THE SUBURBAN HOMESTEAD PROJECT

HOT WATER, REIMAGINED: TIM & KATE'S SWITCH TO A RECLAIM CO2 HEAT PUMP HOT WATER SYSTEM

Ethically Kate

Project partners:

Installation team - Mainly Energy and Mainly Gas and Plumbing

Supplier - Conolidated Energy

CONSOLIDATED ENERGY

MAINLY ENERGY

MGP Mainly Gas & Plumbing Services

HOT WATER SOLUTIONS

cogo

Part 1: Meeting the Household, the Install, and the First Real-World Power Savings Report

ABOUT THE PROJECT

The Suburban Homestead Project exists to prove that a typical, ageing suburban house can be transformed into an efficient, resilient, and genuinely self-sufficient home without moving to a lifestyle block. As part of that mission, this report documents the first major electrification and efficiency upgrade carried out for the project: replacing a 25 to 30 year old, low pressure electric hot water cylinder with a modern Reclaim CO2 heat pump hot water system.

This is the first instalment in what will become an ongoing series of monthly updates, tracking exactly how much energy and money Tim and Kate save by making the switch, using real, logged power data rather than manufacturer estimates.

MEETING

KATE AND TIM

The project began with a visit to Tim and Kate's home, a classic 1970s build in Auckland , to understand how the household actually uses hot water day to day, rather than simply swapping in a new cylinder based on assumptions.

During this initial consultation, the focus was on building a full picture of the home and household, including:

- Daily hot water habits: number of showers, bath use, laundry and dishwasher cycles, and peak demand times through the day.
- The existing system: a 110L simplex low pressure storage cylinder located inside the home's original hot water cupboard and nearing the end of its serviceable life.
- Pain points with the old system, including slow recovery, limited storage capacity for a busy household, and the inefficiency inherent in resistive electric element heating.
- The couple's wider goals for the home as part of the Suburban Homestead Project, including future rooftop solar, battery storage, and a broader shift toward electrification across the property.
- Practical constraints, particularly the desire to reclaim the internal hot water cupboard for storage, given how much valuable space a legacy internal cylinder consumes in an older home.

What This Meant for System Selection

With this information gathered, it became clear that a straightforward like-for-like cylinder replacement would not serve Kate and Tim well long-term. Their hot water demand, their appetite for solar integration, and their desire to free up internal storage space all pointed toward a very different kind of system: one that heats and stores hot water far more efficiently, sits outside the home, and is ready to work alongside solar generation as that gets added to the property.

WHY THE RECLAIM CO2 HEAT PUMP HOT WATER SYSTEM

After weighing up the options against Tim and Kate's brief, a Reclaim CO2 heat pump hot water system with a 250L storage tank was selected, to be installed outside the home. Reclaim Energy is one of the values-aligned partners supporting the Suburban Homestead Project, and their CO2 (R744) refrigerant heat pump technology stood out for several reasons:

- Major power savings: heat pump water heating uses a fraction of the electricity of a resistive element cylinder for the same hot water output, by moving heat from the surrounding air rather than generating it directly.
- Increased storage: moving from a 110L cylinder to a 250L tank gives the household significantly more hot water buffer, reducing the risk of running out during high-demand periods.
- Solar-ready via dry contact: Once rooftop solar is installed, the system can be set to prioritise heating hot water using excess solar generation.
- Freeing up internal space: relocating the cylinder outside removes a large appliance from the original internal hot water cupboard, handing that space back to the household for everyday storage, which was an important, practical win for Tim and Kate.
- Refrigerant choice: CO2 (R744) is a natural refrigerant with an extremely low global warming potential compared with the synthetic refrigerants used in many conventional heat pump systems, aligning with the project's broader sustainability goals.

Measuring the Real Difference: Power Monitoring Setup

Rather than relying on manufacturer specifications or theoretical savings figures, the project is committed to measuring the real-world difference with independent power monitoring equipment, so that the results published here reflect Kate and Tim's actual household use.

July: a dedicated power monitoring module was fitted to the existing low pressure electric cylinder circuit, logging daily consumption for the full month while the old 110L cylinder was still in everyday use.

August: immediately following the changeover, the same style of monitoring was fitted to the new Reclaim CO2 HWHP circuit, logging daily consumption for the full month on the new 250L system.

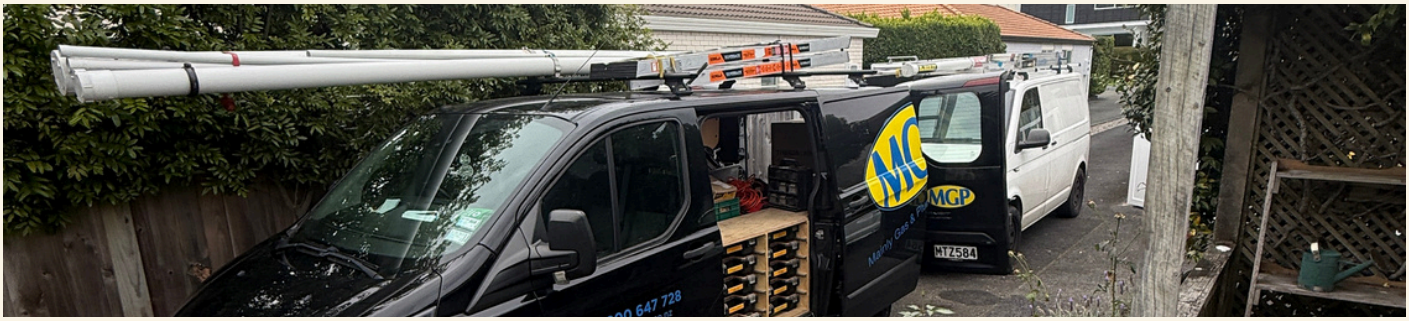
This back-to-back, month-on-month approach means the comparison in this report is drawn directly from the household's own real usage pattern, on the old system and then on the new one, rather than a lab test or an average household estimate.

The Changeover: Installation Day

The installation involved decommissioning and removing the old internal low pressure cylinder from the original hot water cupboard, and installing the new Reclaim CO2 heat pump hot water system, complete with its 250L storage tank, outside the home. Key elements of the changeover included:

- Safe disconnection and removal of the 25 to 30 year old internal cylinder, along with its associated pipework and low pressure fittings.
- Reconfiguration of the plumbing to suit a mains pressure, outdoor-mounted system, improving water pressure and flow throughout the home as a bonus alongside the energy savings.
- Positioning and installing the Reclaim unit and 250L tank outside, in a location chosen to suit both performance and future access.
- Electrical works to connect the new heat pump system, including provision for the dry contact solar control input for future use.
- Reinstating the power monitoring module onto the new circuit so that August's usage could be logged from day one.

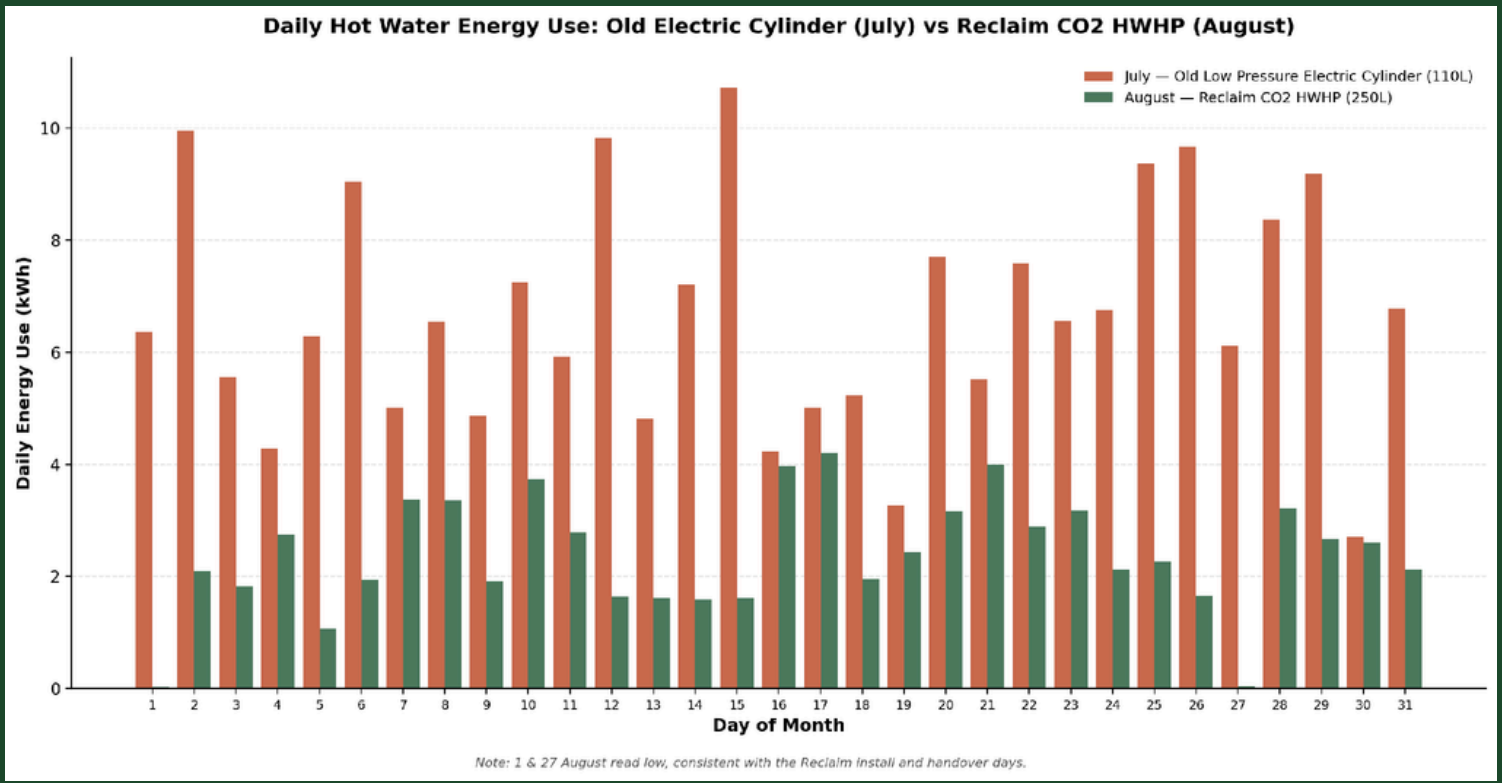
With the old cylinder removed, Tim and Kate immediately regained the internal hot water cupboard as usable household storage space, one of the practical wins they were most looking forward to.



The Savings Report:
JULY VS AUGUST

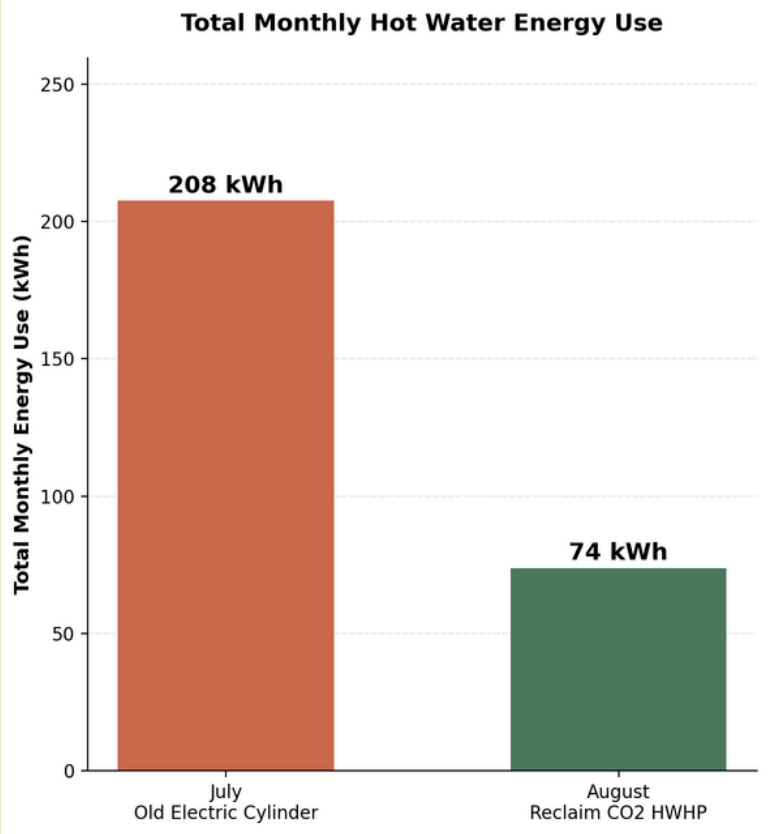
The Real Data

The chart below shows daily hot water energy consumption for both months side by side: July, on the old 110L low pressure electric cylinder, against August, on the new 250L Reclaim CO2 heat pump system.



Two days sit noticeably lower than the rest of August: 1 and 27 August, at just 24.68 Wh and 47.16 Wh. These are not monitoring gaps or installation artefacts, they are genuine low hot water demand days, where the tank was already sitting at temperature from previous heating cycles and the heat pump simply had very little topping up to do.

Total Monthly Energy Use



Metric	July — Old Electric Cylinder	August — Reclaim CO2 HWHP
Total monthly energy use	207.7 kWh	73.8 kWh
Average daily use (all 31 days)	6.70 kWh/day	2.38 kWh/day
Average daily use (excl. install/handover days)	6.70 kWh/day	2.54 kWh/day*
Storage capacity	110L	250L
Lowest Single Day	2.71 kWh	0.02 kWh
Highest Single Day	10.72 kWh	4.20 kWh

**1 August's 24.68 Wh reading is the lowest of the month, a genuine low-demand day rather than a data or installation issue, and is included in full in all totals and averages above.*

THE HEADLINE RESULT

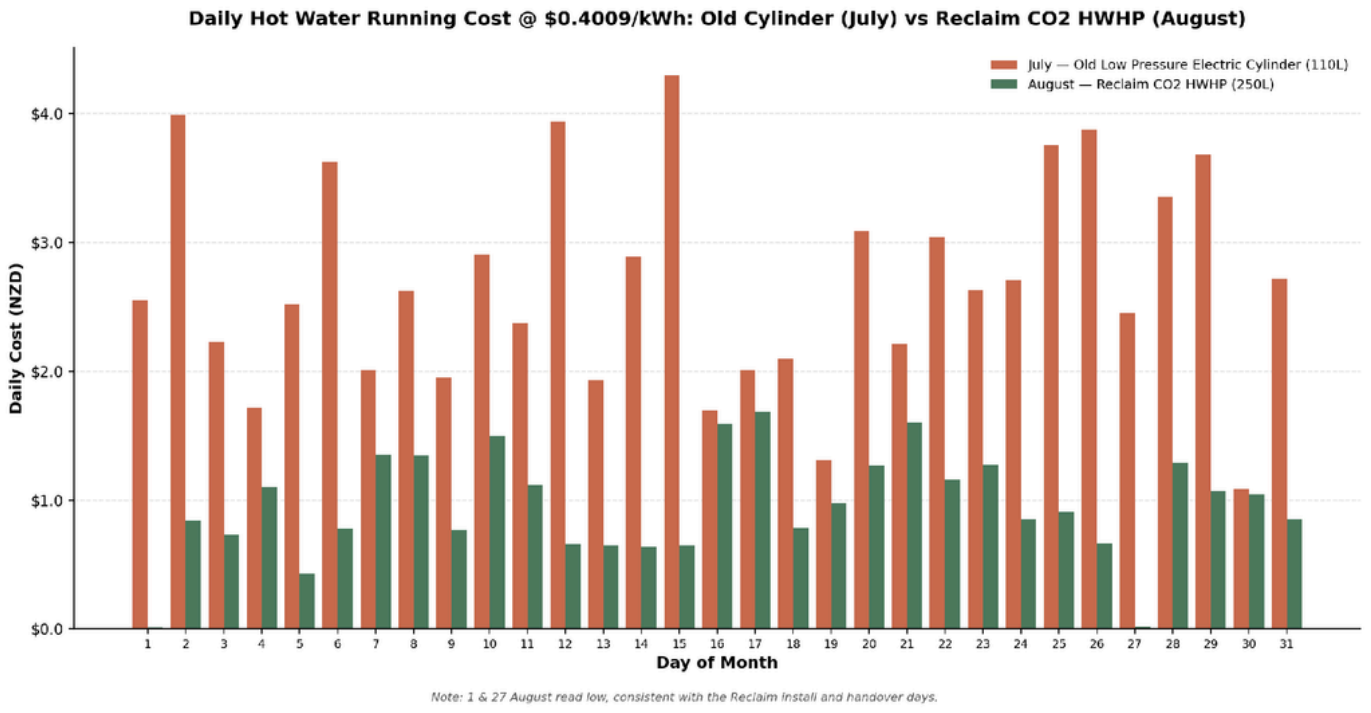
Comparing the two full months exactly as logged, Tim and Kate's hot water energy use fell from **207.7 kWh in July to 73.8 kWh in August**, a reduction of **133.8 kWh, or approximately 64%**, month on month, on real household hot water demand and while gaining more than double the hot water storage.

This **64%** figure already includes every day of August as logged, including the two lowest-demand days (1 and 27 August), when the tank needed almost no reheating at all. Rather than being an anomaly to exclude, those near-zero days are part of the genuine benefit of the new system: on days the household doesn't need much hot water, the Reclaim simply doesn't use much power, whereas the old resistive cylinder had far less ability to modulate itself to actual demand in the same way.

WHAT THIS COSTS IN REAL DOLLARS

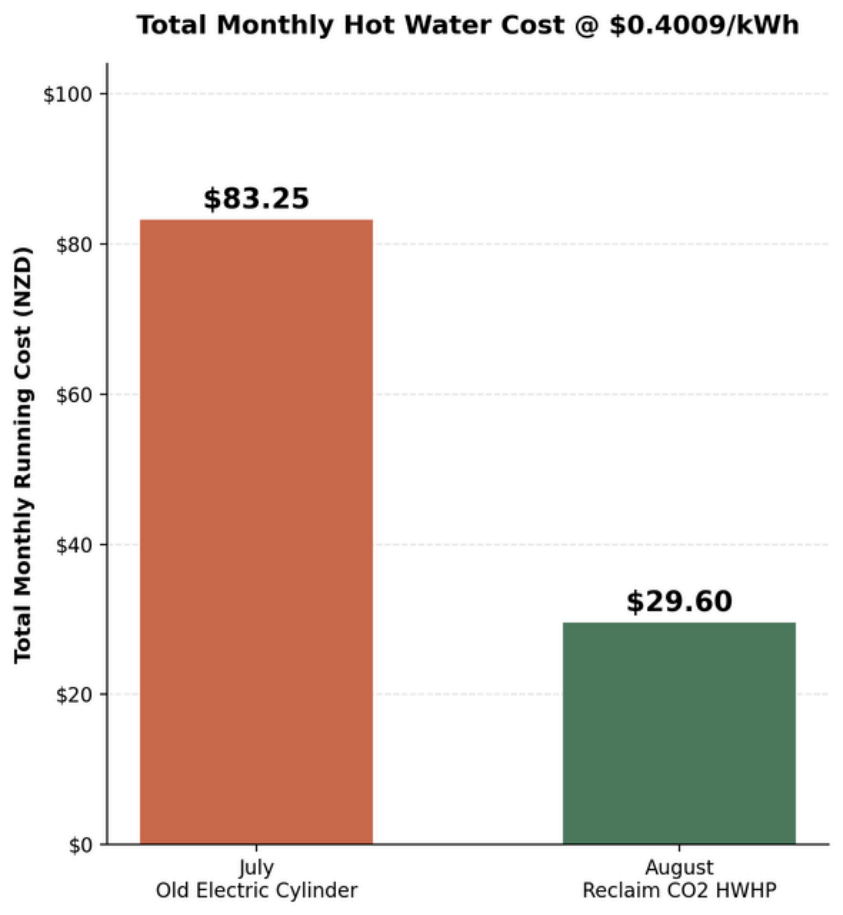
Energy savings only mean something once they're translated into dollars. Using Tim and Kate's electricity rate of $0.4009 per kWh, the logged data converts directly into a real running cost for each system, no estimates required.

Daily Running Cost



On the old cylinder, daily hot water heating typically cost Tim and Kate somewhere between $1.10 and $4.30, depending on demand that day. On the Reclaim CO2 HWHP, most days sit between $0.65 and $1.70, and ***on the lowest-demand day of the month the system cost just one cent to run****, a real-world example of the heat pump only using power when the tank actually needs it.*

TOTAL MONTHLY COST

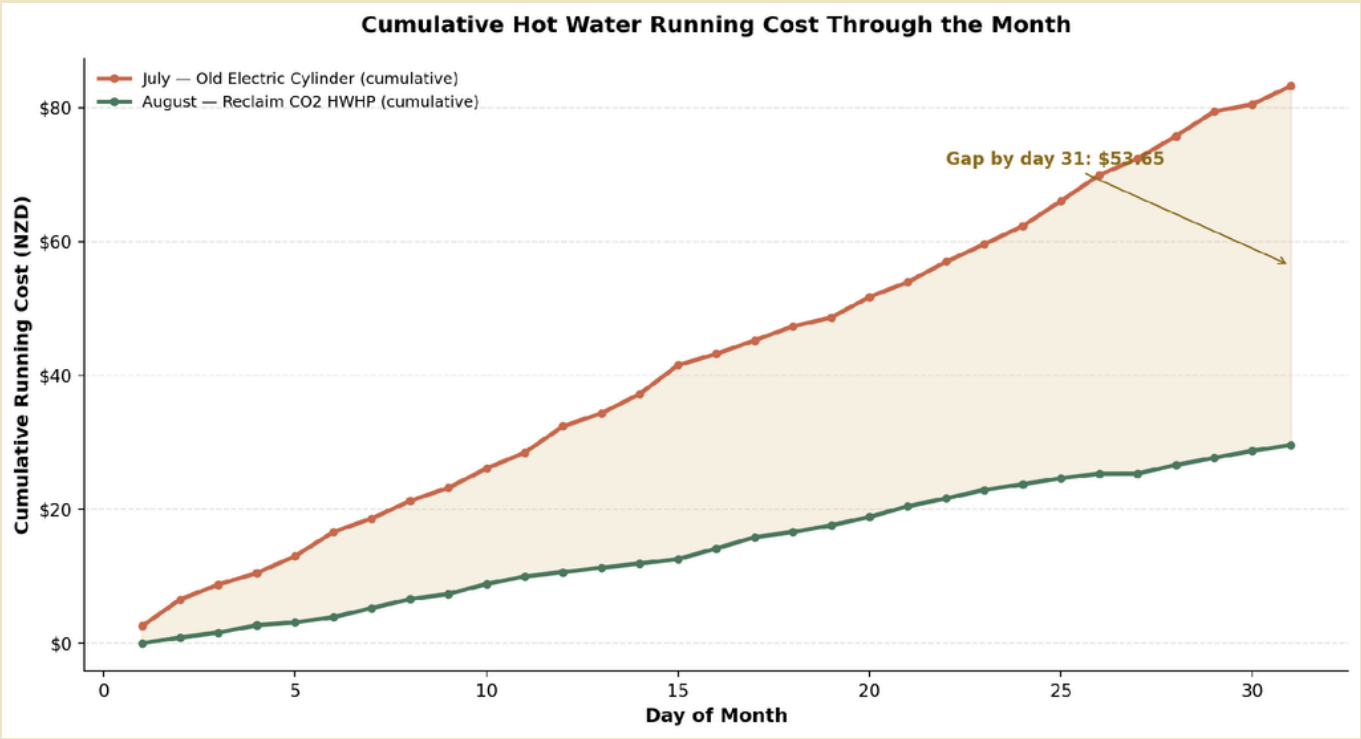


Cost Metric	July — Old Electric Cylinder	August — Reclaim CO2 HWHP
Total monthly cost	$83.25	$29.60
Average daily cost	$2.69	$0.95
Average weekly cost	$18.80	$6.68
Monthly $ saved	-	**$53.65 (64.4%)**

Rate used: $0.4009/kWh, flat, applied consistently across both months for a like-for-like comparison.

Watching the Gap Grow: Cumulative Cost

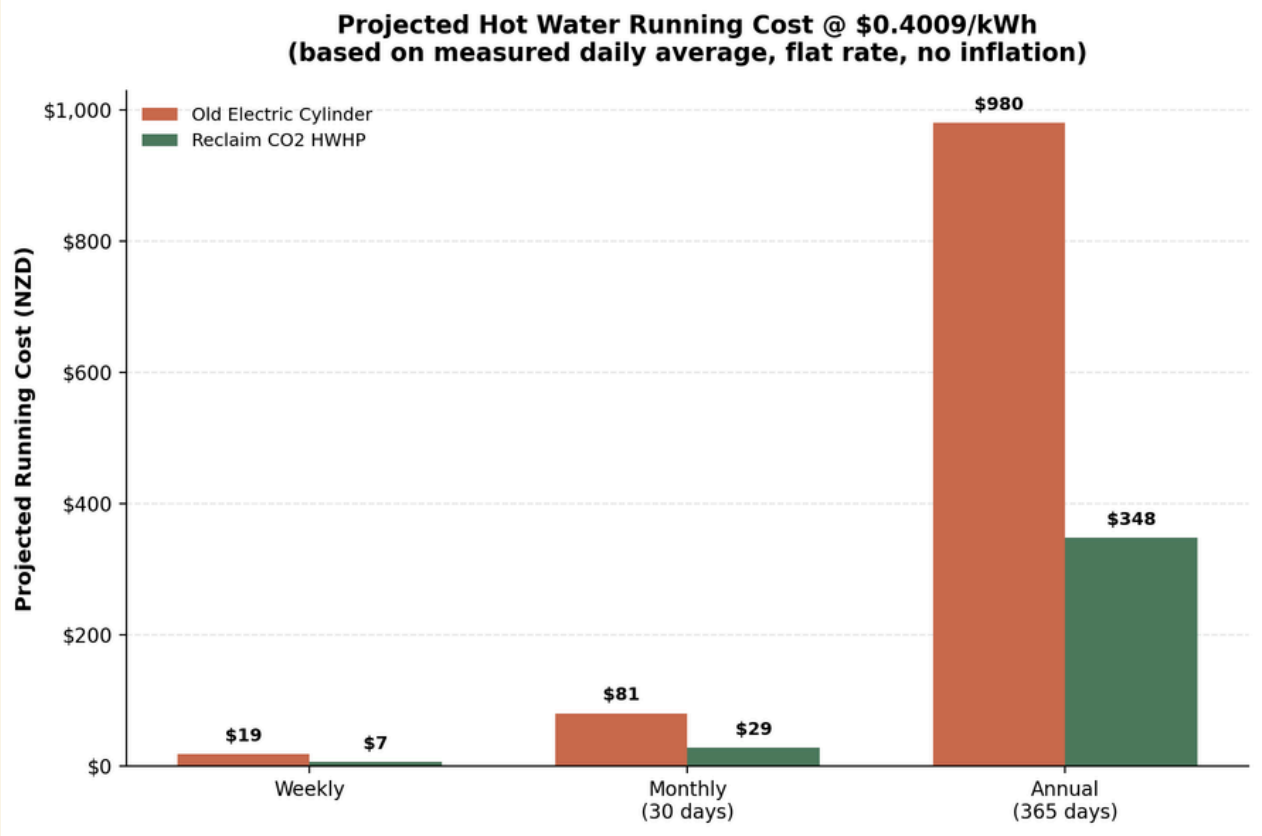
Plotting the running cost day by day makes the difference easy to see build up in real time. The two lines start together on day one and steadily pull apart as the month goes on.



By day 31, Tim and Kate's old cylinder had cost them $83.25 to run hot water for the month, while the Reclaim system delivered the same household's hot water for $29.60, a gap of $53.65 in a single month.

What It Adds Up To Over Time

Using the measured daily average cost from each month and holding the electricity rate flat at $0.4009/kWh, the same pattern of use projects forward into meaningful weekly, monthly, and annual savings:



- **Weekly:** roughly $18.80 (old) vs $6.68 (Reclaim) — **a saving of about $12.11 a week.**
- **Monthly (30 days):** roughly $81 (old) vs $29 (Reclaim) — **a saving of about $52 a month.**
- **Annually (365 days):** roughly $980 (old) vs $348 (Reclaim) — **a projected saving of about $632 a year.**

> *Held flat **over ten years and ignoring any future electricity price rises, that projects to more than $6,300** in avoided running costs from this single change, well before factoring in the value the dry contact solar integration is expected to add once rooftop solar goes in.*

These are projections based on one real month of data on each system rather than a full year, so they should be read as a strong early indicator rather than a guarantee; seasonal hot water demand, weather, and household routines will all move the actual annual figure around. That is exactly what the ongoing monthly updates in this series are designed to confirm.

Looking Ahead:

Solar and Ongoing Monthly Updates

This installation is one piece of a much bigger picture for Tim and Kate's home. The Reclaim system's dry contact input means that once rooftop solar is installed as part of the wider Suburban Homestead Project, hot water heating can be prioritised to run on excess solar generation, pushing the household's hot water costs even lower and increasing the value gained from the future solar array.

This report marks the first entry in an ongoing monthly series tracking Tim and Kate's real energy use and savings as their Reclaim CO2 HWHP settles into everyday use, and as further upgrades, including solar, are added to the home. Each update will continue to use logged, real-world power data so that readers following the Suburban Homestead Project can see genuine performance, not just projected figures.

COMING UP

- September's full month of data on the Reclaim CO2 HWHP, to see how daily draw continues to track real household demand, including further low-use days.
- Early observations on hot water recovery time and comfort with the larger 250L tank.
- Progress on the household's rooftop solar plans, and how the dry contact solar integration will be configured once panels are live.

Data source: independent power monitoring module readings, logged in Wh at daily resolution, July 2026 (Low Pressure Electric — old cylinder) and August 2026 (Reclaim 250L CO2 HWHP — new system).