Exh. HSH-25
Dockets UE-260005, UG-260006 and UE-260113
Witness: Hannah S. Halliday

BEFORE THE WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION, **Complainant,** **v.** **PUGET SOUND ENERGY,** **Respondent.**	**DOCKETS UE-260005 & UG-260006**
In the Matter of the Petition of **PUGET SOUND ENERGY** **For an Accounting Order Authorizing the Deferred Accounting Treatment for FERC Interest Associated with Mandatory Transmission Network Upgrades**	**DOCKET UE-260113 (Consolidated)**

EXHIBIT TO

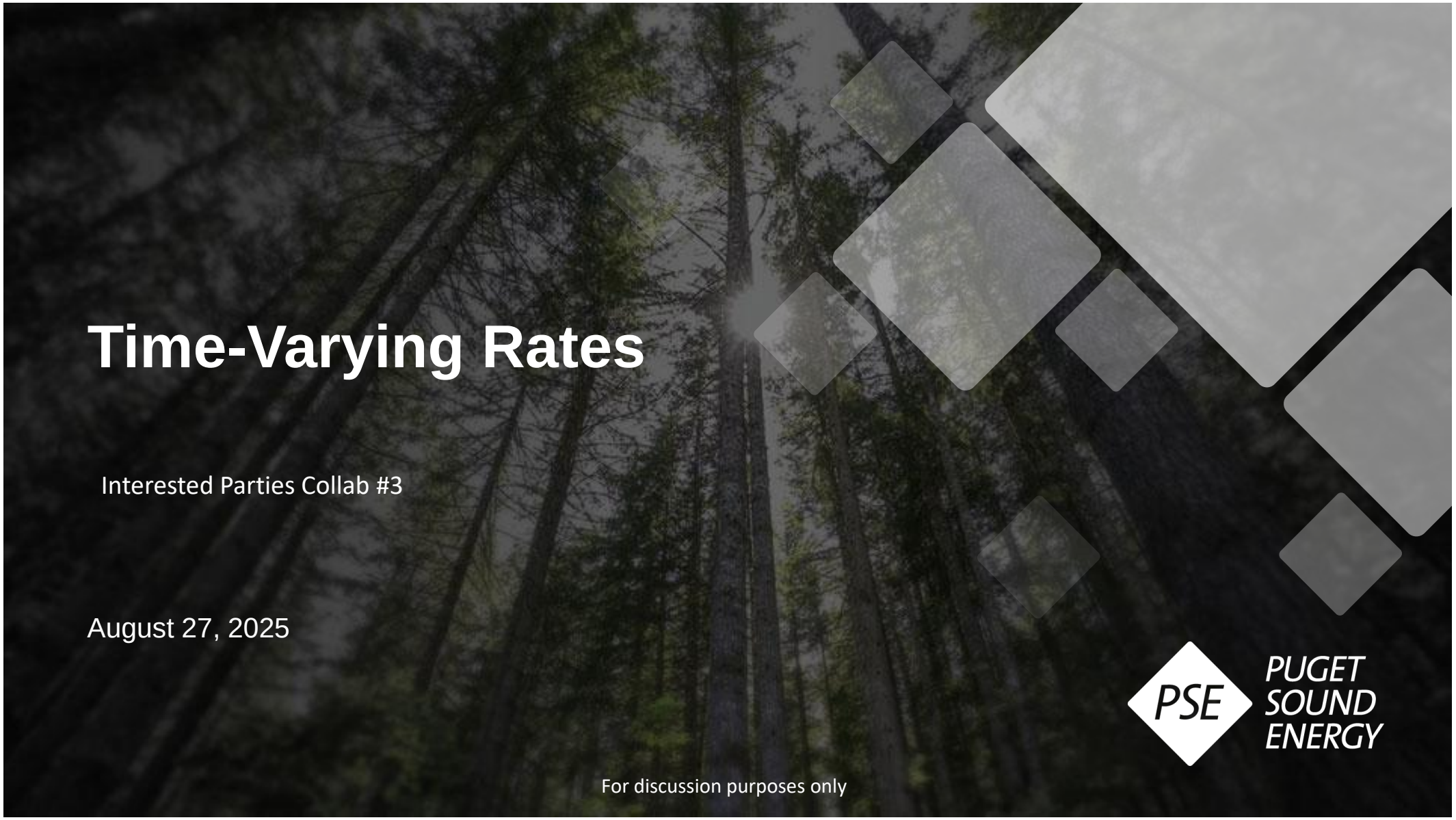
TESTIMONY OF

HANNAH S. HALLIDAY

STAFF OF WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION

Slides from the Third PSE Stakeholder Collaborative Concerning Time-Varying Rates

July 28, 2026



Time-Varying Rates

Interested Parties Collab #3

August 27, 2025

PSE PUGET SOUND ENERGY

For discussion purposes only

Introductions & Ground Rules

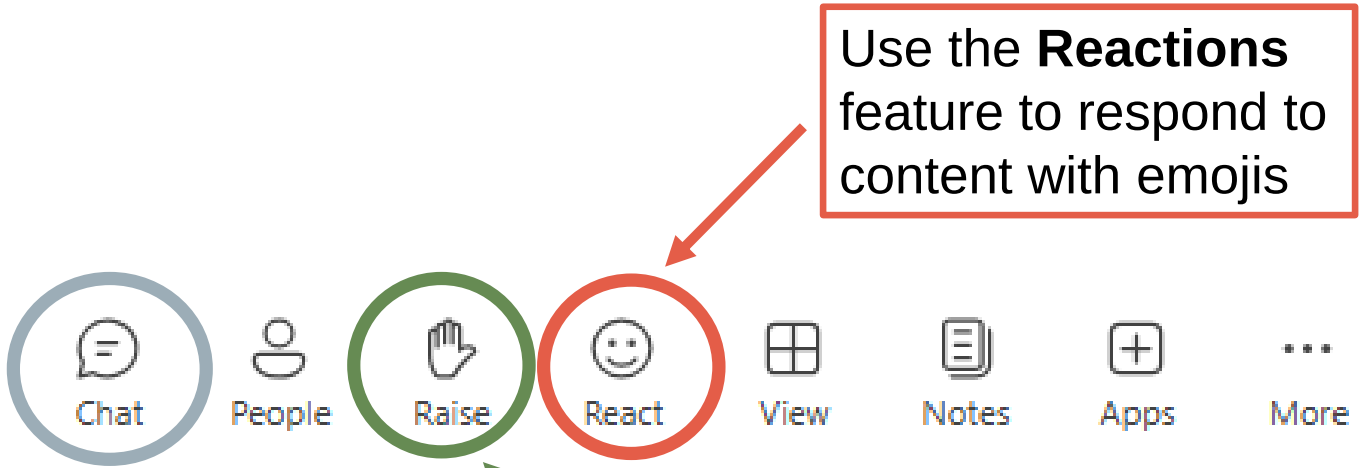
Presenters:

- **Kevin Rivard**, Product Development Manager, PSE (Kevin.Rivard@pse.com)
- **David Ladd,** Associate, Energy Services, Cadmus (David.Ladd@cadmusgroup.com)

Ground Rules:

- Please mute yourself
- Come with a clean slate and open mind
- Engage constructively and courteously towards all participants
- Respect the role of the presenters to guide the discussion
- Avoid use of acronyms and explain technical questions
- Leave the meeting with a clear sense of next steps

Welcome to our Virtual Meeting!



Agenda

- Safety Moment
- Pilot Winter Year Two
  - Impact Evaluation
  - Survey Results
- Conclusions & Recommendations
- Pilot Transition & Next Steps

For discussion purposes only

PUGET SOUND ENERGY

Safety Moment

Back to School Safety Moment

As we welcome a new school year, let's take a moment to think about the safety of our children and our communities. With more kids walking, biking, and driving to school, it's essential to be mindful of the potential hazards they may face.

Here are a few safety tips to keep in mind:

Be aware of your surroundings: When walking or driving near schools, be cautious of children who may be crossing streets or walking along sidewalks.

Follow traffic rules: Obey speed limits and traffic signals and be prepared to stop for pedestrians and school buses.

Teach children about road safety: Remind kids to look both ways before crossing the street, make eye contact with drivers, and use crosswalks.

Bike safety: Ensure children wear properly fitted helmets and follow traffic rules when biking to school.

Be prepared for increased traffic: Plan your route in advance and be patient when driving near schools during peak hours.

By being aware of these potential hazards and taking steps to mitigate them, we can help create a safer environment for our children to learn and grow.

Pilot Winter Year 2: Impact Evaluation

For discussion purposes only

PUGET SOUND ENERGY

Summary of Key Findings: Winter Year 2

Schedule 307 (Residential TOU):

- **Significant load shifting** from TOU peaks (kW), **saving energy** overall (kWh), similar impact by income group (higher kWh savings for income eligible)

Schedule 317 (Residential TOU+PTR):

- **Significant load shifting** from TOU peaks (kW), **saving energy** overall (kWh), similar impact by income group (kWh savings for income eligible trending higher)
  - PTR events reduced demand significantly in both winters (incremental over TOU), but the impact was lower in Year 2 than Year 1 and was not significant in summer

Schedule 327 (Residential TOU Super Off-Peak):

- **Largest loads shifted** (kW) driven by charging EVs overnight during super off-peak period, **highest energy savings** (kWh) indicating they are using less as well as shifting

Schedule 324 (Nonresidential TOU+PTR):

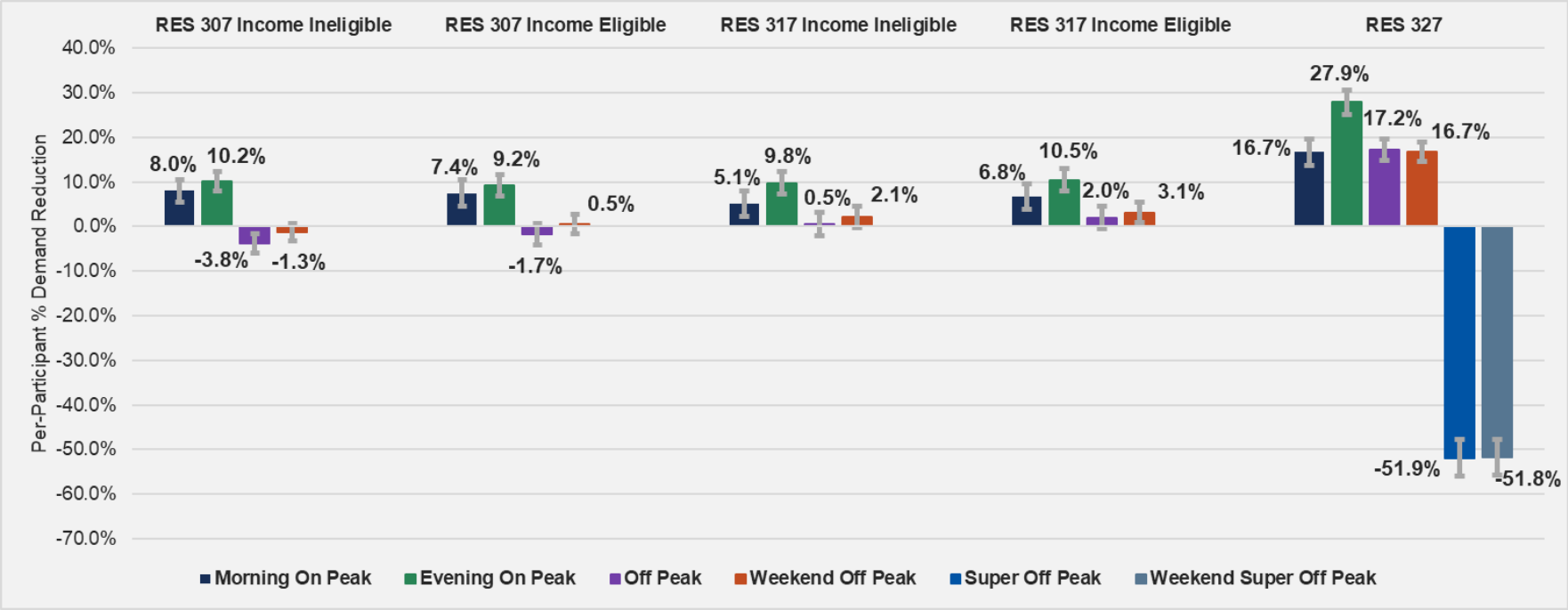
- **No load reductions in winter** (kW) but marginally significant reduction during summer peak, **using more energy overall** (kWh)
  - PTR events saw significant increase in use for winter peaks (incremental to TOU), no effect in summer

For discussion purposes only

TOU Demand Reduction: Winter Year 2 (Residential)

All residential groups saw significant morning and evening on-peak reductions in Winter Year 2

TVR Year 2 Winter Average TOU Demand Reductions by Rate & Period (%)

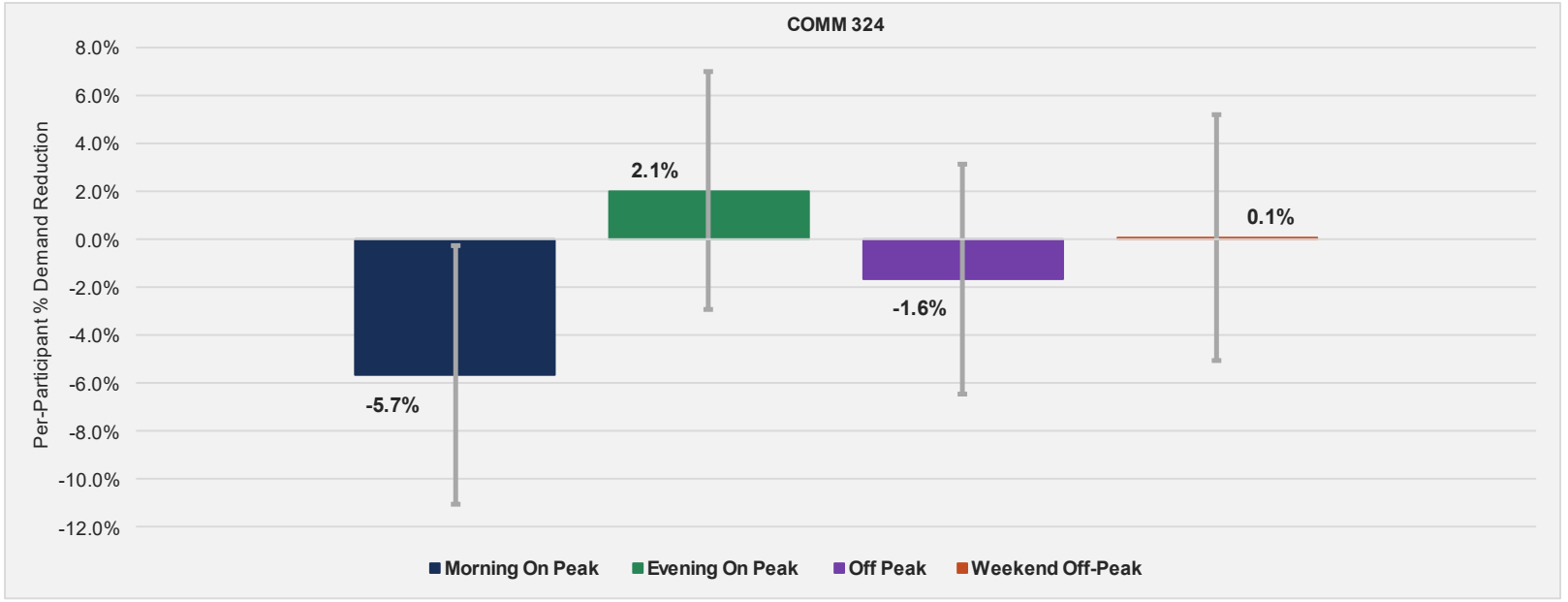


Positive numbers represent reductions in usage, and negative numbers represent increases in usage.
Grey line indicates statistical confidence interval: bars that cross zero are not statistically different from zero (no effect).

TOU Demand Reduction: Winter Year 2 (Commercial)

Businesses in the pilot used significantly *more* energy during morning peak periods, and there was no significant effect for evening peaks

TVR Year 2 Winter Average TOU Demand Reductions by Rate & Period (%)

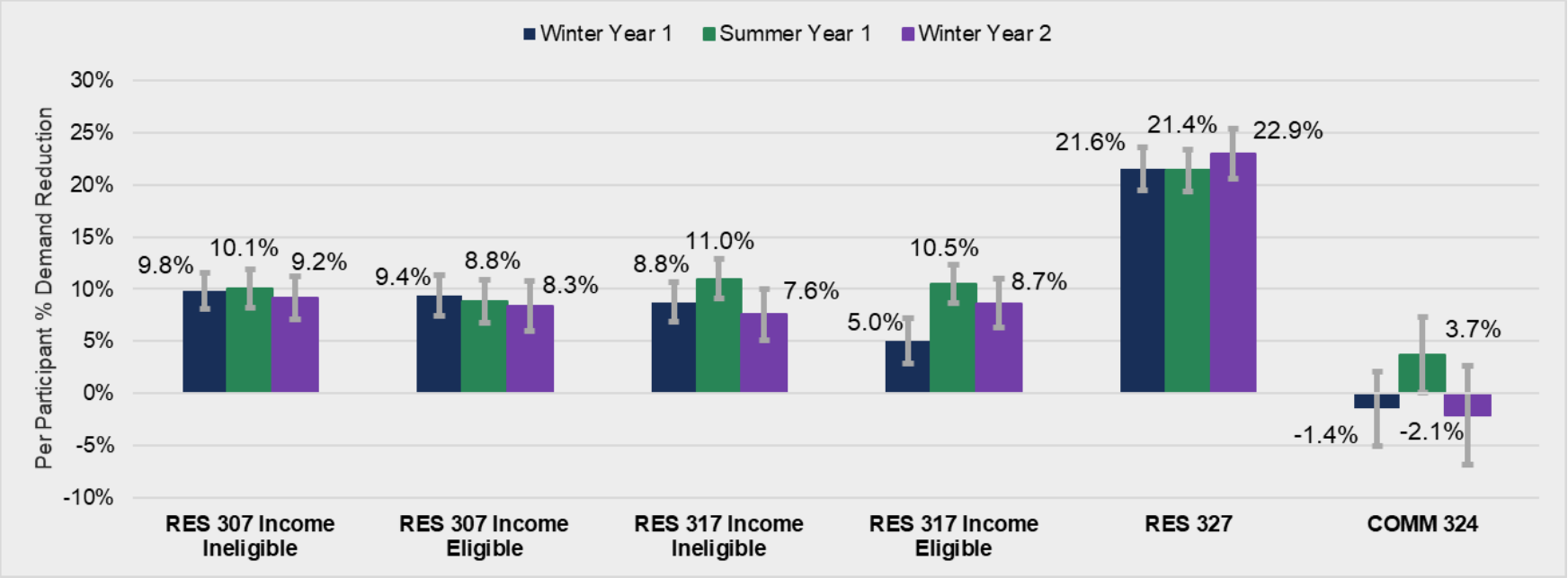


Positive numbers represent reductions in usage, and negative numbers represent increases in usage.
Grey line indicates statistical confidence interval: bars that cross zero are not statistically different from zero (no effect)

TOU Peak Demand Reduction: Trends

Reductions on-peak have been significant for all residential rates in all three seasons, but commercial participants only had a marginally significant reduction in summer

Combined On-Peak Average TOU Demand Reductions by Rate & Season (%)



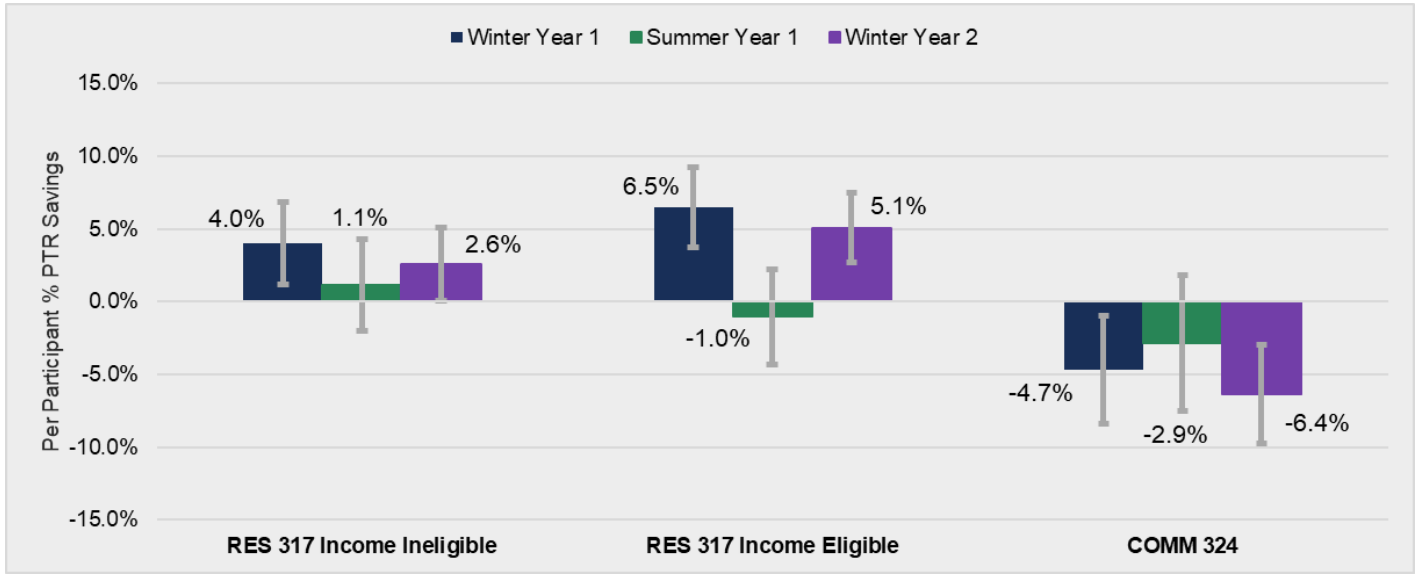
Positive numbers represent reductions in usage, and negative numbers represent increases in usage.
Grey line indicates statistical confidence interval: bars that cross zero are not statistically different from zero (no effect).

For discussion purposes only

Peak Time Rebate (PTR) Events

- These results are the incremental effect of PTR events (called on specific dates) in addition to the effects of TOU (which occur every weekday during the season)
- Residential participants (Schedule 317) produced significant demand reductions during both winters
- Business participants (Schedule 324) used significantly more electricity on-peak during PTR events in both winters
- Summer PTR events did not have a significant impact for any of these rates

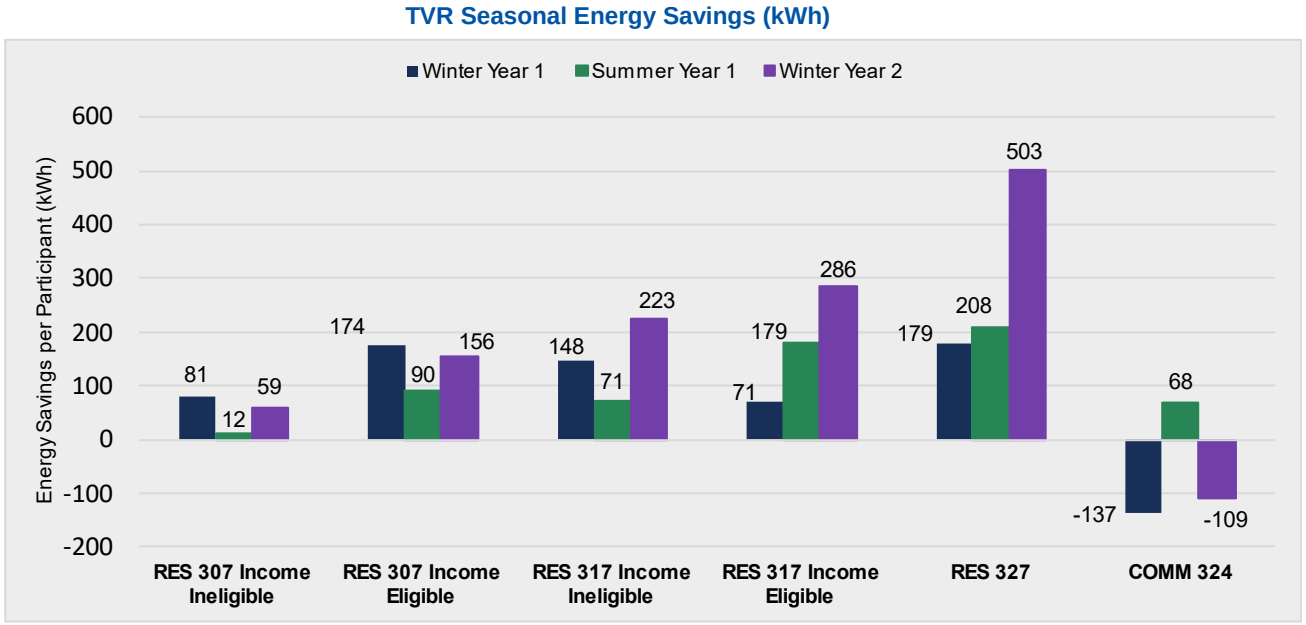
Average PTR Demand Savings by Rate and Season (%)



Positive numbers represent reductions in usage, and negative numbers represent increases in usage.
Grey line indicates statistical confidence interval: bars that cross zero are not statistically different from zero (no effect)

TOU Energy Savings: kWh

- Impact analysis shows that on average residential customers are using less electricity overall (not merely shifting usage to off-peak hours)
- Savings for residential groups are trending higher (Sch. 317 and 327) or steady (Sch. 307) over the first 3 seasons, with winter savings higher than summer for most groups
- Overall, business participants (Sch. 324) used more electricity compared to the control group due to “negative savings” in both winters



Positive numbers represent reductions in usage, and negative numbers represent increases in usage.

Open Q&A

For discussion purposes only

Pilot Winter Year 2 Survey Results

For discussion purposes only

PUGET SOUND ENERGY

Summary of Key Findings

Residential TOU

- Recall and ratings for communications from PSE held steady
- More than 90% took action to reduce usage on-peak in every season

Commercial TOU

- Just over half (57%) took action to reduce usage on-peak in Winter Year 2
- The rate at which they adjusted temperatures and reduced equipment and lighting usage during peaks fell by nearly half between Winter Year 1 and Winter Year 2

PTR event bill credits

- About a third think they are worth the effort, and about half are not sure

Satisfaction with bill savings and the pilot overall

- Residential satisfaction increased significantly from Winter to Summer (Year 1), but declined in Winter Year 2
- Overall, residential ratings in Winter Year 2 were significantly higher than Winter Year 1
- Commercial ratings are lower than residential, and have not improved

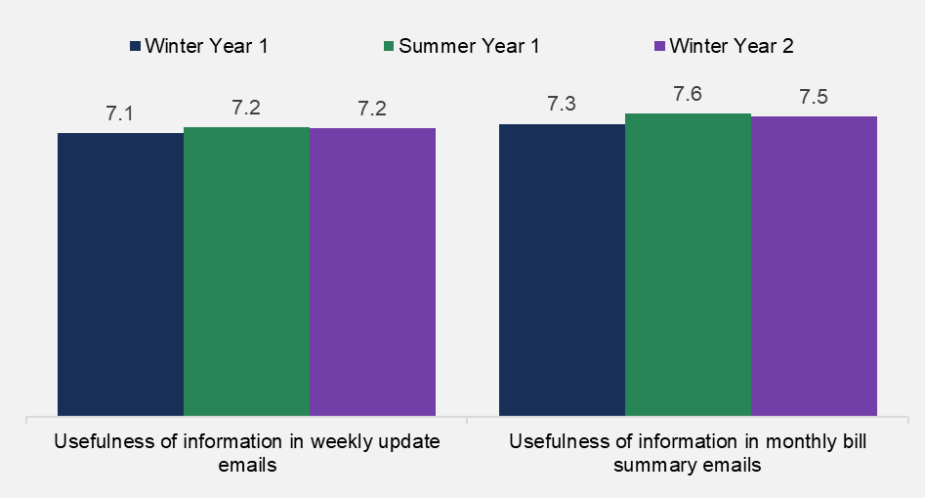
Draft – for discussion purposes only

Response to TOU Peak Periods (Residential)

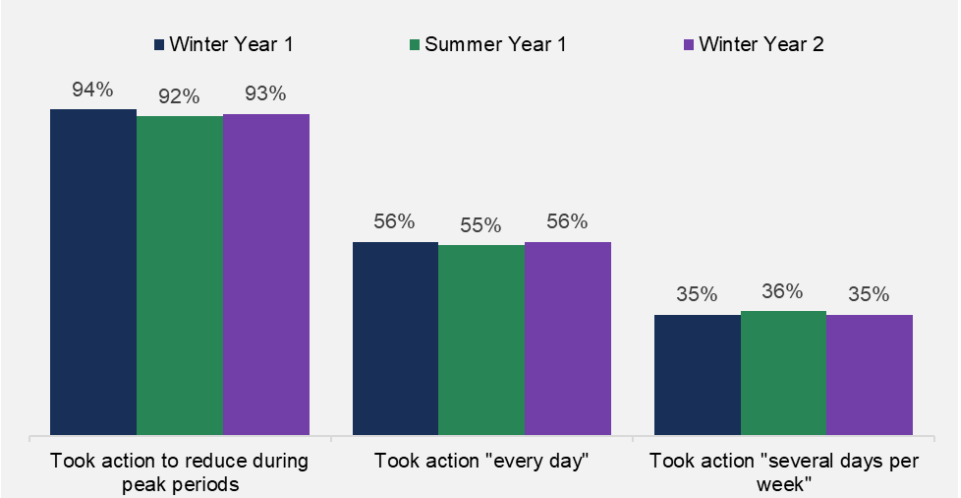
Survey results support persistence of residential impact results in Winter Year 2:

- Over 90% recalled weekly and monthly emails about TVR and gave consistent ratings for usefulness of PSE's communications
- More than 90% took action to reduce during peaks, and more than 90% of those did so "every day" or "several days per week" (actions taken were similar to previous surveys: laundry, cooking, appliances, lights)

Average rating on a 10-point scale where 10 is "extremely useful"



Percentage of respondents

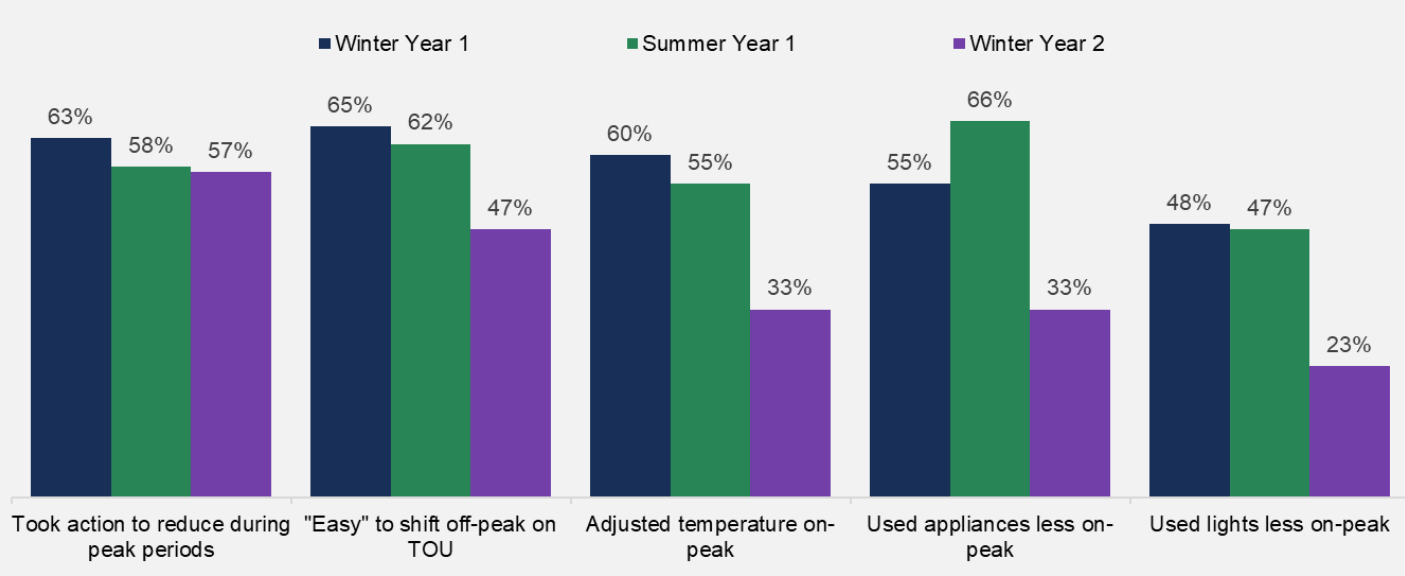


Response to TOU Peak Periods (Commercial)

Survey results support the lack of positive impact results for businesses in Winter Year 2:

- Only 57% took action to reduce during TOU peaks (compared to over 90% of residential participants)
- In Winter Year 2, fewer businesses found it easy to shift usage off peak and they took fewer actions

Percentage of respondents

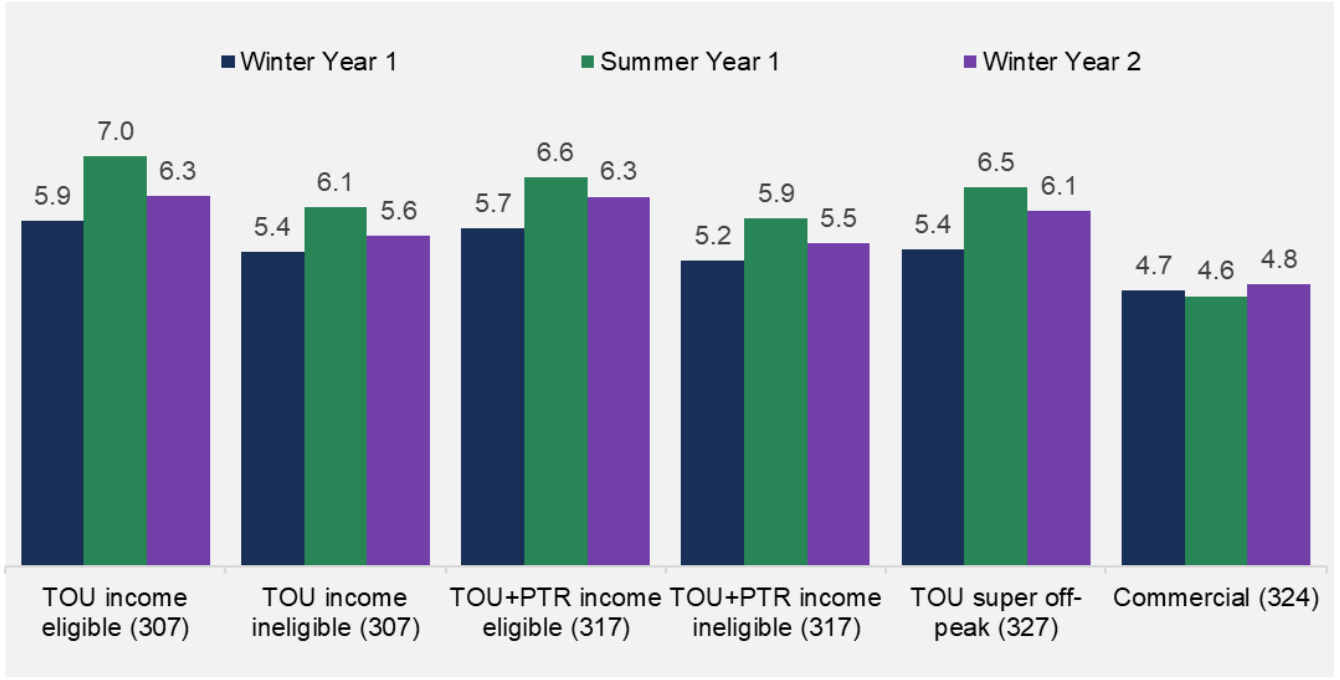


Satisfaction with Bill Savings

Residential satisfaction ratings in Winter Year 2 are higher than Winter Year 1 but were highest in Summer. Commercial ratings are comparatively lower and did not change over time.

- Income eligible participants were consistently more satisfied than ineligible (0.5 to 0.9 ratings points higher)

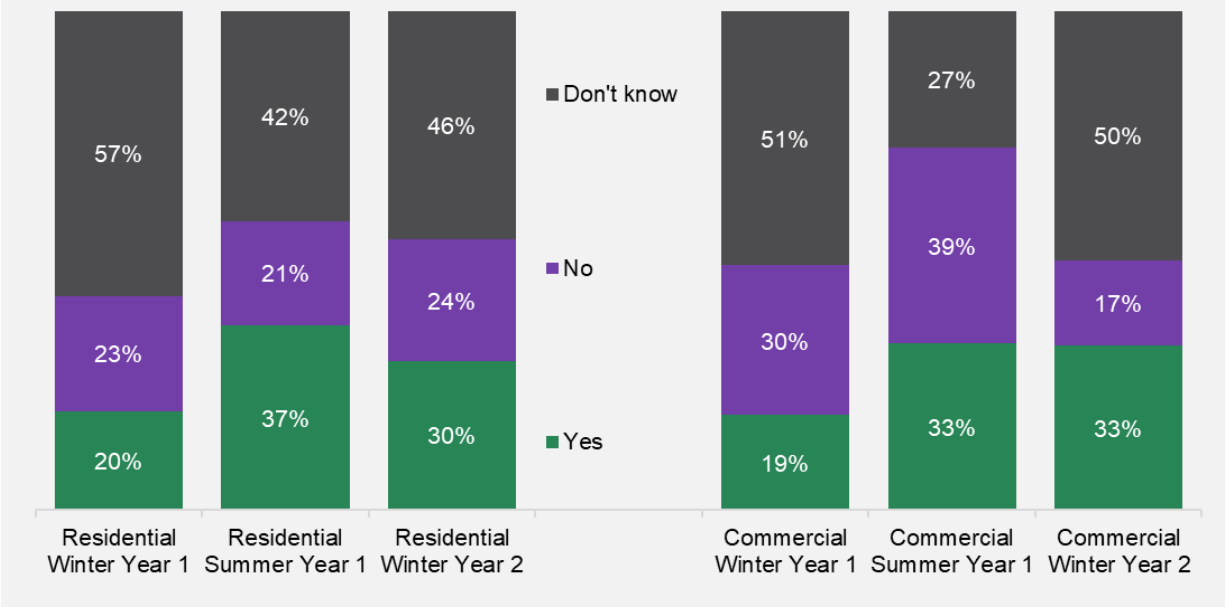
How satisfied are you with your bill savings since enrolling in PSE's TOU pilot program?
Average rating on a 10-point scale where 10 is "extremely satisfied"



Satisfaction with PTR credits

After three seasons in the pilot, only about a third of participants (Residential 317 and Commercial 324) said their bill credits were worth the effort, and about half were still not sure.

Was the bill credit amount for the Peak Time Rebate events consistent with your level of effort?

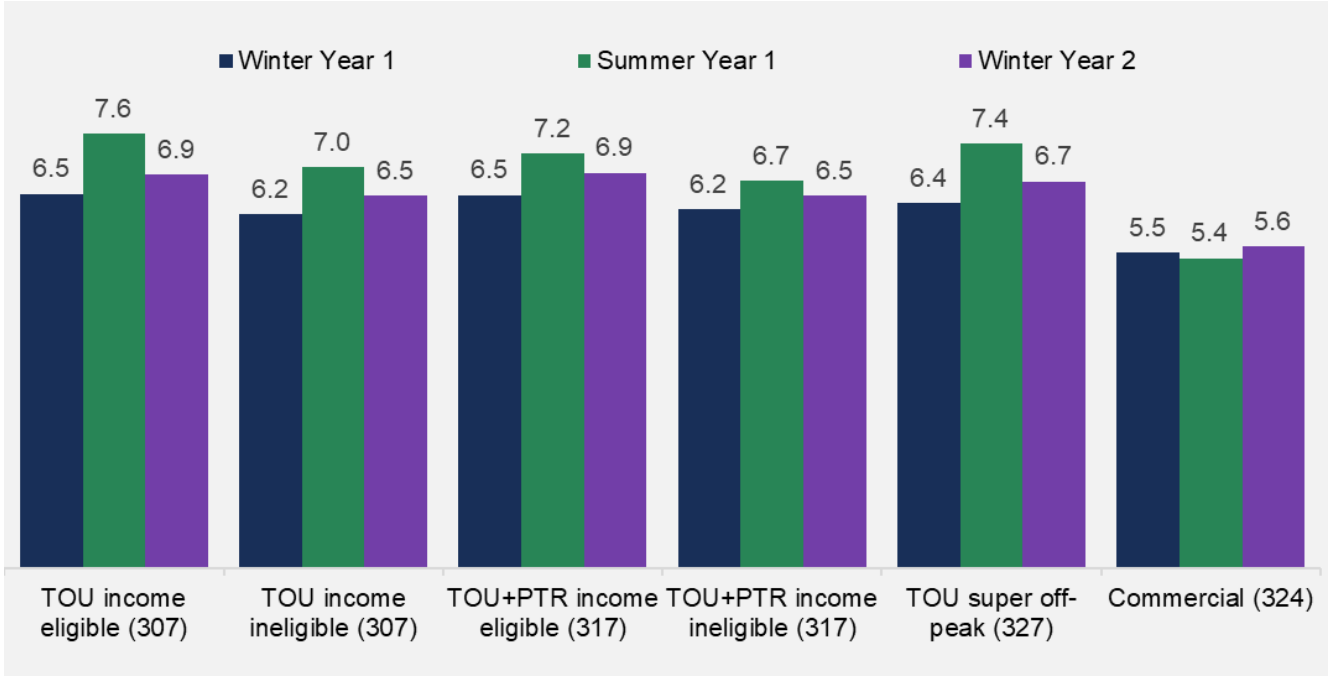


Overall Satisfaction

As with savings satisfaction, overall satisfaction ratings in Winter Year 2 are higher than Winter Year 1 but were highest in Summer. Commercial ratings are lower and did not change.

- Income eligible participants were consistently more satisfied than ineligible (0.3 to 0.6 ratings points higher)

Taking everything into consideration, please rate your overall experience with PSE's TOU pilot program
Average rating on a 10-point scale where 10 is "extremely satisfied"



Open Q&A

For discussion purposes only

Conclusions & Recommendations

For discussion purposes only

PUGET SOUND ENERGY

Year 1 Recommendations and Winter Year 2 Findings

Winter Year 2 results support Year 1 recommendations #1 through #4 (no changes to recommendations currently)

Year 1 Recommendation	Year 2 Results	Tariff Proposal
1. Offer TOU rate options to residential customers	Strong support (persistent effects in Year 2)	Continue Sch 307 and 327
2. Offer a three-period TOU rate and market this rate to households that own EVs		
3. Suspend non-residential TVR (Sch 324) and transition customers to other commercial rate plans; incentivize businesses to reduce demand during peak periods through existing commercial DR programs	Strong support (persistent lack of effects in Year 2)	Sunset Sch 324
4. PSE should consider sunsetting PTR offering (Sch 317) to streamline demand response options – finalizing research of Flex benefits for TOU customers	Modest support (Residential PTR still effective in Year 2 but most do not think it is worth the effort)	Sunset Sch 317
5. PSE should leverage other existing smart thermostat offerings	Not Applicable	End Pilot Thermostat and Bill Protection
6. Upon conclusion of the 2-year pilot, PSE should determine if bill protection for BDR customers is beneficial to TVR offerings		

Draft – for discussion purposes only

Open Q&A

Pilot Transition & Next Steps

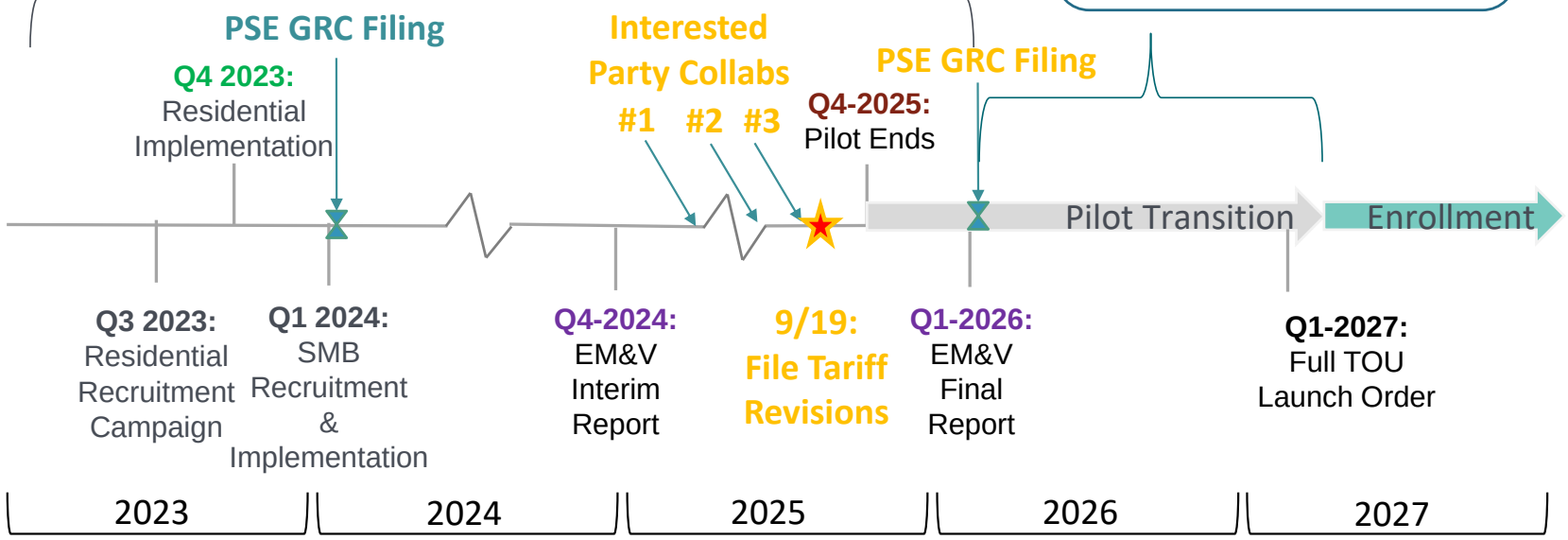
For discussion purposes only

PUGET SOUND ENERGY

Status Update - TVR Timeline

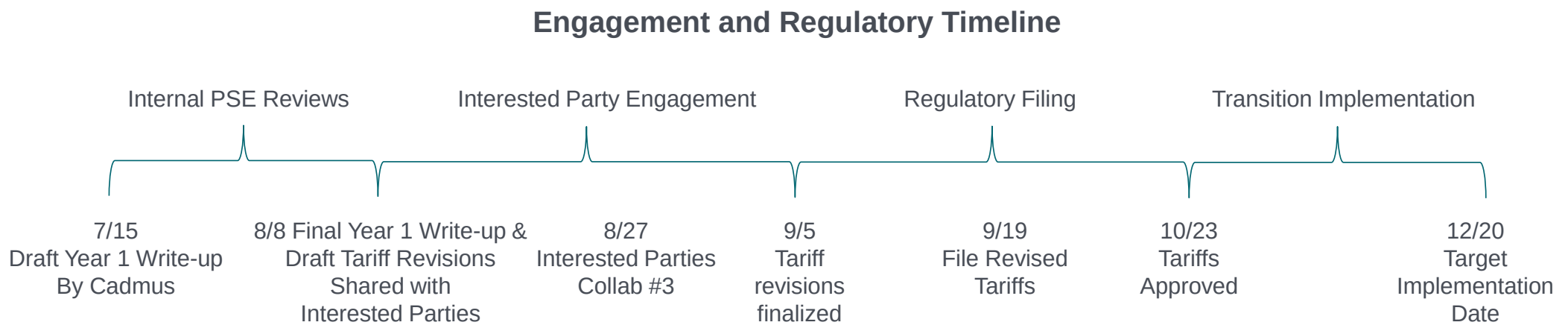
Pilot Duration October 2023 through September 2025
- EM&V Interim Report using data ending September 2024
- EM&V Final Report using data ending September 2025

Calibrate TOU Pilot Findings for Full Scale **Residential** Deployment(s)



For discussion purposes only

Transition Period



Open Q&A

For discussion purposes only

Appendix

For discussion purposes only

PUGET SOUND ENERGY

Conclusion #1

Conclusion

Participants on all residential TOU rates reduced their demand during on-peak periods in both seasons.

- Significant demand reduction during peak periods in both seasons for all groups
- Percentage on-peak reductions were higher for Schedule 327 participants (three-tiered TOU rates) than for Schedules 307 and 317 (two-tiered)

Recommendation

Cadmus recommends that **PSE offer TOU rate options to residential customers** and continue to gather data to optimize residential TOU offerings in the post-pilot phase.

Conclusion #2

Conclusion

Participants on Schedule 327 three-period TOU rate for EV owners achieved the highest per-participant demand reduction among all residential TOU rates, successfully shifting participants' demand to overnight off-peak periods.

- 83% of participants on the Schedule 327 rate had EVs at the time of enrollment. Their substantial shifts in demand indicate that EV owners have a greater ability than the average household to shift demand patterns.

Recommendation

Cadmus recommends that **PSE offer a three-period TOU rate and market this rate to households that own EVs**. PSE should also explore opportunities to stack incentives for these customers (e.g., combine a three-period TOU with smart charger rebates).

For discussion purposes only

Conclusion #3

Conclusion

Non-residential participants on TOU rates were not effective at reducing demand. They were less engaged, had less shiftable peak usage, and many were less satisfied with their pilot experience.

- PTR events for these participants produced a statistically significant *increase* in demand during winter events.
- Most participating businesses were not open during the earliest and latest peak hours and overall were only open during about a third of all peak period hours.

Recommendation

Further refinement is needed to create commercial rate plans that have a positive impact on behavior, savings, and experience for non-residential customers. **Cadmus recommends suspending non-residential TVR** and transitioning these customers to other commercial rate plans. Unless and until a revised TVR program is designed, **PSE should incentivize these customers to reduce their demand during peak periods through existing commercial demand response programs**.

For discussion purposes only

Conclusion #4

Conclusion

For participants on Schedule 317, PTR events produced significant demand reduction during the winter but not the summer.

- Participants on TOU rates may have already changed their energy consumption behavior, making it more challenging to achieve additional demand reduction during events.
- Though more than 90% of Schedule 317 participants earned PTR bill credits, the total average annual PTR credit received was only about $4 per household over the 10 events

Recommendation

Additional evaluation research is underway to determine if demand response offerings under PSE's Flex program deliver equivalent or superior impacts compared to PTR events. **If Flex offerings for TOU customers deliver similar benefits as PTR events, then PSE should consider sunsetting their PTR offering in favor of streamlining its demand response options, concentrating on those that are the most efficient to deliver and administer.**

Conclusion #5

Conclusion

Smart thermostat market penetration is lower among income eligible households. However, few income eligible participants who received them by mail were able to install and use them.

- Smart thermostats were the most leveraged smart technology that participants on 307 and 317 rates used to reduce usage during peak periods, but only a third of income eligible households had a smart thermostat at the time of enrollment compared to just over half of income ineligible households.
- After PSE mailed free smart thermostats to selected participants with compatible electric HVAC systems, only 10% of surveyed recipients confirmed installation.

Recommendation

PSE already has effective programs for delivering smart technology to income eligible customers. Cadmus recommends that **instead of mailing smart thermostats to customers, PSE should explore ways to combine existing offerings with TVR such as stacking incentives**.

Conclusion #6

Conclusion

The bill protection offering for Bill Discount Rate (BDR) customers did not have a significant effect on their bills.

- Only 11% of participants with bill protection earned a credit (averaging $18 for the year), with 89% not having high enough bills under TOU to qualify for a credit.
- The difference in bill savings between participants with and without bill protection was less than $4 per year for Schedules 317 and 327.

Recommendation

After analyzing and reviewing the results of bill protection in the second year of the pilot, PSE and the evaluation team should **determine whether this offering is a beneficial component of TVR offerings based on the cost to administer** relative to leveraging existing BDR program infrastructure to address any potential customer need.

Impact Evaluation Methodology

Objectives

- Estimate average electricity demand (kW) and energy (kWh) for each pilot treatment group

Step 1: Nonparticipant Matched Comparison Groups

- Selected nonparticipant matched comparison group for each pilot treatment group
- Nonparticipants were eligible for pilot, but did not receive marketing or enroll
- Nonparticipants filtered for each group by income eligibility, likely EV owners (for Sch. 327)
- Matched based on each customer's average load shapes in year prior to PY1 (pre-period)
- Result: comparison group with similar daily load shape to TVR enrollees (hourly differences less than +/-5%)

Step 2: Difference-in-Differences Panel Regression Models

- Separate regressions for each group, season, day type, and hour of the day
- Result: TVR pilot demand and energy impacts that control for weather, pre-TVR consumption patterns, and unobservable, non-pilot changes in energy consumption (via the matched comparison groups)
- Statistical significance of results (90% confidence intervals for each result)

For discussion purposes only

Rate Designs

Energy rates reflect those approved in most recent rate case (Schedule 7 - $0.13 first 600 kWh, $0.15 thereafter)

	Residential TOU Schedule 307	Residential TOU+PTR Schedule 317	Residential 3-Period TOU Schedule 327	Commercial TOU+PTR Schedule 324
Winter (Oct–Mar)				
Peak (7am-10am & 5pm–8pm weekdays)	$0.50	$0.27	$0.48	$0.26
Off-Peak (All other hours, weekends & holidays)	$0.10	$0.12	$0.12	$0.11
Super Off-Peak (11pm–7am all days)			$0.07	
Summer (Apr–Sep)				
Peak (5pm-8pm weekdays)	$0.32	$0.24	$0.26*	$0.23
Off-Peak (All other hours, weekends & holidays)	$0.10	$0.12	$0.12	$0.11
Super Off-Peak (11pm-7am all days)			$0.07	
Full Year				
Peak Time Rebate (Event-based)	$0.00	($0.67)	$0.00	($0.66)
Peak: Off–Peak Ratios				
Winter	4.9 : 1	2.2 : 1	6.7 : 1.7 : 1	2.3 : 1
Summer	3.1 : 1	1.9 : 1	3.6 : 1.6 : 1	2.0 : 1
Estimated Peak Impacts (Brattle's Arcturus model)				
Winter	5.5%	3.5%	5.5%	3.5%
Summer	3.4%	3.3%	3.4%	3.3%
PTR Event Day		6.0%		6.0%

* 327 also has Peak in Summer from 7am to 10am

For discussion purposes only