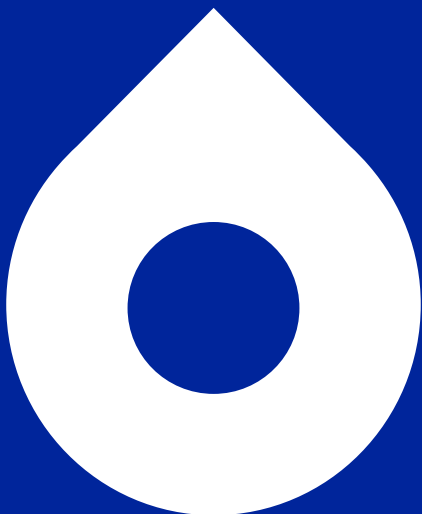


# Customer Metering Program-

Smart Meter Transition

Information to support IPART Price Submission





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# Acknowledgement of Country

Sydney Water respectfully acknowledges the Traditional Custodians of the land and waters on which we work, live and learn. We pay respect to Elders past and present.





# 1. Introduction

The purpose of this document is to articulate why there is a need for Sydney Water to transition from mechanical to smart meters.

The document provides background and information to the following questions:

1. What our customers and stakeholders expect from us and what the industry standard is. (VOC)
2. Why we need to invest in customer meters (risks and consequences)
3. Why do we need to make this investment now (the timing and prioritisation)
4. What the difference is between mechanical and smart meters (the features and benefits).
5. What is the cost for both options and the proposed approach for investment. (the dollars)
6. How do we plan to deliver the benefits of smart meters (the approach)

By the reading this document you will have insight into why Sydney Water needs to pursue digital smart metering solution and an understanding of the additional benefits smart meters will deliver over mechanical meters, both for Sydney Waters' customers and the efficiency of its operations.

# 1.1 Background

Sydney Water has committed to ensuring the customer is at heart of all its major decisions and investments. Making the transition from mechanical to smart meters is key to this commitment.

The time has come to redirect the meter replacement investment from old mechanical meters into new technology that comes with new benefits and can deliver greater cost efficiencies into the future.

Sydney Water’s current customer meter fleet consists of 92% mechanical with the remaining 8% being digital smart meters. Smart meters offer significant benefits over traditional mechanical meters.

Whilst we could continue with a predominately traditional mechanical customer meter fleet, there is a risk that we will fall behind in technological capabilities, in meeting customer expectations and delivering an efficient operation.

In the recent Customer Engagement program ‘Our Water, Our Voice’, customer expressed several priorities that can be fulfilled through smart meters.

The 15 top customer priorities are listed below (figure:1), and the highlighted ones can be answered by smart meters.

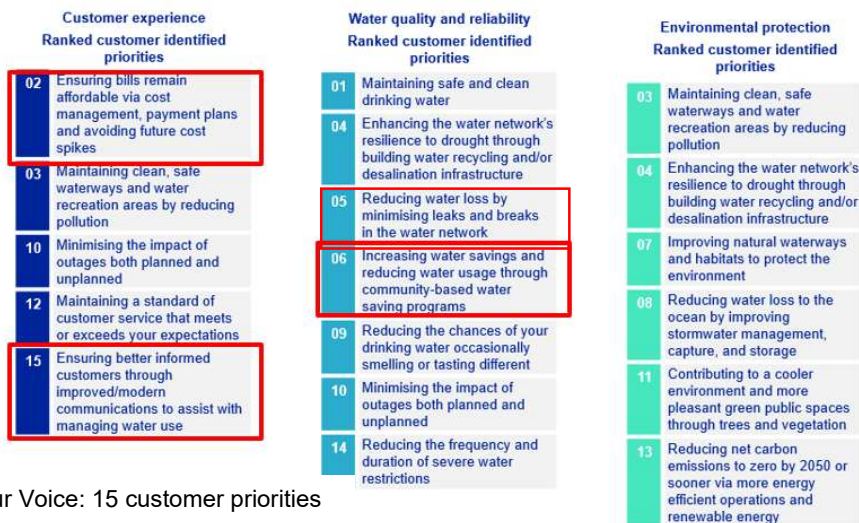


Figure 1 Our Water Our Voice: 15 customer priorities

### Customer Verbatims from Our Water, Our Voice:

*"With rising costs in every area of our lives, the base costs of water and sewerage services needs to be managed."*

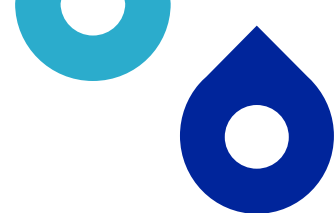
*"The cost of living has increased quite strongly recently. There needs to be some type of safeguard against a sudden rise in water costs."*

*"(Sydney Water should) Educate customers on their personal responsibility and water wastage".*

*"Customers are empowered to save water"*

*"There is a responsibility to manage water sources sustainably for everything relies upon it. Public involvement is also required, so public education/awareness is needed."*





Sydney Water run a quarterly market research Brand Tracker with a representative sample of customers. Data analysis of the research results shows that ‘Value for money’, being ‘Water Wise’ and ‘Innovation’ as important drivers that help drive Advocacy for Sydney Water. See Priority #1 highlighted in the chart below.

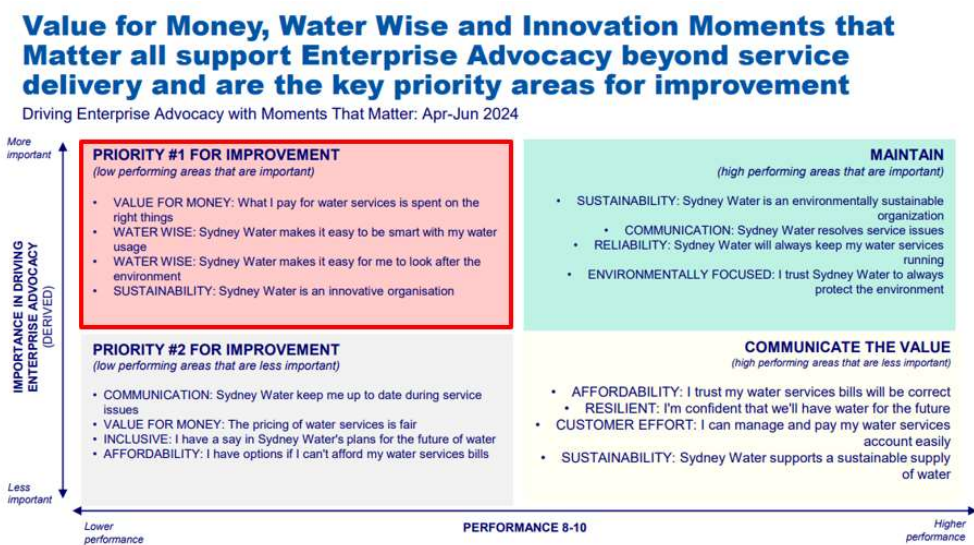


Figure 2: Brand Tracker report April-June 2024

Whilst ‘Value for money’, being ‘Water Wise’ and ‘Innovative’ are important drivers for customer advocacy, customers rate Sydney Water’s performance on these drivers at about 50%, as detailed in the chart below. These results show that there are still opportunities for improvement.

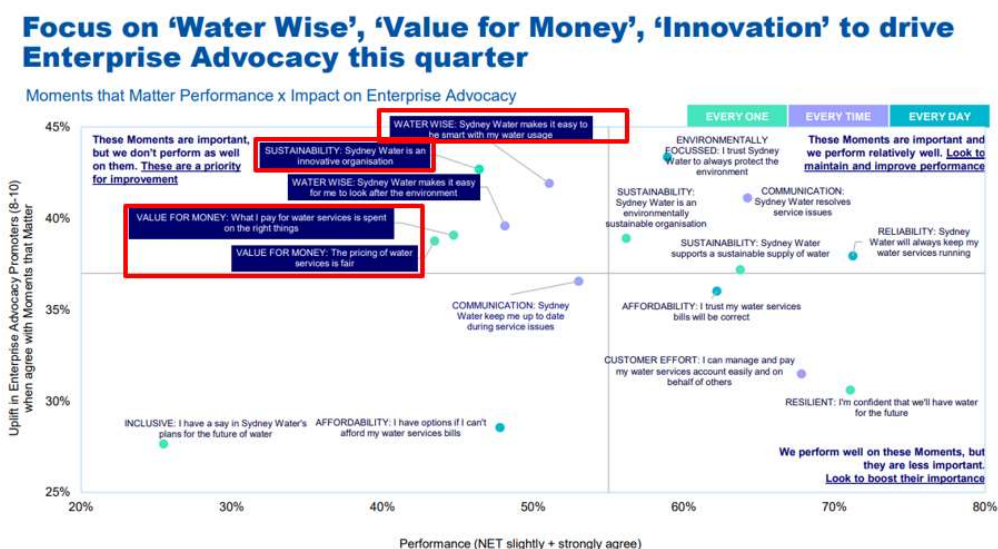


Figure 3: Brand Tracker report April-June 2024

Sydney Water’s Water Efficiency report states that 62% of customers are willing to change their water saving behaviour. The main reasons for wanting to save water is to save on water bills.

About half of customers don't know how much water they consume, but most customers agree that they could save more water.

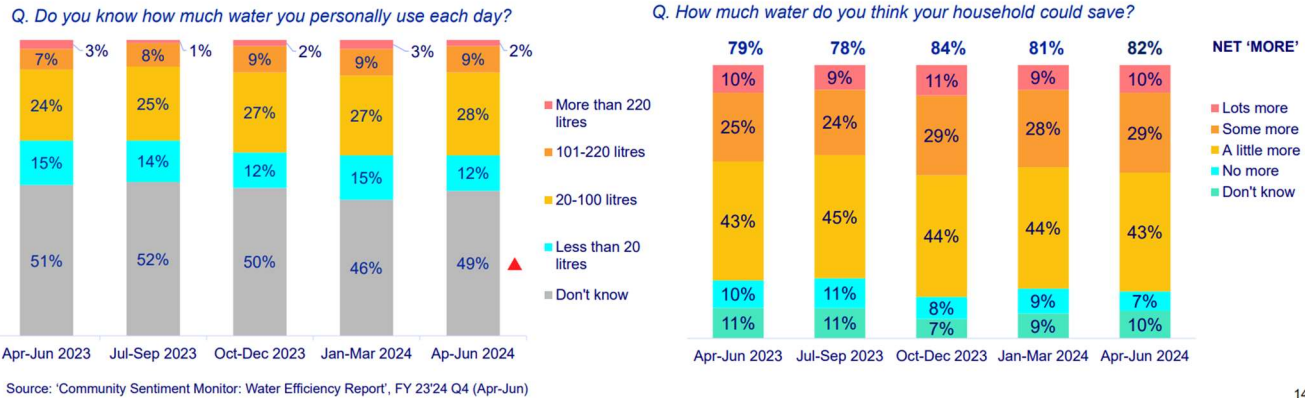


Figure 4: Water Efficiency report April-June 2024

About half of customers already monitor their water usage. Having Smart meters will enable customers to do more accurate and effective monitoring of their water use, leading to the desired cost savings.

*Q. Do you try to monitor the amount of water your household uses either via your water bill or your water meter? (Base: all customers)*

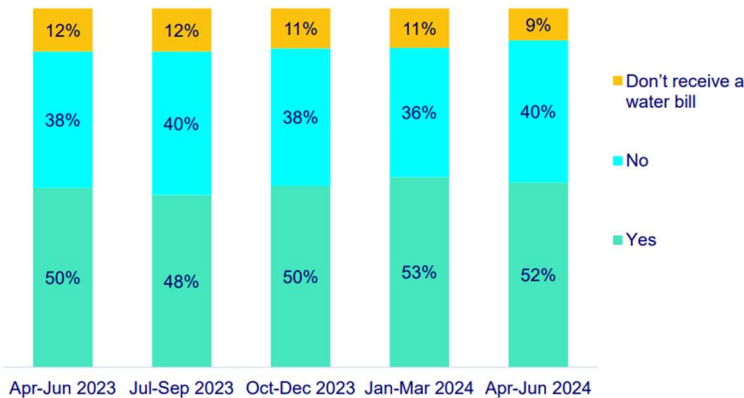


Figure 5: Water Efficiency report April-June 2024

## 1.2 Why we should transition to smart meters

Trials have shown that smart meters empower customers to manage their water use and thereby control their water bills (noting that maintaining the affordability of water bills, was the number 1 priority for customers). Many of the benefits from smart meters will be unlocked by the daily delivery of automated hourly meter readings.

In contrast, mechanical meters do not provide these customer benefits, plus, the meter fleet requires ongoing management to maintain accuracy and compliance with the trade measurement regulations.



To achieve the vision of providing a world class service, it will be critical for Sydney Water to adapt and adopt recent technologies that will drive the value that our current and future customers are expecting.

By moving to smart meters Sydney Water will:

- Meet customers' expectations by leveraging and adopting new and innovative technology to help customers manage their water use and reduce their water bills
- Conserve water by positively influencing and empowering customers to change their water utilisation behaviours.
- Make better operational decisions through the analysis of hourly customer water usage data and behavioural insights
- Improve the management of the water supply network by proactively identifying and resolving issues such as leaks and breaks
- Make data-driven decisions on the design, maintenance, operation, and general management of the network
- Provide customers with new services such as alerts through digital communication channels for leaks in their property. These proactive alerts will reduce water losses, impacts to customers, and the quantity and cost of rebates issued by Sydney Water.

Smart metering enhances many existing business processes such as transitioning meter reading from manual to automatic which reduced human errors in meter reading, the need to estimate meter readings, the volume of customer enquiries and complaints, and the handling time to resolve meter reading issues. It will also eliminate the safety risks associated with manual meter reading.

Smart metering enables new options such as monthly billing for smaller more frequent bills, or time-of-use charges and help with the introduction of new tariff structures in the future to help customers to manager their water usage and costs and reduce peak flows in the water network.

By empowering customers to reduce leakage and general water usage, and by improving the way Sydney Water manages its water network, there will be significant improvements in water security and climate resilience for our community into the future.

An effective and efficient Customer Meter Program is essential for maintaining customer confidence in the accuracy of bills, maximise the economic life of the fleet, support backflow prevention for low-risk residential properties, enable revenue collection and realise new opportunities for investment efficiency.

Without a transition to smart meters, there are significant risks that Sydney Water will fall behind in areas of water security, operational efficiency, and meeting customer expectations for world-class services.

Moreover, nationally, most major and many regional water utilities are already rolling out or are in the process of preparing for large-scale rollouts of smart meters (IWN State of Play report).

Globally, many world-class cities such as London, Paris and Singapore have large-scale smart metering roll-outs underway for millions of customers.



The following two Figures, Figure 6 and 7 detail the comparable costs and benefits associated with a mechanical and smart meter rollout.



Figure 6: Comparison of cost and benefits

	Benefits	Mechanical Meters	Smart Meters
<b>Customer Benefits</b>	Accumulative index read	✓	✓
	Hourly usage data		✓
	Proactive leak notification		✓
	No access to property required to read		✓
<b>Organisational Benefits</b>	Accumulative index for billing	✓	✓
	Hourly Pressure data		✓
	Stopped meter detection		✓
	Automatic meter reading		✓
	Backflow alarm		✓
	Empty pipe alarm (Theft)		✓
	Pressure drop alarm		✓
	Data driving usage behavioural change		✓
	Detection of any cross connection e.g. recycled water connected to the potable connection		✓
	Accurate bill readings. Bill estimates not required		✓
	Fast detection of underground breaks		✓
	Detection of water valve status i.e. is it open or closed		✓
	Reduced Safety risk for meter readers		✓

Figure 7: Benefits comparison table



## 2. Transition to Smart Meters

### 2.1 Existing Situation

Ensuring water usage is measured accurately plays a critical role in customers placing their trust in Sydney Water to deliver accurate and reliable bills.

Sydney Water's total fleet of over 1.6 million customer water meters measures the water used at properties across our area of operations. This generates the water usage component of the bill to the customer, which equates to over one billion dollars in usage revenue per annum.

The management of the Customer Meter is therefore an essential part of the "meter to cash" process.

Sydney Water's meter fleet is required to:

- comply with the National Measurement Act (1960) for trade measurement and its accompanying regulations. In simple terms, this legislation means that we must:
- Purchase verified meters with patten approval (in prescribed sizes, currently up to 40mm);
- Ensure that in-service meters are within  $\pm 4\%$  accuracy.

Since the late 1990's, there has been an ongoing program for the management of Sydney Water's Customer Meters. The Customer Meter Program has previously and continues to comprise of the following activities:

1. Installation of new meters (primarily driven by new construction activities/servicing growth);
2. Preventive maintenance (planned replacement of meters when they reach economic or projected life criteria defined in age or the cumulative flow ceilings per meter type, as outlined in this document);
3. Reactive maintenance (unplanned exchange of meters when they fail in-service)
4. Compliance testing of in-service meters
5. Testing of new technologies and other customer meter related project
6. Management of the metering activities.

In addition to these known circumstances, new metering technologies continue to emerge and represent increasing potential benefit for Sydney Water and its customers. To provide a modern and effective meter asset with benefits beyond the meter asset class, Sydney Water needs to investigate, adapt and consider transitions to new meter technologies.

Failing to adopt smart metering technologies means that Sydney water will be limited in enabling water saving customer behaviours, will result in investment deferral and expose the business to operational decision-making risks and a potential failure to deliver the value customers are now expecting.

## 2.1.1 Meter Fleet Information – (total fleet of meters in operation that are up for replacement)

Different customer water usages required different types of water meters.

Sydney Waters' Meter fleet is composed of 4 different meter types with a wide variety of meter sizes depending on the volume of water required.

**AMI – Advanced Metering Infrastructure.** Usage index reads collected and transferred automatically via radio and cellular technology to a Sydney Water head end system. Currently used for Multi-level individual metering

**AMR – Automatic Meter Reading.** Meter reader collects usage index read via radio technology. Must be within 100m of the meter

**Normal (Mechanical)** – Meter reader visually sights meter to read usage index

**Standpipe** – Accessing water through a Sydney Water Hydrant using a standpipe. Standpipe permit holder submits quarterly index read for billing.

Figure 8 shows the current distribution of meters by size and by volume of total consumption measured. It illustrates that:

- 20mm meters make up 92% of the fleet and measure just over half of all water consumed
- 25-50mm light duty meters make up 7% of the fleet and measure 22% of all water used and
- 50mm heavy duty meters and above make up less than 1% of the fleet by numbers but measure 22% of the water consumed

The costs associated with the purchase and replacement of larger meters are significantly higher than those for 20mm metres. However, 20mm meters make up the bulk of the “jobs”.

Meter Size	Equipment Count				Total
	Reading Type				
	AMI	AMR	Normal	Standpipe	
20	111,188	13,114	1,390,152		1,514,454
25	1,323	435	42,859	1,124	45,741
32	97	203	27,732	2,516	30,548
40	105	373	20,074		20,552
50	908	476	13,141		14,525
80	213	71	1,984		2,268
100	237	12	853		1,102
150	15	4	123		142
200			21		21
250			11		11
300		1	2		3
500			1		1
600			1		1
22				1	1
<b>Overall Result</b>	<b>114,086</b>	<b>14,689</b>	<b>1,496,954</b>	<b>3,641</b>	<b>1,629,370</b>

Figure 8: Equipment Count Table



## 3. Customer Metering Options

### 3.1 Mechanical Meters

Sydney Water's existing meter fleet includes a total of around 1.6 million customer meters. The fleet consists of 92% mechanical meters with the remaining 8% are digital smart meters.

Sydney is a growing city and on average we install 15,000 new mechanical meters each year to low-rise developments that would add to our mechanical meter fleet and require manual meter reading each quarter.

The mechanical water meter market is changing globally with more investment occurring in smart water meters. In recent times we have seen a significant price increase in mechanical water meters due to a shortage of key materials used in manufacturing. It is also expected that mechanical water meter prices will continue to rise due to a global reduction in demand.

A mechanical meter fleet provides little customer benefit beyond the quarterly meter consumption data provided to our business.

While we could continue with predominately a traditional mechanical customer meter fleet, the cost difference between mechanical and smart meters is represented in Figure 6 and mechanical meters don't offer the additional benefits to customers and the business and there is a risk we fall behind meeting with our customer expectations (see Figure 7 Benefits table).

#### 3.1.1 Program Management

The Sydney Water Customer Meter Program is managed by the Customer Metering Operations business.

The Customer Metering Operations business was re-structured in an Organisational Realignment in April 2024 to ensure efficiencies in managing the mechanical meter and smart meter programs.

The Customer Metering Operations Business manages all the internal resources and contracts associated with the procurement, installation and meter reading processes.

The Customer Meter Planning team are supported by a Customer Meter Delivery team (installation) and a Meter Reading team (meter reading). See below.

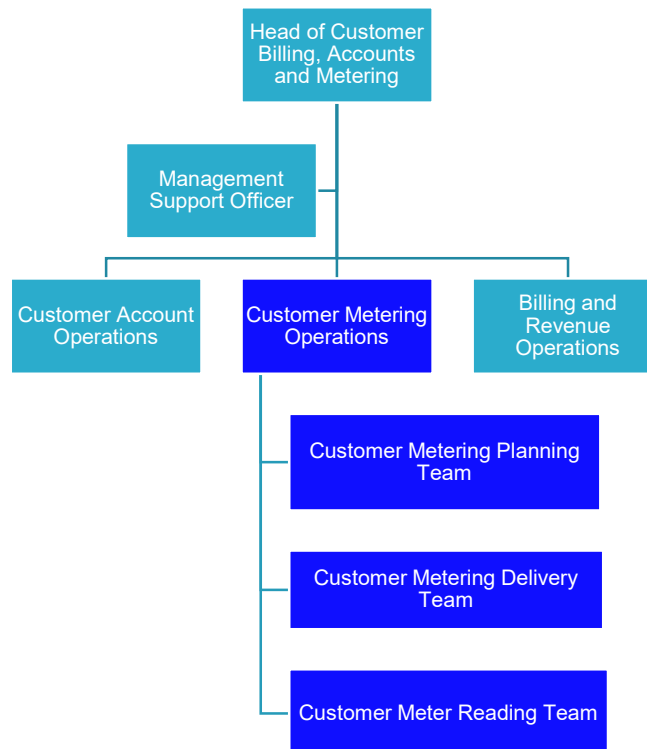


Figure 9: Sydney Water Billing, Accounts & Metering Structure

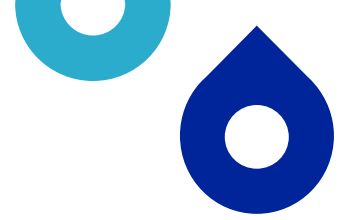
#### The role of Customer Account Operations:

- Lead the creation of new customer accounts, capture and maintenance of customer, meter and property data so we maintain accurate accounts ongoing.
- Lead the processing of customer, meter, property business exceptions so we can issue bills accurately and in a timely manner.
- Ensure that Sydney Water avails itself of all the information required to deliver accurate bills, reduce customer effort and enable pro-active service experiences to customers.
- Support the operational delivery of billing and metering services to customers.

#### The role of Customer Metering Operations:

- Lead the operational delivery of metering services to customers. Ensuring our fleet of 1.6m customer meters provide accurate, timely and reliable water usage data for the purpose of billing customers.
- Lead Sydney Water's transition from traditional meter fleet to a smart meter fleet using new metering technology to ensure we deliver world class services and to ensure delivery of benefits for both customers and our networks.
- Drive contractor performance in the delivery of all customer meter programs.
- Support the capture and maintenance of customer, meter and property data.
- Ensuring that Sydney Water avails itself of all the information required to deliver accurate bills, reduce customer effort and enable pro-active service experiences to customers





The role of Billing and Revenue Operations:

- Ensure when customers receive their bill its accurate, timely and we offer a range convenient payment channels encourages on time payments
- Optimise Sydney Water’s financial health by leading the processing of customer payments
- Lead best practice billing and payment channel experience for customers, building trust and corporate reputation
- Drive contractor performance in the delivery of all billing, payment and revenue collection activities
- Support the operational delivery of billing and metering services to customers.
- Ensure that Sydney Water avails itself of all the information required to deliver accurate bills, reduce customer effort and enable pro-active service experiences to customers.

The Customer Meter Planning team and Customer Meter Delivery team capitalise 100% of their labour to the Customer Meter Program.

There are seven main contracts administered under the Customer Meter Program. Six are managed and administered by the Customer Metering Delivery team which are accounted for as capital cost.

These include:

- 5 x Meter Supply Contracts – to procure new water meters for installation, replacement and exchange.
- 1 x Meter Field Services Contract – to carry out the field services required to complete installation, replacement and exchange work.

The Meter Reading team manage and administer the manual meter reading contract, which is accounted for as an operational cost.

- 1 x Meter Reading Contract – to carry out the manual meter reading functions and inputs into billing.

### **3.1.2 Operating & Delivery**

Sydney Water procures the necessary services to deliver the program and administers these contracts to ensure customers receive value for money.

The Sydney Water team plan out the meter replacement or installation based on a replacement criterion. Contractors are secured by the team to install, replace, and read the meters. These replacements are necessary to keep the meter fleet compliant while the meter reading are the key input and trigger for billing.

### **3.1.3 Digital Systems for Mechanical Meters**

Sydney Water has a standalone Information Technology system to capture manual meter readings which has been in operation since 2013. It is likely this system will require some major upgrades if we were to continue with manual meter reading processes for the next 5-10 years.



Sydney Water's billing system SAP is not planned for replacement.

## 3.2 Smart Meters

Sydney Water's meter fleet is required to comply with the National Measurement Act (1960) for trade measurement and its accompanying regulations.

This legislation means that Sydney Water must purchase verified meters with pattern approval and ensure that in-service meters are within  $\pm 4\%$  accuracy.

Smart meters offer significant features over mechanical meters as they provide automatic recording of meter readings at hourly time intervals, automated delivery of this data via wireless networks, and the ingestion and distribution of this data into various operational systems.

The major benefits delivered by smart meters include:

- More accurate data readings in real time, allowing for more regular information on water use, more accurate and frequent bill cycle for customers.
- The ability for Sydney Water to make data-driven decisions in essential areas of our business including customer benefits, water security, and operational benefits.

Routine preventative mechanical meter exchanges have been steadily reduced since 2020 to allow for a ramp up in investment in smart meters.

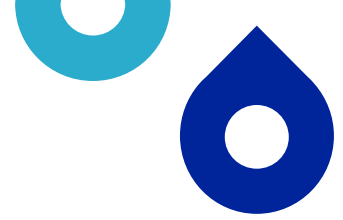
Currently around 307,000 20mm mechanical meters are forecast to meet the exchange criteria by the end of FY25 based on either usage or age of asset. The smart meters program will replace a significant quantity of those meters during 2024-2025 and the bulk of the remaining backlog will be replaced during the upcoming 2025-2030 regulatory cycle when it is anticipated that a further large-scale roll-out of smart meters will occur.

Our customer meter fleet for both high-rise low-rise connections is expected to increase by 25,000 per annum. Customers will fund these meters through the proposed ancillary fee for Meter Fit applications.

### 3.2.1 Program Management

It is proposed that Sydney Water will continue to have inhouse teams that manage the Customer Meter Program. The functions to support our Customer Metering Program are as detailed above in section 3.1.1.

The structure to support this, is a Customer Meter Planning team supported by a Customer Meter Delivery team (as currently with mechanical meters). This structure is not planned to change. There may be changes to the numbers and types of roles needed to successfully deliver our smart meter rollout if we decide to manage and deliver the smart meter rollout in the same manner that is done for the mechanical meter program. For a copy of the structure refer Figure 9.



### 3.2.2 Operating & Delivery

The Smart Metering Needs Business Case, approved in June 2024, aims to secure funding to determine the best long-term operating model (insource, outsource, or hybrid) for our customer metering program. It also aims to design and budget for the digital systems needed for our smart meter rollout.

Sydney Water plans to seek market feedback and cost estimates for the preferred Prime Contractor model in early 2025.

New contracts will be needed for the new metering technologies and will be managed by the Customer Meter Program team and possibly the Sydney Water Digital team. These contracts include:

- **Supply of smart meter supply contracts:** procure smart meters.
- **Supply of meter field services:** to install and exchange meters.
- **Supply of Smart Metering Technology:** Procuring new water meter technologies.
- **Supply of Smart Metering Supporting Systems:** Providing systems and technology, coordinated with the Sydney Water Digital Team.
- **Installation of Smart Metering Technology:** Performing field services for installation, replacement, and exchange work using new technologies.
- **Supply of telecommunications network:** to ensure interval water usage data is transmitted to Sydney Water digital systems to unlock benefits.

### 3.2.3 Digital Systems

We need new digital systems and integration with our existing systems to get the most out of our smart meter rollout.

Sydney Water has a clear plan for the necessary IT components, many of which support other digital projects or are minor updates to current systems. We will use open standards for communication protocols to choose from a wider range of meters and ensure they remain compatible even when networks are upgraded. We will not become a communications network provider but will use existing telecom companies in Greater Sydney.

Sydney Water's billing system, SAP, will not be replaced in the next two IPART price periods.



## 4. Costs Associated with Customer Metering

Detailed cost estimates have been produced for both the mechanical meter and smart meter programs. A breakdown is shown below.

<b>Mechanical Meters</b>	<b>Smart Meters</b>
Meter Supply \$112.3M	Meter Supply \$258.3M
Meter Install \$92.5M	Meter Install \$99.8M
Program Management \$54.1M	Program Management \$86.3M
Meter Reading \$98.1M	Meter Reading \$44.4M
Telecommunications \$0	Telecommunications \$127M
Digital Systems \$0	# Digital Systems \$26M
Capital Uplift \$33M	Capital Uplift \$59.7M
Contingency \$15M	Contingency \$35.2M
P90 TOTAL \$405M	P90 TOTAL \$736.4M

# estimated costs subject to final costs received

Figure 10: Costs comparison

# 5. Benefits Associated with Smart Metering

Transitioning from mechanical to smart meters on a large scale allows Sydney Water to make data-driven decisions in key areas such as customer service, water security, and network management.

As customer expectations evolve, leveraging advanced technology and solutions is essential to enhance performance and offer innovative services. These services empower customers to manage their water use and reduce costs.

Through the “Our Water Our Voice” customer engagement initiative, customers have shared their priorities, some of which smart metering will address.

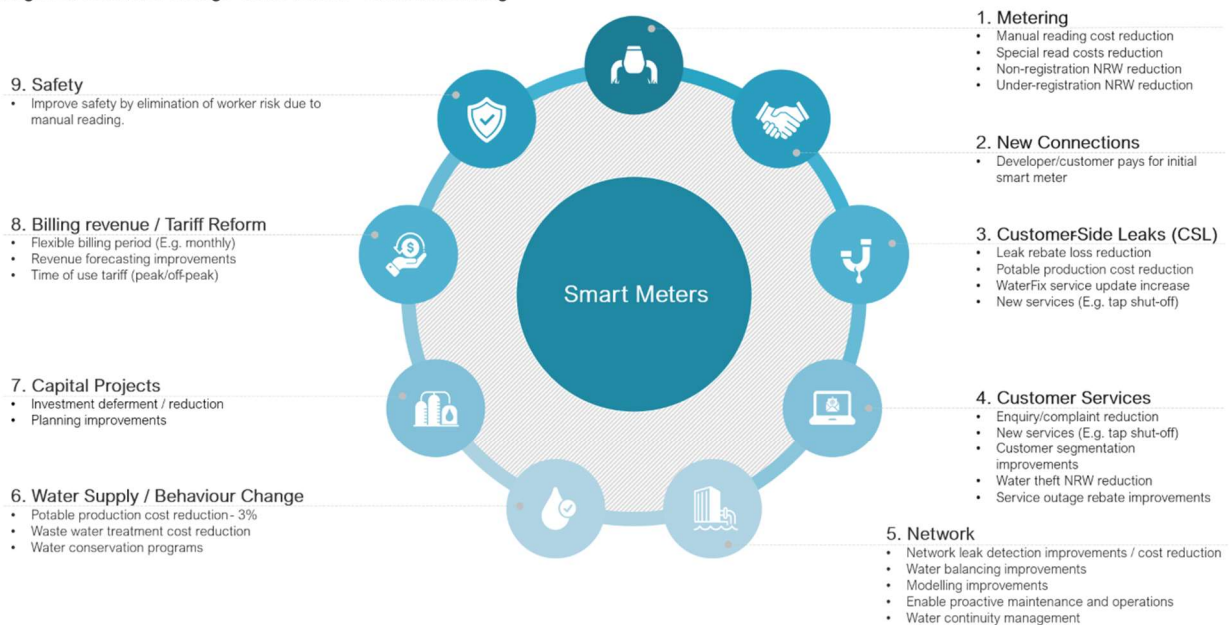
Smart meters will provide proactive notifications for leaks, high usage, and other issues within properties. They will also enable new tariff structures, such as monthly billing, thanks to the daily delivery of automated hourly meter readings.

Our understanding of benefits is an ongoing process, once more up to date data and information becomes available the benefit values will be updated to reflect this.

Below (Figure11) is an overview of the expected benefits that smart meters will bring to Sydney Water and our customers, along with the methodology used to derive these benefits.

## Overview of Benefits and areas of opportunity

Strategic Direction for a large-scale rollout - Smart Metering



17/09/2024

Strategic Direction for a large-scale rollout - Smart Metering 6



Figure 11: Benefits and areas of opportunity- for large scale rollout





## 5.1 Metering

At present, 92% of the meter fleet are read manually once per quarter. We have an existing meter reading contract in place which is structured as follows:

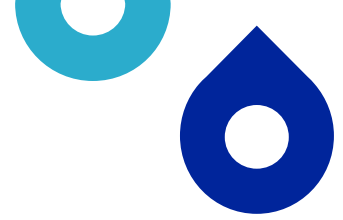
Five separate geographic regions

1. Northeast (NE)
2. Northwest (NW)
3. Central (CE)
4. Illawarra
5. Southwest (SW)

### 5.1.1 Metering Reading

There has been an assumption made that 1% of our customer base will opt out of receiving a smart meter. There are currently no plans to advertise or actively promote smart meters customers opting out of smart meters, as this may impact our ability to maximise the benefits we are forecasting. To ensure we don't incur and increase in manual meter reading costs there is a proposed Ancillary fee of \$9.01 per quarter that will be introduced to cover this increased cost to Sydney Water for manual meter reading.

For the purposes of the business benefits the following assumptions have been made that \$33.1M will be saved in manual meter reading costs over the next two IPART price periods. Meter Reading cost avoidance of \$14.5M over the next two IPART price periods is expected through automated meter reading process enabled. Meaning a total benefit of \$47M.



## 5.1.2 Non-registration NRW reduction

Meters can fail, causing non-registration of water usage. This leads to reduced revenue as the customer is only billed for the usage that is recorded by the meter. Mechanical meters are read quarterly for the purpose of billing and these readings are the only data points that are used to determine if usage is occurring or if meters have failed and are not registering flow.

Smart meters are automatically read hourly and data is delivered to Sydney Water daily. This additional data is used to accelerate the detection of non-registering meters. Rather than waiting for multiple quarterly manual readings to determine a pattern of non-registration, smart metering data can be analysed continuously to determine patterns of non-registration and can be actioned significantly faster than with mechanical meters.

This is expected to result in increased revenue benefits of \$31.7M over the next IPART price period and \$104.5M in total over the next two IPART price periods.

## 5.1.3 Under registration NRW reduction

As mechanical meters age, they are affected by wear and tear of their moving parts. In most cases, this causes meters to under-register. For example, if 100 litres of water passes through an aged meter, it may only register 98 litres.

Smart meters do not have any moving metrological components and instead use ultrasonic and magnetic remnant technologies to detect the flow of water and calculate the volume. As there are no moving parts, smart meters do not suffer from under-registration as they age in the way that mechanical meters do. This results in more accurate billing and increased revenue.

Where mechanical meters are fitted with data loggers to effectively transform them into a hybrid smart meter, the hourly reading data that they produce can be used to identify patterns of under-registration due to wear and tear of the mechanical components. This data can be analysed continuously to determine patterns of under-registration and can be actioned significantly faster than with mechanical meters.

This is expected to result in increased revenue benefits of \$22.9M over the next IPART price period and \$75.4M in total over the next two IPART price periods.

## 5.2 New Connections

Traditionally, Sydney Water supplied and installed mechanical meters for all new connections, except for high-rise developments. In 2014, it became a requirement for all new high-rise developments to have a smart meter installed at the developer's expense, and these meters were then gifted to Sydney Water at no cost.

Starting from July 1, 2025, a new approach will be implemented for all new 20mm connections, which make up an estimated 92% of all new connections. A new Ancillary charge of \$289.45 will be introduced for all Meter Fit applications. This one-off fee covers the cost of managing the application, the smart meter, its



installation, and corporate overheads. This change aims to ensure fairness in the metering process for all new connections.

Introducing a cost to assess, approve, supply and install a customer water meter is standard practice within the water industry.

For business benefits, it is assumed that this process will result in an estimated revenue increase of \$54.64 million over the next two IPART price paths.

## 5.3 Customer Side Leaks

Infrequent collection of consumption data gives mechanical meter customers little insight into their usage patterns. Additionally, leaks or unnecessary usage that aren't obvious to the customer can go undetected for long periods between meter readings. This can result in high water consumption and unexpectedly high bills.

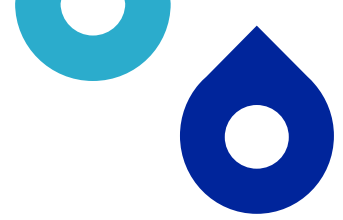
Customer side leaks reduction – Sydney Water offers a Hidden Leak rebate for customers who have experienced a customer side water leak. With near real time smart meter data available and proactive leak notifications we will reduce the rebates customers receive.

This is expected to result in avoided cost benefits of \$13.7M over the next IPART price period and \$28.6M in total over the next two IPART price periods.

*In the first year of our smart meter rollout in the Beecroft, Bellevue Hill and Dural suburbs we have observed 5% of properties have experienced a continuous flow event resulting in Sydney Water proactively notifying the customer of the potential issue. On average customers have saved \$381 and we have reduced the volume of water waste by an average of 143kL for each property.*

*South East Water are attributing a 1.5% reduction in customer demand as a result of providing continuous flow event notifications to their 38,000-property trial. The data analysis completed has been independently verified Environment Protection New York City, 2016.*

*Central Highlands Water (CHW) has rolling out digital metering in their service area during the 2018-2023 pricing period. Results to date have shown a 1.5% reduction in customer demand because of providing continuous flow event notifications CHW has rolled out 25,000 meters as of May 2022.*



### **WaterFix® revenue increase:**

Sydney Water offers a range of services under the WaterFix® name including 'WaterFix® Residential' and 'WaterFix® Concealed Leaks'. These services provide customers with water efficient fixtures and support for leak detection within their properties.

Many leaks go unnoticed or unreported with only quarterly readings for billing. With hourly meter readings from smart meters and pro-active notification to customers of continuous flows, Sydney Water will have greater engagement with our customers regarding leaks. This will lead to an increase in leaks being addressed, and customers being offered WaterFix® services to support them in resolving leaks.

Sydney Water may also introduce a new service to shut off taps for customers when leaks are detected. For example, when a customer is issued a leak alert and they are away from their property but want the tap shut off to minimise leakage or potential property damage.

This is expected to result in increased revenue benefits of \$1.6M over the next IPART price period and \$5.3M in total over the next two IPART price periods.

### **Electronic bill savings:**

Currently, 37% of customers receive their water bills electronically. This figure is growing at 4% per annum.

As a result of active campaigns during the smart metering roll-out, we believe that we will be able to migrate customers to e-billing at a faster rate, which means they will receive their quarterly bill as well as other SW communications via email at a much higher rate than the 'current business as usual' migration rate.

This is due to making customers aware of the e-billing option, and promoting value add services such as regular water use reports which will only be available via electronic channels. E-billing has a significantly lower cost because of reduced paper and postage costs which are replaced with the cost of an electronic transaction. There are also ongoing benefits in being able to send other SW communications electronically (such as works notifications, overdue bill information, and other general information which are legally mandated to communicate)

For the purposes of the business benefits the following assumptions have been made, as a result of our smart meter rollout and associated customer engagement activities there is an assumption that an additional 1% of customers will convert from paper to electronic billing. However for the purpose of financial benefits we have assumed \$0.

## **5.4 Customer Services**

Currently, Sydney Water calculates customer water consumption quarterly using manual meter readings. For most customers, a meter reader visits their property to collect the reading, which is then compared to the previous reading to determine the bill.



This infrequent data collection provides customers with minimal information about their usage patterns. Additionally, leaks or unnecessary usage that aren't obvious to the customer can go undetected for long periods between meter readings, leading to high water consumption and unexpectedly high bills.

By using automated meter reading data, it is assumed that Sydney Water will save the cost of a Business Support staff member, estimated to be \$1.2 million over the next two IPART price periods.

### **Reduction in customer queries, but an increase in water usage conversations:**

For the purposes of the business benefits the following assumptions have been made that there is a likely to be a reduction in enquiries to Sydney Water's contact centre due to incorrect or estimated bills, however it is assumed this reduction will be offset by more engaging conversations around water usage patterns and conservation measures to help manage their bills.

## **5.5 Networks**

A smart water meter allows the collection of granular usage data and additional measurement objects such as water pressure and temperature that is used to assist the management of our network. This data assists with:

- Main break detection. Real time pressure loss alarms can alert to a break and pressure measurements from other smart meters in the vicinity used to determine break location.
- Network and infrastructure modelling. Granular usage data and peaks usage valves from the can be used calculate network demand and accurately determine infrastructure sizing
- Dividing valve status. Being able to determine the status of a dividing valve based on the pressure reading from smart meters either side of the valve.
- Real time back flow alarms alert to water flowing back into the network creating potential water quality issues.

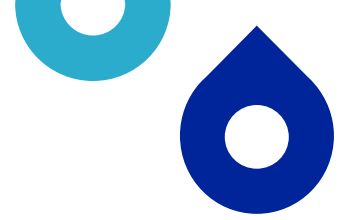
The above benefits, while expected to be significant, are yet to be quantified and therefor have not been included in the financial benefits for the smart metering transition.

Smart metering has benefits for District Metered Area (DMA) management and water balancing including:

- Simultaneous reading of all meters each hour, on the hour. This improves accuracy over mechanical metering where meters are read sequentially and at different times.
- Greater granularity of data where analysis of hourly readings give greater insights into water usage, losses, and other non-revenue events which will improve the ability to interpret data and therefor the accuracy of water balances. For example, a sudden break in a mainline would appear as a step-up in the hourly flow readings of a DMA meter but not in the customers meters.
- Improved reaction times to non-revenue water events. With hourly data delivered to Sydney Water daily, non-revenue water events can be identified much faster than with quarterly readings from mechanical meters.

These benefits to DMA management and water balancing are expected to result in increased revenue benefits of \$5.5M over the next IPART price period and \$23.5M in total over the next two IPART price periods.





## 5.6 Water Supply/Behaviour Change

Providing near real-time water consumption data can help customers make more informed decisions. This can be achieved through:

- Access to hourly water use data via various digital channels.
- Regular water reports that compare neighbourhood water usage.
- Enhanced water use literacy through introduction and installation communications, leading to more personalized tips based on observed consumption.

Additionally, the ability to directly measure the effectiveness of other water-saving programs through A/B testing and accurate consumption data from targeted groups.

Examples of how smart meters have influenced behaviour:

### **Sydney Water Residential Trial (2008-2010):**

Sydney Water conducted a smart meter trial in Westleigh, Sydney, to study the impact on customers' water usage behaviour by providing an in-house display showing near real-time water consumption.

Findings showed customers with an In Home Display reduced consumption on average between 7-10%. The behaviour change was sustained throughout the study period.

About 80% of properties were identified as having leak at some point during the trial. Typically, on

### **Mackay Regional Council Roll-Out (2015):**

Mackay Regional Council implemented a full rollout of smart meters, reducing per capita consumption from 240L/day to 210L/day.

They introduced a behaviour change program encouraging customers to use meter data to lower their consumption.

This led to a 10% reduction in water use, though it's important to note that not all properties were on usage-based charging before the roll-out, and Mackay's weather and housing conditions differ significantly from Sydney's.

### **Literature Review by Institute of Sustainable Futures (2017/18):**

Metropolitan Melbourne water companies commissioned a review of global smart meter roll-outs. Findings showed customer demand reductions ranging from 3% to 8% with an average savings at 5.5% and a median of 5.1%

The review noted limitations such as the small number of completed roll-outs, climate change impacts, varying levels of customer engagement, and the sustainability of savings over time.

For the purposes of the business benefits the following assumptions have been made that 3% reduction in customer demand can be achieved as a result of a behaviour change program.



## 5.7 Capital Projects

When designing water supply infrastructure, assumptions are made to estimate peak consumption and peak flow. Peak flow is crucial for sizing pipes to ensure the minimum level of service defined in the Customer Charter is met.

Monitoring near real-time consumption behaviour allows these design assumptions to be continually refined with data collected over time. It also helps understand and account for the impact of external factors like weather or behavioural change campaigns.

Currently, we assume that this monitoring will not affect the size of water infrastructure pipes, so no financial benefits have been associated with it. We are working with our Asset Planning teams to refine this benefit and determine if a financial benefit can be identified.

Examples of how smart meters have influenced capital infrastructure investment.

*Yarra Valley Water utilised interval water usage from smart meters to update hydraulic models used to size future infrastructure required to service new developments. They have been able to reduce the pipe diameter in new developments by one pipe size.*

*Mackay Regional Council have used the interval water usage data gathered from 35,000 customer meters to confirm that some customer meters were oversized. (Utility magazine, November 2016).*

## 5.8 Billing/Tariff Reform

Smart metering will give customers more flexibility with their billing frequency allowing customers to choose monthly billing frequency as another mechanism to manage their bills. It also allows Sydney Water to consider flexible tariff reforms to encourage customers to use water at different times of the day, helping to manage peak flows in the water network.

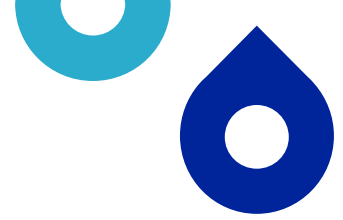
For business benefits, it is assumed that no new programs will be initiated in the next price path.

## 5.9 Safety

Manual meter reading is a high-risk activity, with staff walking up to 15 km a day to read between 500 and 800 meters. Each meter presents unique safety risks when accessing it for accurate billing readings. Data from Sydney Water shows that between July 2020 and June 2023, the Total Recordable Incident Frequency Rate ranged from 9.4 to 45.5, indicating the number of injuries per 1 million hours worked.

Eliminating manual meter reading will significantly reduce safety risks for our employees and contractors.

For business benefits, it is assumed that no financial value will be assigned to this benefit.



## 5.10 Non Financial Benefits

Transitioning to smart meters will unlock some non-financial benefits which will be delivered. These are:

- Reduced costs for commercial customers who currently pay external service providers to analyse their water consumption in near real time and provide insights and advice on how to save money.
- Identifying changes in the split between recycled water and drinking water consumption at individual property level which could suggest a potential cross connection within the household plumbing.
- Near real time alerting of backflow through individual meters which represents a potential risk to drinking water quality.



## 6. Conclusion

Transitioning to smart water meters offers numerous benefits for Sydney Water and its customers.

Smart meters provide near real-time data, enabling customers to better understand and manage their water usage, detect leaks early, and avoid unexpectedly high bills. This technology also enhances operational efficiency by reducing the need for manual meter readings, which are both labour-intensive and risky. Additionally, smart meters support more flexible billing options and potential tariff reforms, helping to manage peak water demand more effectively.

Sydney Water requires a compliant customer meter fleet to maintain customer confidence in the accuracy of bills, maximize the economic life of the fleet, support backflow prevention for low-risk residential properties, enable revenue collection, and realise new opportunities for investment efficiency.

Ongoing investment is essential to achieve these outcomes. The increase in investment between a mechanical meter fleet and a smart meter fleet over the next two IPART price paths is detailed in Figure 6 above.

Overall, the shift to smart water meters represents a significant step towards a more efficient, safe, and customer-centric water management system and is considered prudent investment.