Pacific Water & Wastewater Association

Intelligent Utilities
NEW IBNET

WORLD BANK GROUP

PWWA Benchmarking Report 2025

Utility Performance Benchmarking

NewIBNET dataset (reported data to 2024)

(March 2026)

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FOREWORD

Across the Pacific, water and wastewater utilities are asked to deliver safe, reliable services under conditions that are among the most challenging in the world: small and dispersed customer bases, high logistics and energy costs, constrained workforces, ageing assets, and increasing climate and disaster risks. In this setting, improving services depends not only on investment, but on sustained operational capability, targeted maintenance, sound commercial systems, and strong institutional support.

Long-standing regional experience shows that the most persistent constraints are often not a lack of commitment, but the compounding effects of service fragility—intermittent supply, high losses, limited metering and data, affordability pressures, and capacity gaps in operations and maintenance. These pressures are amplified by climate shocks and disruptions that utilities must manage with limited redundancy and limited financial headroom.

Regional dialogue in Honiara in 2025 (16th Pacific Water and Wastewater Conference & Exhibition and the 9th Pacific Water Ministers Forum) reinforced these realities and sharpened the focus on what is needed next: stronger peer learning, practical O&M strengthening, better use of data for decision-making, and more deliberate alignment between national policy, financing partners, and what utilities can realistically deliver and sustain.

Benchmarking is one of the most practical ways to convert these shared challenges into action. Done well, it helps utilities and stakeholders develop a common evidence base for what is happening on the ground, identify recurring constraint patterns, and focus scarce resources on interventions that deliver measurable improvements in reliability, efficiency, affordability, public health outcomes, and environmental performance. Benchmarking is not about ranking utilities. It is about learning, transparency, and building a stronger dataset over time—so that priorities, funding conversations, and reform pathways are grounded in comparable information.

This 2025 benchmarking report presents results from the NewIBNET benchmarking dataset (with utility-reported data through 2024, subject to completeness). It highlights performance signals across service coverage, continuity, production and billed consumption, non-revenue water, metering and enabling systems, drinking water quality (where available), wastewater service coverage and treatment (where available), and financial and organisational sustainability. Importantly, the report emphasises interpretation: Pacific utilities operate in very different operating environments, so the results are presented to support like-for-like peer learning through typologies, not as a league table.

The intent is straightforward: to support utilities, governments, and partners to move from anecdote to evidence, and from evidence to prioritised, practical improvement actions. With participation and data completeness remaining uneven—and in some cases declining—benchmarking is more important than ever. It provides a shared foundation for honest performance conversations, helps protect scarce resources from being spread too thinly, and supports practical decisions on where to focus O&M, efficiency, and investment effort.

Strengthening benchmarking therefore requires renewed commitment: improving continuity of reporting, reducing the burden on smaller utilities, and embedding KPI tracking into routine operational and leadership practice rather than treating it as an annual “data collection event”. In that context, this report is both a snapshot of current performance and a call to strengthen participation, confidence, and the consistent use of benchmarking as a long-term platform for service improvement across the Pacific.

Pitolau Lusia Sefo Leau

PWWA Chief Executive Officer
Pacific Water and Wastewater Association

ACKNOWLEDGMENTS

PWWA acknowledges and thanks the utilities, country counterparts, and partners who contributed data, time, and technical input to this benchmarking cycle. This report is based on utility-reported information compiled through the NewIBNET process and strengthened through targeted follow-up, validation and quality assurance checks.

PWWA also recognises the ongoing efforts of utility staff—often working with limited time, dispersed teams, and challenging operating conditions—to compile, verify and submit performance information. Their commitment strengthens regional learning, supports more transparent decision-making, and helps utilities, governments and partners focus improvement efforts where they matter most for service reliability, affordability, public health and environmental outcomes.

PWWA MEMBERS ACROSS THE PACIFIC

PWWA's membership spans utilities and agencies across 21 Pacific countries and territories. This diversity reflects the region's wide range of service models—from larger network utilities to small and remote providers operating hybrid systems—and underscores why like-for-like benchmarking and peer learning are essential.

PWWA member countries and territories include: American Samoa; Cook Islands; Federated States of Micronesia; Fiji; French Polynesia; Guam; Kiribati; Marshall Islands; Nauru; New Caledonia; Niue; Northern Mariana Islands; Palau; Papua New Guinea; Samoa; Solomon Islands; Tokelau; Tonga; Tuvalu; Vanuatu; and Wallis and Futuna.

UTILITIES PARTICIPATING IN THIS BENCHMARKING CYCLE

Listed below are the water utilities and agencies that contributed full or partial KPI data and/or participated in validation follow-up for this benchmarking cycle. Participation can vary from year to year due to capacity constraints, competing priorities, and data availability; non-participation in a given cycle does not imply non-membership of PWWA.

Country / Territory	Utility / agency
Cook Islands	Infrastructure Cook Islands
Cook Islands	To Tatou Vai
Federated States of Micronesia (Chuuk)	Chuuk Public Utilities Corporation (CPUC)
Federated States of Micronesia (Yap Southern)	Yap State Public Service Corporation
Federated States of Micronesia (Yap Central)	
Federated States of Micronesia (Yap Northern)	
Federated States of Micronesia (Kosrae)	Kosrae Department of Transportation and Infrastructure
Federated States of Micronesia (Pohnpei)	Pohnpei Utilities Corporation
Nauru	Nauru Utilities Corporation
Palau	Palau Water and Sewer Corporation
Papua New Guinea	Water PNG
Marshall Islands	Majuro Water and Sewer Company (MWSC)
Vanuatu	Department of Water Resources
Vanuatu	UNELCO
Tokelau	Economic Development, Natural Resources & Environment
Tuvalu	Ministry of Public Works
Kiribati	Public Utilities Board
Samoa	Independent Water Scheme Association (IWSA)
Samoa	Samoa Water Authority
Tonga	Tonga Water Board
Fiji	Water Authority of Fiji
Solomon Islands	Solomon Islands Water Authority

PWWA also acknowledges the technical partners who supported utilities with indicator definitions, data processing, and validation follow-up through the NewIBNET process, and the development partners whose support enables continued benchmarking, capacity development, and regional knowledge sharing across the Pacific.

HOW TO USE THIS REPORT

WHO THIS REPORT IS FOR

This report supports:

- Utilities to identify priority gaps, validate improvement narratives, and track progress over time.
- Governments and oversight bodies need to understand sector patterns and target enabling reforms.
- Development partners and financiers to inform prioritisation and programme design, while recognising data limits.

WHAT BENCHMARKING CAN AND CAN'T DO

Benchmarking can:

- provide decision-relevant performance signals;
- support peer learning among similar utilities; and
- track trend direction year-to-year.

Benchmarking cannot:

- provide a definitive ranking;
- replace audits or detailed diagnostics; or
- prove causality.

NOT A LEAGUE TABLE

Utilities operate in materially different contexts. Direct comparison without context can be misleading. This report avoids composite rankings and uses groupings to support more like-for-like interpretation.

HOW TO INTERPRET RESULTS

Read indicators together, not in isolation. A practical sequence is:

Coverage → 2) Continuity → 3) Production/billed/NRW → 4) Metering/commercial enablers → 5) Water quality (where available).

For wastewater and sanitation, prioritise confidence in denominators and basic operational measures before drawing conclusions from more complex metrics.

Interpretation lens (CAPEX–OPEX–People/Institutions):

Many performance signals reflect the balance between (i) infrastructure investment (CAPEX), (ii) sustained operations and maintenance inputs (OPEX), and (iii) workforce capability, governance and systems (people/institutions).

Where continuity is low, NRW is high or financial indicators are weak, treat this as a prompt to test whether the underlying constraint is insufficient O&M funding, limited operator capacity, weak commercial controls, or a mismatch between assets and the operating environment—not simply "under-investment" in new infrastructure.

DATA CONFIDENCE

Results are based on utility-reported data compiled through NewIBNET and strengthened through validation and follow-up.

Benchmarking provides the utility-side performance picture; it does not directly measure household or business impacts such as coping costs, time losses, or production disruptions. Over time, the value of benchmarking can be strengthened by triangulating key reliability signals (continuity, NRW, cost coverage) with household and firm survey evidence where available, while keeping the benchmarking dataset itself consistent and comparable.

Completeness varies by indicator; blanks reflect missing or insufficient inputs.

NAVIGATION

- Parts 1–3: context and methods
- Parts 4–8: results by theme
- From benchmarking to action: next steps and utility support (where included)

ACRONYMS

IBNET – International Benchmarking Network for Water and Sanitation Utilities

NewIBNET – Pacific-adapted benchmarking dataset and workflow aligned to IBNET methods

PWWA – Pacific Water and Wastewater Association

KPI – Key performance indicator

NRW – Non-revenue water

O&M – Operations and maintenance

OPEX – Operating expenditure

CAPEX – Capital expenditure

OCC – Operating cost coverage (ratio)

SDG – Sustainable Development Goals

WSS – Water supply and sanitation

FSM – Federated States of Micronesia

FSSM – Faecal sludge management (where referenced; recommended to avoid confusion with FSM)

LCU – Local currency unit

QA – Quality assurance

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INTRODUCTION

Reliable water and wastewater services are foundational to public health, economic activity, and climate resilience across the Pacific. At the same time, utilities operate in highly diverse contexts—from larger, higher-income territories with mature networks and metering, to small island and atoll systems facing fragmented infrastructure, limited data systems, high energy costs, and acute exposure to climate shocks. These differences shape both performance outcomes and what "good" looks like in practice.

This PWWA Benchmarking Report 2025 presents a structured snapshot of utility performance using the NewIBNET dataset (with reported data through 2024, subject to completeness).

The report's purpose is to support evidence-based decisions by utilities, governments and partners: identifying priority service constraints, improving transparency, and strengthening the foundations for sustained performance improvement over time.

WHY THIS BENCHMARKING MATTERS

In the Pacific context, benchmarking is most valuable when it is used as a practical improvement tool. It helps to:

- make service performance visible and comparable in a consistent way;
- identify common constraint patterns that influence customer outcomes (for example, reliability, NRW, and revenue/operating capacity links);
- support peer learning across utilities facing similar operating conditions; and
- strengthen the regional evidence base year-on-year as data confidence and completeness improve.

COMPARABILITY AND GROUPINGS

To support fair interpretation, utilities are presented using context-based groupings that reflect differences in operating environment and service maturity:

- Group 1 — High-income utilities
- Group 2 — Middle-income utilities
- Group 3 — Transitional and early-stage service organisations

These groupings are used to support more like-for-like interpretation and to avoid over-simplified comparisons where constraints and service models differ materially.

WHAT THIS REPORT COVERS

The report is organised around the customer-to-system logic of service performance, moving from reach and availability through to efficiency, enabling systems and outcomes. It covers:

- Coverage (reach): service area population, population served and connection counts.
- Service reliability and continuity (availability): indicators of continuity of supply and the share of customers receiving continuous service where reported.
- Production, billed consumption and NRW (efficiency): how effectively water production is converted into billed service, and the scale of physical/commercial losses where inputs allow calculation.
- Metering coverage (commercial and data enabler): the extent to which utilities can measure consumption, manage demand, and support NRW reduction.
- Drinking water quality (safety outcome): water quality indicators where available, interpreted in relation to operational conditions and system performance.

- Wastewater and sanitation (where data supports): service population, coverage, and core sustainability signals for sewerage systems where reported.
- Financial and organisational sustainability: revenue and expenditure signals, cost recovery/collection performance, and workforce productivity measures where available.
- From benchmarking to action (where included): practical next steps to strengthen data confidence and support utilities to use benchmarking for planning and improvement.

DATA SOURCES, COVERAGE AND LIMITATIONS

The analysis is based on utility-reported data compiled through the NewIBNET benchmarking process, supported by structured validation and follow-up with participating utilities. Despite these checks, the dataset reflects real regional constraints, including:

- incomplete reporting for some utilities and indicators;
- differences in definitions (for example, what constitutes a "connection" or how service populations are estimated);
- unit inconsistencies and gaps in time series; and
- limited availability of wastewater, water quality, and metering sub-indicators in some contexts.

Where inputs are missing or denominators are not available, values are left blank and interpretation focuses on what can be supported. This approach is intentional: it prioritises transparency and avoids over-interpreting uncertain results.

WHAT'S NEW IN THIS EDITION

This 2025 edition places stronger emphasis on interpretability and practical use: reading indicators together (for example, continuity alongside NRW and financial signals), strengthening comparability notes, and linking results to clear next steps to improve reporting confidence and benchmarking uptake in the next cycle. The aim is to keep benchmarking a living programme—one that strengthens both service performance and the evidence base needed for better decisions.

PART 1

Context, SDG alignment, and benchmarking participation

1.1 Pacific context and purpose of benchmarking

Across the Pacific, water and wastewater service providers operate in conditions that differ materially from many global benchmarking reference settings: small and dispersed populations, high energy and logistics costs, fragile and ageing assets, constrained revenue bases, and increasing exposure to climate shocks. These realities shape both service outcomes and how performance data should be interpreted.

This report presents results from the Pacific Water and Wastewater Association (PWWA) regional benchmarking programme using the NewIBNET/IBNET framework. The purpose is to provide a shared evidence base that supports learning, decision-making and investment prioritisation—helping utilities, governments and development partners strengthen service reliability, sustainability and resilience (see Box below).

HOW TO READ THIS REPORT

- This report is not a league table. Results are presented to support learning, prioritisation and practical improvement.
- Comparisons are most meaningful when using the comparability guide (Section 1.2) and the utility typology (Section 3.1).
- "Latest year" values use 2024 where available and 2023 where 2024 was not submitted (the year used is shown for each utility).
- Wastewater indicators and "sanitation coverage" reflect utility-managed reticulated sewerage and do not capture on-site sanitation systems.
- Some indicators have lower completeness; limitations are stated where they affect interpretation

1.1.1 Why benchmarking matters in the Pacific

Benchmarking helps utilities and stakeholders answer three practical questions:

(i) Where are we now?
(ii) Are we improving?
(iii) What should we do next?

In the Pacific context, this matters for three reasons.

Strengthening policy accountability and transparency. Benchmarking provides consistent performance signals that can be used by utilities and governments to track progress against service commitments and national strategies. It supports more transparent discussions by shifting debates from anecdote to evidence—while still recognising the limits of comparability across very different operating contexts.

Improving investment effectiveness. The region faces a persistent challenge: capital investment alone does not guarantee reliable services. Benchmarking helps identify binding constraints (for example, high non-revenue water, low continuity of supply, weak collection efficiency, limited metering, or underfunded O&M) and supports more targeted "reliability-first" investment packages that combine infrastructure with operational and workforce readiness.

Accelerating peer learning and capability. Benchmarking creates a shared language and reference point across utilities. It supports peer exchange on what works in similar settings and strengthens practical improvement pathways—particularly when accompanied by clear definitions, data quality guidance, and transparent interpretation notes.

1.1.2 Pacific operating realities and implications for interpretation

Benchmarking is most useful when indicators are interpreted through the lens of local service realities. This report applies the following interpretation lenses:

A. Small scale and weak economies of scale

Many utilities operate at a scale where unit costs are structurally high: procurement, freight, specialist contractors, chemicals, and spare parts can cost materially more than in larger markets. This affects operating expenditure, service reliability, and the speed of recovery from breakdowns.

Interpretation implication: comparisons of unit costs, staffing ratios, and cost recovery should be made cautiously, preferably within peer groups with similar scale and operating conditions.

B. Geographic isolation and logistics constraints

Distance from supply chains and limited transport options can increase repair lead times and disrupt routine maintenance. Outer-island systems may also face limited access to laboratories, metering equipment, and technical support.

Interpretation implication**:** indicators such as continuity of service, NRW, and water quality compliance may reflect logistical constraints as much as operational practice and should be interpreted alongside metadata and known context.

C. Mixed service models and "non-networked" supply

Some communities rely on trucked supply, rainwater, standpipes, or hybrid arrangements, and these do not always align neatly with standard network-based KPIs. NewIBNET recognises the need for practical proxy approaches in small systems.

Interpretation implication**:** for some utilities, proxy indicators and documented assumptions may be more valid than forced precision. Where proxy methods are used, transparency (metadata) matters more than apparent accuracy.

D. Climate variability and acute shocks

Droughts, cyclones, flooding, and saltwater intrusion can cause sharp year-to-year changes in continuity, water production, water quality outcomes, and costs.

Interpretation implication**:** year-on-year changes should be reviewed for shock impacts and one-off events; a single year may not reflect underlying trends.

E. Data systems, turnover, and reporting maturity

Utilities' data environments vary widely—from SCADA and digital billing systems to manual logbooks. Staff turnover can disrupt continuity of reporting and institutional knowledge, especially where benchmarking is assigned to a single focal point.

Interpretation implication**:** the report distinguishes between direct (measured) and indirect (calculated) indicators. Calculated KPIs (e.g., NRW %) are only as reliable as their inputs, and missing metadata can materially reduce interpretability.

1.1.3 PWWA benchmarking approach and NewIBNET overview

PWWA's benchmarking programme is delivered as a structured annual cycle using the NewIBNET/IBNET framework. The intent is to support continuous improvement through consistent definitions, peer learning and transparent use of data.

BENCHMARKING CYCLE (HIGH-LEVEL)

Each cycle typically includes:

- (i) Utility engagement and guidance
- (ii) Data compilation and submission
- (iii) Basic quality checks and follow-up queries
- (iv) Validation and consolidation
- (v) Reporting and peer learning

INDICATOR LOGIC AND INTERPRETABILITY

The dataset includes both:

- **Direct (measured) inputs** (e.g., production and billed volumes, service populations, staff numbers, operating expenditure and revenue, water quality testing totals, wastewater volumes); and
- **Calculated indicators** derived from those inputs (e.g., NRW %, operating cost coverage, collection efficiency, staff per 1,000 connections).

Calculated indicators are only as reliable as their underlying inputs. Data completeness and confidence notes are set out in Part 2 and applied consistently throughout the results sections.

1.2 SDG 6 alignment with utility benchmarking

1.2.1 How this report supports (but does not replace) SDG reporting

SDG 6 is measured at national level through official SDG indicators and reporting processes. Utility benchmarking complements this by providing operational and financial performance evidence from service providers—often at a finer resolution and more frequently than national SDG reporting cycles.

This report supports SDG 6 in four practical ways:

- **Translating SDG intent into utility performance signals.** SDG indicators focus on "safely managed" outcomes. Utilities influence these outcomes through measurable drivers such as continuity of supply, water quality testing, metering, NRW, cost recovery, and asset reliability.
- **Providing early-warning and trend insight.** Benchmarking can show whether service reliability and sustainability are improving or deteriorating year-on-year—often before this becomes visible in national SDG results.
- **Strengthening evidence for prioritisation and reform.** Benchmarking helps identify binding constraints (for example, high NRW, low hours of supply, weak collection efficiency, inadequate O&M funding, workforce gaps) that directly undermine SDG progress.
- **Improving transparency and comparability—within limits.** Standard definitions enable peer learning and structured discussion across utilities, while also requiring clear caveats about data completeness and local context.

What benchmarking <u>does not</u> do:

- It does not replace national SDG indicator production (which depends on nationally approved definitions, surveys, and administrative systems).
- It does not, by itself, confirm "safely managed" status (which requires household/service level criteria beyond typical utility datasets—especially for quality at point of use and safe management of excreta).
- It should not be used as a "league table". Performance must be interpreted through scale, geography, service model, climate exposure, and data maturity.

In short, benchmarking is best seen as a decision-support layer—helping utilities, governments, and partners understand what is driving (or constraining) SDG 6 outcomes and what interventions are most likely to shift results.

1.2.2 SDG 6 Linkage framework

Table 1 maps SDG 6 targets to global SDG indicators and summarises the extent to which utility benchmarking provides a direct measure, a proxy, or contextual support, including the strength of the link.

LINK STRENGTH GUIDE

- **Strong:** benchmarking measures a direct operational driver of the SDG outcome or a close proxy.
- **Medium:** benchmarking provides partial coverage or an enabling condition, but not full SDG compliance.
- **Limited:** benchmarking may provide contextual insight, but SDG measurement requires broader data sources.

Table 1: SDG 6 Linkage Framework: What Utility Benchmarking Can Contribute

SDG 6 Target	Global SDG Indicator (UN)	What Utility Benchmarking Can Contribute	Example Benchmarking Indicators	Link Strength
6.1 *Safe and affordable drinking water*	6.1.1 — Proportion of population using safely managed drinking water services	Helps assess service provider performance and reliability drivers that underpin 'safely managed' services.	• Water service coverage (utility service pop ÷ service area pop) • Continuity of supply (hours/day) • Drinking water quality test pass rate • Customer complaints	**Medium–Strong** *(strong on reliability/utility drivers; 'safely managed' requires additional criteria)*
6.2 *Sanitation and hygiene*	6.2.1 — Proportion using safely managed sanitation services (incl. handwashing)	Supports understanding of sewerage coverage and treatment performance where utilities manage sewerage systems.	• Wastewater service coverage • Volumes collected and treated • Sewer blockages • Treatment capacity utilisation (where available)	**Medium** *(household hygiene and safe management beyond network requires other data)*
6.3 *Water quality and wastewater*	6.3.1 — Proportion of wastewater safely treated 6.3.2 — Bodies of water with good ambient quality	Strong support for utility-controlled wastewater collection and treatment volumes; weaker for ambient water bodies.	• Wastewater collected vs. treated • Treatment compliance proxies (where available) • Sewer overflows / blockages	**Strong for 6.3.1 where treatment data exists; Limited for 6.3.2**
6.4 *Water-use efficiency and scarcity*	6.4.1 — Change in water-use efficiency 6.4.2 — Water stress	Helps quantify utility production efficiency and losses; does not measure whole-economy efficiency or national water stress.	• NRW (volume / %) • Production per capita • Metering coverage • Consumption per connection / per capita	**Medium** *(useful for distribution efficiency, not economy-wide efficiency/scarcity)*
6.5 *Integrated water resources management*	6.5.1 — IWRM implementation 6.5.2 — Transboundary cooperation	Utility benchmarking can provide limited supporting evidence on governance, planning, and operational coordination.	• Management practice indicators (plans, monitoring routines, asset management practices) • Drought planning (where captured)	**Limited–Medium** *(SDG indicator is policy/process-based at national scale)*
6.a *International cooperation and capacity building*	6.a.1 — ODA-related water and sanitation spending	Benchmarking can help target and justify where capacity building and investment will have most impact.	• Cost recovery gaps • O&M cost levels • Staffing and productivity • Service reliability constraints	**Medium** *(does not measure ODA; supports prioritisation and accountability)*
6.b *Community participation*	6.b.1 — Participation of local communities in WASH management	Benchmarking may capture limited customer engagement and responsiveness indicators.	• Complaint resolution rates • Customer engagement metrics (where captured)	**Limited** *(participation is broader than utility customer service metrics)*

Notes

Table 1 maps each SDG 6 target and its associated UN global indicator to the relevant utility benchmarking indicators tracked in this report. Link strength reflects how directly the benchmarking data supports measurement or assessment of the SDG indicator, recognising that national-level SDG reporting requires additional data sources beyond utility performance systems.

How to interpret Table 1

Where the link strength is "Medium" or "Limited", benchmarking remains valuable because it helps explain *why* SDG progress is constrained (for example, reliability, NRW, affordability, O&M funding, and workforce capability), even when it cannot confirm the full "safely managed" criteria used in national SDG reporting.

1.2.3 Practical use cases for governments and development partners

Benchmarking is most valuable when used to make choices about:

- What to fund
- What to reform
- How to measure improvement.

Practical applications include:

A. Prioritise investments that unlock service reliability (not just new assets)

Use benchmarking to identify the constraints most associated with poor service outcomes:

- Low continuity / intermittent supply → target storage, pressure management, power reliability, operator capability, and critical spares.
- High NRW → prioritise leak detection, pressure management, targeted mains renewal, meter coverage, and billing system improvement.
- Poor water quality pass rates or low testing coverage → prioritise sampling plans, lab access, treatment process control, and risk-based WSP implementation.
- Low collection efficiency / weak cost coverage → prioritise billing systems, collection processes, tariff policy review, and customer engagement.

<u>Decision shift enabled:</u> from "more infrastructure" to "reliability-first packages" that combine CAPEX with OPEX/PEX readiness.

B. Design funding conditions that protect long-term sustainability

Benchmarking supports funders to include sustainability requirements that are measurable and locally realistic, such as:

- minimum O&M funding commitments (or transitional subsidy strategies),
- workforce and training plans linked to staffing ratios and retention risks,
- NRW reduction milestones with clear baselines,
- metering and billing improvements as investment enablers,
- post-completion service performance monitoring.

<u>Decision shift enabled:</u> from one-off projects to investments that remain functional and affordable after handover.

C. Identify “peer groups” and tailor support packages

Not all utilities can be compared directly. Governments and funders can use benchmarking to define peer groups by:

- scale and density,
- geographic dispersion / outer island logistics,
- water source type (surface/groundwater/desalination/rainwater),
- service model (piped vs mixed delivery),
- data maturity.

Decision shift enabled**:** from uniform programmes to targeted, context-appropriate interventions.

D. Strengthen accountability through trend-based performance conversations

Rather than focusing on rankings, benchmarking enables:

- tracking progress year-on-year,
- identifying “breaks in trend” (for example, post-cyclone disruption, fuel price shock, major system failure),
- linking investment and reform actions to measurable outcomes (continuity, NRW, cost recovery, complaints resolution).

Decision shift enabled: from compliance reporting to learning-driven performance management.

E. Improve investment appraisal and sequencing

Benchmarking can help determine when a utility is “ready” for particular investment types:

- Where **data quality is low**, start with metering, production measurement, billing digitisation, basic asset registers, and operational controls.
- Where **financial sustainability is weak**, pair infrastructure with revenue, subsidy, or efficiency reforms.
- Where **workforce constraints dominate**, stage projects to include operator training, SOPs, spares, and maintainability requirements.

Decision shift enabled: from “build first, fix later” to sequenced delivery that matches capability and reduces implementation risk.

1.3 Benchmarking sample, participation, and data completeness (data to 2024)

This section explains who is included in the benchmarking sample, how utilities are grouped for comparability, and what data completeness and confidence considerations should be applied when interpreting results. The purpose is transparency: readers should be able to see what is covered, what is not, and where results are most reliable.

For clarity, "**data to 2024**" means the dataset includes utility submissions up to and including 2024, with 2023 used where 2024 was not submitted or was incomplete. The reference year for each utility is shown in the relevant tables and figures.

1.3.1 PWWA utility groups and typology

To support like-for-like interpretation and practical peer learning, this report groups utilities using a typology lens. The grouping recognises that performance outcomes in the Pacific are strongly shaped by scale, geography, service model, institutional maturity, and exposure to shocks—not only by management effort. The purpose is comparability and learning, not ranking.

WHY A TYPOLOGY IS USED

Pacific utilities operate across very different environments: some serve dense urban centres with established corporatised arrangements, while others support highly dispersed outer islands, mixed (networked and non-networked) service models, and limited data systems. The typology helps readers to:

1. Compare like-for-like where possible.
2. Interpret indicators through realistic operating constraints (e.g., logistics, energy costs, climate shocks).
3. Identify improvement pathways appropriate to each utility's starting point and capability.

UTILITY GROUPINGS: ECONOMIC BASIS, TYPICAL CHARACTERISTICS AND MEMBERSHIP

Three groups are used throughout the report to contextualise utility performance. Groupings reflect World Bank Atlas GNI per capita thresholds and service delivery context rather than strict regulatory classification. Where naming or membership varies across source documents, this is flagged for reconciliation.

Table 2, below, presents the three groups and their definitions.

Table 2: PWWA Utilities Groups (typology used throughout this report)

Group	Economic Basis	Typical Characteristics	Utilities Included
Group 1 **High-Income Utilities**	**Atlas GNI per capita** ≥ US$20,000	Stronger revenue bases; more established utility systems; higher metering and billing maturity; and greater capacity to fund O&M and renewal — while still facing: • island logistics • climate risk • high unit costs	• American Samoa Power and Water Authority (ASPA) — American Samoa • Calédonienne-des-Eaux — New Caledonia • Guam Waterworks Authority (GWA) — Guam • Polynésienne-des-Eaux — French Polynesia • Commonwealth Utilities Corporation (CUC) — CNMI *Included for comparison where data allows.*
Group 2 **Middle-Income Utilities**	**Atlas GNI per capita** US$3,000 – US$20,000	Utilities operating under constrained affordability and funding trade-offs; persistent challenges around: • NRW reduction • service continuity • wastewater treatment coverage Varying levels of data and asset management maturity.	• Water Authority of Fiji (WAF) — Fiji Federated States of Micronesia utilities: ◦ Central Yap State Public Service Corporation — Yap ◦ Chuuk Public Utilities Corporation — Chuuk ◦ Department of Transportation and Infrastructure (Water), Kosrae ◦ Pohnpei Utilities Corporation — Pohnpei ◦ Northern Yap Gagil Tomil Authority — Yap *Naming/coverage varies across membership sources.* ◦ Southern Yap Water Authority — Yap *Naming/coverage varies across membership sources.* • Kwajalein Atoll Joint Utility Resources (KAJUR) — Marshall Islands • Majuro Water and Sewer Company (MWSC) — Marshall Islands • Palau Public Utilities Corporation (PPUC) — Palau • Water PNG Limited — Papua New Guinea *See reconciliation note on Eda Ranu.* • Public Utilities Board (PUB) — Kiribati • Samoa Water Authority (SWA) — Samoa • Solomon Islands Water Authority (Solomon Water) — Solomon Islands • Tonga Water Board (TWB) — Tonga • Tuvalu — Ministry responsible for water services *Official title varies across sources.*

Group	Economic Basis	Typical Characteristics	Utilities Included
			• Unelco Vanuatu Limited (UNELCO) — Vanuatu • Water and Electricity company — Wallis and Futuna *Not consistently listed in all membership summaries.*
Group 3 **Transitional & Early-Stage Organisations**	Decentralised environments and early-stage service arrangements where utility-type benchmarking is limited.	Service delivery often sits within government departments or community-managed schemes. Typical features: • networks may be partial or absent • data systems are limited • performance indicators often require pragmatic proxies and clear metadata	• Independent Water Schemes Association (IWSA) — Samoa • Cook Islands — ministry/department responsible for water services *Membership listing uses MoIP; benchmarking sources may reference ICI / To Tatou Vai.* • Nauru Utilities Corporation (NUC) — Nauru • Vanuatu Department of Water Resources — Vanuatu • Niue Public Works Department — Niue *Not consistently listed in all membership summaries.* • Tokelau Division of Environment — Tokelau *Not consistently listed in all membership summaries.*

Notes

- GNI thresholds are indicative and based on World Bank Atlas method data used at the time of report preparation. Individual utility assignments were reviewed and corrected against WB FY2025 classifications where inconsistencies were identified (see Data Notes in relevant results tables).
- Utilities in italics or flagged above have variable membership status across source documents and should be reconciled in the final roster.

Reconciliation notes - membership list vs benchmarking roster

During compilation, several entities appear in one list but not the other, or under different names. For transparency, this report treats the above typology roster as the benchmarking frame and recommends standardising utility names in the final country/utility roster used throughout the report.

Key naming and roster issues to resolve include:

- Entities included in the typology but not shown consistently in membership summaries: CUC (CNMI), Wallis & Futuna utility, Niue Public Works, Tokelau Division of Environment, NYGTA and SYWA (FSM).
- PNG naming: Eda Ranu appears in some sources while the benchmarking roster lists Water PNG.
- Cook Islands naming: membership references MoIP, while benchmarking sources reference Infrastructure Cook Islands (ICI) and To Tatou Vai.
- Tuvalu ministry naming: different titles are used across sources; country coverage is consistent, but the agency name should be unified.
- Yap State Public Service Corporation note: Yap State Public Service Corporation (YSPSC) was recently established through the consolidation of previously separate Yap utilities. Its appearance in the benchmarking dataset for one year only reflects this institutional merger and reporting transition, rather than a gap in historical participation.

1.3.2 Participation summary (benchmarking cycle and trends)

Participation is a core determinant of how representative the benchmarking results are. This report distinguishes between:

1. The membership roster (utilities and service organisations associated with PWWA), and
2. The benchmarking sample (utilities that submitted data to NewIBNET for a given year and passed basic validation checks).

This matters because year-to-year changes in the benchmarking dataset can reflect shifts in participation and data completeness, not just in utility performance. Throughout the report, participation and completeness are presented alongside results to support transparent interpretation.

Where trend interpretation is provided, the report distinguishes between:

- Like-for-like comparisons (utilities reporting in both years), and
- Latest-year snapshots (most recent available year per utility).

Unless otherwise stated, regional summaries are based on utilities with sufficient data to calculate the indicator (not the full roster).

PARTICIPATION ACROSS REPORTING YEARS (ILLUSTRATIVE INDICATOR COVERAGE EXAMPLE)

Table 3, below, summarises participation across reporting years using one high-value example field (e.g., service area population submissions).

Each cell indicates whether a utility submitted a valid value for that year. Row totals show the number of years with data per utility; column totals show the number of utilities submitting data in that year.

Table 3: PWWA water utilities participation between 2015 and 2024

Utility	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	Total
American Samoa Power and Water Authority (ASPA)	1	1	1	1	1	1	1	1		1	9
Calédonienne des Eaux	1	1	1	1	1	1	1	1	1		9
Central Yap State Public Service (CYSPS), Micronesia		1	1	1	1	1	1	1			7
Chuuk Public Utilities (CPU), Micronesia	1	1	1	1	1	1	1	1	1		9
Department of Transportation and Infrastructure, Kosrae, Micronesia	1	1	1	1	1	1	1	1			8
Department of Water, Vanuatu		1	1	1	1	1	1	1	1		8
GWA, Guam	1					1	1	1	1		5
Infrastructure Cook Islands (ICI)	1					1	1	1	1		5
IWSA, Samoa						1	1	1	1	1	5
KAJUR, Marshall Islands	1	1	1					1			4
Majuro, Marshall Islands	1	1	1	1	1			1			6
Ministry of Utilities and Industries, Tuvalu	1	1	1	1	1			1			6
Nauru Utilities Corporation				1	1	1	1		1		5
Palau Public Utilities Corporation (PPUC)		1	1		1	1	1	1	1	1	8
Pohnpei Utilities, Micronesia	1	1	1			1					4
Polynésienne des Eaux	1	1	1	1	1	1	1	1	1	1	10
Public Utilities Board, Kiribati	1	1	1	1	1	1	1	1		1	9
Samoa Water Authority (SWA)	1	1	1	1	1	1	1	1	1	1	10
Solomon Islands Water Authority (SIWA)	1	1	1	1	1	1	1	1	1	1	10
Southern Yap Water Authority (SYWA), Micronesia	1	1	1			1	1	1			6
To Tatou Vai, Cook Islands		1	1	1	1	1	1	1	1		8
Tonga Water Board (TWB)	1	1	1	1	1	1	1	1	1		9
Unelco Vanuatu	1	1	1	1	1	1	1	1	1	1	10
Water Authority of Fiji (WAF)	1	1	1	1	1	1	1	1	1	1	10
Water PNG		1	1	1	1	1	1		1	1	8
Yap State Public Service Corporation (YSPSC)										1	1
Grand Total	18	21	21	18	19	22	21	22	17	11	190

Table note:

Yap State Public Service Corporation (YSPSC)**:** YSPSC appears as a new reporting entity in 2024 following the consolidation of previously separate Yap utilities. For this reason, its one-year participation record should be interpreted in the context of institutional restructuring, rather than as limited historical engagement with the benchmarking process

COVERAGE SUMMARY

- Total submissions recorded: 190 across 26 utilities and 10 reporting years (2015–2024).
- Utilities with complete submission across all 10 years: Polynésienne des Eaux, SWA, SIWA, UNELCO, and WAF.
- Utilities with partial recent participation: GWA, ICI, and IWSA (gaps in early years; more consistent from 2020 onwards).
- Structural reporting changes: YSPSC appears only in 2024, likely reflecting a reconfiguration from earlier Yap reporting entities.
- Limited recent submissions: some entities show sparse reporting or older last entries, consistent with capacity constraints and/or changes in organisational arrangements.

1.3.3 Participation in the 2023–2024 reporting years (data to 2024)

For the 2025 PWWA benchmarking report cycle, results draw on 2024 submissions where available, supplemented by 2023 submissions where 2024 data was not provided. The resulting "latest year" dataset is therefore a blended view (2023 or 2024), with the reference year shown for each utility in tables and figures.

Participation in 2024 is best interpreted in three tiers:

- **Full submissions:** utilities providing sufficiently complete water datasets (and wastewater where relevant), enabling calculation of core KPIs (coverage, continuity, NRW, metering, key financial ratios).
- **Partial submissions:** utilities submitting some headline values (often population coverage and selected operational fields) but lacking inputs required for derived indicators.
- **Non-submissions / comparison-only entities:** roster utilities not contributing a usable dataset for the reporting year; referenced only for context where historic data exists.

This tiered framing avoids overstating comparability and ensures indicators are reported only where the underlying inputs exist.

1.3.4 Participation over the last six years (trend and stability)

Over the last six years, participation has varied across the region. Common drivers include:

- turnover of staff responsible for reporting,
- limited capacity to extract and validate data across billing, operations, finance and laboratory systems,
- changes in service area definitions and internal reporting frameworks, and
- disruption from major shocks (cyclones, droughts, supply chain constraints).

To support the interpretation of trends, participation is presented in two complementary ways:

1. **Number of participating utilities per year** (ideally split between full and partial submissions), and

2. **Represented service population**, recognising that a small number of large utilities can account for a large share of the population represented in the dataset.

This prevents misinterpretation where the number of utilities is stable, but population representation changes materially due to the participation (or non-participation) of one or two large utilities.

1.3.5 Participation by group (typology lens)

Participation patterns differ by typology group:

- **Group 1 (high-income):** generally, more consistent participation due to stronger data systems and reporting capacity.
- **Group 2 (middle-income):** typically, the largest share of the benchmarking sample, but completeness is uneven across operational, financial and wastewater indicators.
- **Group 3 (transitional/early-stage):** participation often occurs through proxy reporting and partial datasets, reflecting decentralised or mixed service models and limited information systems.

The report uses the typology to guide interpretation: where Group 3 data are partial or proxy-based, results are presented as indicative and accompanied by clear notes on limitations.

1.3.6 What participation means for interpretation of results

Participation affects interpretation in three practical ways:

1. **Regional medians and ranges can shift when the sample changes.** Apparent changes in "regional performance" may reflect shifts in the participating sample rather than underlying performance change.
2. **Some indicators are systematically under-reported.** Wastewater volumes, sewer network length, water quality testing totals, and detailed financial inputs often have lower completeness than basic coverage and continuity indicators.
3. **Trend analysis requires consistent samples.** Where possible, this report highlights like-for-like comparisons using utilities reporting in both years and separates these from the latest-year snapshots.

PART 2

RESULTS: WATER SERVICE PERFORMANCE

WHY WATER SERVICE PERFORMANCE MATTERS

This part provides a practical, end-to-end view of water service performance using a focused set of indicators that reflect both what customers experience and what utilities must manage to sustain reliable services over time.

The sections are sequenced to follow the service chain from reach to safety:

1. **Water coverage** — whether people within a defined service area are reported as served by the utility.
2. **Service reliability and continuity** — whether water is available when needed, and how evenly that availability is experienced across customers;=.
3. **Water production, billed consumption and non-revenue water (NRW)** — how efficiently systems convert production into billed use, and the scale of losses and under-capture.
4. **Metering coverage** — whether utilities have the measurement and commercial foundations needed to manage demand and interpret NRW credibly.
5. **Drinking water quality** — reported monitoring outcomes that provide a partial proxy for safety performance.

HOW TO INTERPRET THE RESULTS

Results in Part 2 should be interpreted with the dataset's known comparability limits in mind. Several indicators depend on local definitions (for example, service area boundaries, connection types, and what is counted as "metered") and on monitoring intensity (sampling volumes, complaint logging).

Values are utility-reported and are not independently verified. For this reason, the analysis pairs headline percentages with underlying denominators where possible and highlights data-confidence flags (for example, very low sample counts, implausible per-capita values, or abrupt step changes that may reflect re-baselining rather than physical system change).

The intent is to provide decision-relevant signals that support targeted operational improvement and investment planning. Where results appear inconsistent across related indicators (for example, high average hours/day alongside a low percentage of customers with continuous supply), this is treated as a prompt for clarification and validation rather than as a definitive performance judgement.

2.1 Water coverage

SDG linkage

SDG link: SDG 6.1.1 (safely managed drinking water services); contextual relevance to SDG 6.2.1 (safely managed sanitation) where reticulated wastewater services exist.

Type: Input (Medium) — utility-reported service coverage defines the population reached by network services but does not confirm “safely managed” status on its own (which also depends on quality, accessibility and availability “when needed”).

Utility service coverage is a core operational input for interpreting SDG 6.1.1 and, where reticulated wastewater services exist, provides useful context for sanitation system reach alongside wider SDG 6.2.1 considerations (including on-site sanitation). Coverage alone does not confirm “safely managed” outcomes, but it defines the population reached by utility services and provides the baseline for interpreting reliability, quality and affordability.

2.1.1 Water coverage, population served and connections

This section reports utility-reported service area population, population served, and implied water coverage, together with water connections and a simple connection density indicator.

Connection note (comparability): “Water connections” are utility-reported and may include household connections, bulk/community connections (e.g., standpipes or communal tanks), and institutional connections. Counts may include inactive and/or unmetered connections depending on local practice and database hygiene. Connection metrics should therefore be interpreted alongside each utility’s service model and connection definition.

WATER COVERAGE, POPULATION SERVED AND CONNECTIONS (MOST RECENT AVAILABLE YEAR)

Table 4, below, present the most recent available year per utility and covers the following:

- Water coverage (%) = population served ÷ service area population × 100
- Connections per 1,000 served = water connections ÷ population served × 1,000
  Utilities grouped by World Bank FY2025 income classification.

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Table 4: Water coverage, population served and connections (most recent available year, 2023–2024)

Country / Territory	Utility	Year	Service Area Population	Population Served	Water Coverage (%)	Water Connections	Connections per 1,000 Served
Group 1 — High-Income Utilities (3 utilities)							
French Polynesia	Polynésienne des Eaux	2024	95,106	95,106	**100%**	19,175	202
Guam	Guam Waterworks Authority (GWA)	2023	153,836	153,836	**100%**	43,751	284
New Caledonia	Calédonienne des Eaux	2023	216,570	216,570	**100%**	54,503	252
Group 2 — Middle-Income Utilities (7 utilities)							
American Samoa	American Samoa Power and Water Authority (ASPA) (1)	2024	46,765	46,765	**100%**	9,893	212
Cook Islands	Infrastructure Cook Islands (ICI)	2023	4,142	3,040	73%	1,320	434
Cook Islands	To Tatou Vai, Cook Islands	2023	10,898	10,898	**100%**	4,759	437
Fiji	Water Authority of Fiji (WAF)	2024	864,132	692,841	80%	161,126	233
Nauru	Nauru Utilities Corporation (NUC)	2024	11,947	11,947	**100%**	3,021	253
Palau	Palau Public Utilities Corporation (PPUC)	2024	17,727	17,522	99%	5,444	311
Vanuatu	Unelco Vanuatu Limited (UNELCO)	2024	61,071	54,622	89%	10,548	193
Group 3 — Transitional and Early-Stage Service Organisations (10 utilities)							
Federated States of Micronesia	Chuuk Public Utilities Corporation (CPU)	2023	48,654	13,856	**28%**	547	39
Federated States of Micronesia	Yap State Public Service Corporation (YSPSC) (2)	2024	11,597	4,078	**35%**	1,166	286
Kiribati	Public Utilities Board (PUB)	2024	48,244	41,736	87%	4,701	113
Marshall Islands	Majuro Water and Sewer Company (MWSC)	2024	25,000	25,000	**100%**	1,000	40
Papua New Guinea	Water PNG Limited (3)	2024	3,438,113	859,654	**25%**	49,253	57
Samoa	Independent Water Schemes Association (IWSA)	2024	23,866	23,866	**100%**	3,878	162
Samoa	Samoa Water Authority (SWA)	2024	190,195	190,195	**100%**	35,388	186
Solomon Islands	Solomon Islands Water Authority (SIWA)	2024	263,876	108,563	**41%**	18,043	166
Tonga	Tonga Water Board (TWB)	2023	21,185	21,185	**100%**	10,649	503
Vanuatu	Department of Water Resources, Vanuatu	2023	22,815	15,635	69%	4,674	299

Note:

Coverage colour coding: ≤50% critical · 50–74% high concern · 75–89% moderate · 90–99% good · 100% full coverage

TABLE FOOTNOTES

(1) ASPA (American Samoa): service area population equals population served, indicating 100% coverage within the declared service area.

(2) YSPSC (Yap, FSM): service area population is utility-reported; lower coverage reflects reticulated supply reaching part of the island population.

(3) Water PNG: service area population reflects the declared utility service area; coverage reflects the share served within that area and is not equivalent to national access rates.

DATA NOTES

- Year selection: most recent year where service population and connection data are reported (2024 used where available; otherwise 2023).
- Coverage definition: coverage is calculated from utility-reported service area population and population served. Where both values are equal, coverage is shown as 100%—this reflects the utility's declared service boundary, not national access rates.
- Connections per 1,000 served: provides a proxy signal of service model and connection density. Very low ratios may indicate shared/bulk supply points, multi-household connections, or incomplete connection data. Very high ratios may reflect small-household connections, tourism/commercial load, denominator effects, or differences in connection counting practice.
- Income groups: FY2025 World Bank income classifications are applied consistently across the report.

INTERPRETATION NOTE

Water coverage across participating utilities varies substantially by scale, settlement pattern and infrastructure maturity. Many utilities report very high coverage within compact or well-defined service areas.

At the same time, several utilities report materially lower coverage (e.g., parts of FSM, PNG, Solomon Islands, and Vanuatu's Department of Water Resources), reflecting the reality that reticulated piped supply in many Pacific contexts remains concentrated in urban cores and does not yet reach all peri-urban or outer settlements within broader service responsibility zones.

Coverage should always be interpreted alongside continuity and drinking water quality, because high coverage does not necessarily imply continuous or safe service.

2.1.2 Water Coverage by utility (latest available data)

Water coverage is a foundational service outcome indicator: it measures the share of people within a utility's defined service area who are reported as being served by the water supply system.

In Pacific contexts, coverage should be interpreted alongside service-area boundaries and service models: a utility can report "100% coverage" within a defined boundary while access gaps persist outside that formal footprint.

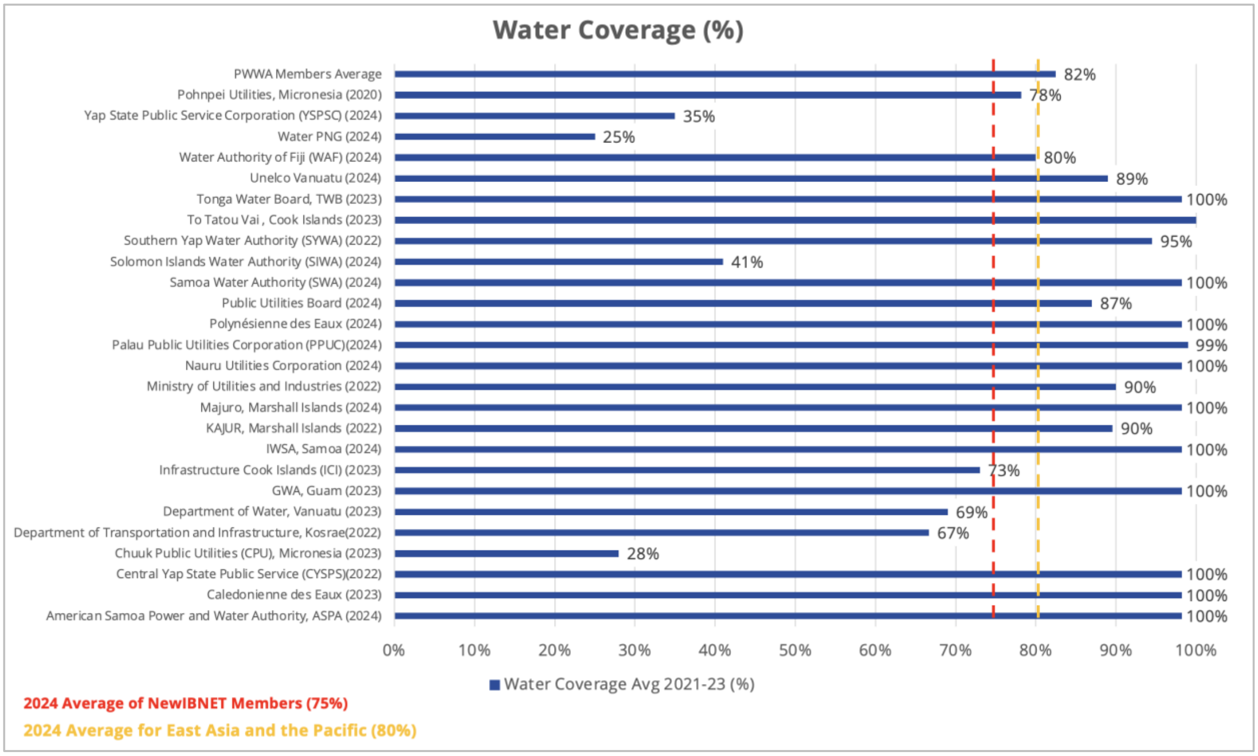


Figure 1: Water coverage (%) by utility (latest available data)

DATA NOTE

Coverage is utility/service-area based and is not directly equivalent to national access measures. Reported years vary by utility (as shown).

WHAT THE DATA SHOWS

Reported coverage is high for many participating utilities (often 95–100%). A subset report materially lower coverage, including (as shown in the figure) utilities such as Water PNG, Chuuk, Yap, and Solomon Islands.

A smaller set sits in a mid-range band (e.g., around 69–73%) where services reach a substantial share of the service area population but remain short of near-universal coverage.

WHY IT MATTERS

Coverage is a headline indicator used by governments and funders to understand how far formal services reach within defined service areas.

Lower coverage often reflects a combination of settlement growth outpacing new connections, delivery constraints (capital availability, land access, approvals/tenure), and mandates that do not yet reach peri-urban or outer settlement areas.

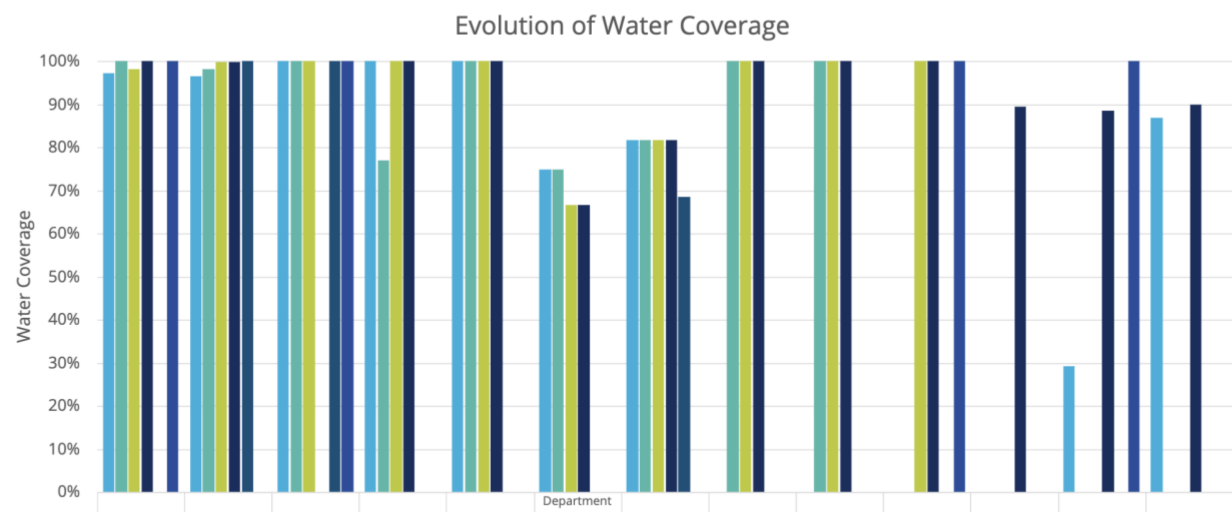
PRACTICAL IMPLICATIONS

- Utilities: pair coverage reporting with a short service boundary statement (what is included/excluded), improve and regularly update service-area population estimates, and develop staged connection pathways where coverage is low.

- **Governments and funders:** validate service boundaries and delivery constraints when using coverage for investment decisions, and support utilities to maintain reliable service-area population baselines (census alignment, GIS boundary mapping).

2.1.3 Evolution of water coverage (2019–2024)

Single-year values are useful, but trends are often more informative. In Pacific settings, step changes can reflect real service expansion but can also reflect revised service-area population estimates, boundary changes, or improvements in data submission practice.



	ASPA	Caledonienne des Eaux	Nauru Utilities Corporation	Central Yap State Public Service (CYSPS)	Chuuk Public Utilities (CPU)	Department of Transportation and Infrastructure, Kosrae	Department of Water	GWA	Infrastructure Cook Islands (ICI)	IWSA	KAJUR	Majuro	Ministry of Utilities and Industries
2019	97%	97%	100%	100%	100%	75%	82%					29%	87%
2020	100%	98%	100%	77%	100%	75%	82%	100%	105%				
2021	98%	100%	100%	100%	100%	67%	82%	100%	105%	124%			
2022	100%	100%		100%	100%	67%	82%	100%	105%	100%	90%	89%	90%
2023		100%	100%				69%						
2024	100%		100%							100%		100%	

Figure 2: Evolution of water coverage (%), 2019–2024 (utilities with time-series data)

Data note: Values above 100% indicate inconsistencies between the population served and the service area population and should be treated as a data-quality flag requiring clarification.

WHY IT MATTERS

Time-series patterns help distinguish sustained expansion from changes driven by data maturity (better denominators, corrected boundaries, revised estimation methods).

Where abrupt shifts occur—especially values above 100%—the priority is to stabilise boundary and population assumptions before interpreting performance.

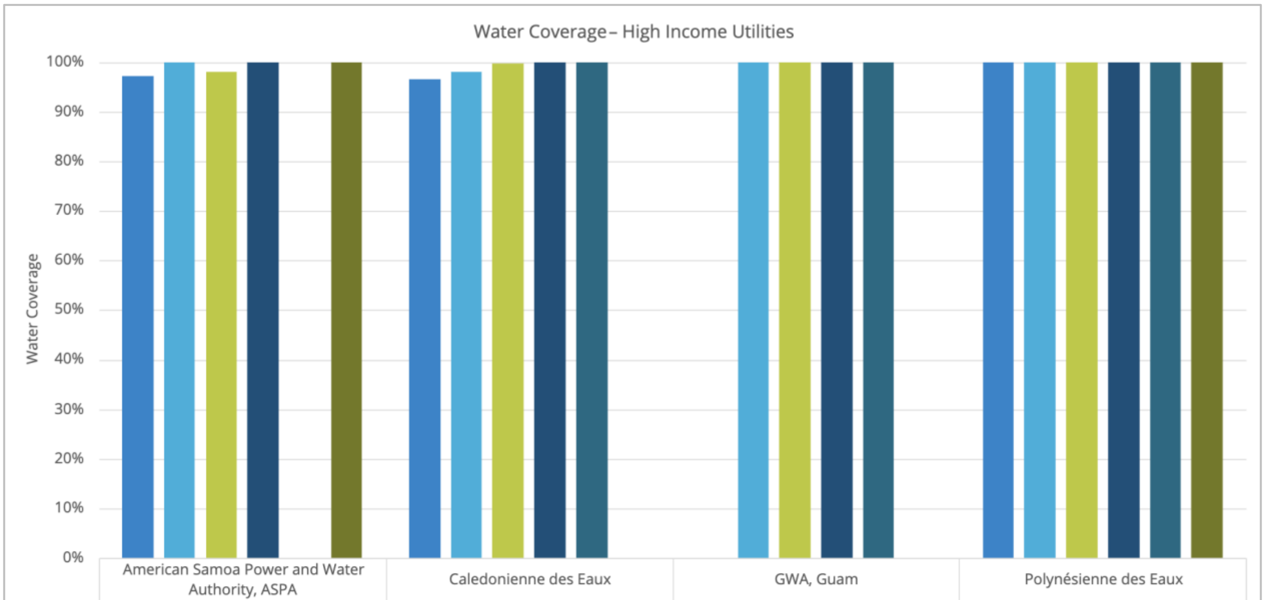
PRACTICAL IMPLICATIONS

- **Utilities:** maintain a consistent documented service-area boundary and population method and treat coverage >100% as an automatic internal validation trigger.
- **Governments and funders:** request short boundary and population-method notes with annual submissions and interpret rapid step changes cautiously unless clearly explained.

2.1.4 Water coverage by peer group (2019–2024)

Peer-group views support fairer interpretation by reducing the influence of structural differences (scale, geography, settlement patterns and service model).

HIGH-INCOME UTILITIES

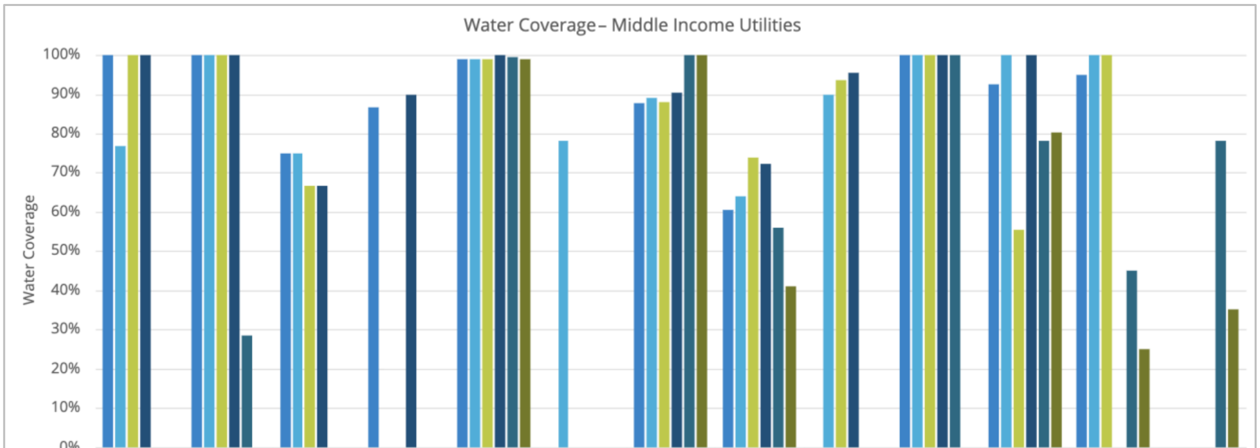


	American Samoa Power and Water Authority, ASPA	Caledonienne des Eaux	GWA, Guam	Polynésienne des Eaux
2019	97%	97%		100%
2020	100%	98%	100%	100%
2021	98%	100%	100%	100%
2022	100%	100%	100%	100%
2023		100%	100%	100%
2024	100%			100%

Figure 3: Water coverage (%) — high-income utilities, 2019–2024

Data note: Blank years indicate no submission.

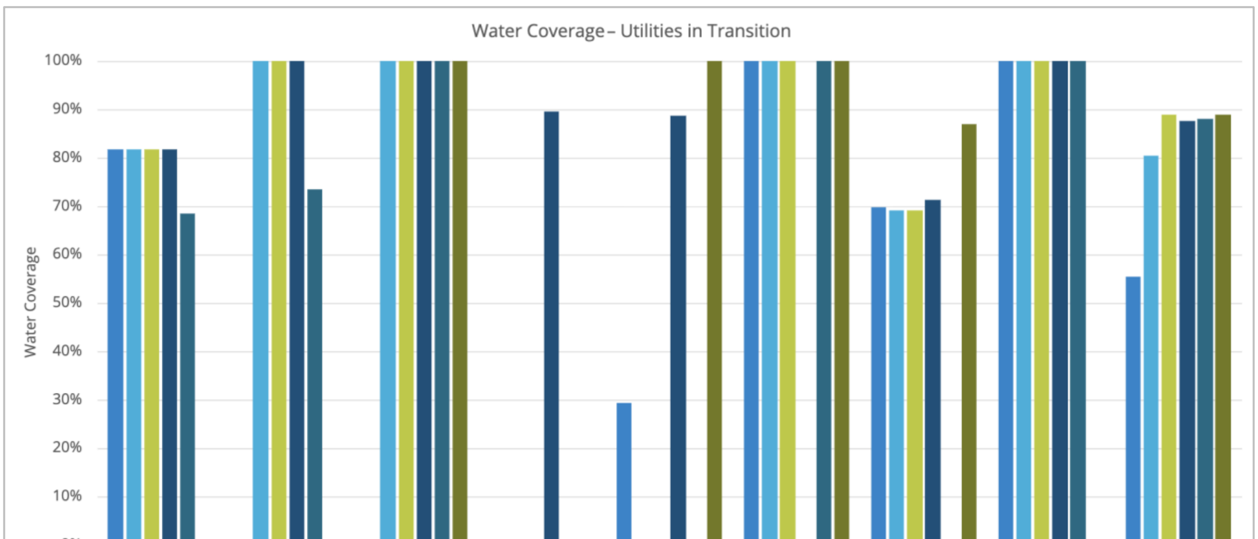
MIDDLE INCOME UTILITIES



	Central Yap State Public Service (CYSPS), Micronesia	Chuuk Public Utilities (CPU), Micronesia	Department of Transportation and Infrastructure, Kosrae, Micronesia	Ministry of Utilities and Industries, Tuvalu	Palau Public Utilities Corporation (PPUC), Palau	Pohnpei Utilities, Micronesia	Samoa Water Authority (SWA)	Solomon Islands Water Authority (SIWA)	Southern Yap Water Authority (SYWA), Micronesia	Tonga Water Board, TWB	Water Authority of Fiji (WAF)	Water PNG	Yap State Public Service Corporation (YSPSC)
2019	100%	100%	75%	87%	99%		88%	61%		100%	93%	95%	
2020	77%	100%	75%		99%	78%	89%	64%	90%	100%	100%	100%	
2021	100%	100%	67%		99%		88%	74%	94%	100%	56%	100%	
2022	100%	100%	67%	90%	100%		90%	72%	95%	100%	100%		
2023		28%			99%		100%	56%		100%	78%	45%	78%
2024					99%		100%	41%			80%	25%	35%

Figure 4: Water coverage (%) — middle-income utilities, 2019–2024

UTILITIES IN TRANSITION



	Department of Water, Vanuatu	Infrastructure Cook Islands (ICI)	IWSA, Samoa	KAJUR, Marshall Islands	Majuro, Marshall Islands	Nauru Utilities Corporation	Public Utilities Board, Kiribati	To Tatou Vai , Cook Islands	Unelco Vanuatu
2019	82%				29%	100%	70%	100%	55%
2020	82%	100%	100%			100%	69%	100%	80%
2021	82%	100%	100%			100%	69%	100%	89%
2022	82%	100%	100%	90%	89%		71%	100%	88%
2023	69%	73%	100%			100%		100%	88%
2024			100%		100%	100%	87%		89%

Figure 5: Water coverage (%) — utilities in transition, 2019–2024

2.1.5 Drinking water coverage — country/territory view (2019–2024)

This chart provides a complementary regional view for dialogue and broad comparison but remains dependent on the reporting entities in the dataset and may not represent all providers nationally.

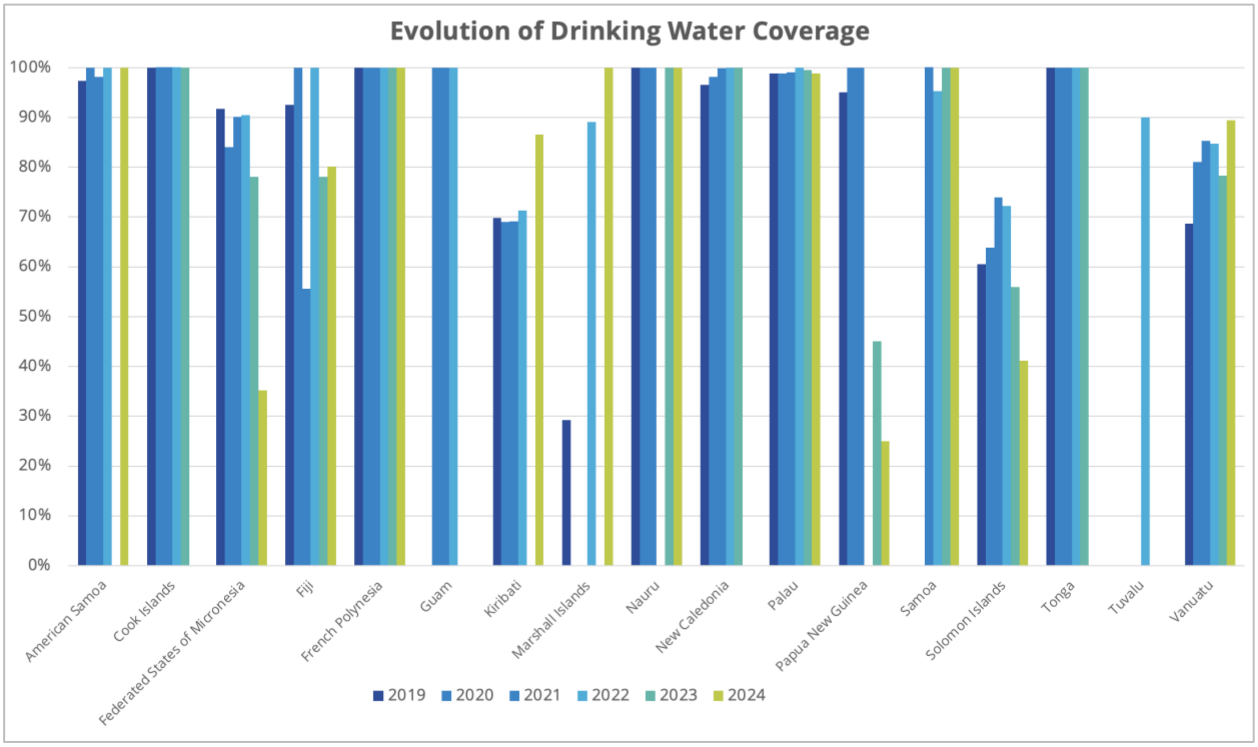
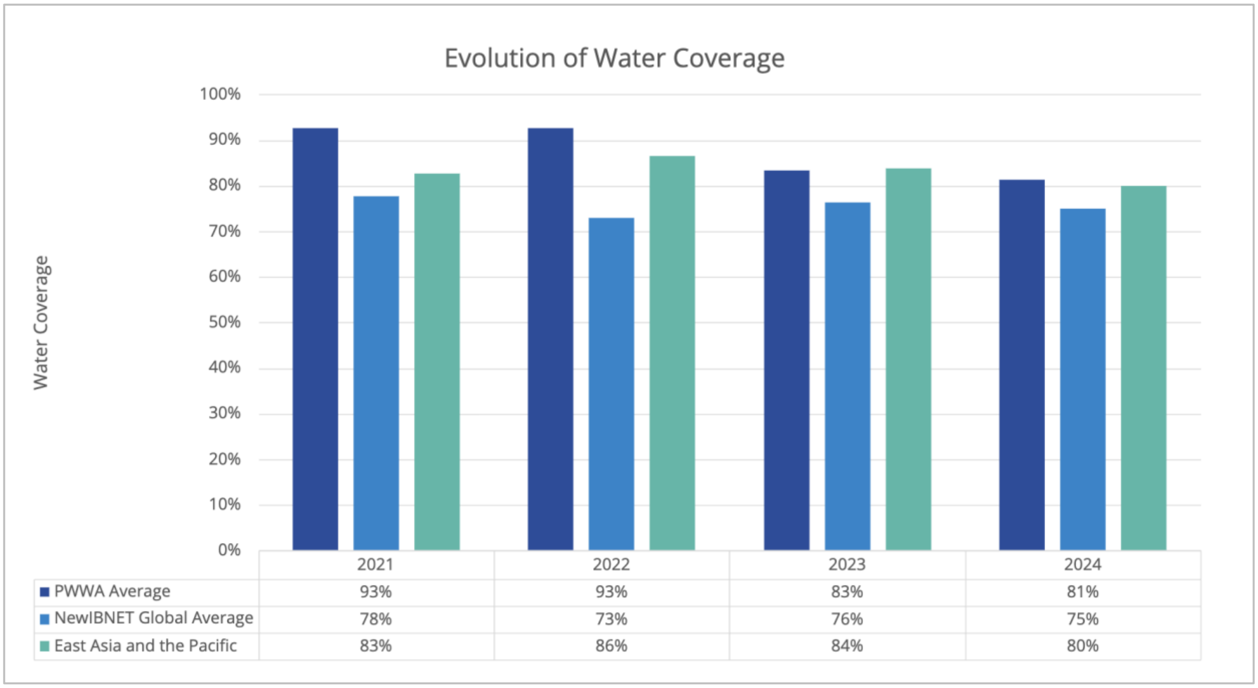


Figure 6: Evolution of drinking water coverage (%), 2019–2024, by country (based on available submissions)

Data note: Country/territory values reflect available reporting entities and may not represent national access.

2.1.6 Evolution of average water coverage — benchmark comparison (2021–2024)

This figure positions the PWWA reporting group against comparator averages, while noting that averages can shift with changes in participation and completeness.



	2021	2022	2023	2024
PWWA Average	93%	93%	83%	81%
NewIBNET Global Average	78%	73%	76%	75%
East Asia and the Pacific	83%	86%	84%	80%

Figure 7: Evolution of average water coverage (%), 2021–2024: PWWA vs NewIBNET and East Asia & Pacific averages

Data note: Changes in the PWWA average may reflect real change and shifts in the reporting sample and denominator assumptions.

INTERPRETATION

Treat sharp changes in the PWWA average after 2022 as a signal that the reporting sample and denominator realism may have changed (e.g., new participants with lower coverage and/or re-baselining of service-area populations), unless validated otherwise.

Maintaining consistent reporting is challenging because utility service provision areas can change over time, including through boundary adjustments, expansion into new service areas, changes in mandate, or institutional restructuring. These changes can affect coverage denominators and trend interpretation even where actual service performance has not materially changed.

Strengthening the “denominator fundamentals” (service-area mapping, settlement growth inputs, consistent population baselines) materially improves the credibility of coverage benchmarking and investment planning.

2.2 Service reliability and continuity

SDG linkage

SDG link: SDG 6.1.1 (safely managed drinking water services), especially the "available when needed" dimension.

Type: Driver (Strong) — continuity directly shapes hygiene, affordability and operational control; intermittent supply can also increase public health risk by destabilising pressure and compromising water safety controls.

Continuity of supply is a key operational driver of SDG 6.1.1 outcomes. It strongly influences household hygiene and affordability, and it affects water safety risk, where intermittent supply and pressure cycling increase the likelihood of intrusion and make it harder to maintain consistent disinfection control. In this report, continuity is treated as a reliability-first indicator that helps explain why safely managed outcomes may not be achieved even where coverage is high.

WHY IT MATTERS

Continuity of supply is one of the most decision-relevant water service indicators in the Pacific because it directly affects household health and hygiene, critical facilities (schools and clinics), and network integrity (pressure stability, leakage and contamination risk). This report presents two complementary measures:

- **Continuity of supply (hours/day):** average hours of water availability per day.
- **% of people with continuous supply:** share of the served population receiving 24/7 service.

These measures should be read together. Where they diverge (for example, near-continuous hours/day but a low % continuous), treat this as a prompt to validate definitions and calculations and to check whether service varies materially across pressure zones or supply areas.

In addition, average hours/day can mask the frequency and duration of outages, including multi-day interruptions, that are often more consequential for households, clinics, schools and businesses. This limitation is particularly important where hours/day is reported as an annual average, as short periods of severe disruption may be diluted across the year. Where results appear inconsistent, they should prompt validation of definitions and simple supporting context on intermittency patterns.

2.2.1 Continuity reporting coverage and headline values (latest year)

Table 5 summarises the latest available continuity results used in this section. For each utility, the most recent year with valid continuity reporting has been selected (2024, where available; otherwise, 2023). Presenting the underlying utility values alongside the served population improves transparency and supports the interpretation of Figures 8–10, particularly where results vary across utilities.

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Table 5: Continuity reporting coverage and headline values (latest year available)

Country	Utility	Year	Service Population	Continuity of Supply (hours/day)	% with Continuous Supply
Group 1 — High-Income Utilities (3 utilities)					
French Polynesia	Polynésienne des Eaux	2024	95,106	24.0	**100%**
Guam	Guam Waterworks Authority (GWA)	2023	153,836	24.0	**100%**
New Caledonia	Calédonienne des Eaux	2023	216,570	24.0	**100%**
Group 2 — Middle-Income Utilities (7 utilities)					
American Samoa	American Samoa Power and Water Authority (ASPA)	2024	46,765	24.0	**95%**
Cook Islands	Infrastructure Cook Islands (ICI)	2023	3,040	24.0	43%
Cook Islands	To Tatou Vai, Cook Islands	2023	10,898	24.0	**100%**
Fiji	Water Authority of Fiji (WAF)	2024	692,841	22.0	**100%**
Nauru	Nauru Utilities Corporation (NUC)	2024	11,947	16.0	**100%**
Palau	Palau Public Utilities Corporation (PPUC)	2024	17,522	24.0	**100%**
Vanuatu	Unelco Vanuatu Limited (UNELCO)	2024	54,622	24.0	**100%**
Group 3 — Transitional and Early-Stage Service Organisations (10 utilities)					
Federated States of Micronesia	Chuuk Public Utilities Corporation (CPU)	2023	13,856	24.0	**100%**
Federated States of Micronesia	Yap State Public Service Corporation (YSPSC)	2024	4,078	24.0	**100%**
Kiribati	Public Utilities Board (PUB)	2024	41,736	**2.0**	**3%**
Marshall Islands	Majuro Water and Sewer Company (MWSC)	2024	25,000	**4.0**	**0%**
Papua New Guinea	Water PNG Limited	2024	859,654	22.0	**18%**
Samoa	Independent Water Schemes Association (IWSA)	2024	23,866	24.0	**100%**
Samoa	Samoa Water Authority (SWA)	2024	190,195	24.0	**100%**
Solomon Islands	Solomon Islands Water Authority (SIWA)	2024	108,563	23.0	**4%**
Tonga	Tonga Water Board (TWB)	2023	21,185	24.0	89%
Vanuatu	Department of Water Resources, Vanuatu	2023	15,635	24.0	80%

Notes:
Latest valid year per utility (2024 preferred; 2023 where 2024 not available).
Continuity of supply = average hours/day supply is available across the service area.
% with continuous supply = share of service population receiving 24-hour supply.
Utilities grouped by World Bank FY2025 income classification.

VALIDATION NOTES

Large differences between hours/day and % continuous supply may reflect within-utility variation (intermittent zones) or differences in definitions/denominators/calculation methods. Where values conflict, treat them as prompts for clarification rather than definitive performance judgements.

DATA AND FIELD MAPPING NOTES

- Continuity of supply (hours/day): sourced from avg_daily_supply (range observed: 2.0–24.0; no conversion required).
- % with continuous supply: sourced from Percentage with Continuous Supply (reported on a 0–100% scale; no conversion required).
- Service population: sourced from wat_service_pop.
- Year selection rule: the latest year where continuity fields are reported (2024 preferred; otherwise 2023).

DATA NOTES

- Continuity indicators are utility-reported. Definitions and measurement methods may vary across utilities.
- Where a utility reports 24.0 hours/day but <100% continuous supply, this usually indicates that some zones/customers experience intermittent supply despite a high system-wide average.
- Kiribati (PUB) and Marshall Islands (MWSC) report severely intermittent supply and should be interpreted in the context of atoll hydrology, limited storage buffers, energy and O&M constraints, and reliance on desalination and/or rainwater systems.
- SIWA (Solomon Islands) reports high average hours/day alongside very low % continuous; this combination strongly suggests spatial variation and/or a definitional issue and should be verified with the utility.
- All utilities in the dataset have at least one continuity field reported and are included in Table 5.

INTERPRETATION NOTES

All high-income utilities report 24-hour continuous supply to 100% of their service populations, consistent with mature infrastructure and operational capacity.

Among middle-income utilities, continuity is generally strong, with notable exceptions including ICI Cook Islands (low % continuous) and Nauru (lower hours/day), which likely reflect structural constraints in small-island systems.

Among transitional utilities, outcomes diverge sharply: several report 24/7 supply, while Kiribati, Marshall Islands, PNG, and Solomon Islands report major reliability challenges that constrain public health outcomes and increase contamination risk.

2.2.2 Average continuity of supply (2019–2024) — country view

Figure 8, below, presents the average continuity of supply (hours/day) over 2019–2024 by country/territory based on available data. Country/territory values reflect the reporting entities in the dataset and are not necessarily representative of all providers or all customers nationally.

WHAT THE DATA SHOWS

Most jurisdictions report high continuity (typically ~22–24 hours/day). Two clear outliers are evident:

- **Kiribati (~2 hours/day)**
- **Marshall Islands (~4 hours/day)**

WHY IT MATTERS

Very low continuity is a strong signal of system fragility and typically reflects multiple binding constraints that cannot be resolved through capital works alone (e.g., energy reliability, O&M capacity, high NRW, storage–demand imbalance, weak preventive maintenance).

Where continuity is high, the priority shifts to sustaining reliability under shocks (drought, cyclones, power interruptions) and confirming that "24 hours" reflects customer experience rather than only a system average.

PRACTICAL IMPLICATIONS

- **Utilities:** Where continuity is below 24 hours/day, identify the dominant constraint (source, treatment, storage, network/NRW, energy, operations) and link it to a targeted improvement plan. Where intermittency is localised, report continuity by zone and provide the served population per zone.
- **Governments and funders:** Treat very low continuity as a high-priority service risk flag requiring targeted investment and embedded operational support (O&M funding, energy resilience, NRW reduction, storage optimisation, operator capability and spares strategies).

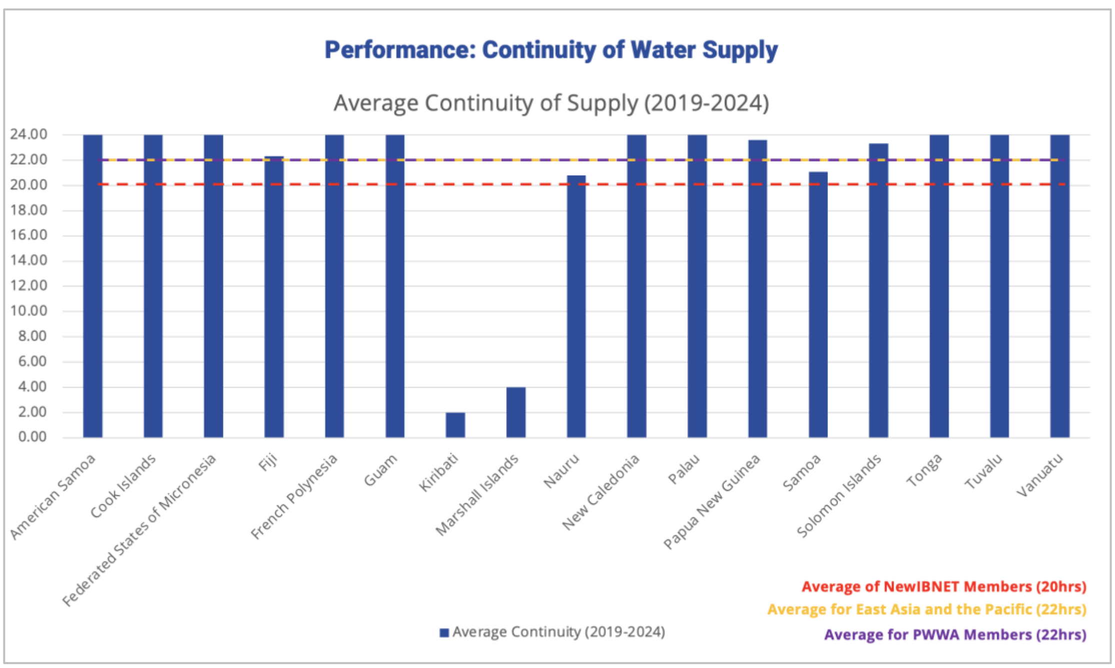


Figure 8: **Average continuity of supply (hours/day), 2019–2024, by country (based on available data)**

2.2.3 Continuity of supply (latest data available) — utility results (hours/day)

Figure 9 below shows the continuity of supply (hours/day) for the latest available year by utility. The "latest year" varies by utility, and results should be validated where values are unusually low or inconsistent with related indicators.

WHAT THE DATA SHOWS

Many utilities report 24 hours/day, but several report materially lower continuity, including very low values (2–4 hours/day) in some systems.

WHY IT MATTERS

Even reductions from 24 hours/day to 16–23 hours/day can create real burdens (household water storage, hygiene constraints, disruption to local services) and can worsen system performance through pressure cycling, higher leakage and increased contamination risk. Very low continuity typically indicates acute service fragility driven by combined infrastructure, operational and funding constraints.

PRACTICAL IMPLICATIONS

- **Utilities:** For intermittent systems (≤16 hours/day), sequence a reliability recovery plan that typically follows: (1) stabilise energy/pumping uptime → (2) reduce losses/pressure instability → (3) optimise storage operations and controls → (4) strengthen preventive maintenance and response. For near-continuous systems (22–23 hours/day), focus on the "last constraints" preventing 24/7 service (critical pump reliability, storage control logic, pressure zone bottlenecks, priority NRW hotspots).
- **Governments and funders:** Where continuity is ≤16 hours/day, prioritise combined packages: targeted capital works plus embedded operational support (spares, O&M budgets, operator training, monitoring and troubleshooting).

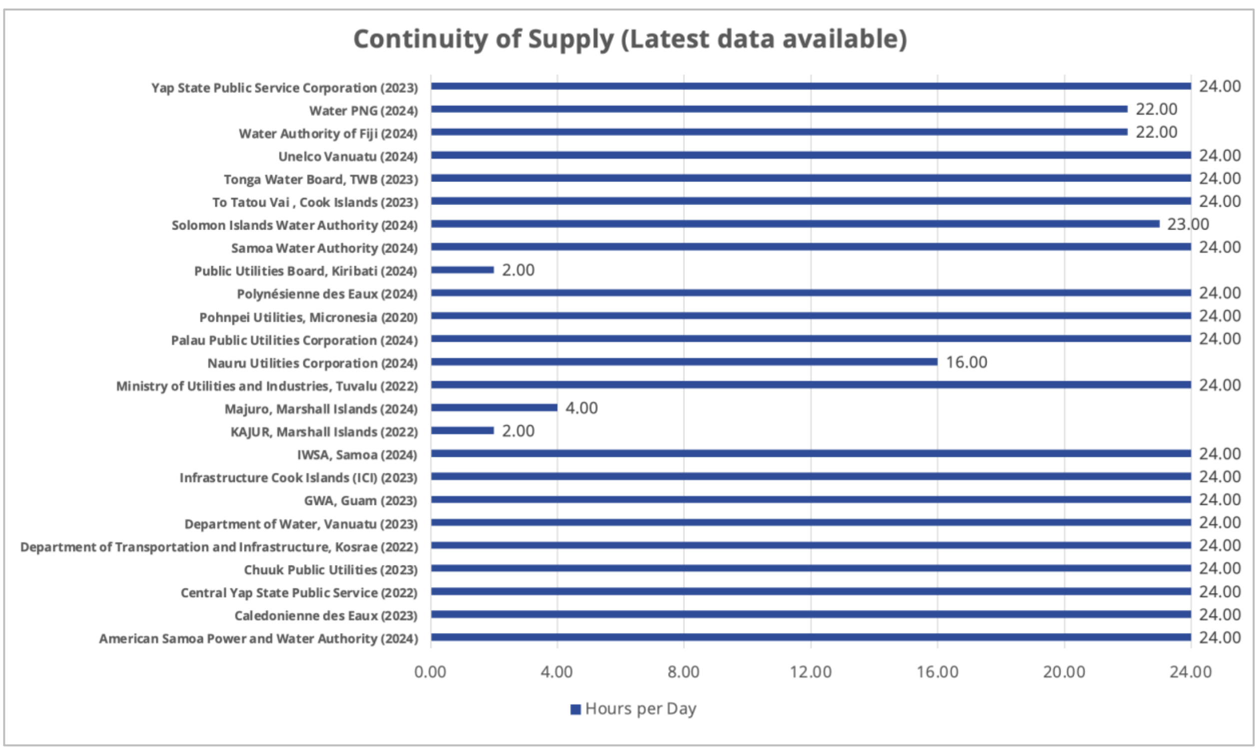


Figure 9: Continuity of supply (hours/day), latest year available, by utility (latest year shown)

2.2.4 Percentage of people with continuous supply (latest data available)

Average hours/day can mask unequal service within a utility. Percentage (%) continuous supply shifts the focus to customer impact and is especially valuable where continuity differs between urban cores and peri-urban/outlying areas.

Figure 10 presents the percentage of people with continuous supply (24/7) for the latest year available by utility. Where values appear inconsistent with reported hours/day, treat this as a data-quality flag requiring clarification (definition, unit scaling, denominator, or calculation method).

WHAT THE DATA SHOWS

Many utilities report 100% continuous supply, while several report substantially lower percentages. This highlights that within-system intermittency can be significant even when average hours/day appears high.

WHY IT MATTERS

This indicator is an equity and realism check. A utility may report high average hours/day while a material share of customers still experience intermittency.

Where % continuous is materially below 100%, it can indicate either (i) real spatial inequality of service within the network, or (ii) definitional/reporting issues—both of which matter for targeting investment and assessing performance.

PRACTICAL IMPLICATIONS

- **Utilities:** Where <100%, identify intermittent zones/customers and link to a prioritised action list (pressure zones, storage controls, pump reliability, NRW hotspots, operational scheduling). Where inconsistent with hours/day, confirm the definition of "continuous", units (fraction vs percent), denominator (served population vs total service area), and calculation basis. Consider reporting a simple companion breakdown: share of customers receiving <12 hours/day / 12–23 hours/day / 24 hours/day (even approximate initially).
- **Governments and funders:** Use % continuous to target reliability funding to the customers most affected, not only to system averages. Encourage standardised definitions and validation rules (including automated flags where hours/day and % continuous conflict).

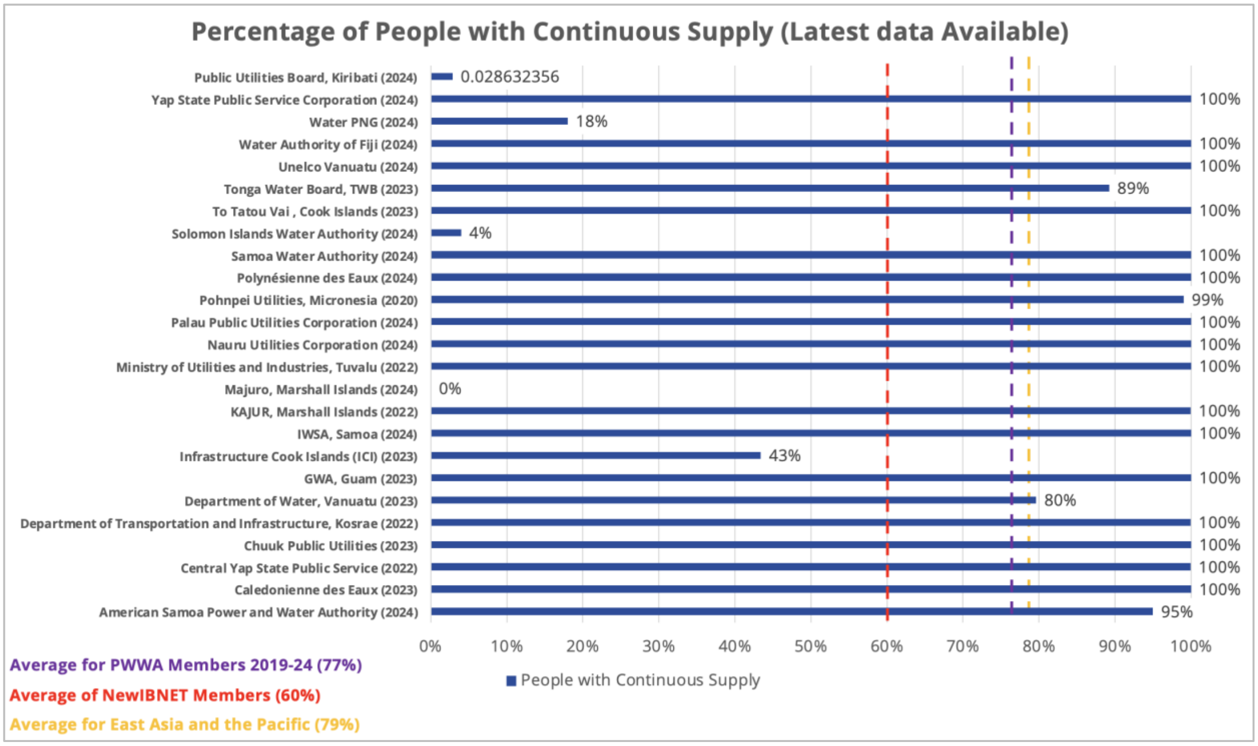


***Figure 10**: Percentage of people with continuous supply (%), latest year available, by utility (latest year shown)*

2.3 Water Production, Billed Consumption and Non-Revenue Water (NRW)

SDG linkage

SDG link: SDG 6.4 (water-use efficiency) and supporting progress on SDG 6.1.1 via effective supply, reliability and affordability.

Type: Proxy/Driver (Strong for 6.4; Medium for 6.1.1) — NRW is the core efficiency signal and an early warning for reliability and cost pressure, but it is not a direct measure of safely managed drinking water outcomes.

Water production, billed consumption, and NRW provide the main utility-level signals of distribution efficiency relevant to SDG 6.4. High NRW can also constrain progress towards SDG 6.1.1 by reducing effective supply, weakening service reliability (through pressure instability and higher break/repair burden), and increasing unit costs that affect affordability and the ability to sustain O&M.

WHAT THIS SECTION COVERS

Table 6 summarises annual water production and billed consumption for each utility, together with implied non-revenue water (NRW).

NRW is presented both as an annual volume and as a percentage of production. Where denominators are available, production and billed volumes are also presented on a per-capita basis as a reasonableness check and to support cross-utility interpretation.

IMPORTANT DEFINITION NOTE

NRW values in this report are calculated from reported production and billed volumes only:

- **NRW (m^3/yr) = Production − Billed consumption**
- **NRW (%) = (Production − Billed) ÷ Production × 100**
  This is best interpreted as apparent NRW (it does not explicitly separate authorised unbilled consumption, apparent losses, and real losses in line with full IWA water balance methodology).

WATER PRODUCTION, BILLED CONSUMPTION AND NON-REVENUE WATER (NRW)

Latest valid year per utility (2024 used where available; otherwise, 2023). Volumes shown in m^3/year after unit conversion (where required).

Per-capita figures use utility-reported service population and represent average daily volumes per person within the service area (not household consumption).

Table 6: Water Production, Billed Consumption and Non-Revenue Water (NRW)

Country / Territory	Utility	Year	Production (m³/yr)	Billed Consumption (m³/yr)	NRW (m³/yr)	NRW (%)	Production per Capita (L/p/day)	Billed per Capita (L/p/day)
Group 1 — High-Income Utilities (3 utilities)								
French Polynesia	Polynésienne des Eaux	2024	14,031,822	9,126,797	4,905,025	35%	404	263
Guam	Guam Waterworks Authority (GWA) (b)	2023	55,172,377	19,161,754	36,010,623	**65%**	983	341
New Caledonia	Calédonienne des Eaux	2023	36,160,540	27,879,265	8,281,275	23%	457	353
Group 2 — Middle-Income Utilities (7 utilities)								
American Samoa	American Samoa Power and Water Authority (ASPA) (a)	2024	16,752,855	6,799,543	9,953,312	59%	981	398
Cook Islands	Infrastructure Cook Islands (ICI) (e)	2023	—	—	—	—	—	—
Cook Islands	To Tatou Vai, Cook Islands (f)	2023	5,413,000	3,944,500	1,468,500	27%	1,361	992
Fiji	Water Authority of Fiji (WAF)	2024	128,763,858	70,980,839	57,783,019	45%	509	281
Nauru	Nauru Utilities Corporation (NUC)	2024	321,788	249,277	72,511	23%	74	57
Palau	Palau Public Utilities Corporation (PPUC) (a)	2024	3,949,777	2,248,474	1,701,303	43%	618	352
Vanuatu	UNELCO Vanuatu Limited (UNELCO)	2024	6,777,638	4,728,543	2,049,095	30%	340	237
Group 3 — Transitional and Early-Stage Service Organisations (10 utilities)								
Federated States of Micronesia	Chuuk Public Utilities Corporation (CPU) (c)	2023	68,137	37,854	30,283	44%	13	7
Federated States of Micronesia	Yap State Public Service Corporation (YSPSC) (a)	2024	576,016	344,837	231,179	40%	387	232
Kiribati	Public Utilities Board (PUB) (b)	2024	539,945	136,505	403,440	**75%**	35	9
Marshall Islands	Majuro Water and Sewer Company (MWSC) (a,d)	2024	28,855	12,492	16,363	57%	3	1
Papua New Guinea	Water PNG Limited	2024	95,712,379	47,266,468	48,445,911	51%	305	151

Country / Territory	Utility	Year	Production (m^3/yr)	Billed Consumption (m^3/yr)	NRW (m^3/yr)	NRW (%)	Production per Capita (L/p/day)	Billed per Capita (L/p/day)
Samoa	Independent Water Schemes Association (IWSA)	2024	3,685,197	2,982,486	702,711	19%	423	342
Samoa	Samoa Water Authority (SWA)	2024	25,967,072	15,288,286	10,678,786	41%	374	220
Solomon Islands	Solomon Islands Water Authority (SIWA)	2024	13,677,405	5,543,890	8,133,515	59%	345	140
Tonga	Tonga Water Board (TWB)	2023	448,000	209,000	239,000	53%	58	27
Vanuatu	Department of Water Resources, Vanuatu	2023	3,400,000	1,690,431	1,709,569	50%	596	296

Notes

NRW (%) colour scale — lower is better:
<25% (Low — good) | 25–39% (Acceptable) | 40–59% (High) | ≥60% (Very high)

TABLE FOOTNOTES

(a) Production and/or billed volumes converted from US gallons to m³ (1 US gal = 0.003785411784 m³).

(b) Per-capita figures are approximate; service population is utility-reported and may differ from census estimates and/or reflect different service boundaries.

(c) CPU (Chuuk) volumes are unusually low relative to service population; figures are presented as submitted. Verify units and reporting scope with the utility.

(d) MWSC (Majuro): very low absolute volumes; per-capita production (3 L/p/day) and billed (1 L/p/day) suggest a potential unit/time-basis or reporting-scope issue. Verification is recommended before publication.

(e) Infrastructure Cook Islands (ICI): no production or billed volume data submitted in any year. Row retained for completeness.

(f) To Tatou Vai (Cook Islands): very high per-capita production and billed volumes may reflect a small denominator, bulk/non-residential supply, losses, or reporting definitions. Verification is recommended.

CALCULATION AND DATA HANDLING NOTES (TABLE 6)

- Year selection: 2024 is used where available; 2023 is used where 2024 is missing key fields.
- Units: all volumes are presented in m³/year after conversion (where required).
- NRW definition: NRW (m³/yr) = Production − Billed consumption; NRW (%) = NRW ÷ Production × 100 (rounded to nearest whole per cent).
- Per-capita metrics:
  - Production per capita (L/p/day) = Production (m³/yr) × 1,000 ÷ service population ÷ 365
  - Billed per capita (L/p/day) = Billed (m³/yr) × 1,000 ÷ service population ÷ 365
- Interpretation limitation: NRW values are calculated from reported production and billed volumes only and therefore represent apparent NRW rather than full IWA "real NRW".

INTERPRETATION NOTE (NRW AND PER-CAPITA PLAUSIBILITY)

NRW varies widely across Pacific utilities, reflecting differences in infrastructure condition, metering coverage, billing system maturity, and operational capacity.

Very high NRW (≥60%)—such as Guam (65%) and Kiribati (75%)—indicates major physical and/or commercial losses and warrants priority validation of production measurement and billing completeness before drawing firm conclusions.

Per-capita production provides a useful plausibility check. Values above ~500 L/p/day (e.g., American Samoa, Guam, To Tatou Vai) warrant follow-up to determine whether the drivers are high leakage, significant non-residential demand, bulk supply, intermittent production estimates, or denominator/reporting scope issues.

Conversely, exceptionally low values (e.g., MWSC Majuro; CPU Chuuk) suggest potential unit or reporting scope issues and should be verified.

DATA COMPLETENESS NOTE

Infrastructure Cook Islands (ICI) did not submit production or billed volumes, so NRW and per-capita volumes cannot be calculated for that utility.

2.3.1 Non-revenue water and efficiency

NRW is a core indicator of both operational efficiency and financial health.

High NRW increases operating costs (energy, chemicals, treatment run-hours), reduces revenue available for O&M and renewal, and can contribute to pressure instability and service interruptions.

INTERPRETING NRW

NRW is an aggregate outcome that can reflect a combination of:

- Real losses (leakage, bursts, overflows)
- Apparent losses (meter under-registration, billing/data gaps, unauthorised use)
- Authorised unbilled consumption (standpipes, flushing, firefighting)

The same NRW percentage can therefore arise from very different underlying drivers. A basic validation of production measurement and billing completeness is a necessary first step before selecting interventions.

To support interpretation, NRW is presented in three complementary ways:

- NRW (%)
- NRW intensity (litres/connection/hour)
- Aggregate trend (sample-sensitive direction of travel)

2.3.2 Aggregate NRW trend (2019–2024)

Figure 11 shows the aggregate NRW trend across the reporting sample using summed produced and billed volumes (NRW% derived from the sums). Because the underlying reporting sample changes year-to-year, this is best interpreted as a direction-of-travel indicator, not a definitive region-wide estimate.

WHAT THE DATA SHOWS

Across the reporting sample, NRW remains high: 48% (2019), 48% (2020), 45% (2021), 40% (2022), 41% (2023), 44% (2024).

This suggests improvement through 2022, followed by a partial reversal by 2024. Put simply, at an aggregate NRW of around 44%, close to half of water produced is not billed across the reporting sample.

WHY IT MATTERS

Even modest NRW reductions can translate into meaningful operational savings and improved service stability. Persistently high NRW limits cost recovery and reduces resources available for maintenance, renewals, and resilience.

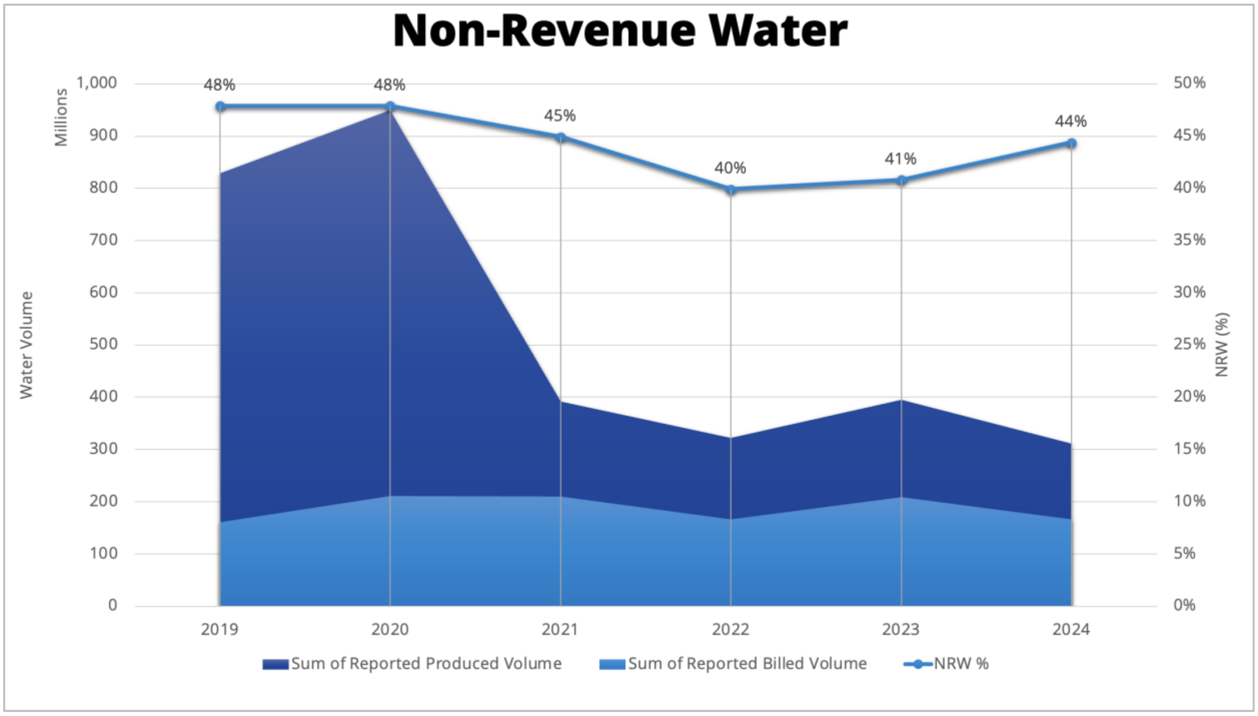


Figure 11: Aggregate non-revenue water trend, 2019–2024 (sum of reported produced and billed volumes; NRW% derived from sums)

DATA NOTE

Year-to-year movements reflect both real performance change and changes in the reporting sample and data completeness.

2.3.3 NRW per utility

Figure 12 presents NRW (%) by utility for the latest year available. NRW can be inflated when billed consumption is under-captured (e.g., low metering coverage, billing gaps) or when production is estimated or poorly measured. Unusually low values should also trigger checks for billing/metering completeness.

WHAT THE DATA SHOWS

NRW varies substantially across utilities. The spread indicates NRW is not “one Pacific story”; performance is shaped by operational practice, metering/billing maturity, and intermittency/pressure conditions.

WHY IT MATTERS

Where NRW exceeds ~50%, drivers are often a mix of physical leakage, intermittent supply and pressure transients, limited customer metering, and weak billing controls. These issues are typically solvable but require sustained operational focus alongside targeted investment.

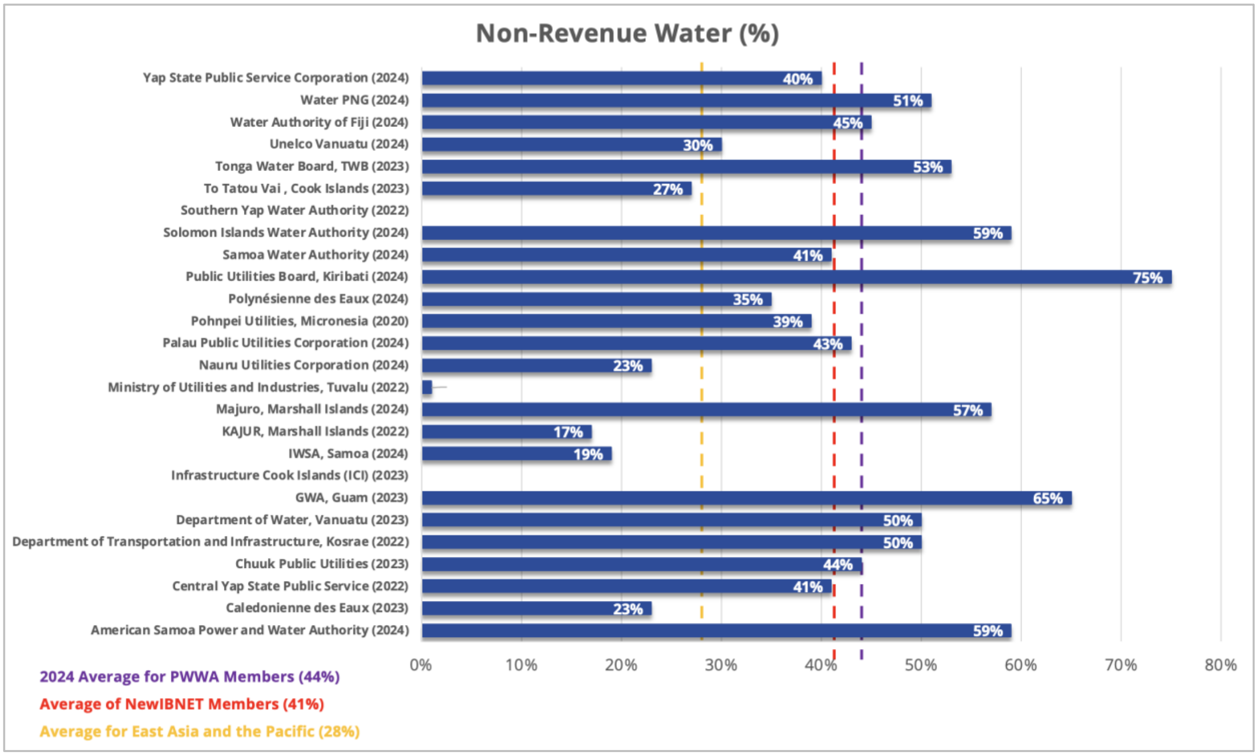


Figure 12: Non-revenue water (%), latest data available, by utility

COMPARISON NOTE

PWWA sample average is indicative only; comparator datasets differ in method and sample.

2.3.4 NRW intensity (litres/connection/hour)

Figure 13 presents NRW intensity (litres/connection/hour). Where supply is intermittent, NRW intensity can be distorted unless hours of supply and connection definitions are consistent.

Very high values often signal major real losses and/or denominator issues (e.g., connection definition, hours-of-supply assumptions).

Very low values may reflect genuinely low losses but can also occur when production is under-measured or when “connections” are defined differently (household vs. bulk/community).

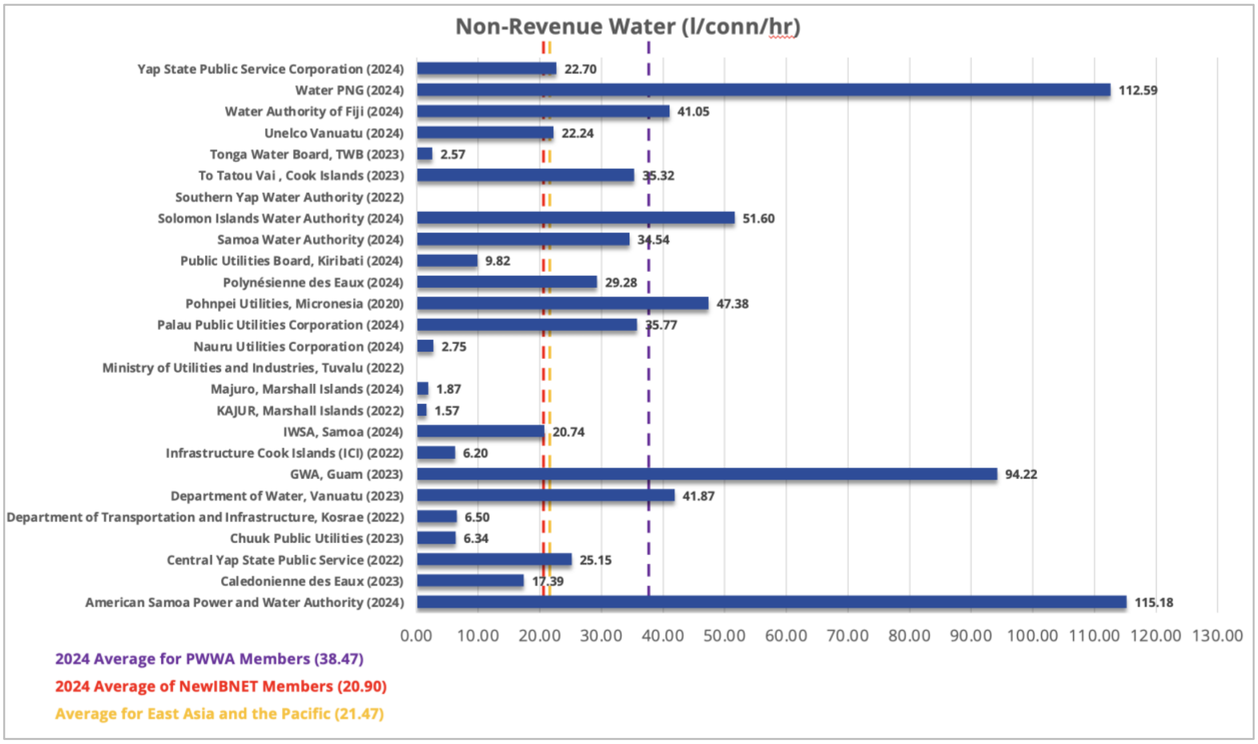


Figure 13: NRW intensity (litres/connection/hour), latest data available, by utility

2.3.5 NRW trends by peer group

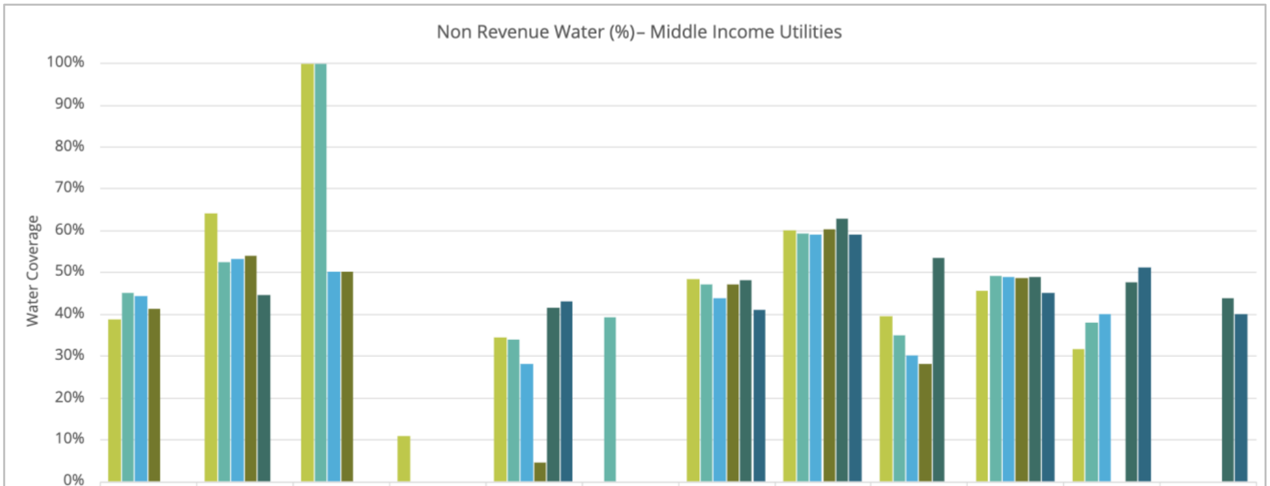
Figures 14–16 show NRW (%) trends by peer group over 2019–2024. Peer-group trends indicate NRW remains material even where coverage is mature.

Transition utilities often show the greatest potential reliability and financial gains from NRW improvement, but trends can also reflect re-baselining as metering and reporting improve.

Tracking both NRW% and NRW intensity helps distinguish genuine operational gains from data maturity effects.

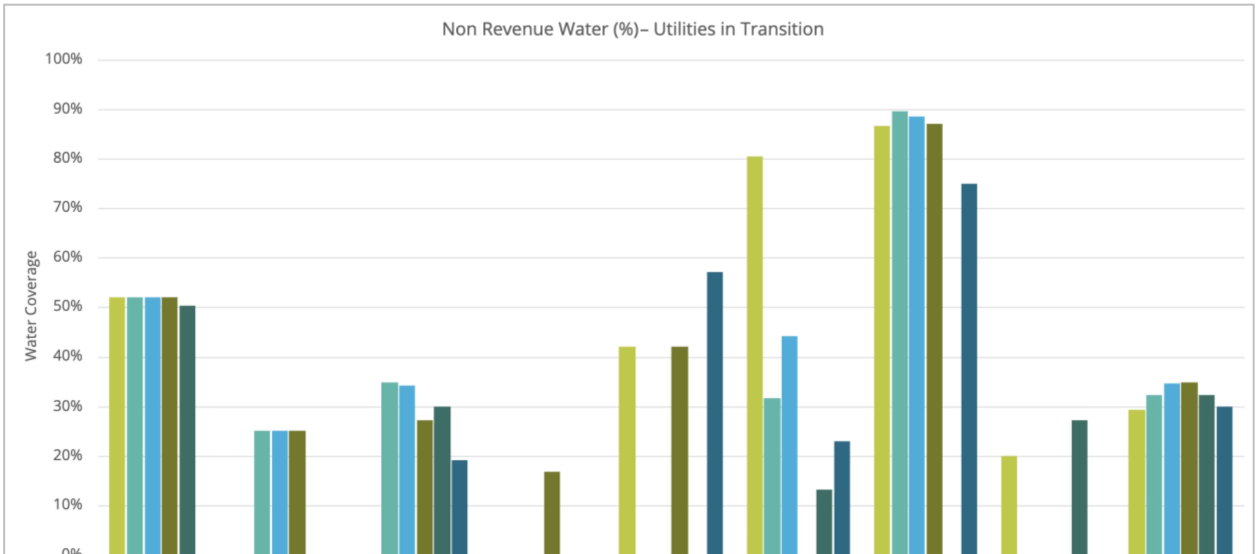
	American Samoa Power and Water Authority, ASPA	Caledonienne des Eaux	GWA, Guam	Polynésienne des Eaux
2019	61%	28%		38%
2020	61%	35%	60%	38%
2021	60%	23%	62%	33%
2022	61%	23%	63%	33%
2023		23%	65%	22%
2024	59%			35%

Figure 14: NRW (%) trends — high-income utilities, 2019–2024



	Central Yap State Public Service (CYSPS)	Chuuk Public Utilities (CPU)	Department of Transportation and Infrastructure, Kosrae,	Ministry of Utilities and Industries, Tuvalu	Palau Public Utilities Corporation (PPUC)	Pohnpei Utilities, Micronesia	Samoa Water Authority (SWA)	Solomon Islands Water Authority (SIWA)	Tonga Water Board, TWB	Water Authority of Fiji (WAF)	Water PNG	Yap State Public Service Corporation (YSPSC)
2019	39%	64%	100%	11%	34%		48%	60%	40%	46%	32%	
2020	45%	52%	100%		34%	39%	47%	59%	35%	49%	38%	
2021	44%	53%	50%		28%		44%	59%	30%	49%	40%	
2022	41%	54%	50%		4%		47%	60%	28%	49%		
2023		44%			41%		48%	63%	53%	49%	48%	44%
2024					43%		41%	59%		45%	51%	40%

Figure 15: NRW (%) trends — middle income utilities, 2019–2024



	Department of Water, Vanuatu	Infrastructure Cook Islands (ICI)	IWSA, Samoa	KAJUR, Marshall Islands	Majuro, Marshall Islands	Nauru Utilities Corporation	Public Utilities Board, Kiribati	To Tatou Vai , Cook Islands	Unelco Vanuatu
2019	52%				42%	80%	87%	20%	29%
2020	52%	25%	35%			32%	90%	0%	32%
2021	52%	25%	34%			44%	89%	0%	35%
2022	52%	25%	27%	17%	42%		87%	0%	35%
2023	50%		30%			13%		27%	32%
2024			19%		57%	23%	75%		30%

Figure 16: NRW (%) trends — utilities in transition, 2019–2024

2.3.6 Practical pathways — what “good” NRW work looks like in the Pacific

WHAT UTILITIES CAN DO

- **Validate the water balance first:** confirm bulk production measurement, customer meter accuracy, and treatment of authorised unbilled consumption.
- **Move toward zone-based management:** DMAs where feasible, or simpler pressure zones to identify and prioritise hotspots.
- **Target dominant loss mechanisms:** pressure management, active leakage control, and rapid repair response for frequent bursts.
- **Strengthen metering and billing controls:** meter replacement, meter reading QA, customer database hygiene, and management of illegal connections/unauthorised use.
- **Publish a short annual NRW narrative:** explain what changed (programme actions, storms, metering upgrades, re-baselining) so trends are credible and investable.

WHAT GOVERNMENTS AND FUNDERS CAN DO

- Fund NRW as a reliability and fiscal-resilience measure, not only technical efficiency. High NRW is not only a technical inefficiency—it is a reliability and affordability risk. In small island systems, losses often translate into higher run-hours, energy and chemical consumption, more frequent breakdowns, and faster asset wear, which then compounds intermittency and raises fiscal exposure to emergency repairs. Positioning NRW reduction as a reliability investment helps justify the practical combination of targeted renewals with the O&M inputs, leakage teams, spares, monitoring and training needed to sustain results.
- Pair targeted CAPEX with embedded OPEX/PEX: meters, pressure control, districting and hotspot renewals alongside training, leakage teams, spares and monitoring.
- Require simple validation rules: flags for extreme NRW%, extreme litres/connection/hour, and large year-to-year swings without an explanation.

2.4 Metering coverage (enabler of NRW reduction and financial sustainability)

SDG linkage

SDG link: Supports SDG 6.1.1 (safely managed drinking water services, especially sustainability of reliable service) and SDG 6.4 (water-use efficiency) through measurement and demand/NRW management.

Type: Enabler (Medium) — metering improves billing fairness, strengthens NRW diagnostics and demand management, and supports cost recovery needed for sustained O&M (but it is not an SDG outcome indicator itself).

Metering coverage is included as a supporting indicator because it directly affects how confidently we can interpret billed consumption and NRW.

Where a low share of connections is metered—or where meters are installed but not functional or regularly read—billed volumes may be under-captured and NRW (%) can be inflated by commercial losses and data gaps as well as physical leakage.

2.4.1 Why metering coverage matters

Customer metering is a foundational capability for effective utility management. High metering coverage strengthens billing completeness, supports demand management, improves the credibility of NRW estimates (by separating real and apparent losses), and enables targeted leakage and pressure management interventions. In Pacific utilities, metering coverage is also closely linked to operating cost recovery and cashflow stability, because consumption-based billing provides a clearer revenue pathway than flat-rate or unmetered charging in contexts of high NRW and constrained O&M budgets.

This report presents metering coverage as the share of connections reported as metered, shown as (i) the latest year available and (ii) the 2019–2024 evolution by peer group (where time-series data exist). Metering coverage should be interpreted alongside connection definitions and service models (household vs bulk/community connections) and—where possible—supplemented by information on meter functionality and reading completeness.

2.4.2 Metering coverage — latest year available (utility results)

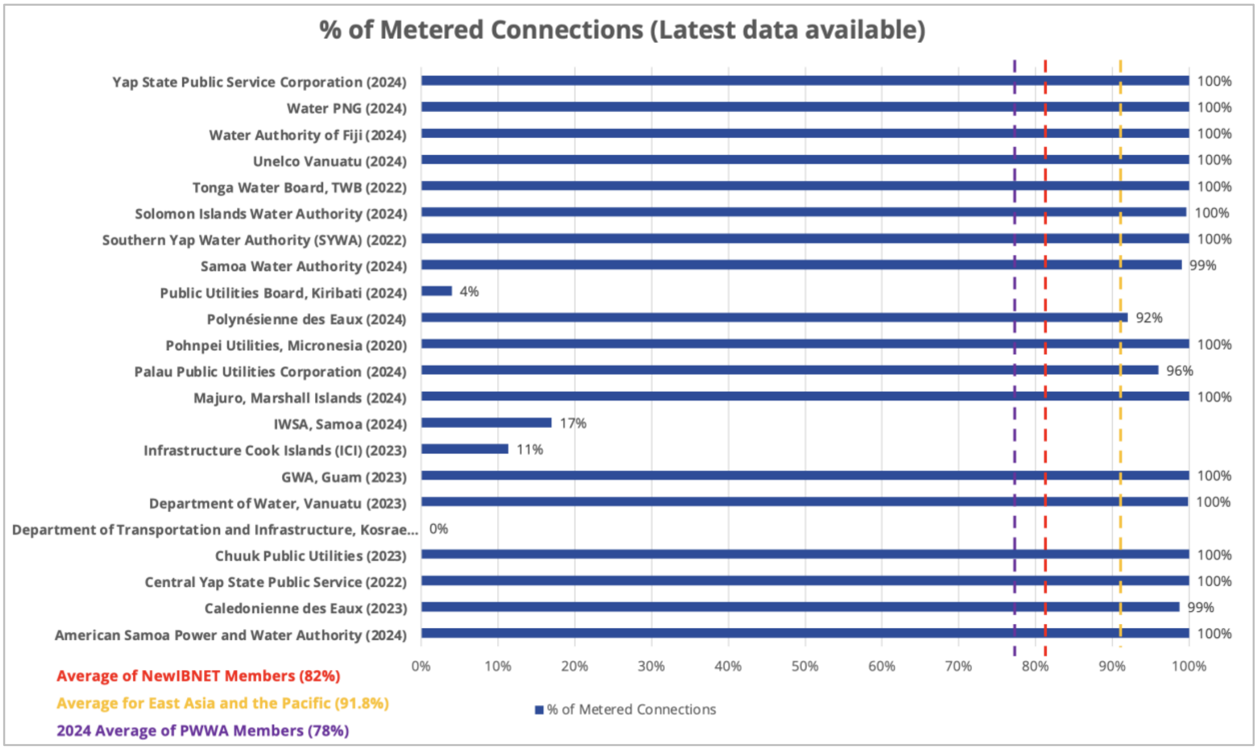


Figure 17: Percentage metered connections

Figure 17 shows the latest reported share of metered connections for utilities with available data. Many utilities report very high metering coverage (often near 100%), while a smaller subset reports very low metering coverage.

Low reported metering coverage is an important flag because it can indicate that billed consumption is under-captured, weakening the interpretability of NRW and limiting the effectiveness of demand management and revenue controls.

DATA NOTE

Metering coverage is utility-reported and may reflect different definitions (e.g., meter installed vs meter functional and regularly read; household vs bulk/community connections; treatment of inactive connections). Results should be treated as indicative unless accompanied by a brief definition.

2.4.3 Evolution of metering coverage (2019–2024) — peer group view

The time-series charts highlight that many utilities report stable, high metering coverage over time, while a small number show persistently low coverage or step-changes that warrant clarification.

HIGH-INCOME UTILITIES

Metering coverage is generally stable and high. Most utilities remain near 100% across the time series, with only minor year-to-year movements.

Polynésienne des Eaux shows more variation (rising from the mid-80s to the low-90s and peaking near 100% before returning to the low-90s), suggesting either operational/portfolio changes or definitional/reporting adjustments that should be explained in a brief narrative note.

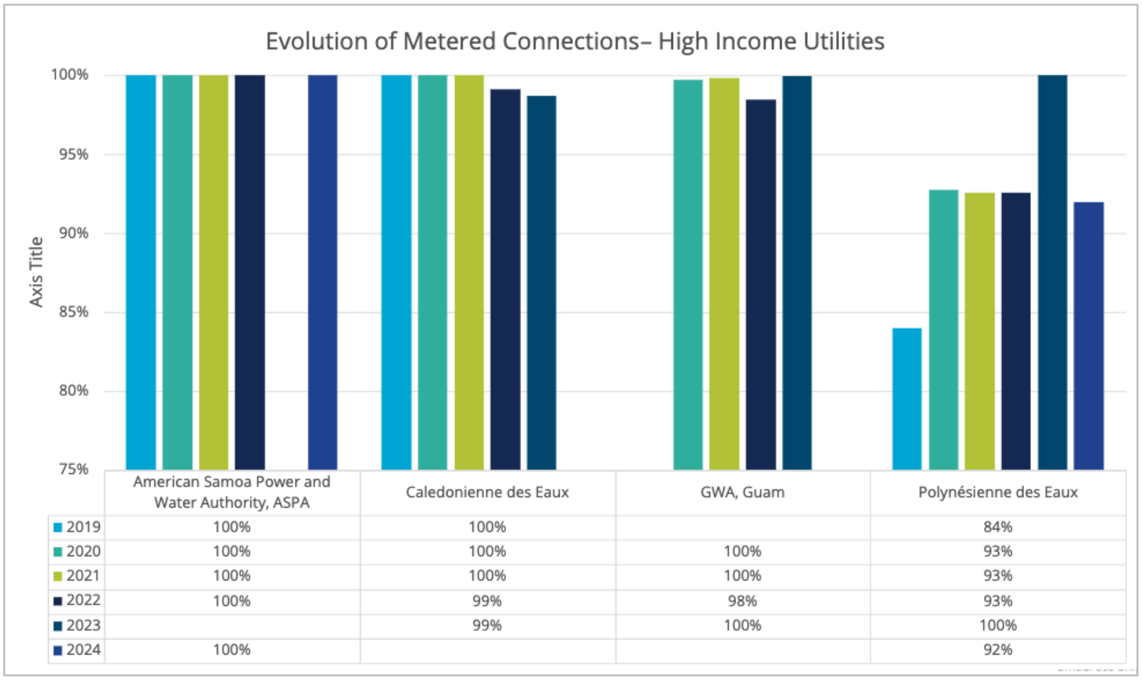
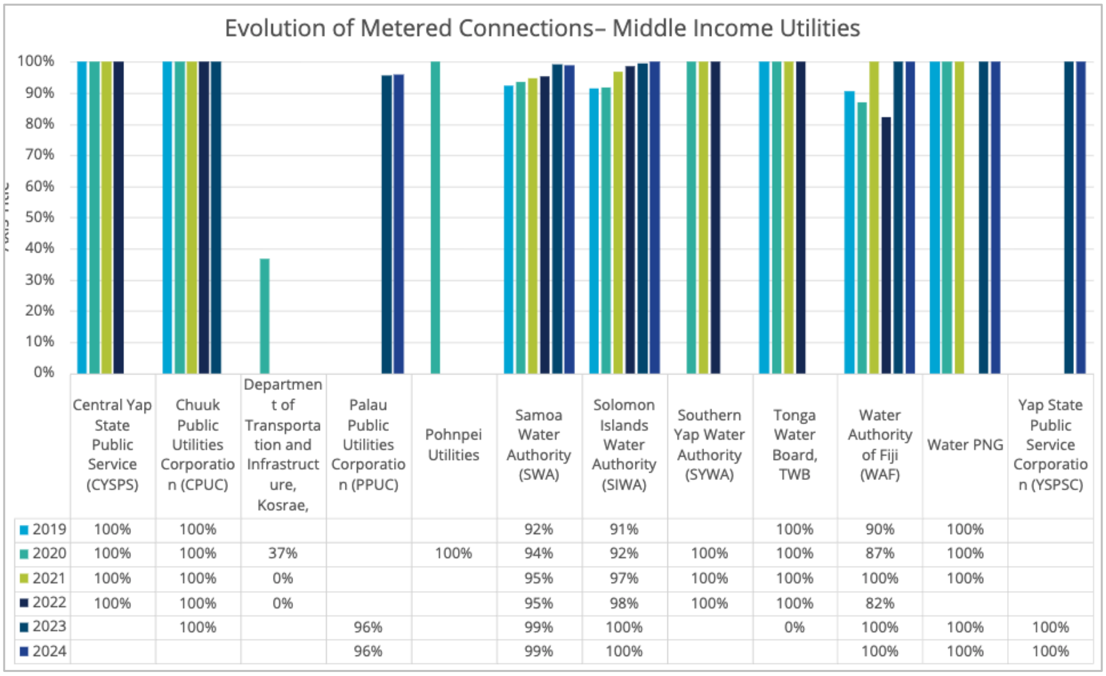


Figure 18: Evolution of metered connections – High-income utilities

MIDDLE-INCOME UTILITIES

Many utilities report near-universal metering across multiple years, while others show gradual improvement (for example, SWA and SIWA) or isolated variability (for example, WAF).

Where metering coverage shifts materially between years, this should be treated as a prompt to confirm whether the metric reflects “installed”, “active”, or “regularly read” meters and whether the connection denominator has changed.



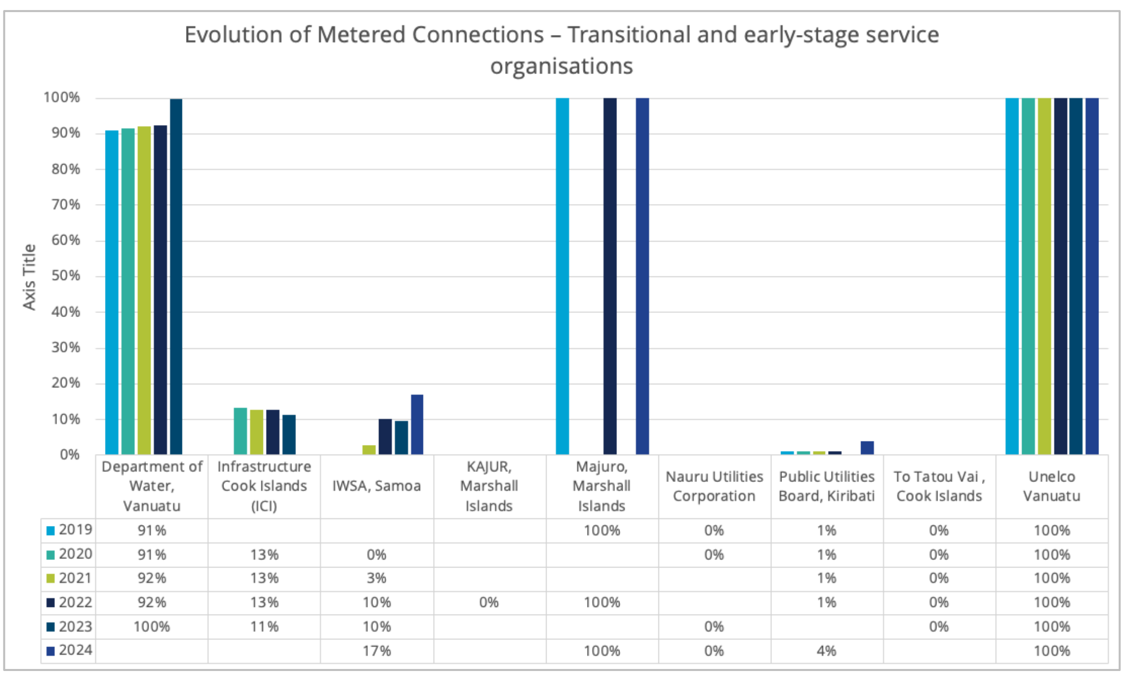
	Central Yap State Public Service (CYSPS)	Chuuk Public Utilities Corporation (CPUC)	Department of Transportation and Infrastructure, Kosrae,	Palau Public Utilities Corporation (PPUC)	Pohnpei Utilities	Samoa Water Authority (SWA)	Solomon Islands Water Authority (SIWA)	Southern Yap Water Authority (SYWA)	Tonga Water Board, TWB	Water Authority of Fiji (WAF)	Water PNG	Yap State Public Service Corporation (YSPSC)
2019	100%	100%				92%	91%		100%	90%	100%	
2020	100%	100%	37%		100%	94%	92%	100%	100%	87%	100%	
2021	100%	100%	0%			95%	97%	100%	100%	100%	100%	
2022	100%	100%	0%			95%	98%	100%	100%	82%		
2023		100%		96%		99%	100%		0%	100%	100%	100%
2024				96%		99%	100%			100%	100%	100%

Figure 19: Evolution of metered connections – Middle-income utilities

TRANSITIONAL AND EARLY-STAGE PROVIDERS

Several entities consistently report persistently low metering coverage (notably PUB Kiribati, ICI Cook Islands, and IWSA Samoa).

In these contexts, metering is likely to remain a binding constraint on billing completeness and NRW diagnostics until supported through targeted investment and operational enablement. Values recorded as 0% in some years should be treated as a data-definition flag unless confirmed as a genuinely unmetered service model.



	Department of Water, Vanuatu	Infrastructure Cook Islands (ICI)	IWSA, Samoa	KAJUR, Marshall Islands	Majuro, Marshall Islands	Nauru Utilities Corporation	Public Utilities Board, Kiribati	To Tatou Vai , Cook Islands	Unelco Vanuatu
2019	91%				100%	0%	1%	0%	100%
2020	91%	13%	0%			0%	1%	0%	100%
2021	92%	13%	3%				1%	0%	100%
2022	92%	13%	10%	0%	100%		1%	0%	100%
2023	100%	11%	10%			0%		0%	100%
2024			17%		100%	0%	4%		100%

Figure 20: Evolution of metered connections – Transitional and early-stage providers

2.4.4 Practical implications

WHAT UTILITIES CAN DO

- Treat metering as a staged capability: prioritise high-consumption areas, commercial customers, and key pressure zones first; then expand household coverage.
- Pair meter rollout with "meter-to-cash" controls: customer database hygiene, meter reading QA, billing follow-up, and tamper/illegal connection management.
- Track not only meter presence, but also meter functionality and reading completeness (e.g., % of meters read each cycle; % functioning/within calibration).

WHAT GOVERNMENTS AND FUNDERS CAN DO

- Fund metering as part of integrated NRW and financial sustainability packages (CAPEX + embedded OPEX/PEX for maintenance, calibration, reading systems, and training).
- Require simple standard definitions and validation rules (e.g., "meter installed" vs "meter functional and regularly read"), and flag years where values move sharply without an explanatory note.

2.5 Drinking water quality

SDG linkage

SDG link: SDG 6.1.1 (safely managed drinking water services).

Type: Proxy (Medium) — compliance results indicate water safety performance where and when sampling occurs, but they require interpretation alongside monitoring coverage and service reliability to avoid over-confidence.

Drinking water quality monitoring provides a partial proxy for SDG 6.1.1. Results should be interpreted alongside monitoring coverage (how many samples are taken, where and how often) and service reliability (hours of supply and pressure stability), because low sampling intensity can under-detect issues and intermittent supply can increase contamination risk (for example, through intrusion during pressure cycling).

WHY IT MATTERS

Drinking water quality is a core dimension of water service performance because it determines whether delivered water is safe to drink and fit for hygiene.

In Pacific systems, risks can increase during high turbidity events, droughts and cyclones, and where intermittency and pressure transients create intrusion risk and undermine residual disinfection control. Water quality outcomes are also closely linked to O&M capacity (chemical supply, equipment uptime, operator capability, monitoring systems) and to network condition and leakage management.

This section presents a simple indicator from utility submissions: the share of reported drinking water samples passing in the reporting year. It should be interpreted as a reported monitoring outcome—not a complete measure of drinking water safety or full regulatory compliance. For transparency, the section reports the underlying sample counts alongside the percentage passing.

DATA NOTE

Drinking water quality is reported as the percentage of utility-reported drinking water samples passing in the reporting year:

- **Pass rate (%) = samples passing ÷ samples tested × 100**
  Results are utility-reported and not independently verified. Comparability is limited where sampling plans, parameters tested, sampling locations, laboratory/QAQC practices, or applicable standards differ. Low sample counts should be treated as a data-confidence flag.

2.5.1 Drinking water quality reporting coverage

YEAR SELECTION

Latest valid year per utility **(**2024 preferred; 2023 used where 2024 is not available or incomplete). A valid year requires samples tested (n) > 0 and samples passing (n) to be reported.

CALCULATION

Pass rate (%) = samples passing ÷ samples tested × 100 (rounded to nearest whole per cent).

Table 7: Drinking water quality reporting coverage and headline values (latest year available)

Country / Territory	Utility	Year	Service Population	Samples Tested (n)	Samples Passing (n)	Pass Rate (%)	Monitoring Confidence
Group 1 — High-Income Utilities (3 utilities)							
French Polynesia	Polynésienne des Eaux	2024	95,106	314	313	**100%**	OK
Guam	Guam Waterworks Authority (GWA)	2023	153,836	9,777	9,607	**98%**	OK
New Caledonia	Calédonienne des Eaux	2023	216,570	13,335	12,668	**95%**	OK
Group 2 — Middle-Income Utilities (6 utilities)							
American Samoa	American Samoa Power and Water Authority (ASPA)	2024	46,765	238	214	90%	OK
Cook Islands	To Tatou Vai, Cook Islands	2023	10,898	1,099	1,031	94%	OK
Fiji	Water Authority of Fiji (WAF)	2024	692,841	5,407	5,195	**96%**	OK
Nauru	Nauru Utilities Corporation (NUC)	2024	11,947	365	365	**100%**	OK
Palau	Palau Public Utilities Corporation (PPUC)	2024	17,522	843	484	**57%**	OK
Vanuatu	Unelco Vanuatu Limited (UNELCO)	2024	54,622	903	903	**100%**	OK
Group 3 — Transitional and Early-Stage Service Organisations (10 utilities)							
Federated States of Micronesia	Chuuk Public Utilities Corporation (CPU)	2023	13,856	125	125	**100%**	OK
Federated States of Micronesia	Yap State Public Service Corporation (YSPSC)	2024	4,078	48	48	**100%**	OK
Kiribati	Public Utilities Board (PUB)	2024	41,736	365	365	**100%**	OK
Marshall Islands	Majuro Water and Sewer Company (MWSC)	2024	25,000	200	60	**30%**	OK
Papua New Guinea	Water PNG Limited	2024	859,654	1,717	1,706	**99%**	OK
Samoa	Independent Water Schemes Association (IWSA)	2024	23,866	220	176	80%	OK
Samoa	Samoa Water Authority (SWA)	2024	190,195	2,421	2,421	**100%**	OK
Solomon Islands	Solomon Islands Water Authority (SIWA)	2024	108,563	34,222	30,446	89%	OK
Tonga	Tonga Water Board (TWB)	2023	21,185	144	141	**98%**	OK

Country / Territory	Utility	Year	Service Population	Samples Tested (n)	Samples Passing (n)	Pass Rate (%)	Monitoring Confidence
Vanuatu	Department of Water Resources, Vanuatu	2023	15,635	9	7	78%	*Low — n<12; interpret with caution*

Note: Pass rate colour scale: ≥95% (green) **|** 85–94% (yellow) **|** 70–84% (orange) **|** <70% (red)

HOW TO READ TABLE 7

- Use pass rate (%) as an outcome signal, but interpret it alongside samples tested (n) as a confidence check.
- Treat very low sampling volumes as a prompt to strengthen monitoring, not as evidence of high performance.
- Lower pass rates should trigger follow-up on which parameters are failing (e.g., microbial, turbidity-related, or operational control) and whether the sampling plan is representative of customer exposure.

CALCULATION AND DATA HANDLING NOTES

- Year selection**:** most recent year with wat_samples > 0 and wat_samples_pass reported (2024 preferred; otherwise 2023).
- Pass rate (%)**:** wat_samples_pass ÷ wat_samples × 100, rounded to nearest whole per cent.
- Monitoring confidence flag**:** "Low" where samples tested < 12 (Department of Water Resources, Vanuatu — n=9).
- Data-quality checks**:** no cases of wat_samples_pass > wat_samples detected.
- Excluded**:** Infrastructure Cook Islands (ICI) — no drinking water quality data submitted.

NOTABLE YEAR-ON-YEAR CHANGES

Three utilities show notable changes between 2023 and 2024. The 2024 figures are used in Table 7 per the latest-year rule. These changes should be confirmed with the submitting utility to determine whether they reflect a reporting scope change, revised sampling plan, or a genuine change in performance.

Country	Utility	2023 tested	2023 pass	2023 rate	2024 tested	2024 pass	Note
Papua New Guinea	Water PNG Limited	47,308	47,308	100%	1,717	1,706	Samples tested dropped 97% (47,308→1,717). Pass rate stable (~100%). 2024 used per latest-year rule; volume drop likely reflects a reporting scope change rather than reduced compliance. Verify.
Palau	Palau Public Utilities Corporation (PPUC)	1,463	1,011	69%	843	484	Pass rate fell from 69% to 57% and sample count dropped 42%. Both the volume decline and pass rate drop warrant verification with the utility.
Samoa	IWSA, Samoa	66	66	100%	220	176	Sample count increased (66→220) and pass rate fell to 80%. May reflect expanded monitoring coverage. Informational only.

INTERPRETATION NOTE

Pass rate measures the share of routine compliance samples that met applicable drinking water quality standards in the reporting year.

High pass rates (≥95%) indicate strong reported compliance under each utility's monitoring framework. Lower rates—such as Majuro (30%)**,** Palau (57%), and IWSA Samoa (80%)—should trigger an investigation into which parameters are failing and whether the monitoring programme is representative.

Results based on very small sample counts (n<12) are statistically unreliable and should be treated primarily as a monitoring-coverage flag.

2.5.2 Drinking water quality (latest data available) — utility results

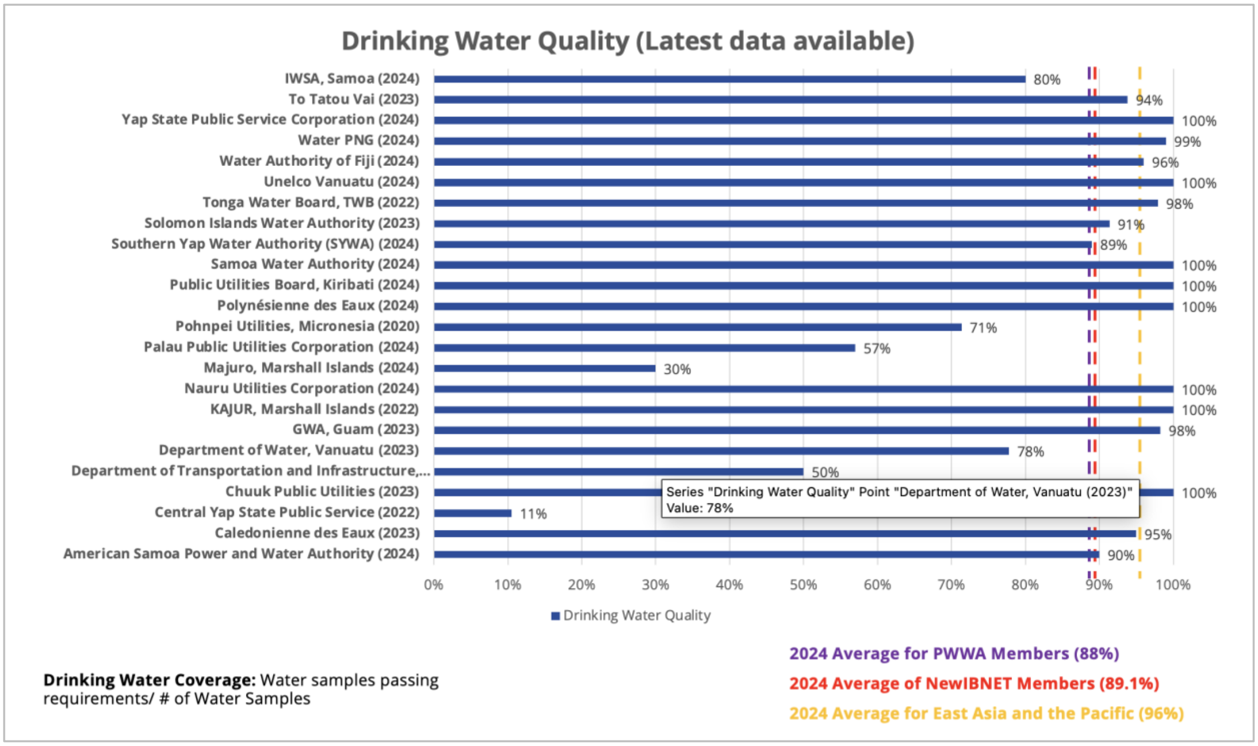


Figure 21: Drinking water quality (latest data available)

Figure 21 presents the reported share of drinking water samples passing for the latest year available by utility.

Most utilities report high pass rates (typically 95–100%), while a smaller subset report materially lower pass rates, including:

- Majuro (MWSC): 30%
- Palau (PPUC): 57%
- IWSA Samoa: 80%
- Department of Water Resources, Vanuatu: 78% *(low sample count, n=9)*
- SIWA Solomon Islands: 89% *(very large sample volume; likely reflects broad monitoring coverage)*

These lower pass rates should be treated as priority follow-up signals to confirm the dominant failing parameters (microbial, turbidity-related, or operational control) and whether the sampling programme is representative of customer exposure.

BENCHMARK REFERENCES

- 2024 average for PWWA members: 83%
- 2024 average for NewIBNET members: 99.1%
- 2024 average for East Asia & Pacific: 96%

The lower PWWA average relative to comparators may reflect a combination of genuine operational challenges in climate-exposed systems and differences in monitoring intensity, parameter suites, and reporting practices. Interpretation should be paired with the sample counts shown in Table 7.

FIGURE DATA NOTE

Drinking water quality is shown as the percentage of reported drinking water samples passing in the latest year available for each utility. Results are utility-reported and not independently verified; low sample counts should be treated as a data-confidence flag.

WHY IT MATTERS

Drinking water quality is directly linked to public health outcomes, customer trust, and the affordability of safe water.

Where quality control is weak or monitoring is limited, households and institutions may rely on coping mechanisms (boiling, storage, purchased water), increasing costs and reducing the health and productivity benefits of utility services.

Quality performance is also a proxy for operational control maturity, including disinfection management, treatment barrier reliability, network integrity, and post-disruption response practices.

2.5.3 Practical implications

WHAT UTILITIES CAN DO

- **Strengthen core operational controls:** residual disinfection management, turbidity control, and consistent post-repair flushing/chlorination SOPs in higher-risk zones.
- **Make monitoring "investable":** document a simple sampling plan (locations, minimum frequency, parameter set) and report it consistently year-to-year.
- **Use failures as action triggers:** ensure exceedances lead to corrective actions (investigation, targeted maintenance, operational changes), not only reporting.
- **Link quality to reliability work:** intermittent zones, pressure transients and high NRW areas are often priority zones for intrusion risk management.

WHAT GOVERNMENTS AND FUNDERS CAN DO

- Treat low-reported pass rates (or very low monitoring volumes) as a service risk flag requiring paired responses: targeted CAPEX (treatment barriers, storage, network integrity) plus embedded OPEX/PECS (chemicals, spares, operator training, monitoring systems).
- Support standardised reporting definitions (what counts as a "sample", minimum parameter suite, minimum sampling thresholds) to improve comparability and credibility.
- Fund monitoring systems as part of reliability and NRW packages (not as a stand-alone compliance activity), recognising the strong link between operational capability and water quality outcomes.

PART 3

RESULTS: WASTEWATER SERVICE PERFORMANCE

WHY WASTEWATER SERVICE PERFORMANCE MATTERS

Wastewater services are fundamental to public health protection and environmental integrity. In Pacific Island contexts, they are also closely linked to service reliability and climate resilience: limited sewerage coverage, weak collection systems, and insufficient or intermittent treatment can increase disease risk, contaminate coastal waters and groundwater, and undermine tourism, fisheries and liveability.

Given the Pacific's high dependence on coastal livelihoods and tourism, wastewater reliability and safe disposal are also **"**blue economy" enablers—helping protect the environmental conditions that support jobs, revenues and community wellbeing.

This part presents wastewater performance using a focused set of benchmarking indicators that provide a practical line of sight from coverage to sustainability:

1. **Wastewater service coverage** — the share of people within declared wastewater service areas who are served by reticulated sewerage.
2. **Wastewater collected and treated** — reported collection and treatment volumes, and the implied share treated as a proxy for environmental performance.
3. **Sewer network performance** — blockages (and blockage rates) as an operational signal of system condition, customer impacts and O&M effectiveness.
4. **Sustainability context** — the financial and enabling conditions that influence whether services can be reliably operated and maintained over time (reported in Part 4: Financial Sustainability, referenced here).

HOW TO INTERPRET THE RESULTS

Wastewater benchmarking requires careful interpretation because service models and mandates differ across utilities. In many Pacific settings, reticulated sewerage covers only urban cores, while sanitation outside those areas relies predominantly on on-site systems (e.g., septic tanks and pit latrines) that are often outside utility reporting.

As a result, low reticulated wastewater coverage does not necessarily imply low sanitation access overall, but it does signal greater reliance on on-site systems and the importance of faecal sludge management and safe disposal pathways.

Several indicators in this part are also sensitive to definitions and monitoring/recording practices. Reported wastewater volumes can be influenced by infiltration/inflow, industrial loads and the metering or estimation approach used.

"Treated" may represent different treatment levels (primary/secondary/tertiary) where standards are not consistently specified. Blockage counts may reflect different incident definitions (confirmed blockages versus any attendance). For these reasons, the analysis highlights data completeness and verification flags where they affect interpretation and prioritisation.

CONTINUITY NOTE

In the previous benchmarking cycle, wastewater data were available for 17 utilities across 13 countries/territories, serving about 1.15 million people, with approximately 2,960 km of sewer network and ~125,000 sewer connections.

Nearly 99% of collected wastewater was treated (about 86 million m^3/year), and reported annual wastewater turnover was around US$79 million (FY2022). This is provided as contextual reference only; current-year coverage depends on the utilities and fields reported in this dataset.

3.1 Wastewater service coverage (population and connections)

SDG linkage

SDG link: SDG 6.2.1 (safely managed sanitation) and contextual relevance to SDG 6.3.1 (wastewater safely treated), as an input for interpreting who is reached by reticulated services.

Type: Input (Medium) — sewerage coverage within the declared wastewater service area indicates reach of formal collection systems, but does not confirm safely managed sanitation (which may also include on-site systems and safe excreta management beyond the utility boundary).

Reticulated wastewater coverage is a utility-level input that helps interpret progress towards SDG 6.2.1 and provides important context for SDG 6.3.1 (by indicating the population potentially connected to formal collection systems). Coverage alone does not confirm "safely managed" sanitation outcomes or safe treatment, but it indicates the share of people within the declared wastewater service area who are reached by sewerage services and therefore may be connected to formal collection and treatment pathways.

DEFINITION

In this report, wastewater coverage refers to the share of people living within the declared wastewater (sewerage) service area who are served by the reticulated wastewater network, expressed as a percentage:

- ⇨ Wastewater coverage (%) = waste_service_pop ÷ waste_service_area_pop × 100

WHAT TO LOOK FOR

- Utilities with established sewer networks and dense service areas often report higher reticulated coverage. In many lower- and middle-income settings, reticulated coverage is lower because sanitation is predominantly delivered through on-site systems and/or arrangements outside the utility's wastewater mandate.
- Low reticulated wastewater coverage does not necessarily indicate low sanitation access overall. It does, however, imply greater reliance on on-site sanitation and therefore increases the importance of faecal sludge management and safe disposal pathways (often outside utility reporting).

3.1.1 Wastewater service population and coverage

Table 8 summarises wastewater service area populations, populations served, and implied sanitation (sewerage) coverage for each utility using the latest available year where both wastewater population fields are reported.

Figures 22–24 provide complementary visual context:

- Figure 22 provides latest-year snapshot of sanitation (sewerage) coverage across utilities (consistent with Table 7 latest-year selection).
- Figure 23 compares the water service area population and the wastewater service area population; a larger gap typically indicates that sewerage is limited to urban cores, and sanitation outside those areas is predominantly served by on-site systems.
- Figure 24 shows the evolution of reported sanitation coverage over 2019–2024 (where available), helping distinguish stable reporting patterns from step changes that may reflect revised service boundaries, definitions, or data issues.

Table 8: Wastewater service population and coverage (latest available year)

Country / Territory	Utility	Year	Water Service Area Population	WW Service Area Population	WW Service Population	Sanitation Coverage (%)	Income Group
	Group 1 — High-Income Utilities (3 utilities)						
French Polynesia	Polynésienne des Eaux	2024	33,100	24,500	24,500	**100.0%**	High income
Guam	Guam Waterworks Authority (GWA)	2023	153,836	153,836	153,836	**100.0%**	High income
New Caledonia	Calédonienne des Eaux	2023	216,200	183,804	129,685	70.6%	High income
	Group 2 — Middle-Income Utilities (4 utilities)						
American Samoa	American Samoa Power and Water Authority (ASPA)	2024	343,800	41,260	22,736	55.1%	Upper middle income
Fiji	Water Authority of Fiji (WAF)	2024	864,132	864,132	477,500	55.3%	Upper middle income
Nauru	Nauru Utilities Corporation (NUC)	2024	11,947	11,947	11,947	**100.0%**	Upper middle income
Palau	Palau Public Utilities Corporation (PPUC)	2024	17,700	14,000	14,000	**100.0%**	Upper middle income
	Group 3 — Transitional and Early-Stage Service Organisations (6 utilities)						
Federated States of Micronesia	Chuuk Public Utilities Corporation (CPU)	2023	17,800	13,000	10,000	76.9%	Lower middle income
Federated States of Micronesia	Yap State Public Service Corporation (YSPSC)	2024	11,600	11,597	581	**5.0%**	Lower middle income
Marshall Islands	Majuro Water and Sewer Company (MWSC)	2024	37,500	15,000	15,000	**100.0%**	Lower middle income
Papua New Guinea	Water PNG Limited	2024	4,200,000	1,887,701	172,085	**9.1%**	Lower middle income
Samoa	Samoa Water Authority (SWA)	2024	3,300	3,230	2,288	70.8%	Lower middle income

Country / Territory	Utility	Year	Water Service Area Population	WW Service Area Population	WW Service Population	Sanitation Coverage (%)	Income Group
Solomon Islands	Solomon Islands Water Authority (SIWA)	2024	104,200	100,010	3,849	**3.8%**	Lower middle income

Notes:

Latest available year per utility where both wastewater population fields are reported.
Coverage = wastewater service population ÷ wastewater service area population (reticulated wastewater coverage).
Income Group reflects World Bank FY2025 classifications (see Data Notes).
Coverage colour scale: ≥95% (High) | 70–94% (Good) | 40–69% (Partial) | <40% (Low)

DATA NOTES

- Utilities included: 13 of 20 utilities with both waste_service_area_pop and waste_service_pop reported in at least one year.
- Utilities excluded: 7 utilities had no wastewater population data in any submitted year.
- Logical checks: no coverage values above 100% were detected; no cases were found where waste_service_pop exceeded waste_service_area_pop; and no duplicate country, utility and year records were identified.
- Water–wastewater comparison: the added water service area population column provides important context for interpreting wastewater coverage. In many cases, wastewater service areas are much smaller than water service areas, meaning high wastewater coverage within the declared sewerage service area should not be interpreted as broad sanitation coverage across the full utility service area.
- Data source and interpretation: water service area population values should be validated against utility-reported water service population/service area data where available. Where values are derived or aligned from Figure 23, they should be treated as indicative and used for comparative interpretation only.

EXCLUDED UTILITIES (NO WASTEWATER POPULATION DATA)

The following 7 utilities had no wastewater population data in any submitted year:

- Cook Islands — Infrastructure Cook Islands (ICI)
- Cook Islands — To Tatou Vai, Cook Islands
- Kiribati — Public Utilities Board (PUB)
- Samoa — Independent Water Schemes Association (IWSA)
- Tonga — Tonga Water Board (TWB)
- Vanuatu — Department of Water Resources, Vanuatu
- Vanuatu — Unelco Vanuatu Limited (UNELCO)

NOTABLE YEAR-ON-YEAR CHANGES

Three utilities show large shifts between 2023 and 2024. As Table 8 applies the latest-year rule, the 2024 figures are used.

These values should be confirmed with the submitting utility to determine whether they reflect revised boundaries/definitions or data issues.

Country	Utility	2023 Area Pop	2023 Serv Pop	2023 Cov.	2024 Area Pop	2024 Serv Pop	2024 Cov.	Note
FSM	YSPSC	11,377	8,885	78.1%	11,597	581	5.0%	Large decline in service population — verify
PNG	Water PNG	3,129,844	500,775	16.0%	1,887,701	172,085	9.1%	Service area and population both declined sharply — verify
Fiji	WAF	330,000	185,000	56.1%	864,132	477,500	55.3%	Large increase in service area — verify scope change

INTERPRETATION NOTE

Sanitation coverage in Table 8 reflects utility-reported reticulated wastewater service populations relative to declared wastewater service areas.

It measures sewerage coverage only and is not equivalent to national sanitation access rates, which include on-site sanitation systems (septic tanks, pit latrines).

Low coverage values for large utilities are typical where sewerage is limited to urban cores and peri-urban areas. The water–wastewater service area gap (Figure 23) provides additional context for these patterns.

SANITATION (SEWERAGE) COVERAGE

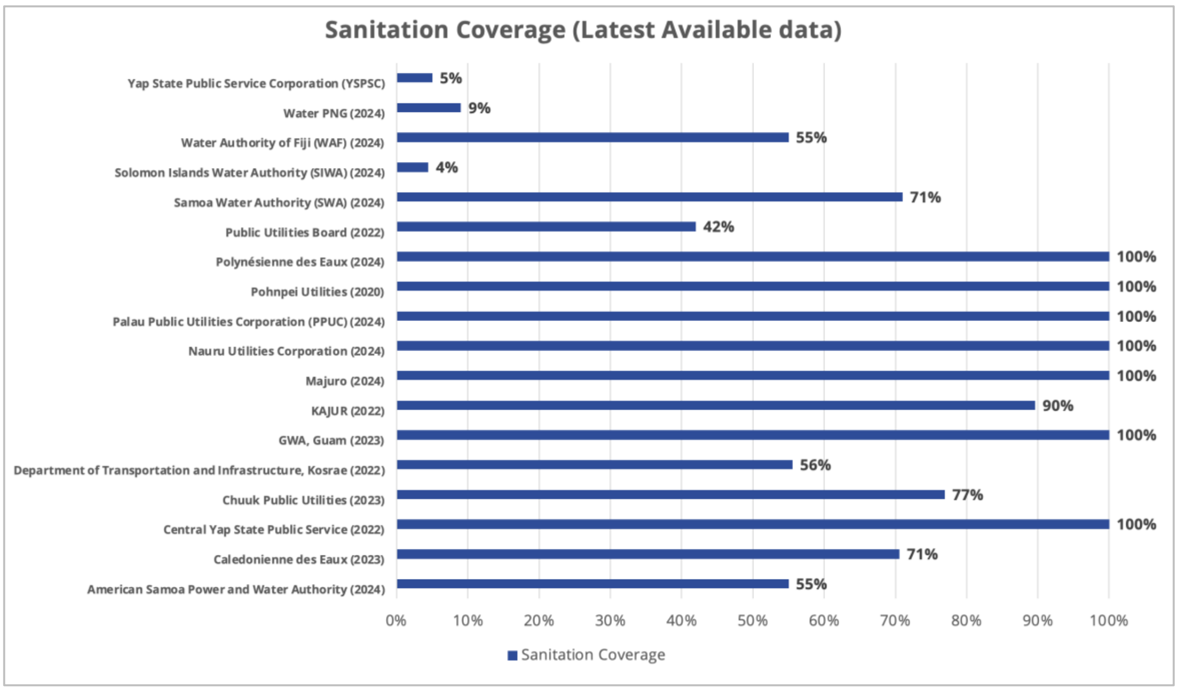


Figure 22: Sanitation (sewerage) coverage (%) – latest available year

Sanitation coverage by utility using the latest year with reported wastewater service area and wastewater service population fields (consistent with Table 8).

GAP BETWEEN POPULATION IN WATER SERVICE AREA AND WASTEWATER SERVICE AREA

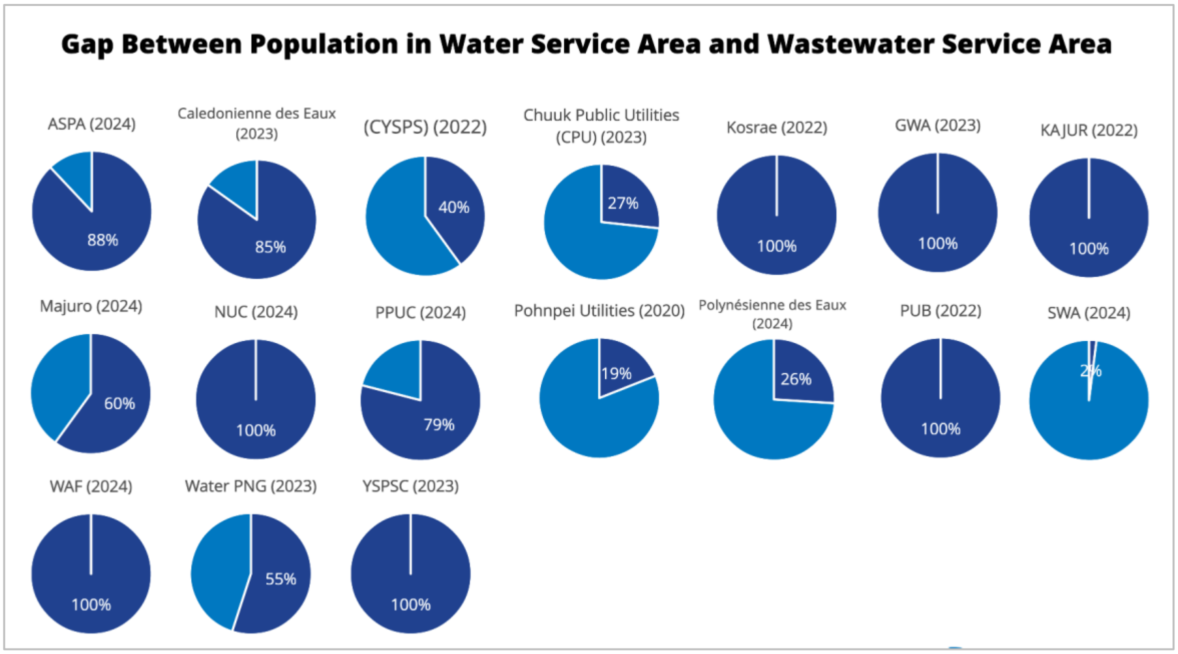
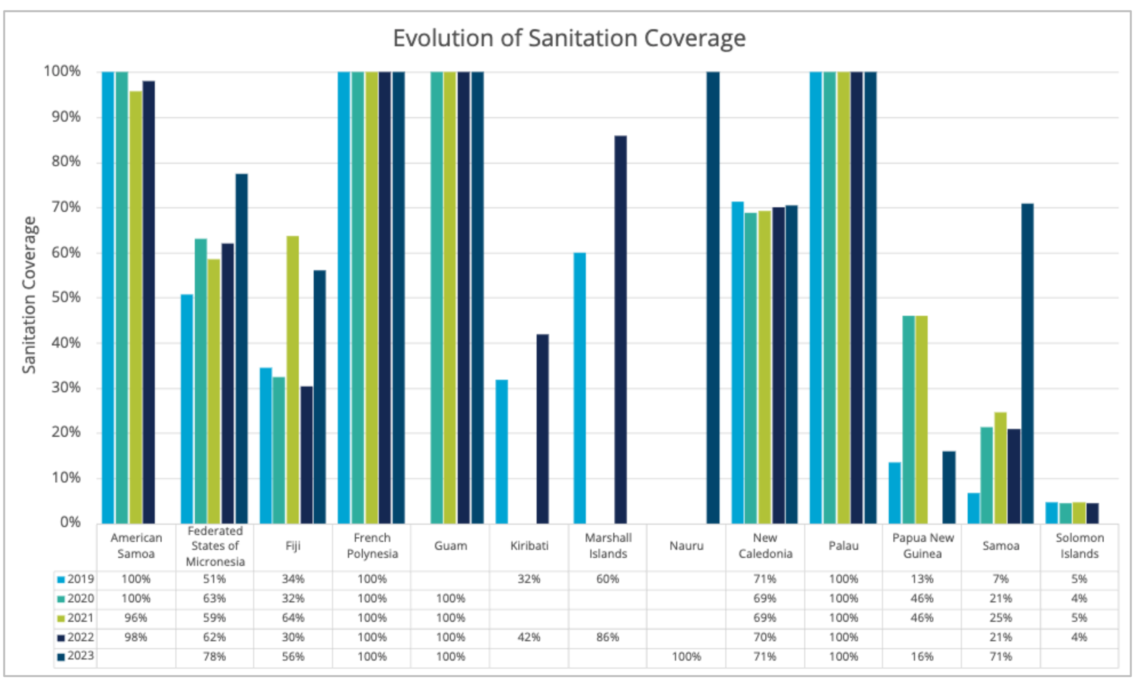


Figure 23: Gap between population in water service area and wastewater service area (latest available year)

Comparison of utility-reported water service area population and wastewater service area population. A larger gap indicates wastewater services are provided to a smaller share of the overall water service area, typically reflecting sewerage limited to urban cores and reliance on on-site sanitation elsewhere.

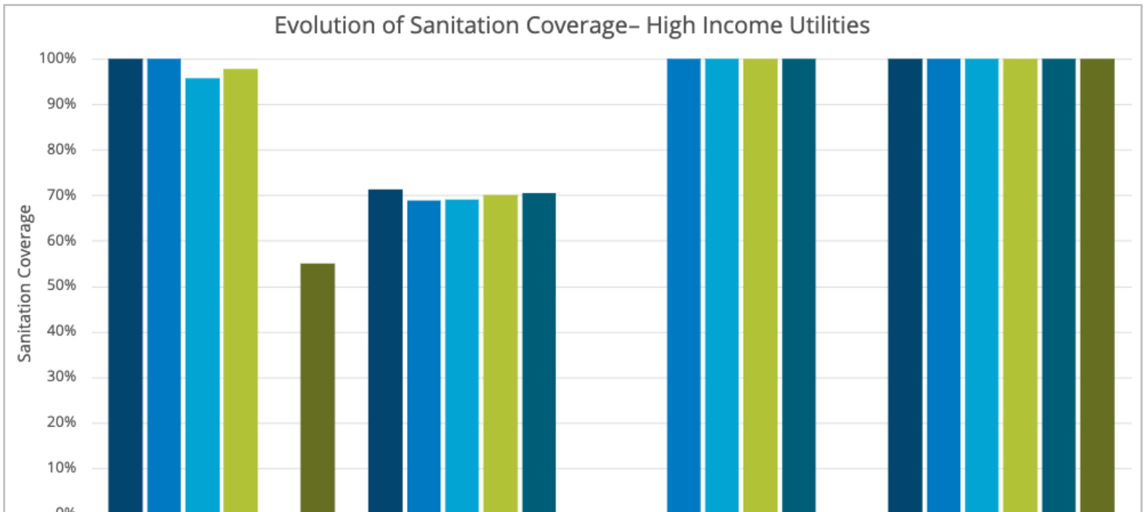
EVOLUTION OF SANITATION (SEWERAGE) COVERAGE



	American Samoa	Federated States of Micronesia	Fiji	French Polynesia	Guam	Kiribati	Marshall Islands	Nauru	New Caledonia	Palau	Papua New Guinea	Samoa	Solomon Islands
2019	100%	51%	34%	100%		32%	60%		71%	100%	13%	7%	5%
2020	100%	63%	32%	100%	100%				69%	100%	46%	21%	4%
2021	96%	59%	64%	100%	100%				69%	100%	46%	25%	5%
2022	98%	62%	30%	100%	100%	42%	86%		70%	100%		21%	4%
2023		78%	56%	100%	100%			100%	71%	100%	16%	71%	

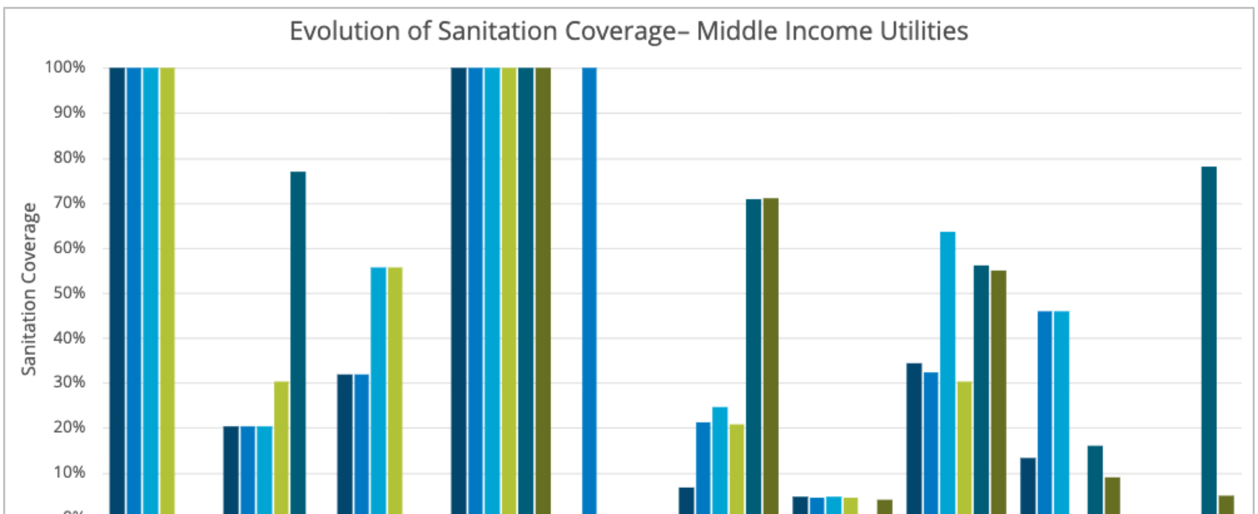
Figure 24: Evolution of sanitation (sewerage) coverage (2019–2024 where available)

Sanitation coverage by utility over time, where data are available. The time series helps interpret whether changes reflect gradual expansion or step changes likely driven by boundary/definition updates.



	American Samoa Power and Water Authority, ASPA	Caledonienne des Eaux	GWA, Guam	Polynésienne des Eaux
2019	100%	71%		100%
2020	100%	69%	100%	100%
2021	96%	69%	100%	100%
2022	98%	70%	100%	100%
2023		71%	100%	100%
2024	55%			100%

***Figure 25**: Evolution of sanitation coverage – High-income utilities*



	Central Yap State Public Service (CYSPS), Micronesia	Chuuk Public Utilities (CPU), Micronesia	Department of Transportation and Infrastructure, Kosrae, Micronesia	Palau Public Utilities Corporation (PPUC), Palau	Pohnpei Utilities, Micronesia	Samoa Water Authority (SWA)	Solomon Islands Water Authority (SIWA)	Water Authority of Fiji (WAF)	Water PNG	Yap State Public Service Corporation (YSPSC)
2019	100%	20%	32%	100%		7%	5%	34%	13%	
2020	100%	20%	32%	100%	100%	21%	4%	32%	46%	
2021	100%	20%	56%	100%		25%	5%	64%	46%	
2022	100%	30%	56%	100%		21%	4%	30%		
2023		77%		100%		71%		56%	16%	78%
2024				100%		71%	4%	55%	9%	5%

Figure 26: Evolution of sanitation coverage – Middle-income utilities

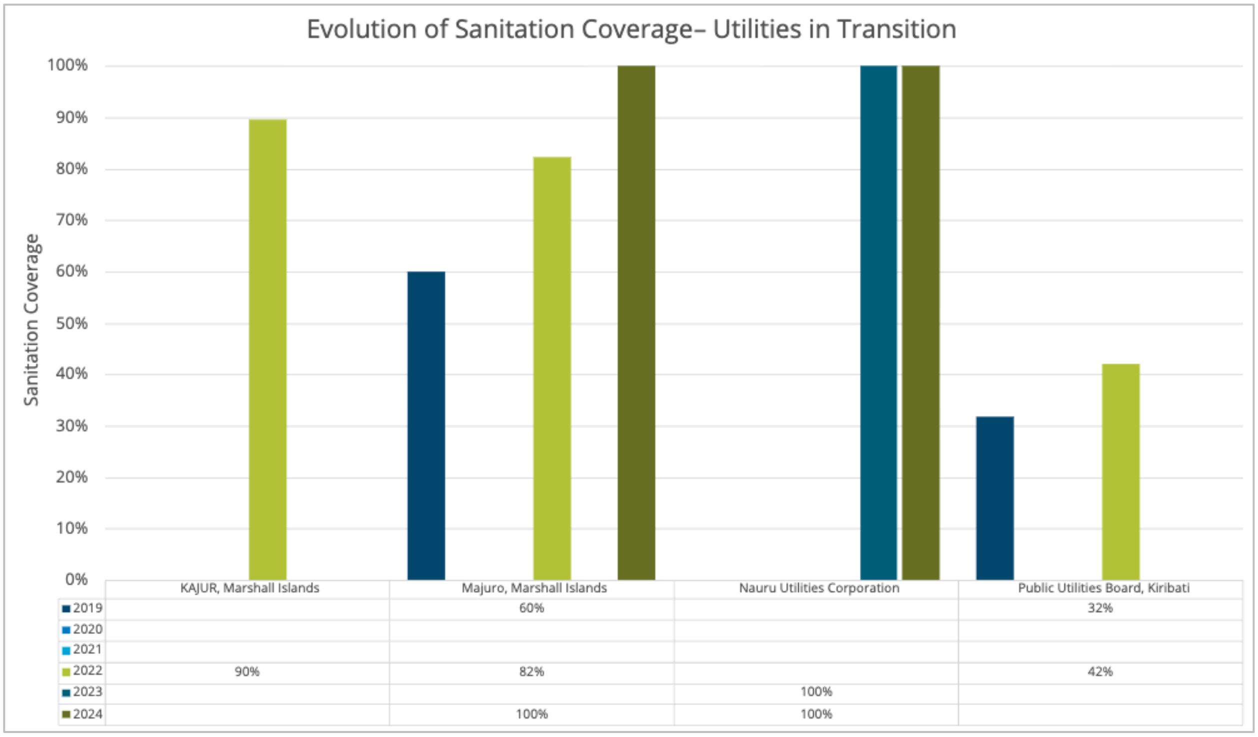


Figure 27: Evolution of sanitation coverage – utilities in transition

3.2 Wastewater collected and treated (service outcome proxy)

SDG linkage

SDG link: SDG 6.3.1 (proportion of wastewater safely treated).

Type: Proxy (Medium) — treated share signals whether treatment is occurring for collected volumes, but does not confirm “safely treated” without information on treatment standard, performance monitoring and compliance.

The share of collected wastewater reported as treated provides a practical proxy for SDG 6.3.1. This indicator reflects whether treatment is occurring for the collected volume, but it does not confirm treatment standard, treatment performance or compliance unless standards and monitoring results are reported.

DEFINITION

Where volumetric data are available, this report uses the share of collected wastewater reported as treated as a proxy indicator for environmental performance:

- ⇨ Wastewater collected and treated (%) = waste_treat_vol ÷ waste_collect_vol × 100

Figure 28 shows the evolution of this indicator over 2019–2024 (where available), while Table 9 applies the latest-available-year rule for summary reporting.

INTERPRETATION CAUTIONS

- Collected volumes may be influenced by infiltration/inflow, stormwater ingress, industrial loads, and the estimation or metering approach used.
- “Treated” may include different treatment standards (primary vs secondary vs tertiary). Where treatment level is not reported, interpretation should be limited to whether treatment is occurring and whether reporting is consistent.
- In some systems, reported treated volumes may exceed collected network volumes where septage or wastewater from individual on-site systems is transported by truck to the wastewater treatment plant. Where this occurs, the treated share should be interpreted carefully and the source of non-networked inflows should be documented.

LATEST AVAILABLE YEAR PER UTILITY WHERE AT LEAST ONE VOLUME FIELD IS REPORTED

Volumes are presented in m^3/year after conversion. Per-capita metrics use wastewater service population (not total service area population).

Table 9: Wastewater collected and treated (latest available year)

Country	Utility	Year	WW service population	WW collected (m^3/yr)	WW treated (m^3/yr)	Collected & treated (%)	Collected (L/p/day)	Treated (L/p/day)	Notes
Group 1 — High-income utilities									
French Polynesia	Polynésienne des Eaux	2024	24,500	2,714,857	2,651,698	97.7%	304	297	
Guam	Guam Waterworks Authority (GWA)	2023	153,836	—	45,425	—	—	1	Collected not reported; treated only
New Caledonia	Calédonienne des Eaux	2023	129,685	9,648,810	9,648,810	100.0%	204	204	
Group 2 — Middle-income utilities									
Fiji	Water Authority of Fiji (WAF)	2023	185,000	22,408,650	19,772,015	88.2%	332	293	2023 used — 2024 data anomalous (unit likely ML entered as m^3)
Nauru	Nauru Utilities Corporation (NUC)	2024	11,947	609,550	609,550	100.0%	140	140	Raw value treated as m^3/day; annualised ×365
Palau	Palau Public Utilities Corporation (PPUC)	2024	14,000	1,368,000	1,368,000	100.0%	268	268	Converted from US gallons
Samoa	Samoa Water Authority (SWA)	2024	2,288	198,209	198,209	100.0%	237	237	
Group 3 — Transitional and early-stage service organisations									
Federated States of Micronesia	Chuuk Public Utilities Corporation (CPU)	2023	10,000	75,708	45,425	60.0%	21	12	
Federated States of Micronesia	Yap State Public Service Corporation (YSPSC)	2024	581	119,662	119,662	100.0%	564	564	Converted from US gallons; pop=581 (verify)
Marshall Islands	Majuro Water and Sewer Company (MWSC)	2024	15,000	13,817	0	0.0%	3	—	Treated = 0: no treatment reported; collection via septic/lagoon system
Papua New Guinea	Water PNG Limited	2024	172,085	26,583,576	26,357,149	99.1%	423	420	
Solomon Islands	Solomon Islands Water Authority (SIWA)	2024	3,849	522,708	0	0.0%	372	—	Treated = 0: no treatment reported

NOTE

Collected & treated (%) colour scale: ≥95% (green) **|** 75–94% (yellow) **|** 50–74% (orange) **|** <50% or 0% (red)

DATA NOTES

- Utilities included: 12 of 20 (utilities with at least one wastewater volume field reported).
- Utilities excluded: 8 utilities had no wastewater volume data in any submitted year (listed below).
- Unit harmonisation: volumes are presented as m^3/year. Where the source did not specify a time basis, assumptions were required and are flagged for verification.
- Conversions: US gallons converted at 1 gal = 0.003785411784 m^3 (where applicable).
- Key verification flags:
    - WAF (Fiji): 2024 values appear inconsistent with the 2023 series and peer magnitudes; 2023 is used pending confirmation of 2024 units/time basis.
    - NUC (Nauru): annualisation is an assumption based on plausibility checks; confirm reported basis with the utility.
    - GWA (Guam): treated only reported; treated per-capita appears unusually low; verify units and reporting scope.
    - MWSC (Majuro) and SIWA: treated volume reported as zero; confirm whether this reflects absence of treatment or a reporting boundary/definition issue.
    - YSPSC (FSM): very low service population reported in 2024; confirm population figure/scope.

EXCLUDED UTILITIES (NO WASTEWATER VOLUME DATA)

The following 8 utilities had no wastewater volume data in any submitted year and are excluded from Table 9:

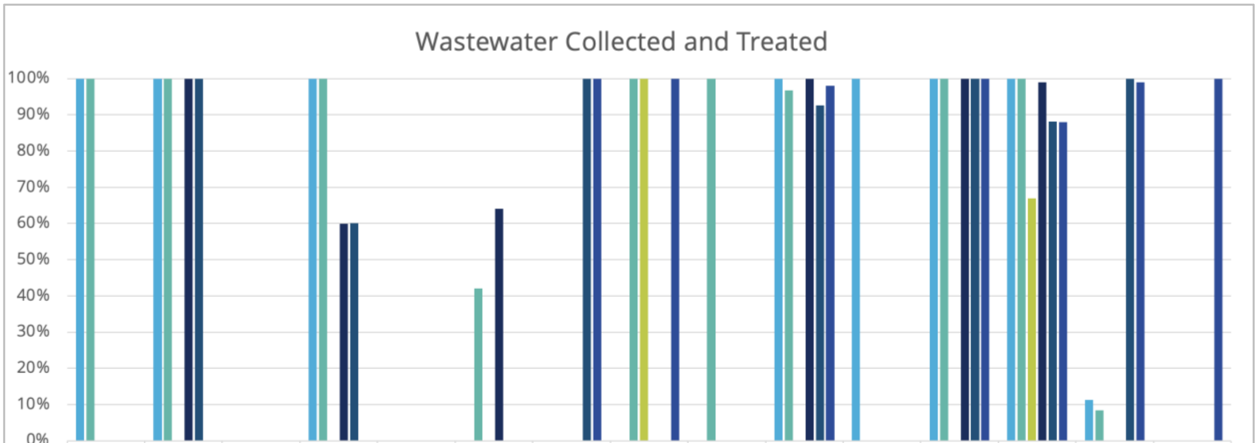
- American Samoa — ASPA (service population reported but no volume fields)
- Cook Islands — Infrastructure Cook Islands (ICI)
- Cook Islands — To Tatou Vai, Cook Islands
- Kiribati — Public Utilities Board (PUB)
- Samoa — Independent Water Schemes Association (IWSA)
- Tonga — Tonga Water Board (TWB)
- Vanuatu — Department of Water Resources, Vanuatu
- Vanuatu — Unelco Vanuatu Limited (UNELCO)

INTERPRETATION NOTE (COLLECTED AND TREATED)

"Collected and treated (%)" measures the share of collected wastewater reported as undergoing treatment prior to disposal. A value of 100% does not imply advanced treatment; it may reflect any treatment level.

Values of 0% indicate that no treated volume was reported for the year and should be confirmed with the utility before interpreting as "no treatment".

Per-capita values (L/p/day) provide a plausibility cross-check and may be elevated where infiltration/inflow is significant.



	American Samoa Power and Water Authority, ASPA	Caledonienne des Eaux	Central Yap State Public Service (CYSPS), Micronesia	Chuuk Public Utilities (CPU), Micronesia	Department of Transportation and Infrastructure, Kosrae, Micronesia	GWA, Guam	Nauru Utilities Corporation	Palau Public Utilities Corporation (PPUC), Palau	Pohnpei Utilities, Micronesia	Polynésienne des Eaux	Public Utilities Board, Kiribati	Samoa Water Authority (SWA)	Water Authority of Fiji (WAF)	Water PNG	Yap State Public Service Corporation (YSPSC)
2019	100%	100%	0%	100%	0%					100%	100%	100%	100%	11%	
2020	100%	100%	0%	100%	0%	42%		100%	100%	97%		100%	100%	8%	
2021	0%	0%	0%	0%	0%	0%		100%		0%		0%	67%	0%	
2022	0%	100%	0%	60%	0%	64%				100%	0%	100%	99%		
2023		100%		60%			100%			93%		100%	88%	100%	
2024							100%	100%		98%		100%	88%	99%	100%

Figure 28: Wastewater collected and treated (%), 2019–2024 (where available)

Share of collected wastewater reported as treated by utility over time. Where collected volume is missing, the treated share cannot be calculated.

3.3 Sewer network performance (blockages as an O&M signal)

SDG linkage

SDG link: Indirectly supports SDGs 6.2.1 and 6.3.1 by identifying the operational conditions needed to sustain sanitation services and reduce environmental risks.

Type: Context (Limited) — blockages are not an SDG indicator but are a decision-relevant O&M signal linked to service disruptions, spill risk and rising maintenance burden.

Sewer blockages are not a direct SDG indicator, but they are a decision-relevant operational signal that influences service reliability, environmental risk, and the ability to sustain SDG 6.2.1 and 6.3.1 outcomes over time. Higher blockage rates typically indicate greater network stress and O&M burden.

WHY BLOCKAGES MATTER

Sewer blockages are a practical, comparable indicator for network condition and hydraulic performance, effectiveness of routine maintenance, customer behaviours (e.g., grease disposal), stormwater ingress and sediment issues, and response readiness.

PREFERRED BENCHMARKING METRICS

Because raw blockage counts are not comparable across network sizes, this report presents both:

- Blockages (count/year) = blockage
- Blockage rate (per 100 km/year) = blockage ÷ sewer_length_km × 100
  (where sewer length is converted to kilometres before calculation)

Latest available year per utility where at least one of sewer connections, network length, or blockages is reported.

Sewer length converted to kilometres. Blockages per 100 km and connections per km are computed metrics. Values flagged “Verify” are arithmetically correct but appear anomalous relative to peers and/or prior-year series.

Table 10: Sewer Connections, Network Length and Blockages (Latest Year by Utility)

Country	Utility	Year	Sewer Connections	Sewer Length (km)	Blockages (n/yr)	Blockages per 100 km	Connections per km	Notes
Group 1 — High-Income Utilities (3 utilities)								
French Polynesia	Polynésienne des Eaux	2024	4,362	175.7	359	204.3	24.8	*Blockages increased 9× year-on-year (2023: 40); verify reporting definition change*
Guam	Guam Waterworks Authority (GWA)	2023	27,150	492.5	83	16.9	55.1	
New Caledonia	Calédonienne des Eaux	2023	15,420	444.6	158	35.5	34.7	
Group 2 — Middle-Income Utilities (4 utilities)								
American Samoa	American Samoa Power and Water Authority (ASPA)	2024	5,684	15.2	231	**1515.7**	373.0	Verify — blockages/100km and connections/km both extreme for network size; raw data internally consistent
Fiji	Water Authority of Fiji (WAF)	2024	144,686	835.7	454	54.3	173.1	Verify — connections/km likely reflects definition change (individual vs property connections); 2023 figure was 33,543 connections (39/km)
Nauru	Nauru Utilities Corporation (NUC)	2024	3,021	—	0	—	—	*Sewer length = 0 (no unit provided in 2024); length-based rates cannot be computed. Blockages = 0 reported.*
Palau	Palau Public Utilities Corporation (PPUC)	2024	2,097	50.0	61	122.0	41.9	
Group 3 — Transitional and Early-Stage Service Organisations (6 utilities)								
Federated States of Micronesia	Chuuk Public Utilities Corporation (CPU)	2023	609	27.4	25	91.4	22.3	
Federated States of Micronesia	Yap State Public Service Corporation (YSPSC)	2024	336	16.0	27	168.8	21.0	
Marshall Islands	Majuro Water and Sewer Company (MWSC)	2024	3,000	24.1	31	128.4	124.3	*Length converted from miles (15 mi × 1.60934); connections/km high for a small island system — plausible given dense urban service area*
Papua New Guinea	Water PNG Limited	2024	17,267	483.2	3,160	**653.9**	35.7	Verify — blockages/100km = 654, nearly 3× 2023 rate (166/100km); reported sewer length also declined (652→483 km)

Country	Utility	Year	Sewer Connections	Sewer Length (km)	Blockages (n/yr)	Blockages per 100 km	Connections per km	Notes
Samoa	Samoa Water Authority (SWA)	2024	127	14.3	238	**1666.7**	8.9	Verify — blockages/100km = 1,667 on a small 14.3 km network; consistent across both 2023 and 2024 submissions
Solomon Islands	Solomon Islands Water Authority (SIWA)	2024	631	36.8	425	**1154.6**	17.1	Verify — blockages/100km = 1,155; may reflect different blockage reporting definition (e.g. any attendance vs cleared blockages)

NOTE

Blockages/100 km colour scale: ≤50 (green) **|** 51–150 (yellow) **|** 151–400 (orange) **|** >400 (red)

DATA NOTES

- Utilities included**:** 13 of 20 (utilities with at least one sewer metric reported).
- Utilities excluded: 7 utilities reported no sewer connections, sewer length, or blockages in any submitted year (listed below).
- Unit conversions: sewer length converted to kilometres using sewer_length_unit. Majuro (MWSC) reported length in miles; conversion applied at 1 mile = 1.60934 km.
- Missing sewer length: Nauru (NUC) did not report sewer length; length-based metrics cannot be calculated.
- Verification flags: very high blockage rates may reflect a combination of asset condition, infiltration/inflow, and/or differences in how "blockage" is defined (e.g., confirmed blockage versus any wastewater service attendance). These should be confirmed with utilities before interpretation.

EXCLUDED UTILITIES (NO SEWER NETWORK DATA)

- Cook Islands — Infrastructure Cook Islands (ICI)
- Cook Islands — To Tatou Vai, Cook Islands
- Kiribati — Public Utilities Board (PUB)
- Samoa — Independent Water Schemes Association (IWSA)
- Tonga — Tonga Water Board (TWB)
- Vanuatu — Department of Water Resources, Vanuatu
- Vanuatu — Unelco Vanuatu Limited (UNELCO)

INTERPRETATION NOTE (BLOCKAGES)

Blockages per 100 km is a standard proxy for network stress and maintenance burden. Very high rates can indicate ageing infrastructure, high infiltration/inflow, operational constraints, or a broad definition of incident recording.

For small networks, rates can also be volatile because a moderate number of incidents divided by a short length yields a high normalised value. Blockage rates should therefore be interpreted alongside sewer length, service area density, and local operating context.

3.4 Wastewater service sustainability (financial context)

SDG linkage

SDG link: Supports sustained SDG 6.2.1 and 6.3.1 performance by enabling continuity of collection and treatment operations.

Type: Enabler (Medium) — cost recovery and cash reliability shape whether utilities can sustain O&M, maintain treatment continuity, and invest in response capacity and preventive maintenance over time.

Financial sustainability is an enabling condition for maintaining wastewater collection and treatment continuity, supporting progress towards SDG 6.2.1 and 6.3.1 outcomes. Cost coverage and revenue collection signals are therefore interpreted as practical enablers of sustained service delivery (reported in Part 4).

Wastewater outcomes depend heavily on the ability to fund routine O&M (network cleaning, pump station upkeep, treatment operations, monitoring, and repairs). For consistency with the report structure, financial indicators such as revenue collection efficiency and operating cost coverage are presented in Part 4 (Financial Sustainability) and should be interpreted as enabling conditions for wastewater reliability and treatment continuity.

3.4.1 Key insights and regional implications (draft narrative to refine once values are computed)

Based on the results above (and the supporting context in Figures 22–24 and 28), several regionally relevant patterns emerge:

- Reticulated wastewater coverage remains uneven across participating utilities: near-universal coverage is reported in some territories, while several utilities report single-digit coverage where sewerage is limited to urban cores, and sanitation is dominated by on-site systems.
- Time-series patterns matter for interpretation. Step changes in reported coverage or treated shares should be treated as “verify before publication” items unless utilities confirm a genuine system change rather than revised boundaries, definitions, or reporting scope.
- High treated shares are common when both volumes are reported, but there are material exceptions (including partial treated shares and years in which treated volume is reported as zero). These cases materially affect the interpretation of environmental and public health and should be verified.
- Network performance varies widely. Very high blockage rates (particularly in small networks) warrant contextual explanation and follow-up to confirm whether the metric reflects confirmed blockages or broader service attendances.
- Data readiness is itself a performance signal. Gaps in wastewater volume reporting and unit/time-basis ambiguity constrain comparability and highlight where utilities may need support in definitions, estimation methods and reporting governance.

3.4.2 Data completeness, quality and comparability notes

This Part reports wastewater performance only where utilities have submitted relevant fields. Key comparability considerations include:

- Service boundary definition: wastewater "service area" and "service population" definitions may vary across utilities and years.
- Volume units and time basis: reported volumes may be affected by missing time-basis qualifiers and conversion assumptions (flagged for verification).
- Treatment definition: "treated" may represent different treatment levels; the dataset does not consistently specify treatment standard.
- Incident recording: blockage counts may reflect different definitions (confirmed blockage vs any attendance).
- Missing data: where denominators are missing (e.g., collected volume not reported), treatment shares cannot be calculated and are shown as not available.

PART 4

FINANCIAL & ORGANISATION SUSTAINABILITY PERFORMANCE

PURPOSE

Reliable water and wastewater services depend on more than infrastructure. Utilities must be able to (i) convert billed revenue into cash, (ii) understand and manage operating costs, and (iii) sustain an appropriately skilled workforce to operate, maintain and improve systems.

In Pacific contexts, these fundamentals are often challenged by small scale, geographic dispersion, high energy and logistics costs, intermittent supply conditions that increase maintenance burden, and affordability constraints.

This section presents decision-relevant sustainability signals to help utilities, governments and partners understand where service delivery is financially and organisationally resilient, and where it is exposed to ongoing O&M risk.

WHY THESE FINANCIAL SIGNALS MATTER FOR RELIABILITY

In Pacific operating contexts, adequate O&M funding and cash discipline function as economic stabilisers—they determine whether utilities can run treatment consistently, maintain disinfection control, respond rapidly to faults, and prevent minor issues from escalating into service failures.

Where collected revenue does not reliably cover routine operating costs, systems are more likely to enter a cycle of deferred maintenance, weaker monitoring, higher losses and more frequent outages, even if assets exist on paper.

HOW TO READ THE INDICATORS

- Revenue collection rate reflects cash discipline and billing/collection effectiveness.
- Operating cost coverage indicates whether collected revenue is sufficient to cover routine operating expenditure (a basic measure of operating viability).
- Cost reporting completeness and cost breakdown provide context for comparability and highlight likely cost drivers.
- Workforce indicators (staffing intensity and gender representation) provide a proxy for operational capacity and sector sustainability.

COMPARABILITY NOTE

Indicators are based on utility-reported data and may reflect differences in accounting boundaries, subsidies and transfers, outsourcing models, and the extent of cost reporting. Results should be interpreted as signals, not as a definitive audit of financial performance.

4.1 Revenue collection performance

SDG linkage

SDG link: Supports sustained SDG 6.1.1, 6.2.1 and 6.3.1 outcomes by enabling reliable operations and maintenance funding (and indirectly supports SDG 6.4 by sustaining efficiency and NRW reduction programmes).

Type: Enabler (Medium) — strong revenue collection improves cash reliability needed to maintain continuity, monitoring and preventive maintenance, but it is not an SDG outcome indicator itself.

Revenue collection is an enabling condition for sustaining the operations and maintenance that underpin SDG 6 service reliability and safety outcomes. Strong collection performance supports continuity, water quality control (including monitoring and disinfection practices), and wastewater treatment continuity over time.

4.1.4 Latest available revenue collection rate (by utility)

Revenue collection rate is reported as the share of billed revenue that is successfully collected. It provides an immediate view of cashflow discipline and the effectiveness of billing and collection systems.

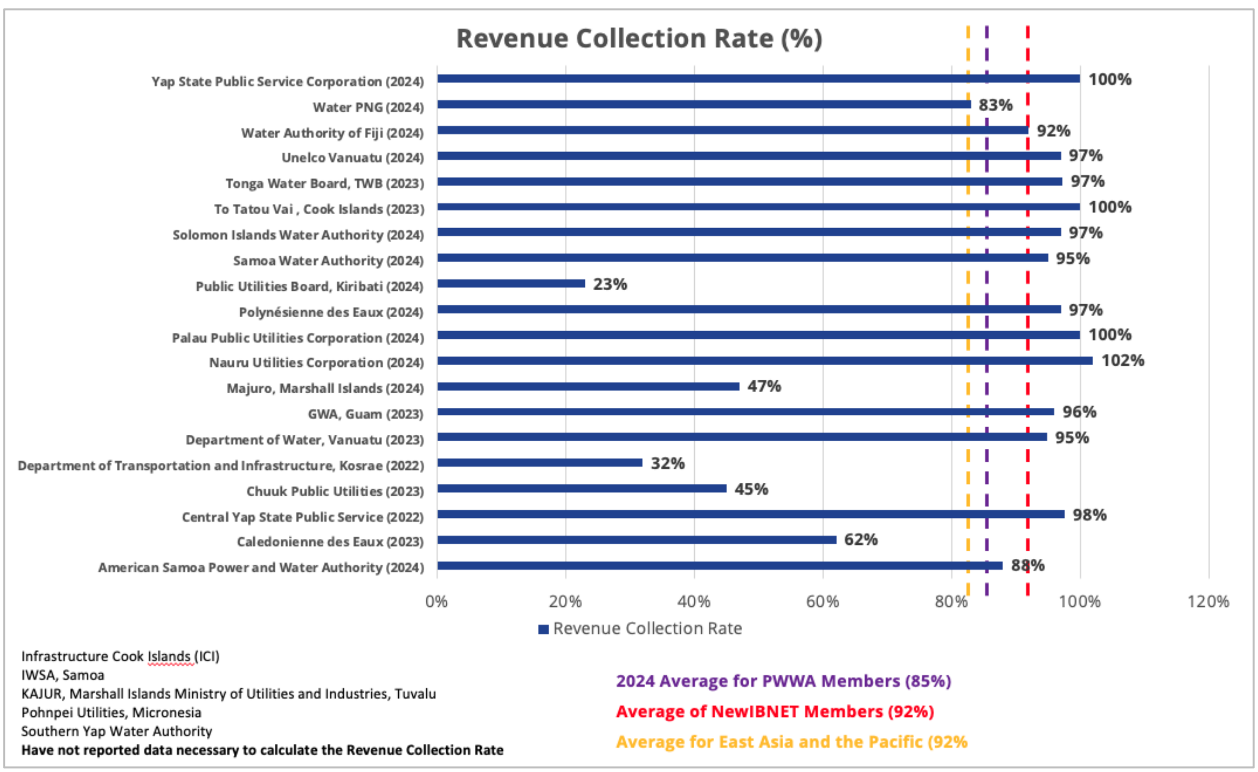


Figure 29: Revenue collection rate (%) – latest year available

To support transparency and replication, underlying billed and collected revenues and the derived collection rates are presented in the financial snapshot table (Section 4.3.1).

4.1.5 Revenue collection trends (Pacific average and by utility group)

Point-in-time collection rates can mask important dynamics. Trend views help distinguish utilities with stable collection performance from those with deterioration, volatility, or step-changes (for example due to arrears recovery or billing system changes).

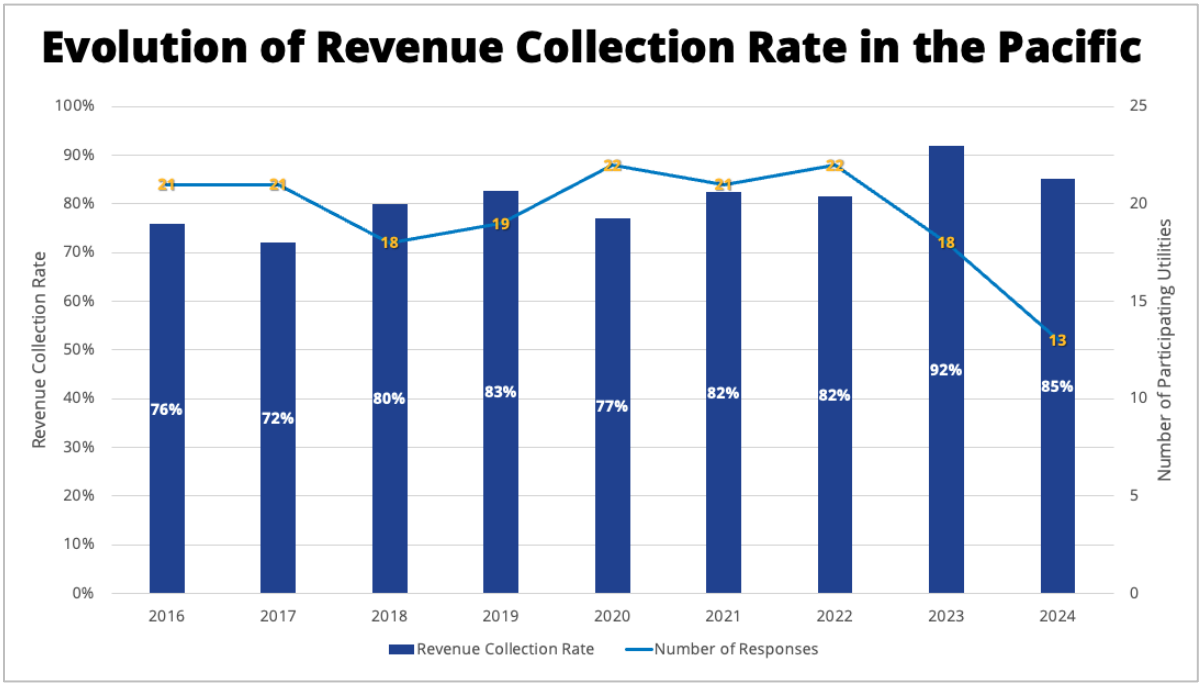
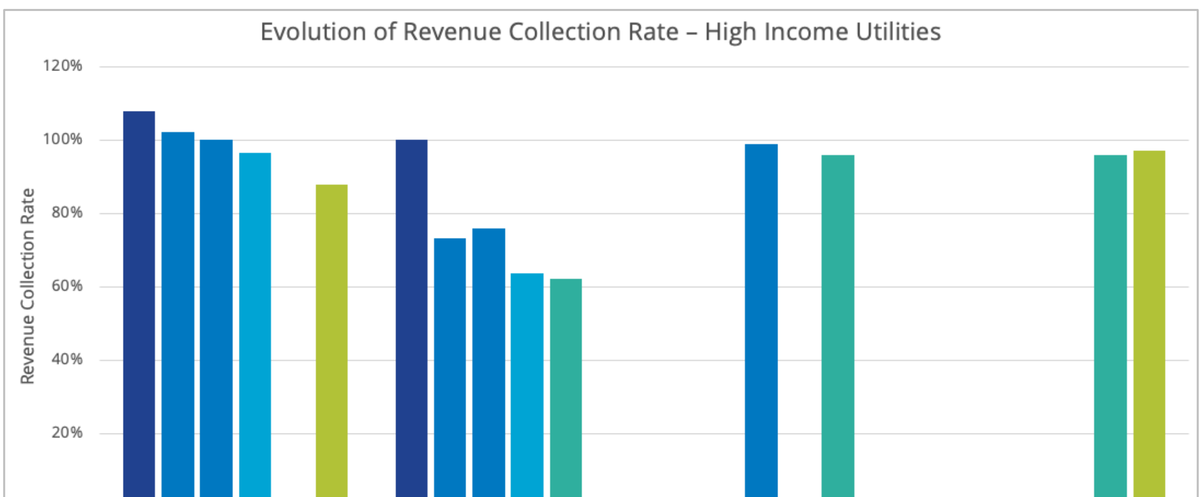
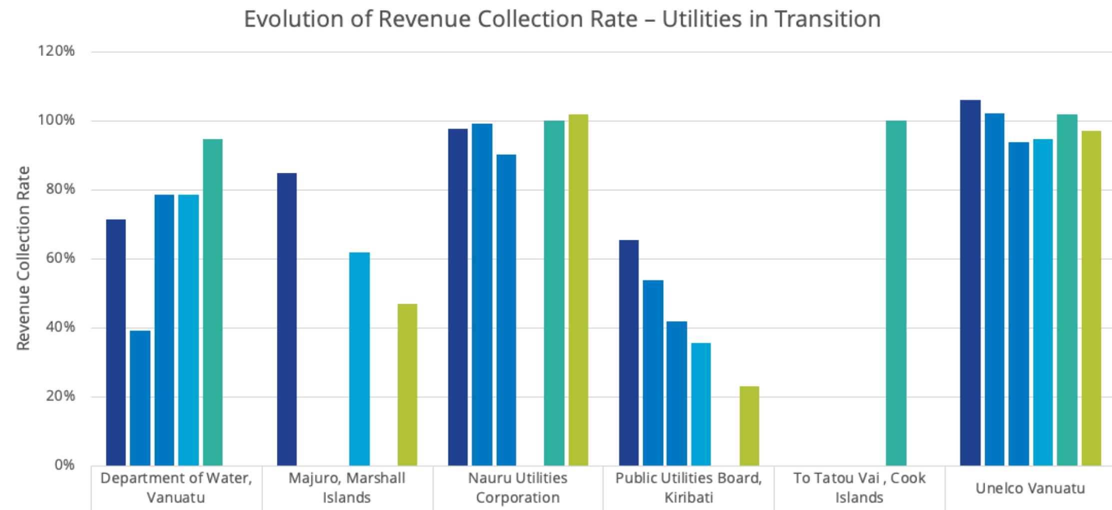


Figure 30: Evolution of revenue collection rate – Pacific average



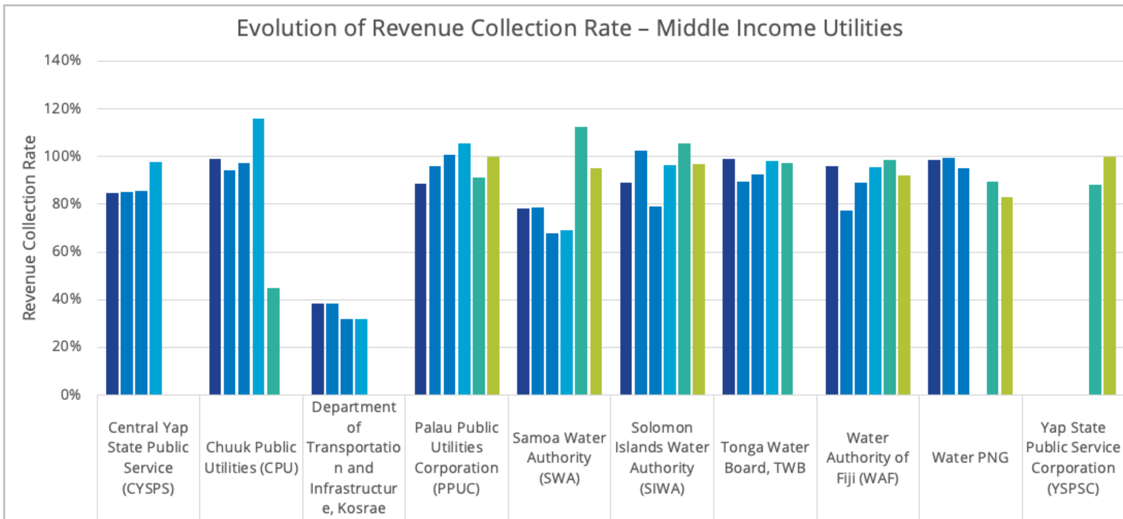
	American Samoa Power and Water Authority, ASPA	Caledonienne des Eaux	GWA, Guam	Polynésienne des Eaux
2019	108%	100%		0%
2020	102%	73%		0%
2021	100%	76%	99%	
2022	97%	64%		
2023		62%	96%	96%
2024	88%			97%

Figure 31: Evolution of revenue collection rate – High-income utilities



	Department of Water, Vanuatu	Majuro, Marshall Islands	Nauru Utilities Corporation	Public Utilities Board, Kiribati	To Tatou Vai , Cook Islands	Unelco Vanuatu
2019	72%	85%	98%	66%		106%
2020	39%		99%	54%		102%
2021	79%		90%	42%		94%
2022	79%	62%		36%		95%
2023	95%		100%		100%	102%
2024		47%	102%	23%		97%

Figure 32: Evolution of revenue collection rate – Utilities in transition



	Central Yap State Public Service (CYSPS)	Chuuk Public Utilities (CPU)	Department of Transportation and Infrastructure, Kosrae	Palau Public Utilities Corporation (PPUC)	Samoa Water Authority (SWA)	Solomon Islands Water Authority (SIWA)	Tonga Water Board, TWB	Water Authority of Fiji (WAF)	Water PNG	Yap State Public Service Corporation (YSPSC)
2019	85%	99%	38%	88%	78%	89%	99%	96%	99%	
2020	85%	94%	38%	96%	79%	102%	89%	77%	99%	
2021	86%	97%	32%	101%	68%	79%	92%	89%	95%	
2022	98%	116%	32%	106%	69%	96%	98%	96%		
2023		45%		91%	112%	106%	97%	98%	89%	88%
2024				100%	95%	97%		92%	83%	100%

Figure 33: Evolution of revenue collection rate – Middle-income utilities

INTERPRETATION GUIDANCE

Persistently low collection often reflects a mix of metering/billing gaps, customer data quality issues, affordability stress, limited enforcement options, and weak customer management systems. Sustained improvements over time commonly align with targeted reforms such as improved metering and customer registers, billing system upgrades, arrears management, expanded payment channels, and clearer community service obligation or subsidy arrangements.

4.2 Operating costs and cost visibility (pressure and comparability)

4.2.4 Cost reporting completeness

Before interpreting cost levels or cost recovery, it is important to understand how consistently utilities report operating costs. A cost reporting completeness indicator is therefore presented to support interpretation of cost metrics and operating cost coverage.

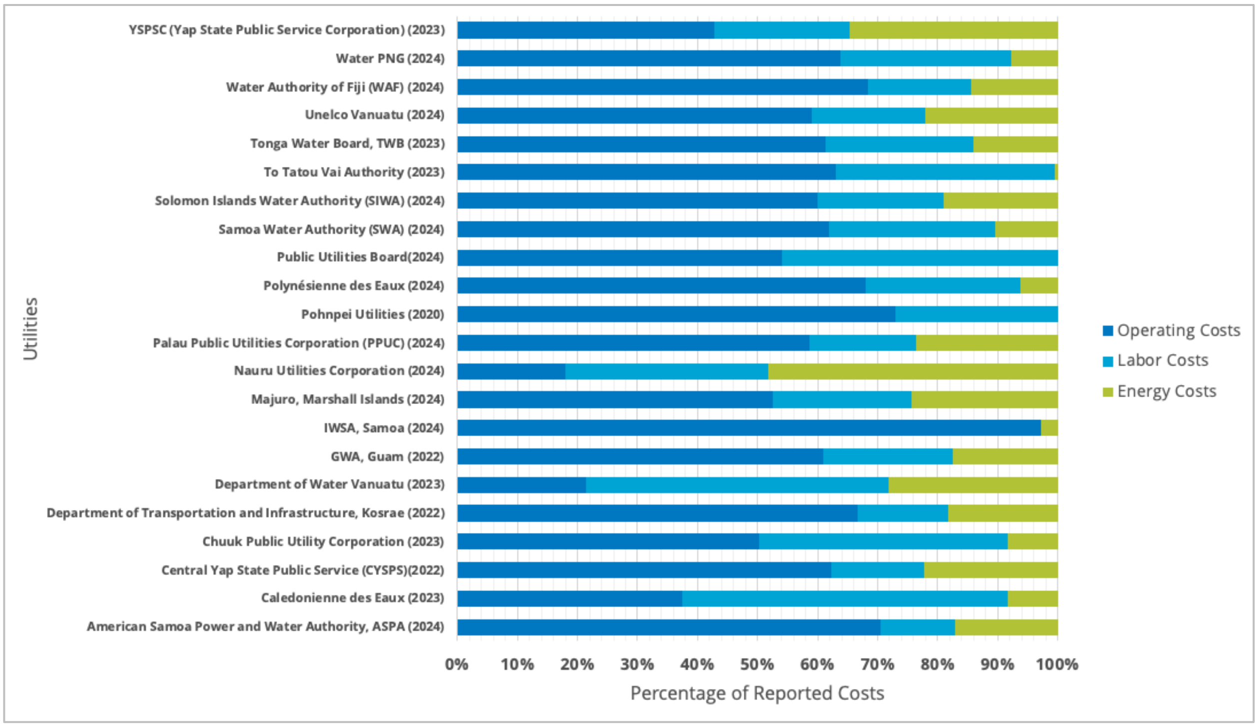


Figure 34: Percentage of reported costs (cost reporting completeness)

Where cost reporting completeness is low, reported operating expenditure may understate the true cost of service delivery (for example, if energy, staffing, contractor costs, or overheads are partially captured elsewhere).

4.2.5 Reported cost structure (2024)

Understanding what drives costs matters as much as knowing the total cost level. The 2024 reported cost breakdown provides an indicative view of major operating cost components across the sample.

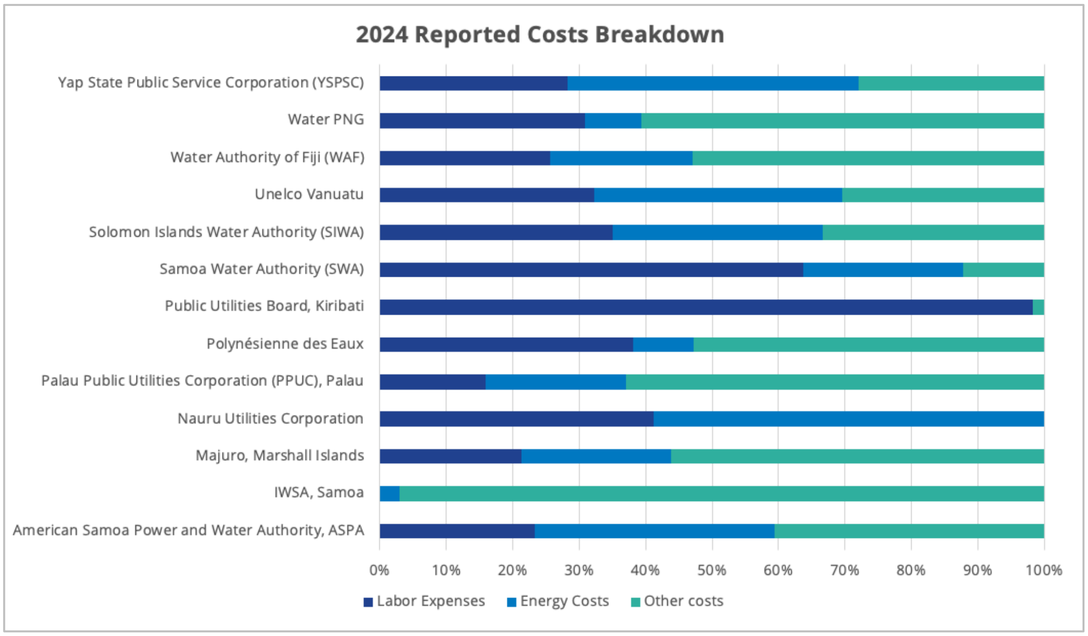


Figure 35: 2024 reported costs breakdown

4.2.6 Cost trends (PWWA average)

The evolution of average reported operating costs highlights whether utilities are facing increasing cost pressure over time, recognising that inflation, energy price volatility, and logistics constraints can materially affect O&M sustainability.

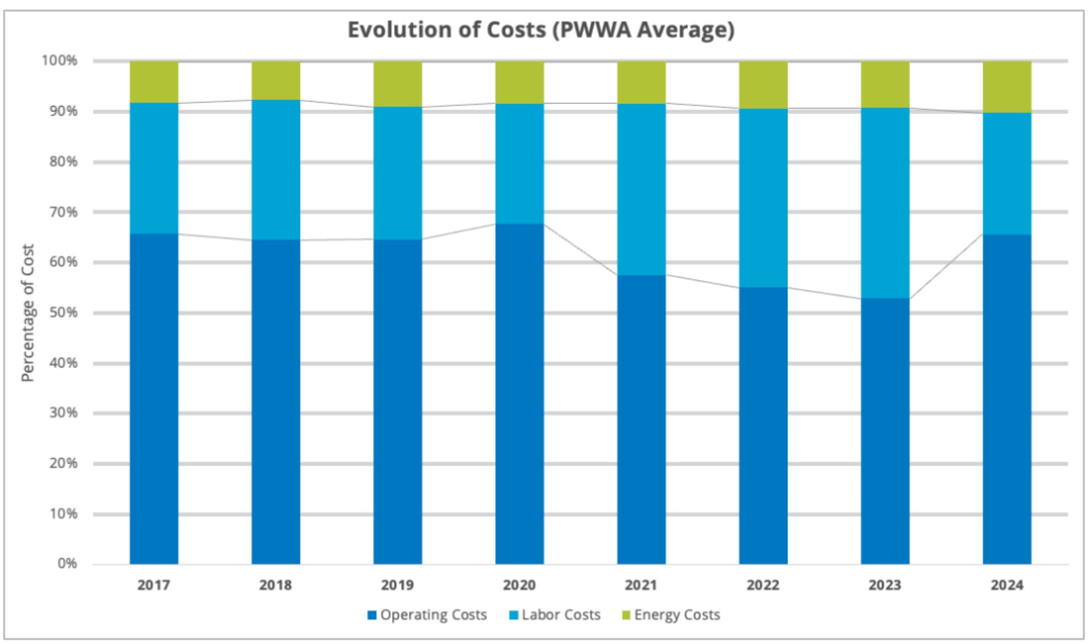


Figure 36: Evolution of costs (PWWA average)

4.3 Costs, revenues, and operating cost coverage (operating viability)

SDG linkage

SDG link: Supports sustained SDG 6.1.1, 6.2.1 and 6.3.1 outcomes by indicating whether routine service delivery is financially viable.

Type: Enabler (Strong) — when operating revenues do not cover routine operating expenditure, chronic cash constraints can translate into deferred maintenance, reduced monitoring and slower repairs, undermining reliability, safety and environmental performance.

Operating cost coverage is a core sustainability signal that shapes whether utilities can sustain reliable water and wastewater services aligned with SDG 6.1.1, 6.2.1, and 6.3.1 outcomes. Where operating revenues do not cover routine operating expenditure, utilities may face persistent cash constraints that contribute to deferred maintenance, reduced monitoring and slower repairs—ultimately weakening service reliability, water safety controls and environmental performance.

Operating cost coverage measures the extent to which revenue collected covers operating expenditure (OPEX)**.** It provides a practical indication of whether a utility can sustain routine operations without persistent external support or progressive service degradation. This indicator is best interpreted alongside collection performance and completeness of cost reporting.

4.3.4 Financial snapshot (latest available year)

Table 11 consolidates operating expenditure (OPEX), revenues billed and collected, and the resulting operating cost coverage ratio (OCCR) for participating utilities. It also presents production and billed volumes to support interpretation of scale and throughput effects (and, where calculated elsewhere, unit cost and unit revenue signals).

DEFINITIONS

- OCCR (operating cost coverage ratio) = *Revenue collected ÷ Operating expenditure*
- Collection efficiency = *Revenue collected ÷ Revenue billed*
- Unit OPEX (where calculated) = *Operating expenditure ÷ Production volume (m^3/yr)*
- Unit revenue (where calculated) = *Revenue ÷ Billed volume (m^3/yr)*

COMPARABILITY NOTE

OCCR and collection efficiency are dimensionless ratios calculated within each utility's reported currency and are therefore suitable for cross-utility comparison regardless of currency. Unit cost and unit revenue values are only cross-comparable where financials are converted to a common currency using a consistent method.

DATA QUALITY NOTE

Some records are flagged where currency metadata is incomplete, where volumes appear implausible on a per-capita basis, or where multi-service revenue boundaries may affect comparability. Flags are prompts for verification rather than conclusions about performance.

LATEST YEAR RULE

2024 is used where available; otherwise, 2023 where 2024 was not submitted or is missing key financial fields.

Table 11: Costs, Revenues and Operating Cost Coverage (Most Recent Available Year, 2023–2024)

Identification			Financials (reported currency)				Volumes		Ratios		Data Flags / Notes
Country / Territory	**Utility**	**Year**	**Operating Expenditure**	**Revenue Billed**	**Revenue Collected**	**Currency**	**Production (m³/yr)**	**Billed Volume (m³/yr)**	**OCCR**	**Coll. Eff.**	**Data Flags / Notes**
Group 1 — High-Income Utilities (4 utilities)											
American Samoa	American Samoa Power and Water Authority (ASPA)	2024	11,601,360	9,844,331	8,689,476	USD	16,755,258	6,800,918	**0.75**	88.3%	QA: Currency unit missing – verify source; missing currency unit for rev_billed; cannot convert to USD
French Polynesia	Polynésienne des Eaux	2024	2,517,000,000	3,271,000,000	3,172,870,000	XPF	14,031,822	9,126,797	1.26	97.0%	*LCU — ratios comparable; unit $/m³ not cross-comparable*
Guam	Guam Waterworks Authority (GWA)	2023	78,472,105	108,180,777	103,874,585	USD	55,172,377	19,161,754	1.32	96.0%	*LCU — ratios comparable; unit $/m³ not cross-comparable*
New Caledonia	Calédonienne des Eaux	2023	1,434,304,227	5,997,972,400	3,721,514,256	XPF	36,160,540	27,879,265	2.59	62.0%	*LCU — ratios comparable; unit $/m³ not cross-comparable*
Group 2 — Middle-Income Utilities (9 utilities)											
Fed. States of Micronesia	Chuuk Public Utilities Corporation (CPU)	2023	418,000	337,000	151,600	USD	68,137	37,854	**0.36**	**45.0%**	*LCU — ratios comparable; unit $/m³ not cross-comparable; per-capita volume implausible — verify unit scale and reporting period*
Fed. States of Micronesia	Yap State Public Service Corporation (YSPSC)	2024	335,834	29,322	29,321	USD	576,123	344,898	**0.09**	100.0%	*LCU — ratios comparable; unit $/m³ not cross-comparable*
Fiji	Water Authority of Fiji (WAF)	2024	123,600,000	43,200,000	39,900,000	FJD	128,763,858	70,980,839	**0.32**	92.4%	*LCU — ratios comparable; unit $/m³ not cross-comparable*

Identification			Financials (reported currency)				Volumes		Ratios		Data Flags / Notes
Country / Territory	Utility	Year	Operating Expenditure	Revenue Billed	Revenue Collected	Currency	Production (m^3/yr)	Billed Volume (m^3/yr)	OCCR	Coll. Eff.	Data Flags / Notes
Palau	Palau Public Utilities Corporation (PPUC)	2024	9,960,641	5,546,660	5,525,183	USD	3,949,984	2,248,628	**0.55**	99.6%	*LCU — ratios comparable; unit $/m³ not cross-comparable*
Papua New Guinea	Water PNG Limited	2024	39,446,128	65,104,403	53,933,838	PGK	95,712,379	47,266,468	1.37	82.8%	*LCU — ratios comparable; unit $/m³ not cross-comparable*
Samoa	Samoa Water Authority (SWA)	2024	29,251,023	23,629,683	22,446,211	WST	25,967,072	15,288,286	**0.77**	95.0%	QA: Currency unit missing – verify source; missing currency unit for rev_collect/rev_billed; cannot convert to USD
Solomon Islands	Solomon Islands Water Authority (SIWA)	2024	124,252,619	153,047,820	149,006,958	SBD	13,677,405	5,543,890	1.20	97.4%	*LCU — ratios comparable; unit $/m³ not cross-comparable*
Tonga	Tonga Water Board (TWB)	2023	7,462,310	11,320,202	11,014,645	TOP	448,000	209,000	1.48	97.3%	*LCU — ratios comparable; unit $/m³ not cross-comparable*
Group 3 — Transitional and Early-Stage Service Organisations (6 utilities)											
Cook Islands	To Tatou Vai, Cook Islands	2023	2,934,000	2,934,580	2,934,580	NZD	5,413,000	3,944,500	1.00	100.0%	*LCU — ratios comparable; unit $/m³ not cross-comparable*
Kiribati	Public Utilities Board (PUB)	2024	1,159,445	745,033	170,107	AUD	539,945	136,505	**0.15**	**22.8%**	*LCU — ratios comparable; unit $/m³ not cross-comparable; per-capita volume implausible — verify unit scale and reporting period*
Marshall Islands	Majuro Water and Sewer Company (MWSC)	2024	1,544,957	750,000	350,000	USD	28,861	12,493	**0.23**	**46.7%**	*LCU — ratios comparable; unit $/m³ not cross-comparable; per-capita volume*

Identification			Financials (reported currency)				Volumes		Ratios		Data Flags / Notes
Country / Territory	Utility	Year	Operating Expenditure	Revenue Billed	Revenue Collected	Currency	Production (m³/yr)	Billed Volume (m³/yr)	OCCR	Coll. Eff.	Data Flags / Notes
											implausible — verify unit scale and reporting period
Nauru	Nauru Utilities Corporation (NUC)	2024	432,000	3,943,959	4,018,264	AUD	321,788	249,277	**9.30**	**101.9%**	QA: Currency unit missing – verify source; collection exceeds billed (timing/arrears) — verify
Vanuatu	Department of Water Resources, Vanuatu	2023	15,200,000	43,000,000	40,800,000	VUV	3,400,000	1,690,431	2.68	94.9%	*LCU — ratios comparable; unit $/m³ not cross-comparable*
Vanuatu	Unelco Vanuatu Limited (UNELCO)	2024	412,601,253	638,267,646	620,550,318	VUV	6,777,638	4,728,543	1.50	97.2%	*LCU — ratios comparable; unit $/m³ not cross-comparable*

Utilities with Incomplete Financial Records (2023–2024)

Utilities with missing fields required to compute OCCR and/or collection efficiency are summarised below.

Country	Utility	Year	Missing Fields
Cook Islands	Infrastructure Cook Islands (ICI)	2023	Operating expenditure, revenue billed, revenue collected, production volume (m³/yr), billed volume (m³/yr)
Samoa	IWSA, Samoa	2024	Revenue billed, revenue collected

Legend:

OCCR (ratio): ≥1.2 resilient | 1.0–1.19 near-coverage | 0.8–0.99 moderate gap | 0.5–0.79 material gap | <0.5 critical gap

Collection efficiency: ≥95% strong | 75–94% moderate | <75% weak

NOTES

- OCCR and Collection Efficiency are dimensionless ratios calculated in the same currency and are valid for cross-utility comparison regardless of currency denomination.
- Unit cost and unit revenue metrics ($/m³) are reported only where currency standardisation to USD was available. For all other utilities, financials are shown in LCU and per-unit metrics derived from LCU are not cross-comparable.
- Nauru NUC: Collection Efficiency > 100% (101.9%) indicates revenue collected exceeds revenue billed, most likely due to collection of prior-year arrears. OCCR of 9.30 is anomalous and should be verified.
- Majuro, Chuuk (CPU), and Kiribati: production volumes appear implausibly low on a per-capita basis. Verify whether volumes are reported in a different unit or cover a sub-system only.

4.3.5 Operating cost coverage results (summary interpretation)

To keep the main report readable, interpretation focuses on the most decision-relevant patterns.

(a) Regional picture: operating cost coverage is a binding constraint for many utilities
A recurring benchmarking pattern is that some utilities can bill for services but do not convert billed revenue into cash at levels sufficient to cover routine operating costs. This is typically visible where collection efficiency is weak and OCCR falls below 1.0, indicating an operating funding gap.

(b) Unit cost signals: scale and throughput matter
Unit OPEX often varies widely. In small or dispersed systems, unit costs can be structurally higher due to minimum staffing requirements, fuel and logistics dependence, and limited economies of scale. Extremely high unit costs should also be treated as a validation flag: they can indicate under-reported volumes, subsystem-only reporting, or boundary differences rather than true cost inefficiency.

(c) The production–billing gap shapes operating viability
Because unit OPEX is benchmarked against production while unit revenues are benchmarked against billed volume, utilities with high NRW and/or limited billing completeness may show weaker unit revenue relative to unit OPEX and therefore weaker OCCR outcomes. This highlights the operational “double dividend” of improving NRW and billing completeness: reduced production burden and increased realised revenue without proportionate increases in cost.

(d) Outliers and verification flags: useful prompts, but interpret with caution
Records flagged for anomalous values (for example, collection efficiency exceeding 100%, unusually low OPEX compared with prior years, or implausibly low annual volumes) remain useful prompts for follow-up validation. However, these cases should not be used to drive strong comparative statements or regional medians until confirmed.

OPERATING COST COVERAGE (% OR RATIO)

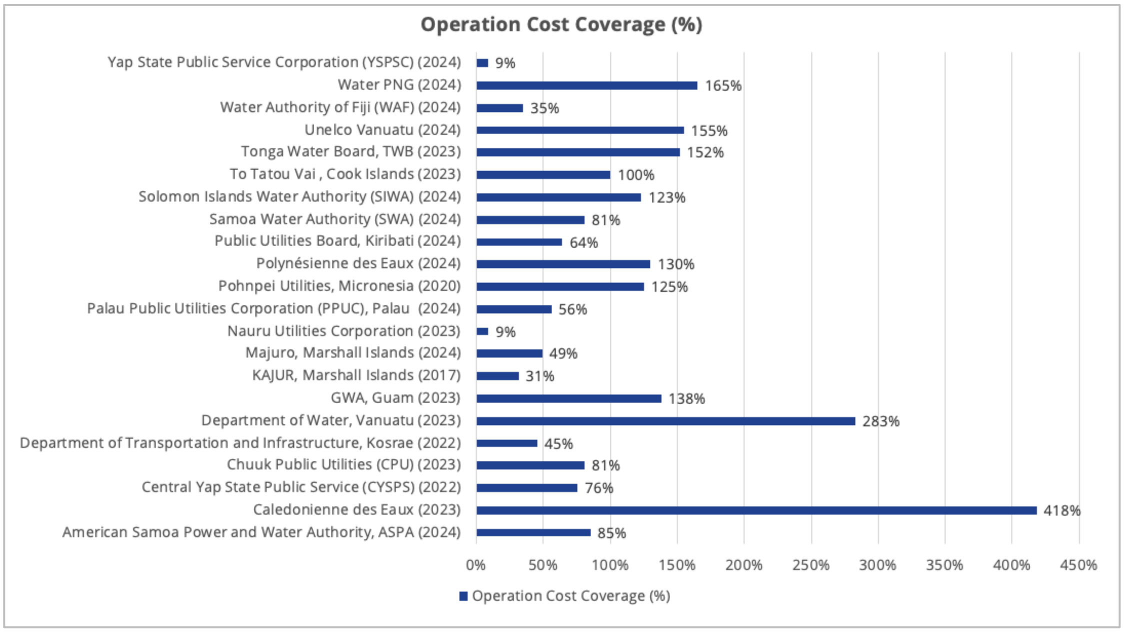


Figure 37: Operating cost coverage (% or ratio) – latest year and/or trend

Operating cost coverage should be interpreted alongside:

- revenue collection performance **(**Section 4.1), and
- cost reporting completeness (Section 4.2.1).

A utility may collect well but still have weak cost coverage if tariffs/subsidies are structurally inadequate. Conversely, apparent cost coverage can be overstated if operating costs are incompletely reported.

4.3.6 What the snapshot typically shows (interpretation)

To keep the main report readable, the narrative below focuses on patterns that are usually most decision-relevant

(a) Regional picture: operating cost coverage remains a binding constraint
A consistent benchmarking pattern is that some utilities can bill for services, but do not convert billing into cash at levels needed to sustain operations. This is visible where collection efficiency is low and operating cost coverage is below 1.0.

(b) Unit cost signals: scale and throughput matter
Unit OPEX often varies widely. In small systems, unit costs can be structurally higher due to minimum staffing, fuel/logistics exposure, and limited economies of scale. Extremely high unit costs are also a flag for denominator issues (under-reported volumes, subsystem reporting, or boundary differences).

(c) The production–billing gap shapes sustainability
Because unit OPEX uses production while unit revenues use billed volume, utilities with high NRW or limited metering/billing completeness can show low unit revenues relative to unit OPEX and weaker operating cost coverage. This reinforces the operational logic that NRW reduction and billing completeness can deliver a “double dividend”: lower production burden and higher realised revenue.

(d) Outliers and verification flags (useful but treat with caution)
Flagged rows remain valuable as prompts for validation, but should not be used to drive regional medians or strong comparative claims until confirmed.

4.4 Workforce capacity and inclusion (organisational sustainability)

SDG linkage

SDG link: Supports sustained SDG **6.1.1**, **6.2.1** and **6.3.1** outcomes through operational control, maintenance execution and safe service practices.
Type: Enabler (Medium) — workforce capability and inclusion strengthen preventive maintenance, fault response and operational safety, particularly in small, remote and resource-constrained systems.

Workforce capacity and inclusion are enabling conditions for sustained SDG 6 outcomes. Adequate staffing and inclusive workforce pipelines support operational control, preventive maintenance and rapid fault response, which are essential for maintaining reliable and safe water and wastewater services over time.

Workforce capability is also a jobs and resilience multiplier: utilities are among the few providers of stable technical career pathways in many Pacific labour markets. Strengthening operator training, mentoring and inclusive entry pathways (including for women and youth) supports service reliability directly (better process control and preventive maintenance) and helps retain skills locally, reducing dependence on short-term external support.

WORKFORCE CAPABILITY IS THE RELIABILITY MULTIPLIER

In Pacific utility contexts, the same asset base can perform very differently depending on operator competence, supervision, maintenance discipline, safety culture and access to practical troubleshooting support. For this reason, workforce indicators should be read as leading indicators of service reliability and water safety, not simply organisational statistics.

4.4.4 Staffing intensity (employees per connection)

Staffing intensity provides a practical proxy for organisational capacity and productivity, but it requires careful interpretation. Smaller utilities often face minimum staffing thresholds regardless of scale (for example, operator coverage, on-call arrangements and basic administration). Conversely, outsourced operating models can reduce utility headcount even when total labour input to service delivery remains high.

To support comparability across utilities, staffing intensity is presented as employees per connection. Figure 38 shows this metric on a per-1,000-connections basis (consistent with the figure labelling).

Table 12 provides the underlying workforce headcount data and presents the same indicator on a per 100 connections basis for ease of reading (multiply by 10 to convert to per 1,000 connections).

RETENTION MATTERS AS MUCH AS RECRUITMENT

Many Pacific utilities face persistent loss of experienced operators and technicians to migration, project-based roles, or better-paid sectors.

Where turnover is high, utilities can appear adequately staffed on paper while still lacking the depth of experience required for stable operations, safe process control, and effective maintenance planning.

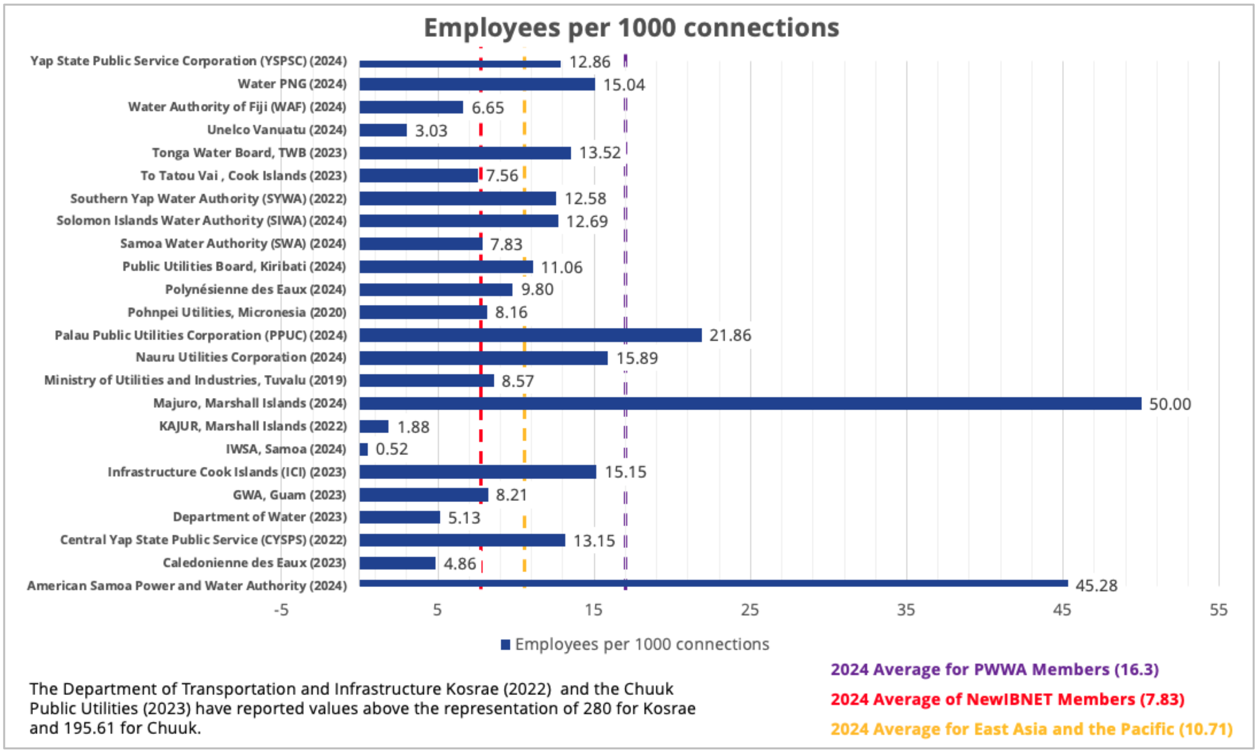


Figure 38: Employees per 1000 connections

Table 12: Workforce and inclusion signals (latest available data)

Identification			Workforce			Gender Indicators		Data Flags / Notes
Country / Territory	Utility	Year	Employees (FTE)	Female Employees (FTE)	Employees per 100 Connections	Female Employees (%)	Female Managers (%)	Data Flags / Notes
Group 1 — High-Income Utilities (4 utilities)								
American Samoa	American Samoa Power and Water Authority (ASPA)	2024	448	72	2.88	16.1%	—	*Total connections (water + wastewater)*
French Polynesia	Polynésienne des Eaux	2024	188	43	0.80	22.9%	—	*Total connections (water + wastewater)*
Guam	Guam Waterworks Authority (GWA)	2023	359	107	0.51	29.8%	—	*Total connections (water + wastewater)*
New Caledonia	Calédonienne des Eaux	2023	265	66	0.38	24.9%	—	*Total connections (water + wastewater)*
Group 2 — Middle-Income Utilities (12 utilities)								
FSM	Central Yap State Public Service (CYSPS)	2022	14	1	1.01	7.1%	—	*Total connections (water + wastewater)*
FSM	Chuuk Public Utilities Corporation (CPU)	2023	107	15	9.26	14.0%	—	*Total connections (water + wastewater)*
FSM	Department of Transportation & Infrastructure, Kosrae	2022	28	6	6.22	21.4%	—	*Total connections (water + wastewater)*
FSM	Southern Yap Water Authority (SYWA)	2022	4	1	1.26	25.0%	—	*Water connections only*
FSM	Yap State Public Service Corporation (YSPSC)	2024	15	1	1.00	6.7%	—	*Total connections (water + wastewater)*
Fiji	Water Authority of Fiji (WAF)	2024	1,071	41	0.35	3.8%	—	*Total connections (water + wastewater)*

Identification			Workforce			Gender Indicators		Data Flags / Notes
Country / Territory	Utility	Year	Employees (FTE)	Female Employees (FTE)	Employees per 100 Connections	Female Employees (%)	Female Managers (%)	Data Flags / Notes
Palau	Palau Public Utilities Corporation (PPUC)	2024	119	8	1.58	6.7%	—	*Total connections (water + wastewater)*
Papua New Guinea	Water PNG Limited	2024	741	152	1.11	20.5%	—	*Total connections (water + wastewater)*
Samoa	Samoa Water Authority (SWA)	2024	277	71	0.78	25.6%	—	*Total connections (water + wastewater)*
Solomon Islands	Solomon Islands Water Authority (SIWA)	2024	229	59	1.23	25.8%	—	*Total connections (water + wastewater)*
Tonga	Tonga Water Board (TWB)	2023	144	34	1.35	23.6%	—	*Water connections only*
Tuvalu	Ministry of Utilities and Industries, Tuvalu	2022	15	1	—	6.7%	—	*Missing wat_conn — ratios cannot be computed*
Group 3 — Transitional and Early-Stage Service Organisations (9 utilities)								
Cook Islands	Infrastructure Cook Islands (ICI)	2023	20	—	1.52	—	—	*Water connections only; female headcount missing*
Cook Islands	To Tatou Vai, Cook Islands	2023	36	5	0.76	13.9%	—	*Water connections only*
Kiribati	Public Utilities Board (PUB)	2024	52	3	1.11	5.8%	—	*Water connections only*
Marshall Islands	KAJUR (Kwajalein Atoll Joint Utility Resources)	2022	15	—	0.09	—	—	*Total connections (water + wastewater); female headcount missing*
Marshall Islands	Majuro Water and Sewer Company (MWSC)	2024	50	7	1.25	14.0%	—	*Total connections (water + wastewater)*
Nauru	Nauru Utilities Corporation (NUC)	2024	48	6	0.79	12.5%	—	*Total connections (water + wastewater)*

Identification			Workforce			Gender Indicators		Data Flags / Notes
Country / Territory	Utility	Year	Employees (FTE)	Female Employees (FTE)	Employees per 100 Connections	Female Employees (%)	Female Managers (%)	Data Flags / Notes
Samoa	Independent Water Schemes Association (IWSA)	2024	2	2	0.05	100.0%	—	*Water connections only*
Vanuatu	Department of Water Resources, Vanuatu	2023	24	5	0.51	20.8%	—	*Water connections only*
Vanuatu	Unelco Vanuatu Limited (UNELCO)	2024	32	10	0.30	31.2%	—	*Water connections only*

HOW TO INTERPRET RESULTS

- High staffing intensity can reflect structural realities (small scale, geographic dispersion, limited automation, higher service complexity), but can also signal constrained productivity due to reactive maintenance, high NRW, weak asset condition, or limited planning systems.
- Low staffing intensity does not automatically imply efficiency. It can reflect outsourcing (staff sit outside the utility), under-resourcing, or reporting boundary differences (for example, shared government staff not captured as utility FTE).
- Interpretation is strongest when staffing intensity is read alongside service performance signals in Parts 4–8 (continuity, NRW, complaints resolution and water quality monitoring effort).

TABLE 12 NOTES (DEFINITIONS AND COMPARABILITY)

- FTE = full-time equivalent employees.
- Employees per 100 connections = emp_full_time ÷ conn_denom × 100
- Connection denominator (conn_denom) = wat_conn + waste_conn where both are reported and >0; otherwise wat_conn only. Where wat_conn is missing, the ratio is shown as "—".
- Female employees (%) = female_full_time ÷ emp_full_time × 100 where female FTE is reported.
- Female managers (%) is not reported in the dataset (no managers field), and is therefore shown as "—".
- Year selection rule**:** latest available year is selected with priority 2024 → 2023 → 2022 → 2021, subject to emp_full_time > 0.
- Known data gaps**:** ICI (Cook Islands) and KAJUR (Marshall Islands) do not report female headcount; Tuvalu does not report water connections and staffing ratios cannot be calculated.

4.4.5 Gender representation (workforce and management)

Gender representation supports a more complete view of sector sustainability, talent pipelines and inclusive leadership. The benchmarking indicators below present female participation in the workforce and, where available, in management roles.

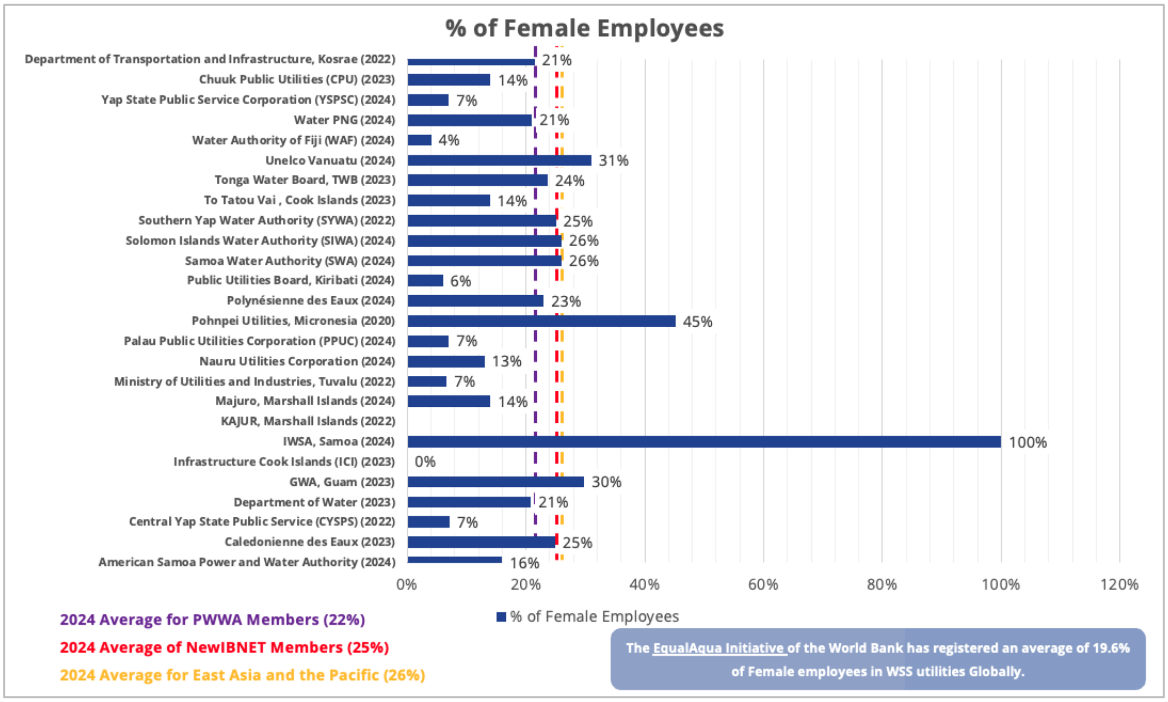


Figure 39: Percentage female employees

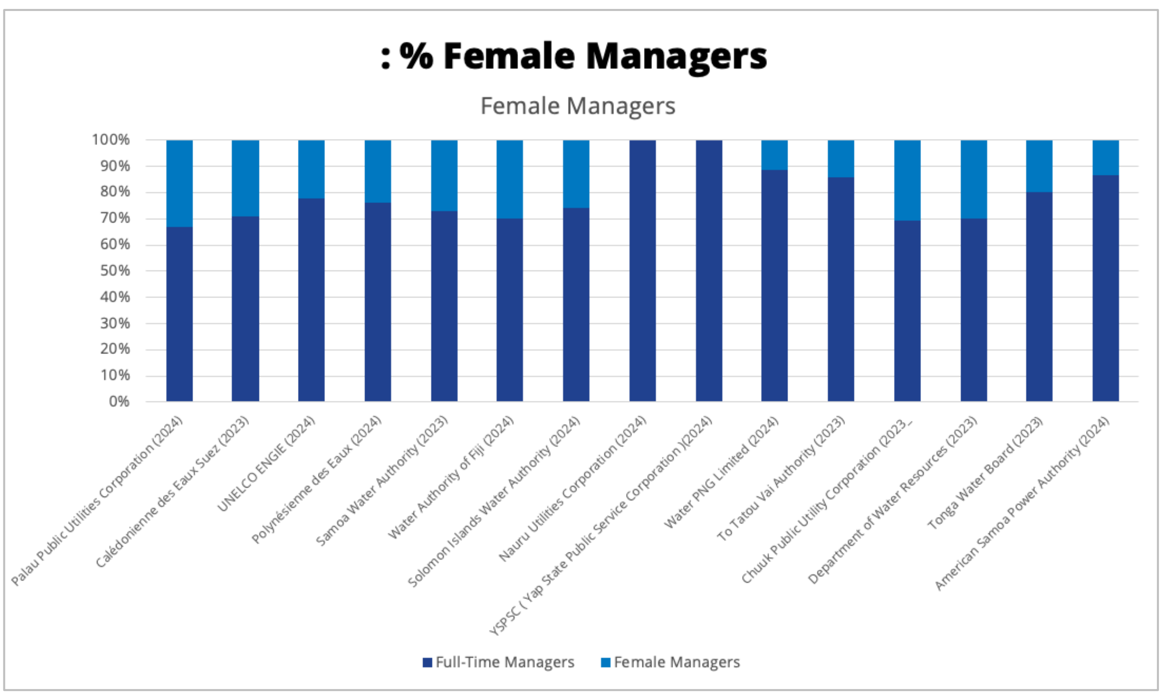


Figure 40: Percentage Female Managers

INTERPRETATION NOTE

Differences may reflect workforce structure, occupational distribution, recruitment pathways, and the maturity of leadership development systems. Results should be treated as indicative where data availability is limited. Where management data are not reported, Figure 40 should be omitted or clearly labelled as "data not available".

Inclusion is also an operational resilience issue. Broadening pathways for women and youth can expand the local technical talent pool, strengthen community trust in services, and improve retention—particularly when paired with practical mentoring, safe workplaces and structured progression from trainee to competent operator.

4.5 Key insights and implications

4.5.4 Diagnostic patterns to look for

Common patterns that typically emerge from benchmarking include:

- Low collection + weak cost coverage**:** immediate cashflow and O&M sustainability risk.
- High collection + weak cost coverage: cash discipline is reasonable, but tariffs/subsidies and/or cost pressures limit viability.
- Rising costs over time: increasing exposure to energy, logistics, contractor reliance, or ageing assets.
- Workforce constraints: staffing intensity and skills availability constrain operational performance and limit improvement capacity.

4.5.5 Practical priority actions (no-regrets)

Depending on the diagnostic pattern, typical priority actions include:

- Strengthen billing and collection systems: improve customer registers, increase metering where feasible, reduce billing errors, and formalise arrears management with affordability-sensitive support for vulnerable customers.
- Protect and target O&M funding: prioritise preventive maintenance and critical spares to avoid reactive cost escalation and service failures.
- Reduce controllable cost drivers: NRW reduction, energy efficiency, operational optimisation, and procurement improvements.
- Invest in workforce capability and retention: strengthen operator training, supervision coverage, safety systems, and management development pathways, including inclusive recruitment and leadership opportunities.

4.5.6 Implications for policy and partner support

For governments and development partners, benchmarking signals can support more targeted interventions, including:

- linking investment decisions to realistic O&M and workforce requirements;
- tailoring financial support to clear performance and reporting improvements; and
- supporting reforms that improve revenue collection, cost visibility, and operational resilience.

PART 5

FROM BENCHMARKING TO ACTION: UTILITY SUPPORT AND NEXT STEPS

5.1 From Benchmarking to Action: Utility Support and Next Steps

PURPOSE

This report provides a structured view of performance signals across Pacific utilities. The next step is to ensure that benchmarking is not only *reported* but also *used*—and that the underlying dataset becomes stronger, more comparable, and more decision-ready each year.

Part 5 sets out a practical support package and next steps for utilities, PWWA and partners to:

- improve data quality, completeness and consistency (especially for high-value operational KPIs);
- make benchmarking easier to maintain despite staff turnover and constrained data systems;
- support utilities to translate results into targeted operational and investment actions; and
- progressively expand the scope of benchmarking (including sanitation where appropriate) while maintaining confidence and comparability.

This is intended as a light, implementable plan for the next cycle, not a new reporting burden.

5.1.1 What utilities and stakeholders asked for

Across the region, a consistent message emerges: utilities want benchmarking to do three things well:

1. **Be credible and comparable** (clear definitions, stable denominators, consistent units, confidence notes).
2. **Be practical and usable** (clear "so what" guidance that supports prioritisation and realistic improvement pathways).
3. **Be sustainable to maintain** (simple handover processes, templates, and support for smaller teams and hybrid/non-networked service models).

These needs are particularly important in contexts where data is spread across multiple systems (or logbooks), and where turnover can disrupt reporting continuity.

5.1.2 Priority data-strengthening focus areas for the next cycle

To lift overall confidence without trying to solve everything at once, the recommended focus is a minimum data-strengthening package targeted at indicators that are most decision-relevant and most used in interpretation across the report.

Minimum package (recommended to prioritise for 2026 reporting):

- **Service population and coverage denominators**
  Confirm service area population and served population definitions; document estimation methods where direct counts are not available.
- **Continuity/hours of service**
  Confirm calculation method (average hours/day, share of population with 24/7, zone variation); document within-utility variation where relevant.
- **Production, billed consumption and NRW**
  Lock units and time basis; confirm meter reading basis and treatment of bulk/community supply; document any estimation steps.

- **Core financial sustainability signals**
  Confirm billed revenue, collected revenue and operating expenditure boundaries; document whether costs are cash or accrual and what is included/excluded.
- **Wastewater (where sewer networks exist and data is available)**
  Confirm service population and basic network/operations denominators first (connections, length, key incidents), before expanding to more complex metrics.

Documentation principle: where direct measurement is not feasible, proxy methods are acceptable—provided the method is explicitly documented and consistently applied year-to-year.

5.1.3 Utility support package

To strengthen reporting and usability, the following support elements are proposed for the next benchmarking cycle.

Element	Description	Output
A. Benchmarking results deep dive (online)	A structured session to walk utilities through the main results, interpretation notes, and common drivers behind the patterns observed (e.g., reliability–NRW–cost recovery linkages). The goal is to help each utility identify a small number of priority actions for the year ahead.	• utility action prompts (what to confirm, what to investigate, what to prioritise); • a short "results interpretation guide" aligned to the report's typology lens.
B. KPI clinics: practical data entry, validation and unit consistency	Short, hands-on sessions focused on: • unit conversions and time bases (volumes, lengths, currency boundaries); • denominator consistency (service population, connections); and • common validation checks (plausibility ranges, internal consistency rules)	• a simple validation checklist embedded into the submission workflow; • clearer confidence notes to accompany results where inputs remain uncertain.
C. Benchmarking support toolkit (templates + guidance)	A lightweight toolkit to reduce effort and improve consistency, including: • reporting templates with embedded unit prompts and definition reminders; • a "data dictionary quick guide" for high-value KPIs; and • examples of acceptable proxy methods and how to document them.	• fewer submission errors; • improved year-to-year continuity and comparability.
D. Benchmarking handover manual (staff turnover continuity)	A short handover package that helps utilities keep reporting consistent when roles change, including: • who owns which data sources (operations, billing, finance, lab); • where the data is stored; • how calculations are performed; and • what assumptions are being used.	• reduced loss of institutional knowledge; • less rework during each annual cycle.

Element	Description	Output
E. Small utilities / non-networked services translation guide (proxy KPI guidance)	For utilities and service organisations operating hybrid or non-networked supply models (e.g., trucked supply, standpipes, rainwater supplementation), force-fitting standard network KPIs can reduce comparability. A translation guide would define: • when proxy indicators are appropriate; • minimum metadata and assumptions required; and • how to preserve comparability without excluding smaller services.	• more inclusive participation; • better interpretability of results for Group 3 contexts.
F. SDG alignment guidance (useful, but not a substitute for SDG reporting)	Provide a practical mapping note showing how the benchmarking dataset can support interpretation and triangulation of SDG reporting, while maintaining clear boundaries on what benchmarking can and cannot claim.	• clearer "use cases" for governments and partners; • reduced risk of over-interpretation.
G. Wastewater metrics guidance (stepwise expansion)	Where utilities have reticulated sewerage systems, a stepwise approach is recommended: 1. lock basic service population and network denominators; 2. strengthen core operational signals (connections, length, incidents); then 3. progressively expand to financial and service sustainability indicators as data confidence improves.	• wastewater benchmarking that grows with confidence, not complexity.

5.1.4 2026 action plan (who does what, and when)

The table below provides a practical roadmap for the next cycle.

Activity	Indicative timing	Lead	Utility role	Output
Results deep dive webinar	Q2 2026	PWWA	Attend; identify 3–5 priority actions + data fixes	Utility action prompts + interpretation guide
KPI clinics (units, denominators, validation)	Q2–Q3 2026	PWWA + partners	Bring operational/billing/finance focal points	Validation checklist + reduced unit errors
Benchmarking support toolkit (templates + guidance)	Q2 2026	PWWA	Adopt templates; document proxy methods	Consistent submissions + clearer metadata
Benchmarking handover manual	Q2 2026	PWWA	Implement locally; store in shared drive	Reporting continuity despite turnover
Small utility / non-networked translation guide	Q3 2026	PWWA + utilities	Provide feedback from Group 3 contexts	Proxy KPI guidance + improved inclusion
SDG alignment guidance note	Q2–Q3 2026	PWWA	Use for stakeholder communication	Clear SDG linkage boundaries
Wastewater metrics guidance (stepwise)	Q3–Q4 2026	PWWA	Confirm minimum denominators first	Stronger wastewater module readiness
Next cycle engagement + submission	Q4 2026	PWWA	Compile and submit dataset	More complete, comparable dataset

Note: timing can be aligned to PWWA's existing annual cycle and partner availability; the core principle is to complete support activities before the submission window opens.

5.1.5 What success looks like by the next report

A realistic set of targets for the next cycle could include:

- Increased participation (especially sustained participation year-to-year).
- Improved completeness for the minimum data-strengthening package (coverage, continuity, NRW inputs, core finance).
- Clearer confidence notes and fewer unit/denominator inconsistencies.
- Better utility uptake of benchmarking as an annual planning tool (evidenced by a small set of tracked actions per utility).

5.1.6 Closing note

Benchmarking is most valuable when it becomes a practical habit: a repeatable annual cycle that strengthens the evidence base, supports peer learning, and helps utilities prioritise improvements under real constraints.

The support package above is designed to reduce reporting effort, increase consistency, and ensure the benchmarking programme continues to mature in a way that is useful for utilities and credible for stakeholders.

Appendix A (Methods and Data Confidence)

Methods, definitions, and data processing

Appendix A explains how indicators are defined, calculated and summarised, and how data confidence and limitations should be applied when interpreting results. This provides the technical backbone for Parts 4–8, allowing the performance sections to focus on findings rather than repeating methodological caveats.

1. Indicator set and calculation principles

This report uses the NewIBNET/IBNET indicator framework adapted for Pacific contexts. Indicators are grouped to reflect the customer and service delivery logic used throughout the report:

- Coverage (reach)**:** who is served and to what extent
- Reliability and continuity (availability)**:** how much water service is available
- Production, consumption and NRW (efficiency/losses)**:** how efficiently water is produced and delivered
- Metering (commercial and data enablement)**:** ability to measure, bill and manage demand/NRW
- Drinking water quality (safety outcome)**:** service safety signals, interpreted alongside testing coverage and continuity.

DIRECT VS CALCULATED INDICATORS

Indicators fall into two categories:

- Direct (measured) inputs reported by utilities (e.g., production volumes, billed volumes, service populations, operating expenditure, billed and collected revenue, water quality testing counts).
- Calculated indicators derived from direct inputs (e.g., NRW %, production per capita, operating cost coverage, collection rate, staff ratios).

Calculated indicators are only as reliable as their underlying inputs and units. Where required inputs are missing or inconsistent, the indicator is either not calculated or is presented with caveats.

GENERAL CALCULATION PRINCIPLES

- Denominators are validated for plausibility (for example, service population not exceeding service area population).
- Per-capita indicators are calculated using the reported served population and the reported annual volume converted to daily litres.
- Where multiple reporting years exist, time series are presented only where consecutive reporting allows meaningful interpretation.

2. Data processing rules

To ensure consistency across utilities and years, the following processing rules are applied:

UNITS AND CONVERSIONS

- Volumes are standardised to m^3/year for annual reporting, with L/person/day shown where per-capita interpretation is useful.
- Length units (where reported) are converted to km for comparability.
- Rates (e.g., blockages per 100 km) are calculated only where both numerator and denominator are available and consistent.

CURRENCY AND FINANCIAL REPORTING

- Financial fields are reported in utility-submitted currency units. Where cross-utility comparison is presented, results are interpreted using ratios (e.g., cost coverage) rather than nominal currency values to avoid misleading comparisons across currencies and inflation environments.
- Where unit costs are shown, interpretation is explicitly guided by the comparability lenses (scale, logistics and service model differences).

MISSING DATA AND PARTIAL SUBMISSIONS

- Where required fields are missing, derived indicators are not calculated.
- Partial submissions may be included in "coverage" reporting where those fields are robust, but excluded from derived metrics that depend on missing denominators (e.g., NRW, cost coverage).
- Metadata and notes are treated as critical to interpretation where proxy methods or estimation are used.

3. Aggregation methods

Regional summaries are intended to support learning, not to imply a single "regional performance score". Aggregation therefore follows these principles:

- Primary statistics: medians and ranges are used for most indicators to reduce sensitivity to outliers and small-sample effects.
- Peer grouping**:** where data allows, summaries are provided by typology group to improve comparability.
- Inclusion rules**:** an indicator contributes to a summary statistic only when the underlying required inputs are present and pass basic validation checks.
- Weighted vs unweighted**:** where population weighting is used (for example, for selected coverage indicators), this is stated explicitly. Otherwise, summaries are unweighted medians across reporting utilities.

4. Data validation checks, limitations, and confidence notes

The dataset is compiled from multiple internal utility systems (operations, billing, finance, laboratory records), which vary in maturity. The report applies a consistent set of validation checks to improve reliability and transparency.

VALIDATION CHECKS

- unit and magnitude checks (e.g., volumes, population values, continuity bounds);
- internal consistency checks (e.g., billed volumes not exceeding production; served population not exceeding service area population);
- year consistency checks (e.g., sudden changes flagged for follow-up where plausible shock explanations are not documented); and
- cross-field logic checks (e.g., NRW derived only where production and billed volumes exist).

CONFIDENCE AND LIMITATIONS

Where completeness or comparability limits interpretation, the report:

- flags the limitation directly adjacent to the result;
- avoids over-interpreting small samples; and
- distinguishes between latest-year snapshots and like-for-like trends.

Where an indicator is strongly affected by known shocks (cyclone, drought, supply chain disruption), the narrative prioritises contextual explanation over implied performance judgement.