AVEVAWORLD

ACCELERATE INDUSTRIAL INTELLIGENCE

PowerWater

A Move to PI Data Infrastructure

Exploring PI in the Sky

Norah Thompson, Specialist ICT (SCADA)

Power and Water Corporation – Who we are, 4 service utility

Service area map

What we do

Water and wastewater

We provide water and wastewater services to urban and remote customers across the Northern Territory. We manage ground and surface water supplies, and wastewater treatment plants as well as water and sewerage pipelines.

Learn more

Power networks and distribution

In most major centres, we distribute electricity through the power networks we maintain, from the wires to the meters. This power is then sold to customers by their selected energy retailer.

Learn more

Serving remote customers

Power and Water supplies electricity, water and sewerage services in 72 remote communities. Unlike urban centres, in remote areas we generate, distribute and retail power.

Learn more

Distibuting electricity to over **244,000** people

and providing safe drinking water and wastewater services

while maintaining

37,500km of poles and towers

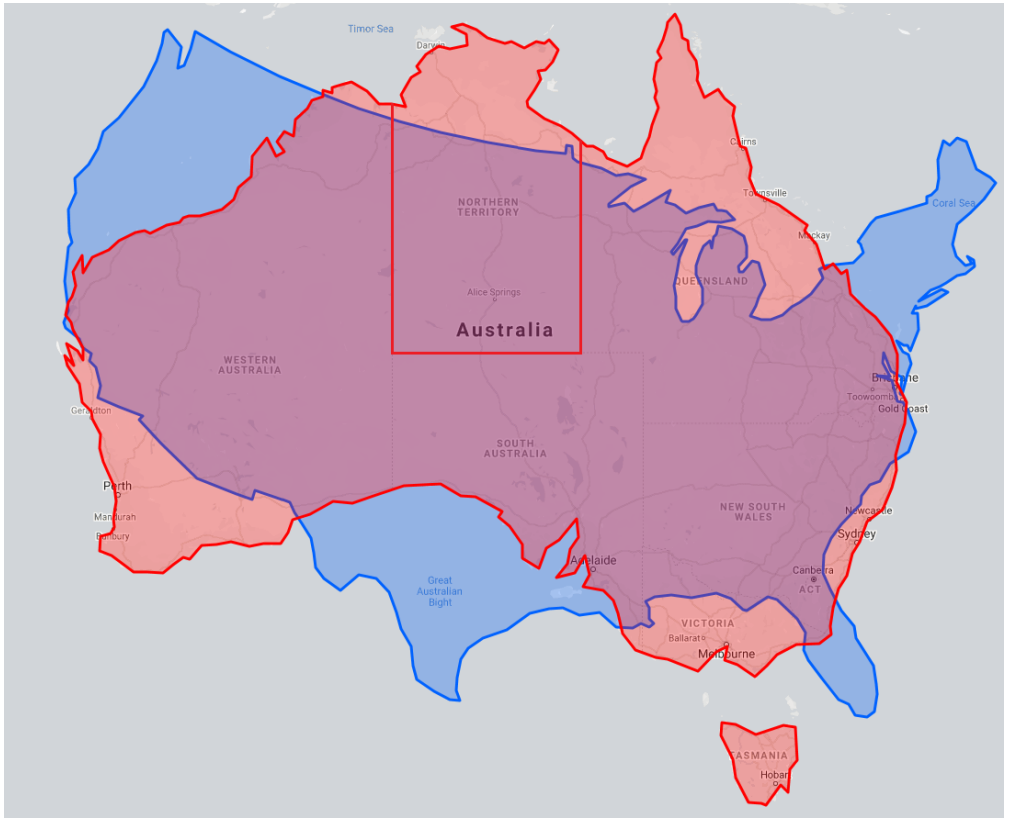
10,520km of overhead lines

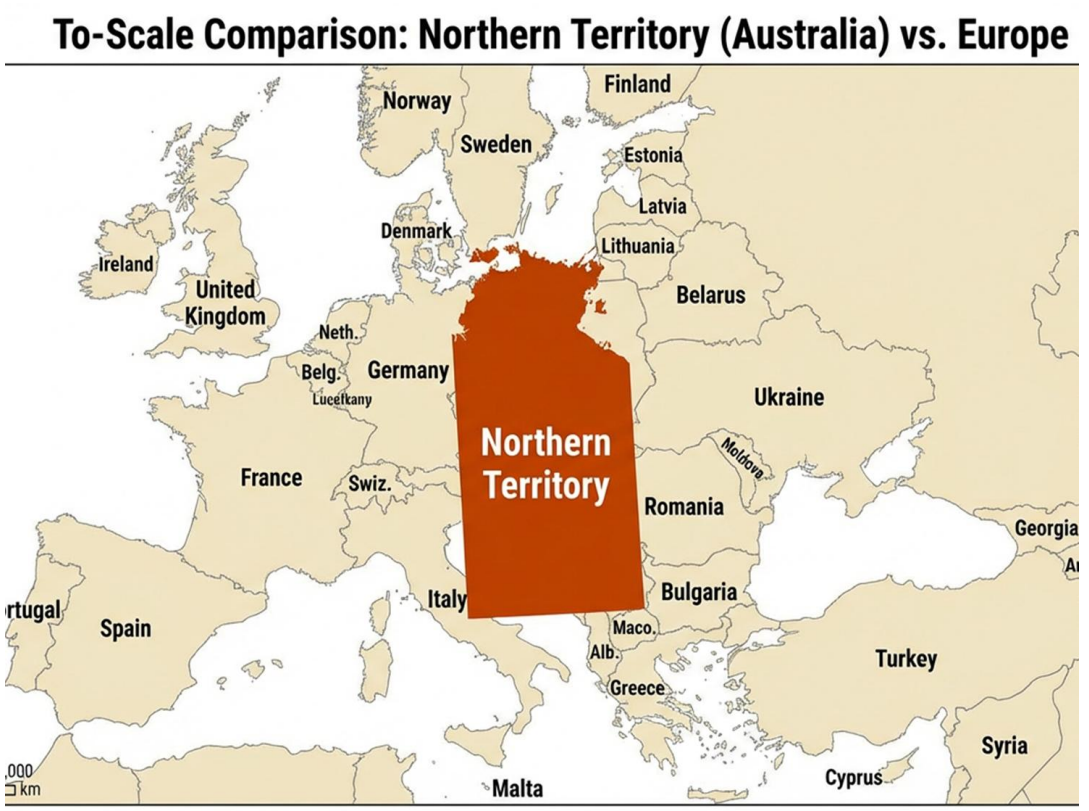
3,012km of water mains

1,608km of sewer mains

across **1.3 million km²** of the Northern Territory

Power and Water Corporation – Where we are





PowerWater

Remote work hazards


WELCOME TO KINTORI

Find the meter

Reconciliation Action Plan

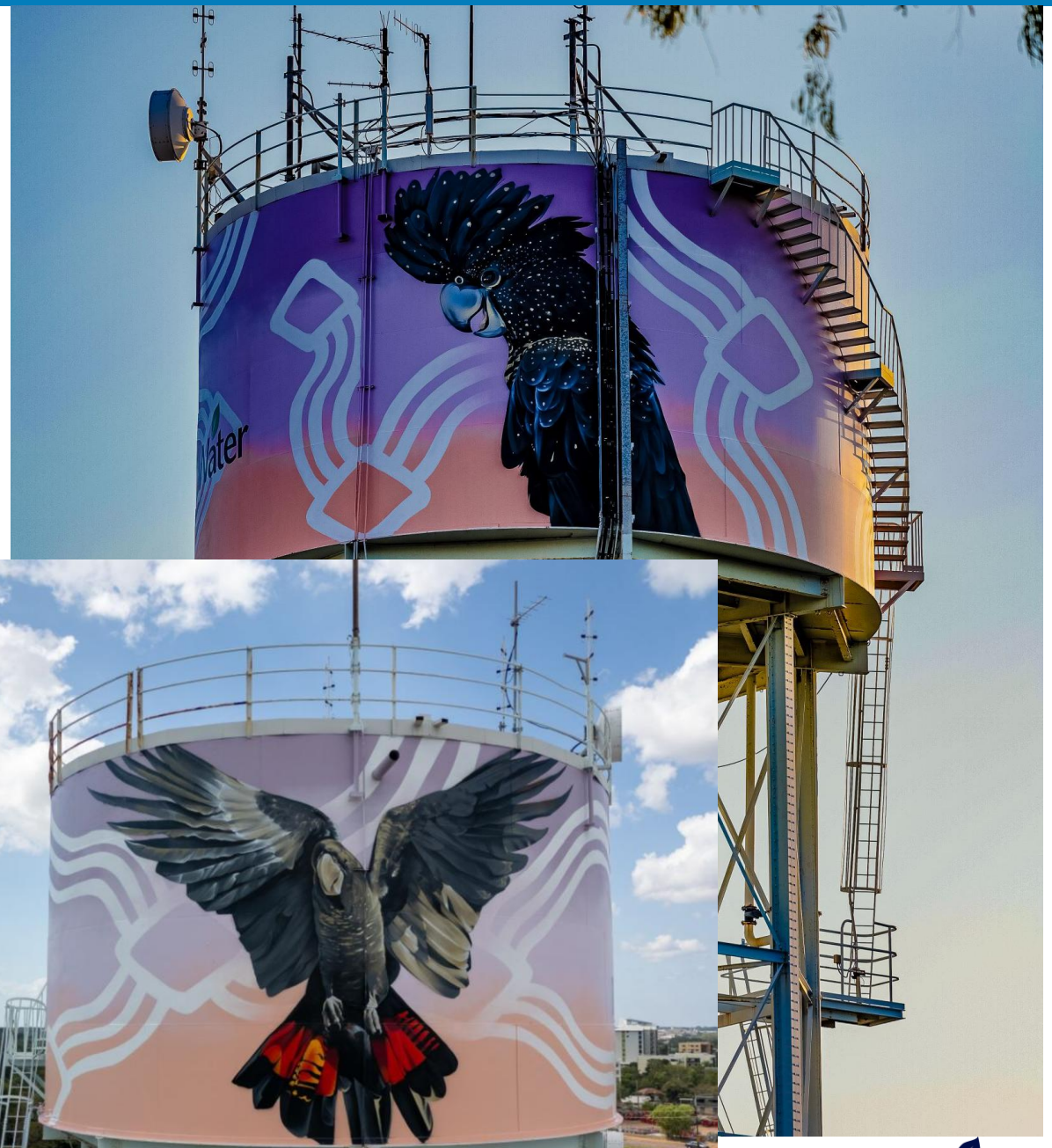
Acknowledgement of Country

“On behalf of Power and Water Corporation we acknowledge the Larrakia people as the Traditional Owners of the Darwin region and the land that we meet on.

We pay our respects to the Larrakia elders both past, present and future.”

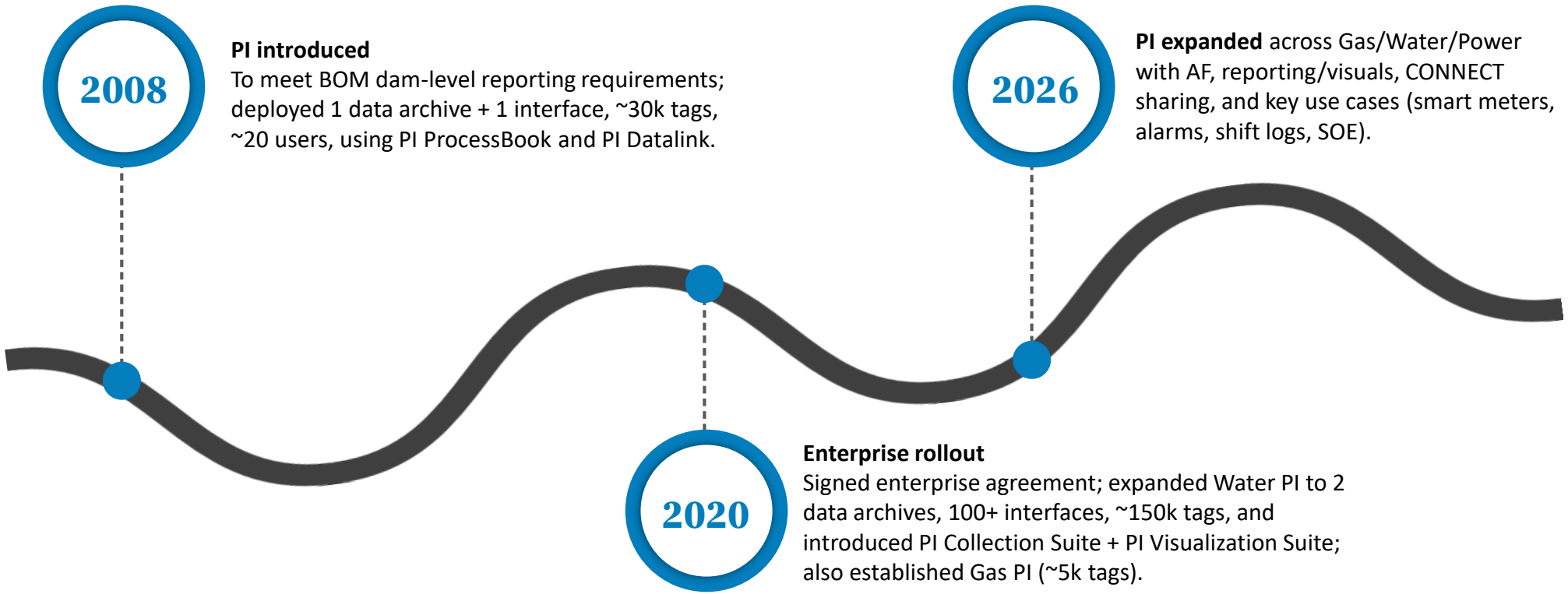
Power and Water completed its first Innovate Reconciliation Action Plan (RAP) in June 2019 and collaborated with key stakeholders to develop the second Innovate RAP for 2023–2025.

The first Northern Territory Government-owned corporation or department to create a RAP, we are working on the next phase of our reconciliation journey under the Stretch RAP 2025 to 2028.



Power and Water PI System Journey

“Once you actualize, you will never go back!”

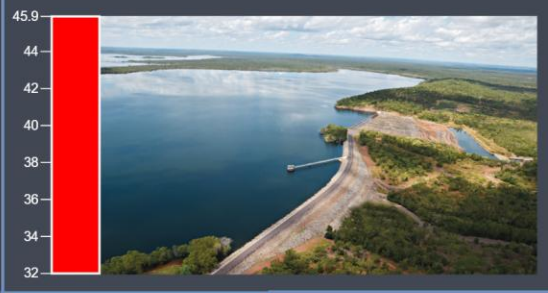


Water PI System Journey

AVEVA™ PI Vision™ | New Display | PAWA\NGT

DRD Level Information

CURRENT DAM LEVEL

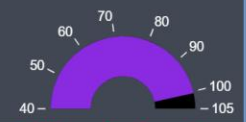


DRD Current Level
45.913 m
Full Supply Level
45.86 m

Stage 1 - Water Restriction
38.38 m
Dead storage
32 m
Zero volume
28 m

CURRENT CAPACITY

100.53 %



Current Water Surface Area
0 km2

Operating Volume (above dead storage)
290.16 GL

SPILLWAY

Position of level relative to the spillway
ABOVE by
0.051998 m

The projected date/time that the level will reach 'Full Supply Level'
No Data
0days

DRD Daily Level

Previous 7 days

Description	Value	Units
Current at 9am	45.912	m
1 day ago	45.926	m
2 days ago	45.937	m
3 days ago	45.948	m
4 days ago	45.942	m
5 days ago	45.942	m
6 days ago	45.954	m
7 days ago	45.958	m

Daily Delta Level

Previous 7 days

Description	Value	Units	Description	Value
Current at 9am	-0.0095024	m	Current at 9am	DECREASED
1 day ago	-0.0087471	m	1 day ago	DECREASED
2 days ago	-0.012001	m	2 days ago	DECREASED
3 days ago	-0.0012512	m	3 days ago	DECREASED
4 days ago	0.0072479	m	4 days ago	INCREASED
5 days ago	-0.013	m	5 days ago	DECREASED
6 days ago	-0.012001	m	6 days ago	DECREASED
7 days ago	0.037003	m	7 days ago	INCREASED

Total Rainfall at 9am

Previous 7 days

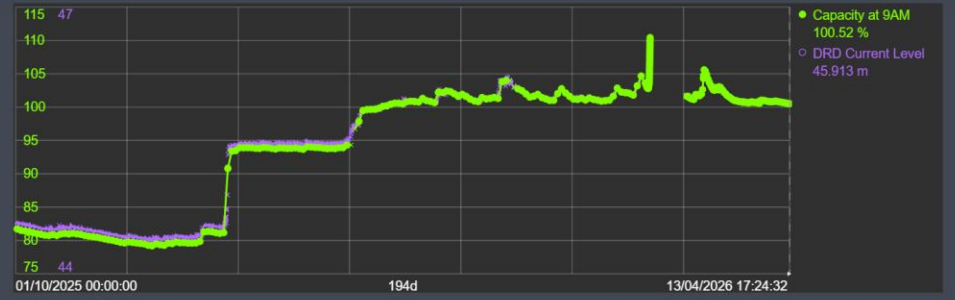
Description	Value	Units
Total since 9am	0	mm
1 day ago	0	mm
2 days ago	0	mm
3 days ago	0	mm
4 days ago	17	mm
5 days ago	13.2	mm
6 days ago	0.6	mm
7 days ago	1.4	mm

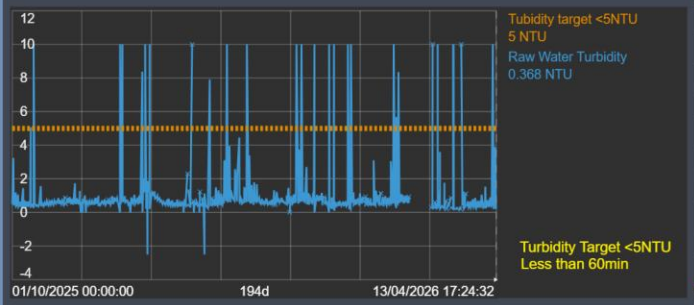
Capacity previous years

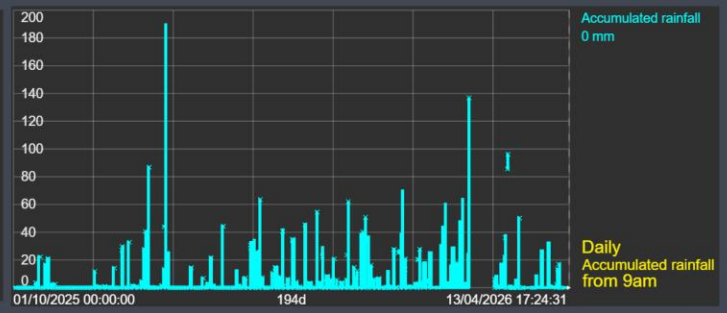
Description	Value	Units
0. Current	100.52	%
1 year ago	98.354	%
2 years ago	99.28	%
3 years ago	100.32	%

Level previous years

Description	Value	Units
0. Current	45.913	m
1 year ago	45.782	m
2 years ago	45.831	m
3 years ago	45.878	m







DRD reached full capacity:
29 Jan 2018; 24 Mar 2022; 04 Jan 2023
8 Feb 2024; 30 Dec 2025

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Darwin River Dam March 9 2026

GAS PI System Journey

Why use PI System?

Empowers Gas Services to manage data seamlessly throughout the entire supply cycle—from the initial stages right through to billing. This really showcases how PI covers the process end-to-end, making data handling smoother and more efficient;

Scalability alongside Gas Services means it can support our expanding needs as we continue to evolve, ensuring we're always ready for future demands.

Power Services PI System Journey

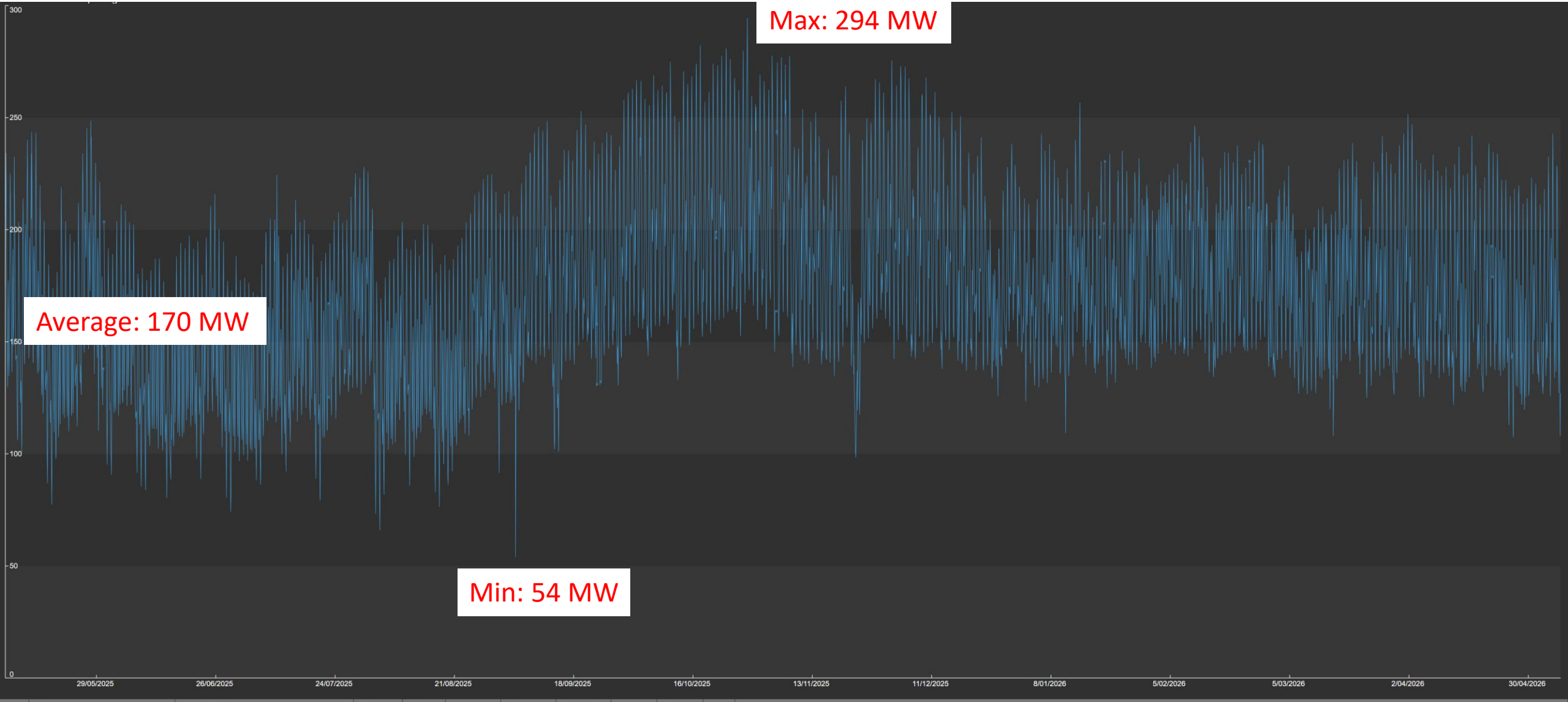
Data hungry team – Solar (VRE) drives the requirement for more data

Tools developed SFURM - Firming Reserve.

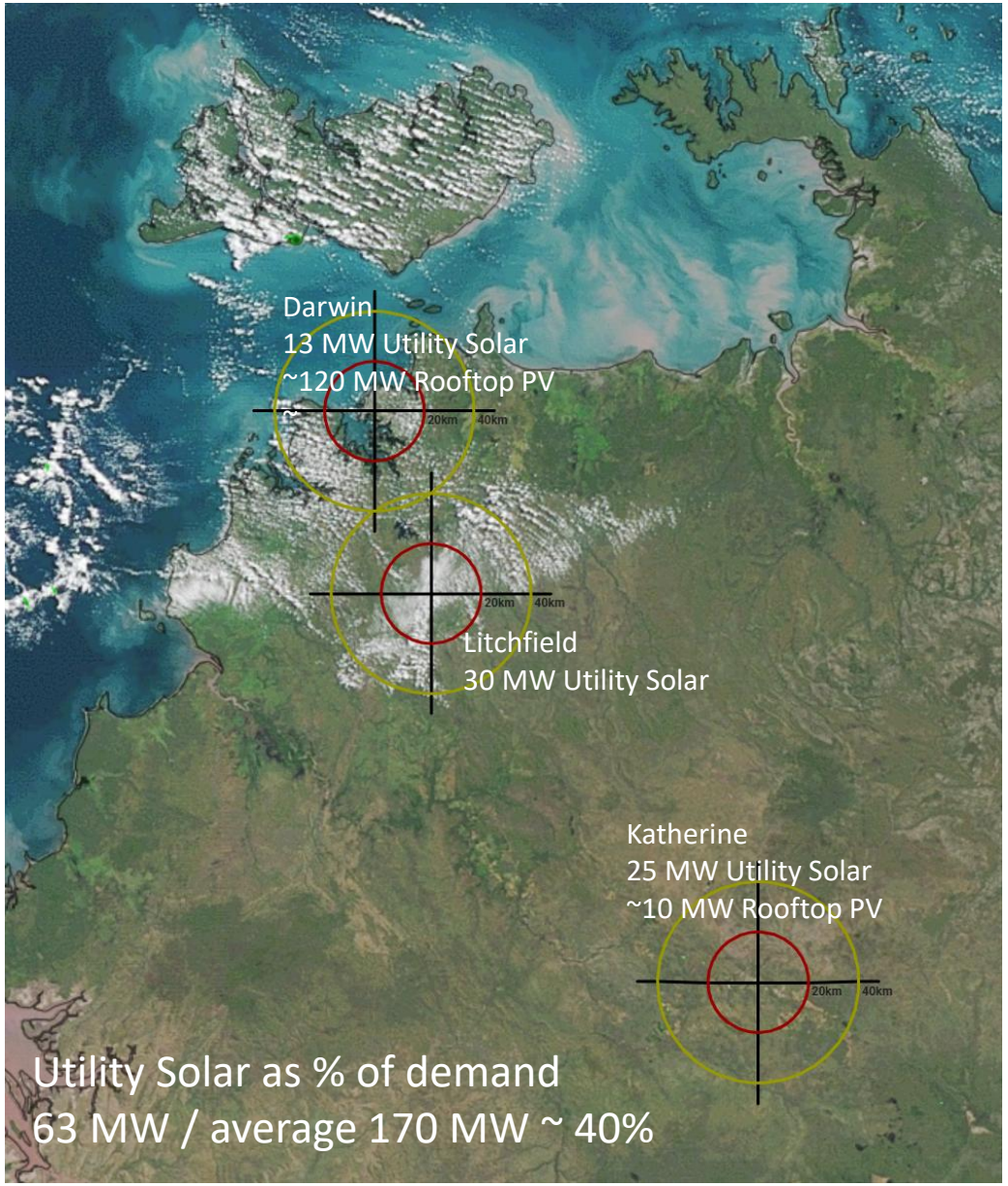
Rapid prototyping and testing requirements. Trial and proof of concept before implementation of EMS tools.

Small team need self reliant and intuitive tools like PI to help with productivity

DKIS Power System: 2025 – 2026 Demand

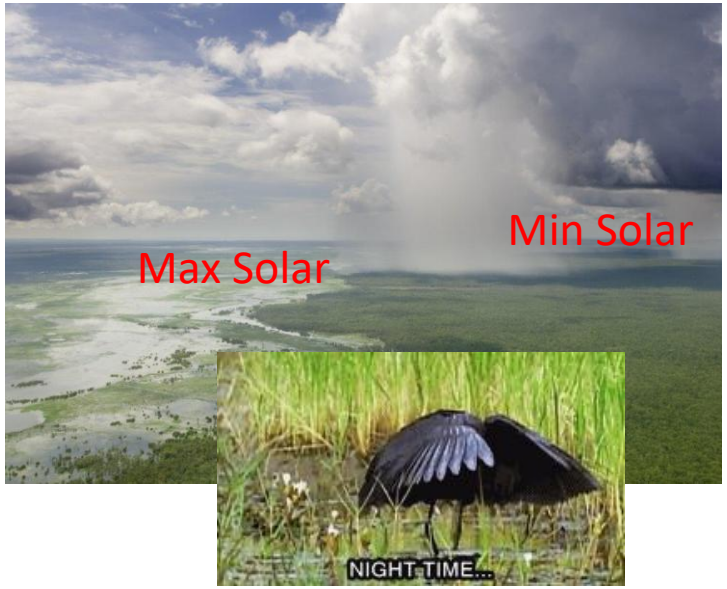


Name	Description	Value	Units	Average	Minimum	Maximum	Bottom	Top
SUBSTN.ZCALC.GLOBAL.CALC_ALG11.-.	Zcalc Global CALC Analogue 11 - Output	127.02		170	54.011	294.49	0	300

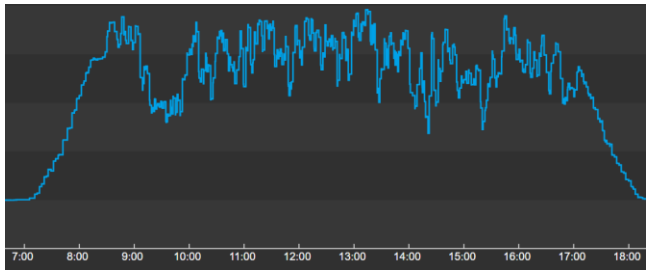


Challenges:

1. Wet season weather – Fast forming and moving Tropical Thunderstorms -> Volatile Solar Generation



Solar Generation



2. Forecast input (satellite input only updates every 10min and fully processed forecast input data 20 to 30min) ref

Question: How much reserve should we hold to manage the volatility and forecast uncertainty and ensure continuous, reliable, power supply?

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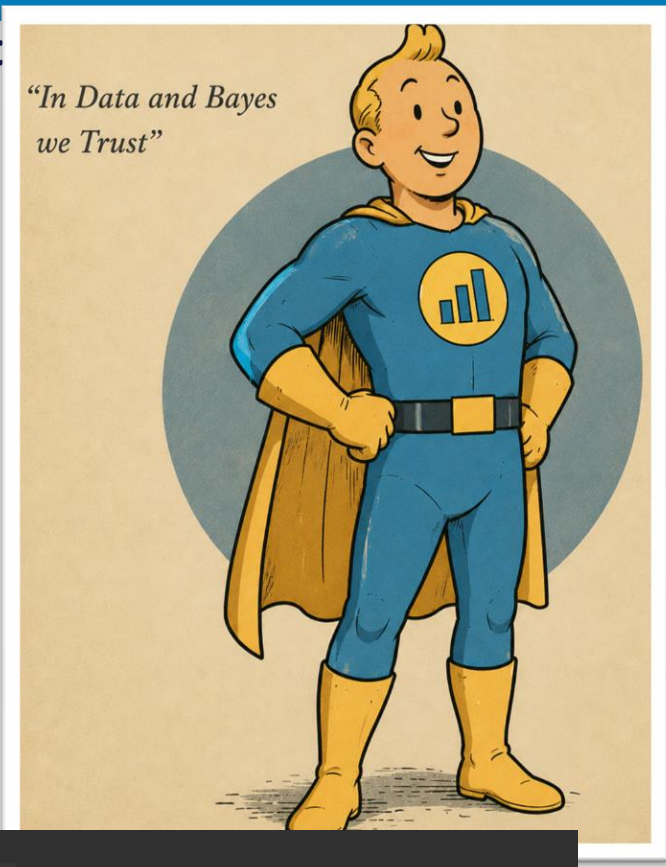
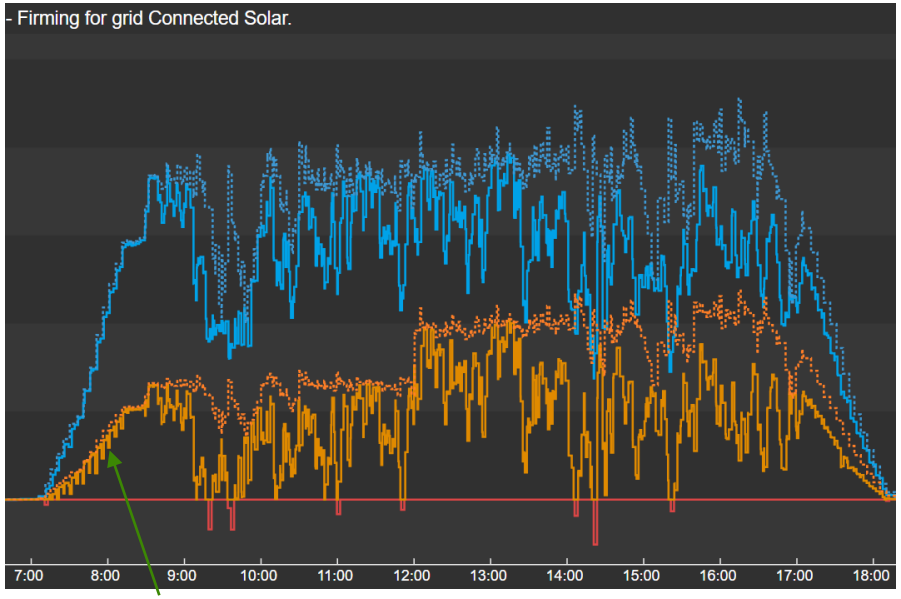


- For this we need to use probabilistic and ML methods!
- These methods are very data (driven) hungry!

How PI helps? Two-Fold: the Analysis and for System Monitoring Tools

1. It is our historian and source of data! Without it, data collection and cleaning would be scary.
   - Currently using PI datalink and hopefully soon PI Connect (or SDK)!
2. Developing System Monitoring Tools using PI AF Calcs and PI Vision Calcs
   - Prototyping on 'live SCADA data' without needing to directly interface with EMS in the early stages.
   - Quickly iterate and iron out methodology flaws, calculation bugs and discover edge cases early.
   - Interactive stakeholder engagement and useful communication tool for new ideas.
   - Provides a solid foundation before EMS/Production system implementation.



Find the 'Goldy Locks' reserve amount
- Not too much and not too little.. Just Right!

Reserve Tracking

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Meter Health Monitoring

***Industry Accelerator for water* Lighthouse**

Challenge

Smart meter data can be unreliable (zeros, abnormal flow, or missing data), limiting confidence in consumption visibility and requiring manual investigation across a large meter fleet.

Objective

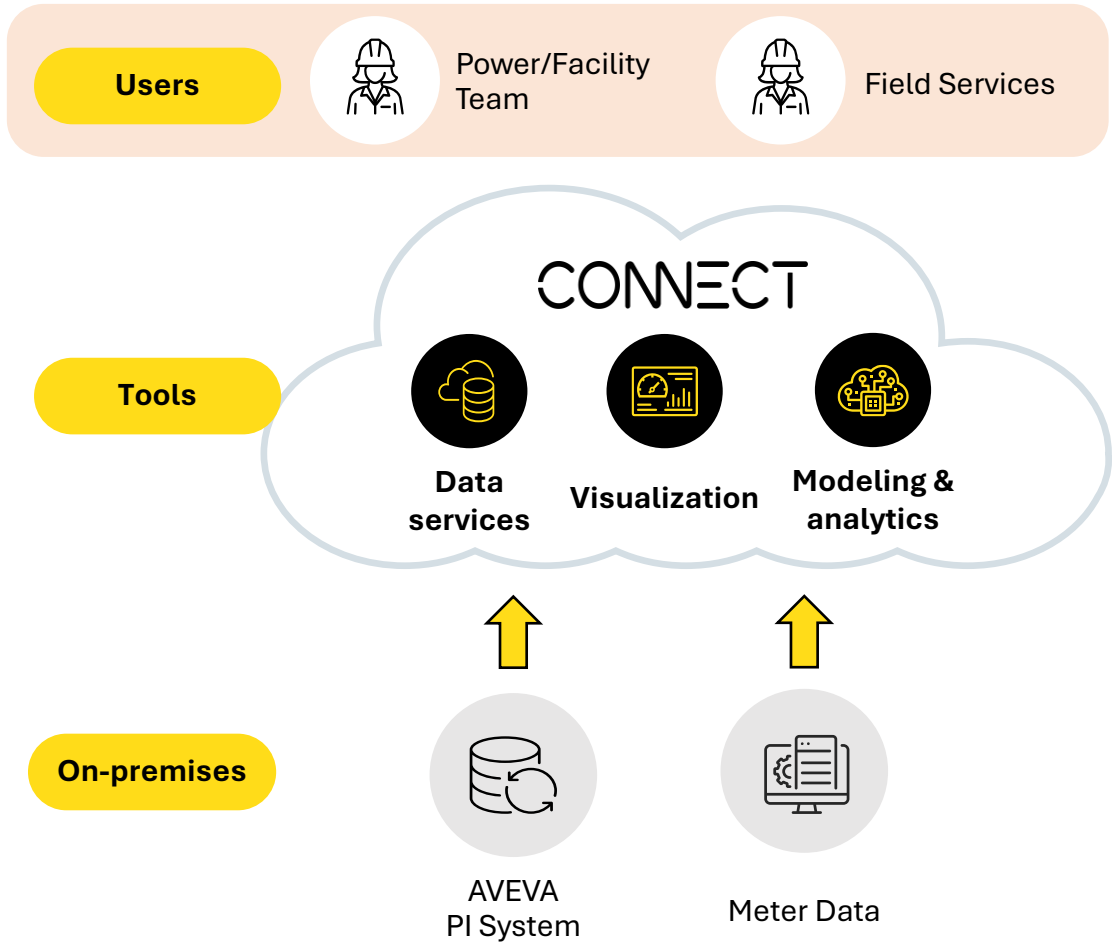
Provide a consistent meter-health view and history so teams can quickly detect, triage, and track leak/no-flow/no-data conditions and improve reporting reliability.

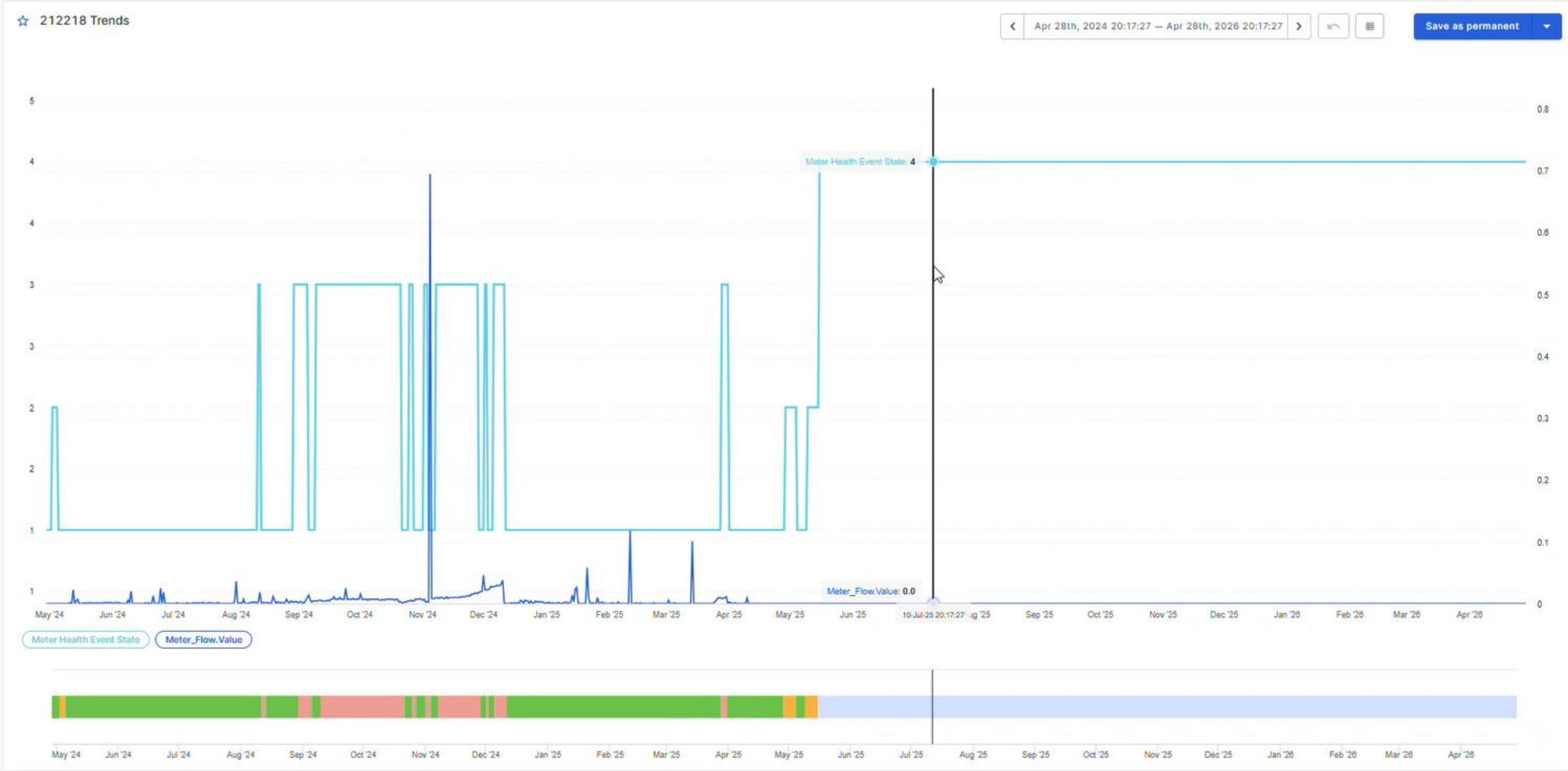
Solution

With AVEVA's *Industry Accelerator for Water*, creating smart meter twins from a shared class and run a single class-level health thread that assigns standard health states and triggers priority-based alerts.

Progress & Findings

Scaled from a single-meter demo to ~246 meters, with active alerts and trended health states improving visibility into problematic meters and supporting identification of reliable meters for reporting.




212218 Trends
Apr 28th, 2024 20:17:27 — Apr 28th, 2026 20:17:27
Save as permanent
Meter Health Event State: 4
Meter_Flow.Value: 0.0
May '24
Jun '24
Jul '24
Aug '24
Sep '24
Oct '24
Nov '24
Dec '24
Jan '25
Feb '25
Mar '25
Apr '25
May '25
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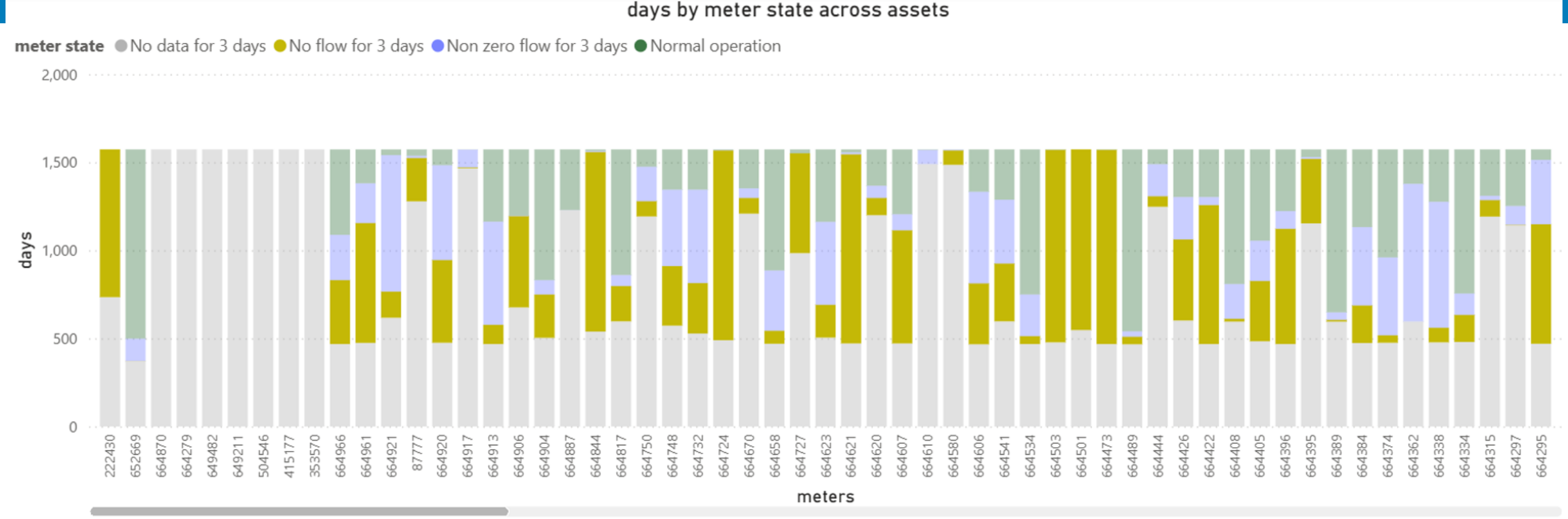
Feb '26
Mar '26
Apr '26
Meter Health Event State
Meter_Flow.Value

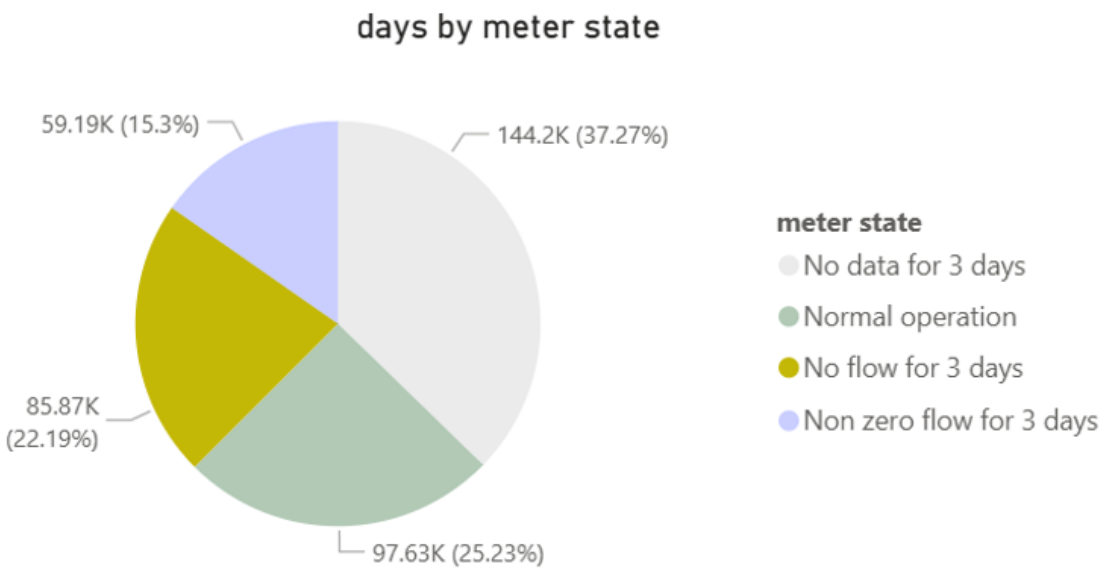


Value.querySmartMeterHeal...

- [ ] ACTIVE
- [ ] CLOSED

Value.querySmartMeterHealth....

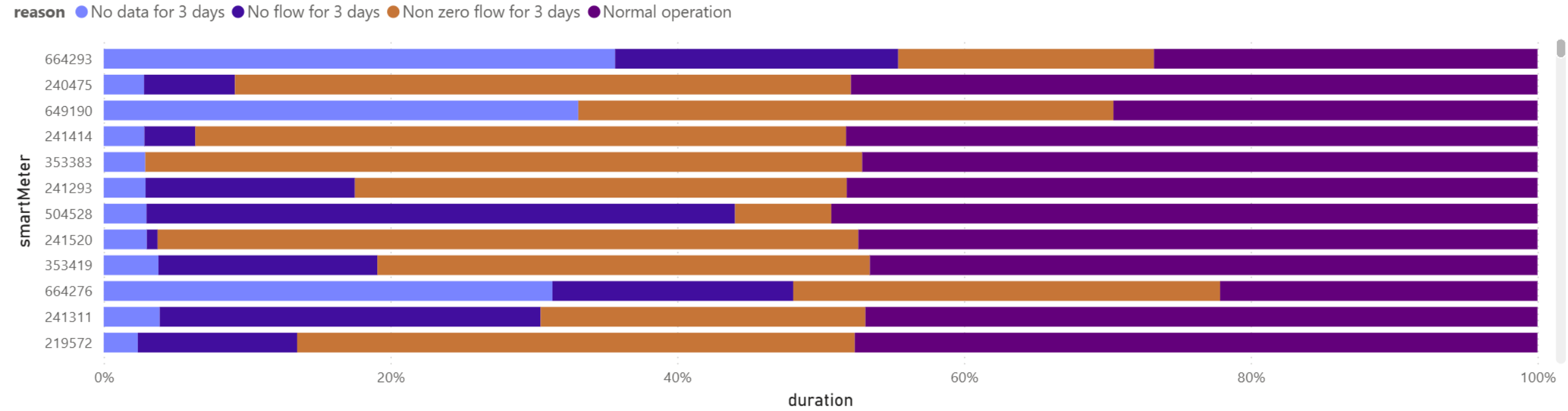
- [ ] No data for 3 days
- [ ] No flow for 3 days
- [ ] Non zero flow for 3 days
- [ ] Normal operation



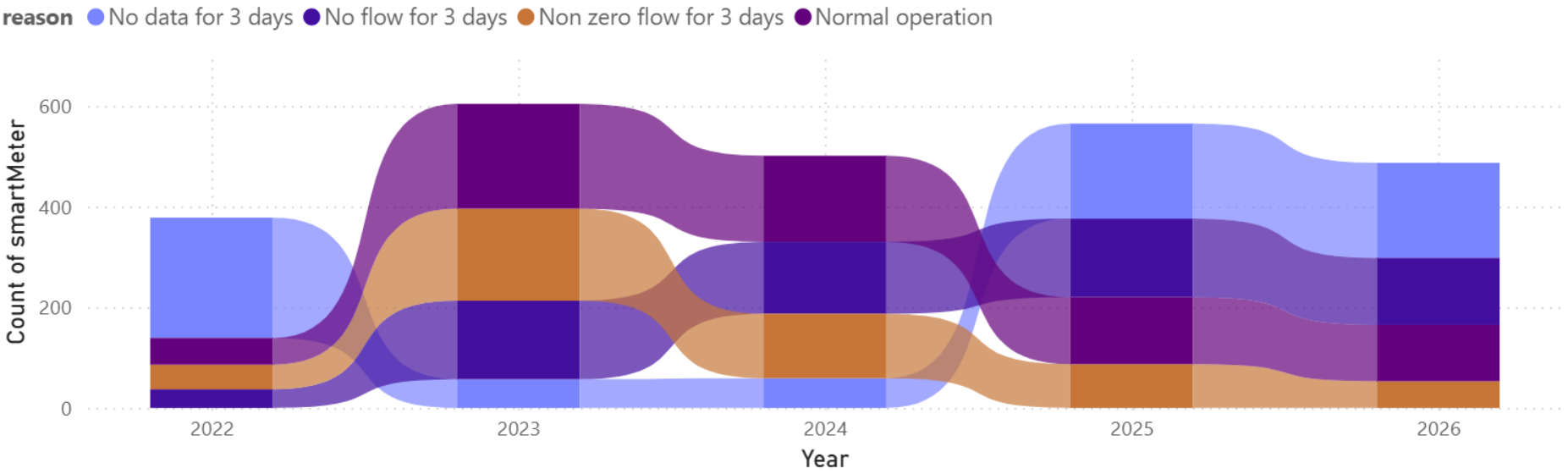
226

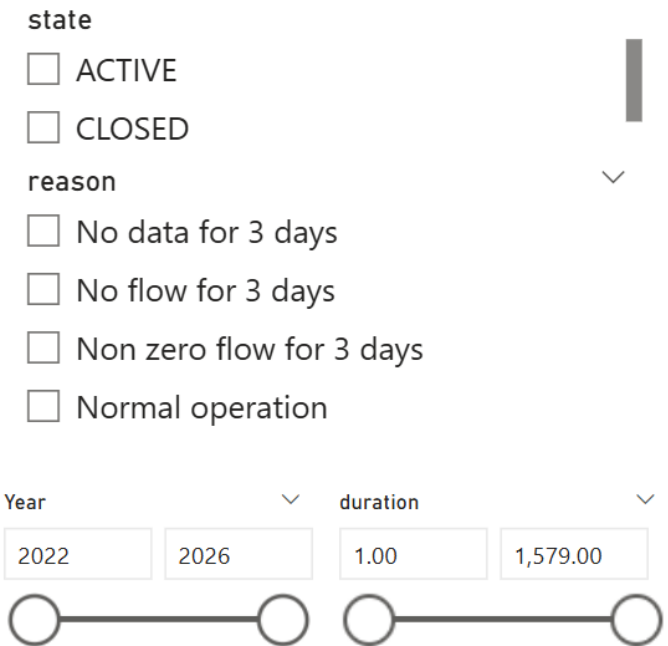
Meters in report

total reason duration smartMeter



smartMeter by Year and reason





Building Data Collection

CONNECT Use Case

Challenge

The Building Management System (BMS) operates separately from operational systems, limiting real-time access to environmental and safety data and reducing visibility on occupancy and project impacts.

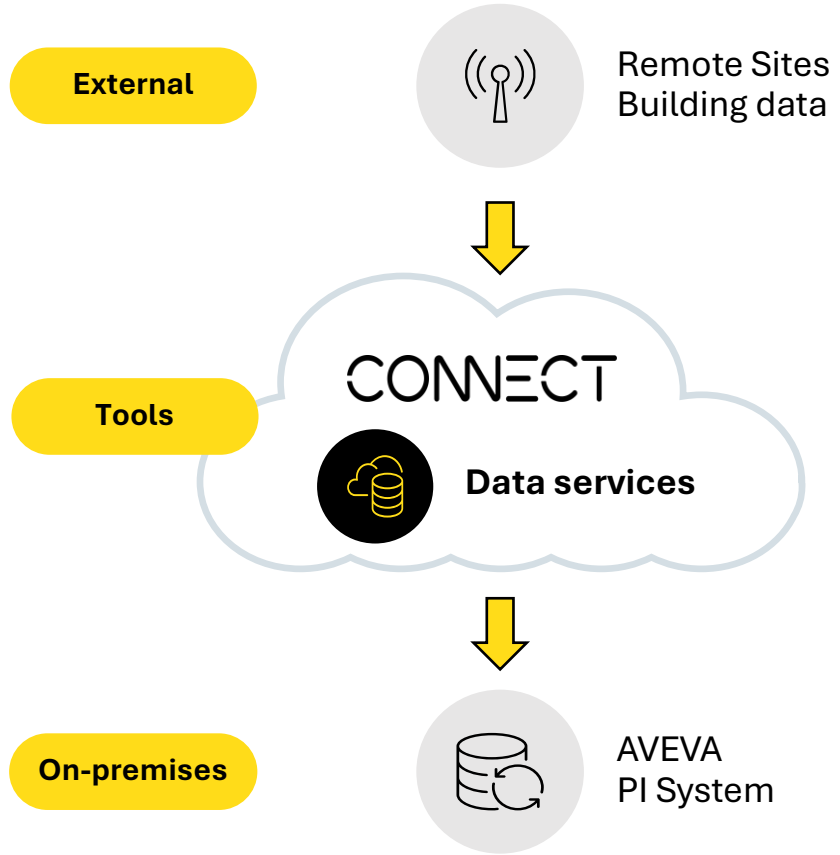
Objective

Capture building data such as HVAC temperature sensors, fire alarms, and CO_2 sensors to better understand CO_2 movement, manage onsite occupancy, and assess the impact on project schedules and personnel safety.

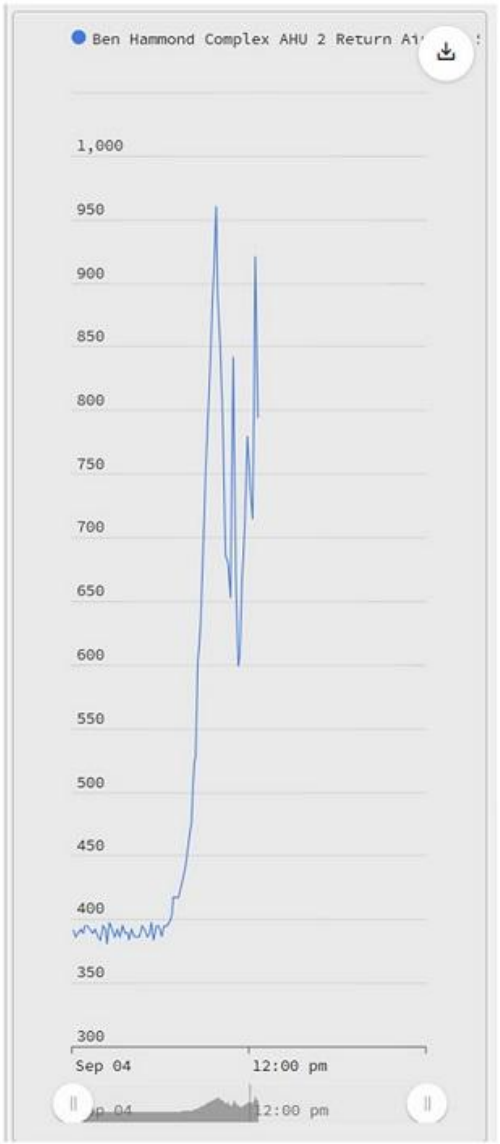
Proposed Solution

Deploy physical sensors across the site and connect them directly to CONNECT, enabling continuous real-time ingestion of BMS data.

This centralized approach provides operational teams with actionable insights to monitor environmental conditions, optimize occupancy, and make informed decisions to maintain safety and project efficiency.



Building Management Data



POWER AND UTILITIES | AUSTRALIA

Power and Water Corporation delivers a trusted data foundation for remote, complex grids

Challenge

- Power data was difficult to scale and govern across vast distances
- Increasing solar and variable generation added operational complexity
- Complex calculations in dashboards slowed performance and decision-making
- Teams needed faster, safer ways to test and operationalize new ideas

Solution

- Power and Water Corporation extended its existing AVEVA™ PI System™ with AVEVA™ PI Data Infrastructure and CONNECT to scale governed operational insight beyond the control room and support reliable, remote operations.

Results

- **Ensured safe, reliable remote operations across geographically dispersed power assets**
- **Improved confidence in operational and grid decisions**
- **Faster access to trusted, action-ready power data**
- **Enabled rapid prototyping, testing, and promotion from development to production**
- **Established scalable foundation for predictive and advanced use cases**
- **Unlocked building management data to baseline water and energy use and gain near-real-time insight into IoT sensors and HVAC performance**

PowerWater

Thank you

Questions and Croc stories

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