ALLIANCE FOR WATER EFFICIENCY

WATER EFFICIENCY & CONSERVATION SYMPOSIUM 2025

AUGUST 6-8, 2025 | CHICAGO, IL

State & Local Policies that Hold Water (Savings)

Room 300 9:45 – 10:35 am

Heather Cooley

Chief Research & Program Officer

Pacific Institute

Laurel Elam

Senior Director, Business & Standards Development

RESNET

Christoph Lohr

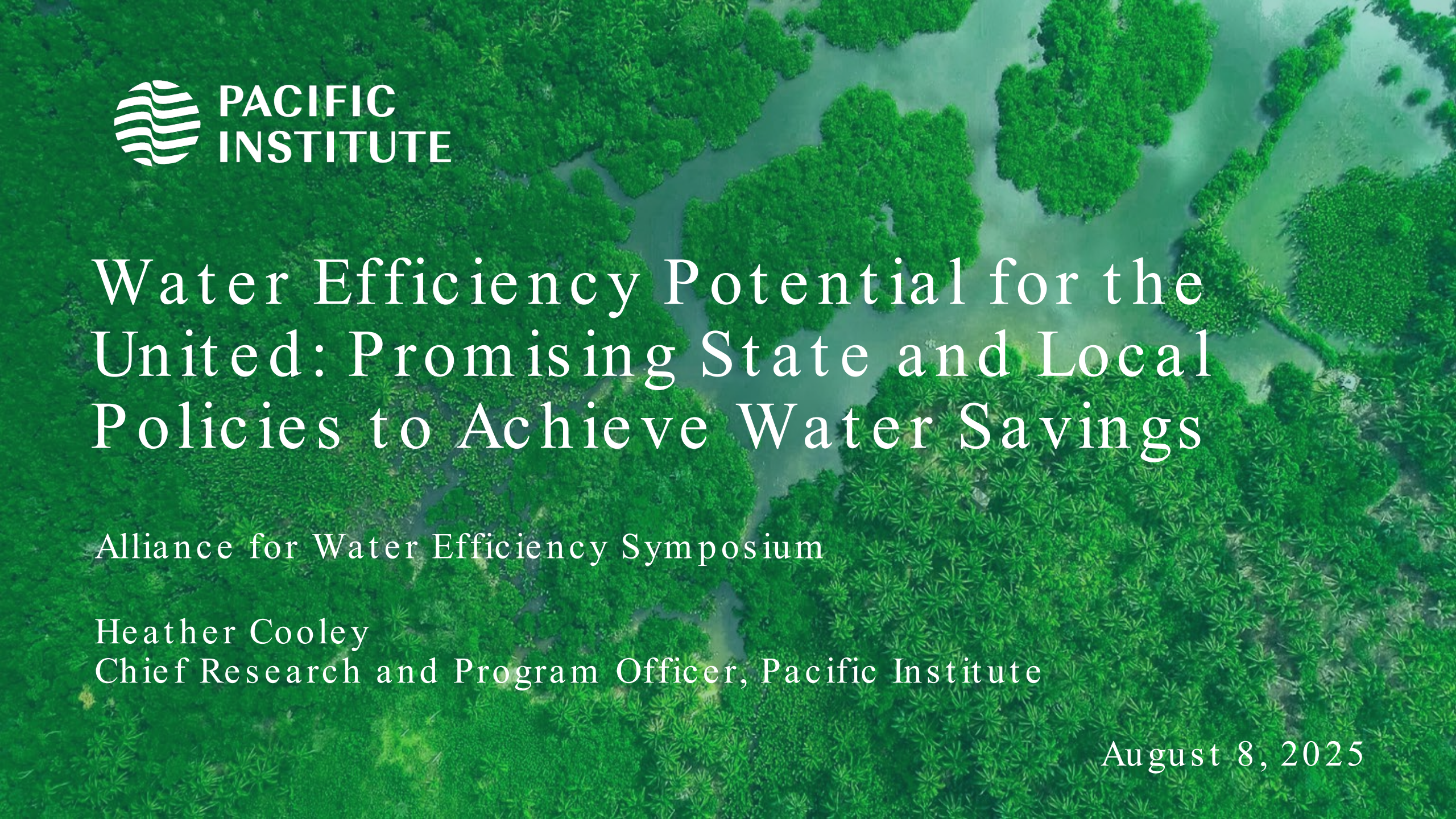
President of Technical Services & Research

IAPMO

National Water Efficiency Assessment Report: Promising State & Local Policies to Achieve Water Savings

Heather Cooley

Chief Research & Program Officer, Pacific Institute



PACIFIC INSTITUTE

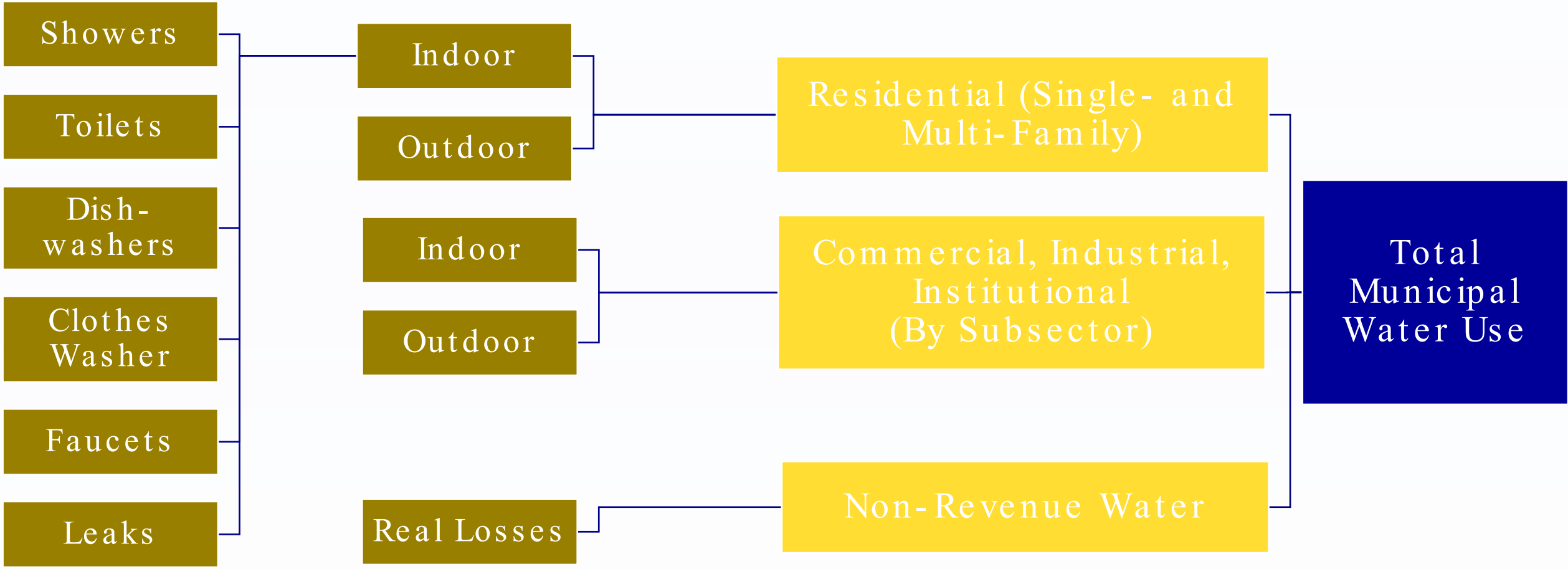
Water Efficiency Potential for the United: Promising State and Local Policies to Achieve Water Savings

Alliance for Water Efficiency Symposium

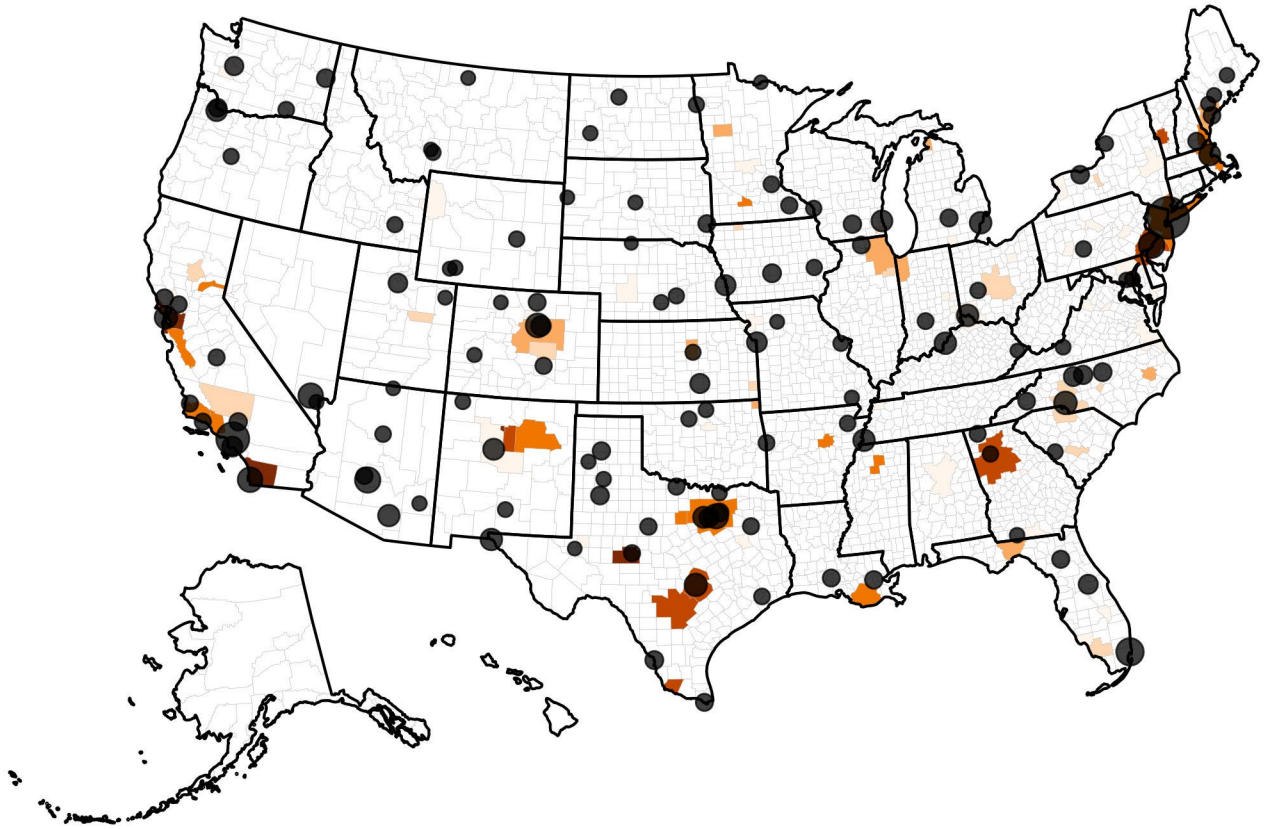
Heather Cooley
Chief Research and Program Officer, Pacific Institute

August 8, 2025

Study examines water savings potential across major sectors, CII subsectors, and residential end uses.



We developed a baseline estimate of municipal water use across the US by combining Flume and billing data.



Average Population (thousands)

- 50
- 100
- 350
- 750
- 1,350
- 1,600
- 3,600
- 5,700

Installed Flume Devices (2023 Count)

- >50
- >100
- >250
- >500
- >1,000
- >5,000

flume™

COLORADO STATE UNIVERSITY

ENERGY STAR® PortfolioManager®

Study uses three water efficiency scenarios.

Residential

CII & Water Loss



Eliminate overirrigation

Performance: 75th


Average Performance

Medium water-use plants and efficient irrigation

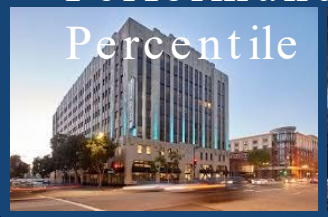
Performance: 50th


Efficiency

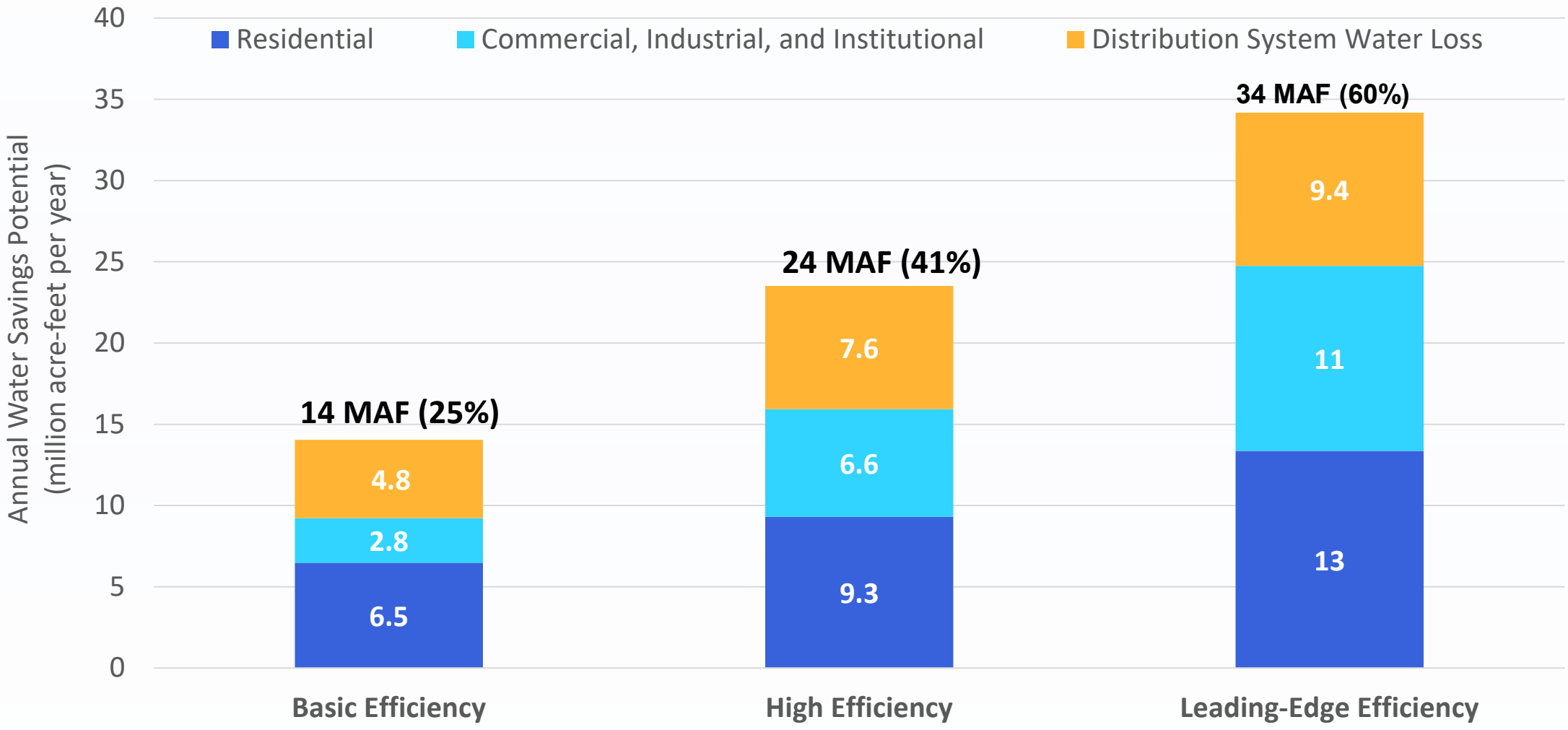
Best Performance

Low water-use plants and efficient irrigation

Performance: 25th Percentile

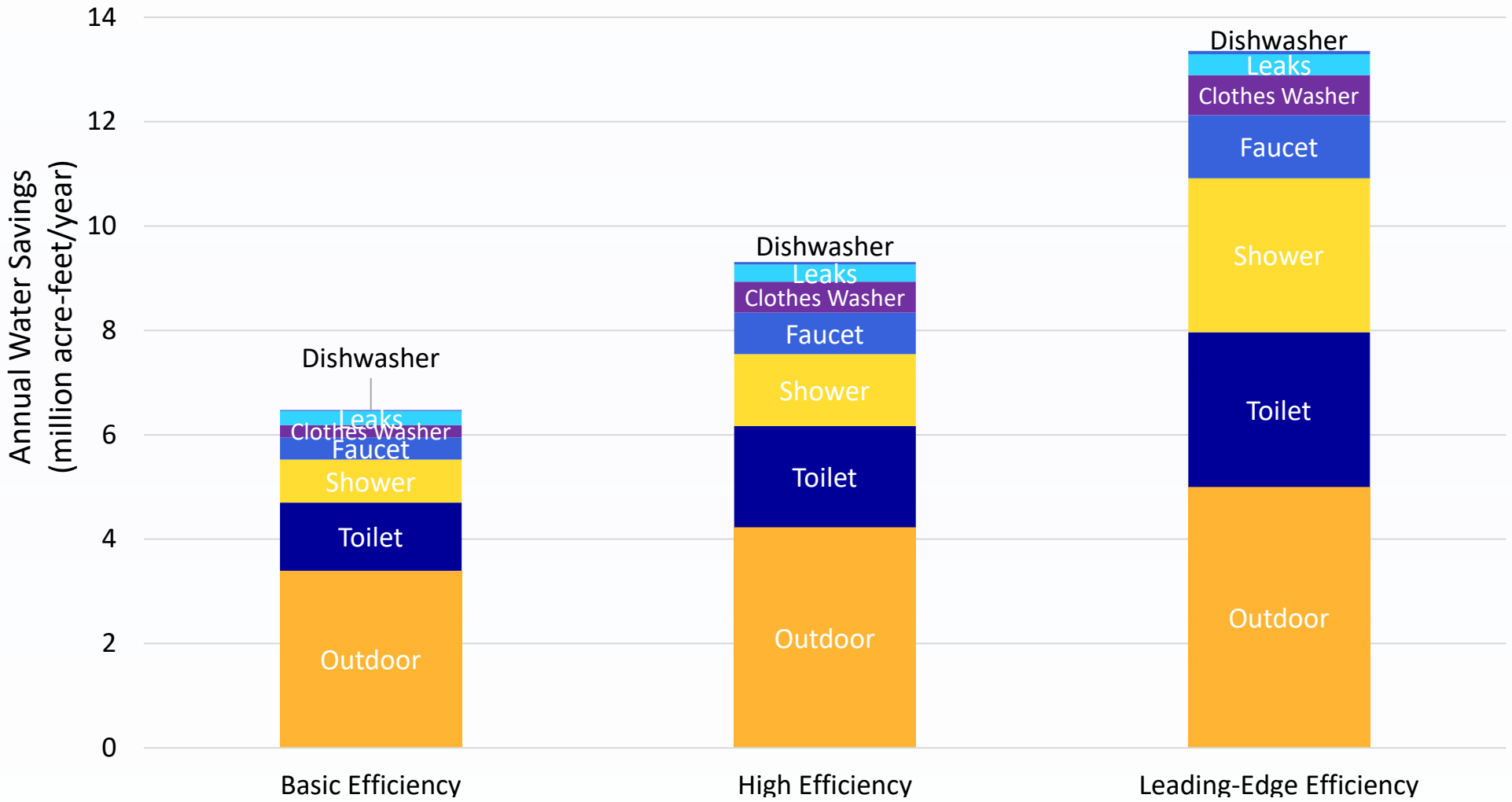



Water Efficiency Potential by Sector



Based on results from Berhanu et al. (forthcoming)

Residential Water Savings by End Use



Based on results from Berhanu et al. (forthcoming)

Recommendations

Update standards and codes.

Expand funding and financing opportunities for water-efficiency programs.

Increase financial and non-financial water-efficiency incentives for customers.

Provide financial and non-financial water-efficiency incentives to retailers, installers, and manufacturers.

Reduce water distribution system leakage.

PACIFIC INSTITUTE

Thank you!

Scan this QR code to sign up to be e-mailed when the report is released this Fall!

State Tax (and Federal) Credits & Incentives for Water-Efficient Homes

Laurel Elam

Senior Director, Business & Standards Development, RESNET

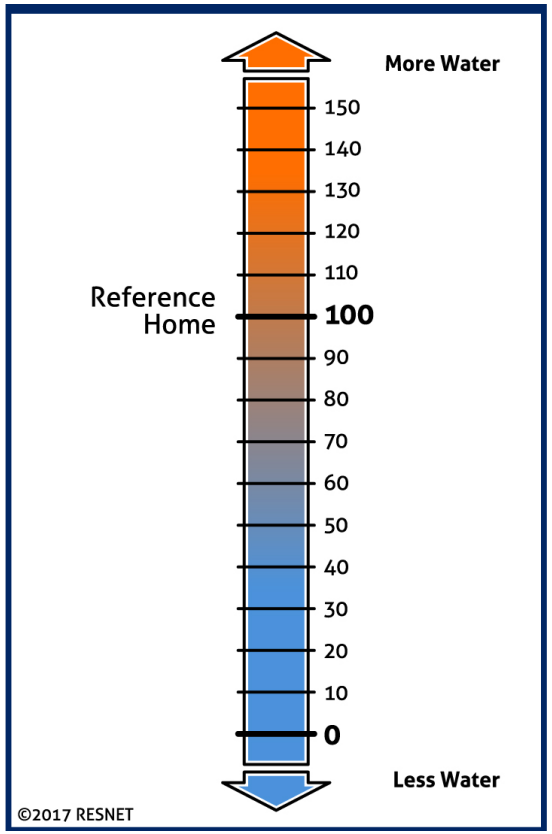
State (and Federal) Tax Credits and Incentives for Water-Efficient Homes

Laurel Elam
RESNET®
Senior Director- Business and Standards Development

August 8, 2025

HERS H20®

- The basis for HERS$_{H2O}$® is an ANSI standard known as ANSI/RESNET/ICC 850. The first version of this standard was published in the summer of 2020. The development of this standard is a collaboration between RESNET and the International Code Council.
- RESNET is a WaterSense Home Certification Organization (HCO) and HERSH2O® is a WaterSense Approved Certification Methodology. This means builders now have a performance-based approach to achieving the WaterSense label for their homes. By achieving a score of 70 or less and meeting a few simple requirements, builders can label their homes as WaterSense certified.



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Components of a Water Rating

Shower Heads

Kitchen Faucet

Lavatory Faucets

Clothes Washer

Toilet Flush Volume

Water Softener

Dishwasher

Excess Pressure

Irrigation

Pool or Spa

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RESNET HERS H20

Proposed Federal Tax Credit for Water Sense Homes

- Similar to the 45L tax credit for energy efficient homes
  45M would be a $2,000 tax credit for builders of WaterSense labeled homes through 2032
- Senator Cortez Mastro (D-NV) agreed to sponsor bill
- Looking for Republican senator to co-sponsor
  Even if not passed this Congress will be a template for future federal water policy initiatives and a model for local water districts

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RESNET
RESIDENTIAL ENERGY SERVICES NETWORK

Water Savings

Location	Baseline Home Annual Water Use	WaterSense Home Annual Water Use	Annual Water Savings
Charlotte, NC	129,000 gal	90,000 gal	39,000 gal
Denver, CO	161,000 gal	113,000 gal	48,000 gal
Orlando, FL	149,000 gal	104,000 gal	45,000 gal
Phoenix, AZ	261,000 gal	182,000 gal	79,000 gal
Salt Lake City, UT	159,000 gal	111,000 gal	48,000 gal
San Antonio, TX	177,000 gal	124,000 gal	53,000 gal

RESNET®
RESIDENTIAL ENERGY SERVICES NETWORK

The Central Arizona Groundwater Replenishment District (CAGRD)

CAGRD Water

EFFICIENT CONSTRUCTION INCENTIVE PROGRAM

EPA WaterSense

2023 PROGRAM DETAILS

Who Qualifies:	Amounts Available for All Participants
Any CAGRD Member Land	$1,000 per house $150,000 available
The following Member Service Areas: Copper Mountain Ranch CFD, El Mirage, EPCOR San Tan (both AMAs), Metro Water – Diablo, Sahuarita Water Company, and Spanish Trail Water Company	

PROGRAM OBJECTIVE

CAGRD CONSERVATION PHILOSOPHY

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Stretch Codes, Industry Standards, & Right-Sizing

Christoph Lohr

Vice President of Technical Services & Research, IAPMO

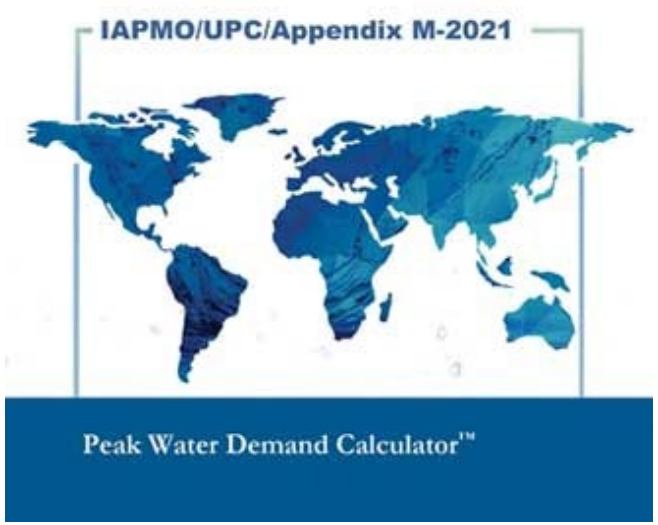
State and Local Policies that Hold Water (Savings):

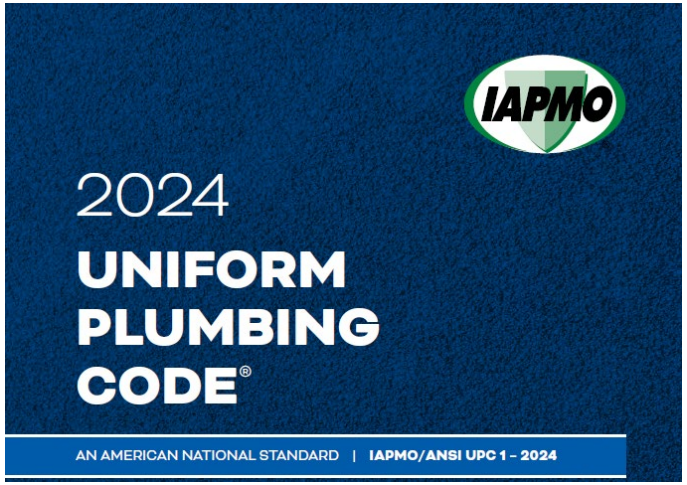
Right-Sizing, Water Auditing, and Water Management: The Data Intersection

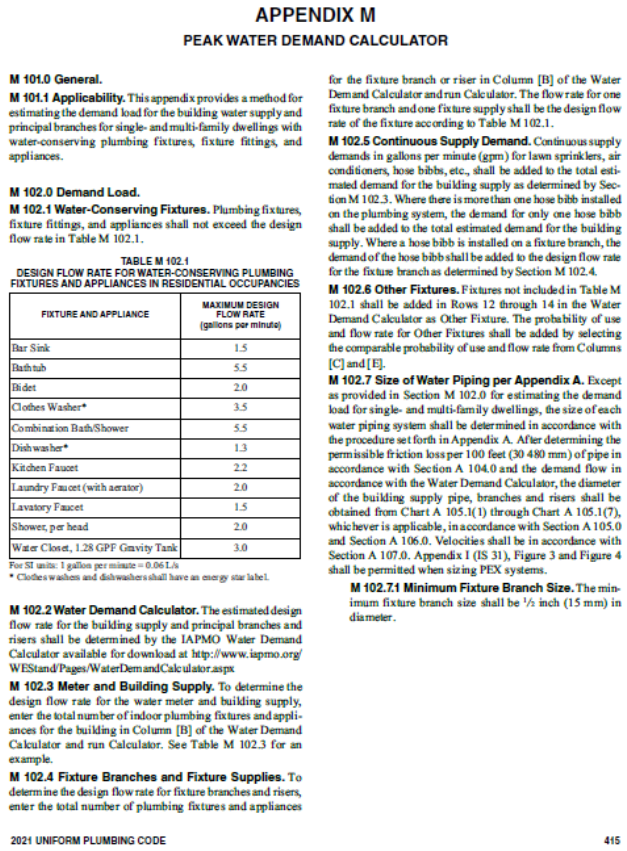
Christoph Lohr, PE,
CPD, LEED AP BD+C, ASSE 12080
IAPMO Vice President of Technical Services and Research

Water Demand Calculator. A Plumbing Resilient Solution by IAPMO

https://www.iapmo.org/we-stand/water-demand-calculator/







APPENDIX M

PEAK WATER DEMAND CALCULATOR

M 101.0 General.

M 101.1 Applicability. This appendix provides a method for estimating the demand load for the building water supply and principal branches for single- and multi-family dwellings with water-conserving plumbing fixtures, fixture fittings, and appliances.

M 102.0 Demand Load.

M 102.1 Water-Conserving Fixtures. Plumbing fixtures, fixture fittings, and appliances shall not exceed the design flow rate in Table M 102.1.

TABLE M 102.1
DESIGN FLOW RATE FOR WATER-CONSERVING PLUMBING FIXTURES AND APPLIANCES IN RESIDENTIAL OCCUPANCIES

FIXTURE AND APPLIANCE	MAXIMUM DESIGN FLOW RATE (gallons per minute)
Bar Sink	1.5
Bathtub	5.5
Bidet	2.0
Clothes Washer*	3.5
Combination Bath/Shower	5.5
Dishwasher*	1.3
Kitchen Faucet	2.2
Laundry Faucet (with aerator)	2.0
Lavatory Faucet	1.5
Shower, per head	2.0
Water Closet, 1.28 GPF Gravity Tank	3.0

For SI units: 1 gallon per minute = 0.06 L/s
* Clothes washers and dishwashers shall have an energy star label.

M 102.2 Water Demand Calculator. The estimated design flow rate for the building supply and principal branches and risers shall be determined by the IAPMO Water Demand Calculator available for download at http://www.iapmo.org/WEStand/Pages/WaterDemandCalculator.aspx

M 102.3 Meter and Building Supply. To determine the design flow rate for the water meter and building supply, enter the total number of indoor plumbing fixtures and appliances for the building in Column [B] of the Water Demand Calculator and run Calculator. See Table M 102.3 for an example.

M 102.4 Fixture Branches and Fixture Supplies. To determine the design flow rate for fixture branches and risers, enter the total number of plumbing fixtures and appliances for the fixture branch or riser in Column [B] of the Water Demand Calculator and run Calculator. The flow rate for one fixture branch and one fixture supply shall be the design flow rate of the fixture according to Table M 102.1.

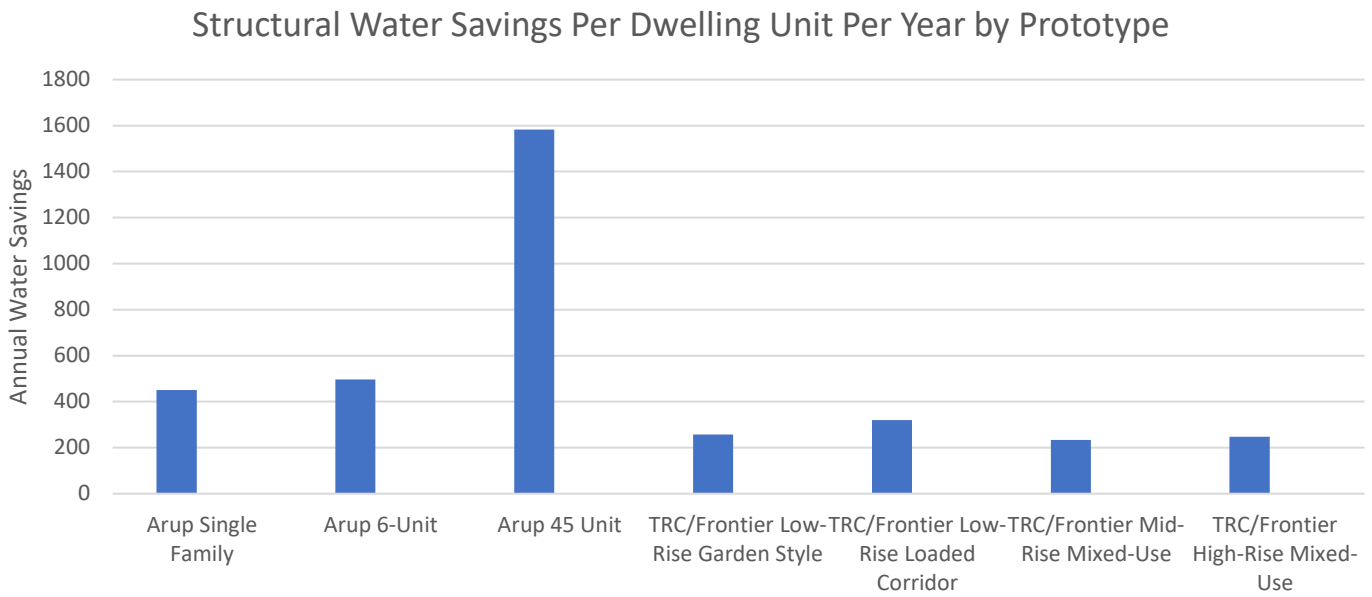
M 102.5 Continuous Supply Demand. Continuous supply demands in gallons per minute (gpm) for lawn sprinklers, air conditioners, hose bibbs, etc., shall be added to the total estimated demand for the building supply as determined by Section M 102.3. Where there is more than one hose bibb installed on the plumbing system, the demand for only one hose bibb shall be added to the total estimated demand for the building supply. Where a hose bibb is installed on a fixture branch, the demand of the hose bibb shall be added to the design flow rate for the fixture branch as determined by Section M 102.4.

M 102.6 Other Fixtures. Fixtures not included in Table M 102.1 shall be added in Rows 12 through 14 in the Water Demand Calculator as Other Fixture. The probability of use and flow rate for Other Fixtures shall be added by selecting the comparable probability of use and flow rate from Columns [C] and [E].

M 102.7 Size of Water Piping per Appendix A. Except as provided in Section M 102.0 for estimating the demand load for single- and multi-family dwellings, the size of each water piping system shall be determined in accordance with the procedure set forth in Appendix A. After determining the permissible friction loss per 100 feet (30 480 mm) of pipe in accordance with Section A 104.0 and the demand flow in accordance with the Water Demand Calculator, the diameter of the building supply pipe, branches and risers shall be obtained from Chart A 105.1(1) through Chart A 105.1(7), whichever is applicable, in accordance with Section A 105.0 and Section A 106.0. Velocities shall be in accordance with Section A 107.0. Appendix I (IS 31), Figure 3 and Figure 4 shall be permitted when sizing PEX systems.

M 102.7.1 Minimum Fixture Branch Size. The minimum fixture branch size shall be ½ inch (15 mm) in diameter.

2021 UNIFORM PLUMBING CODE 415



	Arup Single Family	Arup 6-Unit	Arup 45 Unit	TRC/Frontier Low-Rise Garden Style	TRC/Frontier Low-Rise Loaded Corridor	TRC/Frontier Mid-Rise Mixed-Use	TRC/Frontier High-Rise Mixed-Use
Number of Stories	1	3	5	2	3	5	10
Square Footage Total	2380	14280	45090	7680	40,000	113100	125400
Square Footage Per Unit	2380	2380	1002	960	960	870	850
Total Gallons Saved per Year	451	2980	71258	2056	11520	20592	32736
Number of Units	1	6	45	8	36	88	132
Per Unit Water Savings per Year	451	497	1584	257	320	234	248
Water Savings Gallons per SQFT	0.19	0.21	1.58	0.27	0.33	0.27	0.29
Furthest Fixture From Hot Water Source	Shower	Shower	Kitchen Sink	N/A	N/A	N/A	N/A
Daily Furthest Fixture Uses Per Day	1	1	4	N/A	N/A	N/A	N/A

The median value for water savings for these prototype buildings was **320 gallons per dwelling unit per year** while the average value for water savings for these prototype buildings was **513 gallons per dwelling unit per year.** To put it another way: For each home just by reducing waiting times for hot water can save as much as an outdoor hot tub every year.

Note:
1. Arup 45 Unit water savings show that fixture layout has potential to also have impact on structural water waste.
2. Volume of savings is only for 100% of the difference in volume. Real world data is trending towards 2x of the volume.

Table 52: Impacts on Water Use and Embedded Electricity in Water – CPC Appendix M

Impact	On-Site Indoor Water Savings (Gallons/Year)	Embedded Electricity Savings[a] (kWh/Year)
Average Per Dwelling Unit Impacts	263	1.4
Annual[b] Statewide Impacts for New Construction & Additions	9,296,024	50,505
Annual[b] Statewide Impacts for Alterations	-	-
Annual[b] Total Statewide Impacts	9,296,024	50,505

a. Assumes embedded energy factor of 5,440 kWh per million gallons of water for indoor use (SBW Consulting, Inc. 2022).

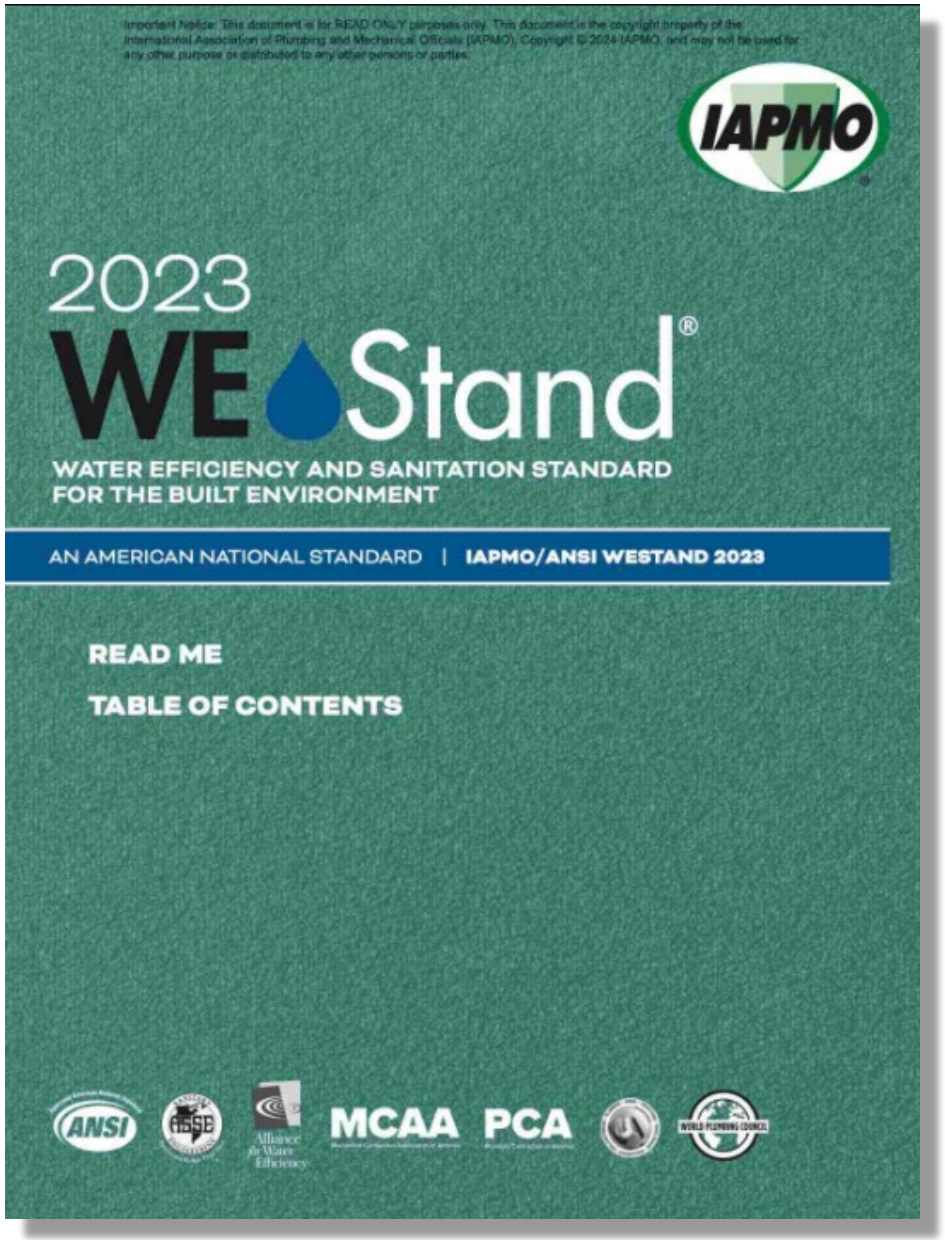
b. First-year savings from all buildings completed statewide in 2026.

Table 383: Estimated Annual Water and Energy Savings Per Dwelling Unit

Building Type	In-Unit Water Savings (Gallons/Dwelling Unit/Year)	In-Unit Embedded Electricity Savings (kWh/Dwelling Unit/Year)
Low-Rise Garden Style	257	1.40
Low-Rise Loaded Corridor	320	1.74
Mid-Rise Mixed-Use	234	1.27
High-Rise Mixed-Use	248	1.35

In a 2024 Report, TRC Companies and Frontier Energy estimated **water savings of 234 to 320 gallons per dwelling unit per year** in four prototype buildings and **also includes embedded energy savings for the water utility.**

Source:
https://efiling.energy.ca.gov/Lists/DocketLog.aspx?docketnumber=24-BSTD-01
(to access the report, look for report number 255321-4 titled 2025 CASE Report – Multifamily Domestic Hot Water)



The WE-Stand is the nation's **most powerful**, flexible, ready-to-adopt plumbing water-efficiency **framework of possibilities.**

Source:
https://iapmo.org/we-stand

2023 WE-Stand Top 15 Water Conservation Provisions				
Water Efficient Pluming Fixtures	Alternate Water Sources for Nonpotable Applications	Onsite Black Water Reuse	Onsite Grey Water Reuse	Onsite Stormwater Treatment Systems
Nonpotable Rainwater Catchment Systems	Potable Rainwater Catchment Systems	Onsite Wastewater Treatment for Direct Potable Water Use	HVAC Condensate Catchment	Right Sizing
Hot Water [Area] Ratio	Ecological-Sanitation: Composting Toilet and Urine Reuse Systems	Vacuum Drainage	Leak Detection	Bath and Shower Flow-Reduction Devices

Out of these top 15 plumbing water conservation provisions, the 2023 WE-Stand includes **650% more options** than some model plumbing codes, and **150% more options** than other water efficiency codes and standards.

Christoph Lohr, PE

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Vice President of Technical Services and Research

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Plumbing Science with Christoph Lohr

THE AUTHORITY PODCAST: PLUMBING & MECHANICAL

Key Takeaways:

1. Total Water Management offers blue ocean to interested and qualified individuals and organizations.
2. Stay tuned for a Non-Residential Water Demand Calculator® - and if you want to help we welcome it, especially in the form of collecting peak flow rate data!

Audience Q&A

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