



Australian Government



Inspector-  
General of  
Water  
Compliance

# Glossary

<b>Accurate</b>	Up to +/-5% MPE in-situ operation as per Compliance Compact and MAF2 requirements.
<b>AS4747-compliant meter</b>	A non-urban water meter that has met the requirements of AS4747 and has been issued with a Pattern Approval certificate.
<b>Australian Standard 4747 (AS4747)</b>	The Australian standard which covers meters for non-urban water supply, and by which said meters are tested and Pattern Approved.
<b>Certified Person; Certified Meter Installer</b>	A person certified by an accredited organisation to undertake meter installation, maintenance and validation activities in accordance with codified industry practices and Australian Standards.
<b>Closed Conduit meters</b>	Meters intended for the metering of water in full flowing pipes.
<b>Entitlement</b>	The amount of water authorised to be taken and used by an irrigator or water authority, up to a certain volume of water in a year.
<b>Grandfathered or Contemporary meter</b>	A meter that is not pattern-approved but has been approved for continued use with compliance processes in effect to ensure ongoing accuracy. The state regulator must have an acceptable level of confidence that grandfathered meters have a $\pm 5\%$ accuracy range and have a manufacturer's certificate of accuracy of $\pm 2.5\%$ and has been installed to manufacturer's specifications. Full details may be found in chapter 1.1.1 of the MAF2.
<b>Murray–Darling Basin Compliance Compact (Compliance Compact)</b>	The 2018 agreement between the Australian Government and the Murray–Darling Basin States, setting priorities and obligations on the governments for water compliance effort and for the integrity of Murray–Darling Basin water management.
<b>Metrological Assurance Framework 2 (MAF2)</b>	Rules and guidance for the use and regulation of non-urban water meters <a href="https://www.agriculture.gov.au/sites/default/files/documents/metrological-assurance-framework-2.pdf">https://www.agriculture.gov.au/sites/default/files/documents/metrological-assurance-framework-2.pdf</a>
<b>Meterable take</b>	Licensed water take, as defined at clause 7 of the Best practice guidelines for minimum metering thresholds as agreed by Basin jurisdictions. Note – exemptions are defined in Clause 8. See: <a href="https://www.agriculture.gov.au/sites/default/files/documents/mbd-best-practice-guidelines.pdf">https://www.agriculture.gov.au/sites/default/files/documents/mbd-best-practice-guidelines.pdf</a>
<b>National Measurement Institute (NMI)</b>	The National Measurement Institute (NMI) is Australia's peak measurement body responsible for biological, chemical, legal and physical measurement.
<b>Open-Channel meters</b>	Meters intended for the metering of water in open channels and partially filled pipes.
<b>Pattern Approval</b>	Evaluation of a design of a measuring instrument (such as a water meter) by an impartial body which examines the pattern of an instrument against a set of national or international metrological specifications, which determine whether an instrument manufactured in accordance with that design is capable of retaining its calibration over a range of conditions.
<b>Pattern approval certificate</b>	A certificate, published by the NMI, which describes the design (including type and size) of the meter, which is Pattern Approved, and any conditions for the installation, maintenance and use of the meter.
<b>Telemetry</b>	Involves automatically recording data and sending it electronically from the meter to another place for monitoring and analysis.

# Murray-Darling Basin – Metering and Measurement Report Card

01 Jul 2021 – 30 Jun 2022. Data as at 30 June 2022. Progress from 2020 – 21 metering report card indicated in brackets

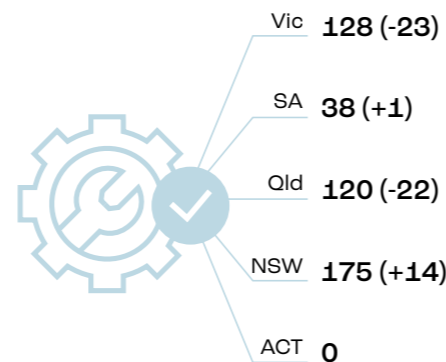
## Pattern approved meters

	Pump size (mm)			Pump size (mm)	
	Min	Max		Min	Max
ABB	40	200	EUROMAG	40	1000
ABB	40	1200	KROHNE	25	600
AQUAMONIX	50	1500	KROHNE	25	1800
ARAD	80	200	RUBICON	600	600
ARAD	40	300	SIEMENS	25	1200
ARAD	50	300	SIEMENS	25	2000
BERMAD	50	300	SENSUS	40	400
ELSTER	50	200	ZENNER	50	300
ENDRESS+HAUSER	25	800			

This measure is reported by the National Measurement Institute as at 30 June 2022. The objective of the measure is to signal the market availability of pattern approved meters and models by manufacturer and pump size.

Data owner/sources: National Measurement Institute

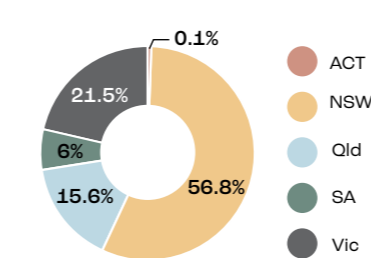
## Count of qualified meter installers



This measure is reported in order to highlight the availability of active certified meter installers (CMI's) that are qualified to install, certify and validate compliant meter installations, as at 30 June 2022.

Data owner/source: Irrigation Australia

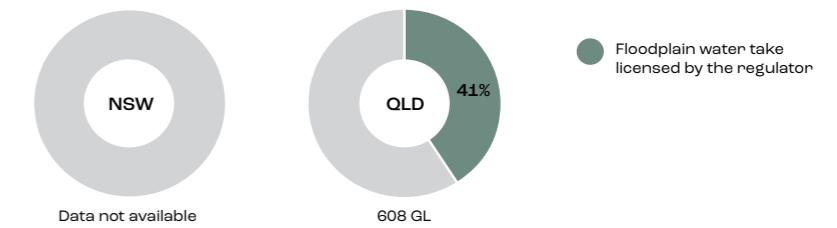
## 2021-22 Water take by Basin State



This measure represents the percent of annual actual take of Basin States for the 2021-22 water year as reported by Basin States under section 71 of the Water Act (2007). The objective of this measure is to give context to the scale of metering reform in each Basin State. Please note that this measure includes take that is not considered meterable.

Data owner/sources: State regulators

## Floodplain water take



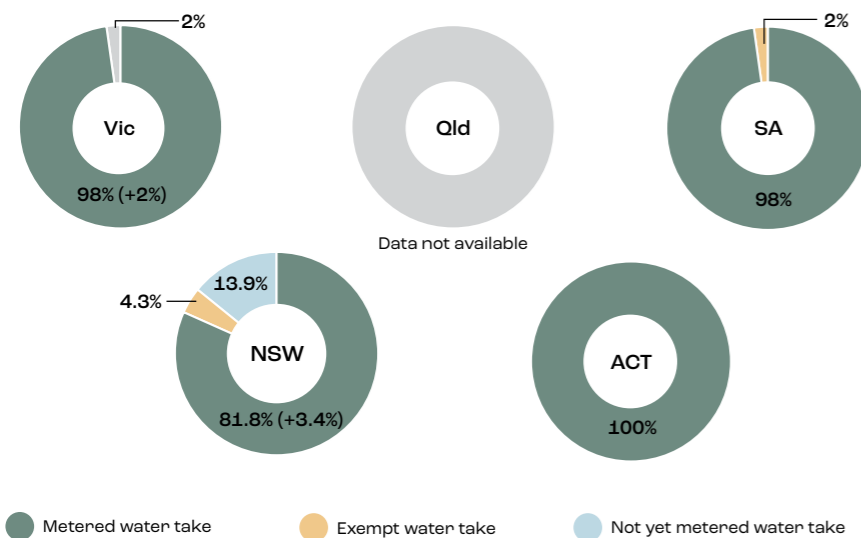
This measure is reported to understand the volume of floodplain harvesting (called overland flow in Qld) take and how progressed states are in licensing that volume.

In the Qld portion of the Murray-Darling Basin, high risk overland flow take is subject to water licensing. The total volume of overland flow water taken in Qld is 608 GL, 41% of which is licensed by the regulator (Lower Balonne high priority overland flow take). Due to a licensing process underway in the Border Rivers and Moonie WRP area, the total licensable volume for overland flow is changing and will not be available until the process has been completed. Qld is also developing an approach for measuring and accounting for the take of overland flow water.

Full implementation of the NSW Floodplain Harvesting Policy including licensing and commencement of measurement was due in June 2021, however delays in implementing the legislative reform have meant that licensing and measurement of floodplain harvesting had not taken place in NSW as of 30 June 2022.

Data owner/sources: State regulators

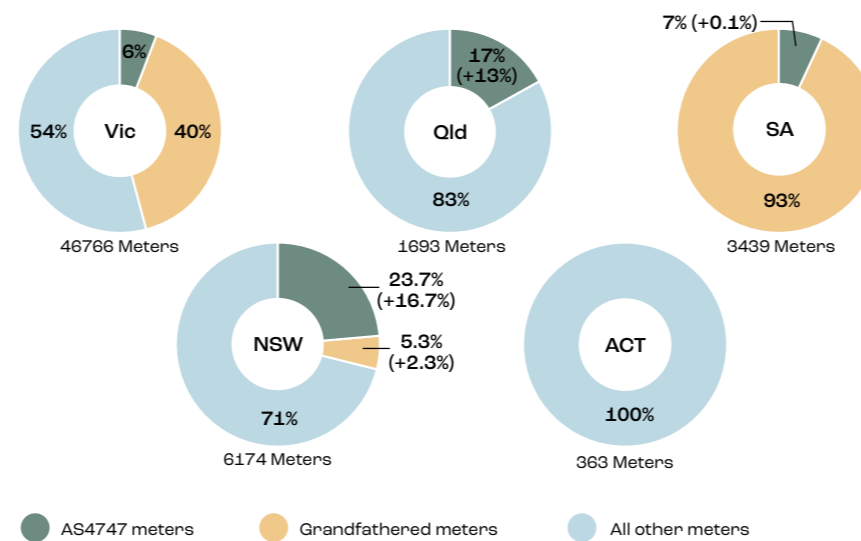
## Percentage of water take metered by state



This measure is reported to highlight percentage of meterable water take across the Murray-Darling Basin by each State that is metered.

Refer to individual State Report Cards for detailed explanation.  
Data owner/sources: State regulators

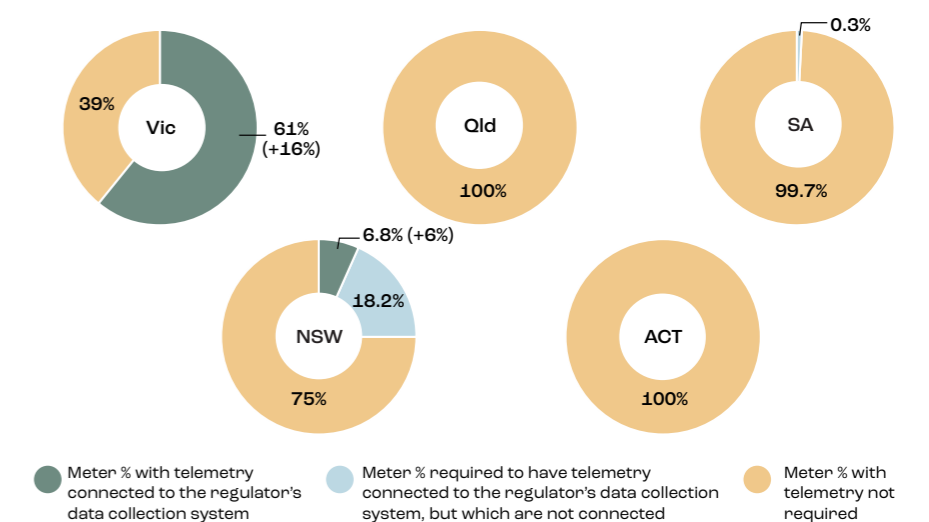
## Metering accuracy by state



This measure is reported to identify the percentages of meters that comply with the State's metering policy and are therefore deemed accurate (which includes AS4747 and grandfathered meters).

Refer to individual State Report Cards for detailed explanation.  
Data owner/sources: State regulators

## Telemetry coverage



This measure is reported to identify the percentage of meters with telemetry connected to the regulator's data system across the Murray-Darling Basin.

Refer to individual State Report Cards for detailed explanation.  
Data owner/sources: State regulators

# Murray-Darling Basin – Metering and Measurement Reportcard

01 Jul 2021 – 30 Jun 2022

## Non-urban metering in the Murray-Darling Basin

Accurate and widespread non-urban metering across the Murray-Darling Basin is an essential component for effective water management. Requirements for non-urban metering were set out in the Compliance Compact (2018), with detailed rules and guidance outlined in the Metrological Assurance Framework 2 (2021). The deadline for metering reform is July 2025, at which point every Basin State must have compliant meters based on the Australian Standard (AS4747) or have relevant exemptions or grandfathering in place.

With each Basin State at different stages of implementing metering reform there is a risk of inconsistent metering causing an unfair playing field across the Murray-Darling Basin. The metering report card aims to transparently report metering reform progress using consistent metrics for coverage, accuracy, and timeliness across Basin States.

As 2021-22 is the second iteration of the metering report card, progress towards these requirements through the years can start to be tracked. For the 2021-22 report card Basin States were also given the option to provide data for supplementary metrics on metered entitlements and volume of telemetered take, giving a more comprehensive picture of metering reform progress.

Widespread adoption of telemetry can significantly improve water compliance monitoring and will be important in ensuring metering data is timely. Both NSW and Victoria are making progress towards meeting goals for telemetry coverage. Victoria's percentage of meters with telemetry increased by 16% and NSWs increased by 6% since the 2020-21 metering report card, with 18.2% of meters in NSW still to have telemetry connected to the regulators data collection system. Victoria has the most widespread telemetry coverage of any Basin State, with 61% of meters being telemetry-enabled and 70% of meterable water take monitored through telemetry-enabled meters in 2021-22. As of June 30, 2022, South Australia and Queensland did not have widespread policy requirements for telemetry in place, while the small geographic size of the ACT means benefits of implementing telemetry there are minimal. South Australia is trialling the suitability of retrofitted telemetry technologies and on-farm water usage analytics during 2022-23. It is noted that Queensland have made significant policy changes after 30 June 2022 which will be reflected in the 2022-23 report card.

A key consideration for metering reform is the number of active certified meter installers (CMIs) available to install, validate, upgrade, and maintain non-urban meters. Since the 2020-21 metering report card there has been a change in CMI numbers across the Basin States. The only notable increase in CMIs occurred in NSW, which rose from 161 to 175. The Inspector-General understands that the actual number of active and available CMIs in NSW (known as DQPs in NSW) is significantly lower than this number and is a significant risk to metering policy implementation in NSW. As NSW have a significant number of meters as part of their reform program, the number of CMIs available will be vital for ensuring their metering reform goals are met. There were also notable decreases in CMIs in Queensland and Victoria. Fulfilling metering reform obligations is reliant upon CMI availability in every Basin State. CMI numbers will continue to be monitored by the IGWC through future versions of the metering report card.

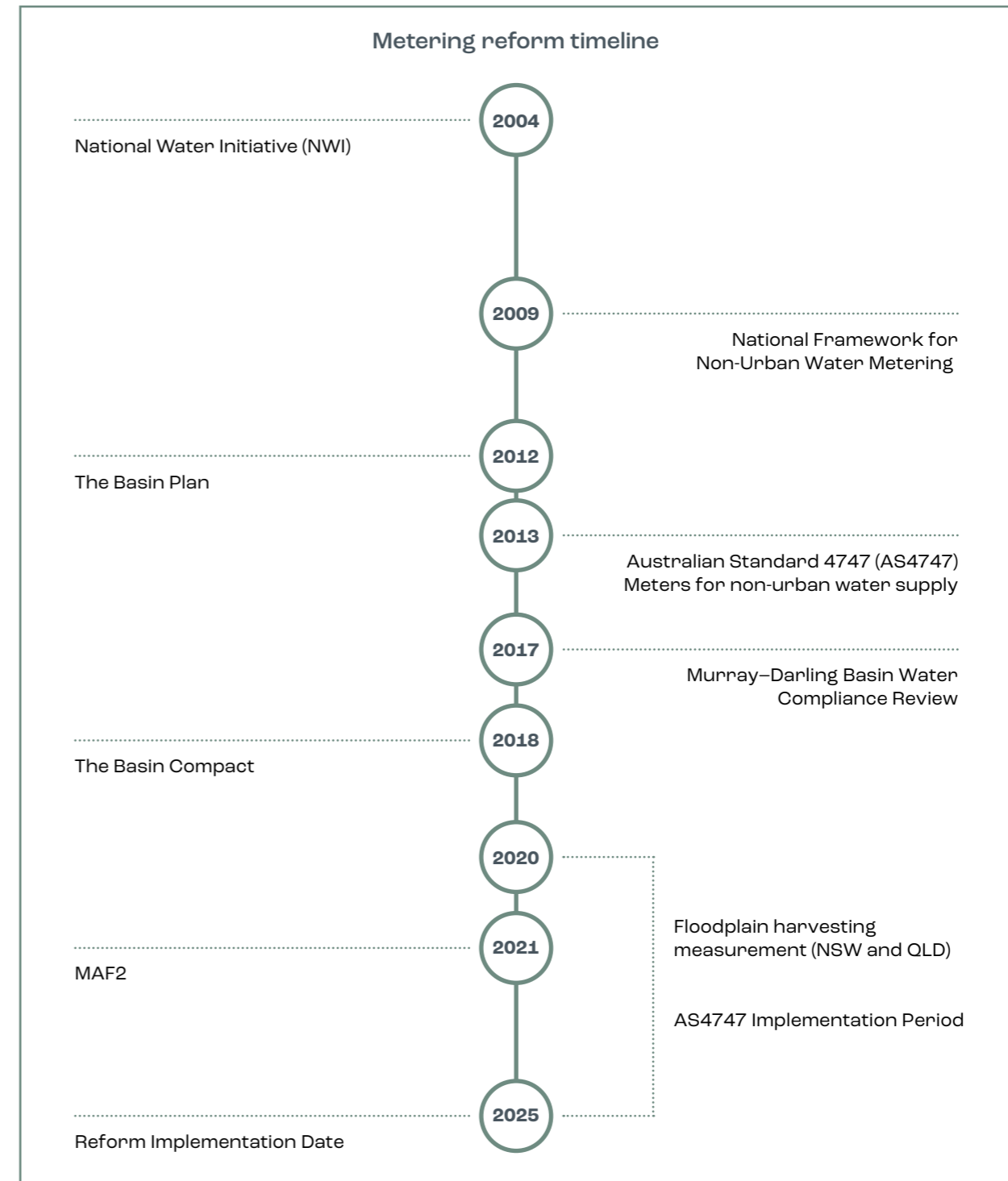
Data on meter accuracy was reported on by all Basin States for the first time in the 2021-22 metering report card. The biggest increases were seen in NSW, with a 16.7% increase in AS4747 compliant meters and a 2.3% increase in grandfathered meters. NSW metering reform efforts have established it as the Basin State with the highest proportion and highest number of AS4747 meters. Queensland also made progress with a 13% increase in AS4747 meters. As South Australia already has 100% of meters classified as grandfathered or AS4747 and compliant with the State's metering policy, the accuracy metric was relatively static with a 0.1% increase in AS4747 meters. Both ACT and Victoria reported on meter accuracy for the first time in the 2021-22 metering report card, so progress between years for these Basin States cannot yet be tracked.

Meter coverage was reported by all Basin States except Queensland. Queensland did however report on metered entitlements, with 74% of entitlement volume metered. It is expected that Queensland will report on the metered water take metric in future metering report cards after a strengthened metering policy is implemented. Since 2020-21 there was little change in South Australia's meter coverage, as all meterable water take was already metered or exempt in the Basin State. NSW and Victoria had increases in metered water take, with NSW also reporting 88.6% of entitlement volume metered. Queensland also reported 41% of floodplain water take licenced, while NSW commenced individual floodplain harvesting licencing in July 2022 which is outside the timeframe of this report card. It is expected that NSW will provide data on licenced floodplain take in future metering report cards as implementation of the State's licencing framework continues.

Through future iterations of the metering report card, the Inspector-General will continue to track the Compliance Compact commitments of the six governments on metering reform across the Murray-Darling Basin to improve transparency and accountability in non-urban metering and water take in the Murray-Darling Basin.

## Metering and measurement in the Murray-Darling Basin and Metering reform timeline

Metering is fundamental to trust in water accounting and compliance. Metering standards need to be consistent to make sure water take is fair for everyone across the Basin. The timeline below demonstrates the commitments to better metering. Each Basin State must have compliant meters based on the AS4747 standard by July 2025, or have relevant exemptions or grandfathering in place.

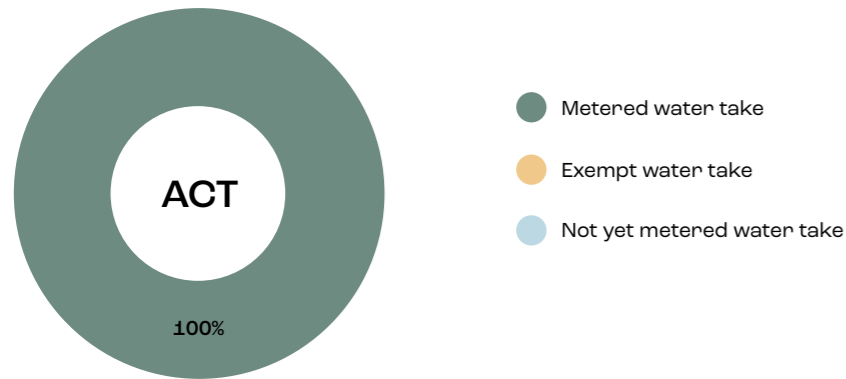




# Murray-Darling Basin – Australian Capital Territory Metering Report Card

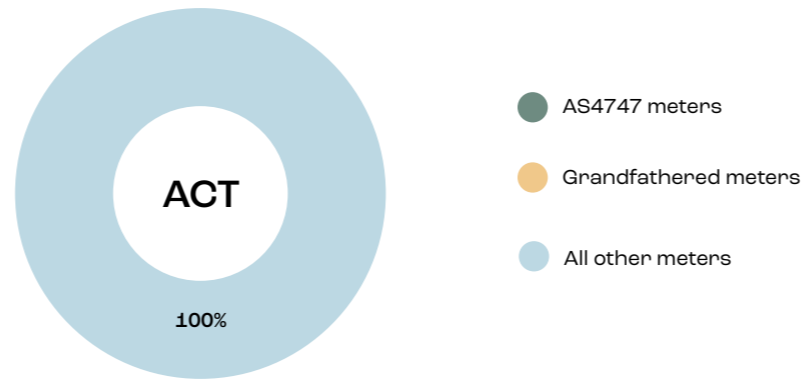
01 Jul 2021 – 30 Jun 2022. Progress from 2020 – 21 metering report card indicated in brackets

## Percentage of water take metered in the ACT



This measure is reported to highlight percentage of meterable water take across the Murray-Darling Basin by each State that is metered.  
Data owner/sources: State regulators

## Metering accuracy in the ACT

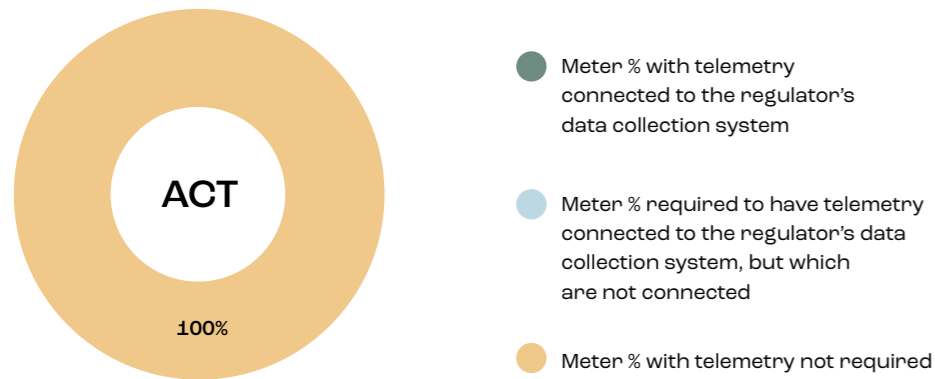


This measure is reported to understand the percentages of meters that comply with the State's metering policy and are therefore deemed accurate (including AS4747 and grandfathered meters). The percentage of AS4747 meters in the measure is intended to show progress basin states are making in the roll-out of AS4747 metering.  
Data owner/sources: State regulators

## State Overview

The ACT comes from a position of strength in terms of water resource compliance in the Murray-Darling Basin. The overall contribution of ACT non-urban water use within the Murray-Darling Basin context is extremely small and considered low risk to the Basin Plan outcomes. ACT water extraction is also well within sustainable diversion limits and of proportionally low consumptive use compared with other Basin jurisdictions. All licensed water extraction points in the ACT are metered. The volume of water used by each licence holder is analysed annually via an accounting process and compliance with licence conditions (supply of data, amount of water used) is also assessed routinely by the ACT authority. Information provided by licence holders is validated by an inspection program that aims to check water meters at least once every three years and more frequently for higher risk water users. The ACT is committed to ensuring all water meters comply with the National Framework for Non-urban Water Metering and is currently developing its own metering policy to further strengthen its compliance work. Public consultation on the draft policy is complete and the policy is being finalised for government approval. The policy is expected to commence on 1 December 2023.

## Telemetry coverage



This measure is reported to identify the percentage of meters with telemetry connected to the regulator's data system.  
Data owner/sources: State regulators

## How is meter data collected where telemetry is not used

In-field visual inspections, photographs, and electronic submission of readings. A risk-based approach is used in determining the frequency and requirements of reporting

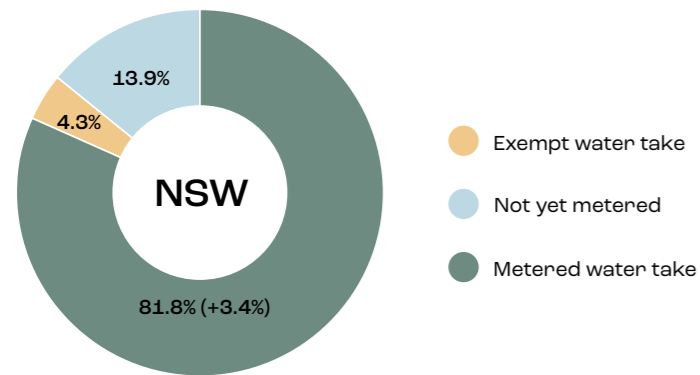
This measure is reported to identify how meter data is collected and how often when telemetry is not being used.  
Data owner/sources: State regulators



# Murray-Darling Basin – New South Wales Metering Report Card

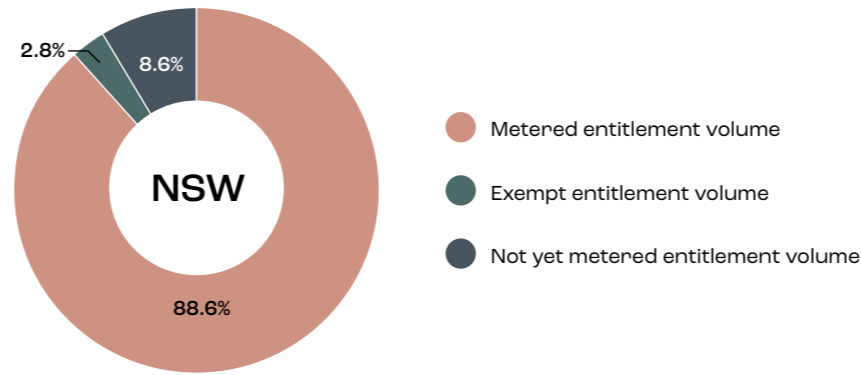
01 Jul 2021 – 30 Jun 2022. Progress from 2020 – 21 metering report card indicated in brackets

## Percentage of water take metered in New South Wales



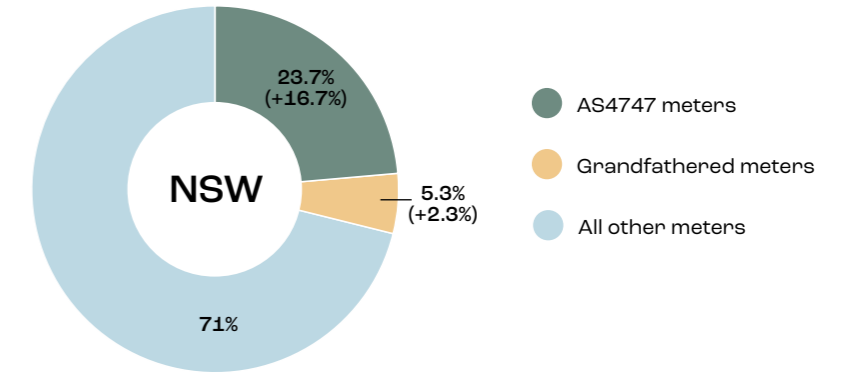
This measure is reported to highlight percentage of meterable water take across the Murray-Darling Basin by each State that is metered.  
Data owner/sources: State regulators

## Percentage of entitlement volume metered in NSW



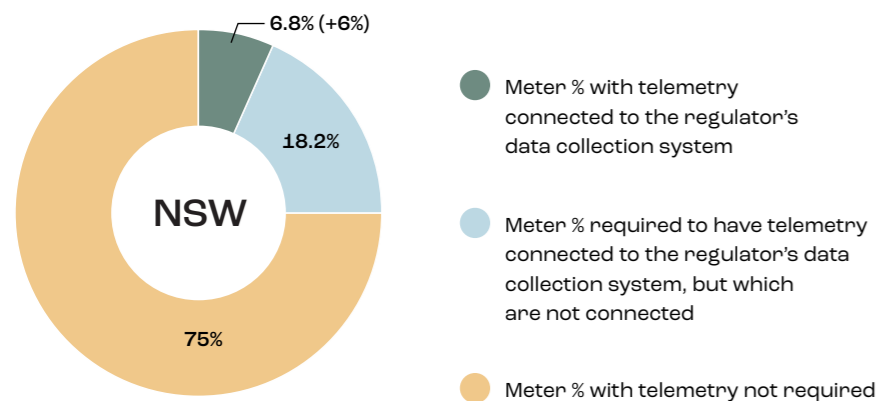
This measure is reported to highlight percentage of entitlement volume across the Murray-Darling Basin by each State that is metered, assuming a 100% utilisation of entitlement. Data provision for this metric was optional by States.  
Data owner/sources: State regulators

## Metering accuracy in New South Wales



This measure is reported to understand the percentages of meters that comply with the State's metering policy and are therefore deemed accurate (including AS4747 and grandfathered meters). The percentage of AS4747 meters in the measure is intended to show progress basin states are making in the roll-out of AS4747 metering.  
Data owner/sources: State regulators

## Telemetry coverage



This measure is reported to identify the percentage of meters with telemetry connected to the regulator's data system.  
Data owner/sources: State regulators

## How is meter data collected where telemetry is not used

Approval holders submit meter reads to WaterNSW as per the schedule below. When submitting meter reads, if no water is taken that also needs to be declared. Non-telemetered meters have their data loggers annually downloaded by WaterNSW. Logbooks with meter records must also be kept for five years.

	Recording frequency	Report monthly	Report annually
Works required to meter <u>before</u> the metering reform compliance date	The water user manually records licensed water take in a logbook each time water is taken. Some exemptions apply in some areas where an operational meter and data logger is installed.	N/A	WaterNSW reads the meter at least annually (and in some cases meters are read quarterly, such as for regulated rivers)
Works required to meter <u>after</u> the metering reform compliance date	Licensed water take is automatically recorded by Local Intelligence Device (logged hourly)	Approval holder submits a meter read	WaterNSW downloads Local Intelligence Device data annually

This measure is reported to identify how meter data is collected and how often when telemetry is not being used.  
Data owner/sources: State regulators

## State overview

Metering requirements were introduced in NSW in the early 1980s for regulated rivers and in 2003 for major inland alluvial groundwater sources.

In December 2018, the NSW Government introduced a new non-urban water metering framework to ensure robust and fair water management across the state. The framework requires all water supply works to have metering equipment that complies with the Australian Standard (AS4747), unless an exemption applies. Existing meters can be retained provided they are validated as accurate to AS4747 requirements (+/-5% field accuracy).

The new water metering framework is being rolled out in 4 stages between 2020 and 2024. The purpose of the staged approach is to ensure all water users have enough time to comply with the new rules and the focus is on the highest risk categories first. The annual rollout date of 1 December for Stage 1 and 2 means these report card metrics are derived at the halfway point for each stage.

For this 2021-22 report period, Stage 1 and Stage 2 have commenced and apply to surface water pumps 500mm and greater, and water users in Northern Inland NSW.

For the volume of water take, metered usage data was used where available, and entitlement was used where metered usage data was not available. As entitlement is the maximum volume permitted to be taken, this is an over-estimate which is expected to influence the reported percentage of exempt water take and not yet metered water take.

For the count of meters, system limitations mean that retrospective point-in-time data is not able to be accessed. Data for the total meter count was captured in August 2022 and was also used for the previous 2020-21 report card. This means there is no reported change to the total meter count from the previous report card.

The Australian and NSW Governments continue to support a suite of programs to assist with the uptake of metering and telemetry across NSW. NSW is continuing to implement its non-urban metering reforms and it is anticipated the annual report cards will demonstrate an improvement in meter coverage as each stage is being rolled out across the state.

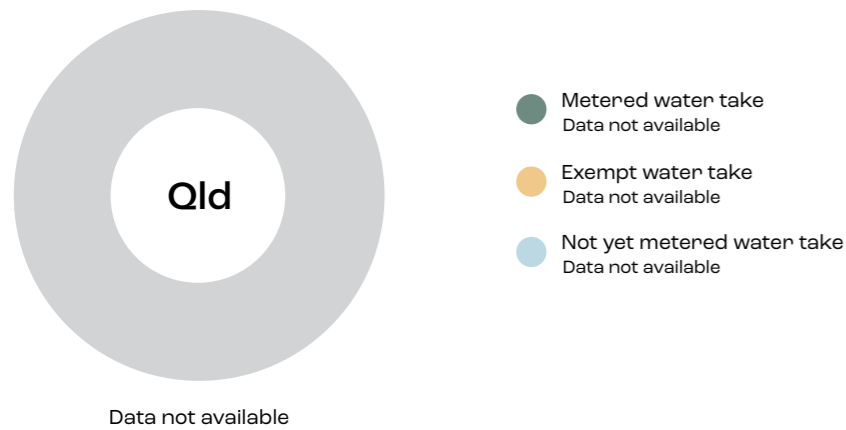
The IGWC makes no claim as to the accuracy of the data shown on this page. Data is collated and supplied directly from the states.



# Murray-Darling Basin – Queensland Metering Report Card

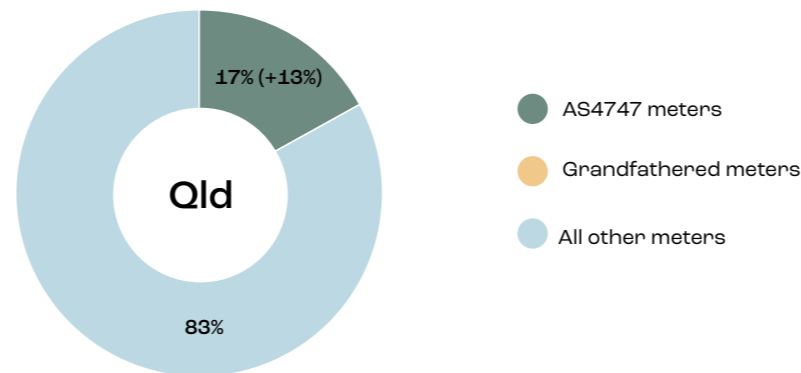
01 Jul 2021 – 30 Jun 2022. Progress from 2020 – 21 metering report card indicated in brackets

## Percentage of water take metered in Queensland



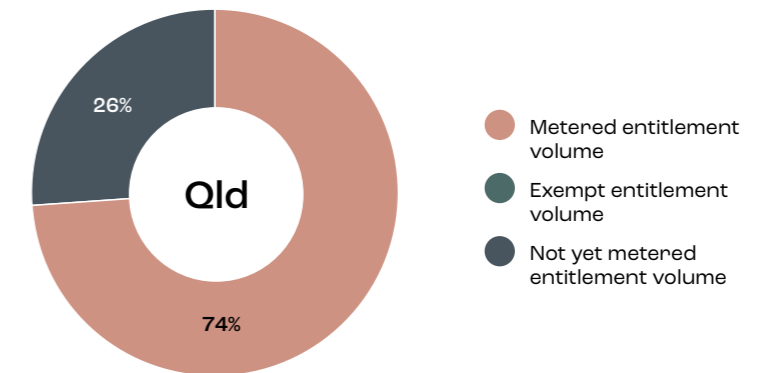
This measure is reported to highlight percentage of meterable water take across the Murray-Darling Basin by each State that is metered.  
Data owner/sources: State regulators

## Metering accuracy in Queensland



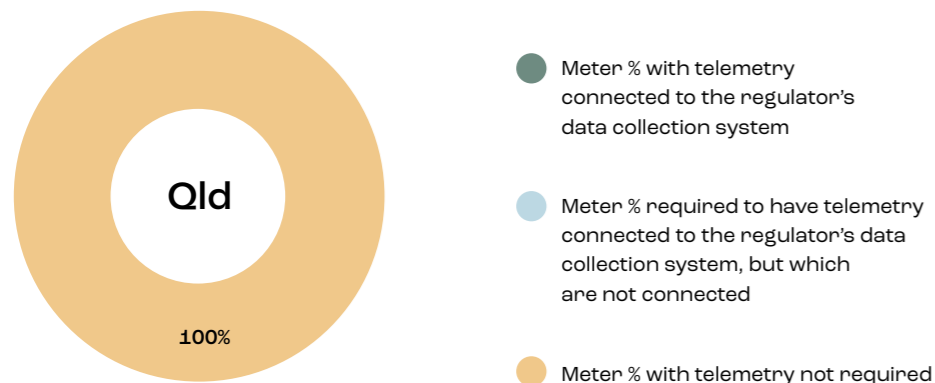
This measure is reported to understand the percentages of meters that comply with the State's metering policy and are therefore deemed accurate (including AS4747 and grandfathered meters). The percentage of AS4747 meters in the measure is intended to show progress basin states are making in the roll-out of AS4747 metering.  
Data owner/sources: State regulators

## Percentage of entitlement volume metered



This measure is reported to highlight percentage of entitlement volume across the Murray-Darling Basin by each State that is metered, assuming a 100% utilisation of entitlement. Data provision for this metric was optional by States.  
Data owner/sources: State regulators

## Telemetry coverage



This measure is reported to identify the percentage of meters with telemetry connected to the regulator's data system.  
Data owner/sources: State regulators

## How is meter data collected where telemetry is not used

Self-meter reads provided to the department at the following intervals for identified take:

- Groundwater (21% of meters/14% of volume) read six monthly;
- Supplemented water meters (36% of meters/18% of volume) read monthly or quarterly
- Unsupplemented water meters (22% of meters/12% of volume) read annually
- Overland flow and water harvesting (21%/57% of volume) measured throughout take events

This measure is reported to identify how meter data is collected and how often when telemetry is not being used.  
Data owner/sources: State regulators

## State overview

In 2021-22, Queensland (QLD) completed consultation and finalised a strengthened water measurement policy. The strengthened policy replaces QLD's former 'Non-urban Water Metering Policy for Unsupplemented Water Extractions' (2019). A strengthened water measurement standard aligned with MAF2 is already in place. All take required to be metered under the former policy at 30 June 2022, is metered. Data is not currently recorded in departmental systems for exempt take and data on percentage of actual take that is metered will be reported in future report cards.

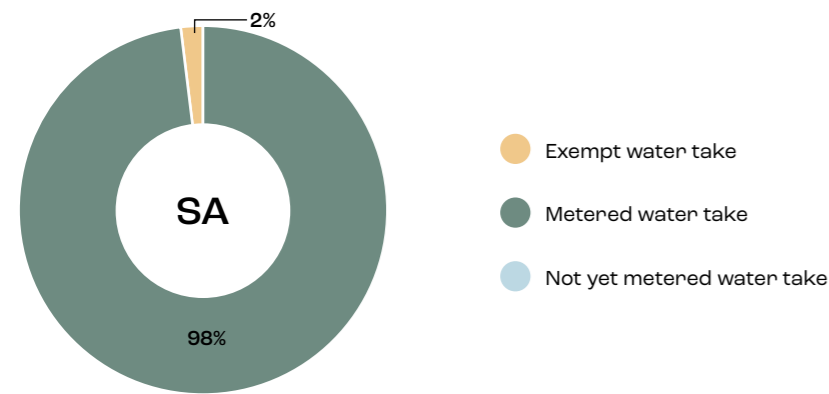
Following the release of the strengthened policy in October 2022, the Water Legislation Amendment Bill 2022 was introduced to the QLD Parliament and includes legislative amendments to establish a strengthened water measurement framework. Meter revalidation is ongoing and new metering in the QLD portion of the Murray-Darling Basin (QMDB) is expected to commence during 2023. Under the policy, telemetry will be required for surface water entitlements in the QMDB. QLD completed work to develop a telemetry guideline during early 2023 and is progressing a telemetry subsidy to support the installation of telemetry devices in the QMDB.

Work on overland flow measurement framework continues in accordance with the QLD's [program to improve the measurement of overland flow](#). The [measurement framework](#) caters to the wide range of water use scenarios and types of water entitlement with fit for purpose measurement requirements and will deliver robust, repeatable, measurement alongside defensibility for the water user. As work to strengthen water measurement in QLD proceeds, QLD will be progressively improve reporting against the metrics in future iterations of this Report Card.

# Murray-Darling Basin – South Australia Metering Report Card

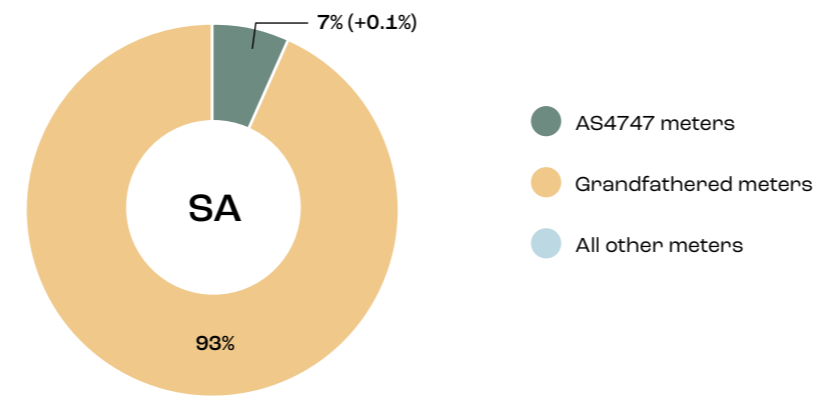
01 Jul 2021 – 30 Jun 2022. Progress from 2020 – 21 metering report card indicated in brackets

## Percentage of water take metered in South Australia



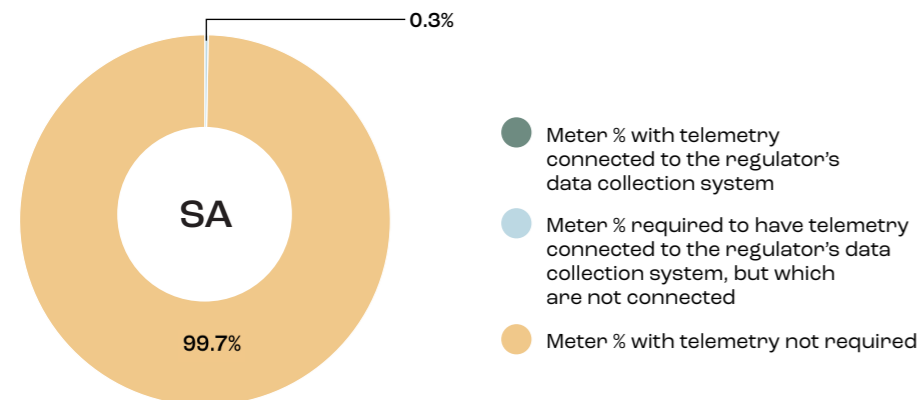
This measure is reported to highlight percentage of meterable water take across the Murray-Darling Basin by each State that is metered.  
Data owner/sources: State regulators

## Metering accuracy in South Australia



This measure is reported to understand the percentages of meters that comply with the State's metering policy and are therefore deemed accurate (including AS4747 and grandfathered meters). The percentage of AS4747 meters in the measure is intended to show progress basin states are making in the roll-out of AS4747 metering.  
Data owner/sources: State regulators

## Telemetry coverage



This measure is reported to identify the percentage of meters with telemetry connected to the regulator's data system.  
Data owner/sources: State regulators

## How is meter data collected where telemetry is not used

Quarterly reads provided by licensee in River Murray prescribed watercourse.  
Annual reads provided by licensee in other MDB regions

This measure is reported to identify how meter data is collected and how often when telemetry is not being used.  
Data owner/sources: State regulators

## State overview

The State's policy mandates that all licensed water take in South Australia must be metered, with the exception of low-risk water use (e.g. stock and domestic with these exceptions published in regional Metering Implementation Plans). This means that 98% of the volume of water taken from the South Australian portion of Murray-Darling Basin is currently metered and all water use is accounted for.

In response to the obligations in the Murray-Darling Basin Compliance Compact, South Australia introduced legislation in 2019 to require that all replacement meters are compliant with AS4747. The percentage of meters currently AS4747 compliant is 7% and this will continue to grow as meters are replaced. All meters in South Australia are compliant with the State's metering policy (being either grandfathered or AS4747 compliant).

South Australia is currently reviewing its metering policies to achieve alignment with the MAF2's national requirements, scheduled to be completed in 2024.

The volume of water used by each licence holder is accounted for quarterly in the River Murray (annually for other areas of the Basin) and if any water is used in excess of, or without, allocation, mandatory financial penalties apply for each kilolitre of water taken unauthorised. In addition, South Australia has an annual compliance program, whereby a minimum of 10% of licensed sites are visited each year (over 20% visited in recent years) which includes meter inspections and prioritisation of high risk sites.

SA acknowledges that telemetry plays a supporting role in compliance and are trialling the suitability of retrofitted telemetry technologies and on-farm water usage analytics during 2022–23.

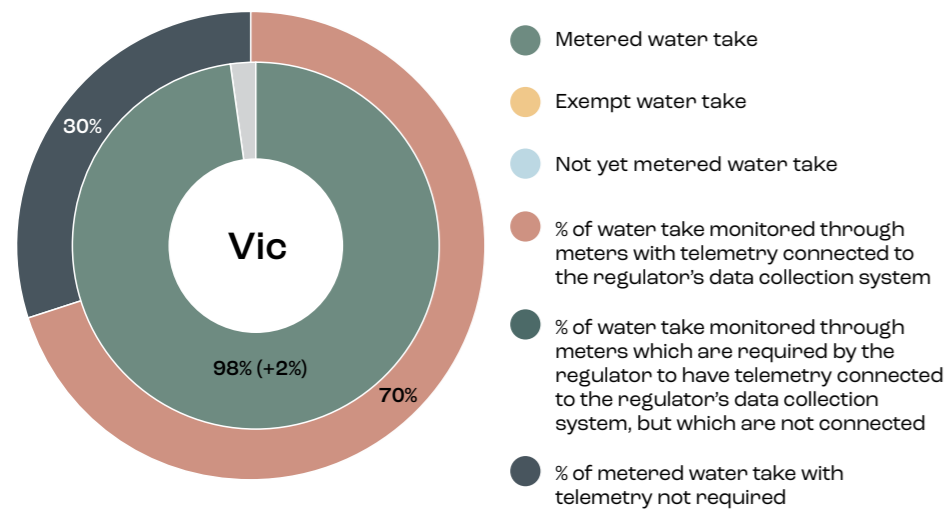
The effectiveness of SA's compliance strategies is demonstrated through high licensee compliance rates with water take rules, which reach 98–99% across the State.



# Murray-Darling Basin – Victoria Metering Report Card

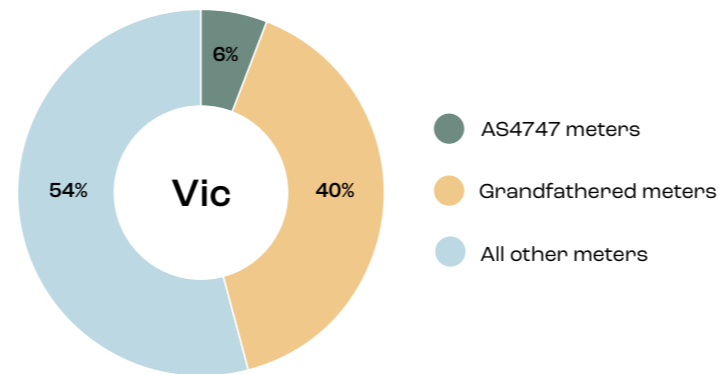
01 Jul 2021 – 30 Jun 2022. Progress from 2020 – 21 metering report card indicated in brackets

## Percentage of water take metered and telemetered in Victoria



This measure is reported to highlight percentage of meterable water take across the Murray-Darling Basin by each State that is metered. Data on percentage of meterable take monitored through meters with telemetry is included. The inner graph represents the % of meterable water take that is metered and the outer graph represents % of meterable water take monitored through meters equipped with telemetry. Data provision for water take monitored through telemetry was optional by States  
Data owner/sources: State regulators

## Metering accuracy in Victoria

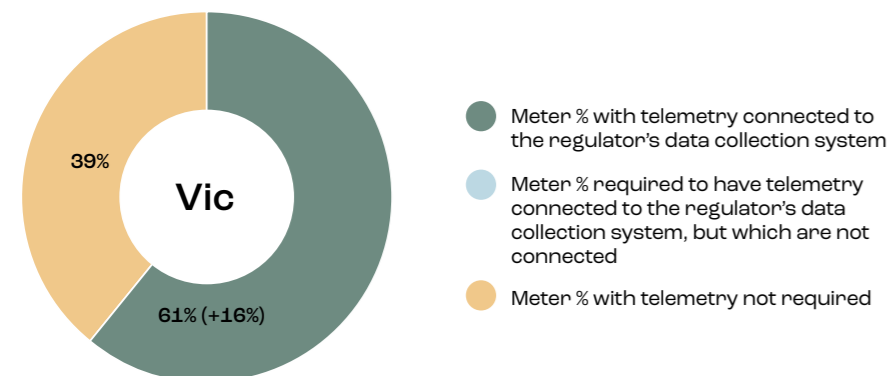


This measure is reported to understand the percentages of meters that comply with the State's metering policy and are therefore deemed accurate (including AS4747 and grandfathered meters). The percentage of AS4747 meters in the measure is intended to show progress basin states are making in the roll-out of AS4747 metering.  
Data owner/sources: State regulators

## State overview

Victoria has had a high coverage of meters across the state for some time. 84% of meters in Victoria were installed prior to 2013 when the Australian Standard for non-urban Water Metering (AS4747) came into being. 98% of take in the Victorian part of the Murray-Darling Basin is metered and 90% of total take is through AS4747 compliant meters and contemporary (grandfathered) meters accurate to +/-5% in accordance with Victorian policy. Victoria has been an early adopter of telemetry and automated control systems. In Victoria 61% of meters have telemetry and this accounts for 70% of total meterable water take. The Victorian Government's Non-Urban metering policy (2020) is consistent with the Compliance Compact (2018). The policy is being updated to reflect MAF2 (2021) requirements.

## Telemetry coverage



This measure is reported to identify the percentage of meters with telemetry connected to the regulator's data system.  
Data owner/sources: State regulators

## How is meter data collected where telemetry is not used

The Victorian Government's Non-urban Metering Policy (2020) requires water corporations to read meters at least once a year for low volume low risk meters, more frequently for higher volumes, and at least twice a year for surface water winter-fill licences or where there is a history of usage breaches. Victoria's Water Corporations own meter assets and are responsible for manually reading meters where telemetry is not available.

This measure is reported to identify how meter data is collected and how often when telemetry is not being used.  
Data owner/sources: State regulators

The IGWC makes no claim as to the accuracy of the data shown on this page. Data is collated and supplied directly from the states.