Eliminating Behavioral Waste Without Requiring Behavior Change
Consider how hard it is to change yourself and you'll understand what little chance you have in trying to change others.

~ Benjamin Franklin
Have You Or A Family Member Ever __________
While Waiting For The Shower To Get Warm?

- shaved
- picked-out clothes
- used washroom
- made bed
- brushed teeth
- had coffee
- used phone
Our Behavior Greatly Impacts The Amount Of Water & Energy We Use For Showering

71%
Leave Shower
And Perform Other Tasks

Lawrence Berkeley National Lab: Lutz 2011 “Water And Energy Wasted During Residential Shower Events”
Our Behavior Greatly Impacts The Amount Of Water & Energy We Use For Showering

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52%
Perform Multiple Tasks
As Part Of Their Warm-Up Routine

Evolve Technologies Shower Survey 2008
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71% Leave Shower And Perform Other Tasks
52% Perform Multiple Tasks As Part Of Their Warm-Up Routine
60% Tasks Dictate Time Away Away From Shower

20% - 30% Of A Shower Is Wasted Before Bathing Begins

Lawrence Berkley National Lab Paper & Data Analysis

2004 Feasibly Study To Improve Hot Water Distribution

2011 Water & Energy Wasted During Residential Shower Events

2014 Disaggregating Residential Shower Warm-Up Waste
Anatomy Of A Shower Warm-Up – Lawrence Berkley National Lab Data Analysis

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TEMP RISE

MAX TEMP PLATEAU

BATHER AWAY MULTITASKING

& SHOWER REACHES MAX TEMP

Anatomy Of A Shower Warm-Up – Lawrence Berkley National Lab Data Analysis

MAX TEMP PLATEAU

TEMP RISE

BATHING TEMP PLATEAU

BATHER ADJUSTS TEMP DOWN FOR COMFORT (105 F – 100 F) & BEGINS SHOWERING
Anatomy Of A Shower Warm-Up – Lawrence Berkley National Lab Data Analysis


BATHER ADJUSTS TEMP DOWN FOR COMFORT (105 F – 100 F) & BEGINS SHOWERING
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WARM-UP WASTE

40% of warm-up waste volume

STRUCTURAL WASTE

BATHING TEMP PLATEAU

BATHER ADJUSTS TEMP DOWN FOR COMFORT (105 F – 100 F) & BEGINS SHOWERING

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WARM-UP WASTE

40% of warm-up waste volume

60% of warm-up waste volume

STRUCTURAL WASTE

BEHAVIORAL WASTE

BATHING TEMP PLATEAU

BATHER ADJUSTS TEMP DOWN FOR COMFORT (105 F – 100 F) & BEGINS SHOWERING

About A Minute Of Behavioral Waste (Hot Water) Occurs With Every Shower

BEHAVIORAL WASTE RANGE

38 seconds 56 seconds

2013 Field Study 95 sec of total waste from Lutz 2004 x 59% Behavioral Waste from 2013 field study
What If Californians Could Eliminate Behavioral Waste ...

Without Changing Behavior or Making Sacrifices?
26 Billion Gallons Water/Year in California

11.5 years of drinking water for everyone in CA (58 gallons person/year)
26 Billion Gallons Water/Year in California

11.5 years of drinking water for everyone in CA (58 gallons person/year)

100 Million Therms/Year in California

185k cars gasoline fueled for a year (13K miles per year)

or
26 Billion Gallons Water/Year in California

11.5 years of drinking water for everyone in CA (58 gallons person/year)

100 Million Therms/Year in California

185k cars gasoline fueled for a year (13K miles per year)

3 Billion kWh/Year in California

260K homes electricity consumption for a year (11,320 kWh home/year)

+ or
The Thermostatic Shut-Off Valve (TSV) Solution

Keep Your Routine – Save Your Hot Water

• Eliminates Behavioral Waste – Saves the water and energy most bathers don’t even realize they’re wasting.

• Savings occur without changing shower flow, feel or even your morning routine.
How A TSV Works
How A TSV Works

COLD EXITS

STOPS WHEN HOT

STRUCTURAL WASTE

BEHAVIORAL WASTE

0:00 0:45 1:30 2:15 3:00

90 F 100 F 120 F

80 F 70 F 60 F

50 F

BEHAVIORAL WASTE

AVG. about a minute

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How A TSV Works

- **Cold Exits**: Cold water is available at all times.
- **Stops When Hot**: Water stops when reaching a certain hot temperature.
- **Normal Flow Shower**: Continuous water flow for showers.

The chart shows the temperature range for each category over time, indicating how the TSV functions in different scenarios.
Behavior Is Persistent - Fast Hot Water Delivery Increases The Volume Of Behavioral Waste By 21%

Thank You

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