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IEPEC 2022

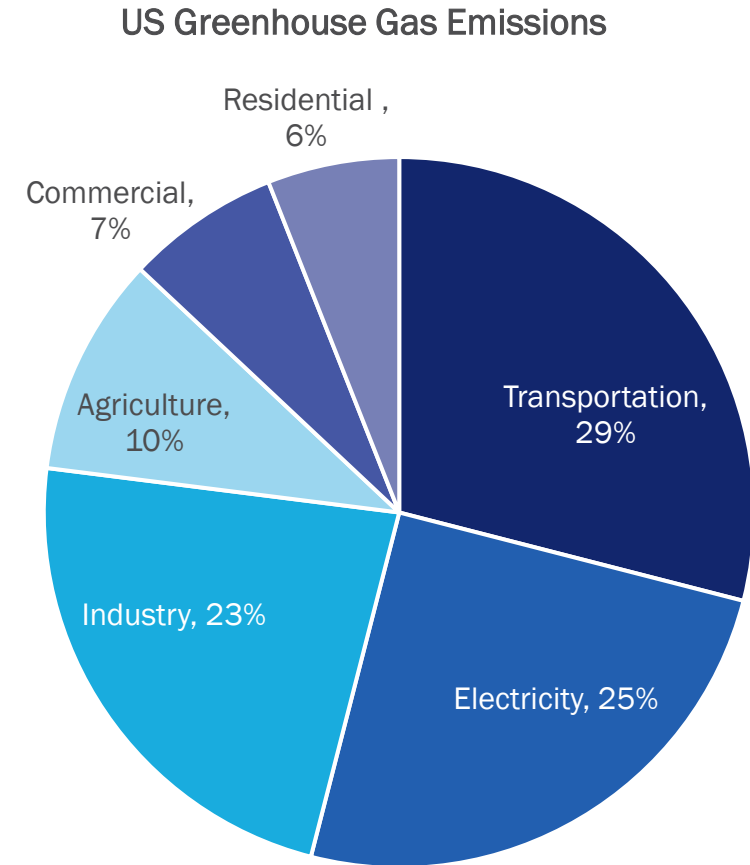
PROVIDING AVENUES TO ELECTRIC VEHICLE OWNERSHIP FOR RIDE-HAIL DRIVERS

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Why Electric Vehicles (EVs)?

- US transportation sector is responsible for nearly one-third (29%) of greenhouse gas emissions
 - Over half (58%) of transportation-related emissions coming from light-duty vehicles
- Zero Emission Vehicle (ZEV) mandates in place in 15 states to increase EV adoption
- As of July 2022, EVs accounted for **6% of all light-duty vehicle sales** in US



Source: <https://www.epa.gov/ghgemissions/sources-greenhouse-gas-emissions>

Why Target Ride-Hail Drivers?

1

Decarbonization

Ride-hail drivers drive considerably more and emit more GHGs than the average driver

- Trips can produce 69% more pollutants than trips displaced
- Vehicles accounted for 2-13% of VMT within six major US metro areas
- Drivers travel roughly 150 miles more per day than non-ride-hail drivers
- A market segment that overlaps with expanding on-demand delivery

2

Equity Disparities

Ride-hail drivers are disproportionately people of color and low-to-moderate income earners

- Median household income is below the national average (\$54,000 compared to \$79,990), according to a 2021 Lyft report
- Nearly half of ride-hail drivers identify as people of color

3

Accessibility

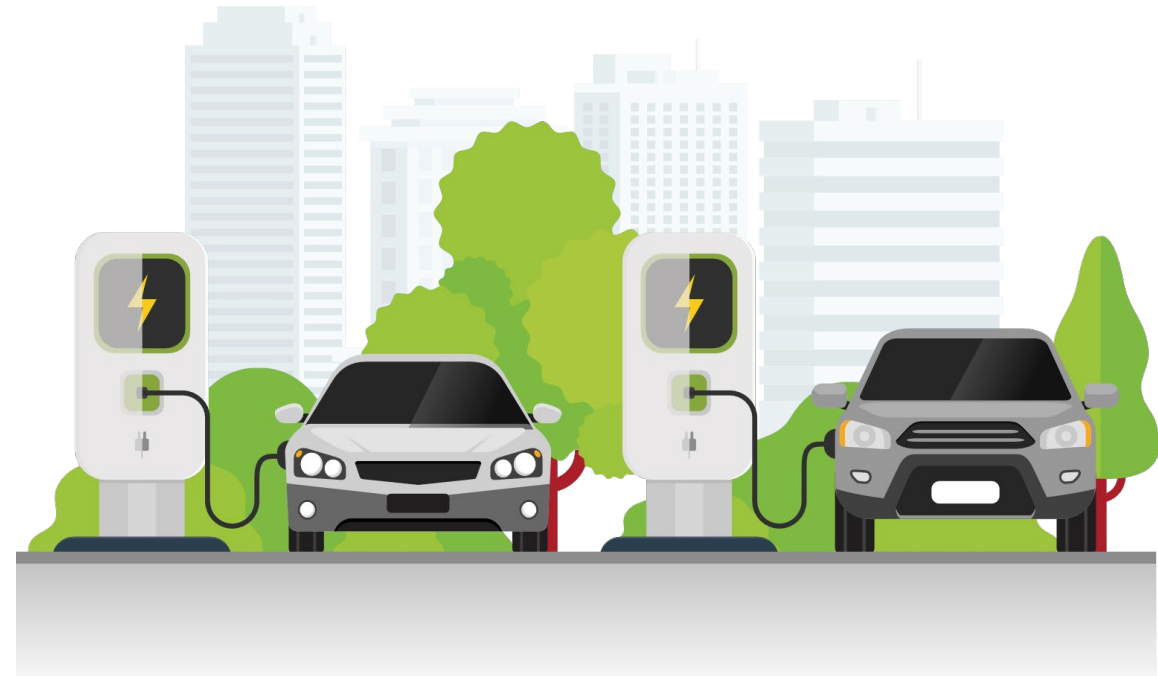
Ride-hail drivers serve low-income communities

- TNCs are critical to providing transportation to low-income communities and populations as nearly half (46%) of rides start or end in low-income communities

Portland General Electric (PGE)'s Transportation Electrification (TE) Efforts



- Since 2018, PGE has been playing key role in Oregon to help to expand EV adoption through TE Pilots
- Pilots targeting residential and commercial customers; one key target of the OE&TA and Electric Avenue Pilots has been ride-hail drivers
 - Addressing equity disparities in transportation electrification
 - Providing outreach and education to ride-hail drivers
 - Partnering with TNC to provide TNC-subsidized subscriptions to PGE-owned Electric Avenue sites

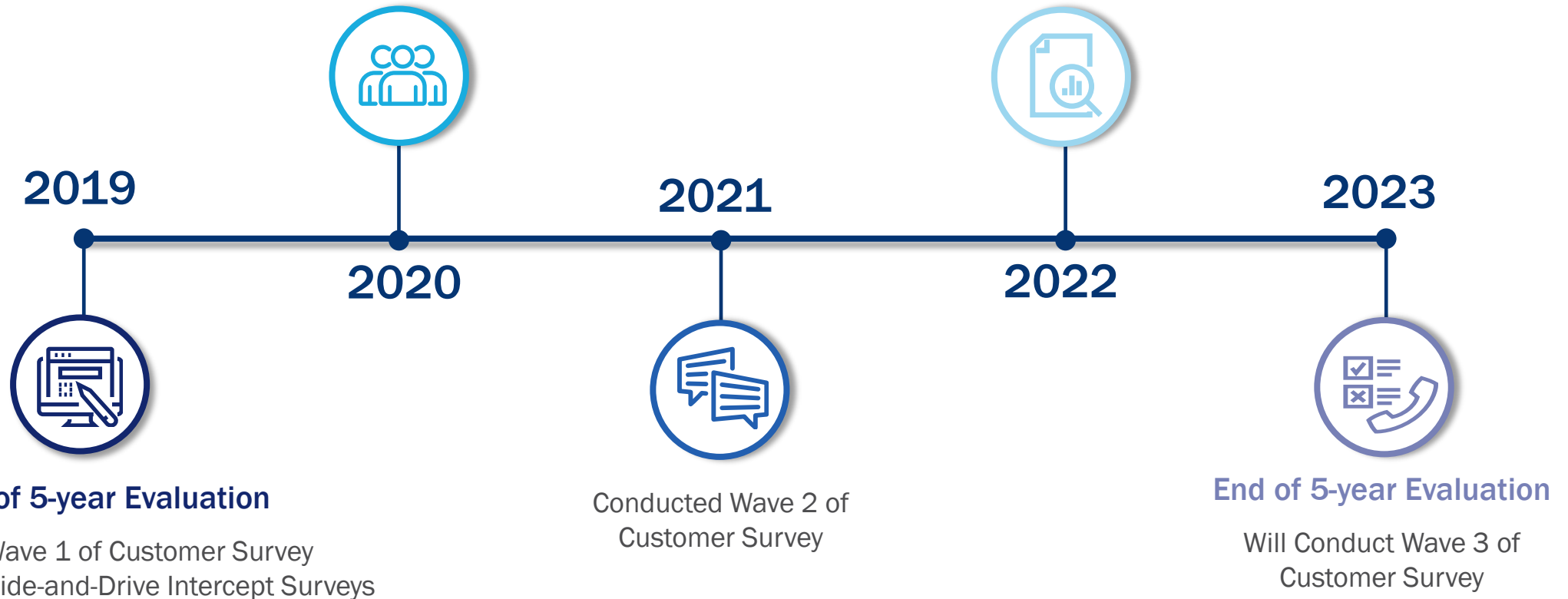


Key PGE TE Pilot evaluation activities targeting ride-hail drivers



- Conducted Wave 1 of Ride-hail Focus Group
- 1st Community Charging Utilization Analysis

- Conducted Wave 2 of Ride-hail Focus Group
- 2nd Community Charging Utilization Analysis



Methods



Ride-and-Drive Event Surveys

2019

- Intercept surveys at two PGE-sponsored ride-and-drive events; one targeting the general population (n=15) and one targeting ride-hail drivers (n=24)
- Surveys explored consideration and intention to purchase an EV, satisfaction with the event, and attendee exposure to PGE outreach and education campaigns

- Two online synchronous focus group: 1) 7 ride-hail drivers who were considering an EV for their next vehicle and 2) 8 ride-hail drivers who owned EVs
- Focus group aimed to get an in-depth understanding of participants' experiences as a driver, reasons for considering and purchasing EVs, and how they use and would use EVs and EV charging for ride-hail driving

Ride-Hail Focus Group

2020 & 2022

Community Charging Utilization Analysis

2021

- Analysis of PGE's Electric Avenue charger utilization data, exploring charger utilization patterns at each of the 6 Electric Avenue sites and impact of a \$0.19/kWh surcharge during PGE's peak system hours (3–8 pm) on charger use among ride-hail subscribers compared to monthly subscribers and non-subscribers.
- Looked at data between March 2019 and October 2020

- Web-based survey with 82 respondents (2% of overall survey sample); 32 ride-hail drivers, 38 on-demand delivery drivers, 12 both
- Survey explored intention to purchase an EV, barriers to purchasing, motivations to purchasing, interest in used vehicles, and demographics

Customer Surveys

2021





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RIDE AND DRIVE EVENT WITH RIDE-HAIL DRIVERS

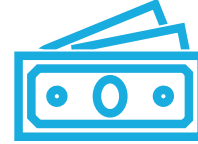
Ride-hail drivers have different range and charging needs, but exhibit similar concerns with EVs



Concern 1

Vehicle battery range and charging needs tend to vary between the general public and ride-hail drivers

- About three-quarters (12 of 15) of general public respondents reported driving 200 miles or less each week compared to over half (13 of 24) of ride-hail driver respondents reporting driving over 400 miles each week
- Highlighting a need for long-range EVs coupled with easily accessible public charging



Concern 2

Surveyed participants mentioned a variety of concerns they had about purchasing or leasing EVs

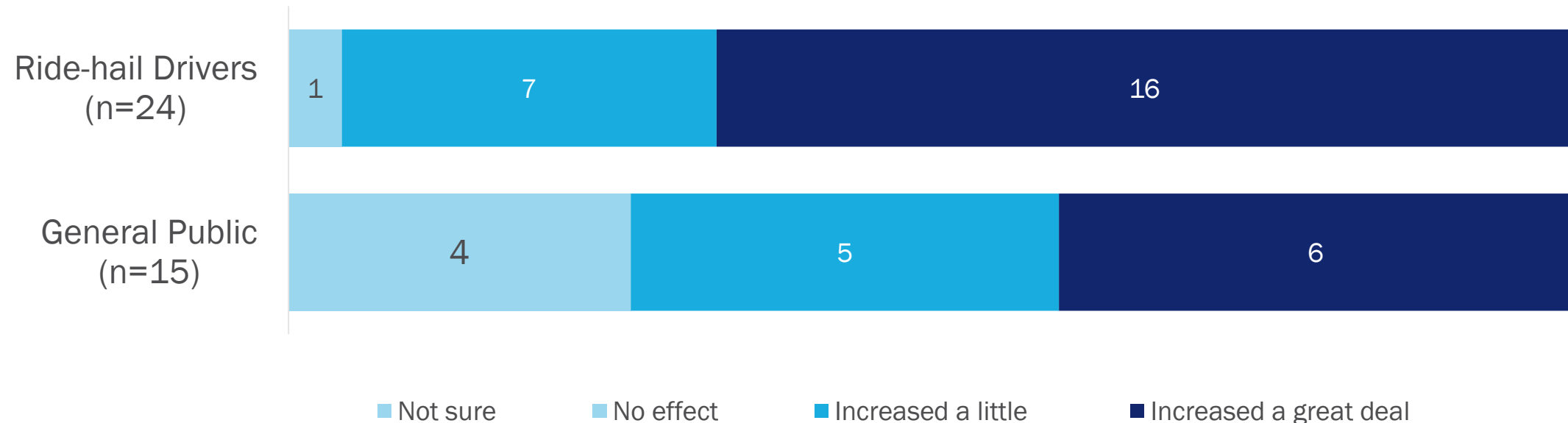
- Both general public and ride-hail driver survey respondents were primarily concerned about purchase price (7 of 15 and 14 of 24, respectively) and vehicle driving range (7 of 15 and 14 of 24, respectively)



Ride-and-drive events can be effective in increasing likelihood to purchase

- Ride-and-drives are an effective way to boost purchase intent, especially among ride-hail drivers.
- Two-thirds indicating the event increased their likelihood to purchase an EV a great deal

Event Effect on Likelihood of Purchasing EV in Next Five Years





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RIDE-HAIL FOCUS GROUP

Fuel and maintenance savings from EVs motivate ride-hail drivers to adopt



Ride-hail drivers are financially motivated to buy an EV

- Focus group participants estimated they could save **\$400–\$625/month** in maintenance and fuel costs with a charging subscription for fueling
- Some indicated filling up every day or every other day; needing to get oil changes about once a month

“ Over time, electric vehicles way more than pay for themselves because you're paying \$25 a month [for charging] versus \$700 a month in gas. That's two car payments right there. ”

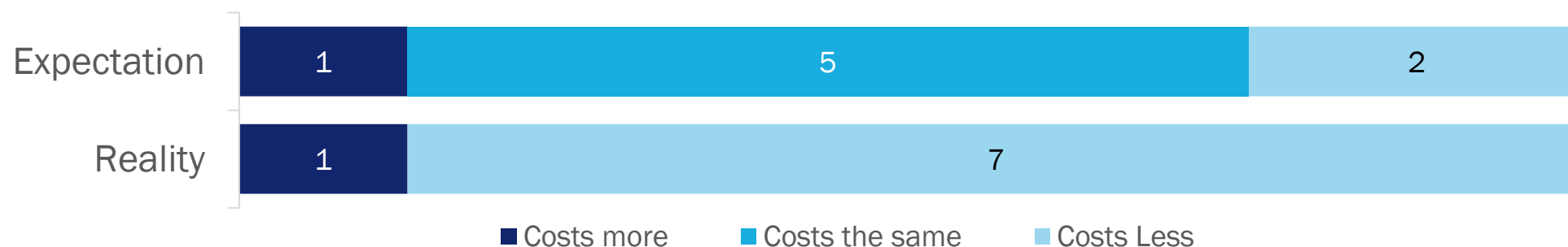


Ride-hail drivers have a strong preference for unlimited monthly charging subscriptions over hourly pricing

- All focus group participants prefer unlimited charging subscriptions over hourly pricing
- One participant noted they could easily spend \$25 on gas per day for rideshare driving

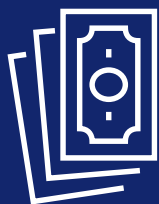
EV cost savings are realized by most ride-hail drivers who own EVs

- Nearly all ride-hail drivers indicated the cost for owning an EV was less expensive than owning an ICE vehicle



- All but one EV-owning ride-hail driver felt that driving an EV has allowed them to be more profitable than driving an ICE vehicle. Only one driver felt that driving an EV led to minimal savings, if at all.
- All but one EV-owning ride-hail driver agreed they have saved money using PGE's Electric Avenue subscription and/or home charging compared to purchasing gas.

Vehicle cost, supply, qualifying for financing, and charging access are likely barriers to purchasing an EV for ride-hail drivers



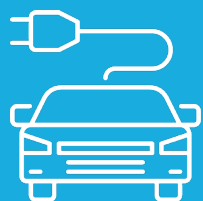
Vehicle Cost

- EVs can be substantially more expensive
- ~\$20K on average

Loan Assistance



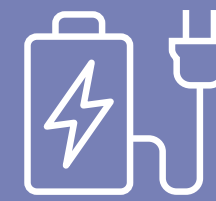
- Participants noted they may not qualify for loans for EVs because driving wages are not factored into income – lenders need two years of driving history



Vehicle Supply

- Used vehicle options are limited
- Expected to increase over time

Charging Access



- Participants likely report relying on public charging
- Participants residing in multifamily properties are less likely to purchase another EV due to lack of charging



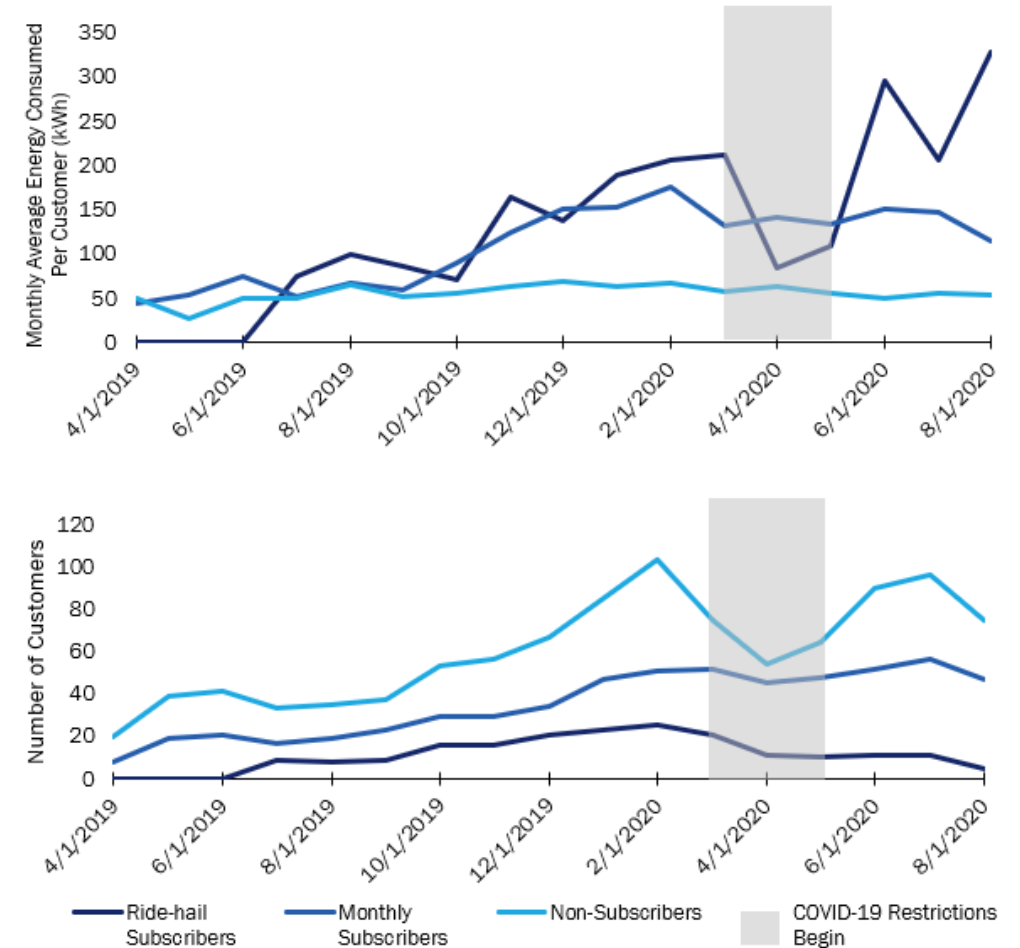
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COMMUNITY CHARGING IMPACT ANALYSIS

While ride-hail subscribers make up the smallest share of users, they have the highest per-customer-energy consumption in most months

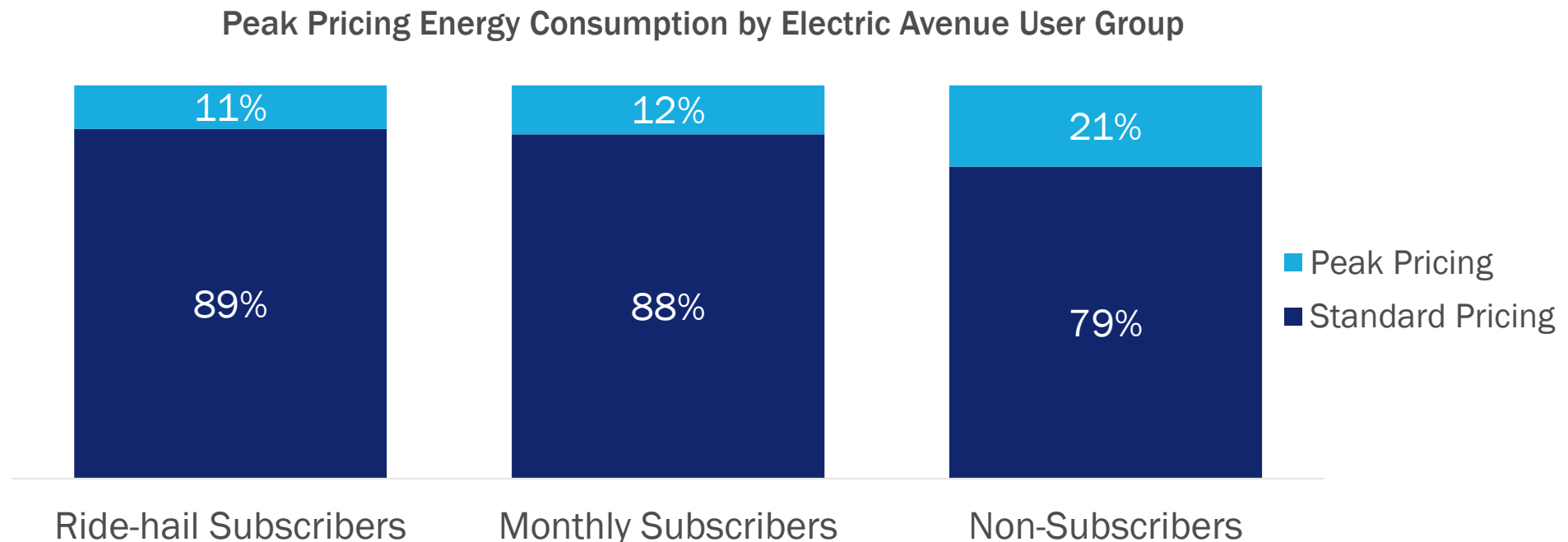
- Ride-hail subscribers consume **1.5 times** more energy each month than monthly subscribers, and **2.9 times** more than non-subscribers
- Customers who consume more energy per month have greater motivation to enroll in a subscription program and those with a monthly subscription plan are more likely to go to the same charging network to fully utilize the subscription
- Significant decrease in usage at start of pandemic, with rebounded thereafter



Ride-hail subscribers are more price sensitive, being more likely to reduce use of charging during peak periods



- \$0.19/kWh surcharge during PGE's peak system hours (3:00 p.m.–8:00 p.m.) highly effective at shifting charging away from system peak load periods
- Peak period surcharge has greatest behavioral impacts on subscribers





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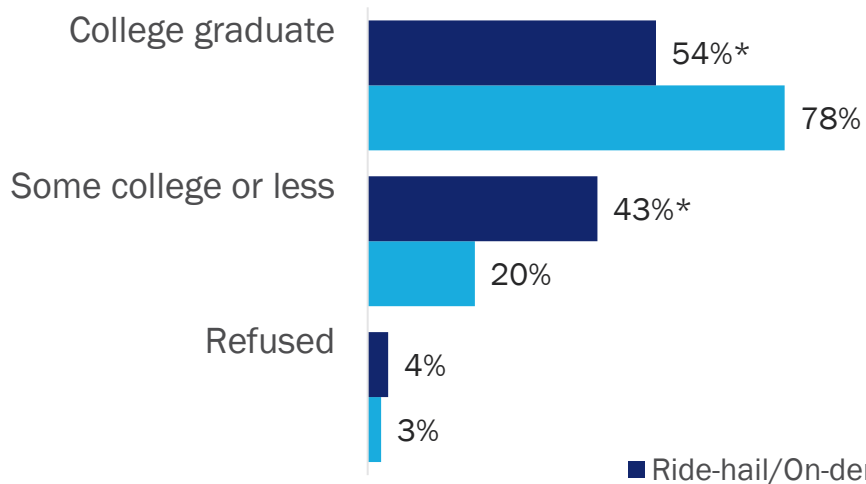
CUSTOMER SURVEYS

Ride-hail/on-demand delivery drivers are lower in socioeconomic status compared to other customers



- Significantly less likely to report being a college graduate
- Much lower rates of home ownership
 - Ride-hail/on-demand delivery drivers and general population who reported owning an EV were equally like to report owning their home and having L2 charging at home
- One-quarter report an annual HH income of below \$50k which far exceeding the general population

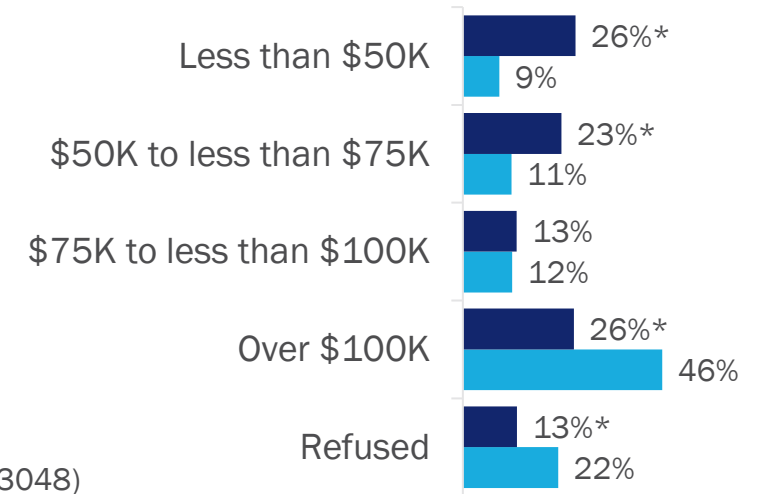
Educational Attainment



Homeownership



2020 Annual Household Income

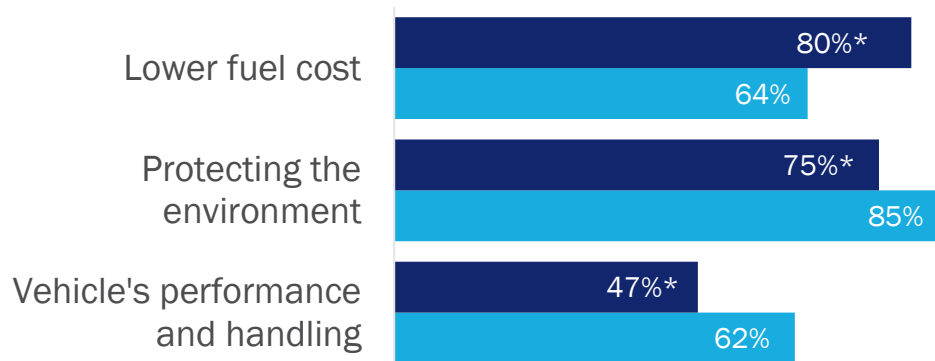


* Indicates statistically significant difference between ride-hail/on-demand delivery drivers and general population (z-test for proportions, $p < .05$).

Ride-hail/on-demand delivery drivers have unique motivations and barriers to purchasing an EV

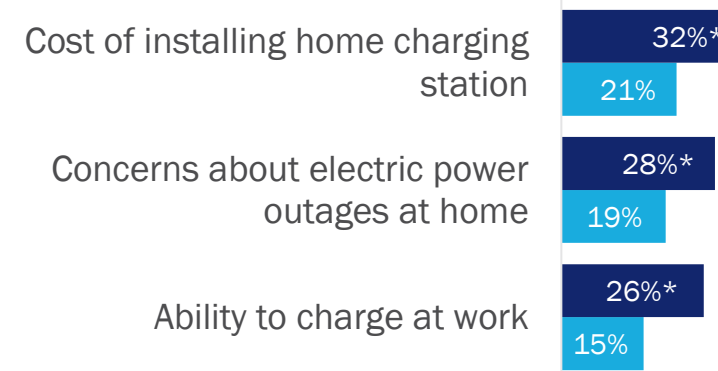
- Lower fuel costs significantly more motivating
- Environmental protection and vehicle performance less important
- Cost of installing home charging (upwards of \$1,000) major barrier for ride-hail drivers, in addition to concerns about power outages (reliability), and ability to charge at work

Reasons for Purchasing or Leasing an EV, by Customer Type (% Reporting a “Major Reason”)



■ Ride-hail/On-demand Delivery Drivers (n=60) ■ General Population (n=2582)

Barriers to Purchasing or Leasing an EV, by Customer Type (% Reporting a “Major Concern”)



■ Ride-hail/On-demand Delivery Drivers (n=82) ■ General Population (n=3048)

* Indicates statistically significant difference between ride-hail/on-demand delivery drivers and general population (z-test for proportions, $p < .05$).



SUMMARY

Ride-hail and on-demand delivery drivers are an important segment to focus vehicle electrification efforts, having unique barriers and charging needs



■ Unique barriers for ride-hail drivers

- More likely to not own their home, making it more challenging to install charging at home
- More likely to have lower incomes, which makes vehicle price a key concern
- May not qualify for loans due to status as independent contractors with variable incomes
- A greater need for increased access to these vehicles at lower-cost, and potentially non-traditional ownership models (i.e., TNC rental programs)

■ Unique charging needs

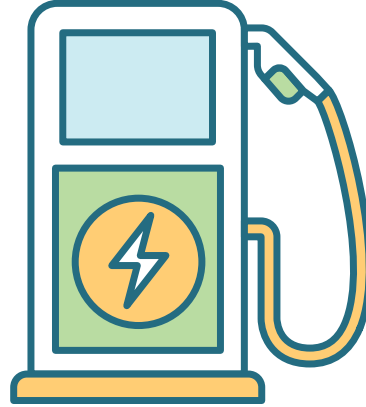
- Can drive over 400 miles each week, considerably more than the average driver, suggesting a need for long range EVs
- Need access to reliable public charging, especially in low-income communities where a large proportion of ride-hail rides begin and end.

Providing greater support to ride-hail drivers can help utilities meet TE goals while managing grid impacts



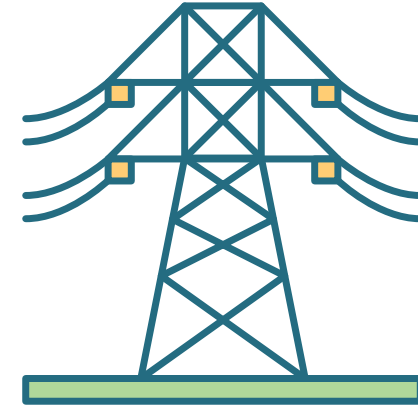
Equity

- Ride-hail drivers have lower socioeconomic status and serve low-income communities
- Greater access to affordable and reliably-priced fuel will help to increase income



Increased utilization of utility-owned public charging

- Ride-hail drivers use significantly more energy each month compared to other users
- A growing segment as on-demand delivery services increase in popularity



Managing grid impacts

- Ride-hail and other subscription customers were observed to reduce usage of Electric Avenue chargers during peak periods
- Off-peak hours coincide when drivers are less busy and have time to charge





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