

# Some advantages and disadvantages of “smart” water metering for single and multi- unit developments

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IPIQ Seminar & Expo

Urban Brisbane Hotel, Spring Hill, November 29<sup>th</sup>, 2013

# ***Presentation outline***

- Background on our research centre & why I am here today
- What makes a meter “smart”?
- Sub-metering requirements in Qld
- Recent review of smart metering in Australia
  - Results from the Survey
  - Business Case Drivers, inc. sub-metering
  - Conclusions and Insights

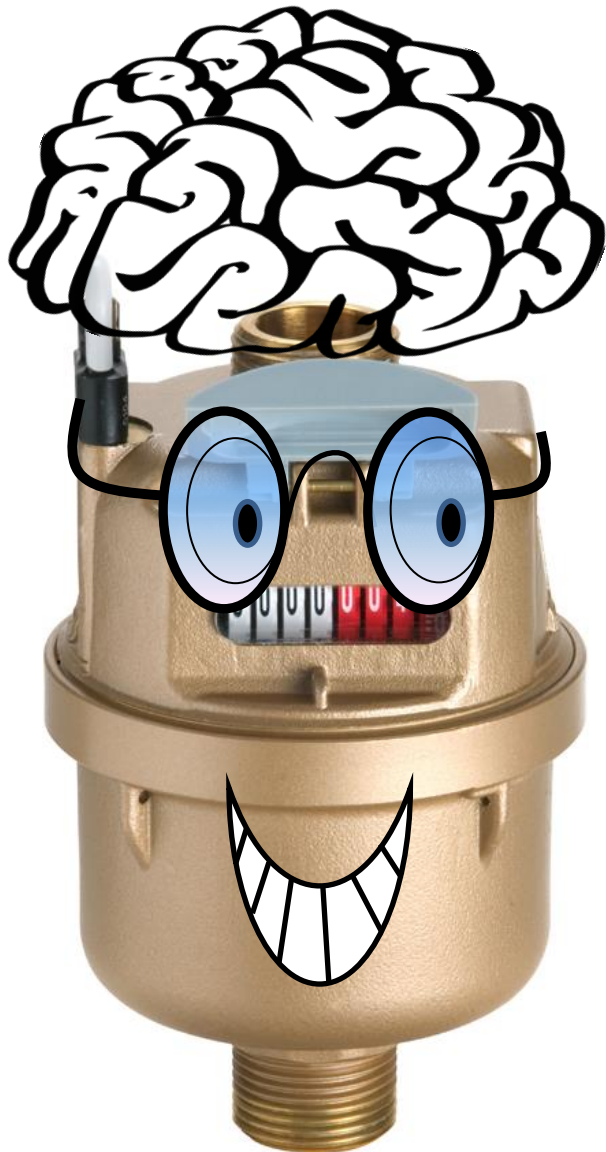
# *Smart Water Research Centre*

- Strategic partnership between industry and universities
- Laboratory services, education & training, research programs
- Water resource science & research team
  - Smart metering and residential water end-use projects (SEQ, FNQ, UAE)
  - Nation-wide review of smart metering / intelligent water networks





# *What's smart about it?*

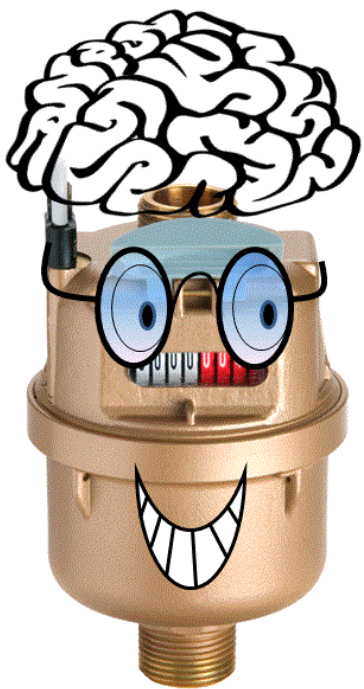


VERSUS



# ***What's smart about it?***

- Several definitions, e.g. WSAA states:
  - Automated collection of meter reads:
    - requiring meter reader to be nearby (**Automated Meter Reading**)
    - Remote, wireless collection (**Advanced Metering Infrastructure**)
- Some have two-way communications



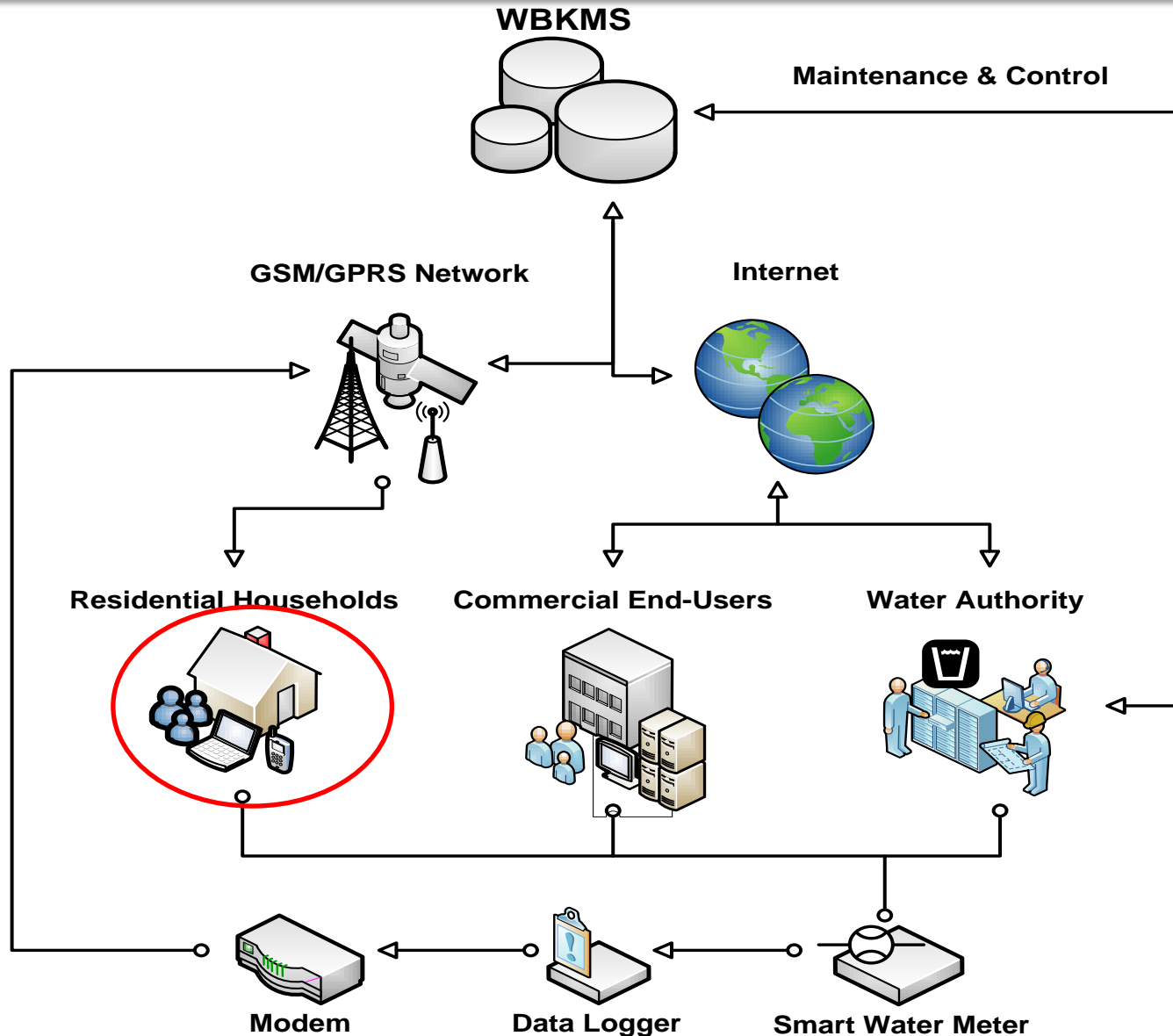
# ***What is an “Intelligent Water Network”?***

- Again, several definitions/opinions but in general:

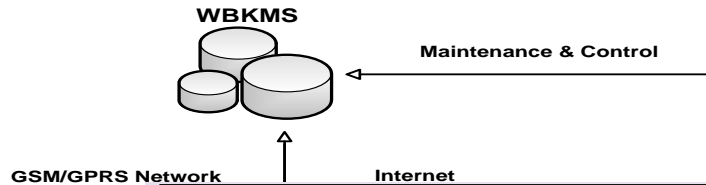
*“The integration of intelligent devices including water meters, pressure sensors, data into business process and using this information to guide and improve strategy, investment and customer service”*

— WSAA definition

# *Intelligent Water Networks*



# Intelligent Water Networks



## WATER BUSINESS X: INTELLIGENT METERING SYSTEM

Welcome: 5 Smith Street, Brisbane, Queensland

Log out

Please make a selection from the following:

News

My Usage and Budget

**Water End Use Reports**

Comparative Usage

Rebate Schemes

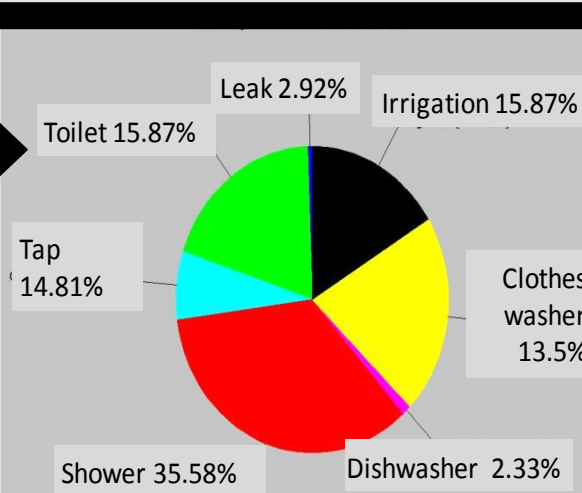
Reduce Your Consumption

View / Pay Bills

Leak alerts

Contacts

Day - 19 October 2012, Water Consumption End Use Report



### Quick Summary: My Usage

Target Usage Per Day: 480 L/hh/d

Yesterdays Usage: 496 L/hh/d

Yesterdays Average Daily Household Consumption: 510 L/hh/d

Last Weeks Average Daily Household Consumption: 472 L/hh/d

Fixture Category	Water Usage (L/hh/d)	Percent (%)
Leak	15.28	2.92
Toilet	83.08	15.87
Clothes washer	70.59	13.49
Shower	186.21	35.58
Dishwasher	12.20	2.33
Tap	77.52	14.81
Irrigation	78.54	15.01
Total	523.42	100



# ***Sub-metering in multi-unit properties***



# ***Sub-metering***

- Condition to sub-meter multi-unit properties (MUP) introduced in 2007 for 2008 start
- Very narrow window (1 week!) for stakeholder comment prior to introduction of policy
- Help track individual dwellings water consumption, streamline water charges and promote customer equity (pay for what you use)
- AMR or basic smart meter requirements
- Developer required to ensure master and sub-meters are installed.....

# ***Sub-metering – challenges!***

- Costs high - for developer and building owners & for LGA's to inspect, assess, approve
- Difficult to streamline the installation process as requirements differ across LGA's and water service providers
- Ambiguity of sub-metering requirements on existing buildings and extensions
- **Often, water service provider does not read / bill from sub-meter**

# ***Who is doing what with smart metering?***

- SWRC engaged by WSAA to conduct an Australian review of smart meter projects
- Online survey send out to all water utilities who registered for the WSAA Smart Metering Workshop (August this year)
- Follow up interviews with selected utilities

# On-line survey

## Smart Metering and Intelligent Water Networks - WSAA Workshop Participant Survey.

This survey is required to be completed by all utility participants of the WSAA Smart Metering and Intelligent Water Network Workshop (13-14 August 2013).

The purpose of this survey is to gather information on "who is doing what" in the area of smart metering (SM) and intelligent water networks (IWN) across Australia.

Results from the survey will be collated, analysed and then summarised at the WSAA workshop in August.

The survey should take no more than 20-25 minutes. It is recommended you have information about any SM / IWN projects (e.g. costs, time-frames, equipment specifications, customer engagement strategies, key business case points) in front of you before you begin, as there is no capacity to save the survey responses - the survey must be completed all in one go. AS A GUIDE, PLEASE REFER TO THE ATTACHED PDF FOR AN EXAMPLE OF A COMPLETED SURVEY. Thank you for your participation.

\* Required



Name of utility or organisation \*

e.g. Water Corporation of Western Australia

Project or program name \*

e.g. "Kalgoorlie Smart Metering Trial".

Current status of project / program \*

- ☐ Initial discussions only
- ☐ Currently developing business case
- ☐ Trial phase being developed
- ☐ Trial phase underway
- ☐ Trial phase completed and no further work likely to occur
- ☐ Trial phase completed and developing business case for larger roll-out
- ☐ Operational roll-out currently underway
- ☐ Operational roll-out completed and no further action
- ☐ Operational roll-out completed and subject to ongoing evaluation and assessment
- ☐ Other:

Key challenges and lessons learnt from the project (dot points are sufficient) \*

e.g. "Timeframe for roll out was unrealistic, budget, customer apprehension/complaints, integrating with existing billing system was very difficult".

If you have any background documents, presentations, business case material or other information that you are happy to share with us, please email to Dr Cara Beal:

[c.beal@griffith.edu.au](mailto:c.beal@griffith.edu.au)

Please indicate if you are happy to be contacted for a brief telephone discussion of your project \*

This is also an opportunity for you to share further relevant information if you have been unable to do so while completing this survey.

Any other comments or observations that you have regarding the program or proposed program??

If you have any questions regarding this survey please contact: WSAA on +61 (0) 3 8605 7666

This is the end of the survey.

Thank you very much for completing it, your responses are valued.



Never submit passwords through Google Forms.



# ***In-depth interviews***

- From the 26 water business respondents, 4 were selected for an in-depth interview
- Water businesses that had completed at least a pilot roll-out of a SM/IWN project
- Seeking to extract empirical evidence of benefits of such SM/IWN project

# *Review of Smart Metering...*

## 2013 Australian Review of Smart Metering and Intelligent Water Networks

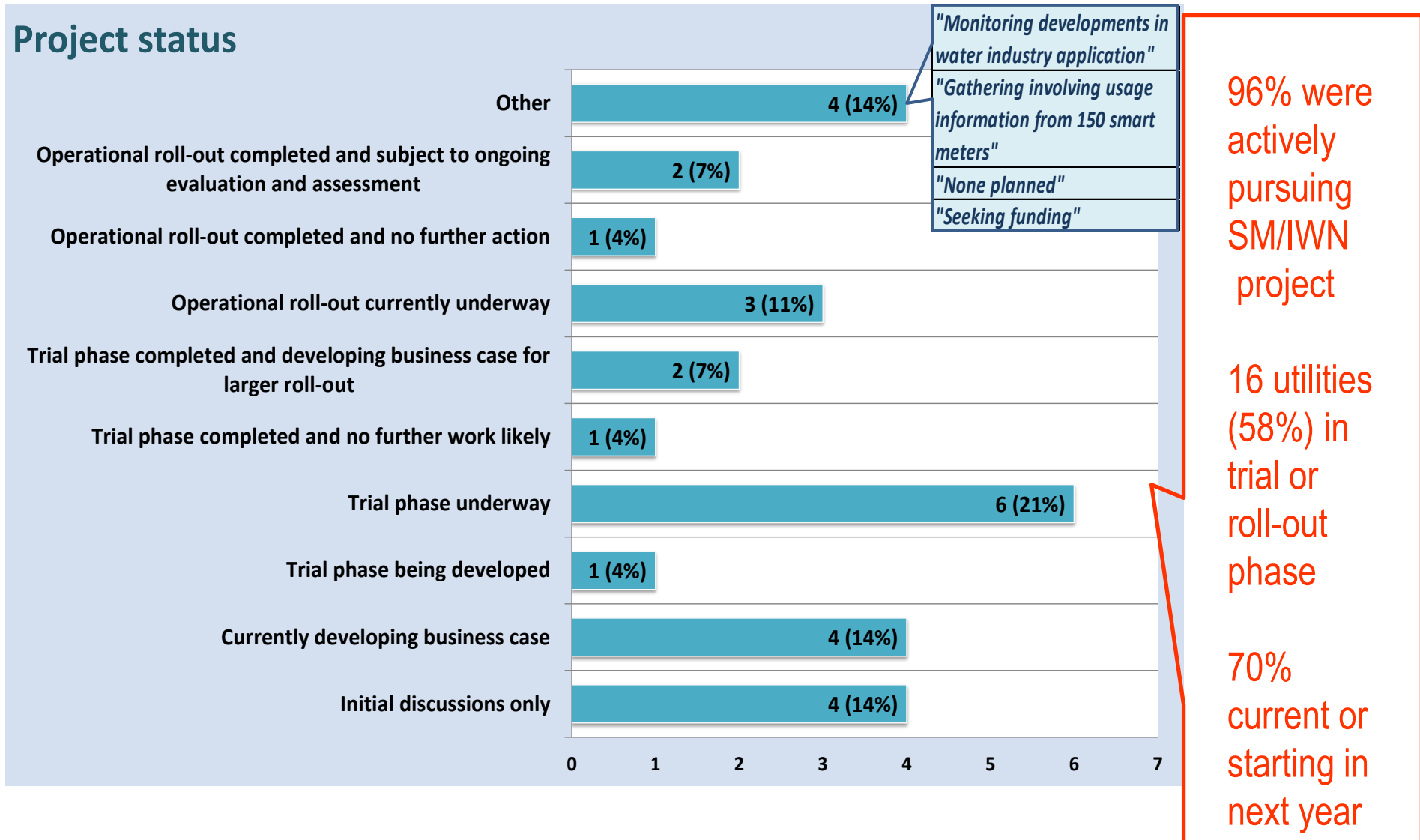
A study of Australian urban water utilities activity in smart metering and intelligent water networks, the challenges they face and the business cases justifying investment.

smartwater  
Research Centre

science  
securing  
our  
future

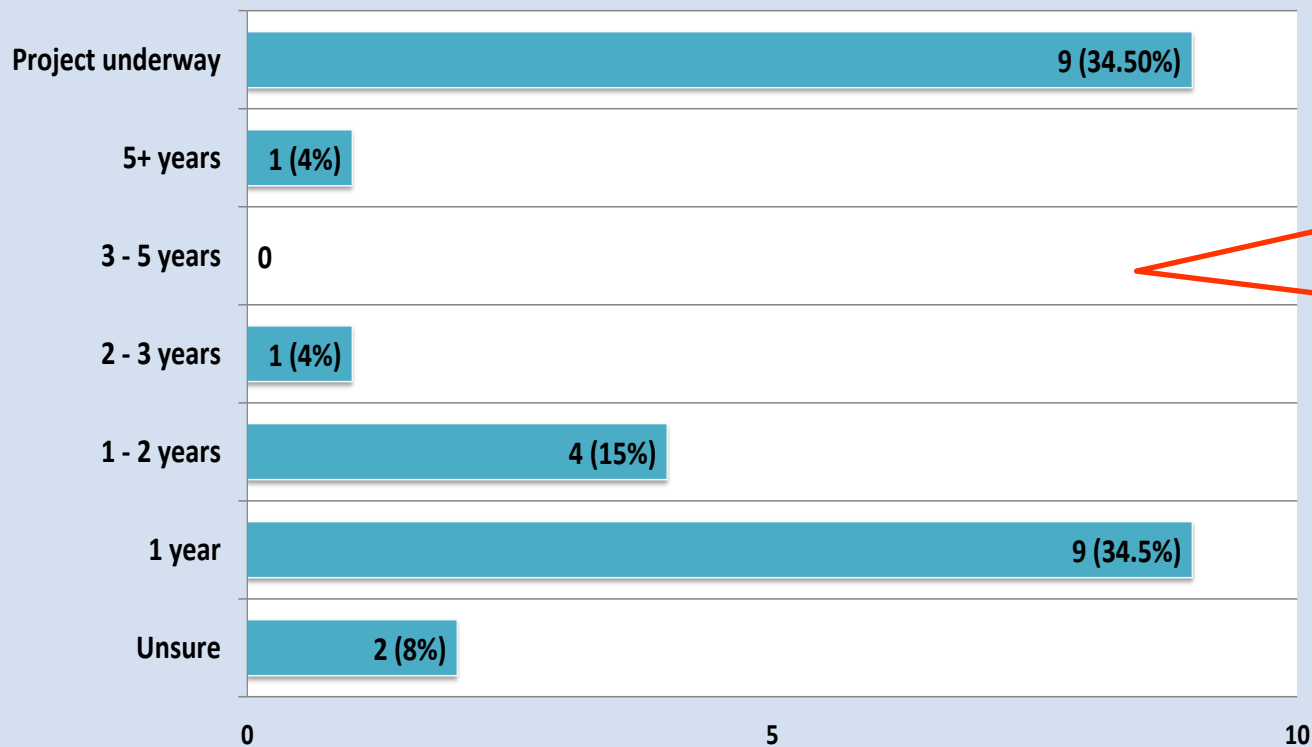
Dr Cara Beal,  
Research Fellow  
PhD, BSc(Hons)  
Joe Flynn  
Adjunct Research Fellow  
BEng, MBA

# Project status



# Project Timing

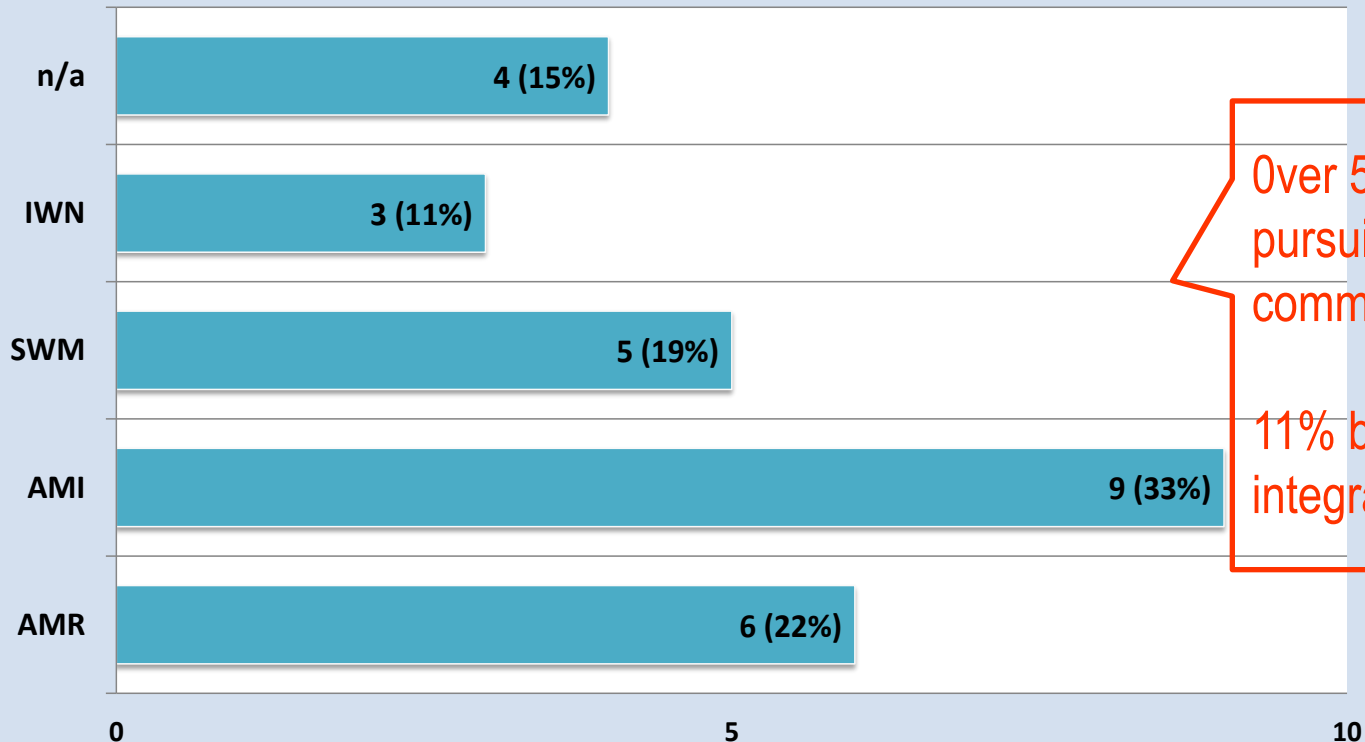
## Project timing



70% SM/IWN  
project  
underway or  
starting in next  
12 months

# Applied Technology

## Applied technology



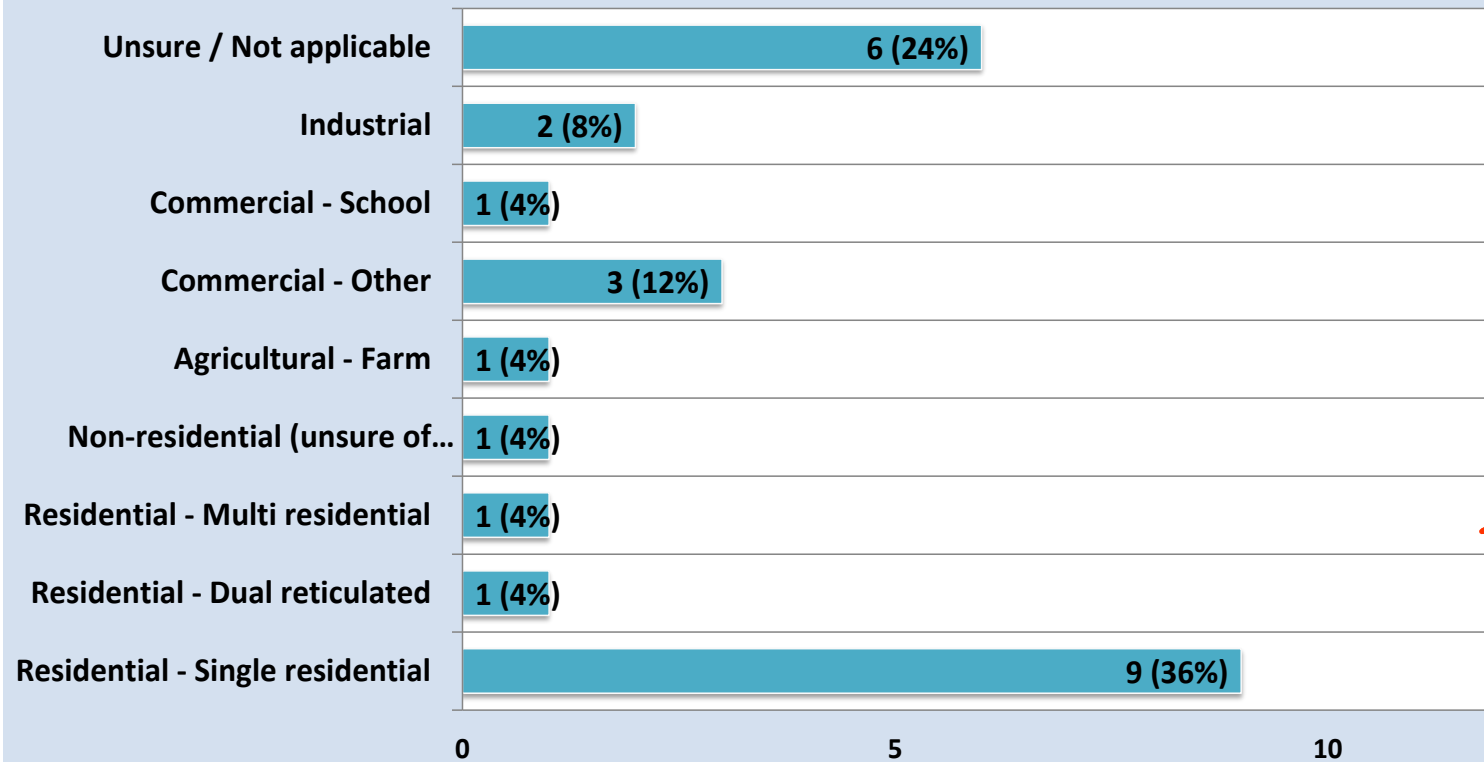
Over 50% are pursuing 2 way communications

11% business integration



# *Where are the meters?*

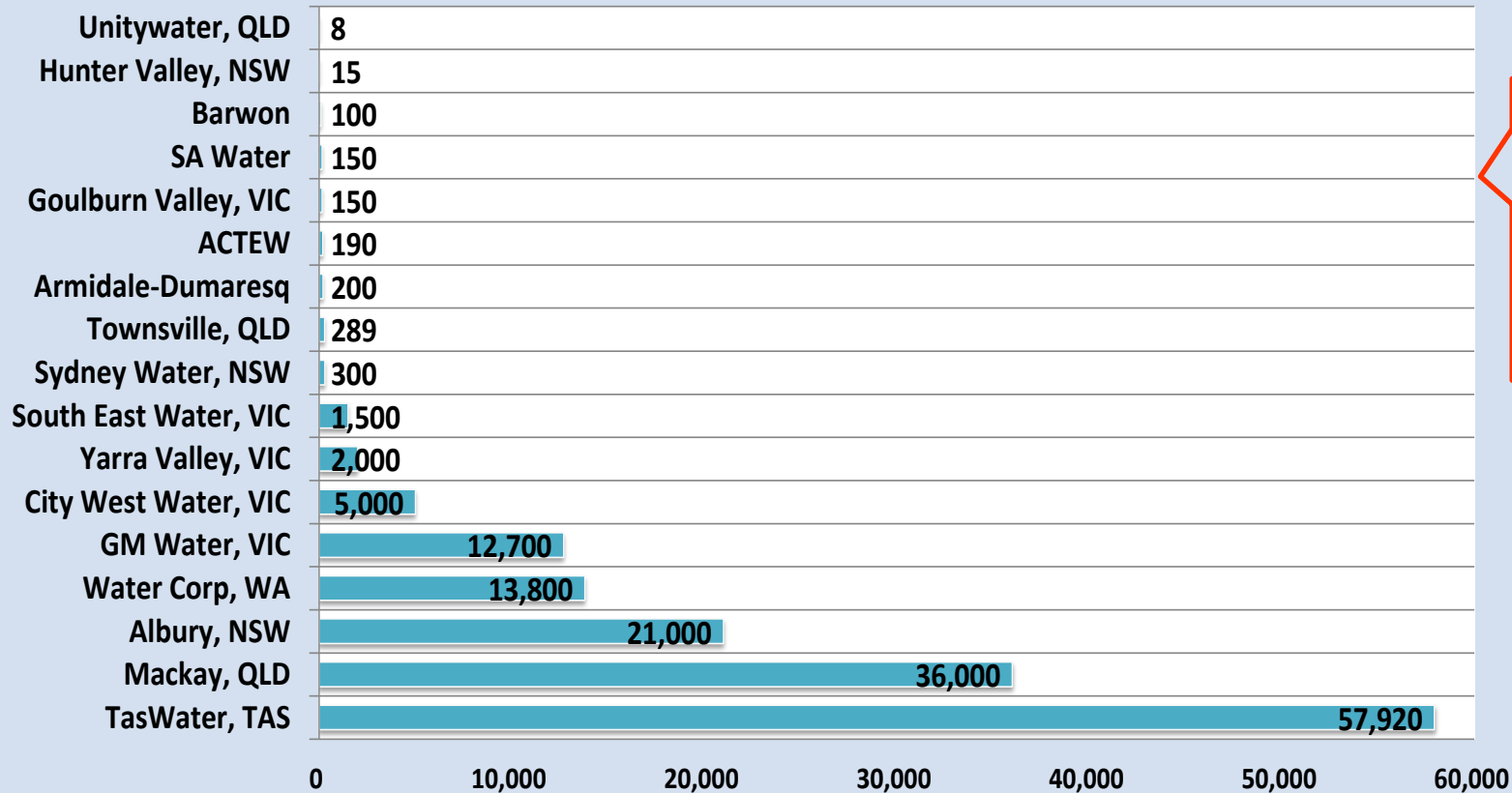
## Customer type breakdown



Residential  
properties  
typically metered

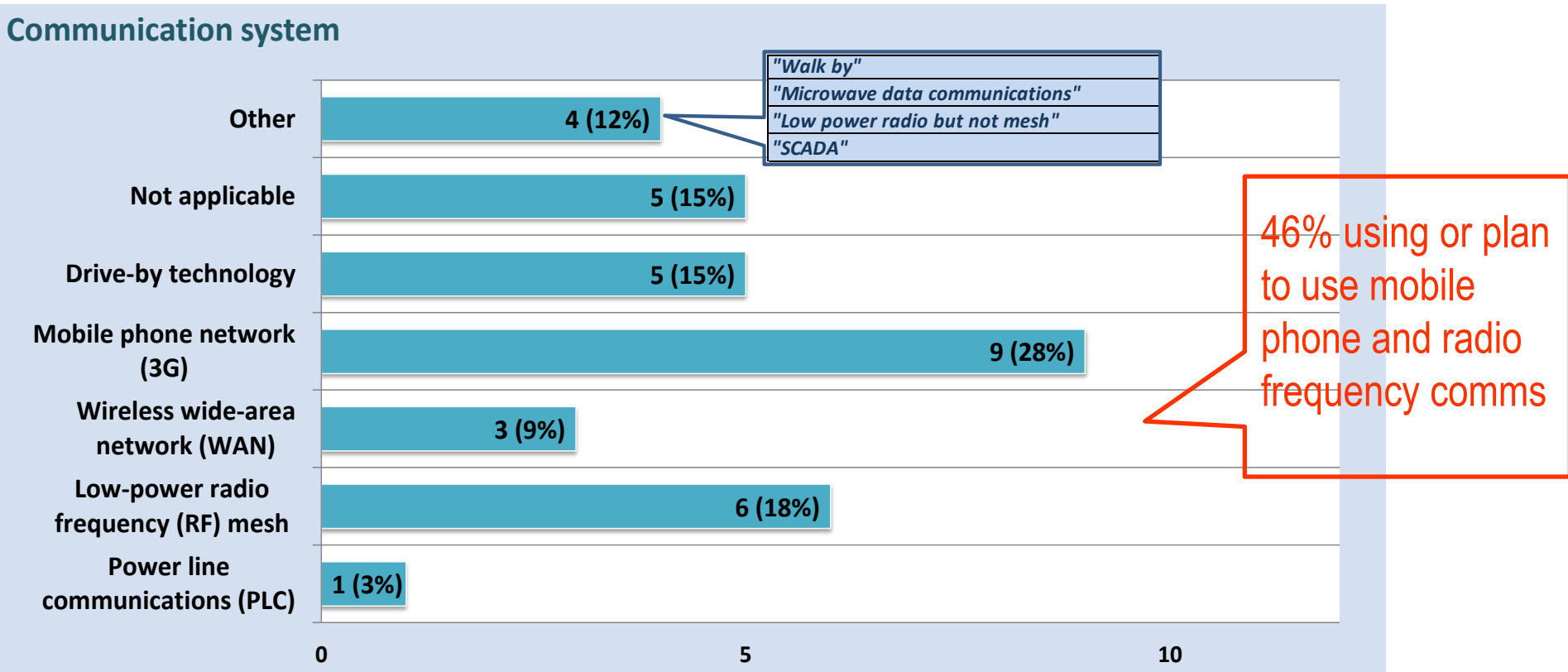
# How many meters?

## Number of end points

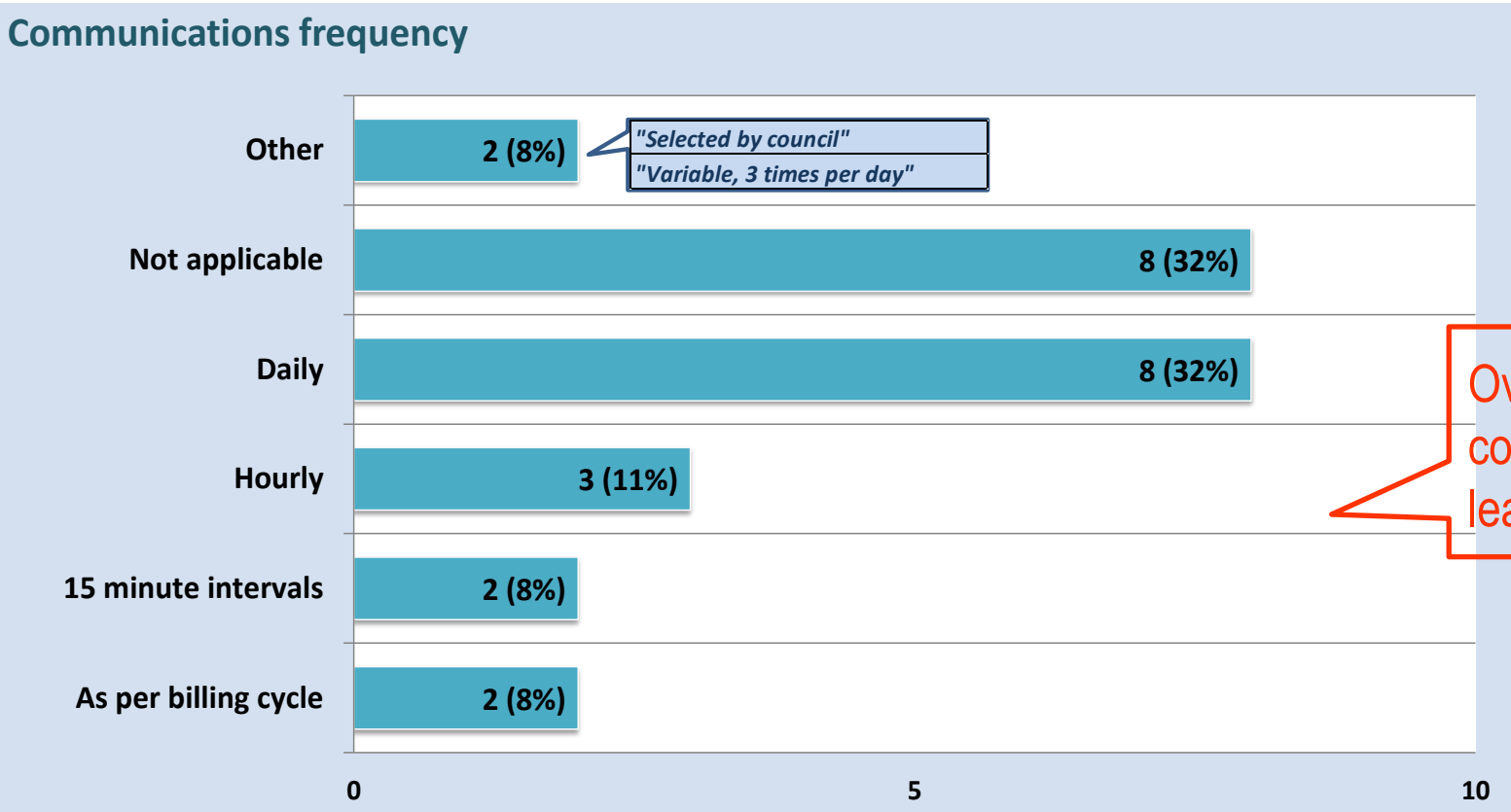


Range of trials and full scale roll-outs

# Communicating... how?



# Communicating...when?



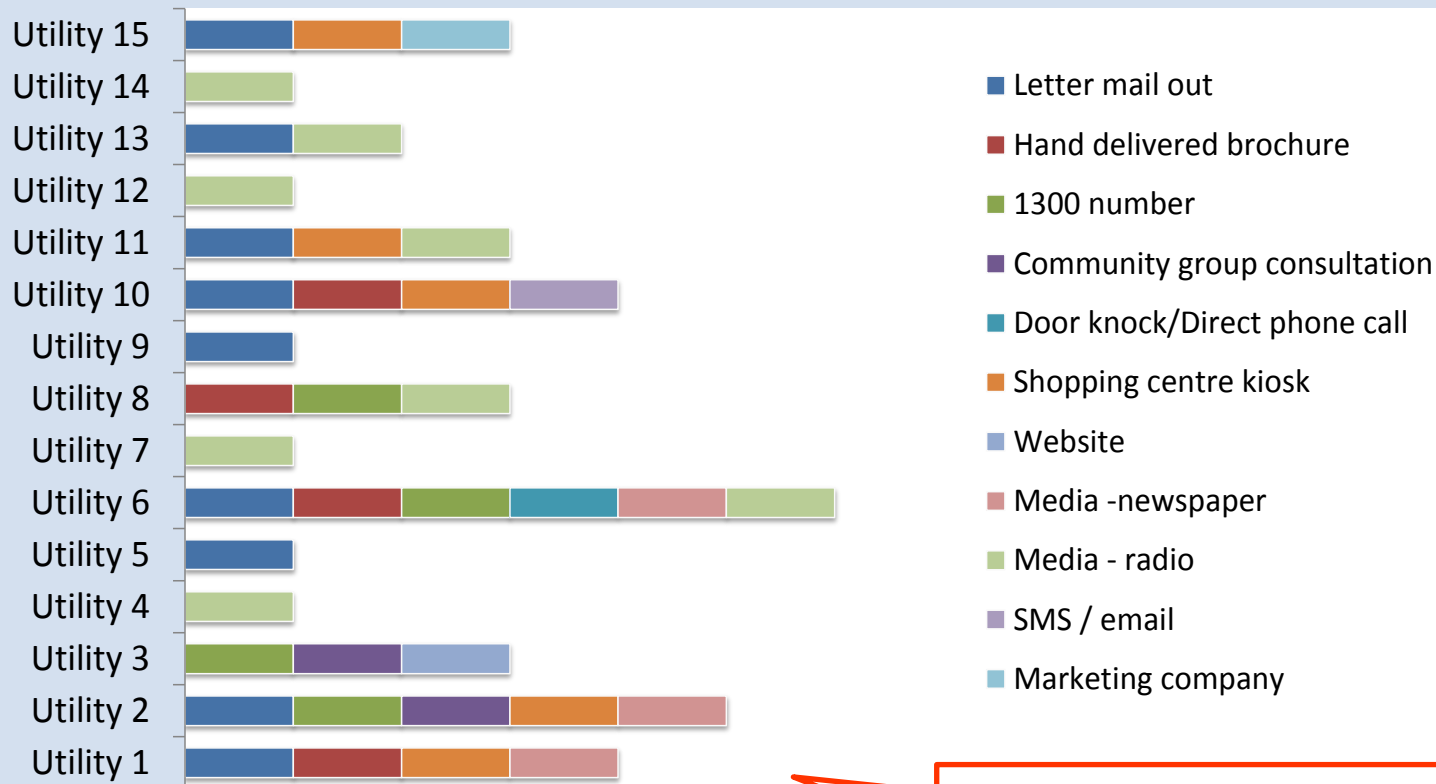
"Selected by council"

"Variable, 3 times per day"

Over 50%  
communicating at  
least daily

# Engaging the customer

## Customer engagement / recruitment strategies

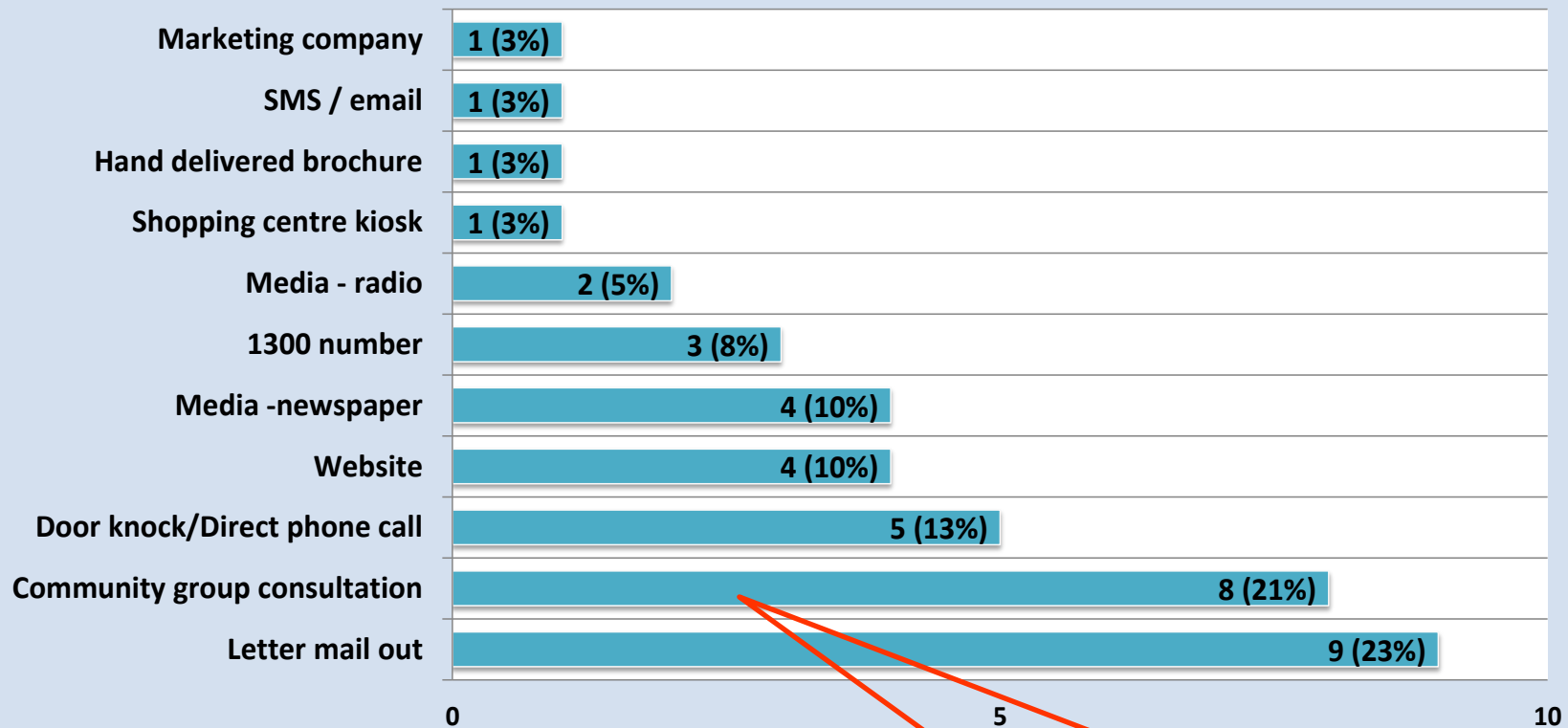


Most utilities doing some form of customer engagement



# Popularity of strategies

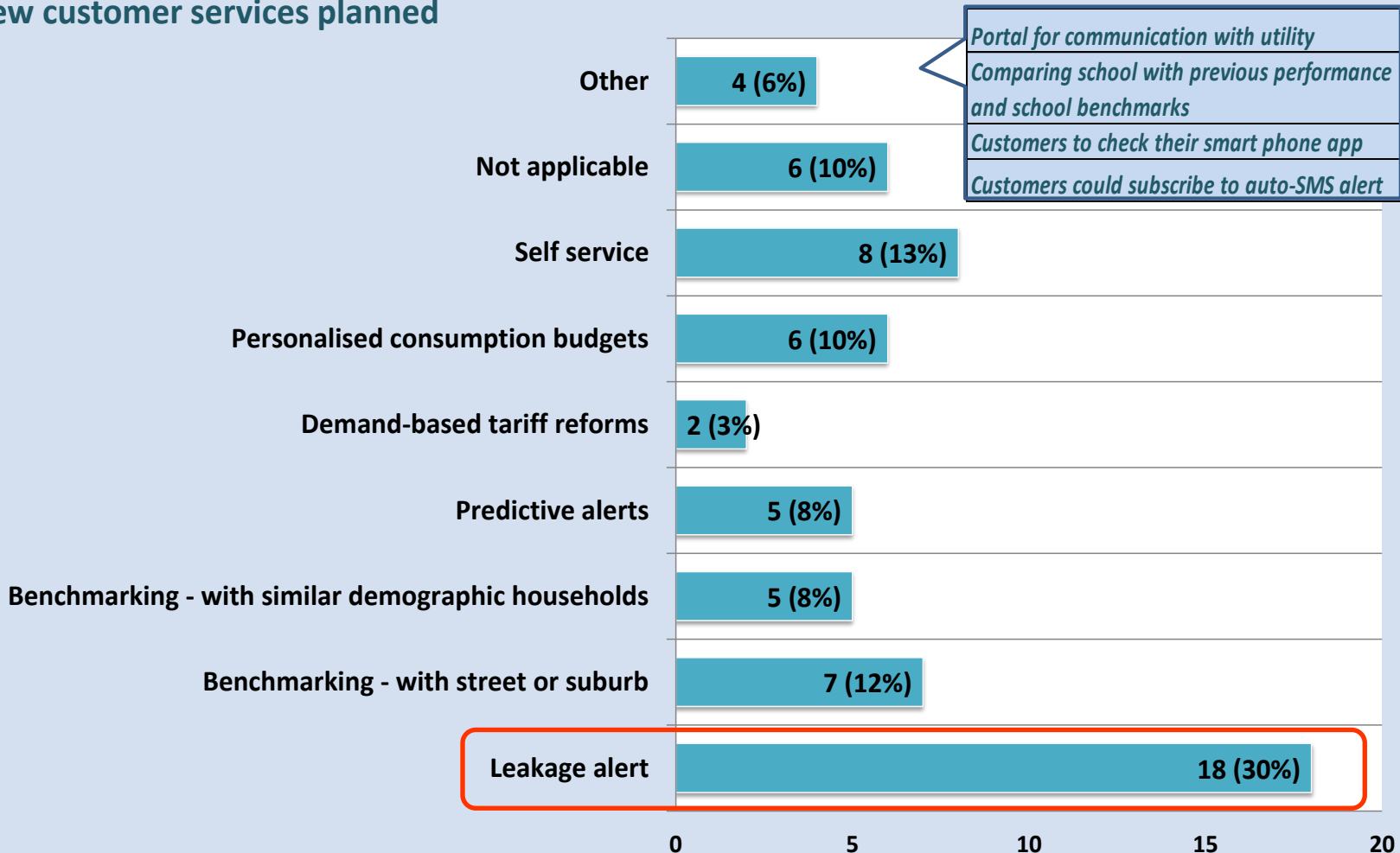
Frequency distribution of customer engagement strategies



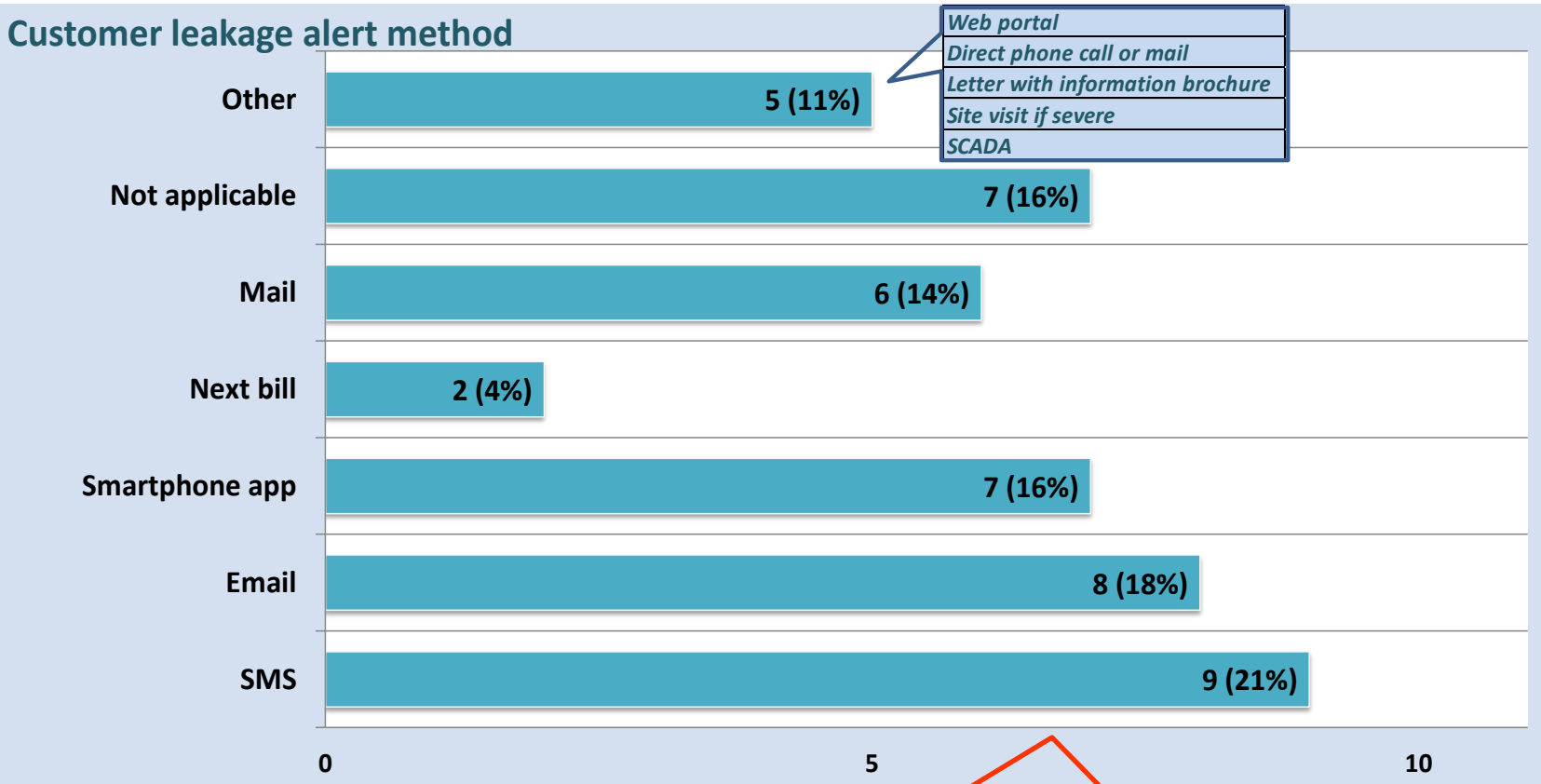
Traditional methods of engagement and consultation adopted

# What else for customers?...

## New customer services planned



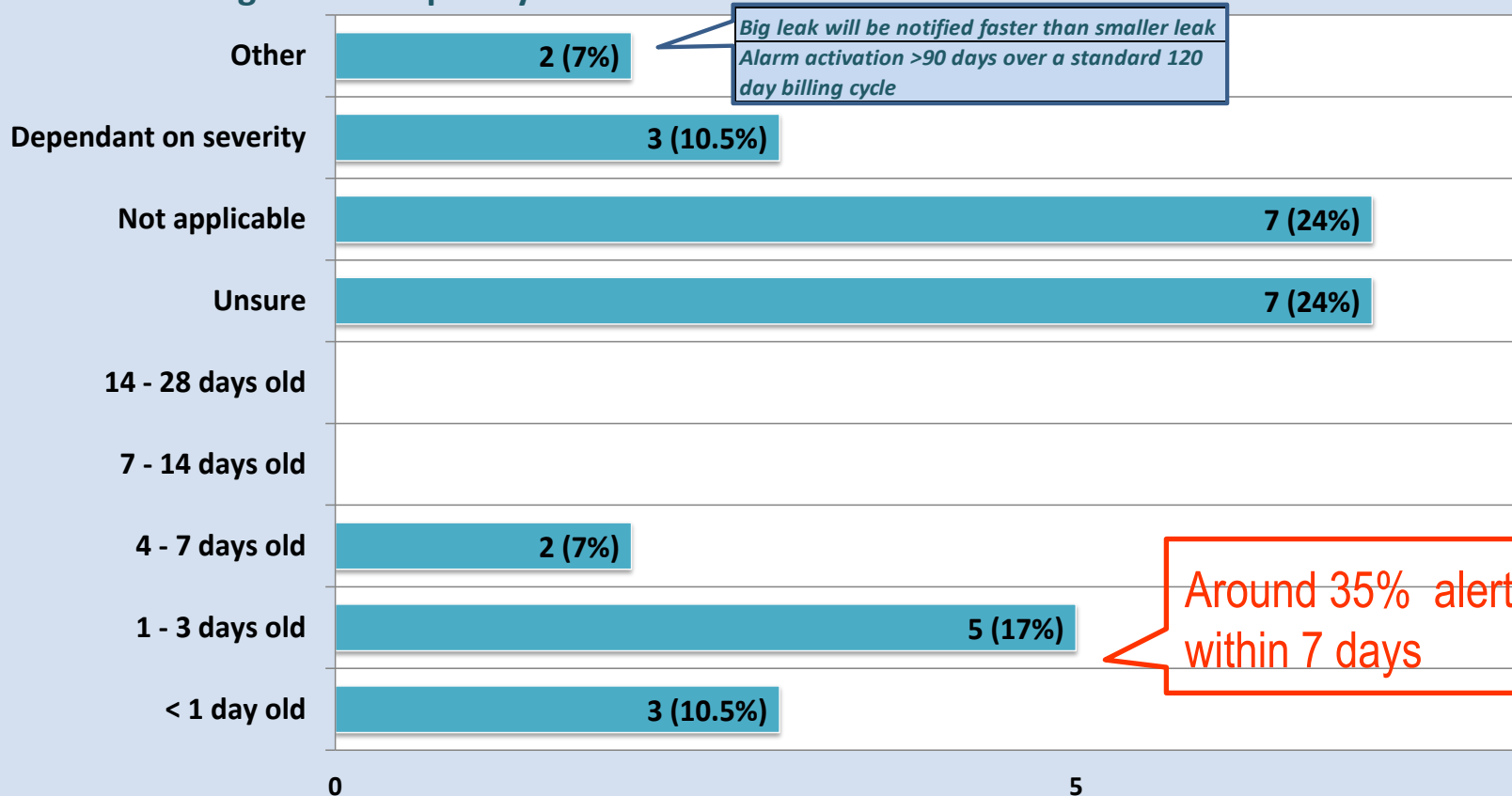
# Hey! You're leaking!



Non-traditional methods of alerting,  
popular choice for utilities

# Still leaking...!

## Customer leakage alert frequency



# ***Business case drivers***

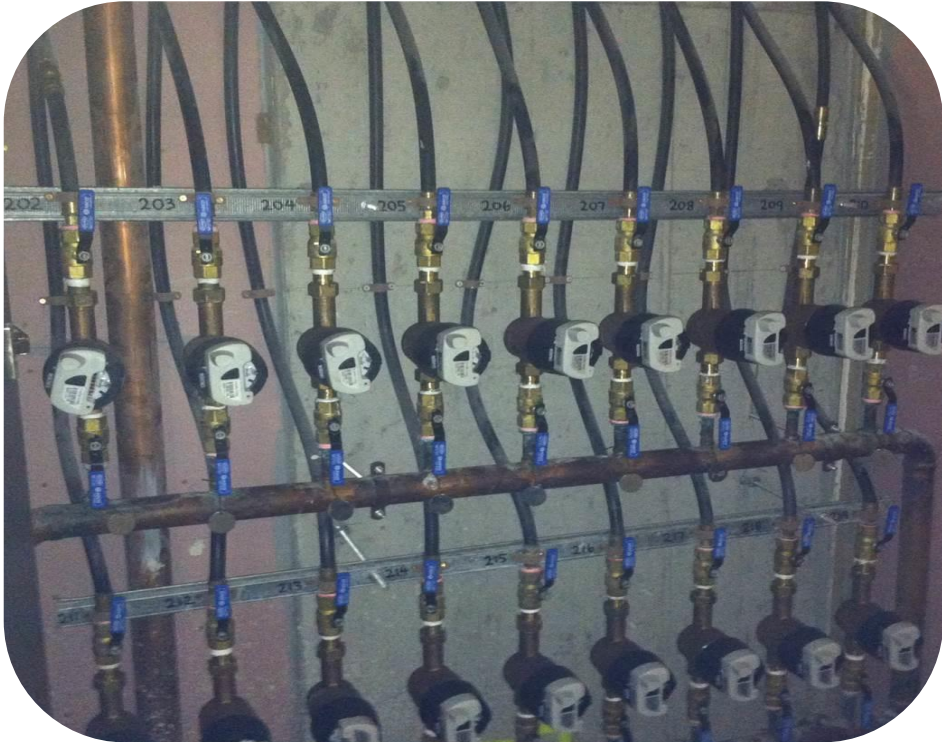


# ***Business case - MUP***

## **BUSINESS CASE REVIEW FOR MULTI-LEVEL DEVELOPMENT AMI PROJECT (CITY WEST WATER, VIC)**

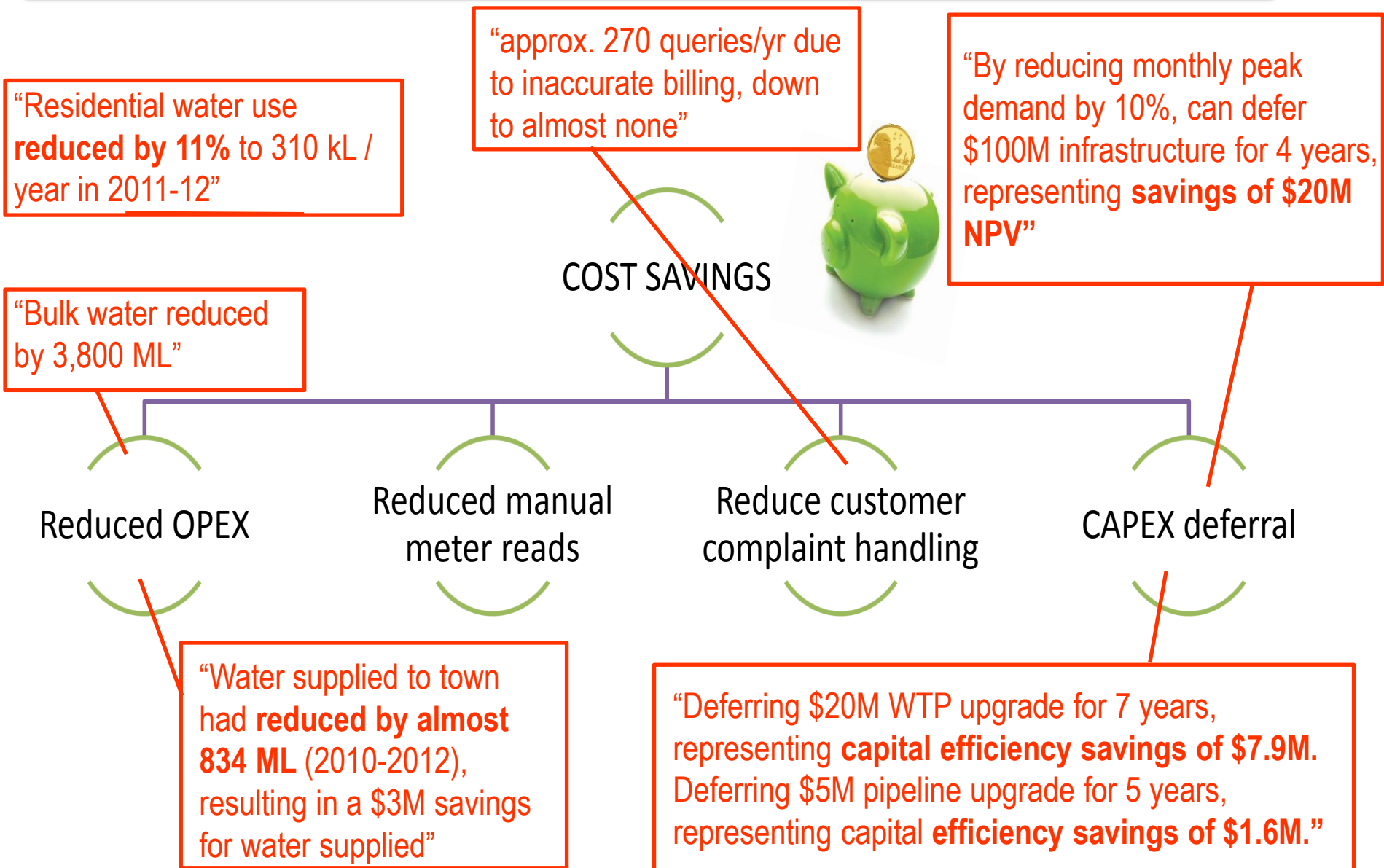
- ❑ Using WSAA definitions – CWW **10k AMR meters existing in field**, (walk-by remotes). This has been part of CWW remote metering strategy for a number of years and is still being rolled out for single meters that are deemed as inaccessible.
- ❑ **6-month trial for Everblu AMI** was on 100 endpoint development, which after successful trial, a decision was made to purchase Everblu hardware installed at site. Included in \$45k purchase price was a software licence for a **further 5000 endpoints**, to be implemented for new developments.
- ❑ **CWW AMI Strategy** is now that any application for a development that exceeds 4 levels will now need to have an AMI installed (Everblu), with the costs being met by the developer.

Business Case Driver	Outcome relating to driver	Comments / assumptions
More accurate meter reads	<ul style="list-style-type: none"> <li>Identified previously that approximately <b>50 kL of water underestimated</b> for several years.</li> </ul>	Assuming 440 L/meter at Step 1 (1.78c/kL). Conservative estimate.



Business Case Driver	Outcome relating to driver	Comments / assumptions
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Reduced operating costs	<ul style="list-style-type: none"> <li>Estimate <b>\$45k annual savings</b> associated with improving manual &amp; special read efficiency</li> <li>If 50kL now accounted for = <b>\$89k savings in future.</b></li> <li><b>Reduced customer contact calls</b> due to accurate and remote reading</li> </ul>	<p>Based on costs of scheduled reads, \$0.70c, and out-of-cycle (OOC) reads, \$7.00 (approx. costs), with 5000 endpoints on Everblu and 20% of meters requiring an OOC read:</p> <p>5000 x 4 reads p.a. = \$14k  1000 OOC reads = \$7k  Totals cost of reads = \$21k  Cost of annual Everblu licence = \$4.5k</p>
Leak detection and improved customer services	<ul style="list-style-type: none"> <li>Internal <b>leaks detected more regularly</b> and informed customer.</li> <li><b>Reduced customer queries and complaints</b> due to inaccurate billing – from 270 to almost none.</li> </ul>	Customer service improvement through leak detection and alert, more so a secondary driver.

# Water and Cost Savings



# *Increase Revenue*

INCREASE  
REVENUE



Reduced non-  
revenue water

Improve accuracy  
of meter reads

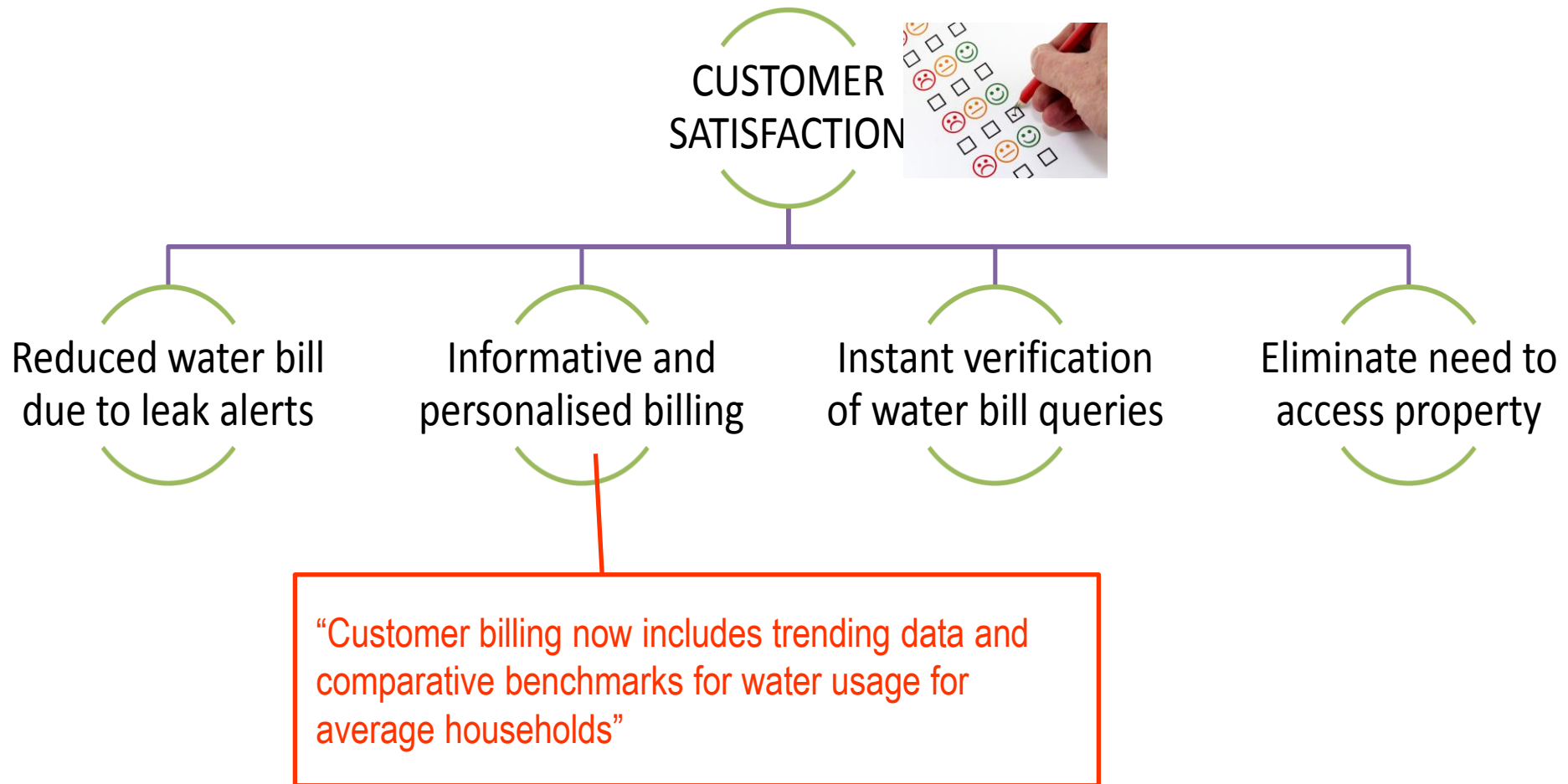
Underpin tariff  
reform

Streamline special  
meter reads

“Identified approximately **50 kL**  
**of water was previously**  
**underestimated** “

“**Two-part pricing able to be introduced** (variable  
and fixed) from July 2012  
Now all 20 mm connections = same service fee and  
one rate of 0.90c /kL.”

# *The customer benefits...*



# ***The community benefits too..***

“Before and after survey showed customers clearly happier with greater focus on them and a more equitable price structure”

COMMUNITY / SOCIAL



Increased goodwill in community

Proactive approach  
“approved” by community

Better education & awareness of water value

“WaterSense campaign and polling indicated 75% of customers likely to **change behaviour toward water use**”



# ***Challenges & Limitations***

# Technical

TECHNICAL



Technology became  
out-dated and easily  
damaged

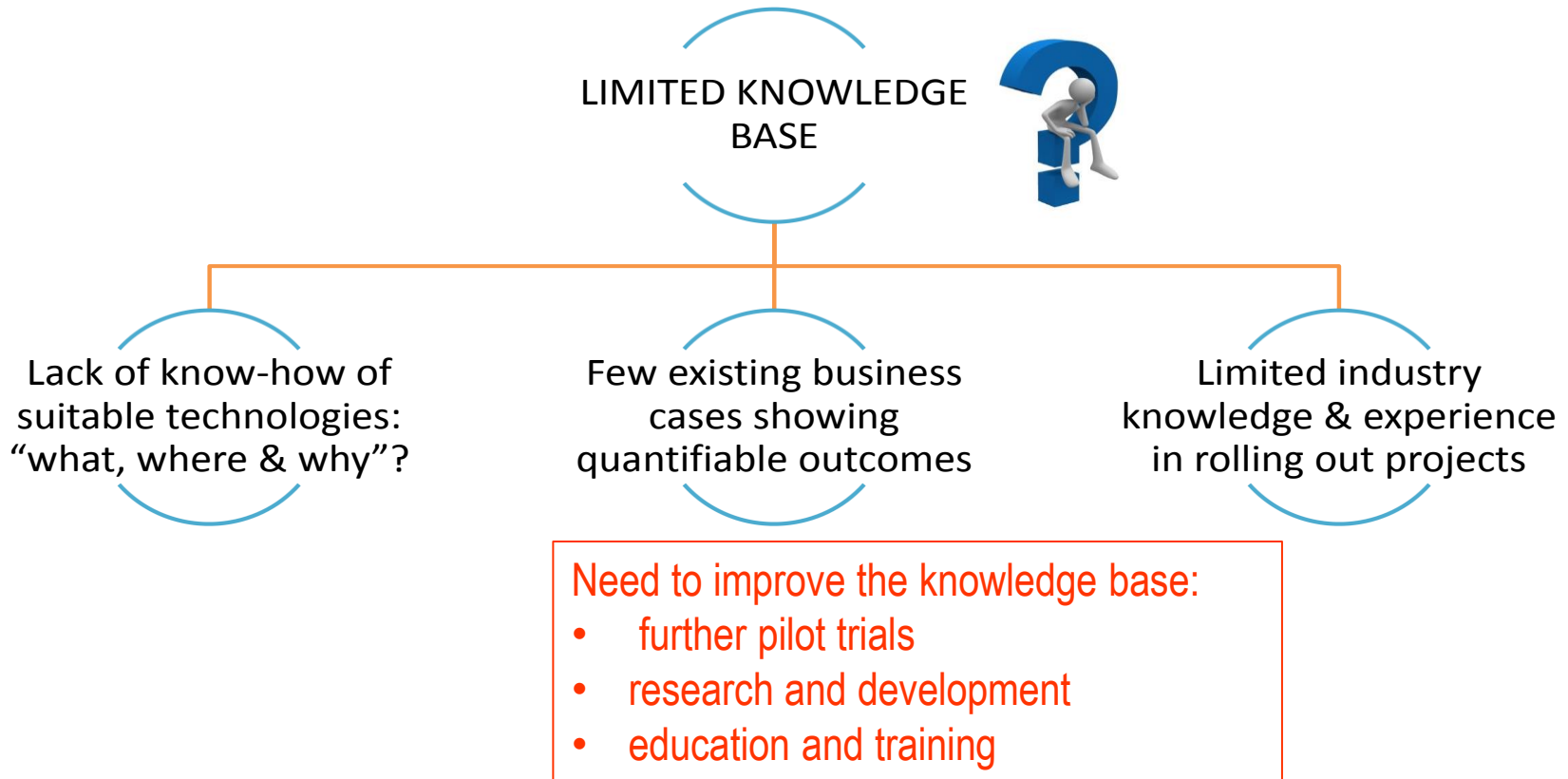
Compatibility of meter –  
communication systems

Difficulties with  
customer portal –  
privacy concerns

Variability in walk /  
drive by signals

Strong opportunities to narrow  
the gap between what we  
want to do in the field, and  
what we can currently do

# *Knowledge limitations*



# ***Making a case..***

DEVELOPING BUSINESS  
CASE



Reluctance from  
internal hierarchy

Silo nature of water  
utilities / councils

Lack of precedence of  
other SM/IWN

Existing industry  
standards insufficient for  
business needs

# *Practical issues*

PRACTICAL



Length of time to install  
and commission meters

Absence of existing  
business systems  
and workflows

Data management and  
data analytics – how to  
maximise benefits of data

Engaging non-residential  
customers to act on leak  
alerts

“We have a lot of information,  
but didn’t have anything to tie  
it together”

# ***Conclusions & Insights***

- Almost 150,000 meters currently installed or planned
- Appears to be a **business case for deployment** of smart metering technology
- The value of smart metering and the specific business case drivers are highly **contextual to location**.
- There is a **limited knowledge of the capabilities** of current and future technology in the smart water metering space
- System only as “smart” or “intelligent” as the know-how of the user
- A need for an agreed, standardised set of **definitions**

# ***Is there a business case for (sub) smart metering?***

- Case study interviews suggest that while the numbers are still being crunched, there is good evidence to suggest economic, environmental and social benefits
- Business drivers: operating **cost savings**, **reduction in bulk water** supplied, **deferred augmentation** of infrastructure.
- Business drivers: **customer satisfaction**, community **acceptance** and improved customer **engagement and trust**
- **BUT – water utilities need to read and bill the sub-meters!!**

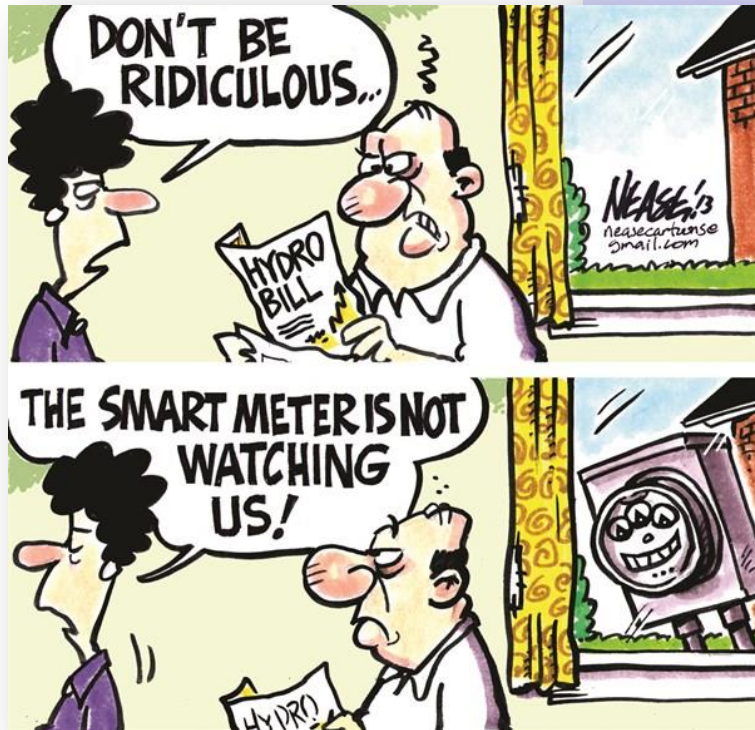


# ***Acknowledgements***

- Joe Flynn (Joe Flynn & Associates)
- WSAA Smart Metering group
  - Water businesses who took the survey!

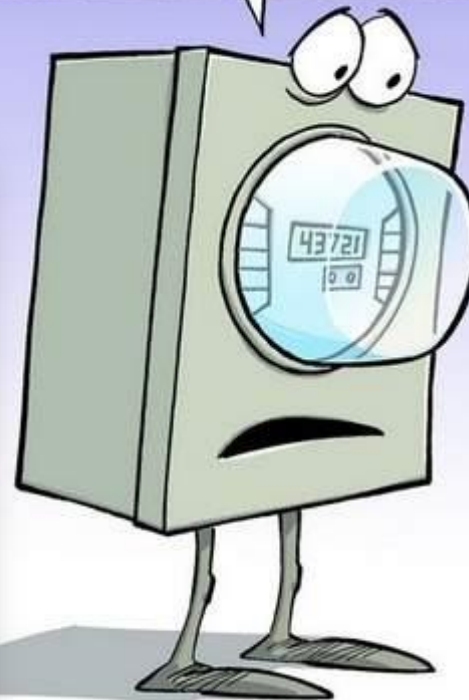
# Thank you

c.beal@griffith.edu.au



I DON'T GET IT. YOU SMARTPHONES GIVE OFF RADIOFREQUENCY RADIATION... YOUR CELLULAR CARRIER CAN TRACK EVERY CALL, TEXT MESSAGE, AND WEBSITE VISITED, BUT PEOPLE LOVE YOU!

IF YOU *REALLY* WERE A SMART METER, YOU'D FIRE YOUR P.R. PEOPLE.



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