

# METERING

*Issues Paper No. 5*

*Inquiry into the reform of SA Water's drinking water and sewerage prices*

August 2013



## REQUEST FOR SUBMISSIONS

The Essential Services Commission of SA (**the Commission**) invites written submissions from all members of the community in relation to the issues raised in this Issues Paper. Written comments should be provided by **5.00 p.m., Friday 8 November 2013**. It is highly desirable for an electronic copy of the submission to accompany any written submission.

It is Commission's policy to make all submissions publicly available via its website ([www.escosa.sa.gov.au](http://www.escosa.sa.gov.au)), except where a submission either wholly or partly contains confidential or commercially sensitive information provided on a confidential basis and appropriate prior notice has been given.

The Commission may also exercise its discretion not to exhibit any submission based on their length or content (for example containing material that is defamatory, offensive or in breach of any law).

Responses to this paper should be directed to:

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The Essential Services Commission of South Australia is the independent economic regulator of the electricity, gas, ports, rail and water industries in South Australia. The Commission's primary objective is the *protection of the long-term interests of South Australian consumers with respect to the price, quality and reliability of essential services*. For more information, please visit [www.escosa.sa.gov.au](http://www.escosa.sa.gov.au).

## BACKGROUND

As part of its inquiry into the reform of SA Water's drinking water and sewerage prices, the Essential Services Commission of South Australia (**Commission**) is considering two metering related areas for possible reform:

- ▲ Individual Metering – the costs and benefits associated with extending individual metering to those customers that currently share a water meter; and
- ▲ Smart Metering – the costs and benefits associated with introducing electronic meters for water customers.

People are strongly encouraged to read Issues Paper 1, accessible [here](#), which describes the context and objectives of this inquiry.

## INDIVIDUAL METERING - THE ISSUE

SA Water's customers are charged based on the volume of water they consume. This creates a price signal that becomes the primary means for driving economically efficient consumption behaviours.

Promoting greater economic efficiency is considered by the Commission to be consistent with the long term interests of consumers.

While the majority of residential and commercial properties are individually metered, there are a number of group sites serviced only by a single, larger meter at the boundary of the property. Individual users within these sites are billed in various ways, based on the information collected by the group meter.

For customers without an individual meter, the price signals they receive can be distorted, as the share of the group bill they are required to pay is unlikely to reflect their actual consumption.

Because there is minimal cost saving unless all members of a group use responsibly, there is little incentive for any one member to do so.

## THE CURRENT APPROACH

Most properties in South Australia have accumulation water meters that measure the amount of water supplied. A meter reading is typically taken every three months and

customers are billed for water used during the period.

However, dwellings or tenancies on group sites (residential and commercial) supplied by a shared SA Water meter receive a bulk bill. Where each dwelling is individually owned, SA Water offers the following options:

- ▲ issuing a single bill to the manager of the site
- ▲ providing separate bills to each owner, reflecting equal division of water use
- ▲ providing separate bills to each owner, reflecting an agreed (and signed in writing) method of apportioning use.

Where a site manager receives a bulk bill there are various methods to charge occupants for water use. These include, but are not limited to:

- ▲ no charge (or an indirect charge)
- ▲ a fixed charge
- ▲ some form of proportionate charge.

Where no individual meters are fitted, charges will not reflect actual water use. Therefore, many customers on shared meters do not receive appropriate price signals to influence their consumption behaviour. For example, low water using customers will have their 'saving' diluted as it is shared among all customers with whom they share a meter.

Customer awareness of water consumption – and attention to bills – has increased significantly in recent years and, in some cases, this has made the use of group meters, and the sharing of water bills, problematic.

SA Water's current policy stipulates that meters must be installed within 0.5m and 0.6m of the boundary of a property. This means that many dwellings or occupancies on group sites are currently 'out of reach' of SA Water metering solutions.

For some sites, such as a row of townhouses, an SA Water manifold can be installed, allowing each dwelling to be metered separately. However, this will only work where the distance from the property boundary to the furthest dwelling is not too far, as water pressure is difficult to maintain over long distances in a typical 20mm pipe.

It is possible to privately install and operate sub-meters, to help allocate charges accurately, and some sites have opted to do this at their own

expense. In other Australian jurisdictions, such as Tasmania and NSW, water companies will maintain, read and bill where sub-meters have been installed on a group site, so long as they are installed in accordance with specifications. However, this is not current practice in South Australia.

## OPPORTUNITIES FOR CHANGE

A number of opportunities for change exist to be compared with the 'do nothing' option. Each has its own costs and benefits.

### *Option 1: Leave the current metering system in place (status quo)*

SA Water has no plans to retrofit individual meters to all dwellings. Developers of new group sites may choose either a large group meter or a manifold solution (if feasible) at the boundary.

This option sees inefficiencies and inequities remain because charging for group metered dwellings does not reflect the user-pays principle.

The Commission's report on *Costs and benefits of installing water meters in public housing*<sup>1</sup> (prepared under Section 99 of the *Water Industry Act 2012*) indicated that, under current water pricing arrangements, maintaining the status quo was likely to be the lowest cost option for these dwellings.

### *Option 2: Mandate the installation of individual meters for all properties*

The roll out of individual meters could be undertaken immediately, on an as quickly as practicable basis, or be phased over a longer period of time. The benefits would flow earlier under an immediate rollout scheme and, due to economies of scale, the cost per unit is likely to be lower than under a longer-term program.

The immediate costs of a mandated metering roll out are:

- ▲ the capital costs of the meters themselves, including any automated meter read (AMR) technology

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<sup>1</sup> Report on costs and benefits of individual metering for public housing, available at <http://www.escosa.sa.gov.au/library/130628-CostsBenefitsInstallingWaterMetersPublicHousing-Report.pdf>.

- ▲ the costs of having each meter installed (plumbing, trenching etc.).

The ongoing costs of installing individual meters are:

- ▲ increased meter reading and maintenance
- ▲ more billing and customer enquiries or complaints, as a result of the increased number of meters
- ▲ costs associated with meter and/or AMR technology replacement, as these assets reach their end-of-life.

Benefits will begin to occur as the first bills reflecting actual consumption are received. There is likely to be some level of reduced consumption as cross-subsidies are removed and strict user-pays principles come into force. Appropriate pricing signals incentivise customers to become more efficient water users.

There will also be better detection of leaks in internal piping, deferred network augmentation works due to suppressed demand, and a reduction in the perceived 'unfairness' of the system.

### *Option 3: Mandate the installation of individual meters for new builds only*

There may be a case for mandating the installation of individual meters to new builds only.

The costs of designing and installing individual meters as part of the build are likely to be considerably lower than the costs of retrofitting. Mandatory individual metering on new builds is expected to be rolled out in NSW in 2014. The Commission also notes that the Productivity Commission, in its 2011 Review of Australia's Urban Water Sector, recommended that all new dwellings have separate water meters installed.

As with retrofitting individual meters, a capital cost is associated with each new meter (and any associated AMR technology). However, for new builds, the installation costs are expected to be much lower, because the meter can be installed along with other plumbing (trenches must be dug and supply pipework laid regardless of whether a meter is installed).

The ongoing costs of installing individual meters are similar as those raised in option 2.

The benefits are likely to be:

- ▲ economically efficient water consumption as customers receive appropriate pricing signals based on user pays principles
- ▲ better detection of leaks
- ▲ network augmentation works deferred (compared with group metering) due to suppressed demand from more efficient consumption and earlier leak detection
- ▲ perceived unfairness avoided.

#### *Option 4: Optional roll out of individual metering*

This option could be rolled out two ways:

- ▲ on a user pays basis, with those receiving the new meter paying for its installation
- ▲ as a capital program undertaken by SA Water and indirectly funded by all water users.

The immediate costs of fitting individual meters are:

- ▲ the capital costs of the meters themselves, including any associated AMR technology
- ▲ the costs of having each meter installed (plumbing, trenching etc.).

The ongoing costs of installing individual meters are similar as those raised in options 2 and 3.

It is expected that a higher marginal (per unit) cost would be incurred under an opt-in scheme, as opposed to a mandated scheme, due to the lack of economies of scale.

Benefits will begin to occur as the first bills reflecting actual consumption are received. They are likely to be:

- ▲ some level of reduced consumption as cross-subsidies are removed, strict user pays principles come into force and appropriate pricing signals are received by customers
- ▲ better detection of leaks in internal piping
- ▲ deferred network augmentation works due to suppressed demand
- ▲ a reduction in the perceived unfairness of the system.

Customers opting for their own meter are likely to be those who take issue with the shared meter arrangements. Problem cases will, therefore, be targeted early and it is likely there will be higher benefit realisation per meter installed.

## QUESTIONS

The Commission seeks the views of interested stakeholders on the above matters and, in particular, in relation to the following:

*Q: Are the current shared water metering and shared billing arrangements satisfactory? If not, why?*

*Q: Should individual metering be mandatory for new build properties even if it is shown to be more expensive than the status quo?*

*Q: Should individual metering be retrofitted to existing properties? If yes, should it be mandated or optional?*

*Q: Would customers be willing to pay a fee for the provision of an individual meter to an existing property?*

*Q: Are there any other matters the Commission should consider as part of this inquiry?*

## SMART METERING - THE ISSUE

Smart water meters are meters with two-way digital communications technology that records water usage at short intervals and sends data automatically to the water utility.

Smart meters are more expensive than traditional, manually-read accumulation meters but the potential benefits include:

- ▲ greater consumer involvement – they enable customers to see their real-time consumption and also better indicate leaks (this benefits the utility, too)
- ▲ reduced costs associated with meter reading
- ▲ more sophisticated pricing structures, potentially involving time-of-use (TOU) tariffs e.g. peak, off-peak and other levels of pricing – similar to smart electricity meters.

However, a roll out of smart meters would come at a cost to consumers and it should be determined, with some surety, if the long-term benefits outweigh the cost of installation.

## THE CURRENT APPROACH

The majority of SA Water's customers are metered using standard accumulation water meters at the supply point to the property. Consumption is determined by the difference in accumulated value at two reading points, generally 90 days apart, to enable quarterly billing. However, as described above, some dwellings on group sites are not individually metered.

As a matter of course, given the extra cost of installing a smart meter over an accumulation meter, smart meters should be assessed for installation in new builds, or as replacements when old meters are no longer fit-for-service.

### *Experience in other jurisdictions*

A number of smart metering trials have been conducted around Australia. For example, the Kalgoorlie-Boulder Smart Meter Trial involved the installation of 13,838 smart meters to residential, commercial and industrial properties and is expected to save about 896 million litres of water in its first full year.

Another trial was one conducted by Wide Bay Water Corporation (WBWC) at Hervey Bay,

Queensland, in 2006. Approximately 20,000 domestic water meters were replaced with smart meters.

A third party evaluation<sup>2</sup> of the trial highlighted benefits in the following areas:

- ▲ **Billing** – the ability to provide a higher level of customer service when customers enquire about their bills
- ▲ **Operations** – the ability to understand, at a detailed level, the effects of pressure reduction on various components of water demand
- ▲ **Research** – the discovery of the level of household water leakage
- ▲ **Planning** – the ability to determine and analyse daytime patterns for individual areas which could allow for improved major capital expenditure
- ▲ **Management** – the ability to cost and develop a business case for an automated meter reading (AMR) project.

The evaluation noted, however, that there are many additional – and significant – opportunities still to be explored. These included:

- ▲ real-time downloading of meter data to a water service provider to enable immediate analysis and response to leaks and water restrictions violations
- ▲ greater interaction between AMR data and water planning and demand forecasting tools
- ▲ the use of climate correction modelling to help provide better understanding of seasonal outdoor demand in various sectors and customer groups, as well as their responses to a variety of restrictions regimes
- ▲ automatic monitoring and evaluation of demand management initiatives (such as water restrictions or scarcity pricing) immediately

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<sup>2</sup> Turner A., Retamal M., White S., Palfreeman L. and Panikkar A., Third Party Evaluation of Wide Bay Water Smart Metering and Sustainable Water Pricing Initiative Project, 2010, Canberra, available at <http://www.environment.gov.au/water/policy-programs/water-smart/projects/pubs/evaluation-feb2010.pdf>. Report prepared by the Snowy Mountains Engineering Corporation in association with the Institute for Sustainable Futures, UTS, for the Department of the Environment, Water, Heritage and the Arts, Canberra.

following implementation, to quickly determine their effectiveness.

As part of its Optimal Water Mix for Metropolitan Adelaide project<sup>3</sup>, the Goyder Institute has installed smart metering technology at 150 households across Adelaide. Their usage will be monitored over a period of 15 months to provide detailed water use patterns which can be measured and applied to understand water demands at a city scale.

However, smart water metering is not yet developed to the same extent as smart electricity metering.

### *Experience in other industries*

#### **National Cost Benefit Analysis of Smart Metering and Direct Load Control (Electricity)**

In July 2007, the Ministerial Council on Energy's *Smart Meter Working Group* appointed a team of consultants to undertake a cost benefit analysis – requested by the Council of Australian Governments – of a mandated national smart electricity meter roll out and a non-smart meter direct load control alternative.<sup>4</sup>

NERA Economic Consulting estimated that total costs of a mandated roll out of smart electricity meters under this scenario in SA ranged from \$188 million to \$308 million.

## OPPORTUNITIES FOR CHANGE

It is proposed that the following broad definition of a smart water meter be adopted for the purposes of this Inquiry.

*A smart water meter is capable of measuring and recording energy consumption in short intervals. It is also capable of two-way communication, which enables water providers to read and control features of the meter remotely.*

This is consistent with adopted definitions of smart electricity meters.<sup>5</sup>

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<sup>3</sup> See project page at <http://goyderinstitute.org/index.php?id=49>.

<sup>4</sup> Refer: [http://www.ret.gov.au/Documents/mce/documents/Executive\\_Summary\\_of\\_NERA%27s\\_Phase2Report20080915085044.pdf](http://www.ret.gov.au/Documents/mce/documents/Executive_Summary_of_NERA%27s_Phase2Report20080915085044.pdf).

<sup>5</sup> NERA, 2008, page iii.

A number of opportunities for change exist to be compared with the 'do nothing' option.

A key task is to determine what smart water meter functionality is required for the assessment as each has a different benefit and cost stream. Accordingly, the analysis the Commission will undertake for this inquiry – which must consider costs and benefits – should be based on an agreed minimum functionality.

Types of functionality that could be considered are:

- ▲ Pulse or time interval-based consumption measurement and recording
- ▲ Consumption measured daily or even more frequently during the day
- ▲ Remote reading of meter data and whether remote reading occurs at the end of a day, week or month
- ▲ Meter consumption data made available to consumers via a Home Area Network (HAN)<sup>6</sup>.

### *Options for assessment*

A mandated roll out of smart water meters could be assessed against various options:

#### *Option 1: Continue to install accumulation meters (status quo)*

Systems used to bill customers based on readings from accumulated meters are already in place, and charges vary depending on consumption.

Under the status quo, existing meters will still need to be replaced when they reach their end-of-life, and manual meter reading costs will continue to be incurred for all meters. While there are pricing signals for water use, because of billing cycles, they are seen by customers up to 90 days after they are incurred.

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<sup>6</sup> To facilitate the provision of an in-home display for customers. The national smart electricity meter functionality only related to the ability for the meter to interface with a HAN, how the interface is ultimately used was to be determined by commercial considerations of both retailers and distributors.

### *Option 2: Replace all existing accumulation meters with smart water meters*

This could be achieved either by an accelerated roll out (possibly completed within five years), or a phased roll out over a longer period of time.

The immediate costs would be:

- ▲ the purchase and installation of smart meters (or simply the purchase and installation of a smart 'bolt-on' to an existing accumulation meter, where that solution is feasible)
- ▲ necessary upgrades to existing customer and billing systems to deal with the data feeds provided from smart meters.

Consideration should also be given to the costs of replacing perfectly serviceable accumulation meters before the end of their useful lives.

The benefits of installing smart meters include:

- ▲ enhanced customer service through more comprehensive usage information
- ▲ lower network water losses due to better detection of leaks
- ▲ improved whole-of-network management
- ▲ the potential to price in a more sophisticated way (e.g. based on time-of-use).

A more systematic approach to roll out would mean lower unit costs incurred, due to economies of scale.

### *Option 3: Replace all existing accumulation meters and also install smart water meters for unmetered dwellings*

Option 3 is similar to option 2, but would involve a larger scale project. It would generally lead to both higher costs and higher benefits, but would not be expected to greatly impact the ratio of costs to benefits. (The costs and benefits of extending metering to properties not currently individually metered is discussed in the first section of this paper)

### *Option 4: Roll out smart water meters on a new and replacement basis only*

This would be limited to greenfield sites or when an existing accumulation has reached end-of-life.

When a meter needs to be replaced, typically because it has reached the end of its useful life, the additional cost of installing a smart meter instead would be relatively low. However, there would also need to be modifications to billing systems so smart meter data can be captured.

Until all meters have been replaced with smart meters, it might be cost prohibitive to introduce more sophisticated pricing such as TOU tariffs.

The costs of manual meter reading can be avoided when entire greenfield sites are fitted with smart meters. However, where a single smart meter is installed to replace an old or faulty accumulation meter, there is likely to be little saving in manual reading costs. This is because the reader must still read all the surrounding accumulation meters in the street.

There would be no issue with sunk costs if smart meters were rolled out on a new and replacement basis only.

## QUESTIONS

The Commission seeks the views of interested stakeholders on the above matters and, in particular, in relation to the following:

*Q: Is there a case for mandating smart meters for all properties in SA? If so, what is the best option for roll out? (e.g. phased, immediate or end-of-life basis)*

*Q: Are there any reasons not to install smart water meters in South Australia?*

*Q: Victorian residential customers reportedly pay around an extra \$80 annually for a smart electricity meter. Would South Australian customers be willing to pay a similar amount for a smart water meter?*

*Q: What functionality should a smart water meter have, and how would customers and water suppliers make use of the functionality that a smart meter could provide?*

*Q: Are there other tools or management options – or any alternatives – that should be considered and implemented in lieu of smart metering, or in conjunction with smart meters?*

*Q: Are there any further matters that should be considered as part of this inquiry?*

## FURTHER INFORMATION

Any queries relating to this consultation should be directed to:

- ▲ Stuart McPherson, Manager, Technical
- ▲ Brooke Palmer, Analyst

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