

Los Angeles Pilot Findings

56% Below Average Use • 4.4 Stars • Better Living



USGBC  **CA**
U.S. GREEN BUILDING COUNCIL CALIFORNIA

ACKNOWLEDGEMENTS

Frantz Beznik, Director, 50 Liter Home Coalition; R&D Director, Global Head of Sustainable Innovation, Procter & Gamble

Maureen Erbeznik, Senior Advisor, Water Innovation, USGBC California

Bryan Frantz, Marketing Project Manager, Electrolux Group

Grace Hamilton-Burge, Senior Associate, 50 Liter Home Coalition

Tara Helms, Director of Sustainability North America, Electrolux Group

Gregory Holiday, Former Director, 50 Liter Home Coalition

Guillaume Levasseur, Senior Machine-Learning Scientist, Procter & Gamble

Kyle Pickett, Senior Project Manager, Community Initiatives, USGBC California

Mike Praksti, Senior Innovation Manager, Procter & Gamble

Maya Serota, Sustainability Program Coordinator, USGBC California

Karin Sjunnesson, Group Experience Marketing Manager, Care, Electrolux Group

Ben Stapleton, Chief Executive Officer, USGBC California

Priscilla Steele, Senior Marketing Manager, USGBC California

Tobias Svanberg, Innovation Lead, Water & Energy, IKEA of Sweden

TABLE OF CONTENTS

Executive Summary	1
Introduction	7
Why Indoor Water Use Remains Critical	9
Los Angeles Pilot Overview	11
Pilot Interventions and Products	16
Pilot Results	18
The Irresistible Standard: Did the Interventions Deliver	22
The Integrated Approach Works	27
The Behavioral Opportunity	28
Cost-Benefit Analysis: The Bottom Line for Customers and Utilities	33
Testing New Frontiers: Recirculating Shower	38
Insights & Lessons Learned	39
Implications by Audience	41
Next Steps	42

EXECUTIVE SUMMARY

Executive Summary

The 50 Liter Home Coalition is a global initiative convened by the World Economic Forum and the World Business Council for Sustainable Development, uniting industry leaders such as Kohler, IKEA, Electrolux Group, and Procter & Gamble. **The Coalition's goal: Prove that homes can run on 50 liters (13 gallons) per person per day that feels like 500 – delivering better performance, easier daily living, and improved quality of life.**

The Los Angeles Pilot, launched in 2023 in partnership with U.S. Green Building Council California (USGBC California), put that premise to the test in real homes under real conditions.

The Results

Participating homes achieved an **average indoor water use of 79 liters (21 gallons) per person per day – 56% less than the official LA average of 182 liters (48 gallons)** – and reported that daily routines became easier, with less time and effort spent on mundane chores.

Rather than relying on conservation messaging or behavioral restriction, the pilot confirms that performance-driven design and convenience are the most effective drivers of lasting change. **Participants didn't endure efficiency – they embraced it.** When products work better and simplify daily routines, water and energy savings follow naturally, and new habits become permanent.

How It Happened: An Integrated Approach

The pilot tested an integrated, whole-home approach that combined mostly existing high-efficiency appliances and fixtures with high-performance consumable products.

No one was asked to take shorter showers, flush less often, or make any sacrifices to conserve.

Instead, participants simplified their routines, saving time, energy, and money by eliminating unnecessary steps. They stopped sorting laundry by color before washing. They eliminated soaking, scrubbing, and pre-rinsing dishes. The savings emerged naturally from products designed to perform better while using less water. The key was integration and a whole-home approach. Pairing high-efficiency appliances with specially formulated consumables produced savings far exceeding what either achieves alone.

THE 50L APPROACH

Integrated Solutions Deliver What Customers Value



**Better
Performance**



Easier Living



Time Savings



**Water Savings
Happen**



Best-in-Class Homes

The pilot identified a consistent set of characteristics shared by the highest-performing homes.

Best-in-class homes, which can be delivered through retrofits one room at a time, included:

- **Kitchen:** High-efficiency dishwashers paired with high-performing faucets and advanced dish soaps – enabling high dishwasher use with no pre-rinsing and minimal hand washing with no need for scrubbing or soaking.
- **Laundry:** High-efficiency washers paired with advanced detergents – enabling effective cold-water washing.
- **Showers:** Well-designed ultra-low-flow showerheads, paired with 2-in-1 or 3-in-1 personal care products – reducing steps and time in the shower.
- **Toilets:** Ultra-high efficiency toilets (0.8/1.1 GPF) paired with high-performance toilet paper – reducing double flushing.

Across these homes, efficiency was not perceived as a compromise – it was embraced as an upgrade in convenience, performance, and overall quality of life. **This is precisely why the changes lasted: Solutions that feel like improvements become permanent habits.**

CATEGORY PERFORMANCE

Customer Benefits Lead to Water Savings



KITCHEN

- 1.0 GPM Faucet
- HE Dishwasher
- Advanced Dish Washing Soaps

Customer Benefits

- ✓ No pre-rinsing
- ✓ Minimal soaking and scrubbing

13%
savings



LAUNDRY

- HE Front Loading Washer
- Coldwater Detergent

Customer Benefits

- ✓ Fewer loads
- ✓ No sorting
- ✓ No hot water

32%
savings



SHOWERS

- High-Pressure 1.25 GPM Showerhead
- 2-in-1/3-in-1 Products

Customer Benefits

- ✓ Fewer steps
- ✓ Less time

9%
savings



TOILET

- 0.8 GPF Toilet
- High-Performance Toilet Paper

Customer Benefits

- ✓ Reduced double flushing
- ✓ Fewer clogs

15%
savings

What We Learned

Not every innovation worked. Certain design choices – such as optional boost functions or user-dependent settings like dual-flush toilets – can unintentionally increase water use based on consumer behavior, underscoring the importance of thoughtful product design and default settings in real-world conditions.

Even among highly engaged participants, significant opportunities remain untapped.

Most never use eco cycles or shift their settings after their first few uses. Few have tried their dryer's refresh feature.

These behavioral gaps represent savings achievable through education, not additional hardware.

Additionally, an integrated approach does not require a full whole-home retrofit.

In existing homes where upgrading everything may be cost-prohibitive or impractical, pairing efficient appliances with high-performance consumables can still deliver meaningful water, energy, and time savings, one room at a time.

But what does a full retrofit cost – and does the math work for utilities and consumers?

WHAT DIDN'T WORK

Choice Architecture Matters

KEY LESSONS

Dual-flush toilets increased water use

Participants defaulted to higher flush option

Rinse booster features added 24%

Convenience undermined efficiency

**Technology + thoughtful design
= sustainable behavior**



The Utility Perspective

A whole-home retrofit – dishwasher, kitchen faucet, washer, dryer, toilet, showerhead, bathroom faucets, and a year of consumables – saves approximately 34,500 gallons per household annually, the **rough equivalent of removing 1,000 square feet of turf**. At a retail cost of \$5,000–\$7,000 and a \$2,000 utility incentive, the net cost runs approximately \$1,574 per acre-foot, competitive with imported water in Southern California. Unlike landscape programs such as turf replacement, **these savings hold year-round regardless of weather or season**. The behavioral shifts that accompany product upgrades also tend to persist, making whole-home retrofits a high-confidence, durable complement to outdoor conservation over the life of the improvements.

The Bottom Line

The Los Angeles Pilot offers a compelling proof point for utilities, policymakers, manufacturers, and the building industry. Indoor water efficiency provides reliable, year-round savings that complement outdoor conservation programs, reduce energy use and emissions associated with hot water, and yield a positive return on investment. For consumers, the pilot demonstrates that when solutions are designed around performance and ease, adoption becomes intuitive and lasting.

- **For utilities:** Indoor efficiency offers a viable pathway that complements outdoor programs and delivers a positive return on investment.
- **For policymakers:** Efficiency and performance aren't in tension; higher standards can drive better outcomes on both fronts.
- **For product manufacturers and the building industry:** Superior performance drives adoption.



“The path to 50 liters runs through technology so good that people actively prefer it”

— Frantz Beznik, 50L Home Coalition Director



Below LA
Average



Satisfaction
Rating



Additional
Reduction

Re-Invent Our Water Future

50lhome.org

INTRODUCTION

The global water crisis is accelerating on two fronts: Availability and infrastructure. Half the world's population experiences severe water scarcity at least one month per year. Major cities – from Cape Town to São Paulo to Chennai – have faced "Day Zero" scenarios where taps nearly ran dry. Meanwhile, aging water infrastructure demands unprecedented investment: the United States alone faces a \$194 billion annual funding gap for water infrastructure by 2030, nearly double today's \$110 billion shortfall. Globally, billions of dollars are needed to maintain, replace, and upgrade water systems strained by climate change, population growth, and decades of deferred maintenance.

What is the 50 Liter Home Coalition?

The 50L Home Coalition (50LH, the Coalition) is a global initiative that addresses these challenges. The Coalition proposes that the solution to the water crisis starts at home, and the answer should not involve a sacrifice in people's quality of life.

Can we get people to live on 50L of water per person per day?

From old questions. **SCARCITY**

What if homes could run at 50L and still feel like 500L, at Low Carbon?

To new questions. [ABUNDANCE.](#)

Why 50 Liters?

The 50-liter daily target was inspired by the water restrictions enforced in Cape Town during its 2018 "Day Zero" crisis. It represented the minimum amount of water needed per person per day to meet basic needs while maintaining dignity and public health.

This benchmark has since become a **powerful global reference** point for what's achievable through efficiency, innovation, and behavior change.

The Coalition's approach is grounded in a fundamental belief: making the experience of new water efficiency innovations irresistible. By combining cutting-edge technology, thoughtful design, and behavioral insights, the Coalition aims to create water-efficient solutions that people genuinely want to adopt.

Convened by the World Economic Forum and the World Business Council for Sustainable Development, the Coalition brings together funding partners and founding members, including Procter & Gamble, IKEA, Kohler, and Electrolux. Collectively, these industry leaders contribute expertise across consumer products, appliances, fixtures, and infrastructure to develop whole-home solutions that work in everyday life.

Partners:



Electrolux



KOHLER®

Our vision: Irresistible innovations that transform urban water and buildings into low-carbon, safe, and sustainable systems.

Drawing on its unique connection to private-sector know-how and the innovations developed in early city pilots and policy engagements, the 50L Home Coalition has pioneered a movement to mainstream disruptive, inclusive, and responsible water access solutions, reducing energy consumption to deliver efficiency globally.

WHY INDOOR WATER USE REMAINS CRITICAL

A widespread misconception persists. Low-flow toilets and showerheads became standard decades ago, leading utilities and consumers to believe indoor water efficiency has been "solved" – that any further improvements would be marginal at best. This assumption is leaving significant water savings on the table.

Reliable & Consistent Savings

Indoor water consumption is remarkably stable and predictable – households shower, wash dishes, do laundry, and flush toilets at relatively constant rates regardless of season, climate, or weather. That consistency is what makes indoor efficiency so valuable. Unlike outdoor programs, which fluctuate with rainfall, landscape size, and temperature, indoor savings don't evaporate in a wet year or spike in a drought.



Globally Replicable

Indoor water efficiency strategies are universally applicable across diverse geographic, climatic, and socioeconomic contexts. While outdoor water use varies dramatically – from minimal in urban apartments to substantial in suburban homes with extensive landscaping – indoor water needs remain remarkably similar worldwide. A family in Los Angeles, London, Amsterdam, or Sydney requires comparable amounts of water for cooking, bathing, sanitation, and cleaning. This universality means that successful indoor efficiency innovations can be modular, templated, and ultimately scaled through global replication without requiring significant adaptation to local conditions.

High Customer Acceptance

Here's what's often overlooked when designing programs: People actually want better appliances, fixtures, and products that make their lives easier. When water efficiency is packaged as an upgrade rather than a sacrifice, adoption soars. Unlike restrictive conservation measures – such as no watering on certain days or shorter shower reminders – indoor efficiency improvements actively enhance daily life.

Co-Benefits of Energy Reduction

The energy-water nexus makes indoor efficiency doubly valuable. Water heating accounts for 18% of residential energy use – the second-largest expense in most homes. Every gallon of hot water saved delivers multiple benefits: conserving water, reducing carbon emissions, and lowering utility bills. In an era of climate crisis and rising energy costs, indoor water efficiency addresses both water scarcity and carbon reduction simultaneously.

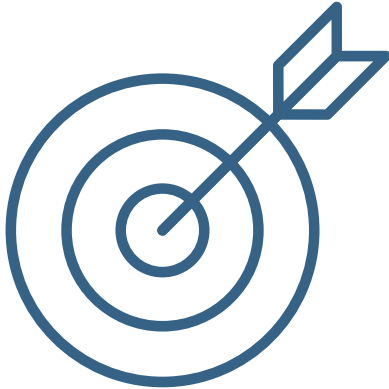
LOS ANGELES PILOT OVERVIEW

To truly reshape how the world uses water, bold ideas must be proven where it matters most: in people's homes. Historically, technologies have been tested in isolation – a new showerhead here, an efficient appliance there – without understanding how they work together as a system. Our pilot bridges this gap, revealing not only whether products work as designed but also what the true costs, savings, and opportunities are under everyday conditions.

The 50 Liter Home Coalition partnered with U.S. Green Building Council California (USGBC-CA) to launch its first pilot in Los Angeles in 2023. USGBC-CA brought local knowledge, community relationships, and on-the-ground pilot implementation capacity. Over three phases, the pilot tested emerging technologies in an integrated fashion – ultra-efficient fixtures, next-generation appliances, and high-performance consumables – to answer a critical question: **Can these solutions significantly reduce residential water and energy use while enhancing comfort and quality of life?**

Equally important, the pilot assessed how consumers actually interact with these technologies – uncovering the co-benefits that drive adoption at scale: **Saving time, making household tasks easier, and delivering genuinely better performance.**

Pilot Goals



Demonstrate Impact

Achieve measurable reductions in indoor water and energy use through efficient products and behaviors.



Understand Customer Experience

Evaluate acceptance and satisfaction with water-efficient products and technologies.



Inform Future Action

Generate insights to shape policy, incentive programs, and future product innovation.

Pilot Phases

Phase 1 – Baseline Establishment (4 months): Established baseline water and energy use in 32 households using existing fixtures and appliances. Sixteen homes were designated for retrofits; the remaining 16 served as the control group.

Phase 2 – High-Efficiency Market-Available Solutions (12 months): Retrofit homes were upgraded with the latest high-efficiency products available on the market. Control homes continued to be monitored.

Phase 3 – Innovative Experimental Products (12 months): Measured incremental savings from installing prototype and next-generation products in the previously retrofitted homes.



Water and Energy End Use Monitoring

The pilot's primary goal was to measure water and energy savings, and the 50LH LA pilot accomplished this through a layered monitoring approach that yielded one of the most granular analyses of savings ever conducted in a residential setting.

Participating homes were recruited from households already equipped with Flume smart water monitors, which capture whole-home water consumption by reading meter pulses every five seconds. **To achieve fixture-level precision, Droople submeters were installed at six points in each home: Kitchen sink, dishwasher, washing machine, showers, bathroom sinks, and toilets.** These submeters recorded minute-by-minute flow rates and water temperatures, enabling detailed analysis of both water volume and the energy required to heat it.



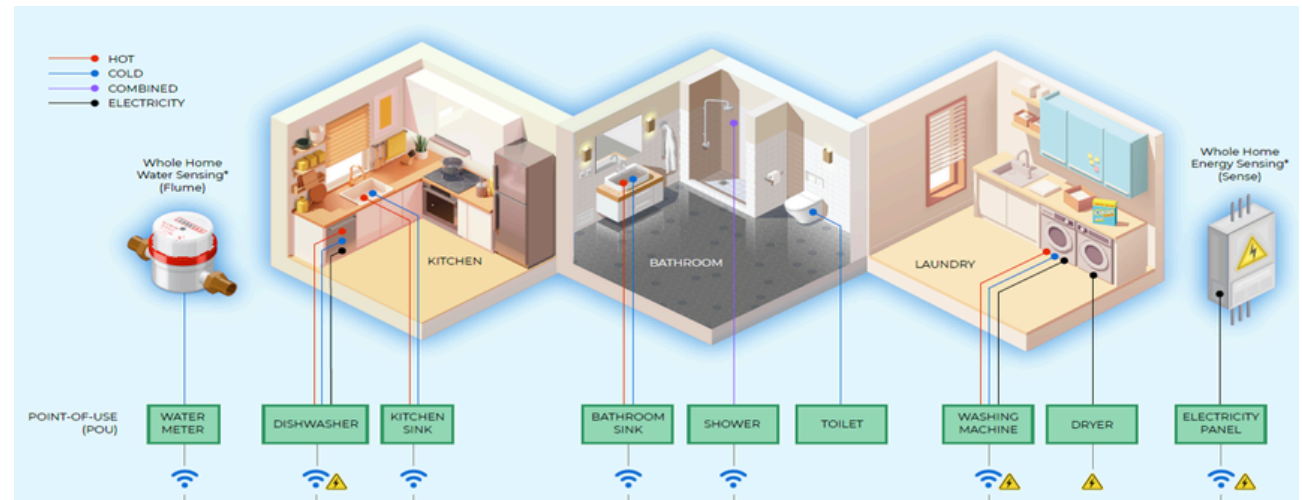
15 TEST, 16 CONTROL SUPER-CONNECTED HOMES.PASSIVE MONITORING

Data from both monitoring systems flows to P&G's secure cloud platform, which meets global security and privacy standards.

Each water event gets categorized into discrete

"jobs": Shower, toilet, bathroom sink, kitchen sink, dishwasher, washing machine, outdoor, leak, or unknown.

For each job, the system records time, volume, flow rate, temperature, and hot-water use. This granular, event-level detail forms the foundation of the study results.



Analysis Methodology

For analysis, August 2023 (baseline, no intervention) was compared to August 2024 (first intervention) and August 2025 (second intervention). Using the same calendar month across years controls for seasonal variation. The Retrofit group was also compared against the Control group for each period to isolate intervention impacts from external factors. For each job category and metric – volume, frequency, duration, and others – home-by-home averages were calculated and cross-referenced with qualitative interview data to ensure consistency between measured results and participants' reported experiences.

PILOT INTERVENTIONS AND PRODUCTS

The pilot tested two generations of products across two phases. Coalition partners Electrolux, Kohler, IKEA, and P&G donated all products. USGBC-CA administered operations, and Bottomline Utility Solutions installed monitoring devices, appliances, and fixtures.

Phase 2 deployed high-efficiency products currently available on the market – fixtures meeting California code, appliances from local retailers, and consumables from grocery stores. To compare brands, half the homes received Kohler fixtures and half received IKEA; all homes received Electrolux washers and dryers, Kohler toilets, and P&G consumable products.

Phase 3 pushed further with prototype fixtures using approximately 30% less water than code-rated models, next-generation appliances with lower water factors, and continued provision of P&G consumables. Phase 3 also tested a Kohler recirculating shower system in one home – an emerging technology that delivers a full shower experience using just 0.5 gallons per minute of fresh water.

For a full list of products for each phase, including the manufacturer, model, and its associated water-use rating (e.g., gallons per minute, gallons per flush, or water factor), [please see Appendix](#).

Phase 2

Kitchen



Bathroom



Laundry Room

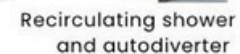
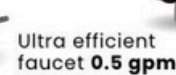
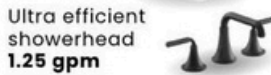


Phase 3

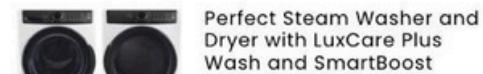
Kitchen



Bathroom



Laundry Room

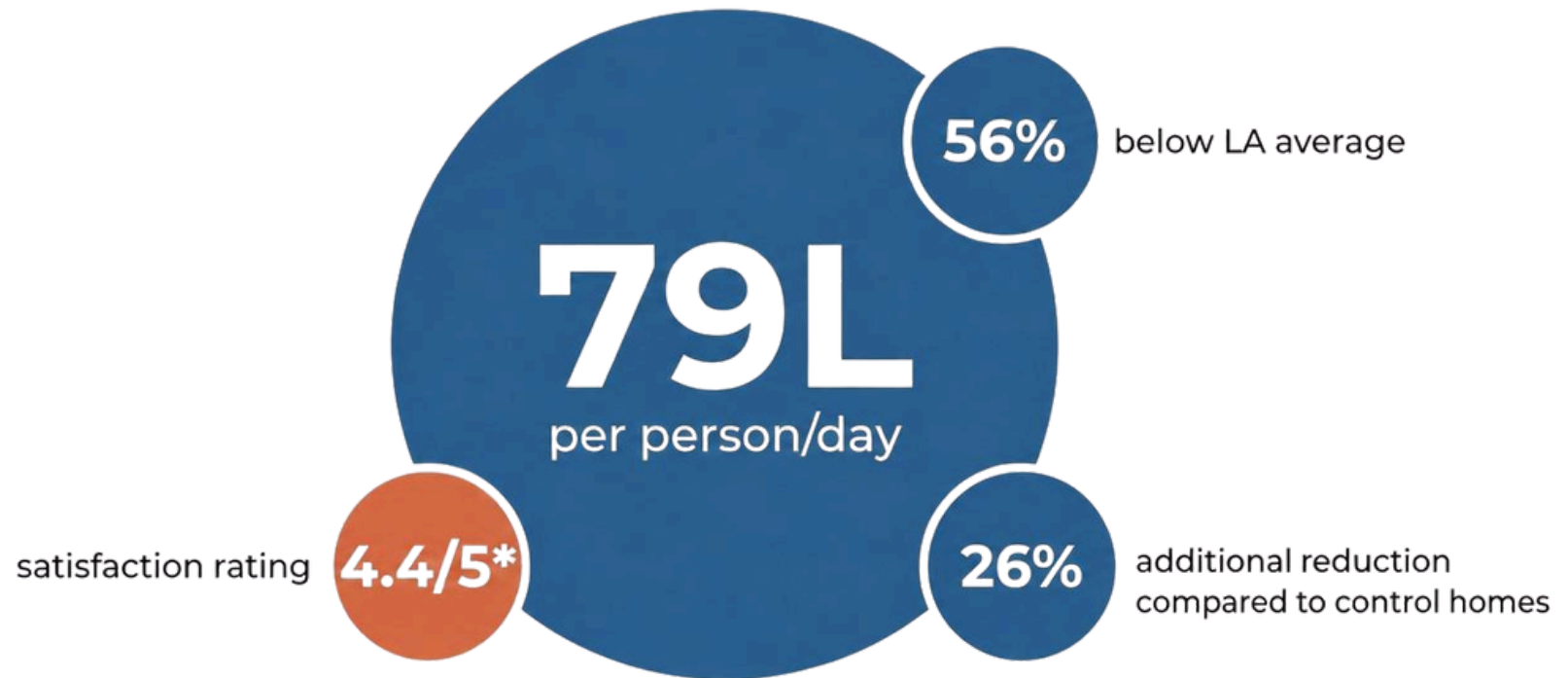


PILOT RESULTS

The pilot achieved results that exceeded expectations – especially considering participants were already efficient water users. These weren't high-consumption households; they were conscientious consumers who had already adopted standard efficiency measures. If integrated solutions can deliver dramatic savings among people already using water efficiently, the opportunity with average and high-use customers is exponentially larger.

	Phase 1 Baseline	➔	Phase 2	➔	Phase 3
Water Use per Day per Person	108 liters (28 gallons)		86 liters (23 gallons)		79 liters (21 gallons)
Reduction from Baseline	--		20%		26%
vs LA Average (182 LPD/48 GPD)	41%		53%		56%

PILOT RESULTS



32 households achieved half of LA's average water use
while rating quality of life 4.4 out of 5

Phase 2 Results (Market-Available Products)

Retrofitted homes achieved 86 LPD / 23 GPD – 21% less than control homes and 53% below the LA average. Hot water use decreased by 23%, resulting in an 18% energy reduction and a 16% greenhouse gas reduction compared to the Baseline.

- **Kitchen:** 18% reduction. Kitchen sink hot water dropped 44%. Dawn Powerwash and Cascade pods eliminated the need for pre-rinsing and soaking entirely. Dishwashers used 26% less water per cycle.
- **Bathroom:** Showerheads reduced flow 15%. Toilets used 23% less than the control.
- **Laundry:** Washers used 22% less water per cycle. Hot water per cycle dropped 55% with Tide Coldwater Clean.

Phase 3 Results (Prototype Products)

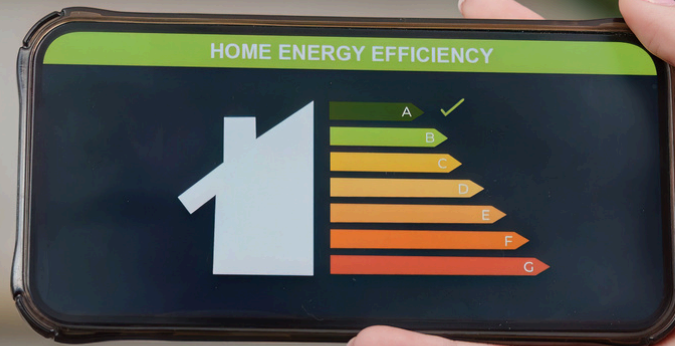
Phase 3 achieved an additional 8% reduction, bringing households to 79 LPD / 21 GPD – clear progress toward the 50-liter target.

- **Kitchen:** 14% net reduction compared to Baseline. Sink volume down 16%, hot water down 49% compared to Baseline.
- **Laundry:** 32% reduction compared to Baseline. Volume per cycle down 28%; ex-top-loader homes achieved 45–53% reduction per cycle compared to Baseline.
- **Shower:** Kohler 1.25 GPM showerheads delivered 22% volume reduction compared to Baseline with no behavioral compensation.
- **Toilet:** Dual-flush at 0.8/1.0 GPF outperformed Phase 2 settings; previous dual-flush users saw 16% reduction.

Energy Co-Benefits

These water savings didn't occur in isolation – they drove measurable energy reductions across every end use:

- Reduced hot water heating energy through lower overall water use
- 48% reduction in hot water for laundry reduced water heating costs
- Energy-efficient appliances reduced electricity consumption
- Demonstrated strong water-energy nexus benefits



THE IRRESISTIBLE STANDARD: DID THE INTERVENTIONS DELIVER

A central premise of the Coalition is that dramatically reduced water use cannot rely on sacrifice. **The goal is to make water-efficient technologies so compelling – performant, attractive, and satisfying – that consumers actively seek them out.** The aspiration is simple: 50 liters should feel like 500.

To test this premise, USGBC-CA engaged the SeeChange Institute, a research firm specializing in behavior change and consumer decision-making, to conduct a comprehensive behavioral analysis. Through in-depth interviews with retrofit households, the research evaluated not only whether participants reduced water consumption, but also whether they did so while maintaining or improving their quality of life.

The research served two purposes:

- First, to establish a baseline understanding of participants' existing water-use behaviors, beliefs, and decision-making priorities before the retrofit;
- Second, to evaluate how participants experienced and responded to the new products throughout the study period.

The findings carry significant implications for how water utilities, manufacturers, and policymakers approach residential water efficiency.

Baseline Context: What Mattered to Participants Before the Retrofit

The August 2023 baseline survey of 32 Los Angeles households (56 respondents) revealed a critical insight that shaped our interpretation of the technology results: **Effectiveness dominates decision**-making across all water activities. When asked what most influences how they perform water-related tasks, participants consistently ranked effectiveness highest among motivating factors.

The baseline survey also revealed that many common conservation behaviors were already well-established among participants – turning off water while brushing teeth, running full dishwasher loads, and choosing showers over baths. **The opportunity for improvement lay not in convincing people to adopt behaviors they were resisting, but in deploying technologies that would automatically reduce consumption, without requiring conscious effort or trade-offs.**

Did the Technologies Meet the Irresistible Standard?

SeeChange Institute conducted one-on-one interviews with the retrofit households in April 2024. Participants compared each product to their previous one across overall impression, aesthetics, functionality, and likelihood to recommend.

Laundry

The washer and dryer were among the most positively received products in the pilot. Participants appreciated both the aesthetics and performance, with several noting that laundry had become noticeably less burdensome.

As one participant explained: *"The new washing machine makes doing laundry much more pleasant... before, I would let the laundry accumulate because it was such a drag."* Tide Pods Coldwater Clean shifted numerous participants toward more cold-water washing, compounding water savings with meaningful energy reductions.

Cold Water Laundry & More Efficient



*"I **don't have to think anymore about sorting clothes** before loading the machines...
[...] **I like doing laundry now!**"*

- 55% hot water
- 22% water per washing machine cycle



Kitchen

The dishwasher earned strong marks for aesthetics, and the combination of the appliance with Cascade's high-performance dishwasher detergent effectively reduced the need for pre-rinsing – a significant behavior shift that drove measurable water savings. However, longer cycle times and fixed rack configurations frustrated some users who valued flexibility.

The kitchen faucet revealed an important systems consideration: In homes with tankless water heaters, lower flow fixtures sometimes failed to trigger the heating element, forcing participants to run water longer to achieve hot temperatures. This underscores the importance of evaluating how individual products interact with existing home infrastructure.

Dawn Platinum Powerwash emerged as a standout performer. The majority of participants rated it significantly better than their previous dish soap, and over half identified it as having the greatest water-saving potential of any product in the pilot.

One participant noted: *"Before, I would have to soak things... fill them up with hot water... with the Powerwash, I don't do any of that."*



- 34% Hot Water Use

- Less hand-washing
- No soaking, no scrubbing

*"[P&G Dawn EZ Squeeze and Dawn Powerwash] are **less water consuming** because they're more effective."*



-15% Less Sink Use

- Maximize use w/ superior cleaning
- No pre-rinsing, no rewashing

"We used to do a lot of pre-rinsing...we don't do quite as much anymore because the dishwasher is a little more efficient."

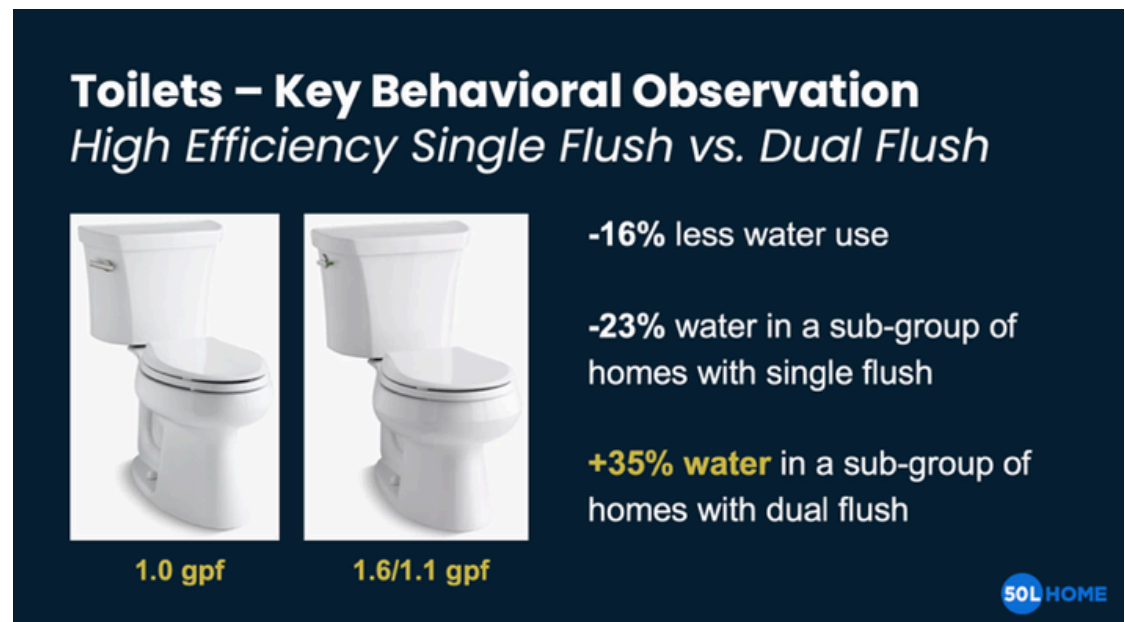
Bathroom

Bathroom faucets performed well overall, with participants appreciating adequate pressure and the ergonomic improvements offered by taller faucet designs.

Showerheads generated the widest range of feedback, reflecting the shower's sensitivity to both performance and perceived indulgence. The key variable was not flow rate but whether a design delivered sufficient spray pressure and coverage at reduced flow. Designs that fell below this threshold risked triggering longer shower durations that offset water savings, while well-engineered, efficient models maintained strong pressure and reduced consumption. **The pilot also reinforced the value of pairing efficient hardware with multi-function personal care products – such as combined wash-and-condition formulas – that reduce steps in the shower routine and further compress water use.**

Toilets delivered a key insight:

Dual-flush technology only saves water if users consistently select the lower-volume option. Data suggest most participants defaulted to the 1.6 GPF flush, driving water use up rather than down. Future fixture selection should favor single-flush ultra-low-flow models or dual-flush designs where even the higher-volume option remains well below conventional volumes.



THE INTEGRATED APPROACH WORKS

The results validate the Coalition's integrated approach. Pairing efficient appliances with complementary consumable products – Tide with efficient washers, Powerwash with efficient dishwashers – enabled behavior changes that compound water savings. Neither component alone achieves the same result. Products that worked better were embraced; those that compromised functionality were not.

INTEGRATION BREAKTHROUGH

Product Pairings Unlock Performance



**Dawn Powerwash + Cascade Platinum Plus
+ Efficient Dishwasher**

44%

kitchen sink
water reduction

CUSTOMER VALUE

- ✓ No pre-rinsing needed
- ✓ Less time at sink



Tide Coldwater + HE Washer

54%

laundry hot
water reduction

CUSTOMER VALUE

- ✓ Wash any mix on cold
- ✓ No sorting required

THE BEHAVIORAL OPPORTUNITY

Phase 3 behavioral analysis shifted focus from how consumers felt about installed products to something more fundamental: How people actually interact with water in their daily routines. The goal was to uncover behavioral opportunities that scale water efficiency without sacrificing experience.

USGBC-CA contracted Behaviour Change UK to conduct the Phase 3 Behavioral Analysis using Conveo, an AI-based interview tool. **26 participants from 13 homes completed three 30-minute interviews covering kitchen, bathroom, and laundry behaviors.**



Kitchen Findings

Kitchens are nearly always in use, with most households preparing three meals daily. **Key patterns emerged:** Fruits and vegetables are washed under running water rather than in bowls; cooking water is routinely discarded (participants acknowledged this as a missed reuse opportunity); and pre-rinsing has become more targeted, limited to sticky residues. Dawn Powerwash was widely praised for reducing the amount of water used for handwashing.

Appliance habits are strong: 18 of 25 participants use the same dishwasher cycle every time, with 17 defaulting to "Normal" and only 4 using Eco. Very few experiment with cycles or read manuals.



Laundry Findings

Weekly loads range from 2 to 12, driven by family size and activities. Participants claim to run "full" loads, but definitions vary from 50% to 100% capacity. Load splitting by color remains common, though some realized through the project, this isn't necessary with cold-water washes.

Most default to the "Normal" washer setting. The dryer refresh cycle has largely gone unnoticed – only 2 of 26 have tried it, though those who did found it useful.



Bathroom Findings

Daily showering is prevalent, with most showers described as purpose-driven and efficient (3-10 minutes).

Nearly all participants wait for the shower water to warm before stepping in – wasting up to 23 liters (6 gallons) per shower.

They know it's wasteful. They just don't see a way around it.

Toilet flushing revealed a gap between perception and reality:

Participants reported high confidence in using dual-flush correctly, yet measured data showed a 35% increase in toilet water volume – highlighting the importance of triangulating self-reported behaviors with actual consumption.



Intervention Opportunities

The research identified 12 behavioral intervention points across the kitchen (coordinating meals, reusing cooking water, using eco dishwasher cycles, filling sinks for hand washing), laundry (consolidating loads, reassessing "full" loads, combining colors, extending clothing wear), and bathroom (capturing heat-up water, reducing shower duration, expanding selective flushing).

Prioritized Interventions

A workshop with 50LH partners and the Advisory Committee prioritized three behavior changes that save water without sacrifice:

1. **Skip the sink:** Use dishwashers more without pre-rinsing (dishwashers use ~15 liters (4 gallons) per cycle vs. faucets at 4–6 liters (1–1.6 gallons) per minute).
2. **Fuller, mixed-color loads on cold:** Many still separate colors unnecessarily, creating more loads
3. **Experiment with cycles:** Most participants picked one cycle and never deviated

The highest-scoring implementation recommendations were "Skip the Sink" prompts on trash cans and dish soap bottles, and "Dishwasher Preferred" labels on cookware. Additional ideas include laundry baskets sized to match full washer loads, simplified how-to guides via QR codes, and bundling interventions with new appliances or utility programs.

Key Takeaways

Even among highly engaged, water-conscious participants, significant behavioral opportunities remain. The highest-impact areas – capturing heat-up waste, encouraging eco settings, consolidating laundry – represent infrastructure-supported changes participants are receptive to but haven't adopted. **Untapped appliance features, such as dryer refresh cycles and eco settings, could yield savings through education rather than additional hardware.**

UNTAPPED OPPORTUNITY

Easy Wins Through Education, Not Hardware



Skip the Sink High Potential

18 of 26 participants never explored eco cycles



Capture Heat-Up Water High Potential

2.5-23 liters wasted per shower while water heats



Fuller, Mixed Loads Medium Potential

Most still separate colors despite cold-water capability



Savings achievable without new products

COST-BENEFIT ANALYSIS: THE BOTTOM LINE FOR CUSTOMERS AND UTILITIES

Understanding the financial implications of water efficiency technologies is essential for household adoption and utility program design. The pilot evaluated water and energy costs across all points of use throughout the study period.

Customer Return on Investment

The 50L Home LA Pilot demonstrates that ultra-efficient water use is not only achievable but can deliver meaningful financial benefits to customers, particularly as water and energy costs continue to rise. Based on pilot findings, the average Los Angeles household **using approximately 182 liters per person per day can achieve substantial cost savings through improved efficiency:**

- Reducing to 79 L/person/day (pilot average) results in approximately \$890 per year in savings
- Achieving the 50L Home target yields up to \$1,162 per year in savings

Savings are driven by reductions across all indoor end uses, with the largest contributions from:

- Showers
- Toilets
- Laundry

Appliance and Product Investment Returns

The pilot evaluated the incremental cost of adopting high-efficiency appliances and consumables relative to standard market options. Results show strong and rapid payback periods:

	Payback Period	Water Savings	10-Year Dollar Savings
Laundry (Washer + Detergent)	~3 years	56,756 liters 14,990 gallons	\$1,516
Kitchen (Dishwasher + Products)	~2 years	66,446 liters 17,560 gallons	\$1,357
Combined Indoor Bundle (Kitchen + Laundry)	As early as 2 years	123,000 liters 32,490 gallons	\$2,873

Financial Resilience and Long-Term Value

Investment scenarios were tested using Net Present Value (NPV) analysis over a 10-year period:

- **Laundry bundle:** Breakeven discount rates up to 51%
- **Kitchen bundle:** Up to 92%
- **Combined bundle:** Up to 64%

These unusually high breakeven rates indicate that efficiency investments are highly resilient to uncertainty, including changes in utility pricing or discount assumptions

Impact of Rising Water Costs

The financial case for efficiency is becoming even stronger as utility costs rise. Between 2023 and 2026, water costs increased by approximately 50%.

As rates continue to climb, the value of water savings grows accordingly – resulting in shorter payback periods and greater long-term returns for customers.



COST-BENEFIT ANALYSIS: THE BOTTOM LINE FOR CUSTOMERS AND UTILITIES

Indoor vs. Outdoor ROI Considerations

While indoor efficiency investments show strong and rapid returns, the pilot also found that:

- Indoor savings (~\$165/year) were offset in some cases by
- Outdoor cost increases (~\$276/year) due to seasonal irrigation demands

This underscores a key insight: Maximizing customer ROI requires a whole-home approach that addresses both indoor and outdoor water use. While outdoor investments – such as turf replacement – can deliver substantial long-term savings, they typically involve higher upfront costs and longer payback periods (often around 15 years without incentives).



The Utility Perspective

Water utilities have traditionally designed conservation programs around a simple principle:

Cost-effectiveness – investing in measures where the cost of saving water is lower than the marginal cost of developing new supply. By this standard, whole-home efficiency retrofits warrant serious consideration as a core resource strategy.

The Los Angeles pilot demonstrates that a comprehensive retrofit – including high-efficiency appliances, fixtures, and consumables – can be delivered at a retail cost of approximately **\$5,000–\$7,000 per home**.

At the household level, these upgrades translate into meaningful and durable savings.

For a typical Los Angeles home, a whole-home retrofit is estimated to **save approximately 34,500 gallons per year, roughly equivalent to eliminating 1,000 square feet of irrigated turf**. This positions indoor efficiency as a high-yield, space-efficient alternative to traditional outdoor conservation measures.

From a programmatic perspective, **if a utility were to contribute \$2,000 per home, the resulting cost of water savings is approximately \$1,574 per acre-foot**. This falls squarely within the range of imported water costs in Southern California, making whole-home retrofits not only environmentally beneficial but also financially competitive with supply-side investments.

Importantly, indoor savings are:

- Reliable and persistent (less weather-dependent than outdoor use)
- Equitable (accessible across housing types and income levels)
- Scalable through direct install or targeted programs

TESTING NEW FRONTIERS: RECIRCULATING SHOWER

One of the most innovative technologies tested in the LA pilot is a recirculating shower system. A single home was selected to pilot this emerging technology – not only to understand its water savings potential, **but to document what it takes to bring such technology to market:** Installation complexity, costs, permitting requirements, and contractor learning curves.

Kohler provided a prototype system for the pilot. The technology captures shower water in a floor receptor sump, then pumps it back through the showerhead while continuously mixing in fresh water (0.5 gallons per minute) to maintain the user's desired temperature. A digital thermostatic valve precisely controls temperature, while an atmospheric vacuum breaker protects potable water. After each shower, an integrated ozone generator runs a short disinfection cycle to sanitize the internal waterways. **The result: A full shower experience using a fraction of the water.**



Because recirculating shower technology does not yet have established code pathways, the City of Los Angeles Department of Building and Safety granted a one-time approval for this installation. This regulatory learning is itself a critical pilot outcome – understanding what code modifications or new standards may be needed to enable broader adoption.

The system is now operational. At the time of this report, data collection is ongoing, and final results are not yet available. Future reporting will include usage patterns, participant satisfaction, maintenance requirements, and measured water savings.

INSIGHTS & LESSONS LEARNED

The Los Angeles pilot generated findings that sharpen the case for indoor water efficiency, complicate some long-held assumptions, and surface practical lessons for the partners who will carry this work forward. The most important insights cut across audience categories.

Integration outperforms individual components. No single product in the pilot delivered the full 26 percent reduction from baseline. **Savings emerged when efficient appliances and fixtures were paired with consumables formulated to match them:** High-efficiency dishwashers with Cascade and Dawn Powerwash, high-efficiency washers with Tide Coldwater Clean, ultra-low-flow showerheads with multi-function personal care products. The appliance or fixture enables the behavior change; the consumable removes the remaining friction. Either alone produces a fraction of the result.

Effectiveness, not conservation messaging, drove adoption. Baseline interviews found that participants consistently ranked effectiveness above every other factor, including water savings, when selecting products and performing water-related tasks. **The pilot confirmed this throughout. Products that performed better were adopted enthusiastically, and the new use patterns persisted. Products that compromised on performance were rejected regardless of their water-saving potential. Conservation framing is not the unlock; performance is.**

Quality of life improved, it did not merely hold. Participants rated their experience above 4.0 on a five-point scale where 3 represents parity with pre-intervention conditions, 4 represents a better experience, and 5 represents a much better experience. Sustained ratings above 4.0 indicate that residents found the efficient products and practices genuinely more satisfying than what they had before, not just acceptable. The savings were a byproduct of an upgrade, which is why the behavior changes persisted.

The behavioral opportunity is real, even among highly engaged users. Most participants settled on a single dishwasher and washer cycle and never changed it. Very few had used their dryer's refresh feature. Nearly all wait for shower water to warm before stepping in, wasting up to 23 liters per shower. These gaps represent meaningful savings achievable through education, prompts, and packaging design rather than additional hardware.

Default settings and optional features matter more than designers assume. Dual-flush toilets were the clearest example. Participants reported using them correctly, yet measured data showed a 35 percent increase in toilet volume, because most defaulted to the 1.6-GPF flush. Boost functions and user-dependent settings on other appliances showed similar patterns. In real-world conditions, the default setting is the used setting. Future product specifications should favor single-flush ultra-low-flow designs, or dual-flush designs where even the higher-volume option remains well below conventional levels.

Hardware does not operate in isolation from the home. Low-flow kitchen faucets paired with tankless water heaters sometimes failed to trigger the heating element, forcing participants to run water longer to reach temperature. Integrated specifications need to account for these interactions if real-world savings are to match laboratory performance.

IMPLICATIONS BY AUDIENCE

For utilities

Indoor efficiency delivers reliable, year-round savings that complement outdoor conservation programs and reach customer segments underserved by landscape initiatives, including renters and residents of multifamily housing. A whole-home retrofit saves approximately **34,500 gallons per household annually, roughly equivalent to removing 1,000 square feet of turf, at a utility cost of approximately \$1,574 per acre-foot with a \$2,000 incentive.** That figure is competitive with imported water in Southern California, and unlike landscape savings it is not subject to weather or seasonal variation.

For policymakers

The pilot supports raising efficiency standards without compromising customer experience. The measured performance levels have direct relevance for California's Urban Water Use Objectives, EPA WaterSense specifications, and building code development at the state and local levels. Emerging technologies such as recirculating showers will require new code pathways before broader adoption is possible.

For product manufacturers and the building industry

Superior performance drives market success, and performance claims must hold up in real homes, not just in test chambers. Integrated system design, with appliances and complementary consumables developed together, creates compounding benefits that neither component achieves alone and represents the clearest commercial opportunity. Product design choices, particularly defaults and optional features, determine whether the water-saving potential of a technology is actually realized in use.

NEXT STEPS

The 50 Liter Home Los Angeles Pilot has demonstrated that meaningful residential water savings are achievable while improving quality of life. The challenge now is translating these findings into broader adoption across the United States and beyond. The Coalition and its partners are pursuing several interconnected pathways to scale these results.

Defining a U.S. Scaling Pathway

The pilot's success in Los Angeles provides proof of concept, but scaling requires a deliberate strategy tailored to diverse utility contexts, housing types, and market conditions across the country. The Coalition is developing a comprehensive scaling framework that addresses key questions, such as: **Which customer segments offer the highest savings potential? How can utilities integrate 50L Home technologies into existing rebate and incentive structures? What partnerships with retailers, contractors, and manufacturers are needed to ensure product availability and proper installation?**

This framework will identify priority markets based on water stress, utility readiness, and regulatory alignment starting with California utilities facing Urban Water Use Objective compliance deadlines, then expanding to water-stressed regions in the Southwest, Southeast, and beyond. **The goal is to create a replicable playbook that any utility can adapt to local conditions.**

Launching New Pilots in London (2025)

Water efficiency is a global imperative, and the Coalition is expanding its pilot program internationally. A new pilot launching in London in 2025 will test whether the integrated technology and consumable approach that succeeded in Los Angeles translates to different housing stock, water infrastructure, and consumer expectations.

The London pilot will also explore how efficiency strategies must adapt to markets with different baseline consumption patterns, energy sources for water heating, and regulatory frameworks. Lessons learned will inform the Coalition's global scaling strategy and strengthen the evidence base for international partners.

100-Home Scaling Pilot and Consumer Products Testing

Moving from 16 retrofit homes to 100 homes represents a critical step in validating scalability. The 100-Home Scaling Pilot will test whether the installation processes, product supply chains, and monitoring systems developed in Los Angeles can operate efficiently at a larger scale – and whether savings persist across a more diverse participant population.

Parallel consumer products pilots will continue refining the formulations and packaging of water-smart consumables, testing new product innovations, and gathering data on adoption patterns when products are available through normal retail channels rather than provided directly to participants. Understanding how consumers discover, purchase, and use these products in real-world market conditions is essential for achieving scale beyond utility-sponsored programs.

Applying Behavioral Study Insights

The Phase 3 behavioral analysis identified several intervention opportunities and produced actionable recommendations for prompts and facilitators that can complement technology installations. The Coalition is now working to translate these findings into practical tools.

Priority interventions include “Skip the Sink” prompts encouraging dishwasher use over hand-washing, simplified appliance guides accessible via QR codes, and laundry baskets sized to match full washer loads. These low-cost behavioral supports can be bundled with appliance installations, incorporated into product packaging, or distributed through utility customer programs. The goal is to capture the additional savings that emerge when customers fully utilize the capabilities of their efficient appliances.

Smart Home and Water Reuse Integration

The recirculating shower pilot in Phase 3 represents the frontier of residential water efficiency technologies that can reduce consumption by 80% or more while enhancing the customer experience they have come to expect. As these systems mature and navigate code approval pathways, they offer transformative potential for water-stressed regions.

The Coalition is also exploring integration with broader smart home ecosystems, including leak detection systems, smart irrigation controllers, and home energy management platforms. Connected technologies can provide real-time feedback to customers, enable utility demand response programs, and generate the granular data needed for continuous program optimization.

Future pilots will test greywater reuse systems, heat recovery from drain water, and other emerging technologies that advance residential water efficiency toward the 50-liter target and beyond.

Continued Engagement with Policymakers and Utilities

The pilot's findings have direct relevance for California's Urban Water Use Objectives, EPA WaterSense specifications, and building code development at state and local levels. The Coalition is actively engaging with policymakers to ensure that efficiency standards reflect the performance levels demonstrated in this pilot and that code pathways exist for emerging technologies like recirculating showers.

Utility engagement remains central to the scaling strategy. The Coalition is working with water and energy utilities to incorporate pilot findings into conservation program design, develop joint water-energy incentive structures that capture the full value of hot water reduction, and build the data infrastructure needed for verified savings attribution. As utilities face increasing pressure to meet conservation mandates cost-effectively, the 50L Home approach offers a proven pathway that complements existing outdoor programs and reaches customer segments currently underserved by landscape-focused initiatives.

The ultimate goal is to make 50-liter living not an exception, demonstrated in a pilot, but the standard for new construction and retrofits across water-stressed regions worldwide – and really for all homes, because the products and systems that get you there simply make life better.

Scaling the Breakthrough



Los Angeles Pilot Findings

56% Below Average Use • 4.4 Stars • Better Living

