

Engagement Platform— Voice Automation & Smartphone App for Load Management



Orly Hasidim
Utility Relations Executive
Universal Devices



Albert Chiu
Product Manager, Clean Energy
Programs
PG&E



Eric Bell
Principal
Apex Analytics



Agenda

- ❖ Study Overview
- ❖ Key Evaluation Findings
- ❖ Utility Perspective- Looking Ahead
- ❖ Next Steps- Phase II Study

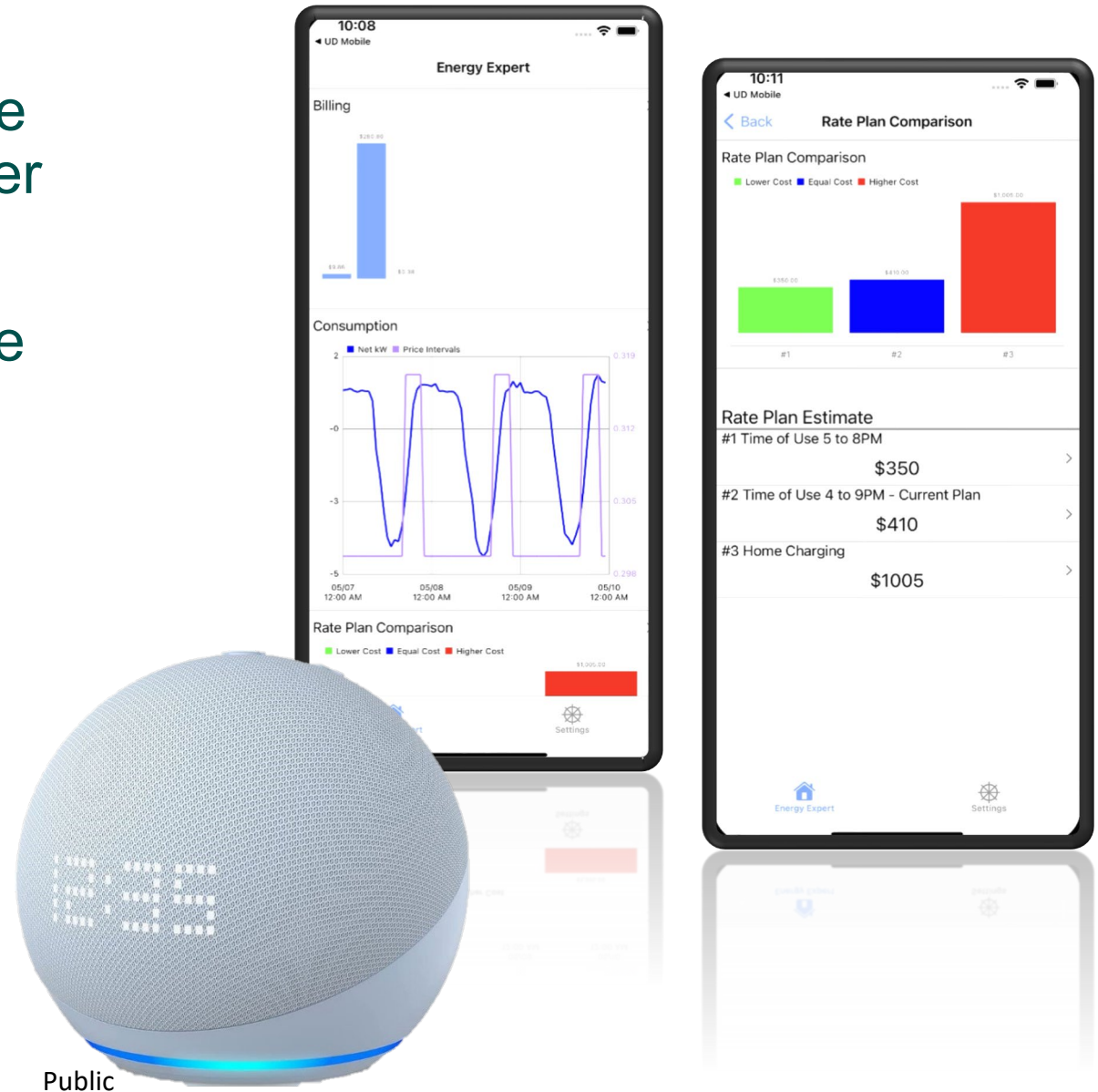
Voice Automation Study Background

- This study was funded by the Demand Response Emerging Technologies (DRET) Program
 - DRET Program is administered by 3 CA IOUs
 - Facilitate collaborations on emerging technologies projects
- Study designed to test:
 - Evaluating communication channel for time-of-use customers
 - Voice command mechanism/smart speaker function
 - Bidirectional communication with the customers
- Customers use Alexa Smart Speaker or a cell phone app, branded as Energy Expert, to:
 - Receive Notifications: PSPS, High Price
 - Ask questions about:
 - Best time to use an appliance or charge an EV
 - Optimal Rate
 - Energy Use
 - View PV Production and Consumption



Study Objectives

1. Develop, test, deploy and refine the Energy Expert Alexa Smart Speaker skill and cell phone application
2. Understand the effectiveness of the Smart Speaker and the app as a platform to provide information
3. Explore additional communication channels for information such as time-of-use, PV production, PSPS, and demand response events
4. Gain experience working with technology providers such as Amazon



Evaluation Objectives



Study the data collected by the Energy Expert apps to:

- Understand how participants are using the available tools, features, and Alexa skills
- Identify which features are used most over time
- Analyze changes in participant energy usage

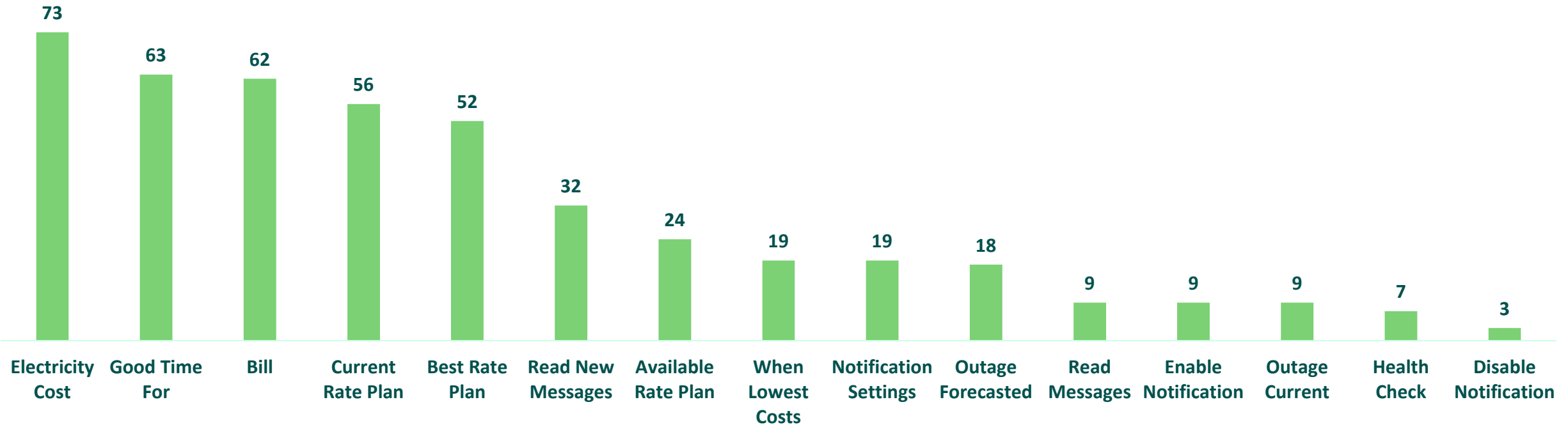


Conduct a process evaluation to gain an understanding of:

- Perceptions of Energy Expert
- Customer interactions and satisfaction with Energy Expert and Utility
- Changes in customers' knowledge of energy rates and their usage of electricity
- Feedback on Energy Expert app usability and features

Smart Speaker Interactions

- 15 intents were available for customers to use with Alexa
- The 'Electricity Cost' intent was most popular with 73 unique conversations
- The 'Good Time For' and 'Bill' intents were the second and third most popular with more than 60 unique conversations each



- 6 types of notifications were available to study participants via their preferred notification channel
 - Smart speaker, text message, or pushed to the Energy Expert app
- The most common notification was the High Price alert during the TOU peak period, followed by the Flex Alert notification

Count of Notifications by Type

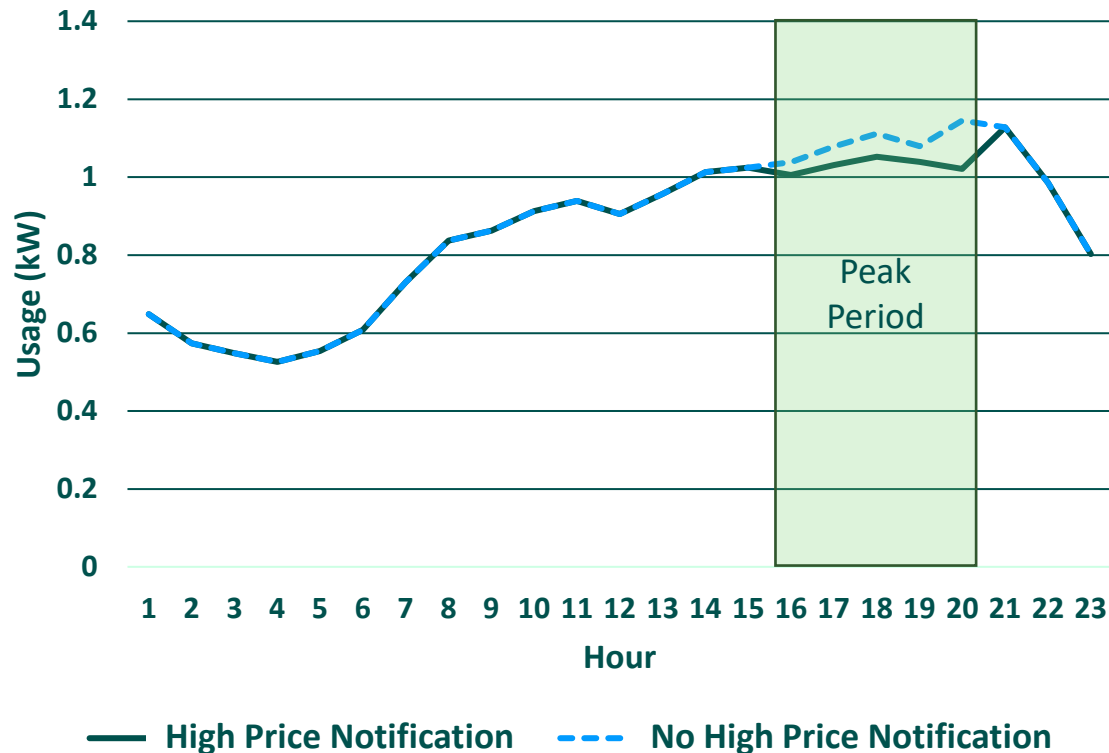
	High Price	Flex Alert	PSPS*	SmartDay	Other**
Customer Count	148	182	9	7	244
Average Total Notifications	342	33	12	10	3

* Public Safety Power Shutoff (PSPS) notifications were tests

** Average number of Other utility related notifications were low due to only being tested during a portion of the study

TOU Peak Period Load Reductions

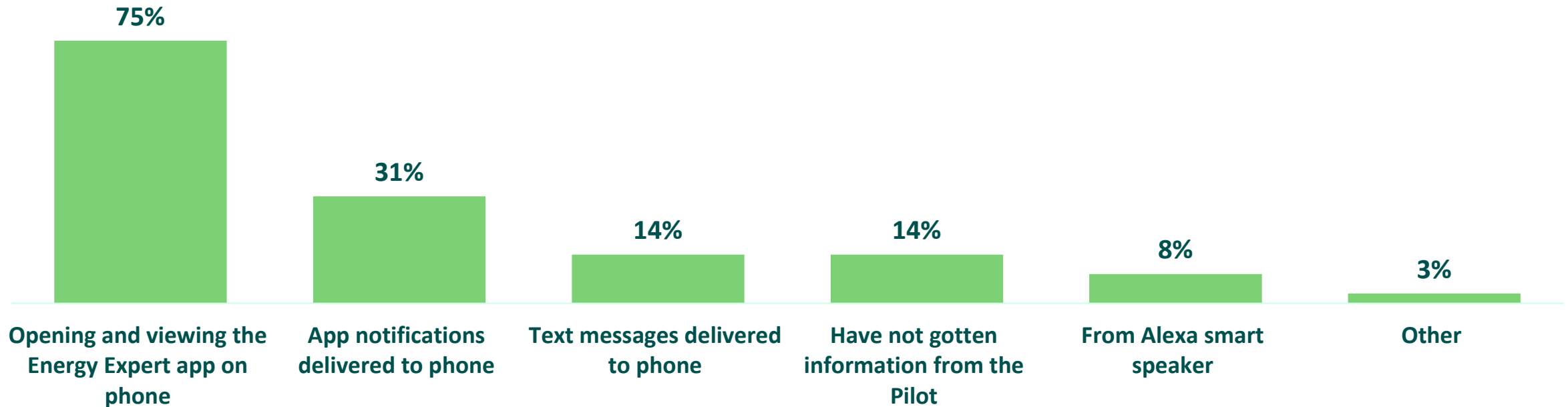
Estimated Load Reduction- High Price Notifications



- Rate: PG&E E-TOU-C most common
 - 4PM – 9PM peak period
 - 1.15:1 Peak to off-peak price ratio
- High Price notification customers showed hourly TOU peak-period load reductions in the 3% to 5% range
 - Impacts are incremental to underlying impacts attributable to the TOU rate
 - Impacts are directional due to the small sample size (148 customers, average of 89 days with notifications)
 - Within-subjects weather normalized pre-post analysis was used

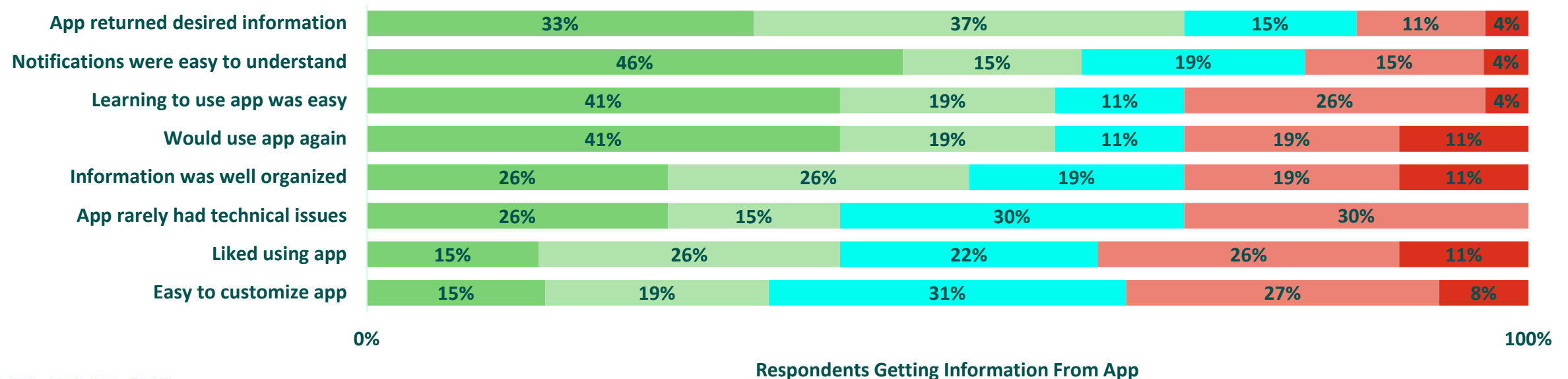
Most Participants Accessed Energy Expert Information by Using the Mobile App

- While most participants preferred the app, others preferred the smart speaker
- Many study customers did not have an Alexa Smart Speaker

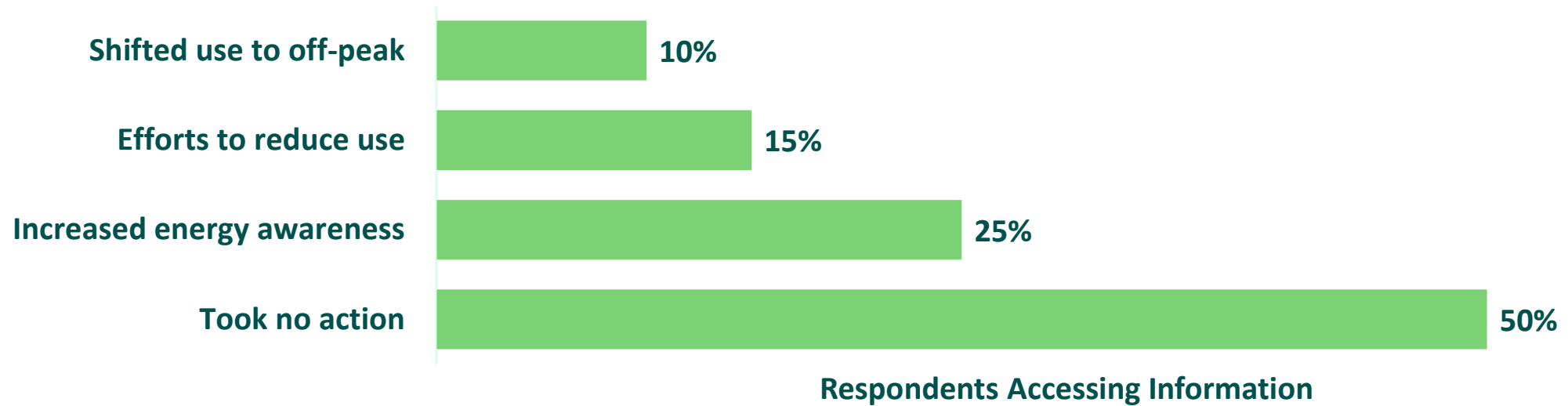


Most Participants Got the Information They Needed from the App, But It Was Harder for Some

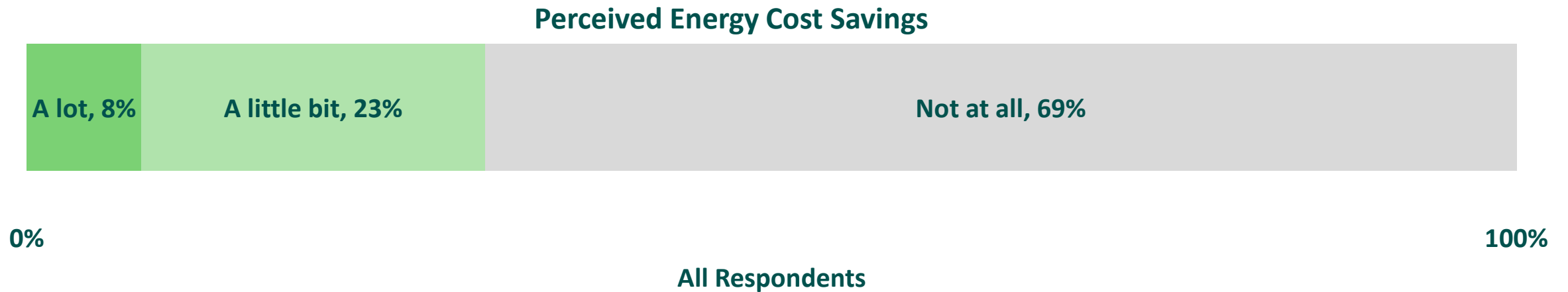
- Most agreed the app returned the desired information and that notifications were easy to understand
- Participants were interested in more customization features, and some had technical issues



Actions Taken



Even Among Savvy Customers, the App Increased Understanding of Rates



Comparison Between PG&E & SCE DRET Studies



Vision- take advantage of new technologies, DRET collaboration

June 27, 2019 – June 26, 2020,

August 12th, 2020 - December 31st, 2022

Energy Expert Alexa Smart Speaker

Energy Expert Alexa Smart Speaker & App

Smart home devices provided to participants

No equipment was provided to participants

OpenADR, Smart Meter, Direct to Device

Green Button, Rate service, Outage Management System and CPUC-Flex Alert

Time of Use

Time Of Use, Smart Day, Flex Alert

Energy Automation and Optimization

Notifications, Customer Engagement, Communication Preferences, Real Time Analytics

Cost and Optimization were 60% of all Alexa interactions

Alexa - Get Electricity Cost
App - Am I on the best rate

Findings:

- ✓ High usage customers are more likely to participate in load shifting
- ✓ Ongoing customer engagement is vital to success
- ✓ Increased savings corresponds to optimization and rate awareness

Findings:

- ✓ High price notification customers showed hourly TOU peak load reductions
- ✓ Customer engagement and real time analytics are vital
- ✓ App Vs Smart Speaker - different customer segments have different preferences

- Additional engagement necessary to successfully roll out the app to PG&E's broader customer population.
 - Need to define customer types most likely to benefit and design to meet their needs
 - Is this a tool to provide enhanced data to sophisticated users (like the study population)?
 - Is it a tool to provide information and awareness to customers with less energy awareness?
- User experience research can identify specific opportunities to improve usability
- Additional research is required to determine what other functions should be added to the app

- ✓ Enhancing the App and Analytics to better connect with a broader audience
- ✓ Improving the App to enhance customer comprehension and satisfaction
- ✓ Originally initiated with DRET, these engagement tools have gained interest from the Customer Service and Outage management departments
- ✓ Engagement tools could assist customers in adapting to Dynamic rates such as real-time pricing

Q&A



Orly Hasidim
Utility Relations Executive
Universal Devices
orly@universal-devices.com



Albert Chiu
Product Manager, Clean
Energy Programs
PG&E
AKC6@pge.com



Eric Bell, Ph.D.
Principal
Apex Analytics
ericb@apexanalyticsllc.com

