



CADMUS



# ShowerStart<sup>®</sup> Pilot Study

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# Agenda

## INTRODUCTION



Funder Recognition



ShowerStart<sup>®</sup> TSV



The Pilot

## FINDINGS



Engineering Findings



Survey Results



Conclusions



Questions



# Funder Recognition



THANK YOU PPL ELECTRIC UTILITIES!



# ShowerStart® TSV

## WHAT DOES IT DO?

ShowerStart reduces **Behavioral Waste** by **restricting the flow rate** once the water is warm

This **reduces the amount of hot water that goes down the drain** while the shower is not in use

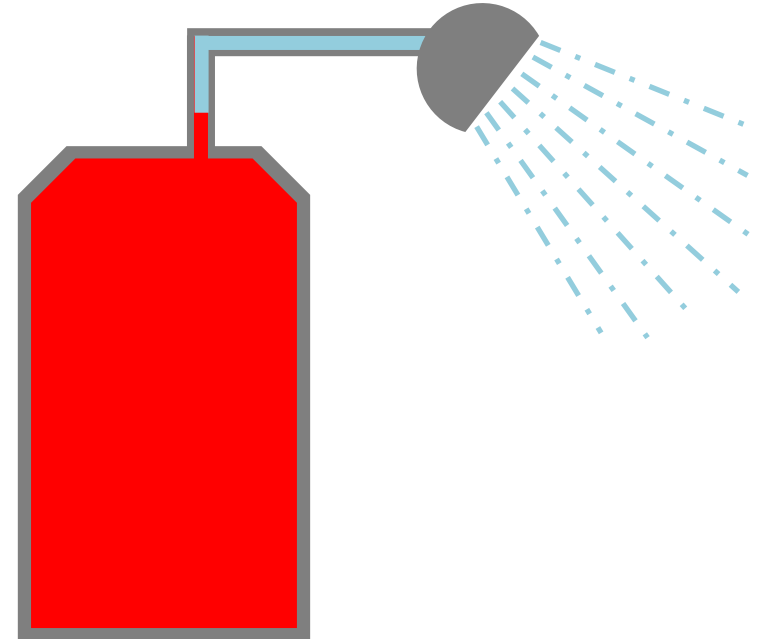


# ShowerStart<sup>®</sup> TSV

TURN ON THE SHOWER

Cold water exits the **system** as hot water flows to the showerhead.

This is **Structural Waste**.

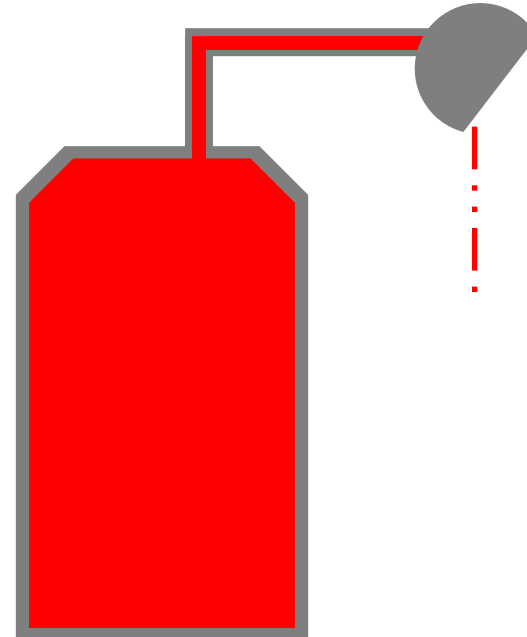


# ShowerStart® TSV

## SHOWERSTART KICKS IN

When the water reaches **95 degrees**, the flow is **slowed to a trickle**

This **prevents hot water from going down the drain**. Hot water going down the drain is known as **Behavioral Waste**



# ShowerStart® TSV

THE SHOWER IS READY

When the occupant is ready to shower, they pull the cord and **full flow resumes**



# The Pilot

## Two Primary Purposes

Quantify Behavioral Waste

Gather Customer Feedback

Metering

Survey

How long is the device active?

What temperature is the water?

Functionality

Usability

**22** showers in **18** homes





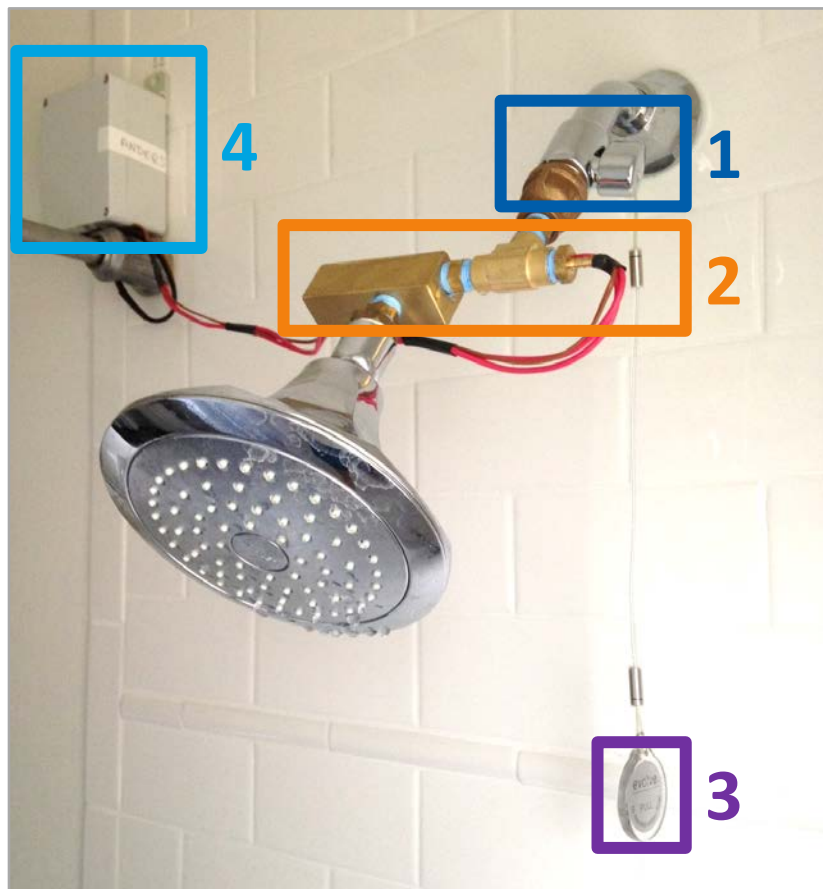
# The Pilot

## THE METERING SETUP



# The Pilot

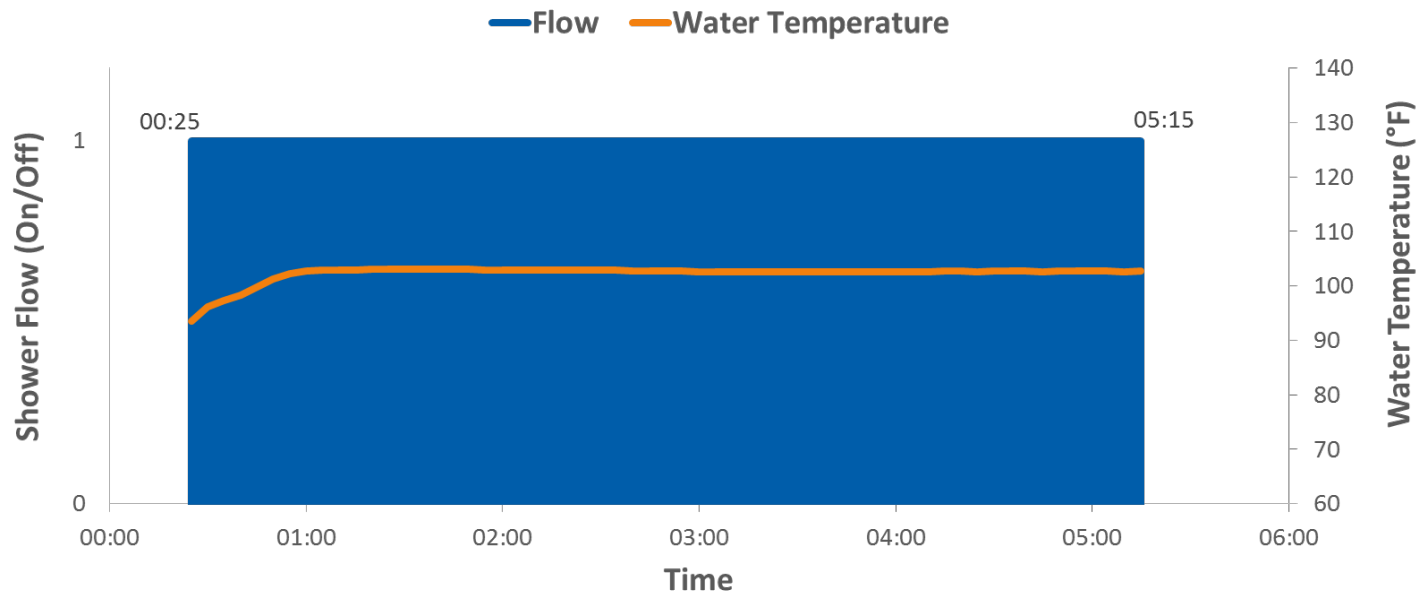
## THE METERING SETUP



- 1** Thermostatic Restriction Valve
- 2** Temperature and Flow Sensors
- 3** ShowerStart TSV Pull Cord
- 4** Data Logging Equipment

# Engineering Findings

## THE DATA – A TYPICAL SHOWER

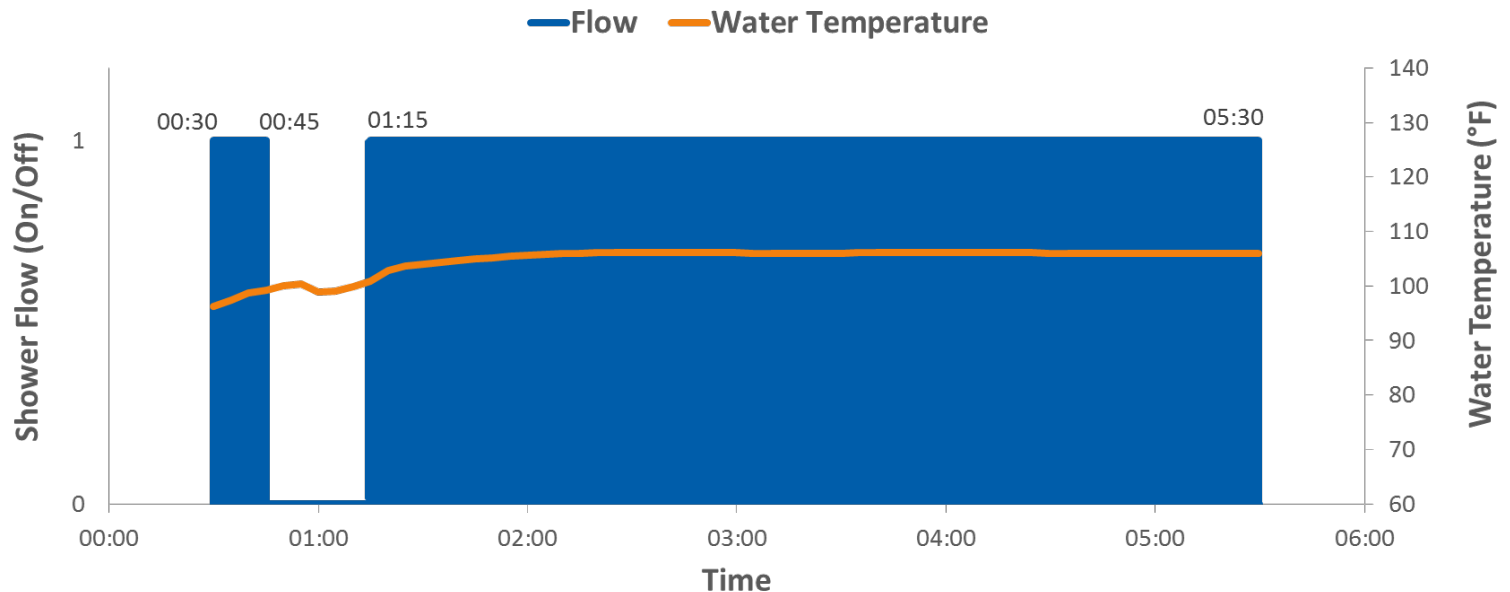


Shower turned on

**Operates at full flow until the occupant turns off shower**

# Engineering Findings

## THE DATA – WITH A SHOWERSTART TSV

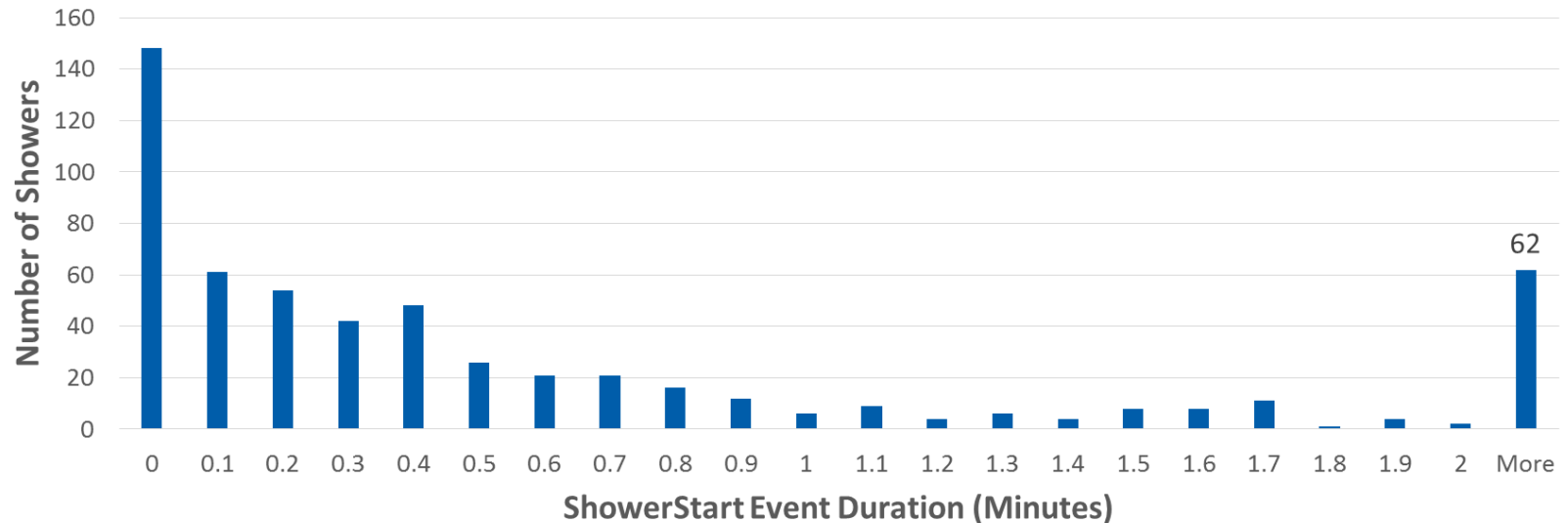


The shower is turned on  
**Once the temperature hits 95 degrees – flow stops**

Cord is pulled **30 seconds later** and **full flow resumes**

# Engineering Findings

## THE RESULTS – QUANTIFYING BEHAVIORAL WASTE



**Average behavioral waste event lasted 59 seconds; average water temperature was 104 degrees**

**Of 574 shower events, 62 (11%) had behavioral waste periods longer than two minutes**

# Engineering Findings

## THE RESULTS – QUANTIFYING BEHAVIORAL WASTE

**110 – 125** kWh / year  
**900 – 1,000** gallons / year

### Savings based on:



**Behavioral Waste Period of 59 seconds**



**Average water temperature of 104 degrees**



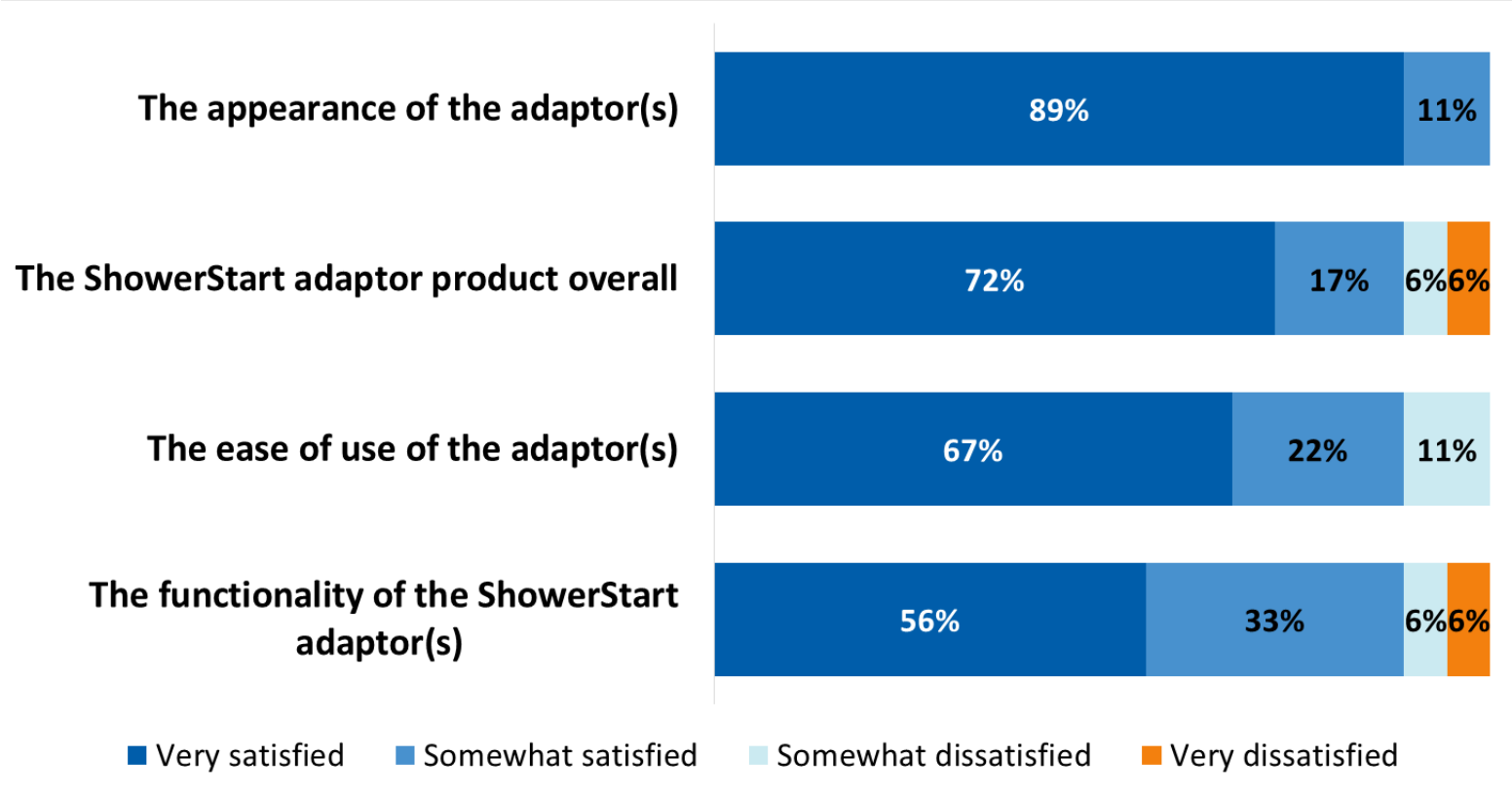
**Showerhead flow rate is 2.5 GPM**





# Customer Survey

## THE RESULTS



# Customer Survey

## WHAT DID PEOPLE HAVE TO SAY?

### DISSATISFIED

Some participants would **enter the shower before the ShowerStart TSV activated**, so flow would cut out part way through their shower

One participant **felt that their shower's flow rate decreased** as a result of the equipment installation

### SATISFIED

One participant mentioned they would take **another ShowerStart TSV for their second bathroom** if it were offered





# Conclusions

## THE TAKEAWAYS

**On average**, the device saved energy and water.

On an individual basis:

- About **25% of participants did not save energy or water**
- **Many saved much more** energy and water than the average

**Most users were satisfied** with the device's appearance and functionality

**User education** can address dissatisfaction **with the functionality**



Findings



# Considerations

## THINGS TO KEEP IN MIND

To achieve savings, the **device must be installed on a frequently used shower**

Savings will vary based on the occupant's **selected showering temperature**

- Cooler showers may not trigger the device

The device **may not work consistently** when showers are taken **back to back**

- “Cool down” period

Think about the application; the **cord must be reachable by user**



### Findings





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