

NOT YOUR GRANDMA’S WATER HEATER: CUSTOMERS’ TAKE ON LOAD-SHIFTING TECHNOLOGY

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BACKGROUND

PILOT OVERVIEW

Self Generation Incentive Program (SGIP) Heat Pump Water Heater (HPWH) Program provides rebates to single family, multifamily and commercial, general market and equity customers installing HPWHs with load shifting capabilities.

- Over 10,000 units installed to date.

Key electric utilities: PG&E, SCE, SDG&E, & SMUD.

Top manufacturers: Rheem, AO Smith, Bradford White, & American Standard.

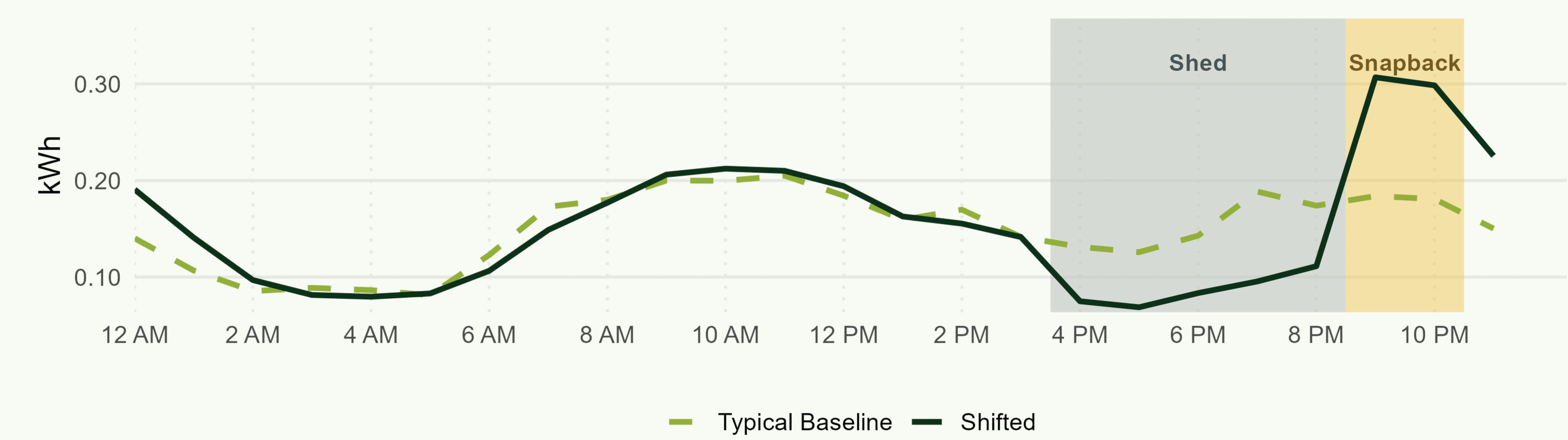
SURVEY GOALS

- Assess customers satisfaction levels.
- Understand customer perception of bill impacts and hot water availability.
- Understand awareness of demand response and load shifting.

WHAT IS A LOAD SHIFTING HPWH?

- **HPWH Shifts** to use very little energy during peak hours (4pm to 9pm) when electricity costs are highest, and reheats water during non-peak hours when electricity costs are lower.
- **Maximizes savings** when paired with a Time-of-Use (TOU) rate plan.
- **Thermostatic mixing valve (TMV)** and active load up/load shed signals can enable more aggressive load shifting.

LOAD SHAPES - AVERAGE WEEKDAY



Comparison of Average Weekday Load Shape: Typical Baseline vs. Load-Shifted HPWH

Shed – During peak electricity pricing hours, the load-shifted HPWH reduces or pauses energy use to help relieve grid stress.

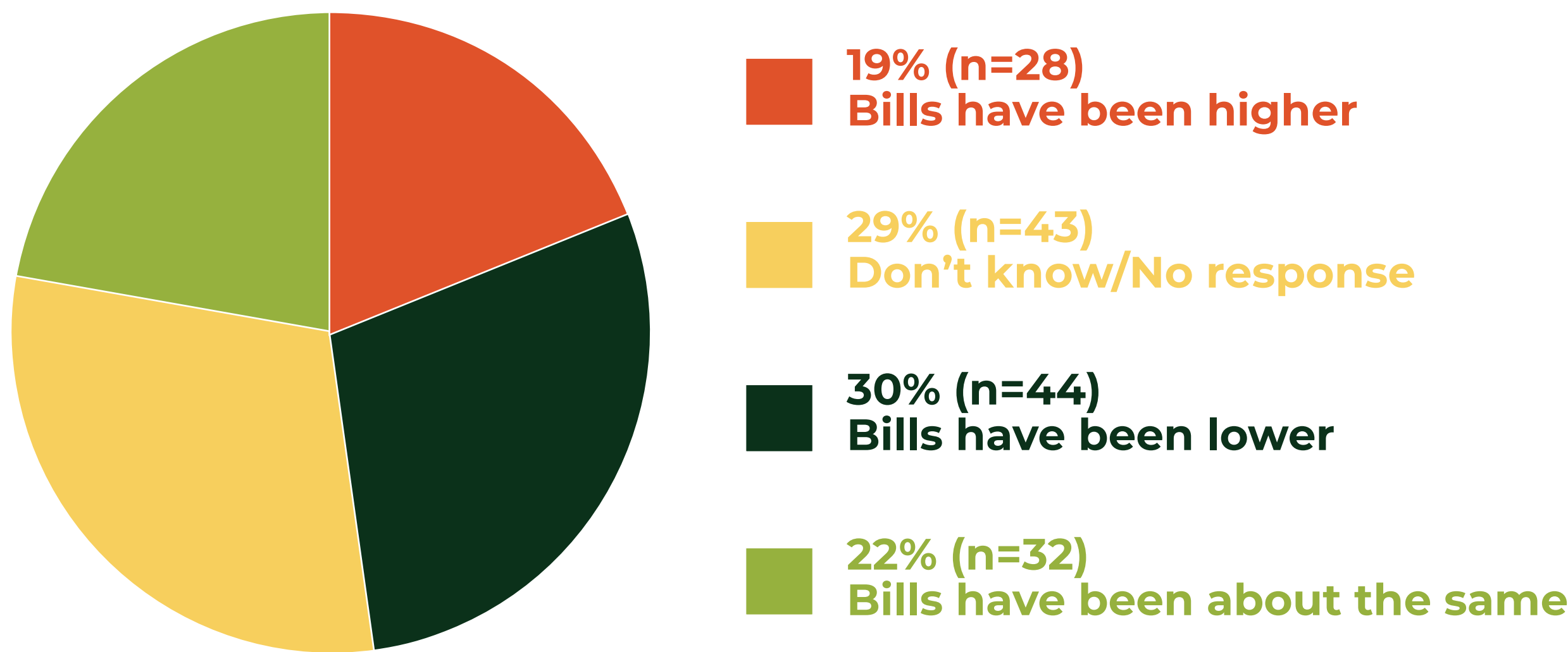
Snapback – After peak hours, the HPWH resumes heating, using lower-cost electricity to reheat water efficiently.

DEMOGRAPHICS & RESPONSE

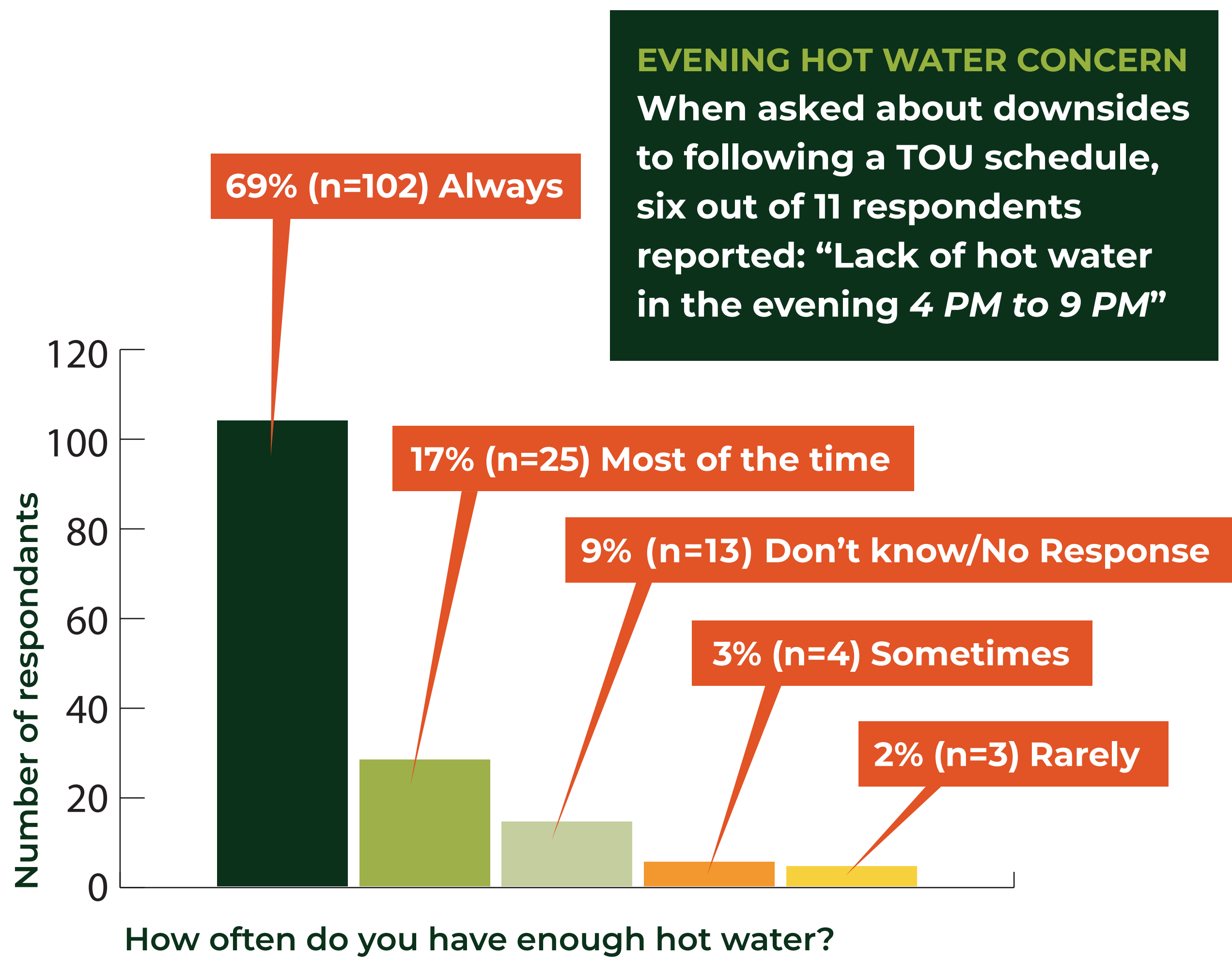
Survey Sample, Number of Completes, & Response Rates				
Type	Population*	Survey Sample	Completes	Response Rates
General Market	1,899	409	143	35%
Equity	319	33	4	12%
Total	2,218	442	147	33%

*Total population reflects the number at the time of the surveys

CUSTOMERS’ PERCEPTION ON BILLS



“The HPWH is more efficient, but with gas and electric prices in my area, the dollar savings are small. Since I have solar, I do not pay for the HPWH’s energy use” - Paraphrased from Participant Comment.

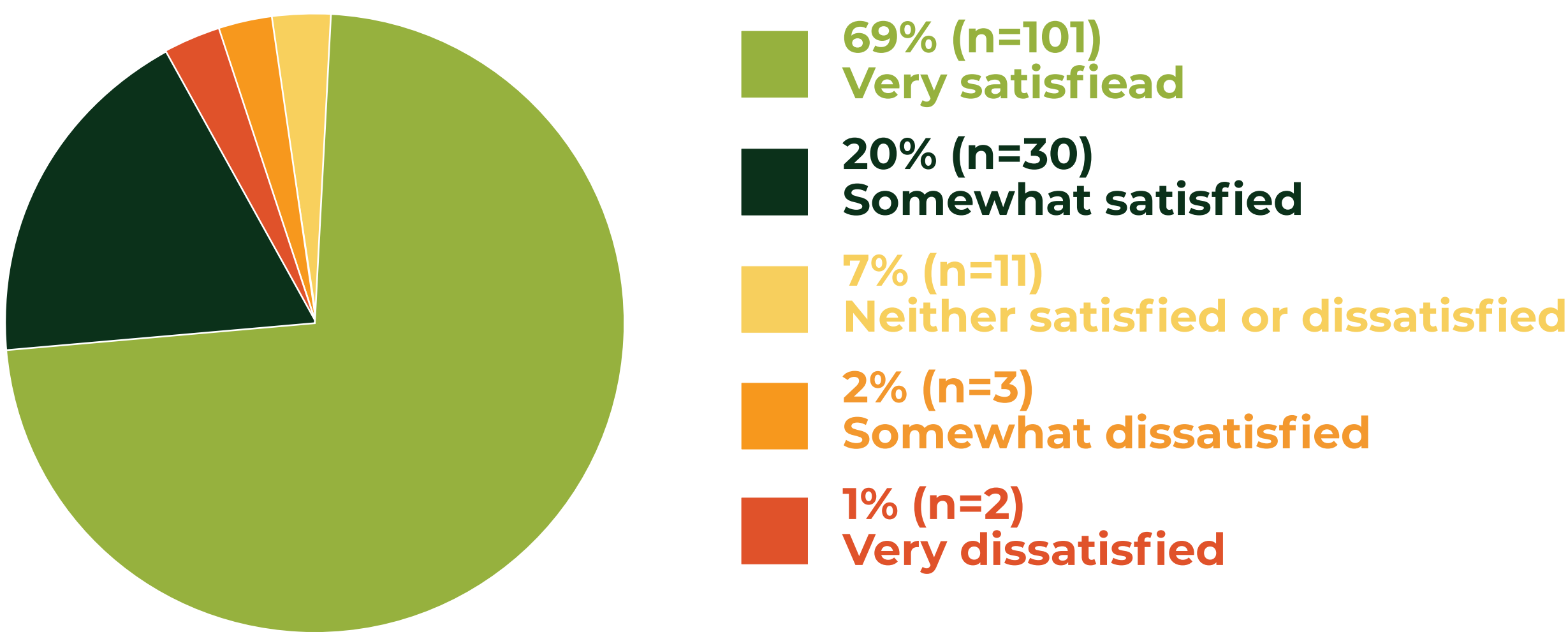


EVENING HOT WATER CONCERN

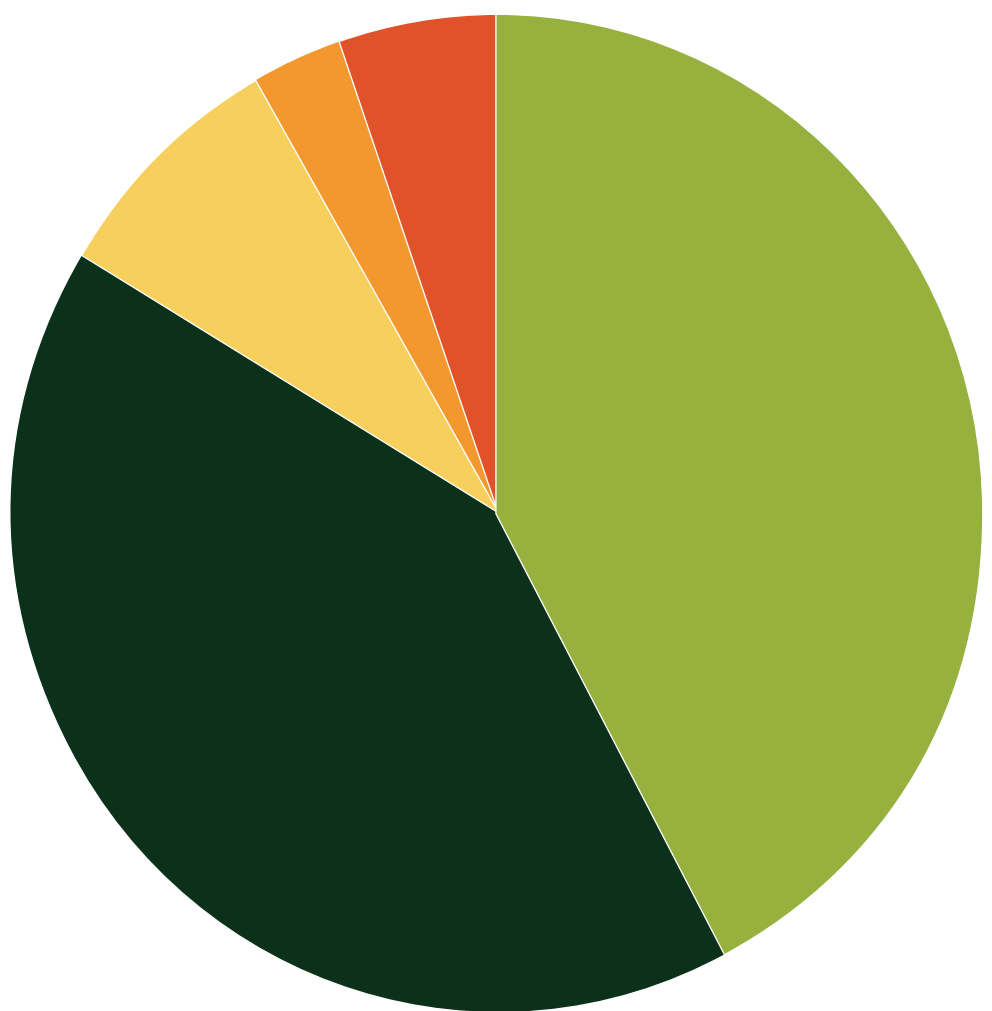
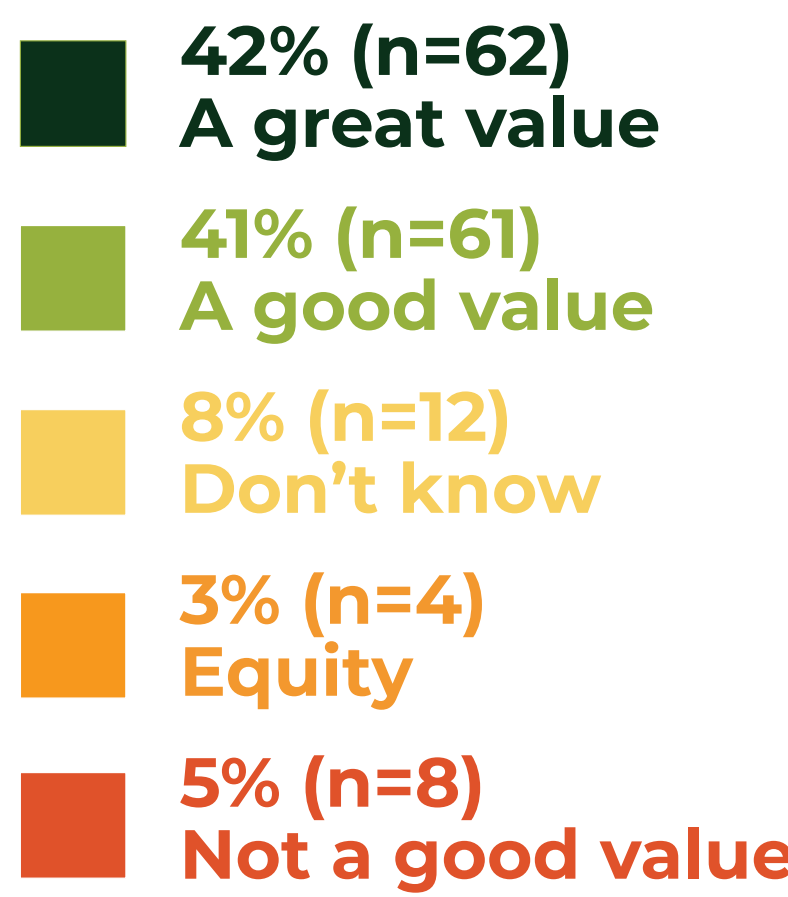
When asked about downsides to following a TOU schedule, six out of 11 respondents reported: “Lack of hot water in the evening 4 PM to 9 PM”

CUSTOMER SATISFACTION

HOW SATISFIED ARE YOU WITH YOUR NEW HPWH?



HOW WOULD YOU RATE YOUR OVERALL INVESTMENT IN YOUR HPWH?



ISSUES/REPAIRS

75% (n=110) No issues

19% (n=28) Yes, troubleshooting

3% (n=5) Yes, repair

3% (n=4) Yes, replacement

Participants Report Issues

Three dominant drivers

Above

Below

Issue 1: Connectivity

Both internet & HPWH app contributed to issues

Issue 2: HPWH System

The HPWH Computer System seemed to pose problems for many people

Issue 3: Installation

Improper installation contributed to the need for repairs and replacement

Other Electric Technologies – Solar, EV, Battery Storage or Heat Pump – Based on self-reports, the HPWH did not influence participants to adopt additional electric technologies. However, 58% of participants already had solar, nearly 2.5 times higher than the general population.