

Community Renewable Energy Program (CREP) Survey

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WEBER STATE UNIVERSITY
CCEL – Community Research Extension

Agenda

- ▲ Review survey purpose and methods
- ▲ Resident survey results:
 - ▲ Willingness to pay for renewable energy
 - ▲ Should Ogden join CREP?
 - ▲ Opt-out behavior
 - ▲ Perceptions of business, resident, and government roles in renewable energy
- ▲ Business survey results
- ▲ Questions/discussion



Survey Purpose

- ▲ To determine what **residents AND business owners** in Ogden are **willing to pay** to for renewable electricity
- ▲ To determine whether **residents AND business owners** in Ogden think Ogden City should join the Community Renewable Energy Program (CREP)



Sampling

Sampling Methods: *Resident Sample*

Address-based sample of Ogden residences

- Utah Address Points database¹ and Ogden City Water account database (deduplicated)

Distribute survey to random sample of 10,000 residences

- Via email where possible (about 1,400), or regular mail otherwise (about 8,600)
- Those receiving invitations via regular mail scanned a QR code to access the survey
- Email links and QR codes were personalized
- WSU students followed up door-to-door in areas with low response rates

Sampling Methods: *Business Survey*

Used Ogden's Business License database

Distribute survey to all businesses in the database with a valid email (about 1,700)

1. <https://gis.utah.gov/data/location/address-data/>

Resident Results: *Response Rate*

▲ 803 Ogden residents consented to take the survey
(response rate = 8.03%)

▲ Response rate of 7-8% is typical for mail surveys

▲ Of these, 92 had solar panels → reduced sample to 711

▲ Of these, 42 did not answer key questions → final sample = 669

▲ Key questions:

- *Average monthly electricity costs*
- *Willingness to pay for renewable energy*



Measuring Willingness to Pay More

▲ Survey asked residents to report their willingness to pay as a dollar amount

▲ If implemented, CREP would increase electricity rates as a percent increase

▲ We converted all dollar amounts reported into percentages

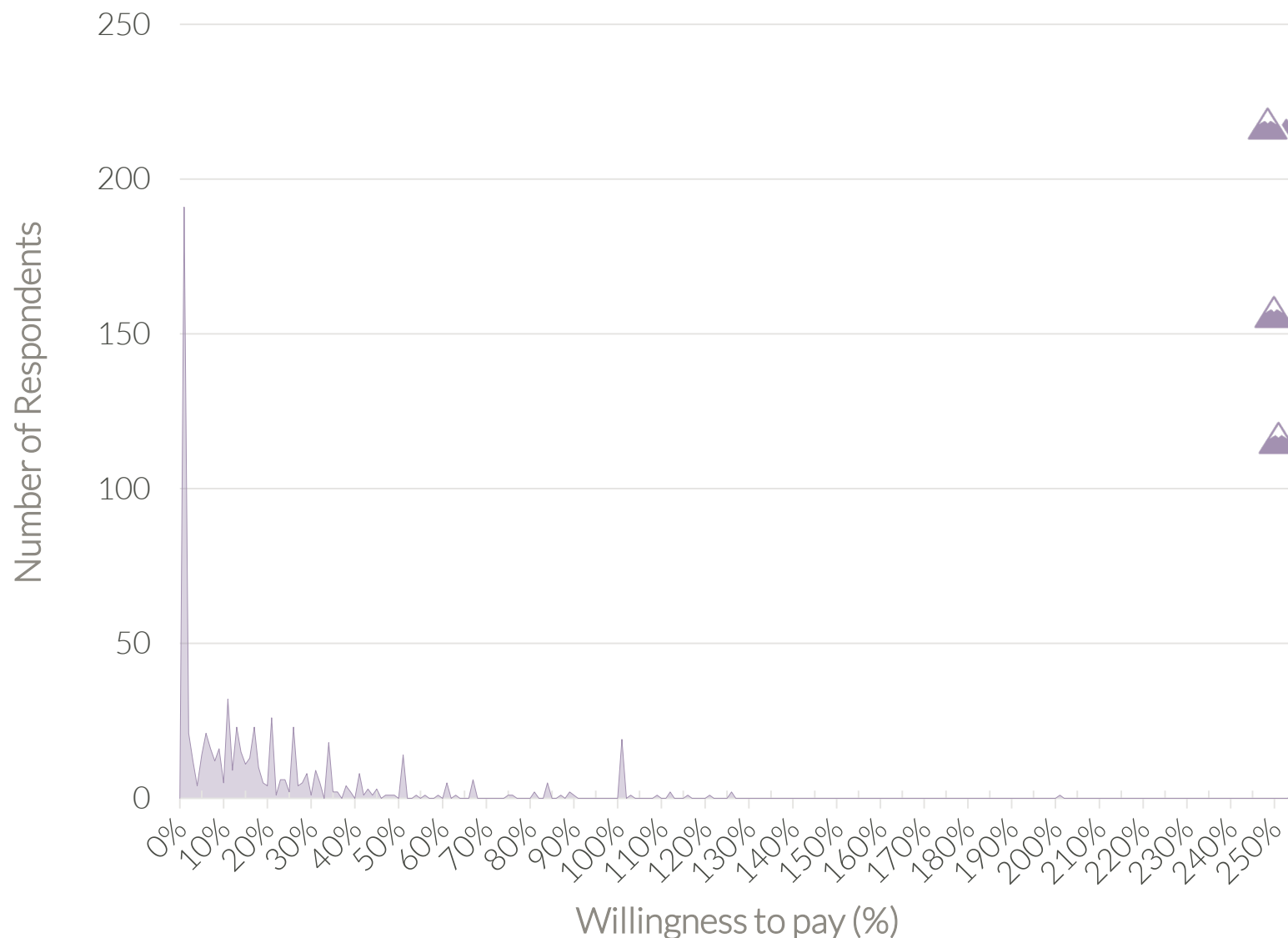
$$\frac{\text{Respondent's willingness to pay}}{\text{Reported average monthly electricity cost}} \times 100 = \% \text{ WTP}$$

▲ We report all results on willingness to pay more for renewable energy as a percent increase in monthly energy costs



Willingness to Pay More

Willingness to pay more as a percentage



▲ 72.8% of respondents reported a willingness to pay (WTP) greater than 0%

▲ Relatively large concentration of responses at WTP=0%

▲ 27.2% of respondents

▲ Distribution is NOT symmetric

▲ Has a strong right skew

▲ For these reasons we focus on median willingness to pay

▲ Median WTP

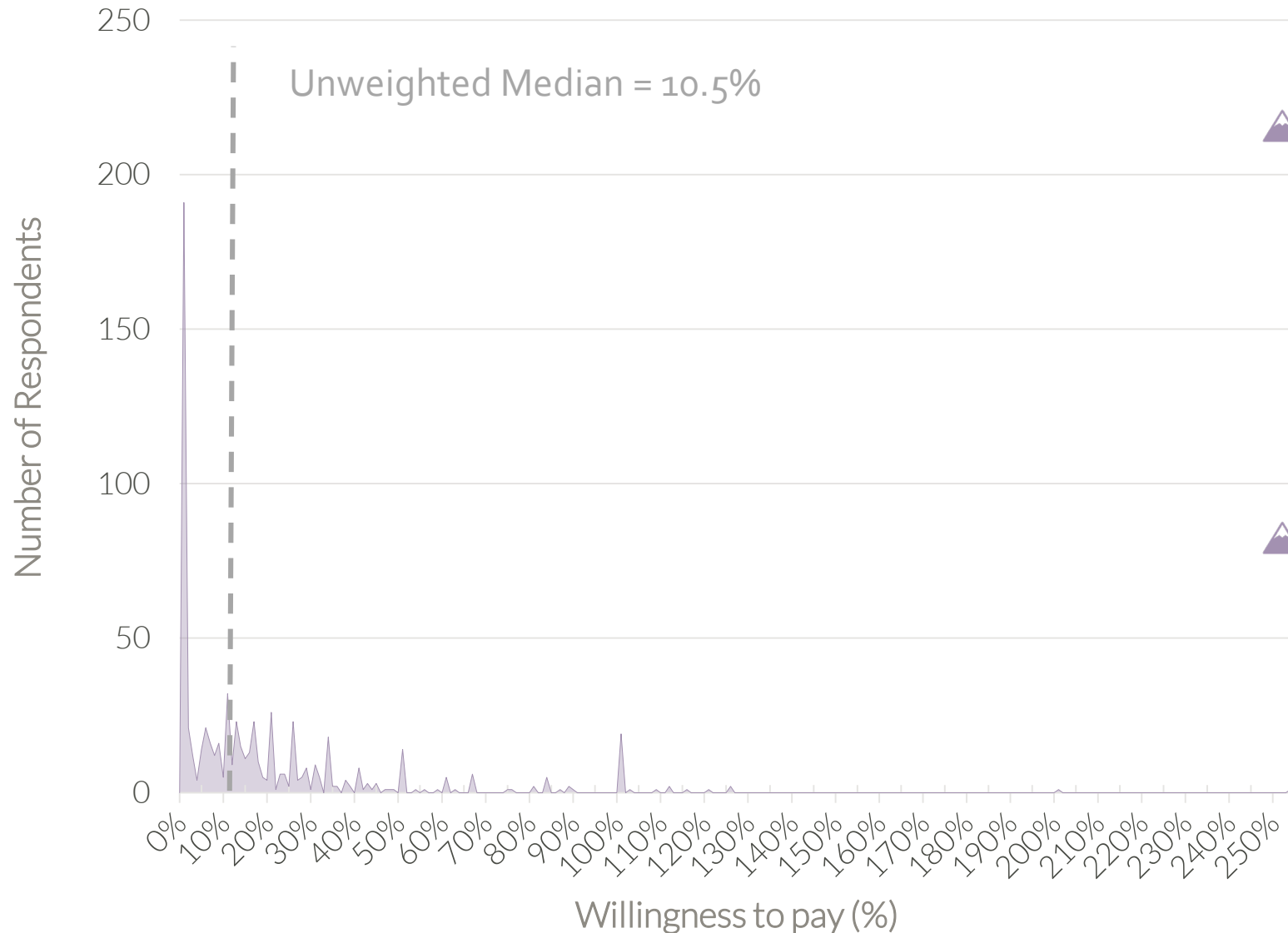
= WTP at the 50th percentile

= max amount a majority of respondents are willing to pay



Median Willingness to Pay More (Unweighted)

Willingness to pay more as a percentage



Median willingness to pay (unweighted data): **10.5%**

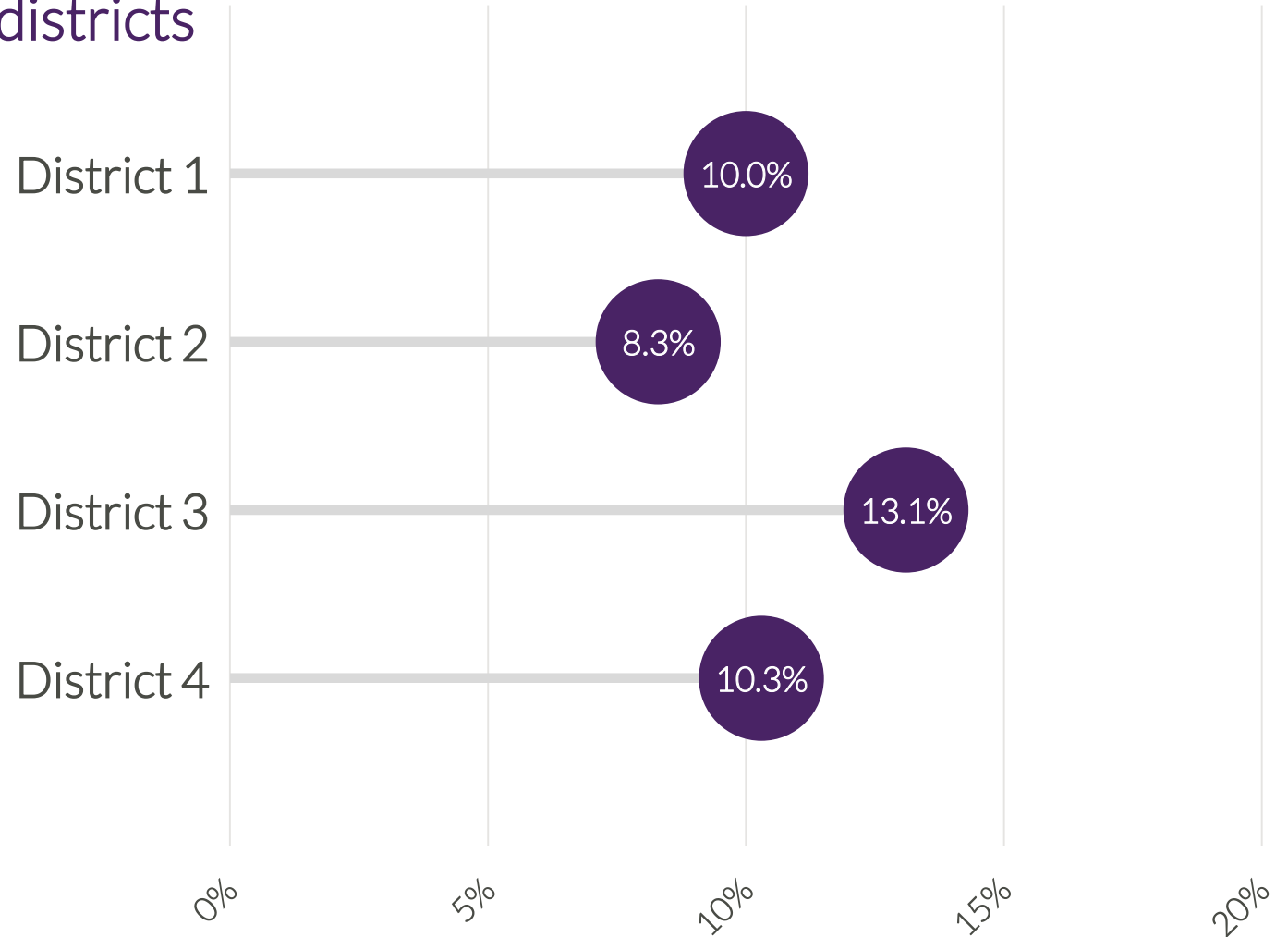
A majority of respondents would be willing to pay 10.5% more for renewable energy

95% confidence interval

Median WTP is between **10.0%** and **12.5%**

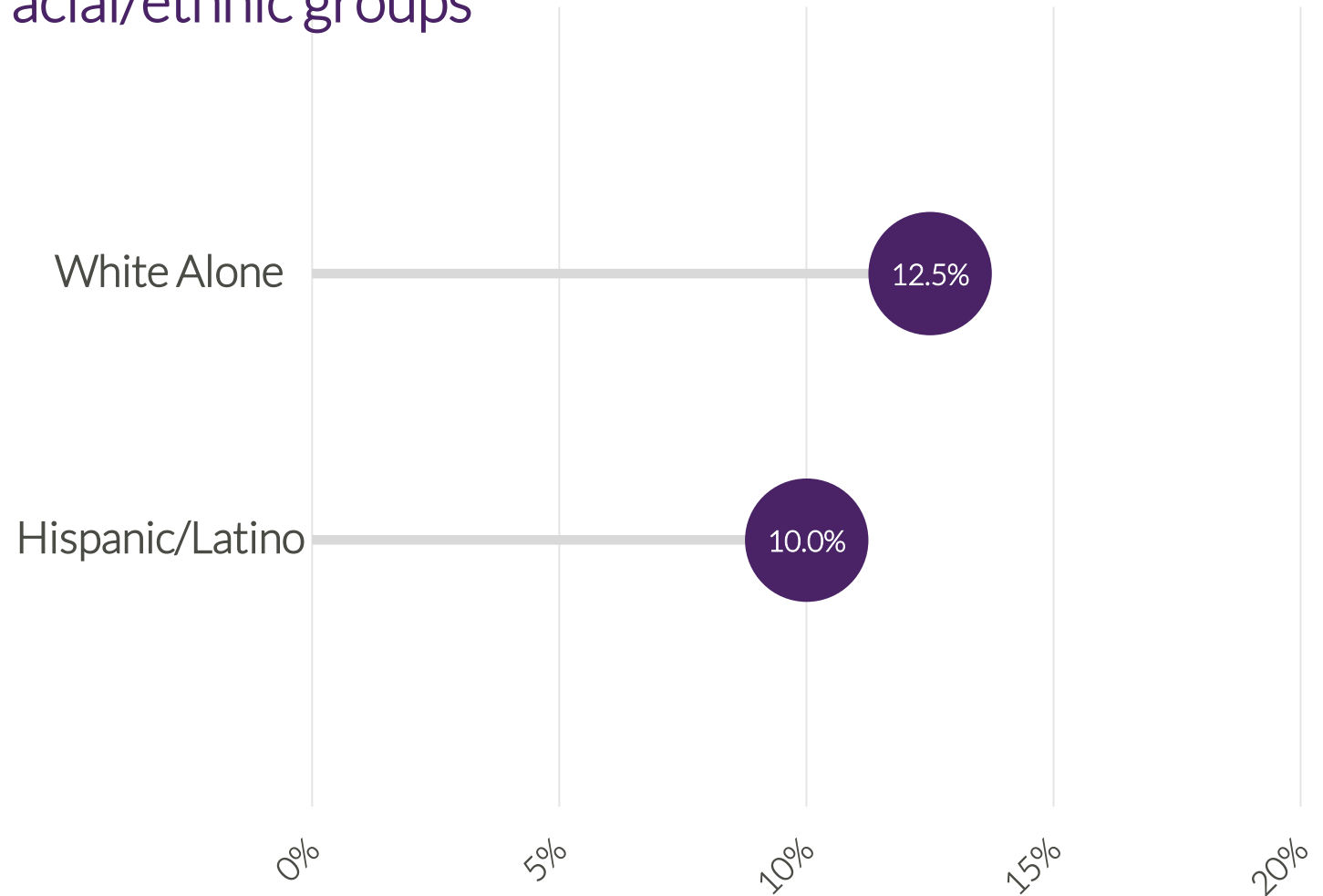
Districts:
*Median
Willingness to
Pay More*

Median willingness to pay more by municipal districts



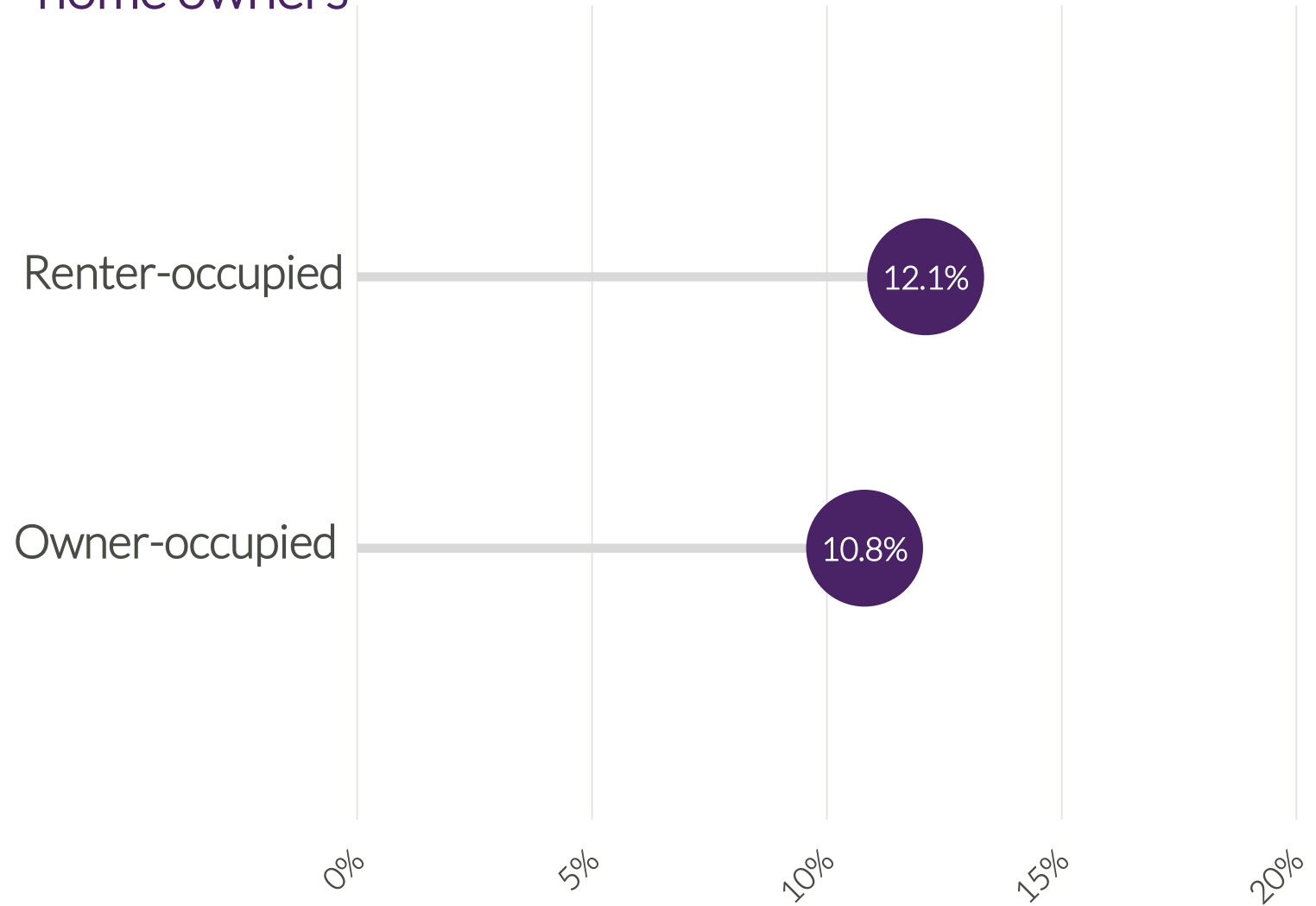
Race/Ethnicity:
*Median
Willingness to
Pay More*

Median willingness to pay more by racial/ethnic groups



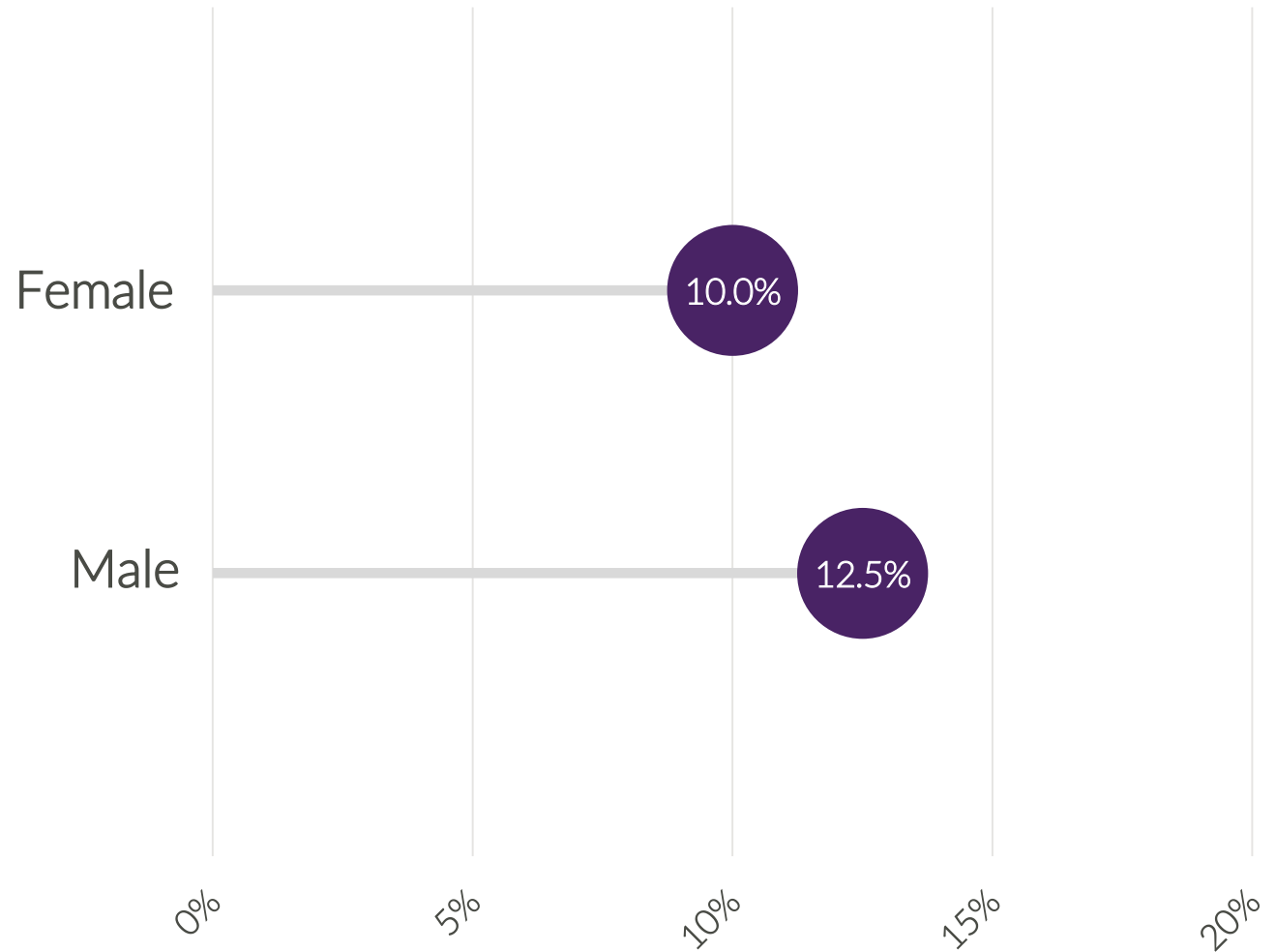
Renters and Homeowners:
Median Willingness to Pay More

Median willingness to pay more by renters and home owners



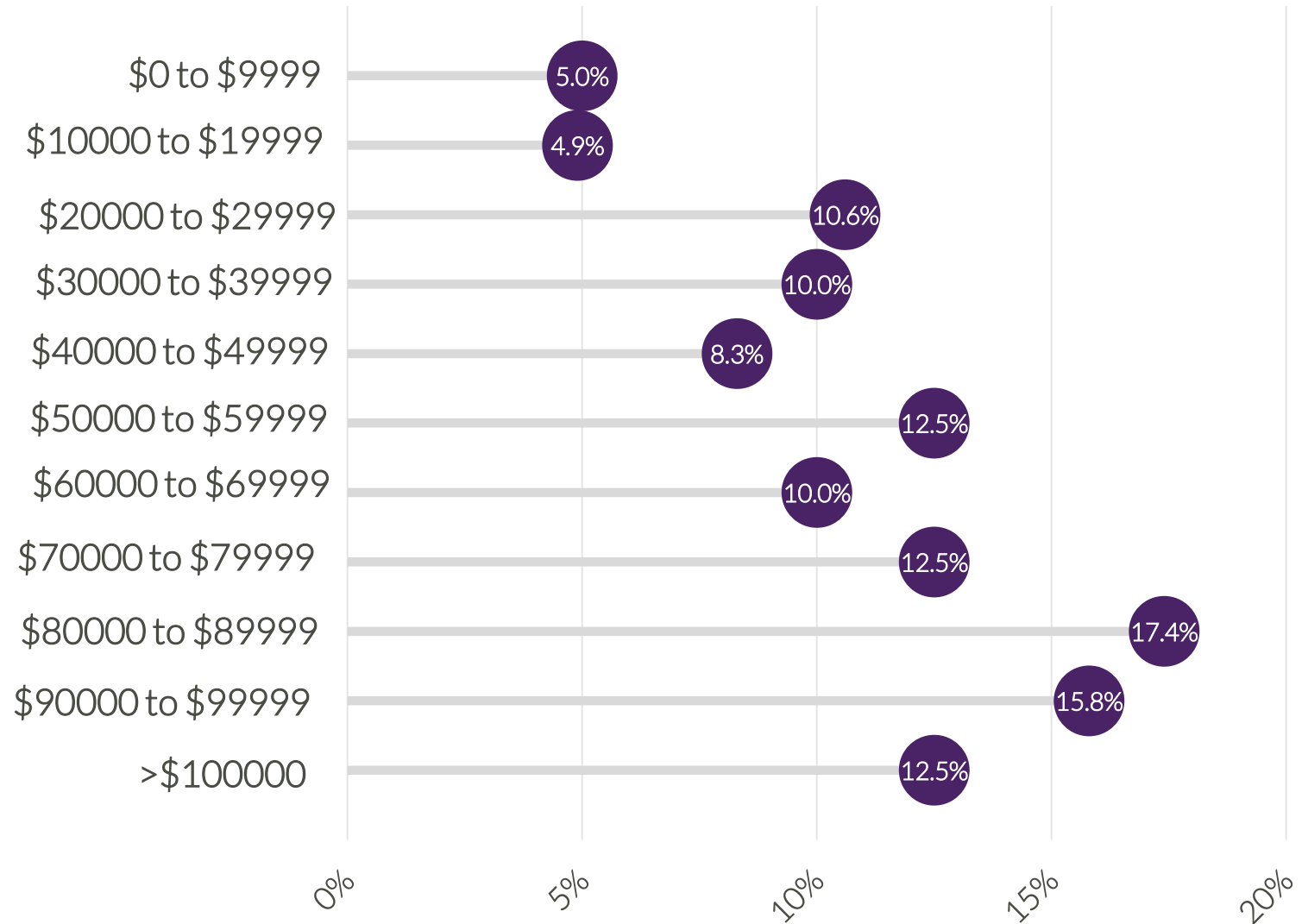
Gender: Median
Willingness to
Pay More

Median willingness to pay more by gender



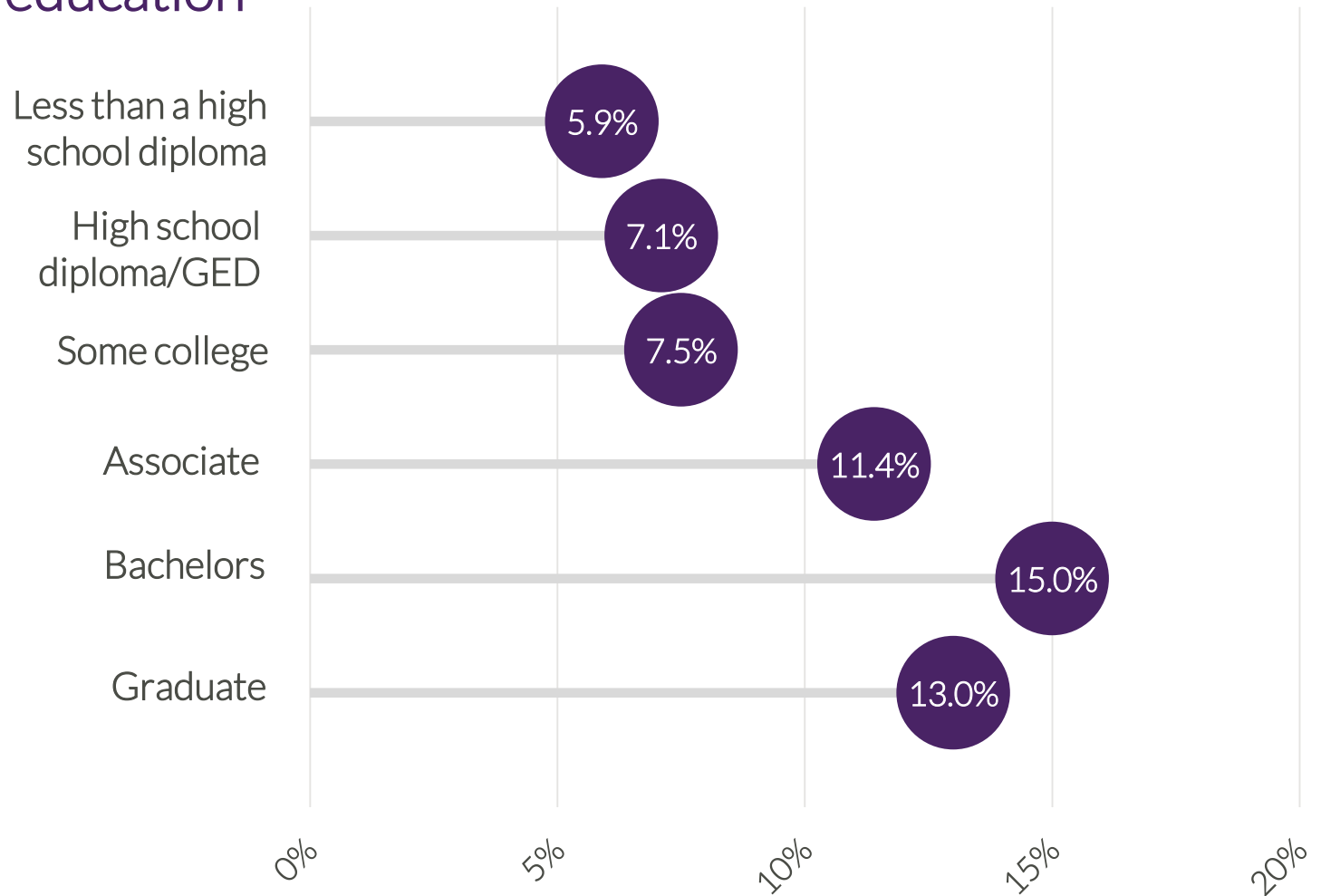
Income: Median Willingness to Pay More

Median willingness to pay more by income



Level of Education:
Median Willingness to Pay More

Median willingness to pay more by level of education



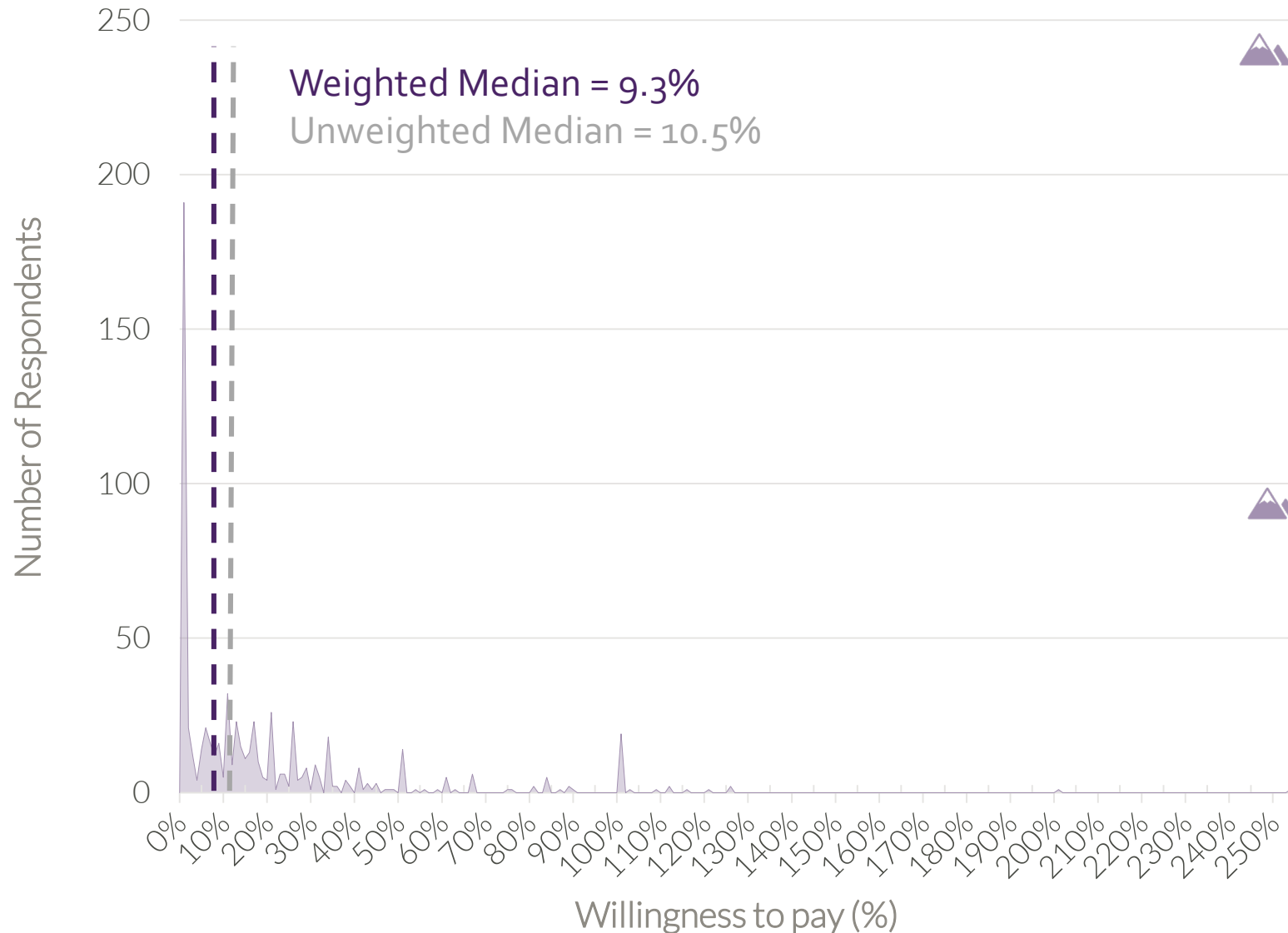
Resident Results: *Observations*

- ▲ Respondents with **lower incomes** tended to have a **lower median willingness to pay more**
 - ▲ They were also **under-represented** in our sample
- ▲ Respondents with **less formal education** tended to have a **lower median willingness to pay more**
 - ▲ They were also **under-represented** in our sample
- ▲ This under-representation can cause inaccurate results
- ▲ Sample weighting can reduce the inaccuracies due to under-representation
- ▲ We weighted the sample by **income** and **education level** and calculated the weighted median willingness to pay more



Median Willingness to Pay (Weighted)

Willingness to pay more as a percentage



Weighted median willingness to pay: **9.3%**

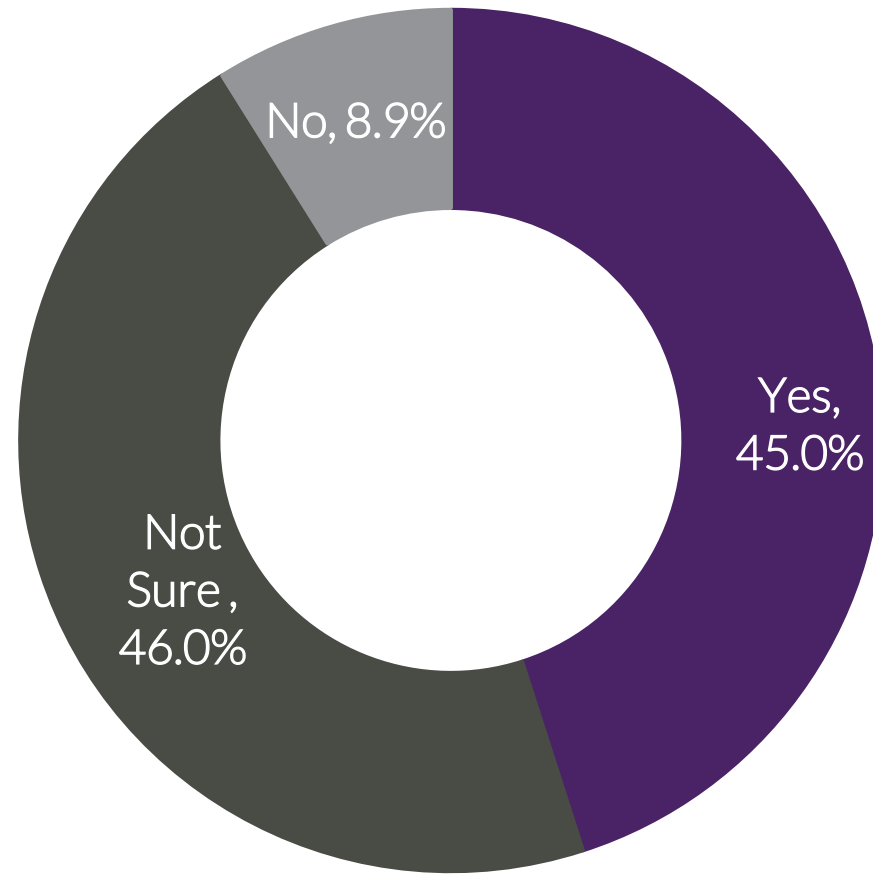
We estimate a majority of Ogden residents would be willing to pay 9.3% more for renewable energy

Weighted 95% confidence interval

Weighted median WTP is between **6.7%** and **10.0%**

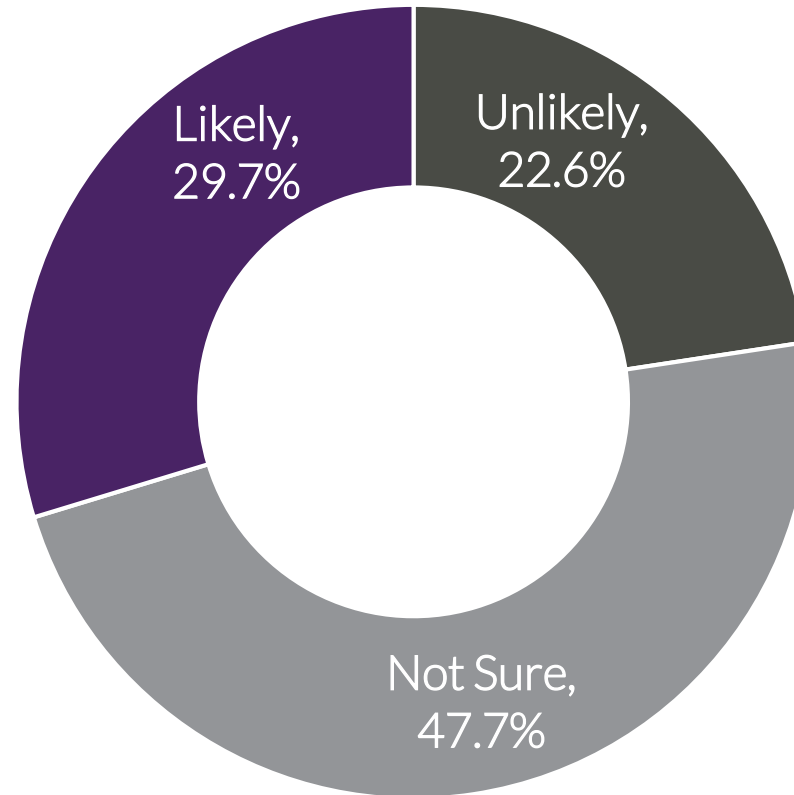
Should Ogden
City join CREP?

Should Ogden join CREP?



How likely is a resident to opt-out of CREP?

How likely is a resident to opt-out of CREP if costs exceed their willingness to pay?



How likely are residents to opt out?

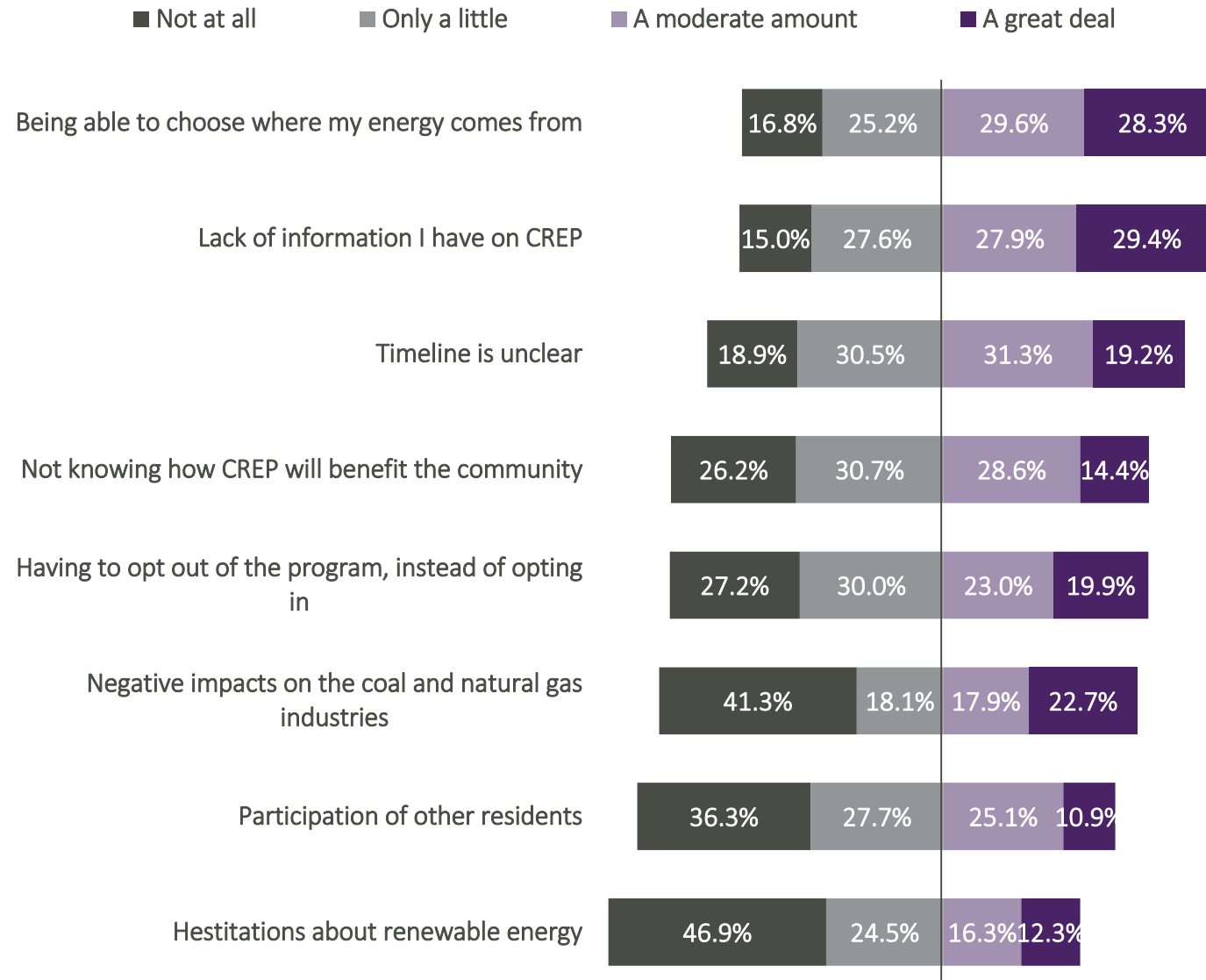
How likely are residents to opt out?

Increase in energy costs	Percent of total Ogden residents likely to opt out
1%	14.1%
5%	16.9%
10%	20.3%
15%	20.9%
25%	24.2%



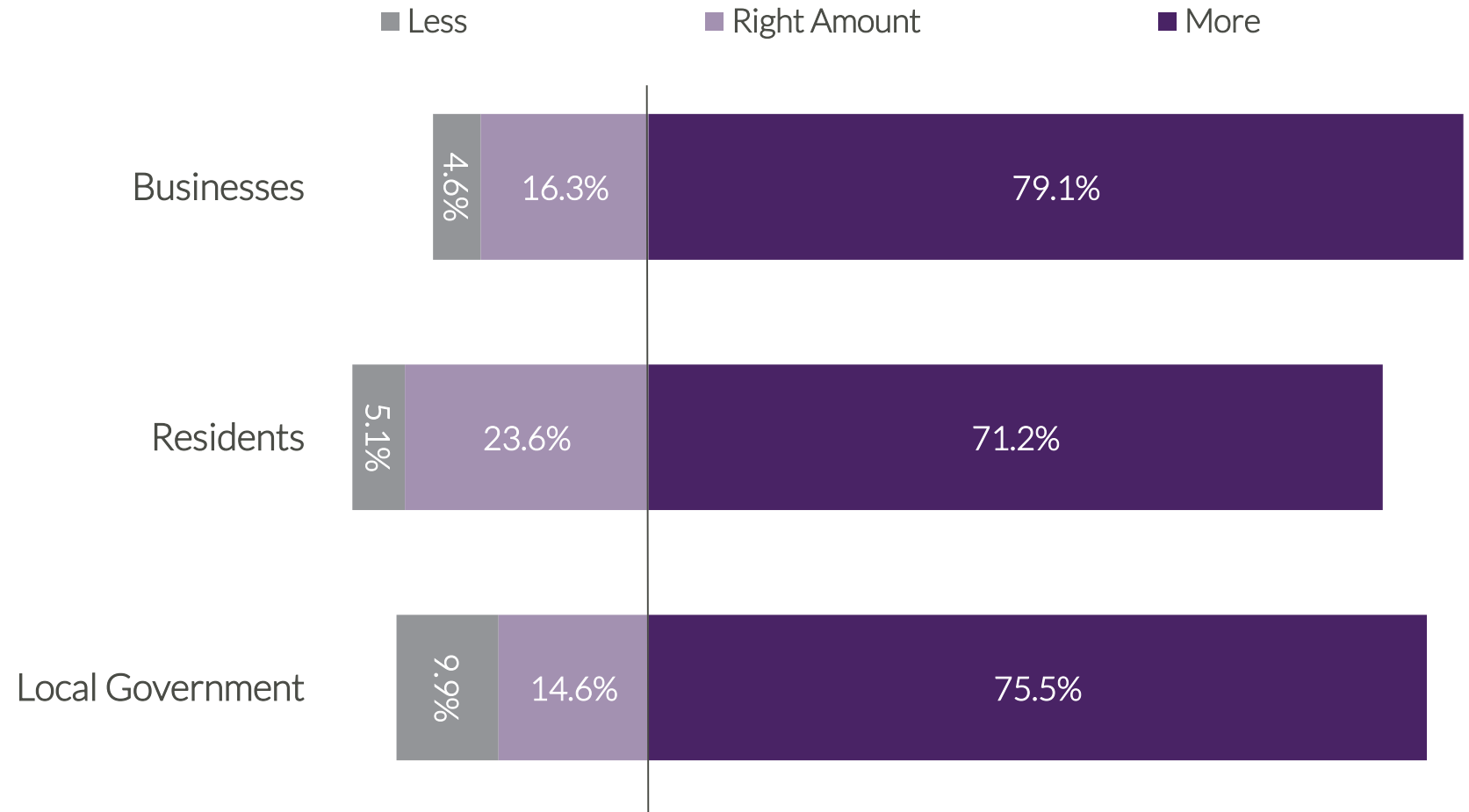
Factors contributing to CREP decisions

To what extent do these other factors contribute to your decision to participate in or opt-out of CREP?



Responsibility for Seeking Out Renewable Energy

Residents think the entire community should be doing more to seek out renewable energy



Business Results: *Response Rate*

- ▲ 133 Ogden business owners consented to take the survey
(response rate = 7.8%)
- ▲ Of these, 28 had solar panels → reduced sample to 105
- ▲ Of these, 19 did not answer key questions → final sample = 86
 - ▲ Key questions:
 - *Average monthly electricity costs*
 - *Willingness to pay for renewable energy*



Business Survey Results

▲ Median willingness to pay (raw data): **6.9%**

▲ A majority of respondents would be willing to pay 6.9% more for renewable energy, but not statistically different from 0%

▲ 95% confidence Interval

▲ Median WTP is between **0%** and **11.1%**

▲ Should Ogden City join CREP?

▲ **61.3%** of Ogden businesses think Ogden City should join

▲ **38.7%** think Ogden City should not join CREP



Residents: *Summary and Takeaways*

- ▲ We estimate that a majority of Ogden residents are willing to pay **9.3% more for renewable energy**
- ▲ Close to an **equal amount of residents** think the city should **join** CREP (45%) or are **unsure** about the city joining CREP (46%)
- ▲ If energy cost **increase by 10%**, about **20% of residents** are likely to **opt out**
 - ▲ Many residents are **not sure** if they would opt out if costs exceeded their willingness to pay
- ▲ A large majority (70%+) of residents think **businesses, residents and local governments should be doing more** to seek out renewable energy



Businesses: *Summary and Takeaways*


- ▲ We estimate that a majority of Ogden businesses are willing to pay 6.9% more for renewable energy
 - ▲ This is not statistically different from 0, so take estimate with caution!
- ▲ A majority of businesses (61.3%) think Ogden City should join CREP




Questions?

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APPENDIX

Demographics: Income

Household Income					
	Weighted Number	Weighted Percent	Unweighted Number	Unweighted Percent	Percent in Ogden Overall
Less than \$10,000/year	29	4.7%	28	4.6%	4.6%
\$10,000- \$49,999/year	233	38.3%	267	27.4%	38.3%
\$50,000- \$99,999/year	233	38.3%	261	42.8%	38.3%
\$100,000 or more/year	114	18.7%	155	25.4%	18.7%

Notes: Ogden % from the 2019 ACS 1-year estimates. Income brackets chosen to match those reported in ACS.

Demographics: Education

Education Level					
	Weighted Number	Weighted Percent	Unweighted Number	Unweighted Percent	Percent in Ogden Overall
Less than a high school degree/GED	80	13.4%	19	3.2%	13.4%
High school/GED	190	31.8%	94	15.8%	31.8%
Some college	175	29.3%	113	19.0%	29.3%
Associate degree certificate	43	7.2%	60	10.1%	7.2%
Bachelor's degree	74	12.4%	169	28.4%	12.3%
Graduate degree	35	5.9%	141	23.7%	5.8%

Notes: Calculations exclude those who responded "prefer not to answer." Ogden % from the 2019 ACS 1-year estimates

Demographics: Municipal District

Municipal Districts

	Weighted Number	Weighted Percent	Unweighted Number	Unweighted Percent	Percent in Ogden Overall
District 1	155	23.2%	144	21.5%	25.0%
District 2	171	25.6%	149	22.3%	25.0%
District 3	194	29.0%	162	24.2%	25.0%
District 4	149	22.2%	214	32.0%	25.0%

Demographics: Race/Ethnicity

Race/Ethnicity					
	Weighted Number	Weighted Percent	Unweighted Number	Unweighted Percent	Percent in Ogden Overall
Hispanic/Latino	123	21.6%	75	13.1%	30.8%
White alone	411	72.2%	454	79.1%	60.4%
Black alone	13	2.3%	9	1.6%	2.0%
Native American/Alaskan alone	5	0.9%	4	0.7%	0.8%
Asian alone	4	0.7%	10	1.7%	1.4%
Hawaiian/Pacific Islander alone	0	0.0%	1	0.2%	0.4%
Another race alone	8	1.4%	12	2.1%	0.5%
More than one race	5	0.9%	9	1.6%	3.8%

Notes: Calculations exclude those who responded "Prefer not to identify." Ogden % from the 2019 ACS 1-year estimates

Demographics: Housing Tenure

Household Tenure					
	Weighted Number	Weighted Percent	Unweighted Number	Unweighted Percent	Percent in Ogden Overall
Rent	157	25.3%	118	18.9%	41.2%
Own	464	74.7%	507	81.1%	58.8%

Notes: Calculations exclude those who responded "Other." Ogden % from the 2019 ACS 1-year estimates

Demographics: Gender

Gender					
	Weighted Number	Weighted Percent	Unweighted Number	Unweighted Percent	Percent in Ogden Overall
Male	293	52.0%	291	51.6%	49.6%
Female	271	48.0%	273	48.4%	50.4%

Notes: Calculations exclude those who responded "non-binary," "self-identify," or "prefer not to answer." Ogden % from the 2019 ACS 1-year estimates.

Demographics by not willing vs willing to pay

Table 3. Profile of respondents willing to pay more and not willing to pay more

	Demographics	<u>Not willing to pay more</u>		<u>Willing to pay more</u>	
		Number	Percent	Number	Percent
Overall	Unweighted	182	27.20%	487	72.80%
	Weighted	211	31.50%	458	68.50%
District	1	43	29.90%	101	70.10%
	2	48	32.20%	101	67.80%
	3	40	24.70%	122	75.30%
	4	51	23.80%	163	76.20%
Race/Ethnicity	Hispanic/Latino (Not White)	20	26.70%	55	73.30%
	White Alone	107	23.60%	347	76.40%
Tenure	Owner-occupied	133	26.20%	374	73.80%
	Renter-occupied	29	24.60%	89	75.40%
Gender	Male	67	23.00%	224	77.00%
	Female	74	27.10%	199	72.90%
Income	0 to 29999	35	38.90%	55	61.10%
	30000 to 6999	56	24.80%	170	75.20%
	> 70000	63	21.40%	232	78.60%
Education	Less than high school diploma	7	36.80%	12	63.20%
	High school diploma/GED	34	36.20%	60	63.80%
	Some college	38	33.60%	75	66.40%
	Associate degree/certificate	16	26.70%	44	73.30%
	Bachelor's degree	33	19.50%	136	80.50%
	Graduate Degree	26	18.4%	115	81.6%

Note that weighting can only be applied when the income and education levels of the population are known. Through the American Community Survey, we know these levels for the Ogden population as a whole, but we do not know these levels for specific demographic groups. Therefore, weighted results are only presented for the overall sample and not for specific demographic groups.

Opt Out Behavior

How Likely are Residents to Opt Out?

Increase in Energy Costs	% of Total Ogden Residents Likely to Opt Out	% of Total Ogden Residents Likely OR Unsure about Opting Out
1%	14.1%	26.5%
5%	16.9%	33.2%
10%	20.3%	43.0%
15%	20.9%	50.9%
25%	24.2%	63.4%

Should business do more by not willing vs willing to pay

Response	<u>Not willing to pay more</u>		<u>Willing to pay more</u>	
	Number	Percent	Number	Percent
Much less or less	19	11.7%	11	2.4%
Currently doing the right amount	40	24.5%	58	12.4%
More or much more	104	63.8%	397	85.2%

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Should residents do more by not willing vs willing to pay

Response	<u>Not willing to pay more</u>		<u>Willing to pay more</u>	
	Number	Percent	Number	Percent
Much less or less	18	11.0%	16	3.4%
Currently doing the right amount	57	35.0%	95	20.4%
More or much more	88	54.0%	355	76.2%

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Should local govt.
do more by
not willing vs
willing to pay

Response	<u>Not willing to pay more</u>		<u>Willing to pay more</u>	
	Number	Percent	Number	Percent
Much less or less	34	20.9%	22	4.7%
Currently doing the right amount	36	22.1%	58	12.4%
More or much more	93	57.1%	386	82.8%

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Contributing factors by not willing vs willing to pay

	<u>Not willing to pay more</u>				<u>Willing to pay more</u>			
	Not at all	Only a little	A mod. amount	A great deal	Not at all	Only a little	A mod. amount	A great deal
Being able to choose where my energy comes from	22.2%	20.4%	28.4%	29.0%	18.0%	25.2%	29.7%	27.1%
Lack of information I have on CREP	13.0%	17.9%	27.2%	42.0%	17.1%	29.9%	32.9%	20.1%
Timeline is unclear	19.3%	19.3%	32.9%	28.6%	21.9%	37.5%	26.5%	14.1%
Not knowing how CREP will benefit the community	31.5%	21.0%	24.1%	23.5%	29.8%	33.0%	28.3%	8.9%
Having to opt out of the program, instead of opting in	20.0%	21.9%	20.6%	37.5%	38.6%	29.3%	20.4%	11.7%
Negative impacts on the coal and natural gas industries	36.7%	18.4%	20.9%	24.1%	52.3%	16.3%	13.0%	18.4%
Participation of other residents	48.1%	24.4%	17.5%	10.0%	37.7%	29.7%	23.6%	8.9%
Hesitations about renewable energy	37.8%	22.6%	18.3%	21.3%	61.7%	21.7%	10.3%	6.2%

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