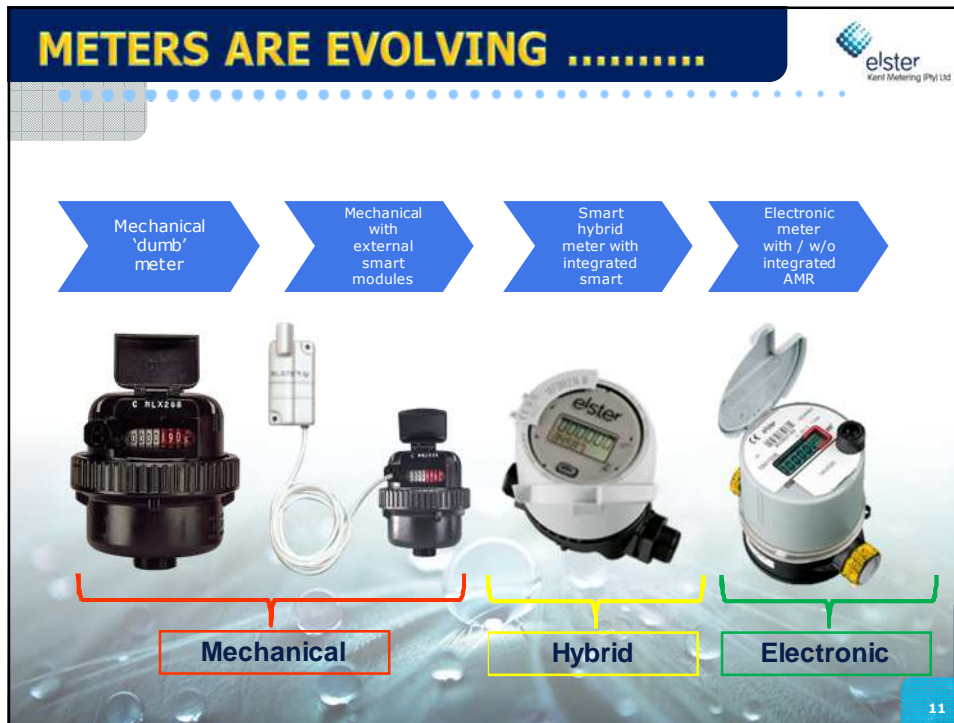
- is not the price of the meter,
- but the effective cost of a meter in terms of maintenance cost and water losses over a period of time

A more expensive meter with superior long term performance and service life can be more economical than a cheaper but more short lived water meter

“Price is what you pay,
Value is what you get”

Warren Buffett





HYBRID SMART WATER METERS


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Hybrid meters are a combination of mechanical and electronic meters:

- One mechanical moving part as the flow / volume sensor, combined with electronic signal transmission and counters
- With only one moving part, accuracy is improved while wear and tear is minimised
- Intelligent LCD counters (alarms, etc)

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C&I (BULK) HYBRID METERS



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C&I Hybrid meters provide the widest measuring range of a single element meter.

C&I hybrid meters could make combination meters obsolete:

- Wide measuring range
- Lower price
- No change over valve
- Single electronic register to read
- Electronic register pre-equipped for AMR/AMI
- Easy retrofit of mechanism into H4000 body




H5000 Hybrid

Range: 40-150mm

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C&I HYBRID H5000



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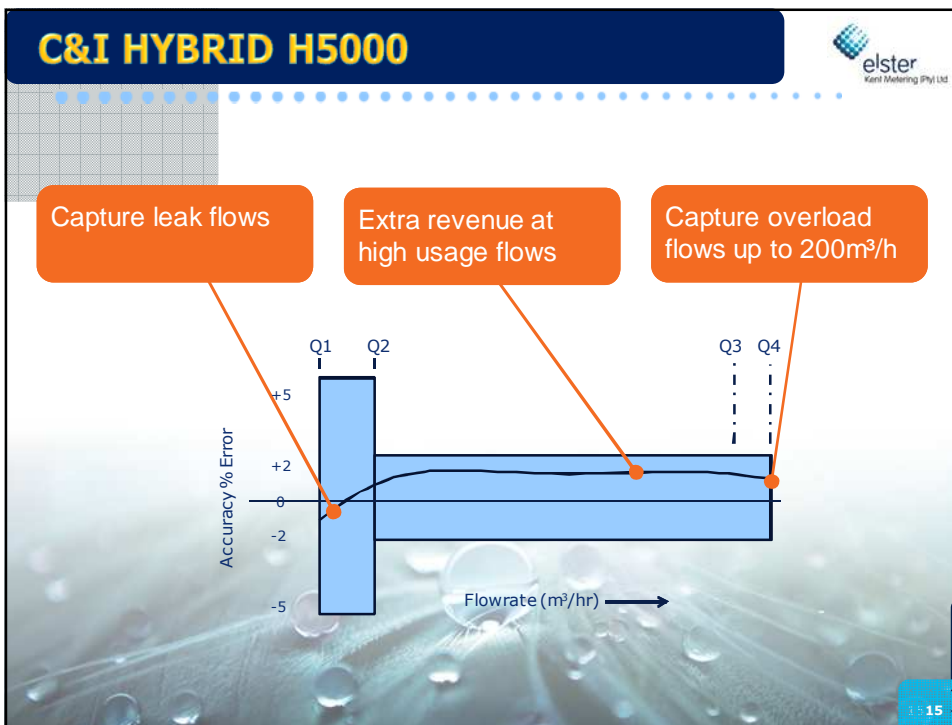
Comparison at measuring ranges (DN50)

Meter Type	Min Flowrate (m³/h)	Max Flowrate (m³/h)
H5000	0.04	79
Single Jet Meter	0.1	25
Woltmann Meter Vertical (WS)	0.25	25
Woltmann Meter Parallel (WP)	0.5	63

“ We are now seeing flow 24/7 which means we can quantify leakage at far lower levels. ”

BARRIE LIGHT, LEAKAGE SUPERVISOR,
SEMBCORP BOURNEMOUTH WATER

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C&I (BULK) HYBRID METERS

H5000 Hybrid

The World's most accurate commercial turbine meter

- Pays for itself in less than a year..... (profit of €1,949 per annum)
- Returns €29,235 profit during its lifetime!

Recent pilot in Europe (DN50)
(typical European flow profile data. 138,000m³ per annum @ €1 per m³ of water)

ELECTRONIC WATER METERS




Electronic meters have no moving parts and as a result can cope with suspended solids and do not measure air




In theory, measuring capability and accuracy remains constant for the life of the battery



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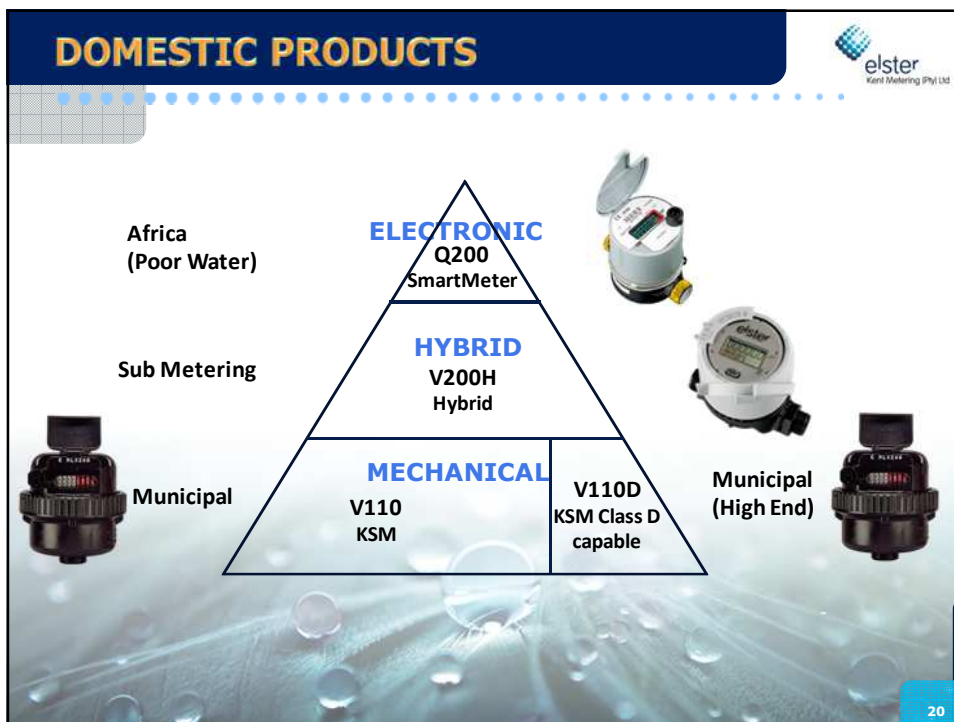
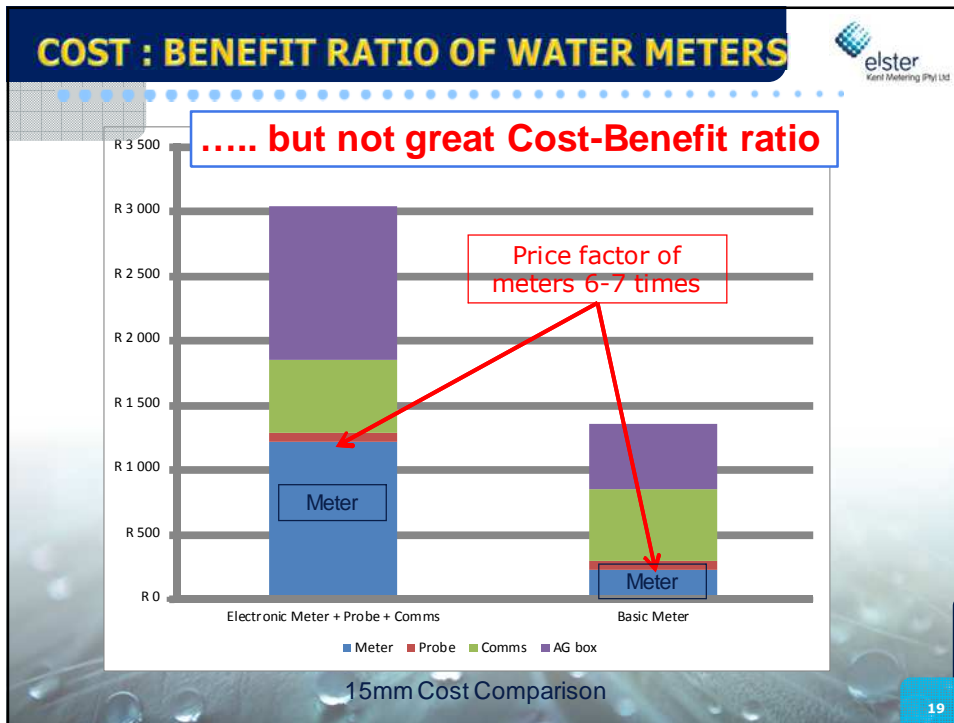
COST VALUE BENEFIT OF WATER METERS

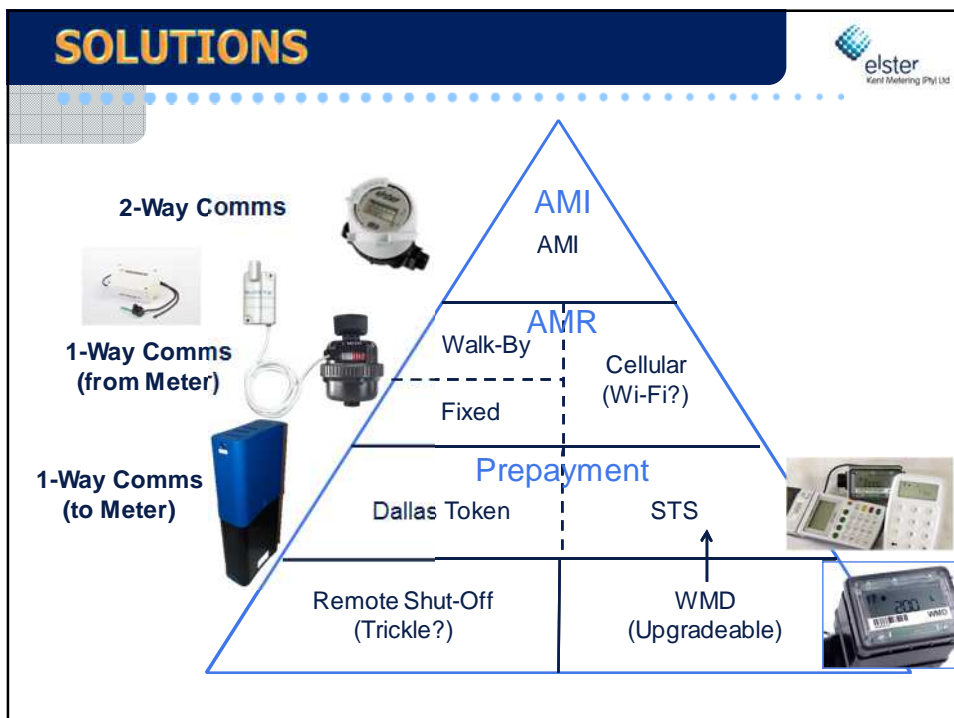
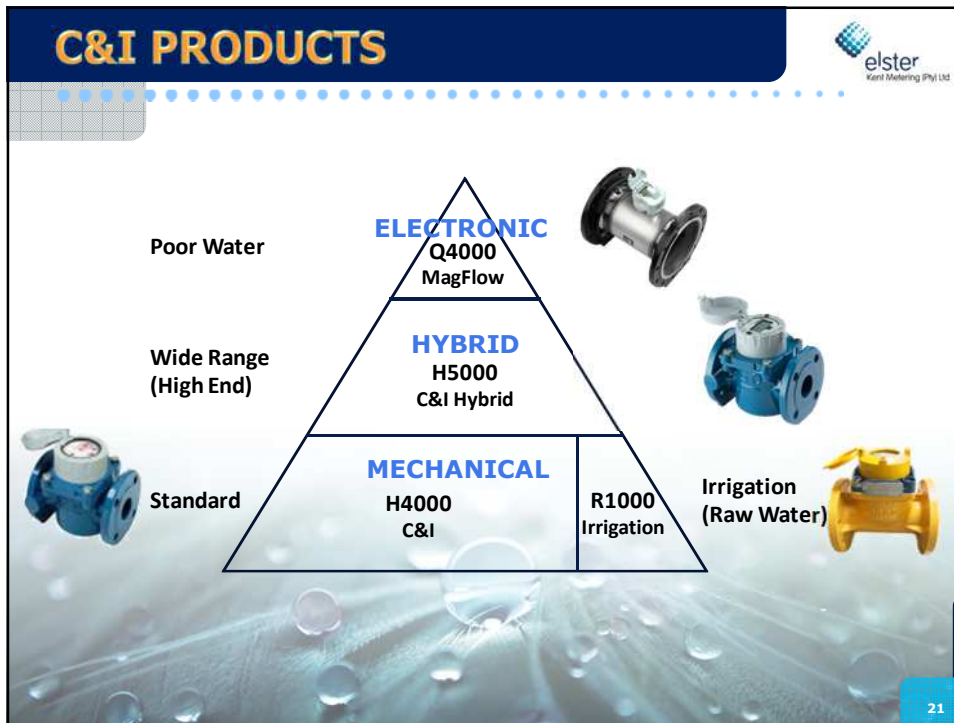


<p>SAMSUNG - 65" CURVED UHD LED TV</p>  <p>* R49,900.00</p>	<p>SAMSUNG - 48" FHD LED</p>  <p>* R7,000.00</p>	<p>FONG KONG - 48" FHD LED</p>  <p>R6,000.00 Was: R6,500.00</p>
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* DionWired Pricing as at 10 June 2015

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AUTOMATIC METER READING (AMR)



AMR (Automated Meter Reading) is the fundamental technology that enables:


- Collection of data from meters via one-way communications using radio frequency
- Integration of information back into a database for billing or basic analysis

This eliminates manual readings, and means that billing can be based on actual consumption rather than on an estimate, giving customers better control of their water consumption. AMR is the foundation for AMI.



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SMART METERS



- No clear definition of a “smart” meter, term “Smart” loosely used to “upsell” meters – media articles

Smart prepaid meters: Meralco secures regulatory green light for 40k rollout

In South-East Asia, the Philippines' largest distributor of electrical power has secured regulatory approval for a 40,000 rollout of smart prepaid meters.

Smart lighting most popular home automation product, says survey

In the US, a survey conducted by global firm, ON World, reveals that smart lighting is the most popular home automation product among consumers are likely to use within the next 12 months.

Smart meters: France's Engie offers 'Dolce weekend' tariff

In Lyon, France, GDF Suez or Engie as it is now called, has launched its first commercial smart meter specifically for consumers with Linky smart meters.


World Bank initiative aims to develop renewable-friendly smart grids

Low-income as well as developing countries can apply to the World Bank's Energy Sector Management Assistance Program (ESMAP) for help with grid modernization to allow them to handle the volumes of wind and solar energy.

Washington Gas selects IP solution for smart distribution network

In the US, global telecommunications company Alcatel-Lucent and California-based communications software provider Trilliant will work with Washington Gas to create an IP utility network for the purpose of increasing efficiency and safety of gas distribution.

Smart Metering requires reliable power sources



SMART GRIDS: say YES to time synchronization

Milton Keynes leverages IoT for innovative smart city services

City of Milton Keynes is reported to be one of the first in England to establish a city-wide, open access (IoT) network in a bid to create a smart city infrastructure as a testing ground for smart city services.

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DEFINIFITON OF SMART METER



- “A smart meter is an Internet-capable device that measures energy, water or natural gas consumption of a building or home. Whereas traditional meters only measure total consumption, smart meters record when and how much of a resource is consumed.” Source: w hatis.com
- “A smart meter is usually an electronic device that records consumption of electric energy in intervals of an hour or less and communicates that information at least daily back to the utility for monitoring and billing.” Source: Wikipedia

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DEFINITION OF SMART METER



- Simplified Definition: A Smart Meter is a measuring device that is capable of communicating data to a remote interface at regular intervals
- In it's basic form, smart metering is Automatic Meter Reading (AMR)



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BENEFITS OF SMART METERS



Benefits to Utility:

- Read meter remotely / no access required to properties
- Improve meter reading performance – efficiency and accuracy
- Proactive leak detection
- Tamper detection
- Reduced water pumping through reduced water leakage

Benefits to Consumer:

- Provide greater information to customers in relation to their consumption, which enables them to make informed, proactive decisions about their water usage
- Provide information to customers that allow them to identify household leakages
- Support more frequent and accurate customer billing

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CONCLUSION



**“Price is what you pay,
Value is what you get”**

Warren Buffett

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Leading the World
in Metering Technology

Thank You

Mark Shamley
 +27-11-470-4900
mark.shamley@elster.com
www.elster.com

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METERING TYPES



Metering types:*

- **Accumulation meter** – Single meter read every meter reading period measuring accumulated consumption
- **Pulse meter** – where consumption is recorded when a certain volume is consumed e.g. 0.5L, 10L
- **Interval meter** - where consumption is recorded at specific time intervals e.g. 15 minutes, hourly, monthly (and the volume of water consumed to that point)
- Interval metering is comparatively more expensive than pulse metering, as the interval meter is required to constantly monitor the water flows through the meter and record this volume at the expiration of the metering interval
- **Use of pulse metering is more common in the water industry and these pulse meters are available at reasonable cost**

* Smart water Metering Cost-Benefit Study by Marchment Hill Consulting

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