



Thermalize Juneau 2021 Community Survey Report

December 2021



Prepared for:
Alaska Heat Smart
Juneau, AK



Prepared by:
Information Insights
Fairbanks, AK



Sponsored by:
Building Technologies Office
U.S. Department of Energy
Office of Energy Efficiency &
Renewable Energy
Washington, D.C.



Thermalize Community Survey Report

December 2021

Acknowledgement of federal support:

This material is based upon work supported by the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy.

EERE Award Number: DE-EE0009079

Sponsoring Program Office:
Building Technologies Office
U.S. Department of Energy
Office of Energy Efficiency & Renewable Energy
1000 Independence Avenue, S.W.
Washington, D.C., 20585

Primary author:

Information Insights, Inc.

information  insights
vision + creativity = solutions

Secondary authors:

Alaska Heat Smart
Cold Climate Housing Research Center
National Renewable Energy Laboratory



Project team:

Alaska Electric Light & Power
Renewable Juneau
Southeast Alaska Building Industry Association
Environmental and Energy Study Institute
Panasonic Life Solutions Company
Rocky Mountain Institute



Disclaimer

This work was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or any third party's use or the results of such use of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government or any agency thereof or its contractors or subcontractors. The views and opinions of authors expressed herein do not necessarily state or reflect those of the United States Government or any agency thereof, its contractors or subcontractors.

List of Acronyms

ACS	American Community Survey
AHS	Alaska Heat Smart
AEL&P	Alaska Electric Light and Power Company
CCHRC	Cold Climate Housing Research Center
DOE	U.S. Department of Energy
JCOF	Juneau Carbon Offset Fund
USDA	U.S. Department of Agriculture

Table of Contents

Survey Overview /7

- Purpose /7
- Methodology /7
- Report Outline /8

Part 1 | 2021 Thermalize Juneau Campaign /9

- Background /9
- Recruitment & Incentives /9
- Timeline /14
- Installation Numbers /16
- Profile of the Thermalize Juneau 2021 Participant /17

Part 2 | Profile of the Juneau Resident who *Did Not* Participate in the 2021 Thermalize Campaign /18

- Initial Recommendations for Future Campaigns /19

Part 3 | Community Survey Responses /25

- Demographics /25
- Energy Burden /30
- Knowledge of Local Resources /31
- Heating Systems /34
- Energy Efficiency /35
- Familiarity with Heat Pump Technology /37
- Thermalize and Juneau Goals /39
- Barriers to Participation /48
- Reasons to Participate /50

Appendices /52

- Appendix A: Thermalize Community Survey Template /52
- Appendix B: Thermalize Juneau Intake Survey Results /65
- Appendix C: Strategies to Promote Equity and Inclusion /79

List of Tables

Table 1: A list of complementary programs offered to Thermalize Juneau participants /13

Table 2: Estimated and actual Thermalize Juneau timelines /15

Table 3: Thermalize Juneau 2021 Campaign in Numbers, as of December 1, 2021 /16

Table 4: What is the primary and secondary way your home is heated? /34

Table 5: Familiarity with heat pump technology, Part 1 /37

Table 6: Familiarity with heat pump technology, Part 2 /38

Table 7: Barriers to participation /49

Table 8: Reasons to participate /51

List of Figures

- Figure 1:** Excerpt from Thermalize Juneau informational brochure /10
- Figure 2:** Sample social media post used by Alaska Heat Smart during the Thermalize Juneau 2021 campaign /11
- Figure 3:** Sample social media post used by Alaska Heat Smart during the Thermalize Juneau 2021 campaign /11
- Figure 4:** Social media post image /12
- Figure 5:** Graphic from a biweekly update email to Thermalize participants /14
- Figure 6:** Thermalize Juneau participation timeline graphic /14
- Figure 7:** How would you describe yourself? /25
- Figure 8:** How old are you? /26
- Figure 9:** What was your household income (before taxes) in 2020? /27
- Figure 10:** Do you own or rent your home? /28
- Figure 11:** What kind of building do you live in? /29
- Figure 12:** How much does your household spend annually on electric heating fuel, and other cooking fuel bills? /30
- Figure 13:** How much of your annual household income is spent on energy costs? /31
- Figure 14:** Have you heard of Alaska Heat Smart before? /31
- Figure 15:** Have you heard of Renewable Juneau before? /31
- Figure 16:** If yes, have you accessed any of the Alaska Heat Smart Resources? /32
- Figure 17:** If yes, have you accessed any of the Renewable Juneau Resources? /33
- Figure 18:** Do you consider your residence to be energy efficient? /35
- Figure 19:** Are you currently looking for ways to lower your heating or electricity bills? /36
- Figure 20:** Have you heard about the Thermalize Juneau Campaign? /39
- Figure 21:** If yes, how did you hear about Thermalize Juneau? /40
- Figure 22:** If yes, did you know what a thermalize campaign was prior to learning about Thermalize Juneau? /41
- Figure 23:** If you have not heard of Thermalize Juneau 2021, do you know what a thermalize campaign is? /42
- Figure 24:** Are you aware that the City and Borough of Juneau has set a goal to reach 80 percent renewable energy for heating and transportation by 2045? /43
- Figure 25:** Have you heard about the Juneau Carbon Offset Fund and its work to install heat pumps in income-qualified homes? /44
- Figure 26:** Would you be interested in a heat pump, knowing that it is over 200 percent more efficient than other electric heating and would reduce electricity costs by \$480 to \$720 per year? /45
- Figure 27:** Would you be motivated to finance a heat pump or energy retrofits if the annual energy cost savings exceeded the annual payments on the loan? /46
- Figure 28:** If no, (to Figure 26) why? /47
- Figure 29:** Would you be motivated to invest in energy efficiency upgrades if you had access to on-bill financing with your utility? /48

List of Figures, Continued

Figure 30: *How would you describe yourself and others in your household?* /65

Figure 31: *Who lives in the home?* /66

Figure 32: *What was your annual household income (before taxes) in 2020?* /67

Figure 33: *How did you hear about Thermalize Juneau?* /68

Figure 34: *What made you want to join the Thermalize Juneau Campaign?* /69

Figure 35: *Was your income in 2020 significantly different from past years?* /69

Figure 36: *Why haven't you installed a heat pump yet?* /70

Figure 37: *What do you like about the idea of installing a ductless heat pump?* /70

Figure 38: *Are you satisfied with the financing options you have identified or know about?* /71

Figure 39: *Do you have a payback period in mind that would need to be met in order to install a ductless heat pump?* /71

Figure 40: *Would you be motivated to finance a heat pump or energy efficiency retrofit if the annual energy cost savings exceeded the annual payments on the loan?* /72

Figure 41: *Are you looking at financing options for ductless heat pump installation or energy efficiency retrofits?* /72

Figure 42: *Have you had any issues or problems with existing heat pump installers?* /73

Figure 43: *If yes, (to Figure 41) why?* /73

Figure 44: *How much did you know about ductless heat pumps prior to signing up for Thermalize Juneau?* /74

Figure 45: *Did you know what a thermalize campaign was prior to learning about Thermalize Juneau?* /74

Figure 46: *Are you aware of any of the solarize campaigns that have happened in Alaska over the past few years?* /75

Figure 47: *Have you heard about the Juneau Carbon Offset Fund and its work to install heat pumps in qualified housing units?* /75

Figure 48: *Are you aware that the City and Borough of Juneau has set a goal to reach 80% renewable energy for heating and transportation by 2045?* /76

Figure 49: *Are you considering replacing your heating appliance(s) with a heat pump(s) entirely, or in addition to current heating appliances?* /76

Figure 50: *Is this building a residence, business, or other non-residential building?* /77

Figure 51: *For this building, which options are a higher priority for you or your organization?* /77

Figure 52: *Please select the option that best describes the building's ownership status.* /78

Survey Overview

Purpose

Energy campaigns, such as Thermalize Juneau 2021 or the solarize campaigns that have occurred throughout the United States, use a campaign model to reduce the cost of adopting clean energy technology, accelerate adoption by setting deadlines for action, and make it easier to act by providing technical and community resources on the specific technology. The campaigns are useful tools for breaking down barriers to the installation of energy efficiency and renewable energy technologies. However, even with thoughtful outreach plans and alternative financing options, these types of campaigns have limitations in reaching every demographic equitably. Knowing the Thermalize Juneau 2021 campaign was the first thermalize campaign in Alaska and one of only a handful of thermalize campaigns in the United States to date, the Thermalize Juneau team planned a community survey at the conclusion of the recruitment phase of the campaign to gather input from groups that were unable to participate.

Methodology

The objective of this community survey was to help evaluate the 2021 Thermalize Juneau outreach campaign by identifying barriers to participation and possible ways to address them. The Thermalize Juneau team is hopeful that future programs can repeat the successes and learn from any mistakes of this campaign so they are able to reach as many people as possible in the most effective way. The survey, open to Juneau residents who did not register for Thermalize Juneau 2021, collected demographic data and participant knowledge and perceptions about energy use, heat pumps, local programs in Juneau, and outreach methods. These questions were meant to identify groups that the Thermalize Juneau 2021 campaign did not reach and why, as well as potential ways to reach more people in future campaigns.

The 2021 Thermalize Community Survey was developed by Information Insights, Inc., in coordination with the Cold Climate Housing Research Center and Alaska Heat Smart staff and board members. The survey team developed initial questions for the survey, then created a list of survey-appropriate questions and logic. These were entered into survey software, Survey Monkey, and the online survey was sent to the team for testing. After review, the survey was finalized and distributed widely to residents in Juneau. The questions for the full survey are available in Appendix A.

The target audience for the survey was individuals who live in Juneau and did not participate in the 2021 Thermalize Juneau campaign. To ensure the survey was completed by this audience, the survey included two screening questions to identify geographic location and participation (registration) in the 2021 Thermalize Juneau campaign. A total of 523 individuals started the survey, with 453 passing the screening questions and completing the full survey. Though the team was not seeking a specific number of responses, the representative nature of respondents was a critical standard for determining if survey marketing was reaching the intended audience and when to close the survey.

For the purposes of this survey, representation was defined as comparable to 2020 and 2019 U.S. Census Bureau data on demographics of Juneau residents. The demographics considered were race, household income, and housing type and ownership.

The survey opened on September 15, 2021 and closed on October 15, 2021. As noted above, a response rate was not calculated because the goal of the survey was to have respondents that represented the community of Juneau based on key demographics.

The team engaged in an intensive marketing campaign to recruit survey participants. Multiple modes of response collection were used, including:

- Social Media: Frequent Facebook posts and shares with community organizations, including the Juneau Community Collective with 18,000 members,
- Radio: Audio and digital ads played through Juneau Radio Center,
- Newspaper: A quarter page ad in the Juneau Empire,
- Flyers: Over 100 flyers distributed throughout the community, using a flyer hanging service,
- Emails: A series of emails to community organizations with memberships, including Renewable Juneau, were sent out by the Alaska Heat Smart Executive Director and Board members, and
- Coffee Shops: A focused incentive campaign with flyers was conducted with two coffee shop businesses with locations across the community.

Along with the marketing campaign, multiple incentives were offered including free coffee (through the coffee shop campaign), \$10 coffee cards to the first 200 respondents, and eight drawings for \$500 gift cards.

Report Outline

This report is laid out in three parts. Part 1 is a detailed overview of the Thermalize Juneau 2021 Campaign. This includes the structure, materials, timeline, installation numbers, and profile of participants. Part 2 provides a profile of the 2021 Thermalize Community Survey respondents (Juneau residents who did not participate in the 2021 campaign) and offers initial recommendations for future campaigns based on the Community Survey results, a Thermalize Participant Intake Survey, experiences with energy campaigns, and evaluations and research completed on other energy campaigns, mostly solarize efforts. Part 3 is a detailed description of survey responses to the Thermalize Community Survey with charts and analyses. The appendices provide additional material referenced in the parts noted above, including the survey tool for the 2021 Thermalize Community Survey, equity challenges and strategies, and responses to the Intake Survey, which was completed by the majority of Thermalize Juneau 2021 participants.

Part 1 | 2021 Thermalize Juneau Campaign

Background

The City and Borough of Juneau, Alaska has set an ambitious goal to reach 80 percent renewable energy for the heating and transportation sectors by [2045](#). To help reach this goal, the local nonprofit Alaska Heat Smart formed in 2019 to provide education and information on heat pumps, offer free home heat pump assessments for Juneau residents, and act as a bridge between residents and heat pump installation contractors. Alaska Heat Smart's programs intend to take the confusion out of the process of upgrading a home's level of energy efficiency. With detailed home energy information provided via Alaska Heat Smart services, a resident can feel confident in approaching contractors, streamlining the purchase process, and reducing the likelihood of receiving wide-ranging quotes and proposals.

In 2020, Alaska Heat Smart partnered with several organizations to launch Thermalize Juneau 2021, the first thermalize campaign in Alaska. Thermalize Juneau 2021 officially began with an educational [kickoff event](#) in December 2020, followed by a five and a half month registration and recruitment period for participants. Participants in the campaign received an Alaska Heat Smart heat pump assessment, an optional energy audit, bulk purchase discounts, consumer education, and a simplified installation process for a ductless heat pump and other energy efficiency improvements. The 2021 Thermalize Juneau campaign also has a research component to evaluate the results of the campaign and inform future thermalize campaigns in Alaska and elsewhere. The survey discussed in this report is a part of that research, with the aim to evaluate the outreach component of Thermalize Juneau 2021 and improve the outreach for future campaigns.

Recruitment & Incentives

Thermalize Juneau 2021 relied on outreach across several different mediums to recruit participants. Recruitment began with a virtual (due to the COVID-19 pandemic) [kickoff event](#) on December 8, 2020 attended by 150 people, as well as informal conversations between Alaska Heat Smart assessors and Juneau residents already undergoing heat pump assessments in Fall 2020. Interested parties had the ability to sign up for a listserv managed by Alaska Heat Smart staff to be kept informed of key dates and milestones. Registration opened on February 1, 2021. At that time, Alaska Heat Smart announced the opening on social media, on its website, and via the listserv.

Registration closed on July 15, 2021, with interested parties able to sign up for a waitlist after that date. During the registration period, outreach was informed by interviews with outreach partners throughout the community and by the results of a survey¹ conducted in Fall 2020 of current and prospective heat pump owners in Juneau to identify motivations for heat pump and efficiency upgrades and barriers to acting on those motivations. Outreach activities included:

- A [virtual Q&A workshop](#) in March 2021 attended by 41 guests and 8 staffers;
- Advertising on [Alaska Heat Smart's web page](#) (which had an average of 14 users per day during the registration period according to Google Analytics);
- Posts about heat pumps (Figures 2 & 3) and the thermalize campaign (Figure 4) on Alaska Heat Smart's social media suite of Facebook, Twitter, and Instagram, with the majority of posts occurring on Facebook where Alaska Heat Smart has the most followers;
- A virtual presentation by an AEL&P representative and AHS board member to a group of 55 people at the Glacier Valley Rotary Club on December 16, 2021; and
- Features on local radio stations, including inclusion in an interview with partnering organization Southeast Alaska Building Industry Association in January and interviews with Alaska Heat Smart board president in March 2021.
- Emails and discussions with Juneau community organizations by Alaska Heat Smart Board members in March and April 2021. A [brochure](#) (Figure 1) on Alaska Heat Smart and the thermalize campaign was developed to assist with this outreach.

What is a Thermalize campaign?

Thermalize Juneau harnesses our power as buyers to negotiate better prices for heat pump equipment and installation, while local suppliers and installers get lots of reliable work. Thermalize is a one-of-a-kind partnership between Alaska Heat Smart, Renewable Juneau, and AEL&P.

Why is a Thermalize campaign a good choice for Juneauites?



Heat pumps run on Juneau's hydroelectricity, making them one of the most environmentally friendly heating systems available to Juneauites.

Mass adoption of heat pumps contributes to a low-carbon future.



Community use of heat pumps can lead to improved community health benefits, such as better indoor and outdoor air quality.

The Thermalize campaign will connect you with local resources providing guidance when it comes to choosing, installing, and financing heat pump options.



The Thermalize Juneau team will undergo a rigorous process to select trusted installers and equipment so you don't have to.

Figure 1: Excerpt from an informational brochure about thermalize campaigns used by Alaska Heat Smart during the Thermalize Juneau 2021 campaign

¹Information Insights, Inc., Alaska Heat Smart, & Cold Climate Housing Research Center. 2020. Juneau Ductless Heat Pump Market Survey: Survey Results. Fairbanks, AK: Information Insights, Inc. Available at: <http://cchrc.org/media/2020-Juneau-DHP-Survey-Final1.pdf>

To register for Thermalize Juneau, applicants filled out an online form via the Alaska Heat Smart web page. This form was a modification of the form that Alaska Heat Smart already maintained for people wanting a heat pump assessment – a one-on-one meeting with an Alaska Heat Smart expert during which the assessor walks a Juneau resident through the decisions to purchase a heat pump and perform energy efficiency upgrades. The form collected building information, such as building type, year built, occupancy, square footage, and heating systems. The updated form also collected information about participants including how they learned about Alaska Heat Smart and Thermalize Juneau, where they were in the process of considering a heat pump, and reasons for considering a heat pump.

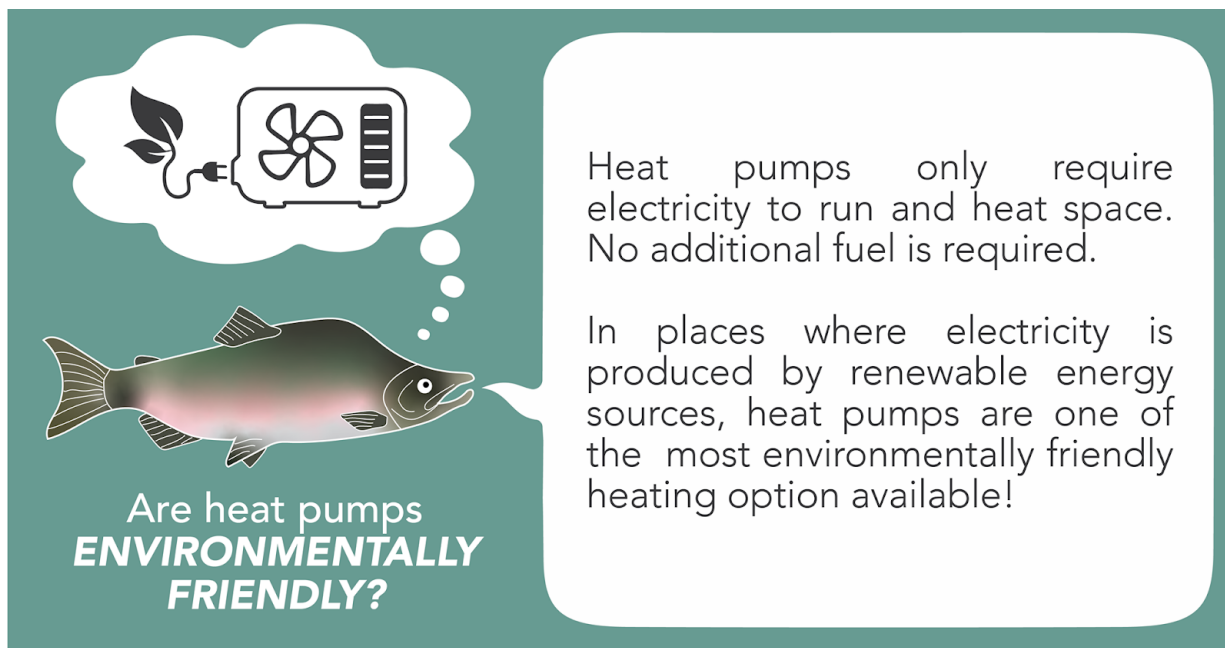


Figure 2: Sample social media post used by Alaska Heat Smart during the Thermalize Juneau 2021 campaign

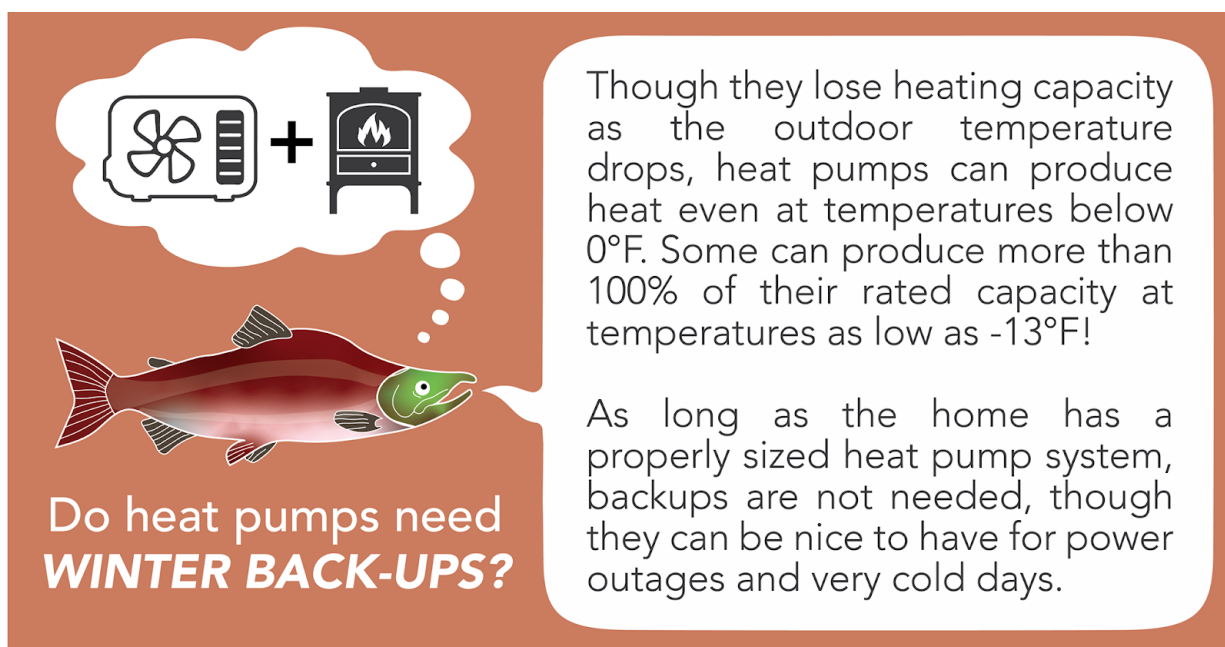


Figure 3: Sample social media post used by Alaska Heat Smart during the Thermalize Juneau 2021 campaign

Once an individual registered for Thermalize Juneau 2021, project staff followed up to collect energy bills, including electricity use from local utility and project partner AEL&P, information about biomass appliances and fuel oil records, and a floor plan. At this point, registrants were assigned to an Alaska Heat Smart assessor, offered the option of obtaining an energy audit by a certified professional, and sent a link to an anonymous survey collecting additional demographic information. The heat pump assessment consisted of a one-on-one meeting with the Alaska Heat Smart assessor, during which the assessor walked the participant through the decision of whether a heat pump was right for their building, and estimated energy savings using a custom Microsoft Excel-based calculator tool that incorporates past energy use and building characteristics. Numerous participants decided that the limited equipment options (single-head mini-splits) offered through the Thermalize Program were not the best fit for their building configurations and heating needs. They still wished to install a heat pump, but opted to proceed with a more suitable heat pump system, such as a multi-head or ducted system. The heat pump assessment analyzed the feasibility and economics of those non-Thermalize options as well.



Figure 4: Social media post image advertising the RFP for heat pump installers and builders used by Alaska Heat Smart in the Thermalize Juneau 2021 Campaign

Thermalize contractors were recruited in May and June 2021 via a competitive request for proposals (RFP) process and included an electrician for required electrical upgrades and wiring, a licensed HVAC heat pump installer, and a building contractor for energy efficiency upgrades. Each signed a Memorandum of Agreement with Alaska Heat Smart, outlining a timeline for quotes and installations and any bulk discounts. After these contractors were announced, home site visits began for those interested in receiving a free quote for a heat pump installation and/or energy efficient retrofits. Those interested in proceeding to contracted work placed a deposit with the appropriate contractor and coordinated the retrofit directly with them. The heat pump installer and building contractor both offered bulk discounts:

- Panhandle Heat Pumps offered participants a \$200 rebate if at least 10 heat pumps were installed through the program. This increased to \$300 for 20 heat pumps, and maxed out at \$400 if 30 or more heat pumps were installed.
- Building Pros, Inc. offered a 3 percent overall discount if at least 5 people put down a deposit for energy efficiency improvements.

Campaign staff also provided information to Thermalize participants about other, complementary programs to consider in order to make energy efficiency improvements and heat pumps more affordable. These are listed in Table 1. At least one person left the campaign to join the Juneau Carbon Offset Fund (JCOF) program, a successful referral by campaign staff to a program that better suited their needs. JCOF sells carbon offsets and collects donations from entities who wish to offset their carbon emissions and uses these funds to provide significantly reduced-cost heat pumps to households that meet program eligibility criteria.

Table 1: A list of complementary programs offered to Thermalize Juneau participants

Program	Description	Incentive
True North FCU Heat Pump Loan Program	True North Federal Credit Union (FCU) provides low-cost loans for heat pump installations in Juneau, within or outside of the Thermalize campaign. The loan program was developed in 2020 in collaboration with Alaska Heat Smart. https://akheatsmart.org/programs/heat-pump-loan-program/	\$7,500 loan for up to 60 months with rates starting at 4 percent.
Juneau Carbon Offset Fund (JCOF)	JCOF provides qualifying Juneau households with free ductless air source heat pumps if households meet low income, building, and fuel consumption requirements. JCOF is an active partner of Alaska Heat Smart and the Thermalize Juneau campaign. https://juneaucarbonoffset.org/apply/	Free or subsidized heat pump for income and oil-use qualified households.
US Department of Agriculture Renewable Energy Development Assistance	Southwest Alaska Municipal Conference, an Alaska Regional Development Organization, manages this US Department of Agriculture (USDA) Program. Thermalize Juneau partner, Information Insights, administers this program for rural small businesses, offering access to low-cost energy audits (discounted by 75 percent) and USDA grants for energy efficiency upgrades, which includes heat pumps. The grants are competitive and cover 25 percent of an energy efficiency upgrade. https://www.rd.usda.gov/programs-services/rural-energy-america-program-energy-audit-renewable-energy-development-assistance/ak	75 percent off cost of standard energy audit for businesses.
Equipment Federal Tax Credits for Primary Residence	Air source heat pumps that are ENERGY STAR® certified are eligible for this federal tax credit. Residents can claim the tax credit using Form 5695 and submit it with their tax return to the IRS. https://www.energystar.gov/about/federal_tax_credits/non_business_energy_property_tax_credits	\$300 tax credit

Timeline

Throughout the Thermalize Juneau 2021 campaign, project staff provided biweekly update emails to registrants to share the latest information on contractor recruitment, timeline, and next steps. These emails also included counts of people in the program and steps in the process where project staff were working to address bottlenecks so those on wait lists, such as for a heat pump assessment or energy audit, would have an estimate of how long it would take to receive that service. Project staff also began outreach phone calls to registrants during June 2021, continuing through to the end of the program, to assist with decisions to sign up for a free quote and/or to place a deposit and receive a heat pump installation and/or efficiency improvements. During these calls staff clarified what the program and contractors were offering and answered questions participants had from their heat pump assessment and energy audit. When participants committed to receiving a site visit and quote, project staff would send their names to the appropriate contractor(s) and email the participant that they had moved to the next step. Figure 5 shows an overview of the participation steps in the Thermalize process.



Figure 5: Graphic from a biweekly update email to Thermalize participants, with an overview of the Thermalize process. The “electrical pictures” step allowed participants to provide pictures of their electrical panel to the Thermalize electrician and receive a quote without having to schedule a site visit

The proposed timeline for Thermalize Juneau is detailed in Figure 6. This timeline has since been updated to reflect changing conditions, such as a longer registration period. Table 2 contains an updated timeline.

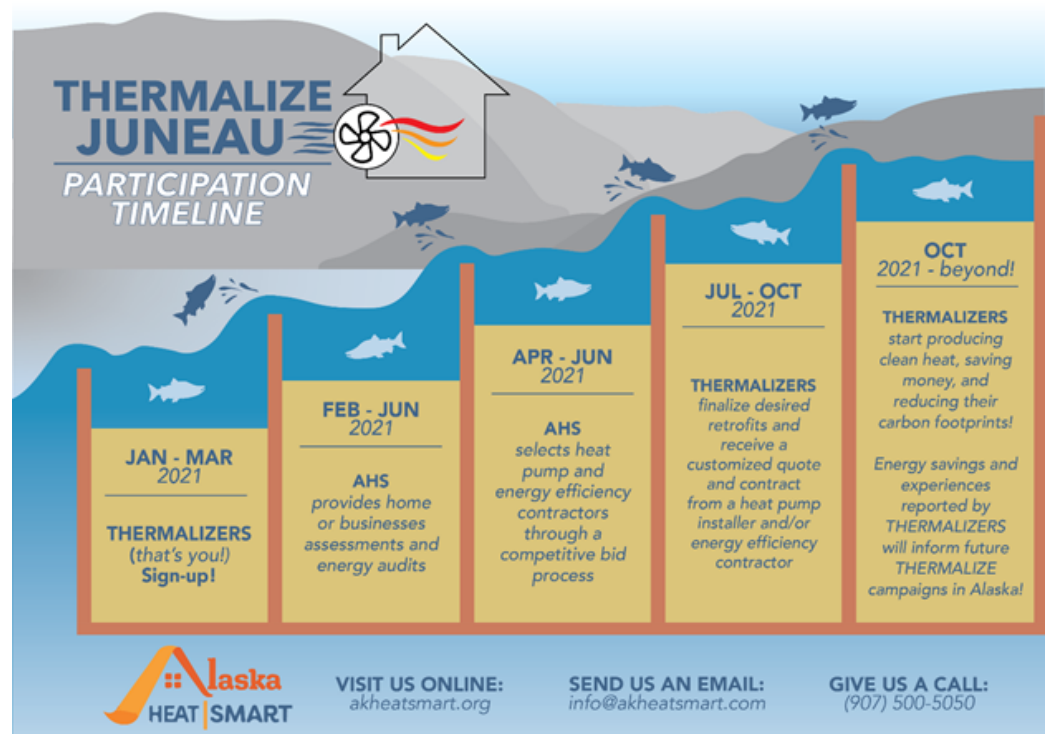


Figure 6: Thermalize Juneau participation timeline graphic from the kickoff event in December 2020

Table 2: Estimated and actual Thermalize Juneau timelines

Thermalize event	Estimated timeline	Actual timeline	Notes
Registration	January – March 2021	January – July 2021	The project team determined the capacity existed to extend the registration timeline.
Heat pump assessments	February – June 2021	February – October 2021	Due to a temporary staff shortage in late spring and the extended registration timeline, heat pump assessments continued throughout the summer.
Energy audits	February – June 2021	February 2021 – January 2022	The energy audit process was slow to start as the team set up recruitment and energy modeling protocols. Also, both energy auditors had to take extended breaks during the summer.
Contractor selection	April – June 2021	April – June 2021	No change
Quotes for installation	July – October 2021	July 2021 – January 2022	Quotes will continue through December to accommodate workforce shortages on the heat pump installer and building crews, and so people can receive energy audits before the quote.
Installations	July – November 2021	September 2021 – February 2022	Due to workforce shortages and potential material delays, the heat pump installer and builder may work on campaign homes through early 2022.

Installation Numbers

A total of 164 people registered for Thermalize Juneau, the vast majority during the registration period. The rest were added from the waitlist in September. As of this report, the campaign is nearing completion, with final heat pump installations and energy efficiency improvements to occur by February 2022. Current numbers are listed in Table 3.

Table 3: Thermalize Juneau 2021 Campaign in numbers, as of December 1, 2021

	Total	Notes
Registrants	164	The 164 registrants represented 161 individual people (three people registered twice, for two different buildings in each case), 3 nonresidential buildings, 194 residential units (either single-family residences or units in multifamily buildings), 147 whole buildings (either single-family residences or a multifamily building where all units were considered for the Thermalize Juneau 2021 campaign).
Completed heat pump assessments	142	Not every participant elected to complete an assessment, as some people had already done their own calculations and others only joined the campaign for the energy efficiency portion. An additional 23 registrants left the campaign before receiving an assessment for a variety of reasons, including moving from the house or not realizing what the Thermalize campaign was for when they signed up.
Completed energy audits	65	The Thermalize Juneau campaign was able to offer free energy audits, conducted by two Juneau energy auditors, to participants. Every participant who wanted an audit was able to receive one, for a planned 86 audits in total.
Heat pump installation quotes	67	A total of 89 people have signed up to receive a quote for a heat pump installation.
Heat pump installations	22	Completed as of December 1, 2021.
Energy efficiency improvement quotes	10	At this time, 27 people have signed up to receive a site visit and quote from the Thermalize builder, Building Pros, Inc.
Energy efficiency improvements	1	One homeowner received a comprehensive attic and crawlspace retrofit, including air sealing, ventilation improvements, and insulation. A second homeowner has provided a deposit for air-sealing and insulation in their attic and crawlspace, with retrofit work scheduled for December 2021.

Profile of the Thermalize Juneau 2021 Participant

A profile of Thermalize Juneau 2021 participants is provided based on an optional and anonymous Participant Intake Survey completed as part of the campaign registration. The goal of the survey was to learn what demographic groups were participating in the program and why. An exit survey of participants is scheduled for 2022, and additional information collected on participants will be included in the 2023 program guide. A total of 131 respondents out of the 161 unique Thermalize registrants completed the intake survey.

The Thermalize Juneau campaign exceeded the recruitment target of 150 participants. However, the diversity of participants, when compared against census data for Juneau, shows a clear need and opportunity for changes in future thermalize campaigns. See Appendix B for detailed demographic breakdowns and comparisons of campaign participants, Juneau homeowners, and Juneau residents.

Demographics

For race, 93 percent of Thermalize campaign participants identified as white and 18 percent identified as Alaska Native or American Indian, Asian, African American, Hispanic origin, and Native Hawaiian or other Pacific Islander. (Participants were able to select all racial identities that represented them.) This is compared to 82 percent of Juneau homeowners and 61 percent of Juneau residents who identify as white. **For building type**, an estimated 80 percent of campaign registrants live in single-family homes. **For income**, 84 percent of participants have incomes over \$75,000 compared to 80 percent of Juneau homeowners and 59 percent of Juneau residents.

Reason for participation: The top three reasons for participation in the 2021 campaign are to reduce personal fossil fuel use, lower installation price for a ductless heat pump, and help Juneau reach its renewable energy goal.

Effective communication media: Forty-five percent learned of the campaign through word of mouth, 30 percent through the kickoff event in December 2020, and 27 percent via Alaska Heat Smart's social media presence.

Equity & Inclusion

The 2021 Thermalize Juneau Campaign did not reach many households of color or low- and moderate-income households in Juneau. Part 2 outlines initial recommendations for future campaigns based on results from the Thermalize Community Survey, implementation experiences with the Thermalize Juneau 2021 and other Alaska energy campaigns, and energy campaign literature. These initial recommendations will be refined through additional evaluation of the 2021 Thermalize Campaign and research. A summary of the research and strategies is available in Appendix C.

Part 2 | Profile of the Juneau Resident who Did Not Participate in the 2021 Thermalize Campaign

The primary purpose of the Thermalize Community Survey was to evaluate the effectiveness of outreach, messages, campaign incentives, and other aspects of the Thermalize Juneau program in reaching consumers and promoting participation. Based on the survey responses, a profile of those who did not participate in the 2021 Thermalize Campaign has been developed.

For all respondents:

- **Demographics:** Respondents are roughly representative of the Juneau population (See Part 3, Community Survey Responses). Of importance for this profile is that the survey effectively reached demographic groups who were underrepresented in the 2021 Thermalize Campaign, specifically lower-income households, renters, residents of apartments/non-single-family homes, and Alaska Native households. **For race**, 28 percent of respondents identified as Alaska Native or American Indian, Asian, Hispanic, or Native Hawaiian or Pacific Islander, compared to 18 percent of campaign participants. Twenty percent of respondents identified as Alaska Native compared to 8 percent in the campaign. **For income**, households with reported incomes under \$50,000 are better represented in the survey, 23 percent compared to 3 percent in the campaign. Households with reported incomes between \$50,000 and \$75,000 were also better represented, accounting for 23 percent of survey respondents and only 14 percent of campaign participants. Households with reported incomes over \$75,000, 54 percent of survey respondents, are significantly fewer than households with the same income in the campaign, 87 percent. **For household type**, the breakdown between survey respondents in single-family homes and those in apartments, duplexes, etc. is more representative of the Juneau population than the campaign. Thirty-seven percent of survey respondents do not live in a single-family home, compared to an estimated 20 percent in the campaign and 53 percent overall in Juneau.
- **Unaware of 2021 Thermalize Juneau Campaign:** Seventy-two percent of respondents did not know of Thermalize Juneau.
- **Unfamiliar with heat pump technology:** Respondents on average are unfamiliar with air source and ductless air source heat pump technology. When asked to rate their familiarity, with 1 meaning they have no idea about the technology and 10 meaning they own the technology, the results show that familiarity with heat pumps is 3.9 out of 10 and familiarity with ductless heat pumps is 2.8 out of 10.
- **Unaware of Juneau's Climate Action Plan Goal:** The majority, 59 percent, of respondents are not aware that the City and Borough of Juneau has set a goal to reach 80 percent renewable energy for heating and transportation by 2045.
- **Consider their homes inefficient & looking for ways to lower heating or electricity costs:** The majority of respondents are unsure or do not currently consider their residence energy efficient. The majority of respondents, 58 percent, are also looking for ways to lower their heating or electricity bills and already employ a variety of methods to do so.

- **Top 3 barriers to participation (after explaining a thermalize campaign):**
 - Lack of homeownership
 - High installation costs
 - Not knowing if a heat pump is right for one's home
- **Top 3 reasons to participate (after explaining a thermalize campaign):**
 - Supporting a community effort to reduce personal fossil fuel use
 - Helping Juneau reach its renewable energy goal
 - Not having to purchase fuel oil

For respondents who knew about the 2021 Thermalize Juneau Campaign:

- **Word of mouth & social media:** The two most effective means of communication for those who know about the campaign are word of mouth and social media.

Initial Recommendations for Future Campaigns

The following recommendations are drawn from several sources: implementation experiences with the Thermalize Juneau 2021 campaign and other energy campaigns in Juneau and Alaska, energy campaign literature, the participant Intake Survey for 2021 Thermalize participants, and of course the community survey that is the focus of this report. The goal of these initial recommendations is to identify and address barriers to community wide implementation of energy efficiency and renewable energy campaigns. These recommendations will be refined as the evaluation of the 2021 Thermalize Campaign continues and a guidebook outlining the challenges and successes across the campaign from outreach to coordinating with heat pump installers are completed in 2023.

Design & redesign future campaigns with groups that were underrepresented in Thermalize Juneau 2021.

While Thermalize Juneau 2021 and the community survey were able to reach participants of diverse races, ages, income levels, and building types, there are groups that are underrepresented. These include some communities of color, low-to-middle income households, younger homeowners, and residents not living in single family, owner-occupied houses. Reaching out to and working with (including funding for their time) these populations from beginning to the end of the campaign will build groundwork and planning equity (see Appendix C). This would enable Alaska Heat Smart and future energy programs or campaigns to design a campaign with the concerns, interests, and lived experience of the energy burden in Juneau at its center. In addition to continuing the current work of the Alaska Heat Smart board in reaching out to organizations via email, approaches that could be used include:

- Develop a representation matrix for campaign planners and participants. This matrix opens the questions of “who should be at table when planning the campaign” and “who would be the participants in the campaign.” The matrix is used to identify individuals and/or organizations that are not yet represented who campaign organizers may then connect and discuss engagement in the planning/campaign design and later in outreach strategies.

- Be in your community and other communities. Attending the events of partners and potential partners, even those that may not have explicit renewable energy or energy efficiency missions or goals, to listen to their priorities, is an essential part of community organizing and building a community energy campaign. The key is continuing to strengthen existing relationships and build relationships with others who are underrepresented.²
- Engage and hear from underrepresented individuals and community leaders. This is a time intensive process but critical to expanding campaign participation beyond early adopters. These are options used in Juneau and other rural communities:
 - Arranging focus groups with specific populations. Recently the utility in Juneau, AEL&P, funded focus groups of renters and landlords to better understand interest, concerns, and barriers to heat pump adoption. The same approach could be used with community members whose participation has been identified as key to Alaska Heat Smart's mission. Compensation for participation is recommended.
 - Coordinating one-on-one interviews and story circles to hear from different communities in Juneau. This is a multi-phase effort starting with one-on-one dialogues with community leaders, design of engaging questions, and hosting story circles with invited community members. This effort seeks to create a space for sharing, hearing, and engaging amongst people with different values, ways of thinking, and ways of living. This opens opportunities to connect with artists, educators, care givers, and more. The aim is to develop curated stories that guide the campaign work and offer creative ways to connect with others.³
 - Use community science and engage community scientists in campaign design and campaign education and awareness. Community data needs could be tracked and reported by community scientists - for example, how many heat pumps are in a specific neighborhood? How much fuel is used in a home with or without a heat pump? This may be a way to engage with community members who are not in a position to install a clean energy system but are able to participate in the campaign. Displaying and updating community science findings is a technique used to engage different age groups and communities.
- Ensure funding is in place both to facilitate these activities and compensate participants and planners for their time. Approaches could include routinely looking for and applying for grant funding for discrete activities, a donation campaign aimed at inclusivity, or reaching out to organizations in Juneau to partner on fundraising.

Set goals, articulate strategies, and track results of Alaska Heat Smart programs and energy campaigns with a focus on modifying and improving for future efforts.

Start the energy campaign off by establishing goals that are not just SMART⁴ but SMARTIE (inclusive and equitable). For example, if the goal is to accelerate adoption of heat pumps to reduce fossil fuel consumption in Juneau, then this is turned into a SMARTIE goal by focusing not just on specific, measurable, achievable, relevant, and time-bound outcomes but also 1) focusing on who is included in the heat pump adoption campaign and

² Taylor, K. (2017) Module-1: Getting Organized So You Can Organize, JEP Action Toolkit. NAACP. Retrieved from <https://naacp.org/resources/just-energy-reducing-pollution-creating-jobs-toolkit>

³ See Voices for Rural Resilience, The Rural Reveal for an example of this practice. <https://voicesforrural.org/everydaychangemakers>

⁴ SMART goals are **S**pecific (simple, sensible, significant), **M**asurable (meaningful, motivating), **A**chievable (agreed, attainable), **R**elevant (reasonable, realistic and resourced, results-based), and **T**ime bound (time-based, time limited, time/cost limited, timely, time-sensitive).

whether populations are underserved or underrepresented by the campaign; 2) adding an additional goal pertaining to inclusion of these populations (i.e., 10 participants from low-income communities, or 10 Indigenous participants). This helps create distributional and long-term equity, described in Appendix C.

Thermalize Juneau 2021 has SMART goals built into the program, tracking participant and non-participant data through the intake survey and this community survey. The program will also conduct an exit survey of participants that includes compensation for participants' time to describe their experience during and after the campaign and comment on barriers to completion. Researchers are also tracking how many participants are able to install a heat pump and other efficiency measures and gathering information from Thermalize contractors on how to improve the process. They will track the costs of the program and energy savings and carbon reduction achieved.

Tracking these SMART goals requires funding and designing SMARTIE goals would require the same. Rethinking these SMART goals and adding SMARTIE goals sets out a clear and focused pathway for energy campaigns to design for equity. To make this possible, it is important to include the design and tracking of SMARTIE goal in funding requests and build systems to collect, analyze, and store this information.

Intensify and personalize community wide awareness on local expertise & value of heat pumps:

The majority (72 percent) of the respondents to the community survey had not heard of Thermalize Juneau 2021. Sixty percent (60 percent) of respondents had not yet heard of Alaska Heat Smart, 56 percent had not heard of JCOF, and 38 percent had not heard of Renewable Juneau. While these numbers reflect the time these organizations and campaigns have been in existence, with those operating in Juneau for a longer time showing higher levels of awareness from survey respondents, there is an opportunity to engage Juneau residents with additional outreach efforts. Many residents in Juneau are also unfamiliar with heat pump technology: 29 percent of Thermalize participants knew very little about heat pumps at the time of registration, and community survey respondents who did not participate in the Thermalize campaign rated their knowledge of air source heat pumps and ductless heat pumps at 3.9 and 2.8 on a scale of 1 to 10, with 1 being I have never heard of the technology and 10 I use a heat pump.

This speaks to the need for new awareness approaches or intensification of those that have proven effective on a smaller scale.

Potential approaches include:

- **Multiple community organizers/trusted messengers:** For those that had heard of the Thermalize Juneau 2021 campaign, word of mouth and social media were the two most effective means of communication. This raises the potential value of employing a community/area organizer model in the future. This could be done with the approach often used in solarize campaigns of designating areas by geography or membership (condo, place of worship, or otherwise), and asking volunteers from the participating areas to lead the area or neighborhood campaigns. The importance of building on existing relationships and trusted messengers is a hallmark of the solarize model.⁵

⁵ Bollinger, B., & Gillingham, K. (2020) Wherever the Sun Shines. Yale School of the Environment. Retrieved from <https://environment.yale.edu/news/article/wherever-the-sun-shines-bringing-solar-to-low-and-middleincome-communities>

- **Social networks:** Drawing another recommendation from solarize campaigns, future thermalize campaigns have the opportunity to capitalize "on the power of social networks and community-based social interactions" by recruiting "ambassadors" to be the trusted messengers on heat pump installation. In sharing their personal experience, ambassadors do the work needed to make the process and technology familiar and possible.⁶
- **Open houses or mobile heat pump displays:** Bridging the familiarity gap is difficult. Potential approaches could include a series of neighborhood open-houses showing installed heat pump systems, with the homeowner describing their experiences with it, accompanied by knowledgeable personnel similar to Alaska Heat Smart staff and/or heat pump installers. Mobile displays may also be an option and, potentially, more viable in times of COVID-era mitigation measures.
- **Highlight households with heat pumps in Juneau:** The Juneau Carbon Offset Fund (JCOF) has employed an effective marketing strategy by requesting homeowners post a promotional sign in front of their house after the installation of a heat pump. The Thermalize 2021 Campaign has started disseminating yard signs for thermalize campaign participants. Anecdotal reports show this method works, and survey findings emphasize the importance of word of mouth as an effective strategy.
- **Maintain and tailor outreach platforms:** Of the community survey respondents that have heard of Alaska Heat Smart and Renewable Juneau, the website was the most accessed resource. Maintaining an informative, engaging, and up-to-date website will be an important goal for both organizations to ensure it continues to provide useful information. After word of mouth, social media was a top platform for learning about the thermalize campaign and heat pumps. Tailoring social media posts with the messaging recommended below offers the potential to connect with more community members.

Find ways for campaigns to include renters, landlords, and non-residential building owners.

Thermalize Juneau was open to all types of buildings but not marketed specifically to them. Other clean energy campaigns, such as Solarize Fairbanks, also include and market to businesses. Traditionally though, the thermalize/solarize campaign model is aimed at homeowners who have permission to modify their own single-family residence. However, just over half of those in Juneau (53 percent) do not live in a single-family home. Community survey respondents noted that one of the top three barriers to participation in a thermalize campaign was not owning their building. This means to reach these populations, future campaigns will need to include mechanisms for renters to participate and/or incentives for landlords to participate. One option is to highlight landlords, businesses, and nonprofits' experience and savings with heat pumps. Another option to reach renters is through community organizations that they might access, such as nonprofit organizations or businesses and helping these groups reduce energy costs in the hope they can pass savings onto the populations they serve.

- The [Fairbanks Nonprofit Retrofit Pilot Project](#), which concluded in 2015, facilitated energy efficiency retrofits in nonprofit organizations and saw increases in service as a result.
- The 2021 Fairbanks Solarize campaign included a solar pledge component where the installer donated solar panels to local nonprofits, selected by participants, with size based on the amount of solar installed through the campaign. Requesting that clean energy technology installers "donate" to community-selected buildings, whether a non-profit or residence, is an option for highlighting and spreading awareness on the value of clean energy technology.

⁶ Bollinger, B., & Gillingham, K. (2020) Wherever the Sun Shines. Yale School of the Environment. Retrieved from <https://environment.yale.edu/news/article/wherever-the-sun-shines-bringing-solar-to-low-and-middleincome-communities>

Plan for financing mechanisms for ongoing programs and future clean energy campaigns.

Only 36 percent of Thermalize participants at the time of the Intake Survey were satisfied with the available financing options. Over half (56 percent) were unsure, which may be a result of the survey occurring prior to participants knowing the heat pump and energy retrofit rebate amounts. At the same time, 57 percent were open to financing at the time of the Intake Survey. Of community survey respondents, 43 percent would be motivated to finance energy efficiency retrofits (40 percent unsure), including a heat pump, with a loan and 36 percent would finance with on-bill financing (52 percent unsure). Barriers to loan financing for community survey respondents include discomfort with owing money (38 percent), preference to save and pay outright (29 percent), concern over interest rates (15 percent), too much paperwork (11 percent), and other reasons such as renting, not staying long in the current home, or unable to afford loan payments. At the same time, one of the top barriers to participation for a thermalize campaign was reported as the installation cost being too high.

Thermalize Juneau 2021 offered information on outside financing options, detailed in Table 1. It is important to continue to develop and facilitate these options to ensure members from the communities organizers are trying to reach know about them and find them easy to access.

Continue to offer one-on-one assessments while emphasizing that knowledge of heat pumps is not required to participate in programs.

Survey respondents who did not participate in Thermalize Juneau 2021 identified heating and electricity cost as a key concern and uncertainty on the value of a heat pump for one's home a top barrier. Of Thermalize participants, two of the top three reasons why they had not installed a heat pump are that they were still gathering information and were not confident the energy savings would justify the expense.

General messaging may not provide potential participants with the information they need to sign up for a thermalize campaign. Alaska Heat Smart already provides household assessments and did so as part of the Thermalize Juneau Campaign as well. This points to the need for a more robust home assessment and advising process to occur before and during the next thermalize campaign. This process could create a pipeline of thermalize participants who would be ready to start as soon as an installer is selected and quotes are sent out.

For reference, an assessment helps the homeowner develop a strategy for integrating a heat pump into their existing home heating system. The heat pumps offered in the Thermalize program (single indoor heating heads) cannot entirely replace the existing heating system in the vast majority of houses and still be compliant with building code, which requires that each room has a dedicated, permanent heating source. This means that the homeowner must either retain their existing heating system or implement another system to supplement the heat pump. This can be a complex analysis that requires substantial owner education.

Messaging priorities for future Thermalize campaigns:

- **Offer one-on-one advising and support** on heat pumps;
- **Make energy efficiency improvements, both building retrofits and heat pumps, more accessible.** Combine the why and the how, and ideally do this with the words and images of Juneau residents;
- **Partner with the municipality, City and Borough of Juneau** to promote the community's renewable energy goals and the thermalize campaign as a core strategy to reach that goal;
- **Highlight specifics on upfront costs and annual savings** for different types of buildings, and work closely with Juneau Carbon Offset Fund (JCOF) and True North Credit Union to develop detailed and clear messages on options for reducing or financing the upfront cost;
- **Emphasize the personal and community benefits of the campaign.** This may include reducing personal fossil fuel use and/or reducing up front costs, as well as supporting neighbors in doing the same;
- **Familiarize Juneau residents with heat pumps.** Personalize heat pump ownership through the experience, voices, and images of Juneau residents with heat pumps. Using this approach, more detail on heat pump installation, operation, maintenance, financing, permitting, and more could be provided.

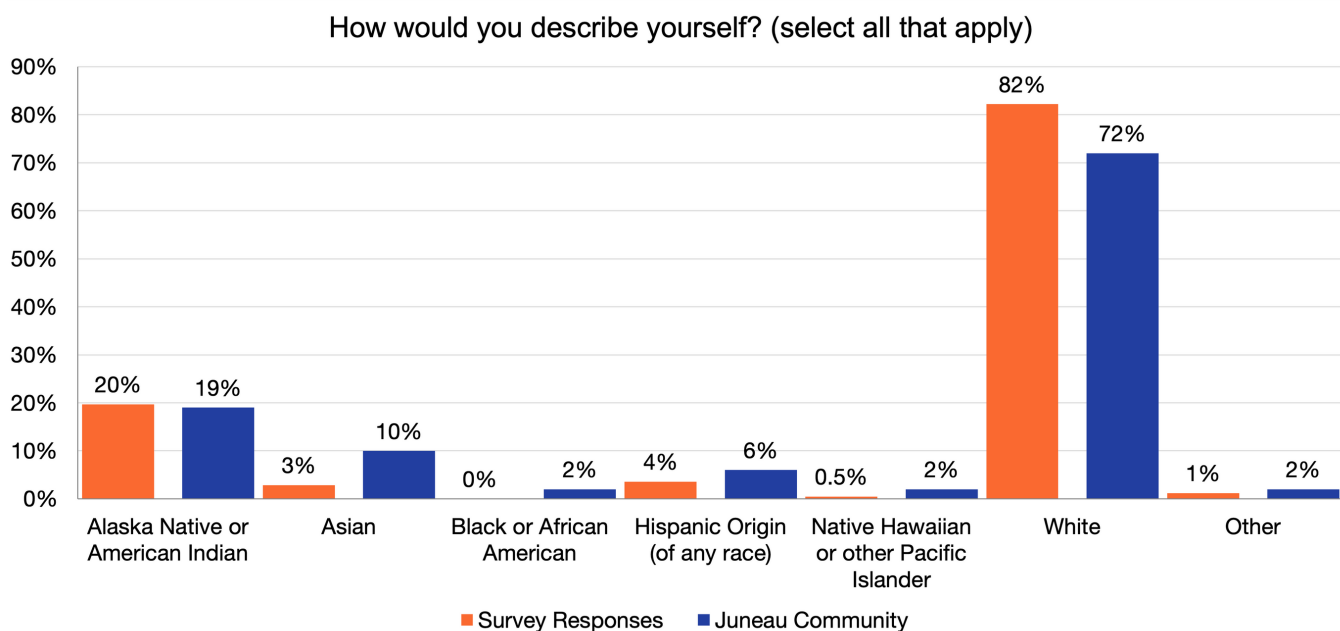
Part 3 | Community Survey Responses

Demographics

The following section provides an overview of results from the Thermalize Juneau Community Survey. A full copy of the survey template can be found in Appendix A. The results presented cover demographics and age, followed by income, home ownership, type of home heating, perception of energy efficient house or lack thereof, familiarity with the non-profits working to improve Juneau's energy resilience as well as with home heating technologies, familiarity with the Thermalize Juneau campaign, and barriers to people participating in that campaign. Results from the Thermalize Juneau Community Survey (presented as "Survey Responses" on all figures) are compared with 2019 American Community Survey data and the 2020 Census data provided by the U.S. Census Bureau (shown as "Juneau Community" on the following figures). An overview of the survey methodology is provided on pages 7-8. A total of 453 survey responses are summarized in these figures.

A variety of communities participated in this survey. As seen in Figure 7, compared with data from the 2020 Census, white and Alaska Native or American Indian respondents are overrepresented in the survey's demographics, while Asian, Black or African American, Hispanic, and Native Hawaiian or Pacific Islander respondents are underrepresented.

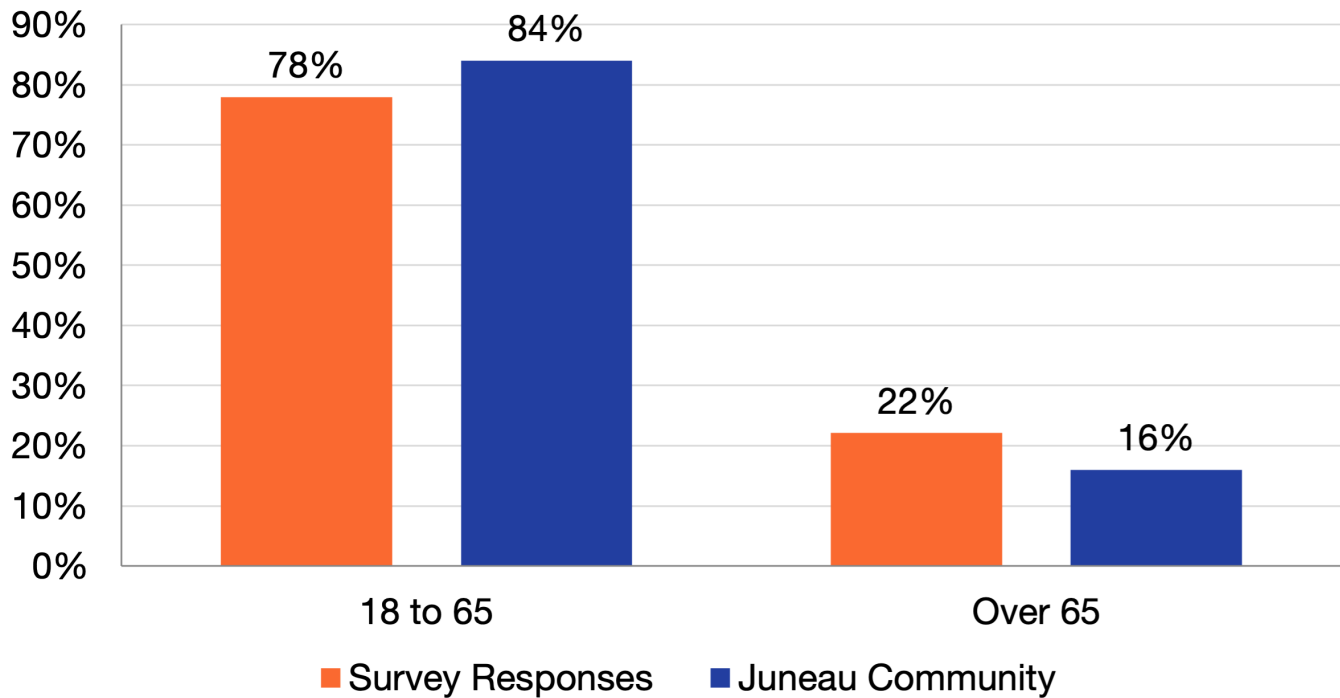
Figure 7: How would you describe yourself?



Note: Because respondents were prompted to select all options that may apply, response totals do not necessarily sum to 100%.

Compared with data from the 2019 American Community Survey (ACS), respondents over 65 years of age were overrepresented in this survey (see Figure 8), making up 22 percent of survey respondents compared with 16 percent of the general population (adjusted to exclude those 17 and under). Respondents aged 18 to 65 made up 78 percent of survey respondents compared to 84 percent of the general population.

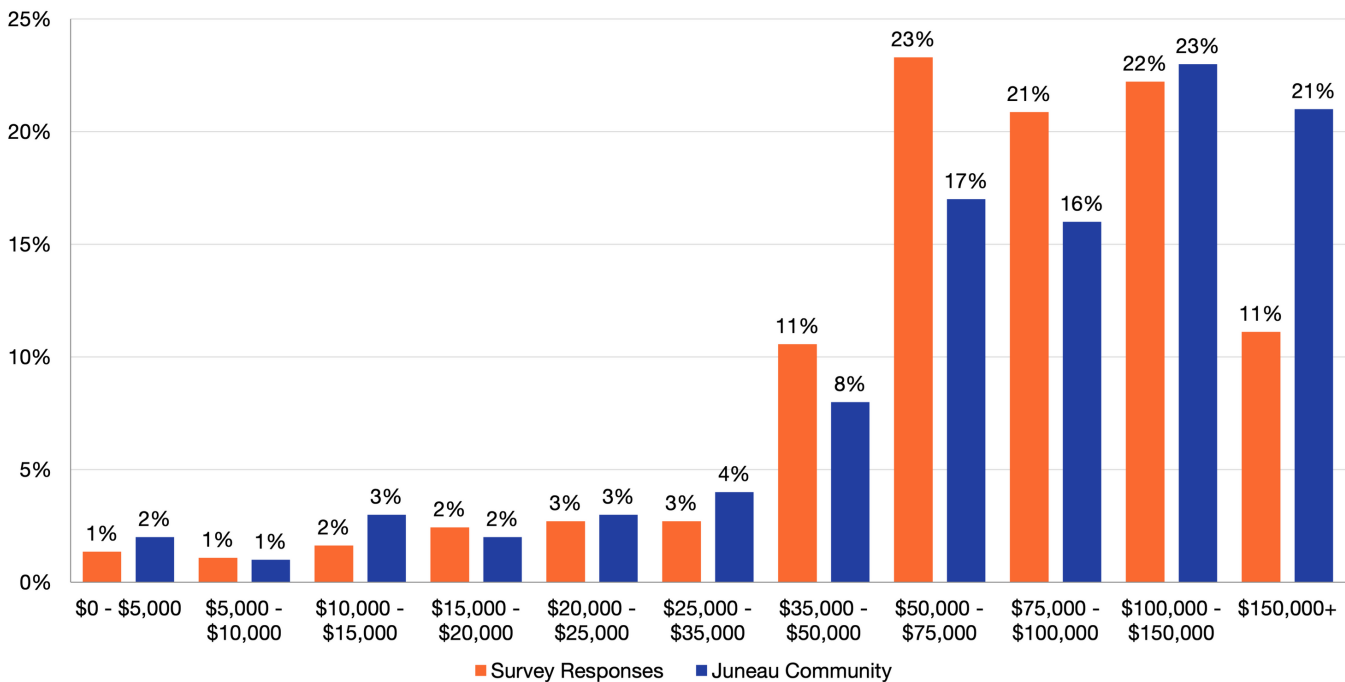
Figure 8: How old are you?



Presented in Figure 9, survey respondents spanned a variety of income levels, largely mirroring the general Juneau population, especially among lower income levels. Those who are overrepresented in this survey include respondents making between \$35K and \$100K, while those underrepresented include higher-income respondents making \$100K and more. Lower income groups are represented closely to Juneau’s general population.

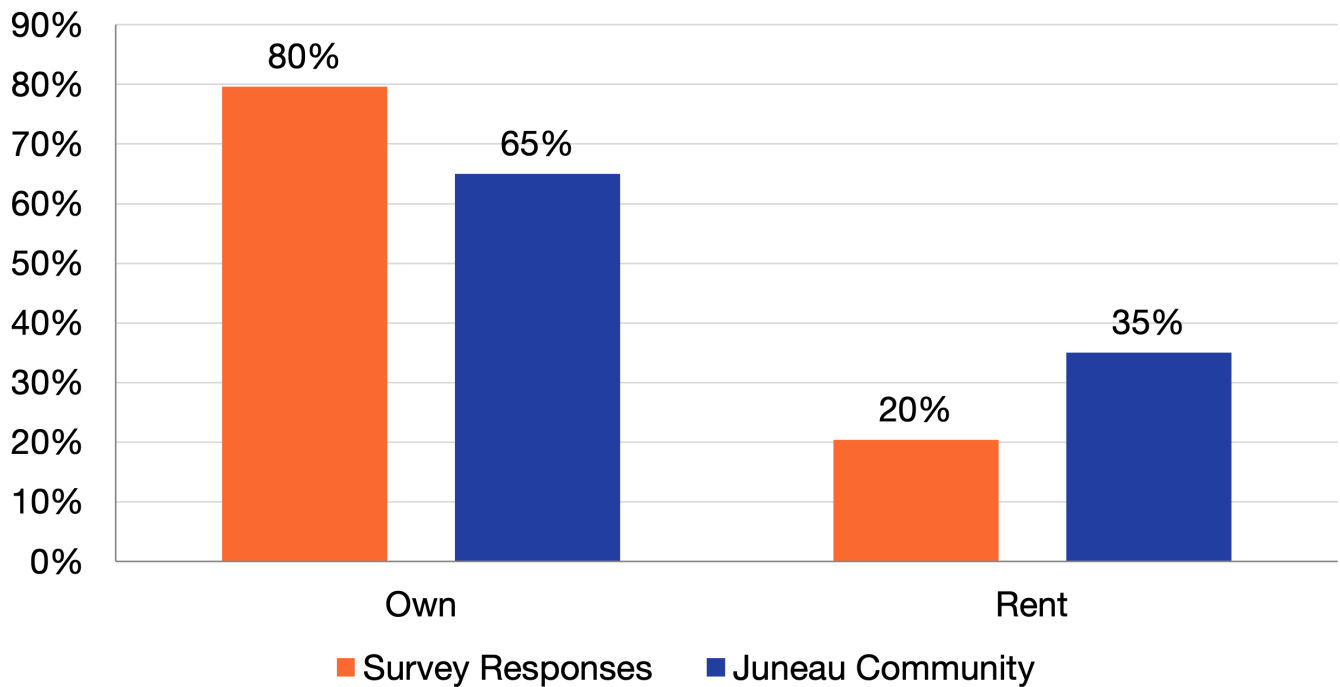
In addition to household income, respondents were also asked to select the number of people who regularly live in their residence. Analyzing this in combination with income provides an indicator of poverty levels among the survey’s participants. Approximately 8 percent of respondents live in households at or below the 2021 federal poverty line for Alaska. Since respondents provided income data by selecting a range, this estimate is likely an underestimation of poverty among respondents.

Figure 9: What was your household income (before taxes) in 2020?



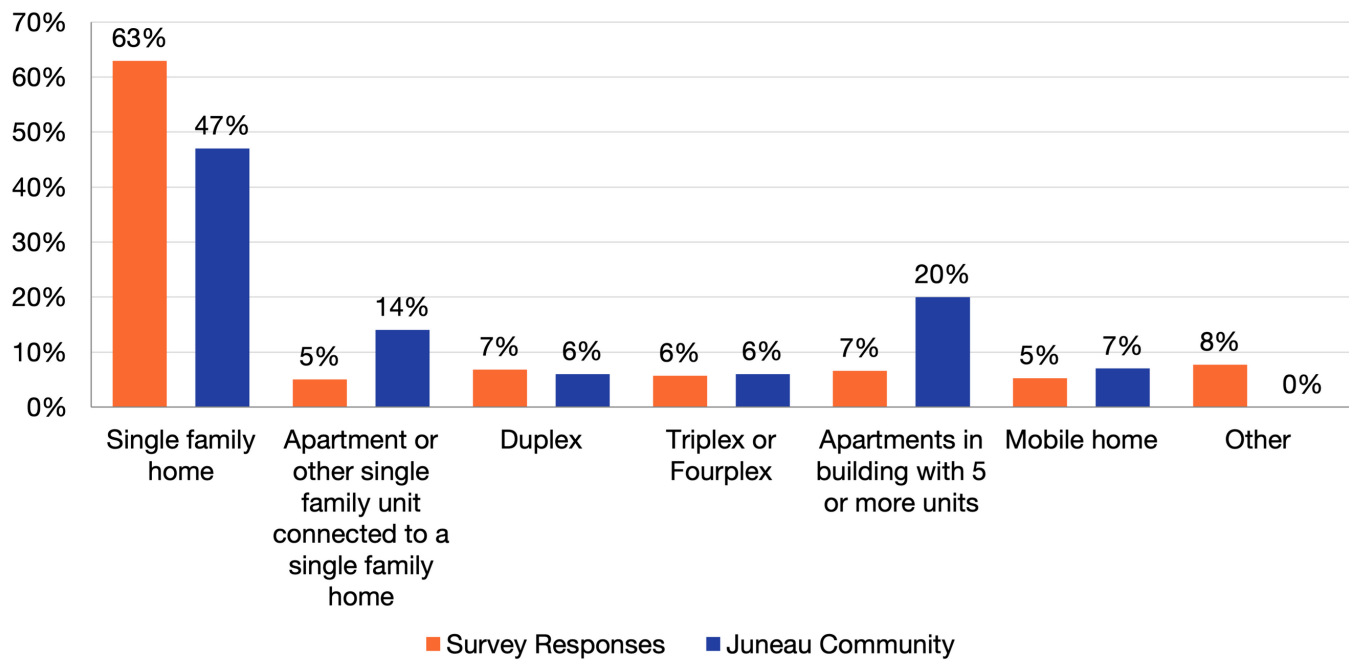
As shown in Figure 10, homeowners are disproportionately represented in this survey, with 80 percent owning their homes and 20 percent renting their homes, compared with 65 percent owners and 35 percent renters in the general Juneau community.

Figure 10: *Do you own or rent your home?*



Thermalize Juneau Community Survey respondents occupy a variety of housing types. Compared with the 2019 ACS for the City and Borough of Juneau (displayed in Figure 11), those living in single-family homes and duplexes are overrepresented while those living in apartments, mobile homes, and rentals with three or more units are underrepresented. Eight percent of respondents selected “other” housing types, ranging from boats and RVs to condos and townhomes as their primary residences.

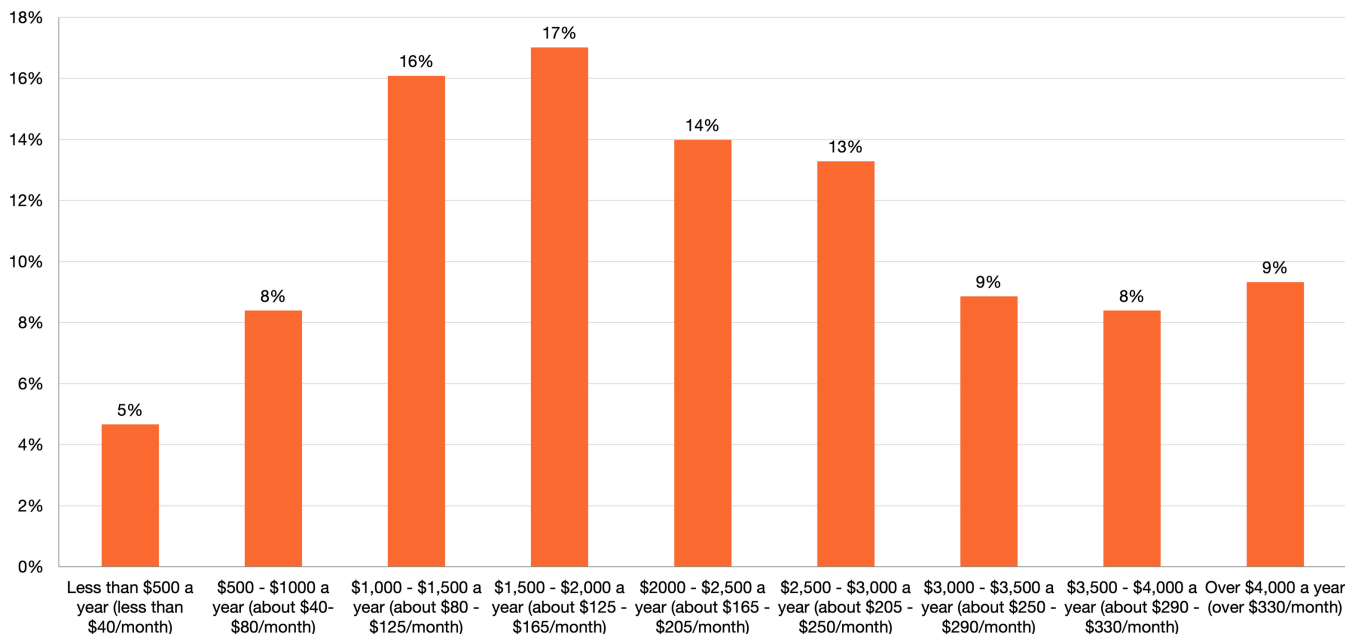
Figure 11: What kind of building do you live in?



Energy Burden

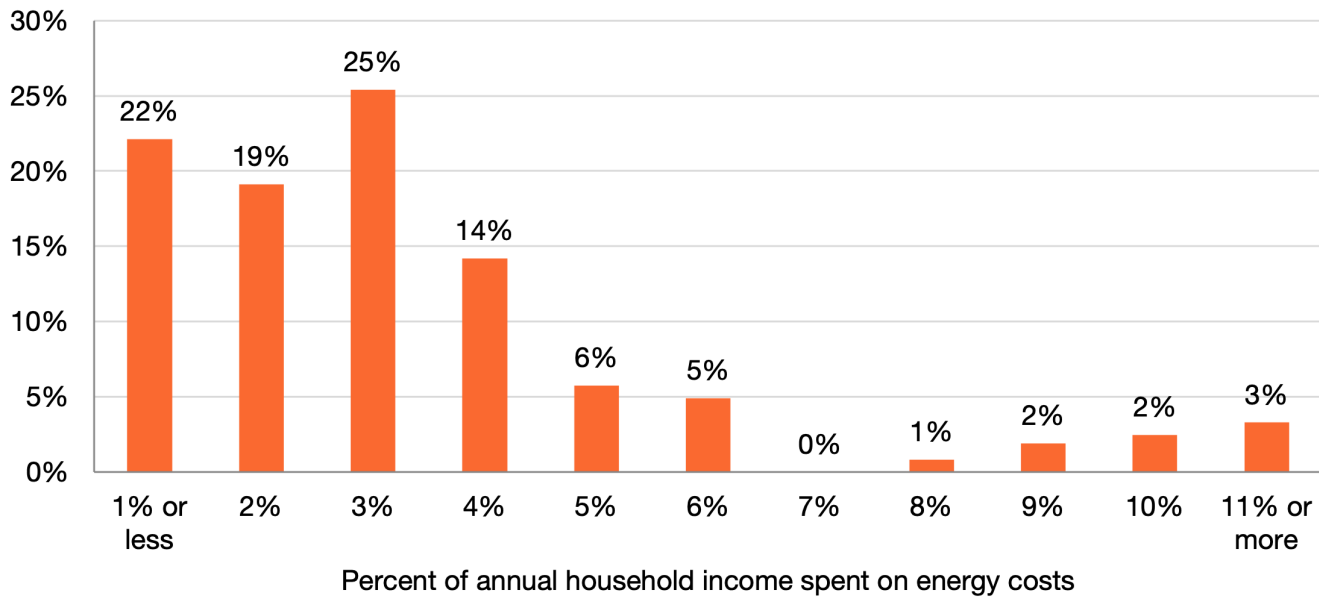
In Figure 12, a third of respondents (33 percent) indicated that they spend between \$1000 and \$2000 annually on electricity, heating fuel, and other fuel (such as cooking) bills. Twenty-seven percent of respondents spend between \$2000 and \$3000 annually on electricity and heating bills, followed by 17 percent that spend between \$3000 and \$4000 a year, and 9 percent that spend over \$4000 a year on these expenses. Only 13 percent spend less than \$1000 a year on these same expenses.

Figure 12: How much does your household spend annually on electric heating fuel, and other cooking fuel bills? (estimates are fine)



Examining these spending patterns by income level provides a rough indicator of energy burden in Juneau's community. As shown in Figure 13, approximately 13 percent of respondents who took the Thermalize Juneau Community Survey live in households with an energy burden of 6 percent or higher (meaning that they spend 6 percent or more of their household income on electricity, heating, and cooking fuel bills). A 6 percent or higher energy burden is generally classified by researchers to be a "high burden," with those spending 10 percent of their income or higher being "severely burdened."⁷ Five percent of respondents live in households with a severe energy burden, and this drastically increases in lower income brackets. Out of respondents who have an annual household income of \$50,000 or less, 30 percent have a severe energy burden (10 percent or higher).

⁷ American Council for an Energy-Efficient Economy. Understanding Energy Affordability. 2020
<https://www.aceee.org/sites/default/files/energy-affordability.pdf>

Figure 13: Estimated energy burden among survey respondents

Knowledge of Local Resources

As shown in Figures 14 and 15, Renewable Juneau is much better known in the surveyed population than Alaska Heat Smart. While the majority of respondents (60 percent) have not heard of Alaska Heat Smart, the majority (62 percent) have heard of Renewable Juneau. This is likely due in part to Alaska Heat Smart being relatively new (formed in 2019) compared to Renewable Juneau (established in 2016).

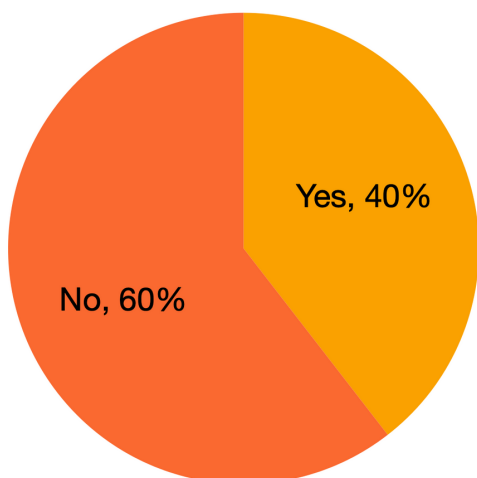
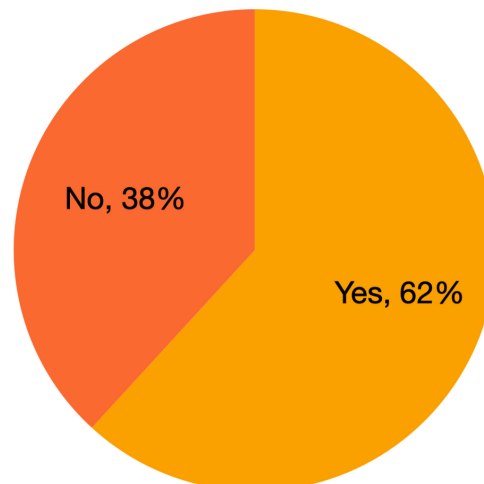
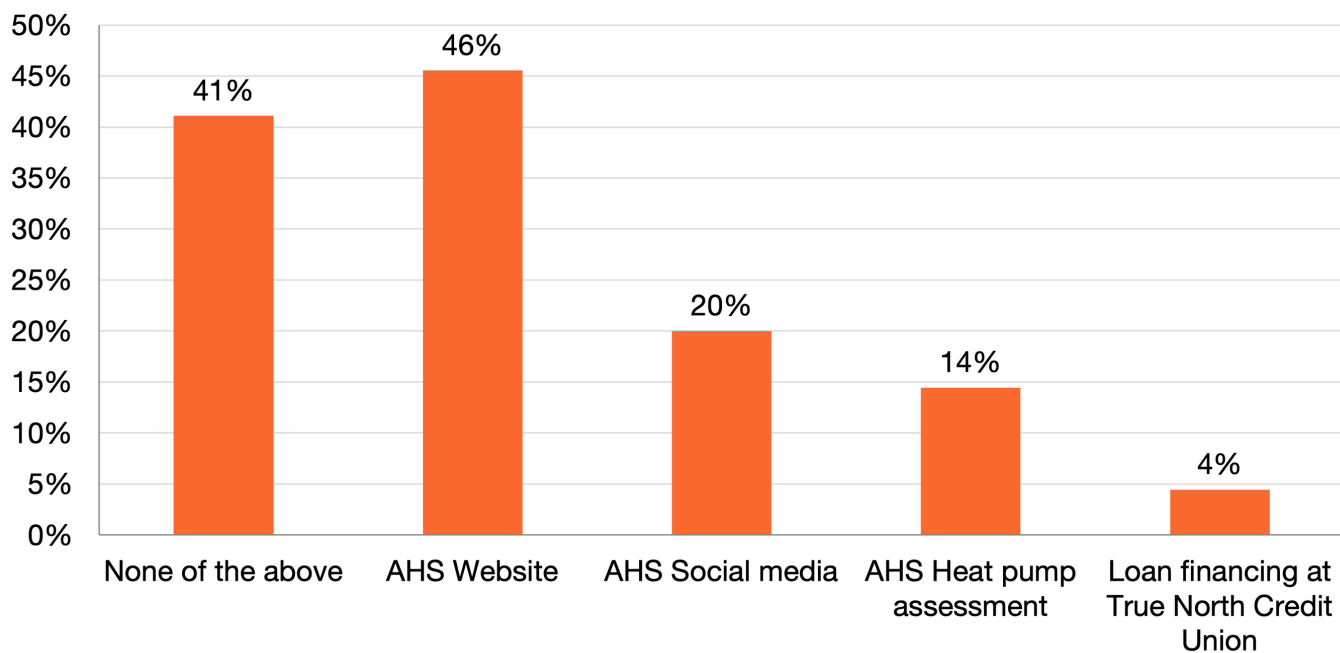
Figures 14 & 15: Have you heard of Alaska Heat Smart / Renewable Juneau before?**Figure 14: Familiarity with Alaska Heat Smart****Figure 15: Familiarity with Renewable Juneau**

Figure 16 shows the primary ways respondents have accessed information about Alaska Heat Smart. Most of those who have heard of Alaska Heat Smart have accessed the AHS website, 20 percent have accessed AHS social media, 14 percent have had a heat pump assessment, and 4 percent have accessed loan financing at True North Credit Union. Many respondents (41 percent) who have heard of Alaska Heat Smart have not accessed any of these resources, suggesting that word of mouth or other communication such as radio advertisements may be just as effective, if not more, than Alaska Heat Smart's existing social media presence at increasing awareness of its services.

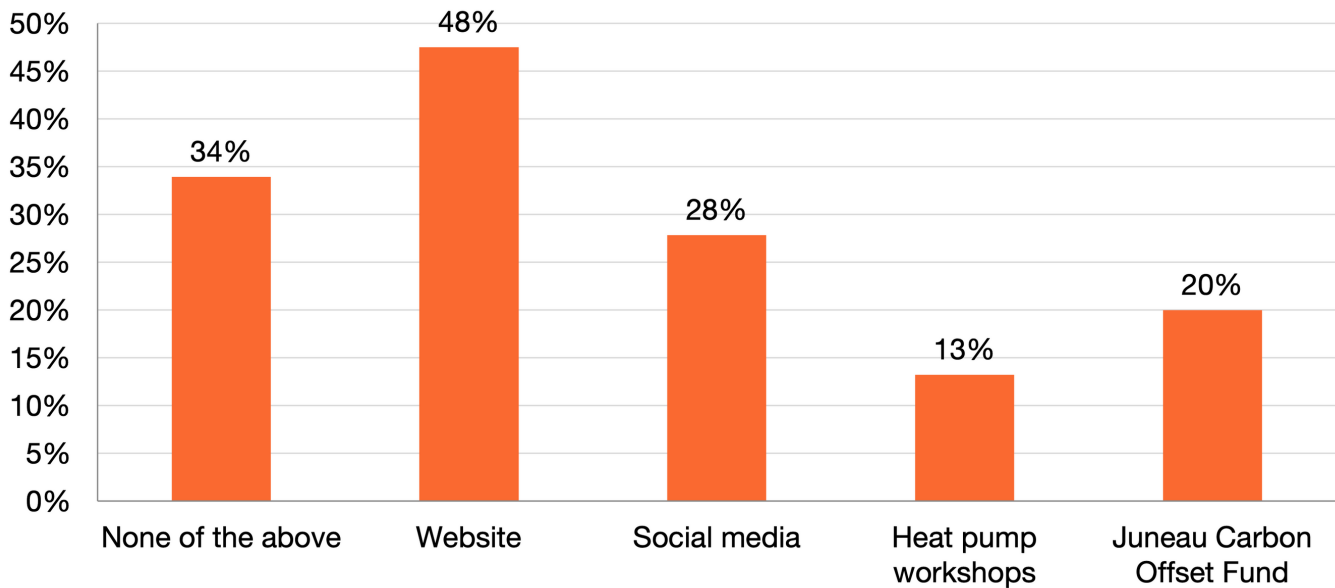
Figure 16: *If yes, have you accessed any of the Alaska Heat Smart Resources (Check all that apply)?*



Note: Because respondents were prompted to select all options that may apply, response totals do not necessarily sum to 100%.

As shown in Figure 17, nearly half of respondents (48 percent) who have heard of Renewable Juneau have also accessed the Renewable Juneau website, followed by 28 percent who have accessed Renewable Juneau’s social media, 20 percent who have accessed the Juneau Carbon Offset Fund, and 13 percent that have attended a Renewable Juneau heat pump workshop. Many respondents (34 percent) who have heard of Renewable Juneau have not accessed any of these resources.

Figure 17: *If yes, have you accessed any of the Renewable Juneau Resources (Check all that apply)?*



Note: Because respondents were prompted to select all options that may apply, response totals do not necessarily sum to 100%.

Heating Systems

Table 4: What is the primary and secondary way your home is heated?

Heating System	Primary	Secondary
Heat pump	13%	0.5%
Electric baseboard	16%	18%
Electric boiler	3%	1%
Electric furnace	3%	2%
Electric space heater	4%	14%
Oil-fired boiler	22%	3%
Oil-fired furnace	18%	2%
Toyo stove or equivalent	11%	4%
Wood stove	2%	14%
Pellet stove	2%	2%
Pellet boiler	0%	0%
Propane boiler	2%	0%
Propane furnace	1%	0.5%
Propane fireplace	0%	4%
Other	3%	5%
None	--	31%

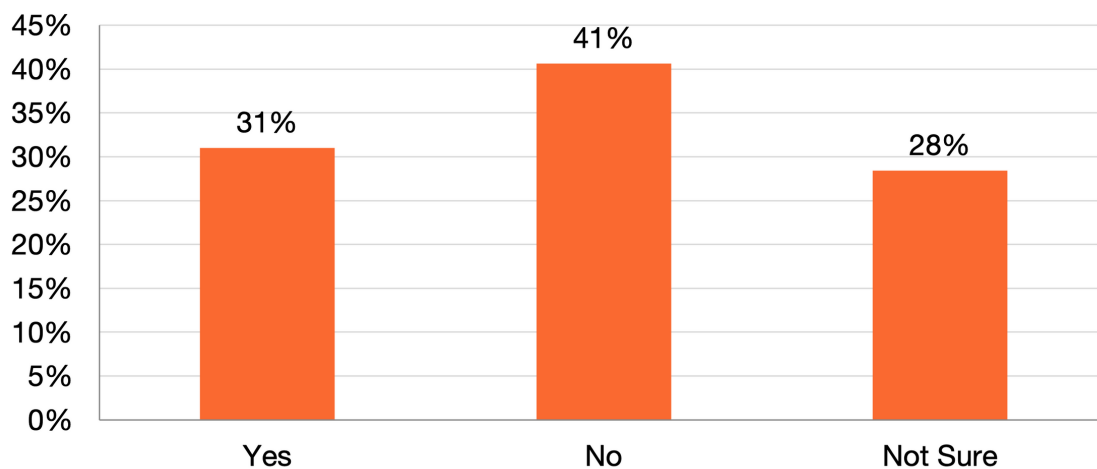
Table 4 shows the primary and secondary heating systems used by survey respondents. Fifty-one percent of respondents are using an oil-fired system as their primary heating source (oil furnaces, boilers, and Toyo stoves). Electric resistance appliances are used as primary heating systems in a quarter of homes (26 percent) and are another target for replacement by heat pumps.

While 31 percent of respondents have no secondary heating system, 18 percent use secondary electric baseboard systems. Electric space heaters and wood stoves are each used by fourteen percent of respondents for secondary heating. Propane systems, pellet systems, electric boilers, Toyo stoves, and heat pumps are not commonly used as secondary heating systems.

Energy Efficiency

In Figure 18, survey respondents were asked whether they consider their residence to be energy efficient, with an open-ended question of why or why not. Most respondents (41 percent) do not consider their residences to be energy efficient. Thirty-one percent of respondents do consider their residences energy efficient, and 28 percent are unsure. This suggests that the majority of Juneau residents who responded to the survey are either unsure of the energy efficiency of their homes or are aware that it is inefficient, highlighting the potential for energy efficiency messaging to resonate with Juneau residents who did not participate in the Thermalize Juneau Campaign. Common answers to the open-ended question are included below.

Figure 18: *Do you consider your residence to be energy efficient?*



Why or why not?

Common Reasons Respondents Consider Their Home Inefficient:

- High cost of heating
- Cold temperatures within home and/or noticeable drafts
- Older home and/or outdated appliances
- Reliant on heating oil or other fossil fuels
- Lack of proper insulation

Common Reasons Respondents Consider Their Home Efficient:

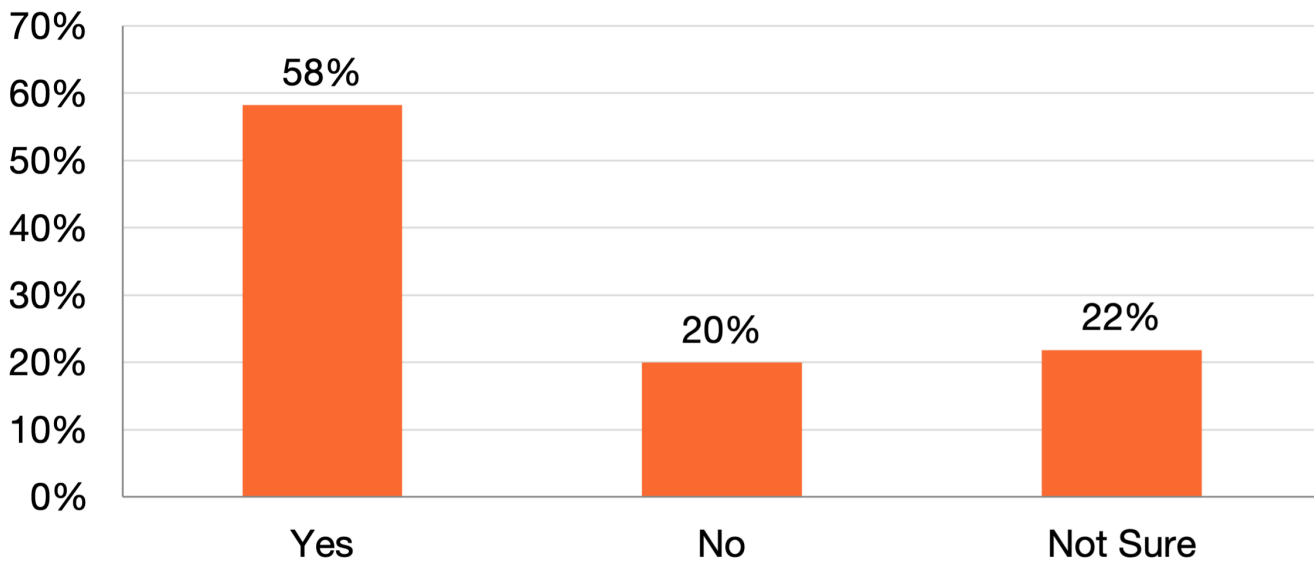
- Completed retrofits (upgraded appliances, heating methods, insulation, windows, etc.)
- Utilities seem affordable
- Good energy rating
- Completed audits or weatherization in the past
- Alaska Housing Building Energy Efficiency Standard (BEES) certified construction
- Electric heating and appliances
- Homeowners make effort to conserve electricity use

The majority of respondents (58 percent) were looking for ways to lower their heating or electricity bills, 22 percent were unsure, and 20 percent were not currently looking for ways to lower their heating or electricity bills (see Figure 19).

What have you considered or done to lower your electricity bills?

- Turned off appliances or lights when not in use
- Reduced use of appliances like dryers, ovens, stoves, etc.
- Kept thermostats at a consistent temperature
- Weatherized (improved insulation, replaced windows)
- Heated with wood
- Made energy efficient swaps (LEDs, efficient appliances, etc.)
- Bundled up in the winter instead of turning on the heat
- Changed heating methods

Figure 19: Are you currently looking for ways to lower your heating or electricity bills?



Familiarity with Heat Pump Technology

Respondents were asked to rate their familiarity with air source and ductless heat pump technology on a ten-point scale, with one being "I have never heard of (air source/ductless) heat pumps" and ten being "I use an (air source/ductless) heat pump." Respondents on average are unfamiliar with air source and ductless air source heat pump technology. Familiarity for heat pumps overall was 3.9 out of 10 and for ductless heat pumps was 2.8 out of 10.

A survey commissioned by the Juneau utility, AEL&P, was conducted during the same time period of renters and landlords in Juneau. The same set of familiarity questions were asked of landlords and renters. The results from this survey showed landlords significantly more familiar (weighted average of 5.5 out of 10) with heat pumps than renters (weighted average of 2.7 out of 10) and Thermalize community survey respondents. The survey sample is not large enough to draw statistically significant conclusions that could be applied to the overall Juneau population. However, this does provide initial insight into differences in familiarity and confidence in heat pumps' ability to keep homes warm among different communities in Juneau.

Table 5: What is your familiarity with heat pump technology on a scale from 1 to 10, with 1 being never heard of the technology and 10 being very familiar (owning the technology)?

Question	Weighted Average
What is your familiarity with air source heat pump technology on a scale of 1 to 10? (with one being "I have never heard of heat pumps" and ten being "I use a heat pump")	3.9
What is your familiarity with ductless heat pumps on a scale of 1 to 10? (with one being "I have never heard of ductless heat pumps" and ten being "I use a ductless heat pump")	2.8

Respondents were asked to rate how much they agreed with a series of statements based on their understanding of air source heat pump technology. It is notable that the weighted average for all of these statements were primarily within the range between 3 (neither agree nor disagree) and 4 (slightly agree), with the “idea that heat pumps offer a lower cost of heating than standard electric resistance heating” being the most widely agreed upon statement, closely followed by “heat pumps keep housing units warm and comfortable in cold weather.” The statement that was less agreed upon (by a narrow margin) was the idea that “heat pumps provide energy efficient heating in cold weather to 0 degrees F.” This suggests that there is significant work that needs to be done on educating potential thermalize participants on the current state of heat pump technology. The lower rating for energy efficiency in 0 degree weather likely reflects an understanding of or experience with older heat pump technology.

A survey commissioned by the Juneau utility, AEL&P, was conducted during the same time period of renters and landlords in Juneau. The same set of understanding questions were asked of landlords and renters. The results were comparable to the Thermalize survey with weighted averages for the three statements ranging from 3.4 to 4.1 from landlords and renters, respectively. Of note was a small but consistent difference between landlords and renters. Renters consistently provided lower ratings, reflecting less agreement with the statements, than did landlords.

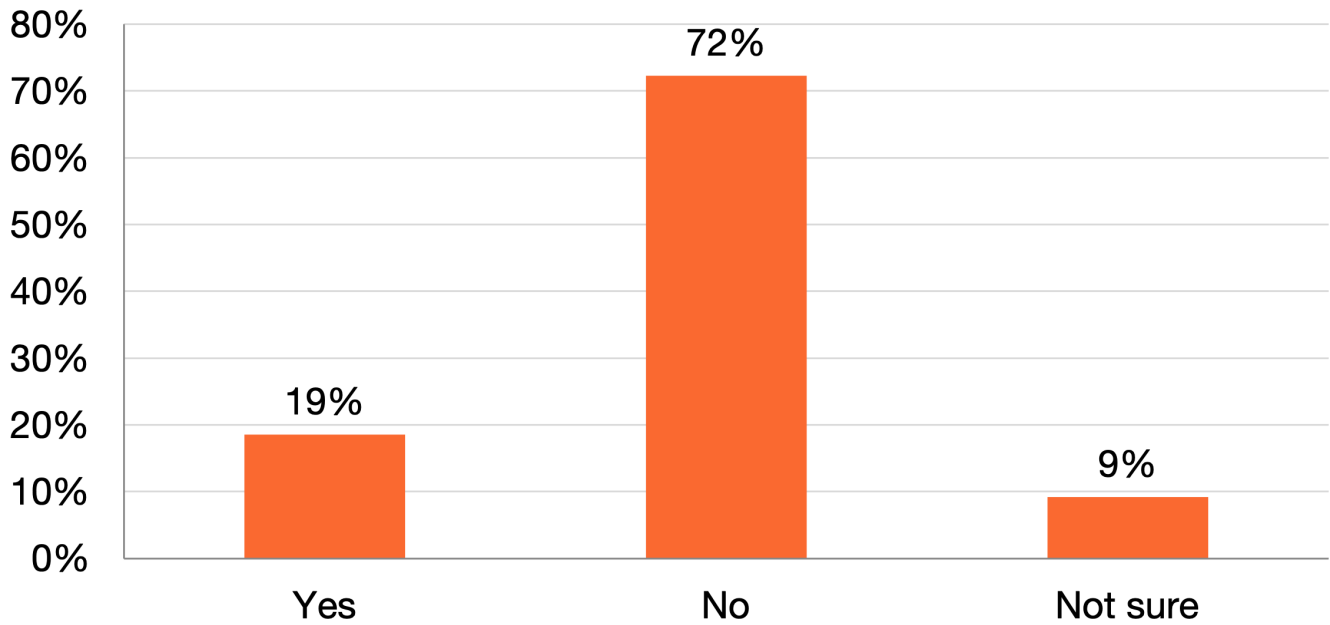
Table 6: Based on your understanding of air source heat pump technology, how much do you agree with the following statements on a scale from 1 to 5? (with 1 being “strongly disagree” and 5 being “strongly agree”)

Statements	Weighted Average
Heat pumps offer a lower cost of heating than standard electric resistance heating, such as electric baseboards	3.9
Heat pumps keep housing units warm and comfortable in cold weather	3.8
Heat pumps provide energy efficient heating in cold weather to 0 degrees F	3.5

Thermalize and Juneau Goals

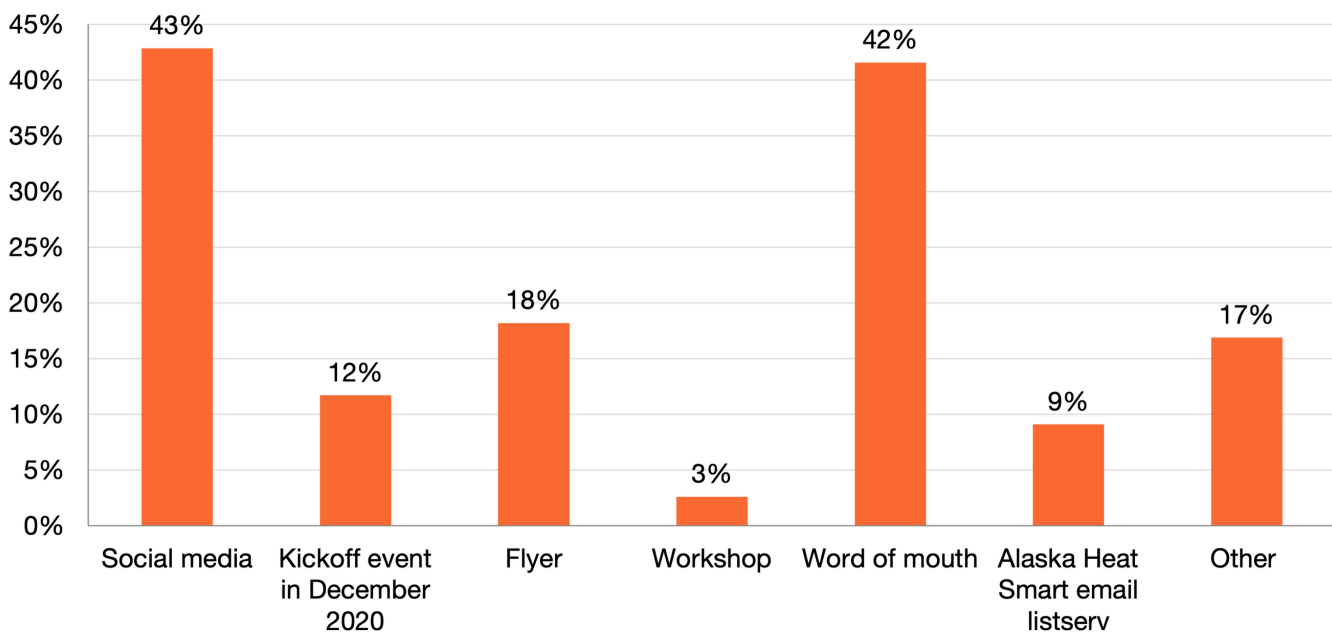
As shown in Figure 20, the vast majority (72 percent) of respondents have not heard about the Thermalize Juneau 2021 Campaign, compared to 19 percent of respondents who have. Nine percent were not sure if they have heard of the campaign.

Figure 20: Have you heard about the Thermalize Juneau Campaign?



For those who have heard of the Thermalize Juneau 2021 Campaign, most (43 percent) heard of it through social media, closely followed by 42 percent of respondents who heard of the campaign through word of mouth (see Figure 21). Eighteen percent of respondents heard of the campaign through distributed flyers, 12 percent attended the kickoff event in December 2020, 9 percent were on the Alaska Heat Smart listserv and 3 percent attended a workshop. Seventeen percent specified other sources, particularly radio and newspaper advertisements. The community survey was also one way that respondents found out about the campaign.

Figure 21: *If yes, how did you hear about Thermalize Juneau? (check all that apply)*



Note: Because respondents were prompted to select all options that may apply, response totals do not necessarily sum to 100%.

The majority (66 percent) of respondents who had heard of the Thermalize Juneau 2021 Campaign did not know what a thermalize campaign was prior to learning about Alaska Heat Smart's effort (see Figure 22). Twenty-two percent of respondents heard about thermalize campaigns before they learned about Thermalize Juneau, and 12 percent were unsure. These responses suggest a need for greater public awareness around thermalize campaigns; creative ways to catch people's attention should be explored.

Figure 22: *If yes, did you know what a thermalize campaign was prior to learning about Thermalize Juneau?*

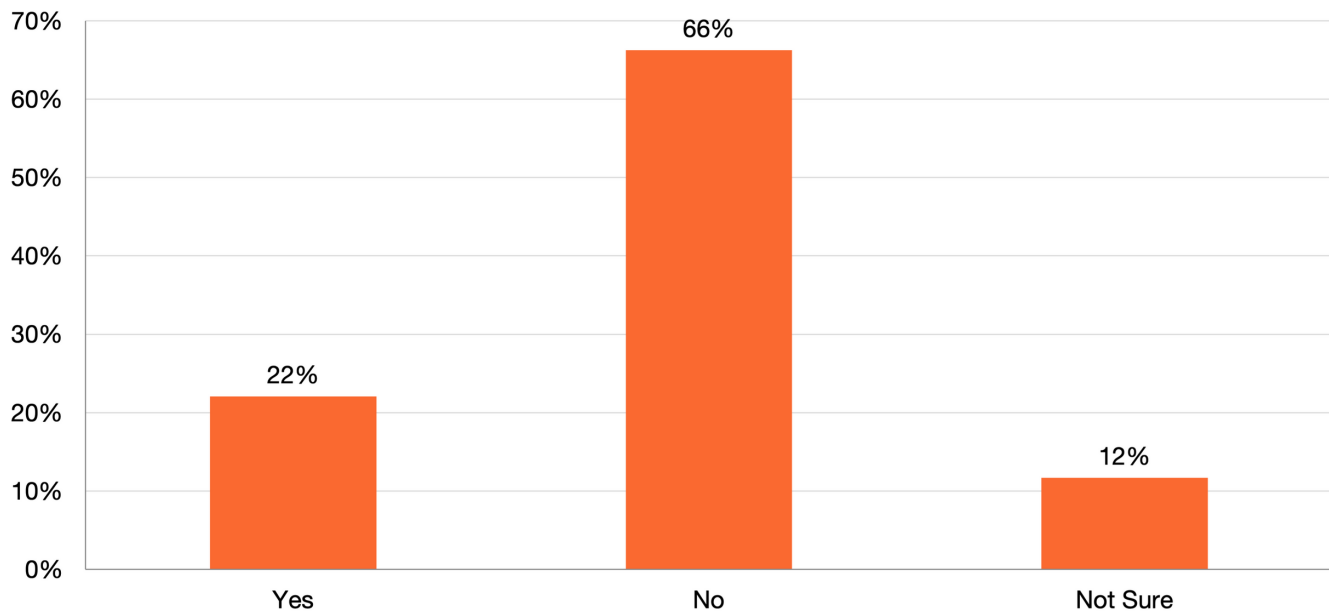
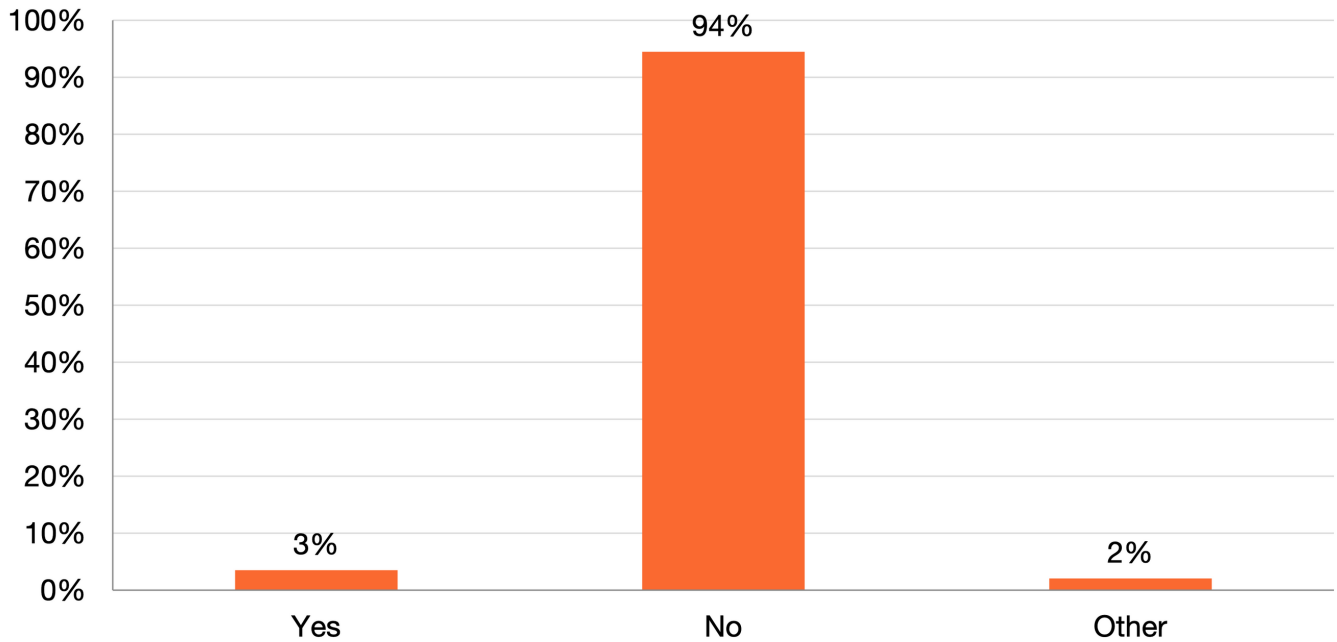


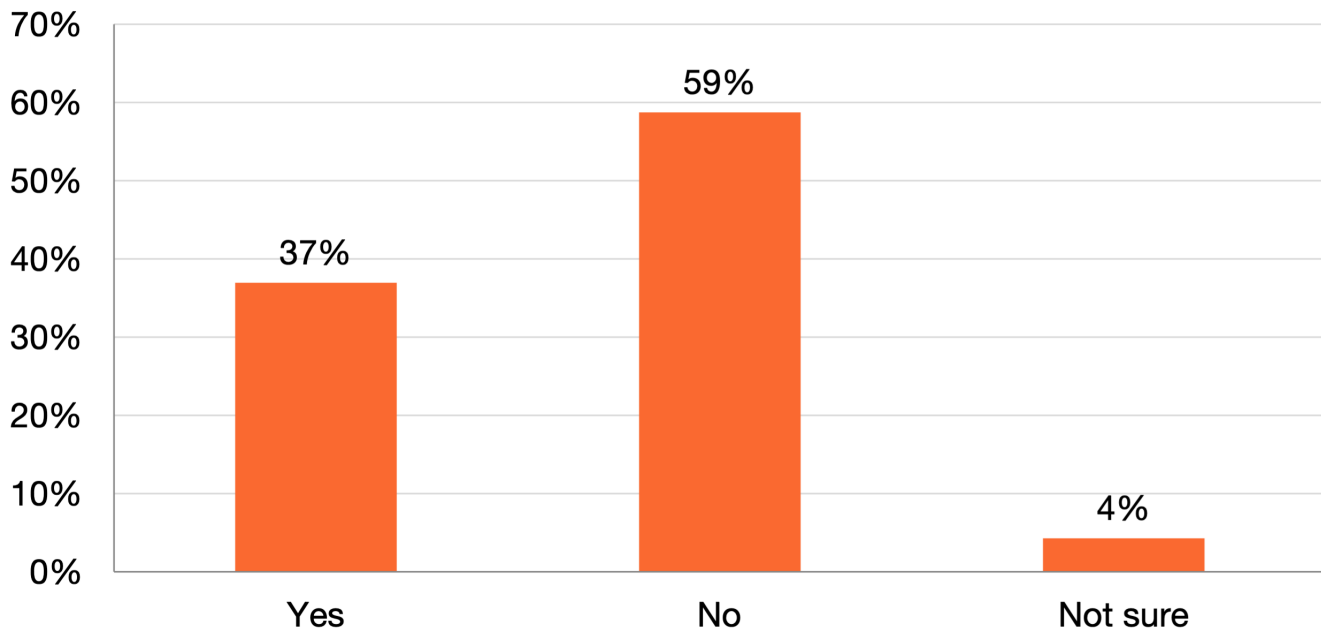
Figure 23 shows that of those respondents who had not heard of the Thermalize Juneau 2021 Campaign, the vast majority (94 percent) did not know what a thermalize campaign is, compared to 3 percent that did. Two percent left free response comments making educated guesses based on the name of the campaign, assuming it was related to energy efficiency, electric vehicles, and/or weatherization.

Figure 23: *If you have not heard of Thermalize Juneau 2021, do you know what a thermalize campaign is?*



In Figure 24, the majority (59 percent) of respondents were not aware that the City and Borough of Juneau has set a goal to reach 80 percent renewable energy for heating and transportation by 2045, compared to 37 percent of respondents who were aware of this goal. Four percent of respondents were not sure if they were aware of the City and Borough's goal.

Figure 24: Are you aware that the City and Borough of Juneau has set a goal to reach 80 percent renewable energy for heating and transportation by 2045?



In Figure 25, the majority (56 percent) of respondents had not heard about the Juneau Carbon Offset Fund and its work to install heat pumps in income-qualified homes, followed by 39 percent who had. Five percent of respondents were unsure.

Figure 25: Have you heard about the Juneau Carbon Offset Fund and its work to install heat pumps in income-qualified homes?

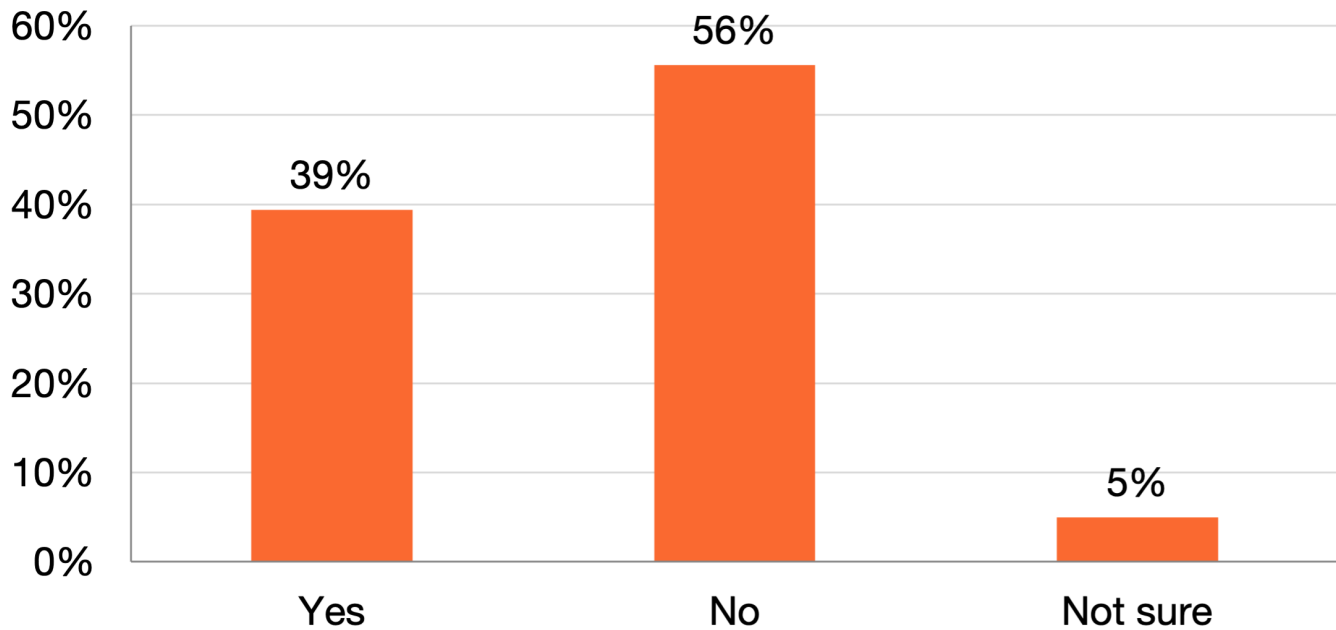
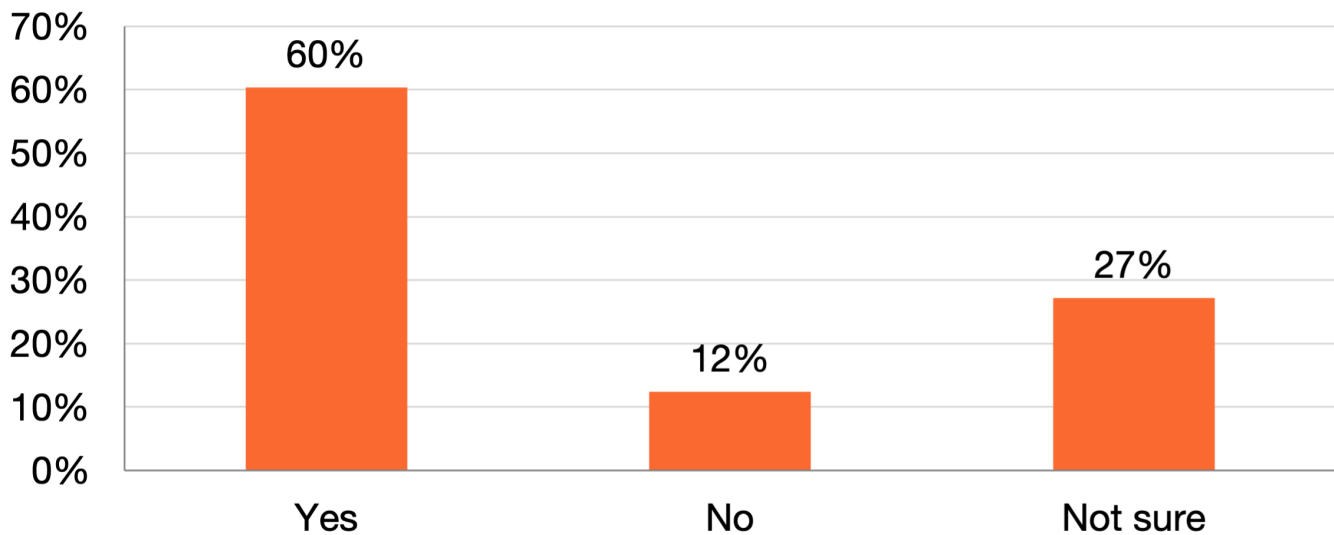


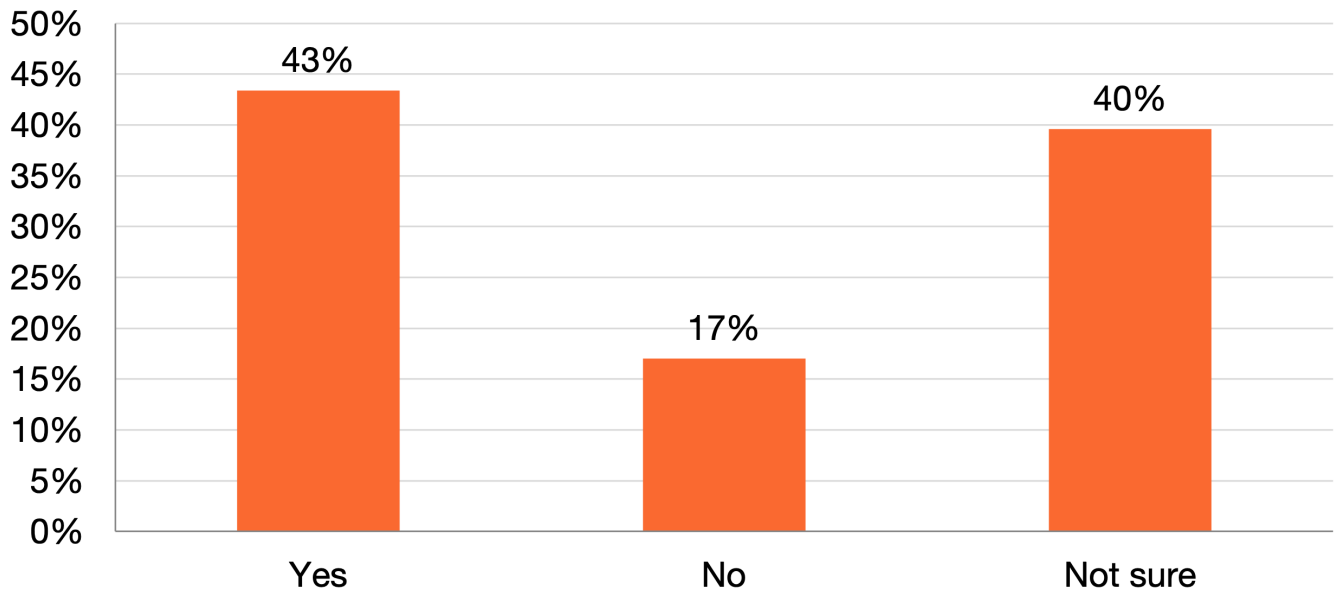
Figure 26 shows a breakdown of respondents based on their potential interest in installing a heat pump. The majority (60 percent) of respondents indicated they would be interested in a heat pump, knowing that it is over 200 percent more efficient than other electric heating and would reduce electricity costs by \$480 to \$720 per year, compared to 27 percent who were not sure and 12 percent who would not be interested.

Figure 26: *Would you be interested in a heat pump, knowing that it is over 200 percent more efficient than other electric heating and would reduce electricity costs by \$480 to \$720 per year?*



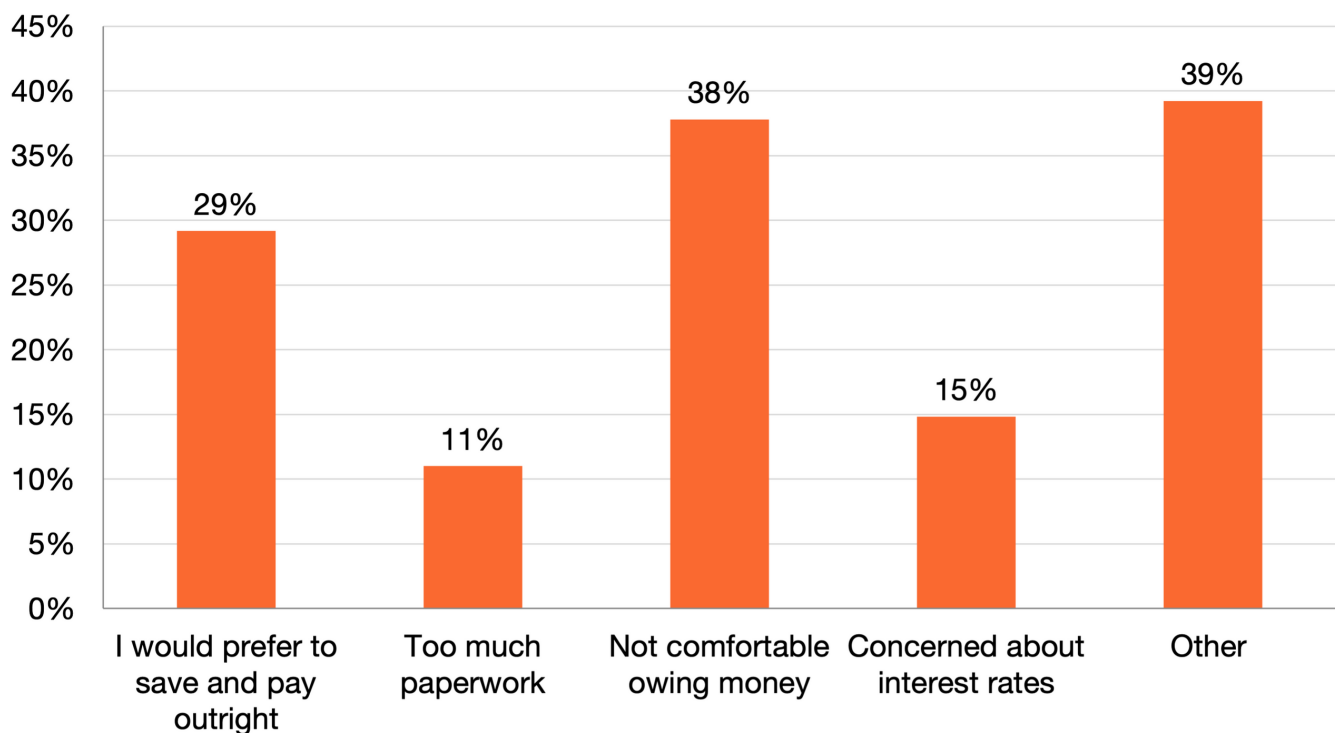
The largest percentage (43 percent) of respondents would be motivated to invest in energy efficiency upgrades if they had access to a loan with payments lower than the money they'd be saving from the upgrades, followed by 40 percent who were unsure, and 17 percent who would not be motivated (see Figure 27).

Figure 27: *Would you be motivated to finance a heat pump or energy retrofits if the annual energy cost savings exceeded the annual payments on the loan?*



In Figure 28, those who would not be motivated to invest in energy efficiency upgrades if they had access to a loan with payments lower than the money they'd be saving from the upgrades were asked to specify why. Thirty-eight percent of respondents answered that they were not comfortable owing money, 29 percent prefer to save and pay outright, 15 percent were concerned about interest rates, and 11 percent reported that a loan would require too much paperwork. Of the 39 percent who selected "other," many specified reasons like renting, not staying long in their current home, being unable to afford payments on a loan, and prioritizing other home improvements.

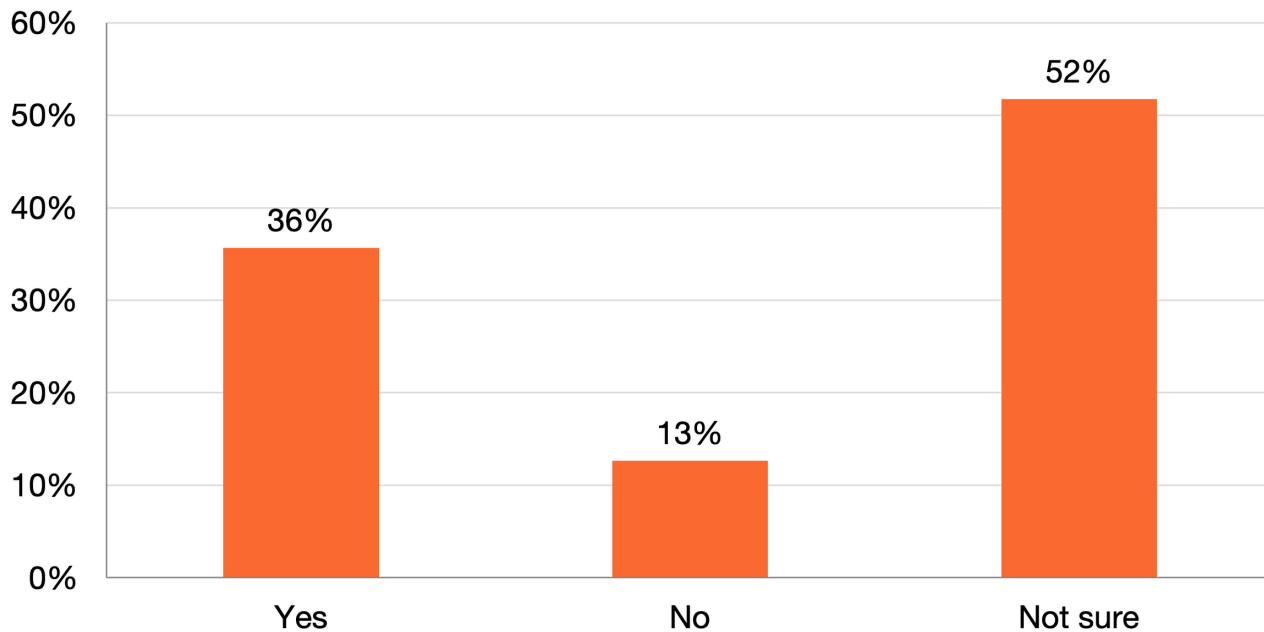
Figure 28: *If no, why? (check all that apply)*



Note: Because respondents were prompted to select all options that may apply, response totals do not necessarily sum to 100%.

In Figure 29, respondents were asked if they would be motivated to invest in energy efficiency with access to on-bill financing through their utility. Over half (52 percent) of respondents were not sure if they would be motivated to invest, 36 percent would be motivated to invest and 13 percent would not be motivated to invest in this circumstance.

Figure 29: Would you be motivated to invest in energy efficiency upgrades if you had access to on-bill financing with your utility?



Barriers to Participation

Respondents who had heard of the Thermalize Juneau Campaign but had not participated were asked to rate a variety of potential barriers to participation on a five-point scale (1=not a barrier, 2=slight barrier, 3=moderate barrier, 4=significant barrier, 5=deal-breaker). In Table 7, lack of homeownership, high costs, and not knowing if a heat pump is right for one's home were the most significant barriers to participation in the Thermalize Juneau campaign (slight to moderate ranking). Living in homes that are already presumed to be energy efficient was also a slight barrier to participation, closely followed by already owning a heat pump, misunderstanding the purpose of the campaign, or wanting a different style of heat pump than the one offered through the campaign.

Given that 27 percent of respondents identified already owning a heat pump as a "moderate" barrier to a "deal-breaker," diversifying and increasing advertisements to Juneau residents who fall outside the "early adopter" group for heat pumps is critical. This also highlights the potential to further emphasize the energy efficiency component of the campaign to highlight the ways that existing heat pump systems can be optimized.

Potential barriers that rated midway between "not a barrier" and "slight barrier" included not having the time to figure out if one should register, not hearing about the campaign, not knowing anyone participating, and finding the registration process difficult.

Language barriers ranked the least significant out of all potential barriers, though it should be noted that five respondents ranked this a moderate to significant barrier to participation. This is also the same number of respondents who primarily speak another language at home.

Table 7: Rate the following on how much of a barrier it was to your participation in the Thermalize Juneau 2021 campaign (defined in the survey for people that didn't know what it was)

Barriers	Weighted Average
I don't own my house/building	2.3
I cannot afford it/I thought the installation cost of the heat pump would be too high	2.3
I wasn't sure a heat pump was right for my house	2.2
My house was already energy efficient	2.0
I already have a heat pump	2.0
I heard about the thermalize campaign, but never understood what it was about	1.9
I want a heat pump, but not the ductless single head heat pump offered through the campaign	1.7
I didn't have the time to figure out if I should register	1.4
I never heard about a thermalize campaign	1.4
I didn't know anyone else participating in the campaign	1.3
The registration form was too hard to fill out	1.2
There was a language barrier (I didn't understand the language that the information was presented in)	1.1

Note: Respondents were asked to rank each of these barriers from 1 to 5, with 1 being "not a barrier," and 5 being a "deal-breaker."

Reasons to Participate

Respondents were asked to rate a variety of reasons or motivations for participation in a Thermalize campaign on a five-point scale (1=not at all important, 2=slightly important, 3=neutral, 4=important, 5=very important). In Table 8, supporting a community effort to reduce personal fossil fuel use, helping Juneau reach its renewable energy goal, and not having to purchase fuel oil were the top reasons to participate (with a weighted average of 2.3 and 2.2 out of 5). Other motivations that rose to the top include improved indoor air quality and access to more education about heat pumps and energy efficiency options. Lower installation prices for other energy efficiency measures and not having to research contractors on one's own closely followed. Thermalize's lower installation price, streamlined installation process, personalized home assessment, and the ability to cool in the summertime were rated as less important.

The weighted averages for the reasons for participation may reflect a lack of understanding of the inner workings of the Thermalize Campaign, particularly lower installation prices, streamlined process, and personalized home assessment. The selection of community-related motivations fits within previous research on solar adoption via the solarize model, specifically, the importance of technology adoption that benefits both the greater population and the individual.⁸

⁸ Bollinger, B., & Gillingham, K. (2020) Wherever the Sun Shines. Yale School of the Environment. Retrieved from <https://environment.yale.edu/news/article/wherever-the-sun-shines-bringing-solar-to-low-and-middleincome-communities>.

Table 8: Rate the following on whether they would make you want to participate in a Thermalize campaign

Motivations/Reasons	Weighted Average
Support a community effort to reduce personal fossil fuel usage	2.3
Help Juneau reach its renewable energy goal	2.3
Install a heat pump and not have to purchase fuel oil	2.2
Access a heat pump that improves indoor air quality	2.0
More education about heat pump and energy efficiency options	2.0
Lower installation price for other energy efficiency measures	1.9
Not having to research contractors on my own	1.7
Lower installation price for a ductless heat pump	1.4
Streamlined installation process	1.4
Getting a personalized home assessment	1.3
Install a heat pump and have the ability to cool in summertime	1.2

Note: Respondents were asked to rank each incentive on a scale from 1 to 5, with 1 being "not at all important" and 5 being "very important."

Appendices

Appendix A: Community Survey Template



Juneau Community Survey

Survey purpose: Thermalize Juneau 2021 was [Alaska's first thermalize campaign](#), and the team in Juneau is eager for future programs to learn from this experience. With this survey, we're trying to identify participation barriers and ways to address them. By completing this survey you are helping this and other thermalize campaigns reach as many people as possible in the most effective way. Thank you!

Survey overview: This survey will collect data on Juneau residents' knowledge and perceptions about heat pumps. We hope to identify who this campaign did not reach and why, and ways to reach more people in the future. We estimate this survey will take approximately 10 minutes to complete. You may return to the survey if you are using the same device on which it was started. Answers are saved every time you hit **next** at the bottom of the page. Answers are submitted when you hit **done** at the end of the survey.

Incentive: All eligible participants that complete the survey will be eligible for an incentive and four drawings.

- Weekly drawings will be held for \$500 gift cards to a business of your choice.
- Those who refer a friend to complete the survey will be entered into additional drawings.

Risks: There are minimal risks to completing this survey. The project team has a plan to ensure answers are kept in confidence. You may choose to leave the survey at any time.

Confidentiality: Survey responses will be kept confidential. Contact information, names and email addresses are needed to prevent duplicate entries and to deliver incentives, but will be removed from survey data. Results will be summarized and will not include information that can be linked to individual survey respondents. Survey answers will be stored in a password-protected folder. Only individuals who have completed training on confidentiality will have access to that folder. More information on study standards for confidentiality are located in the [Data Management Plan](#) on the project website, or questions can be directed to Jamie Hansen with Information Insights at jamie@iialaska.com.


Juneau Community Survey

Eligibility

* 1. Do you live in Juneau? 

☐ Yes

☐ No

* 2. Did you register for [Thermalize Juneau 2021](#)? 

☐ Yes

☐ No

Contact Information

* 3. First Name 

* 4. Last Name 

5. Phone number 

* 6. Email address 

* 7. Have you heard of Alaska Heat Smart before? 

☐ Yes

☐ No

8. Have you accessed any of the following Alaska Heat Smart (AHS) resources? (Check all that apply) 

☐ AHS Website

☐ AHS Social media

☐ AHS Heat pump assessment

☐ Loan financing at True North Credit Union

☐ None of the above

* 9. Have you heard of Renewable Juneau before? 

☐ Yes

☐ No

10. Have you accessed any of the following Renewable Juneau resources? (Check all that apply) 

☐ Website

☐ Social media

☐ Heat pump workshops

☐ Juneau Carbon Offset Fund

☐ None of the above

* 11. How would you describe yourself? (select all that apply) 

☐ Alaska Native or American Indian

☐ Asian

☐ Black or African American

☐ Hispanic Origin (of any race)

☐ Native Hawaiian or other Pacific Islander

☐ White

☐ Prefer not to answer

☐ Other (please specify)

* 12. What kind of building do you live in? 

- ☐ Single family home
- ☐ Apartment or other single family unit connected to a single family home
- ☐ Duplex
- ☐ Triplex
- ☐ Fourplex
- ☐ Apartments in building with 5 or more units
- ☐ Mobile home
- ☐ Prefer not to answer
- ☐ Other (please specify)


* 13. Do you own or rent your home? 

- ☐ Own
- ☐ Rent
- ☐ Prefer not to answer

* 14. How many people regularly live in your residence? 

- ☐ 1
- ☐ 2
- ☐ 3
- ☐ 4
- ☐ 5
- ☐ Other (please specify)
- ☐ 6
- ☐ 7
- ☐ 8
- ☐ Prefer not to answer

* 15. Are any of those living at the house dependents?

NOTE: A dependent is a person who relies on someone else for financial support, and can include children or other relatives. 

- ☐ Yes
- ☐ No
- ☐ Prefer not to answer

* 16. What was your household income (before taxes) in 2020? 

- ☐ \$0 - \$5,000
- ☐ \$5,000 - \$10,000
- ☐ \$10,000 - \$15,000
- ☐ \$15,000 - \$20,000
- ☐ \$20,000 - \$25,000
- ☐ \$25,000 - \$35,000
- ☐ \$35,000 - \$50,000
- ☐ \$50,000 - \$75,000
- ☐ \$75,000 - \$100,000
- ☐ \$100,000 - \$150,000
- ☐ \$150,000+
- ☐ Prefer not to answer

* 17. How old are you? 

- ☐ Under 18
- ☐ 18 to 65
- ☐ Over 65
- ☐ Prefer not to answer

* 18. What language is primary spoken in your home? (select all that apply) 

- ☐ English
- ☐ Spanish
- ☐ Asian and Pacific Island Languages
- ☐ Other (please specify)

* 19. How much does your household spend annually on electricity, heating fuel, and other cooking fuel bills? (estimates are fine) 

- | | |
|--|--|
| <input type="radio"/> Less than \$500 a year (less than \$40/month) | <input type="radio"/> \$2,500 - \$3,000 a year (about \$205 - \$250/month) |
| <input type="radio"/> \$500 - \$1000 a year (about \$40- \$80/month) | <input type="radio"/> \$3,000 - \$3,500 a year (about \$250 - \$290/month) |
| <input type="radio"/> \$1,000 - \$1,500 a year (about \$80 - \$125/month) | <input type="radio"/> \$3,500 - \$4,000 a year (about \$290 - \$330/month) |
| <input type="radio"/> \$1,500 - \$2,000 a year (about \$125 - \$165/month) | <input type="radio"/> Over \$4,000 a year (over \$330/month) |
| <input type="radio"/> \$2000 - \$2,500 a year (about \$165 - \$205/month) | <input type="radio"/> Prefer not to answer |

* 20. Does your household own and charge an electric vehicle at your home? 

- ☐ Yes
- ☐ No

21. Does your household pay for the electric vehicle charging costs on your electricity bill? 

- ☐ Yes
- ☐ No

* 22. What is the **primary** way your home is heated? 

- | | |
|--|--|
| <input type="radio"/> Heat pump | <input type="radio"/> Toyo stove or equivalent |
| <input type="radio"/> Electric baseboard | <input type="radio"/> Wood stove |
| <input type="radio"/> Electric boiler | <input type="radio"/> Pellet stove |
| <input type="radio"/> Electric furnace | <input type="radio"/> Pellet boiler |
| <input type="radio"/> Electric space heater | <input type="radio"/> Propane boiler |
| <input type="radio"/> Oil fired boiler | <input type="radio"/> Propane furnace |
| <input type="radio"/> Oil fired furnace | <input type="radio"/> Propane fireplace |
| <input type="radio"/> Other (please specify) | |

* 23. What is the **secondary** way your home is heated? 

- | | |
|--|--|
| <input type="radio"/> Heat pump | <input type="radio"/> Wood stove |
| <input type="radio"/> Electric baseboard | <input type="radio"/> Pellet stove |
| <input type="radio"/> Electric boiler | <input type="radio"/> Pellet boiler |
| <input type="radio"/> Electric furnace | <input type="radio"/> Propane boiler |
| <input type="radio"/> Electric space heater | <input type="radio"/> Propane furnace |
| <input type="radio"/> Oil fired boiler | <input type="radio"/> Propane fireplace |
| <input type="radio"/> Oil fired furnace | <input type="radio"/> No secondary heating appliance |
| <input type="radio"/> Toyo stove or equivalent | |
| <input type="radio"/> Other (please specify) | |

* 24. Do you consider your residence to be energy efficient? 

- ☐ Yes
- ☐ No
- ☐ Not Sure

* 25. Why or why not? 


* 26. What is your familiarity with **air source heat pump technology** on a **scale of 1 to 10?** (with one being "I have never heard of heat pumps" and ten being "I use a heat pump") 

1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 27. **What is your familiarity with ductless heat pumps** on a **scale of 1 to 10?** (with one being "I have never heard of ductless heat pumps" and ten being "I use a ductless heat pump")



1	2	3	4	5	6	7	8	9	10
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

28. Based on your understanding of air source heat pump technology, how much do you agree with the following statements? 

	Strongly disagree	Slightly disagree	Neither agree nor disagree	Slightly agree	Strongly agree
Heat pumps provide energy efficient heating in cold weather to 0 degrees F	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heat pumps keep housing units warm and comfortable in cold weather	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Heat pumps offer a lower cost of heating than standard electric resistance heating, such as electric baseboards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

* 29. Are you currently looking for ways to lower your heating or electricity bills? 

- ☐ Yes
- ☐ No
- ☐ Not Sure

30. What have you considered or done to lower your electricity bills? 


* 31. Have you heard about the Thermalize Juneau 2021 Campaign? 

- ☐ Yes
- ☐ No
- ☐ Not sure

32. How did you hear about [Thermalize Juneau](#)? (check all that apply) 

- ☐ Social media
- ☐ Kickoff event in December 2020
- ☐ Flyer
- ☐ Workshop
- ☐ Word of mouth
- ☐ Alaska Heat Smart email listserv
- ☐ Other (please specify)

33. Did you know what a thermalize campaign was prior to learning about Thermalize Juneau?

NOTE: A "thermalize campaign" is an energy efficiency project that combines energy advising with installation assistance by offering free energy audits, a competitive selection process for installers and contractors, and discounts on heat pumps and energy efficiency retrofits. 

- ☐ Yes
- ☐ No
- ☐ Not Sure

* 34. Rate the following potential barriers that impacted your decision not to participate in the [Thermalize Juneau](#) campaign. 

	Not a barrier	Slight	Moderate	Significant	Deal-breaker
I already have a heat pump	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My house was already energy efficient	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I cannot afford it / I thought the installation cost of the heat pump would be too high	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I wasn't sure a heat pump was right for my house	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I never heard about a thermalize campaign	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

I heard about the thermalize campaign, but never understood what it was about

☐
☐
☐
☐
☐

I want a heat pump, but not the ductless single head heat pump offered through the campaign

☐
☐
☐
☐
☐

I don't own my house/building

☐
☐
☐
☐
☐

There was a language barrier (I didn't understand the language that the information was presented in)

☐
☐
☐
☐
☐

I didn't know anyone else participating in the campaign

☐
☐
☐
☐
☐

I didn't have the time to figure out if I should register

☐
☐
☐
☐
☐

The registration form was too hard to fill out

☐
☐
☐
☐
☐

Other (please specify)

32. Do you know what a thermalize campaign is? 


- ☐ Yes
- ☐ No
- ☐ Other (please specify)

* 33. Are you aware that the City and Borough of Juneau has set a goal to reach 80% renewable energy for heating and transportation by 2045? 


- ☐ Yes
- ☐ No
- ☐ Not sure

* 34. Have you heard about the [Juneau Carbon Offset Fund](#) and its work to install heat pumps in income-qualified homes? 

- ☐ Yes
- ☐ No
- ☐ Not sure

* 35. Would you be interested in a heat pump, knowing that it is over 200% more efficient than other electric heating and would reduce electricity costs by \$480 to \$720 per year? 

- ☐ Yes
- ☐ No
- ☐ Not sure

* 36. Would you be motivated to invest in energy efficiency upgrades if you had access to a loan with payments lower than the money you'd be saving from the upgrades? 

- ☐ Yes
- ☐ No
- ☐ Not sure
- ☐ Prefer not to answer


37. If no, why? (check all that apply) 

- ☐ I would prefer to save and pay outright
- ☐ Too much paperwork
- ☐ Not comfortable owing money
- ☐ Concerned about interest rates
- ☐ Other (please specify)

* 38. Would you be motivated to invest in energy efficiency upgrades if you had access to on-bill financing with your utility? 

- ☐ Yes
- ☐ No
- ☐ Not sure
- ☐ Prefer not to answer

* 39. How important are these factors in encouraging you to participate in a Thermalize campaign?

NOTE: A "thermalize campaign" is an energy efficiency project that combines energy advising with installation assistance by offering free energy audits, a competitive selection process for heat pump installers and energy efficiency contractors, and discounts on heat pumps and energy efficiency retrofits. 

	Not at all important	Slightly important	Neutral	Important	Very important
Lower installation price for a ductless heat pump	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lower installation price for other energy efficiency measures	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Support a
community
effort to
reduce
personal
fossil fuel
usage



Access a
heat pump
that
improves
indoor air
quality



Install a
heat pump
and not
have to
purchase
fuel oil



Install a
heat pump
and have
the ability to
cool in
summertime

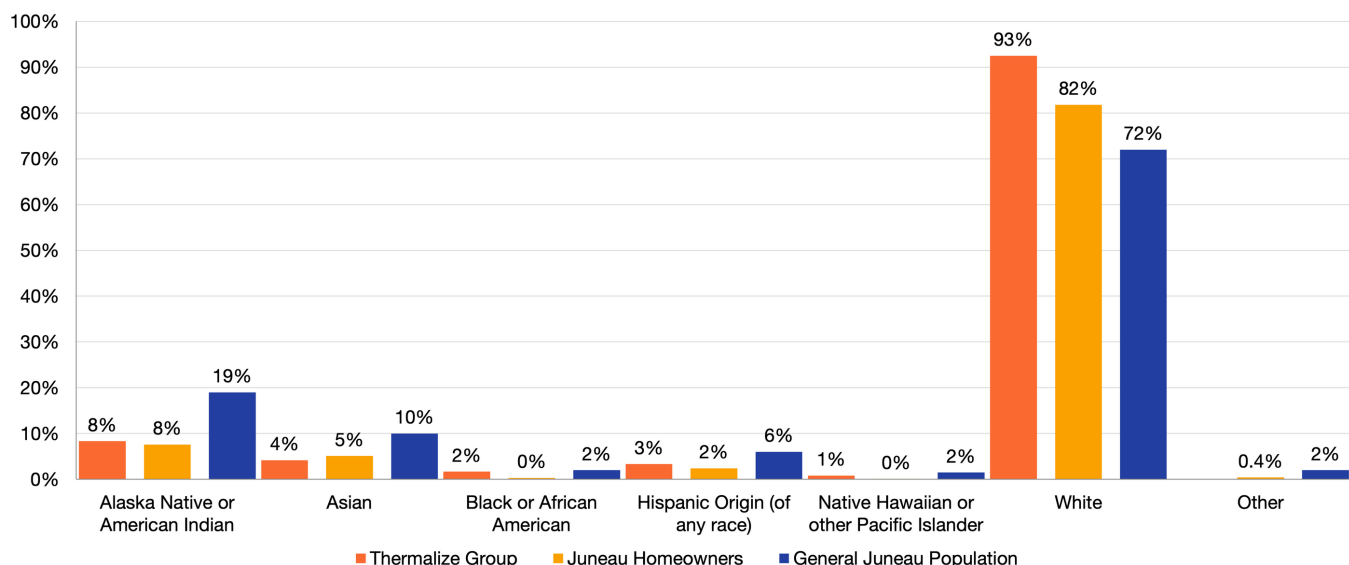


Appendix B: Thermalize Juneau Intake Survey Results

In contrast to the Thermalize Juneau Community Survey that collected responses from those who did not participate in the Thermalize Juneau campaign, the Thermalize Juneau Intake Survey was designed to collect information from participants. These results were partially described in Part 1 and are shown in full below. All survey questions and results are included below with the exception of questions for which the number of respondents was too small to maintain anonymity.

The intake survey asked about the race and ethnicity of those living in the house. Historically, clean energy campaigns have not reached communities of color. Thermalize Juneau aims to equally represent the Juneau population across all races and ethnicities. The race and ethnicity of those participating in the campaign were compared with those living in Juneau. Figure 30 illustrates the results of this comparison. The data regarding the race and ethnicity of the general Juneau population was collected from the 2020 U.S. Census, while the data on homeowners was collected from the 2019 American Community Survey (data on homeowners has not yet been released in the 2020 Census). Comparing the census race/ethnicity data with that from the Thermalize Juneau Campaign shows that Thermalize Juneau respondents represented a higher percentage of white individuals than the general Juneau population and Juneau homeowners. The campaign, on average, underrepresented Alaska Native or American Indian, African American, Asian, Hispanic, and Native Hawaiian or Pacific Islander individuals. Renters cannot apply for the Thermalize program, so when compared to the group of Juneau homeowners, the Thermalize Juneau 2021 campaign overrepresented white homeowners but had comparative numbers for American Indian or Alaska Native, Black or African American, and Hispanic Origin. Asian homeowners were underrepresented.

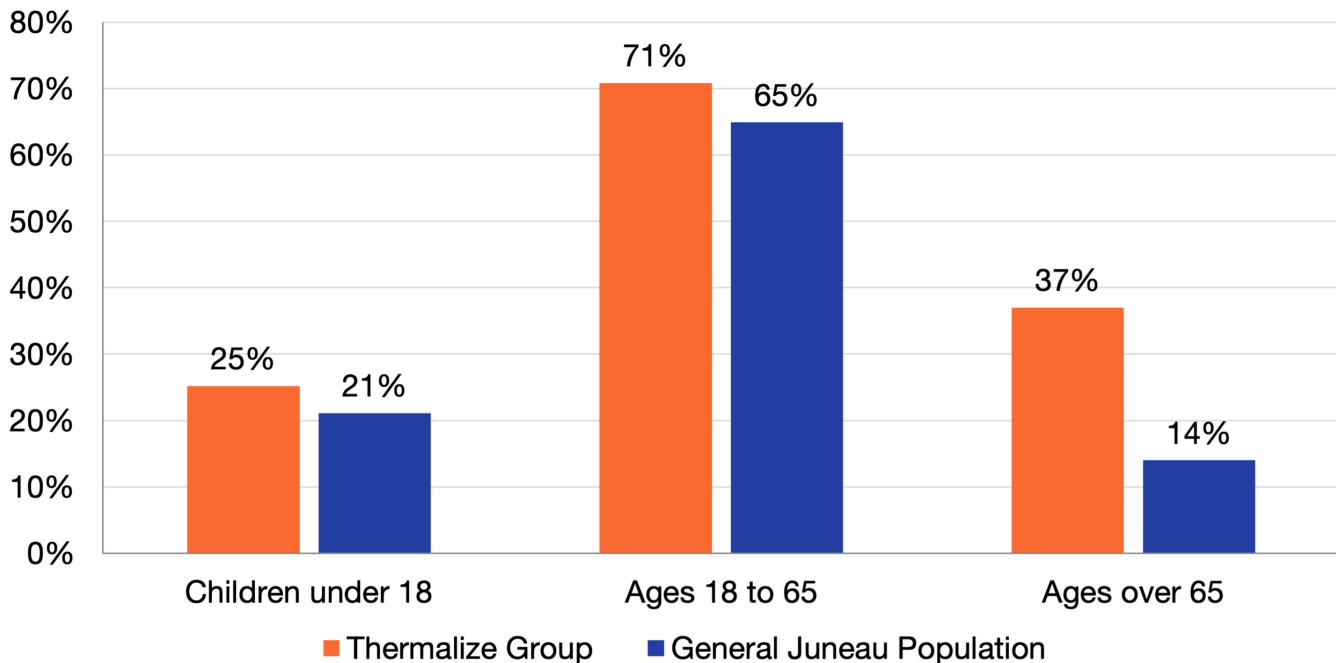
Figure 30: *How would you describe yourself and others in your household?*



Note: Because respondents were prompted to select all options that may apply, response totals do not necessarily sum to 100%.

Figure 31 shows the age distribution within households who participated in Thermalize Juneau. A quarter of participating homes were families with children under 18; 71 percent of participating households had members with ages of 18 to 65; and 37 percent of households had those aged 65 and over. Adults aged 65 and over were most dramatically overrepresented in the Thermalize 2021 cohort compared with the general Juneau population.

Figure 31: Who lives in the home?



Note: Because respondents were prompted to select all options that may apply, response totals do not necessarily sum to 100%.

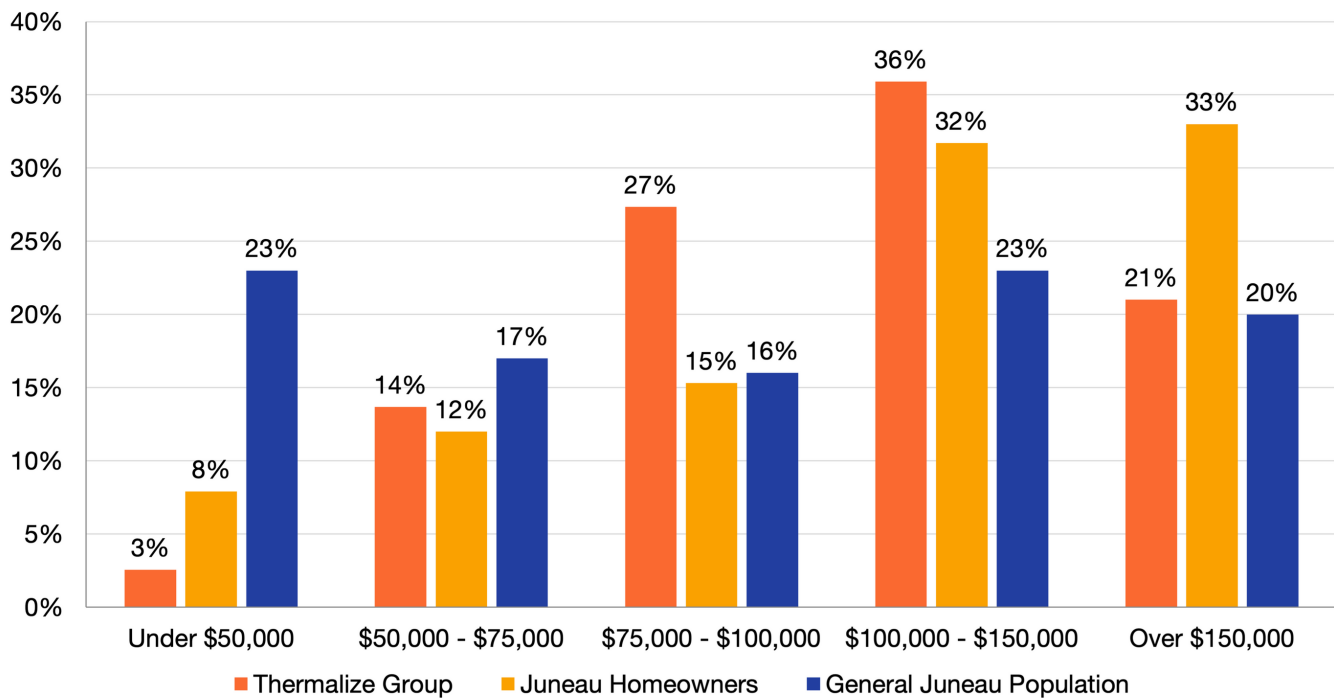
Looking at the household income question from the Participant Intake Survey, the most represented income level in the campaign was the \$100,000 to \$150,000 range for annual household income. Comparing the income distribution from the intake survey with that provided from the U.S. Census data, the survey data shows that low-income communities were underrepresented in the Thermalize group. Figure 31 depicts the contrast between those who participated in the Thermalize campaign and the Juneau population.

It is important to note the existence of the Juneau Carbon Offset Fund. This is a fund that finances heat pumps for low-income households. Households that are at or below 80 percent of the median area income in Juneau qualify for the fund, including a free installation of an air source heat pump. The number of people living in the home is also factored into who qualifies for the fund. The fund covers all the costs associated with switching a home from oil heating to air source heat pumps. Thus, for 2020, one person with an annual income of \$65,968 qualifies, or a family of two qualifies if the income is below \$75,392. The income limit increases as the family size increases.

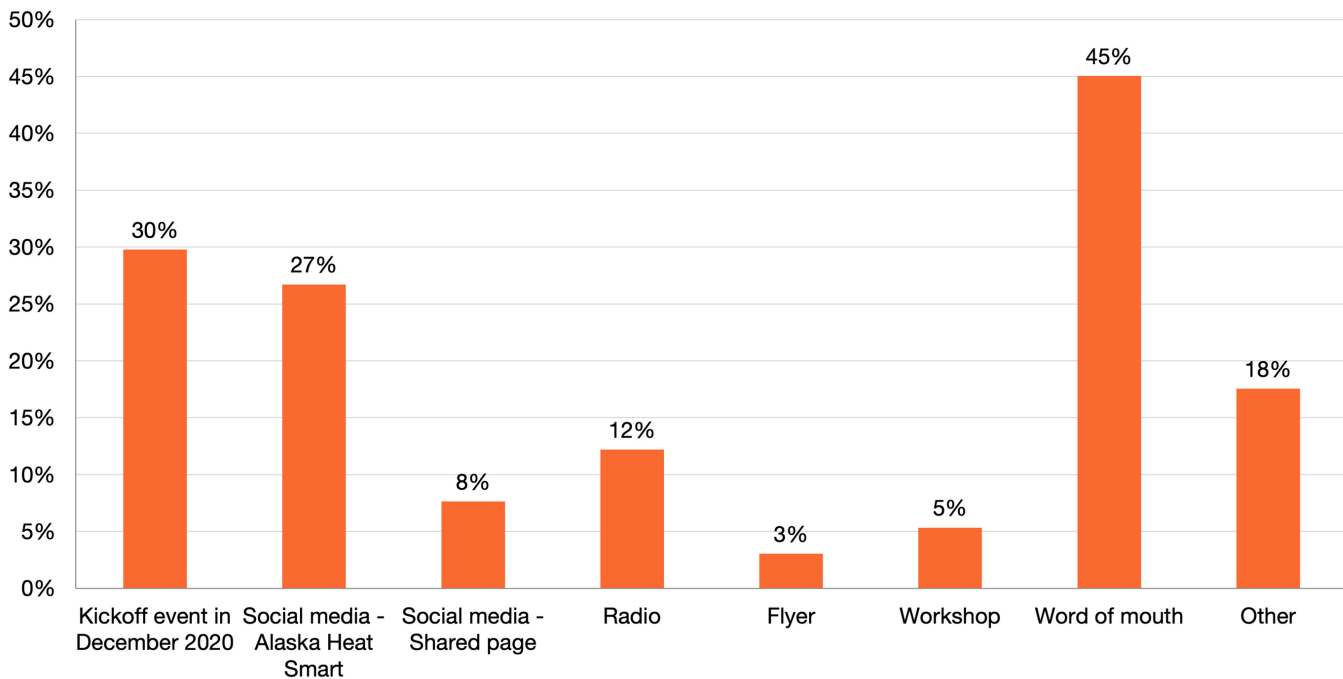
Looking at Figure 32 there is a large difference between the household income of homeowners in Juneau vs the general Juneau population. All households with an income below \$50,000 qualify for the Juneau Carbon Offset Fund regardless of how many live in the home, and also any family of two or more people and income below \$75,000 qualifies for the free installation of an air source heat pump. This means they are not the target audience for Thermalize Juneau 2021. When looking at data for all of Juneau, households with income between \$50,000 and \$75,000 are underrepresented in Thermalize Juneau 2021, potentially because many of them qualify for the free air source heat pump through the Juneau Carbon Offset Fund. Thermalize Juneau also successfully referred an individual to the Juneau Carbon Offset Fund program, a program started in 2019 to help Juneau meet its goal via heat pump installations in low income households.

The majority (74 percent) of the Thermalize cohort (131 respondents) were not aware of the solarize campaigns that had happened in Alaska to date, nor did they know what a thermalize campaign was prior to hearing about Thermalize Juneau (70 percent). Approximately 36 percent knew that the City and Borough had set a renewable energy goal, and over half (55 percent) had heard of the Juneau Carbon Offset Fund.

Figure 32: What was your annual household income (before taxes) in 2020?



While Thermalizers heard about the campaign via several different methods (see Figure 33), the most commonly selected outreach mechanism was “word of mouth” (45 percent), followed by the kickoff event in December (30 percent) and Alaska Heat Smart’s social media (27 percent).

Figure 33: How did you hear about Thermalize Juneau?

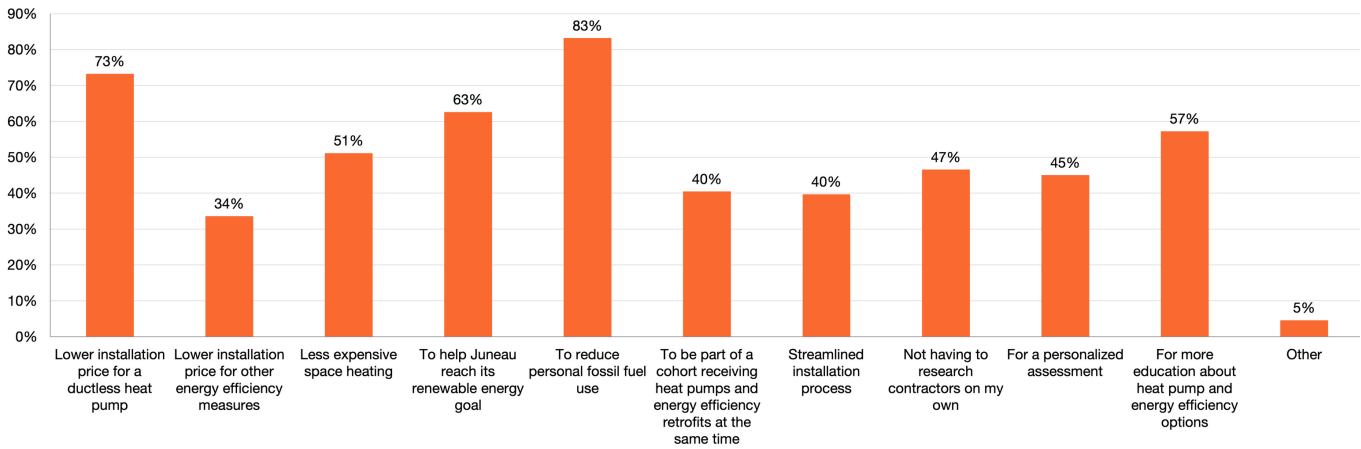
Note: Because respondents were prompted to select all options that may apply, response totals do not necessarily sum to 100%.

They were motivated to join for several reasons, with the most common reason being to reduce personal fossil fuel consumption, followed by lower installation costs, helping Juneau reach its renewable energy goal, and for more education about heat pump and energy efficiency options (see Figure 34).

The majority of the cohort had heard of heat pumps before Thermalize Juneau 2021 but had varying degrees of knowledge about the technology, with 29 percent having heard of them but knew very little details and 26 percent having spent time researching general information about ductless heat pumps. Eight percent had already consulted at least once with Alaska Heat Smart and 8 percent had talked to an installer before the campaign.

While a slight majority were not looking at financing options for the heat pump installation at the time of the survey (before they had received their quote), the majority (57 percent out of 131 respondents) would be motivated to finance either a heat pump or energy efficiency improvements if the energy savings exceeded the loan payments on an annual basis. The majority were unsure if they were satisfied with the financing options they had identified at the time of the survey, perhaps a reflection of the survey occurring before Thermalizers had an installer quote in hand.

Figure 34: What made you want to join the Thermalize Juneau Campaign?



Note: Because respondents were prompted to select all options that may apply, response totals do not necessarily sum to 100%.

Figure 35: Was your income in 2020 significantly different from past years?

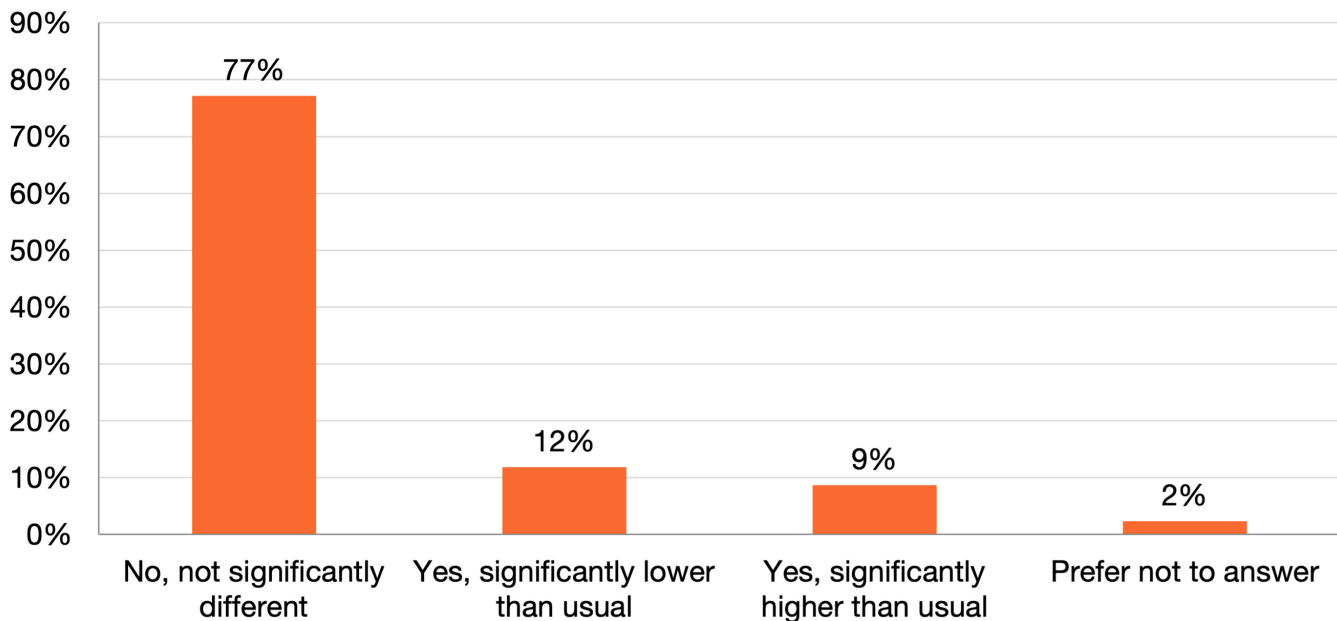
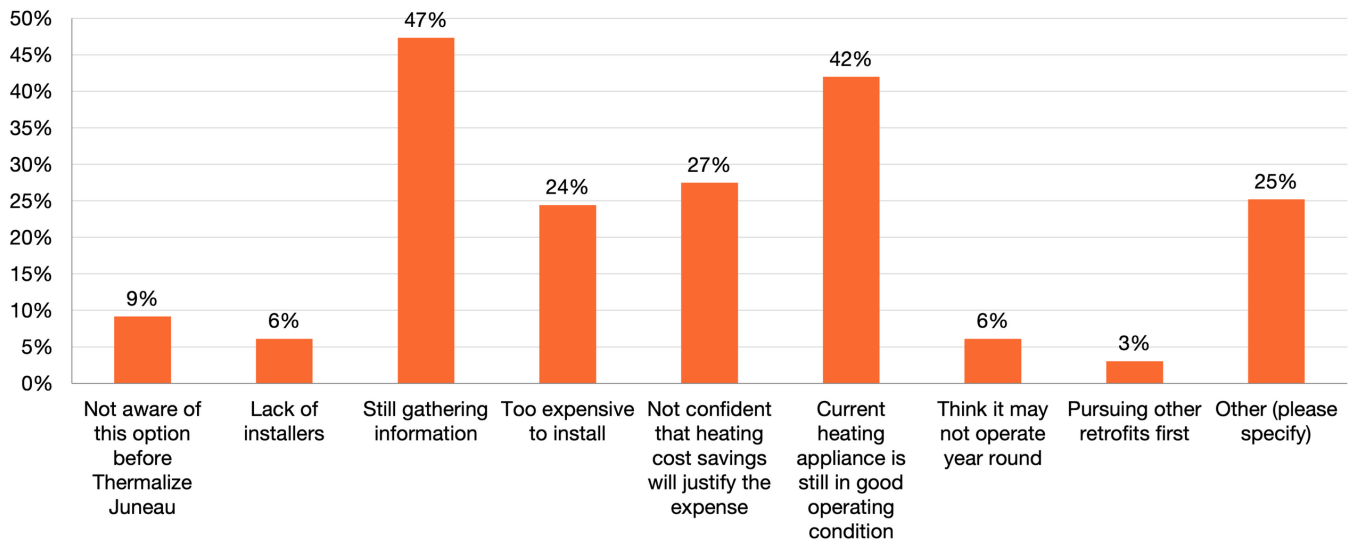
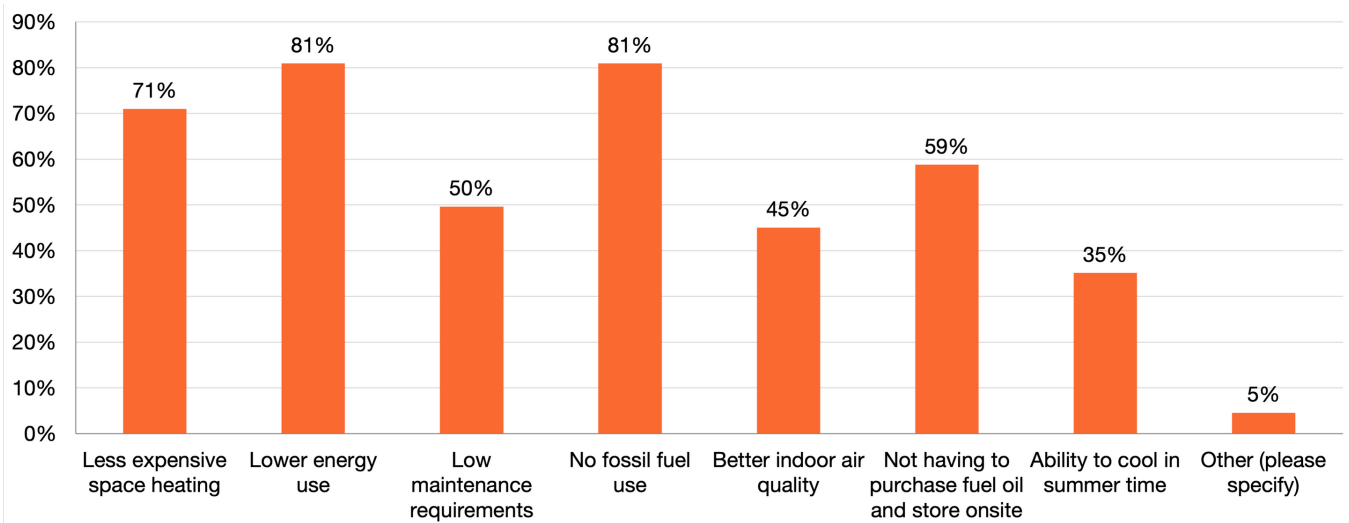


Figure 36: Why haven't you installed a heat pump yet? (select all that apply)



Note: Because respondents were prompted to select all options that may apply, response totals do not necessarily sum to 100%.

Figure 37: What do you like about the idea of installing a ductless heat pump? (select all that apply)



Note: Because respondents were prompted to select all options that may apply, response totals do not necessarily sum to 100%.

Figure 38: Are you satisfied with the financing options you have identified or know about?

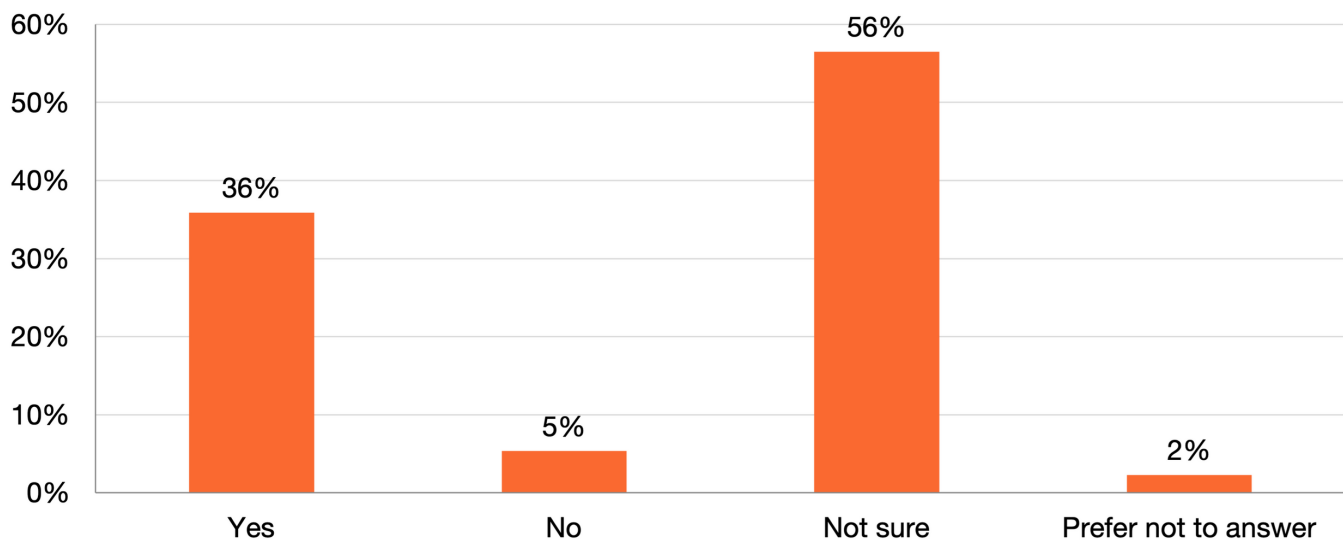


Figure 39: Do you have a payback period in mind that would need to be met in order to install a ductless heat pump? (This is the length of time it will take to save enough in fuel costs to cover the cost of the heat pump.)

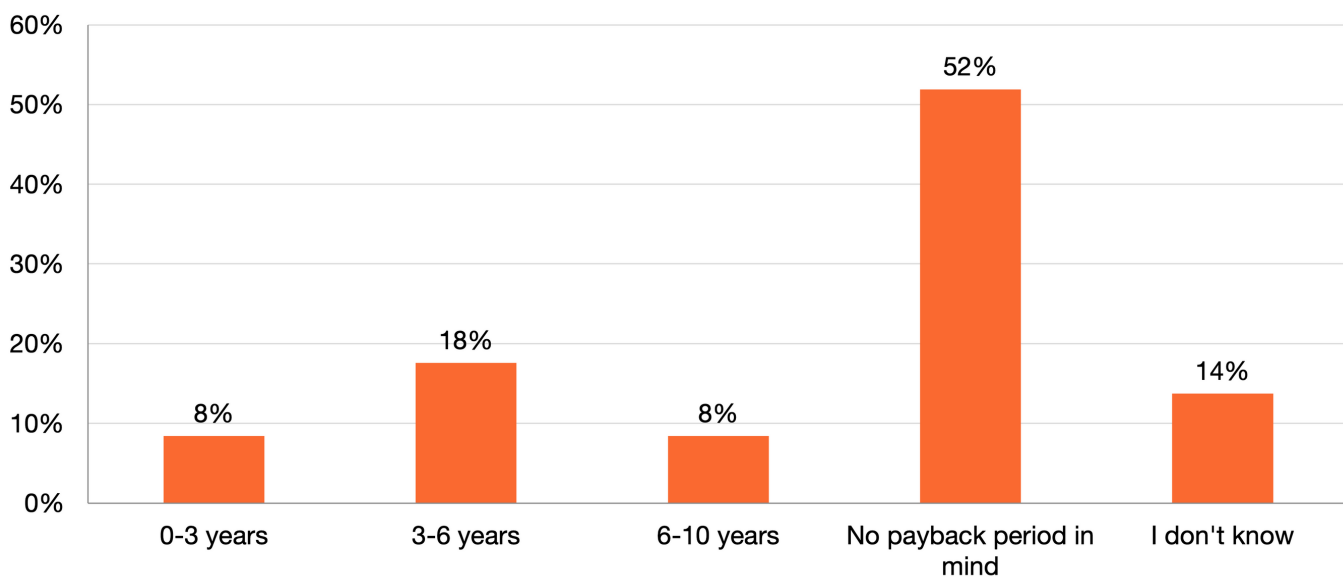


Figure 40: Would you be motivated to finance a heat pump or energy efficiency retrofit if the annual energy cost savings exceeded the annual payments on the loan?

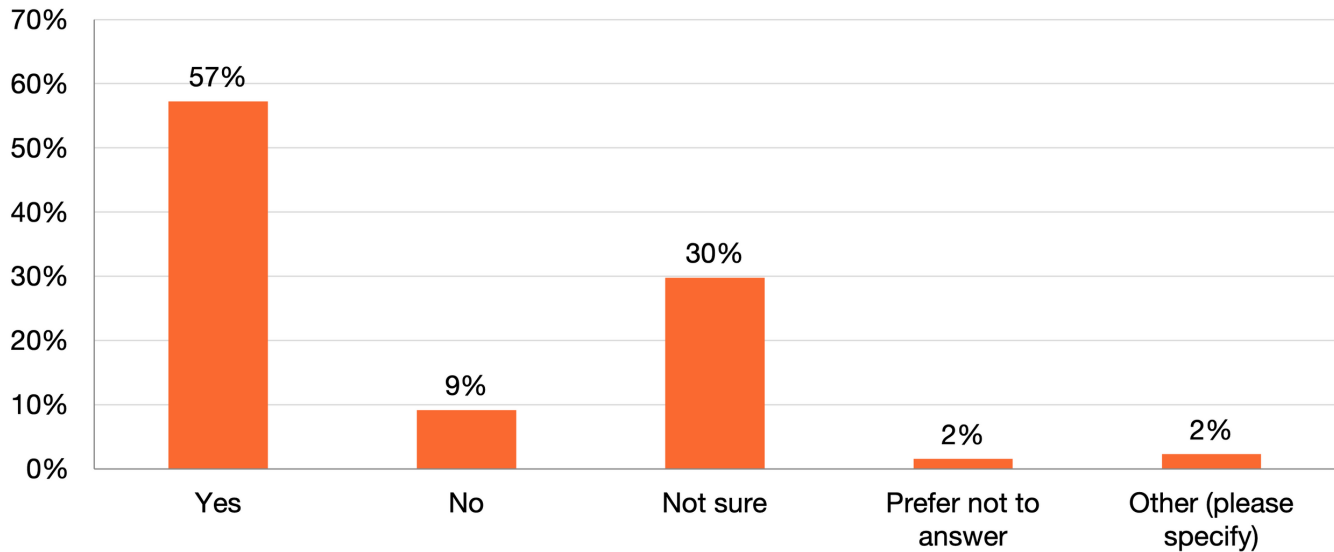


Figure 41: Are you looking at financing options for ductless heat pump installation or energy efficiency retrofits?

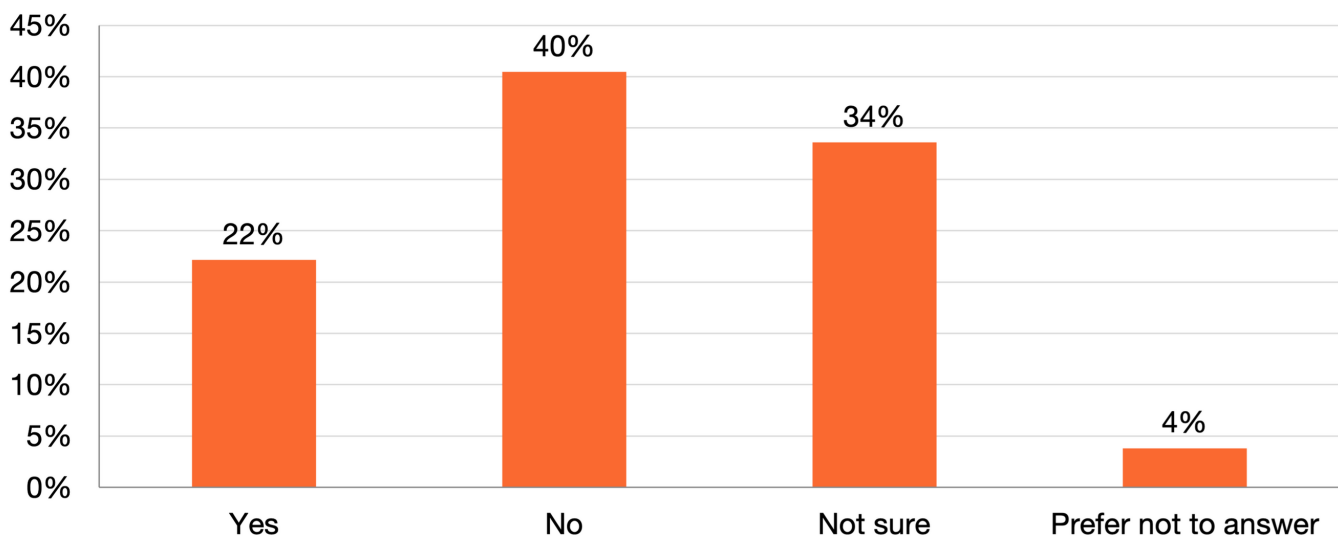


Figure 42: Have you had any issues or problems with existing heat pump installers?

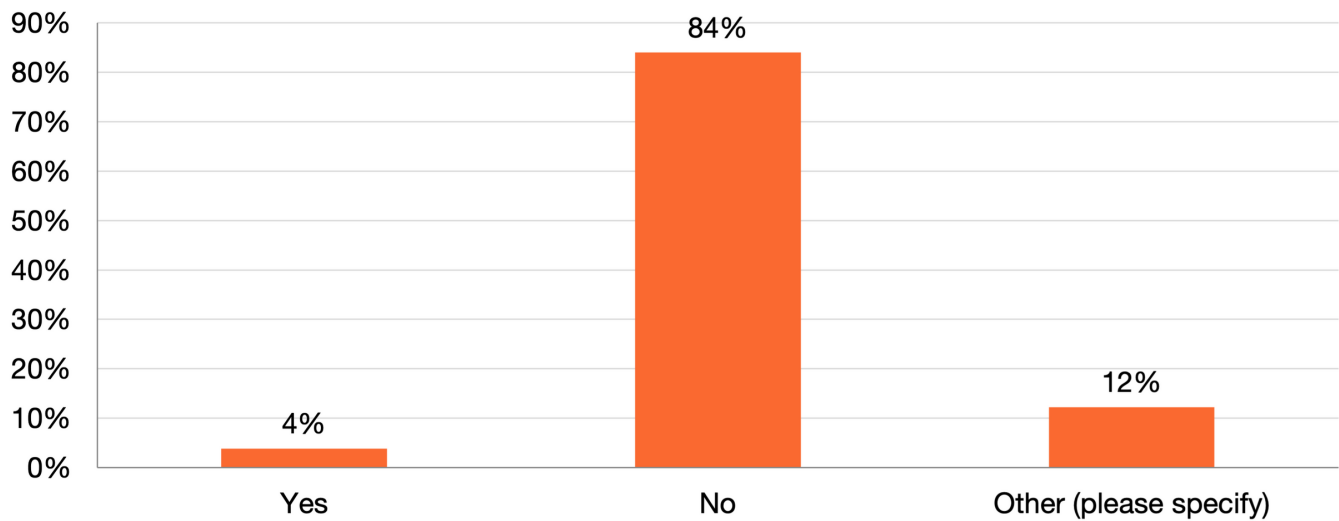
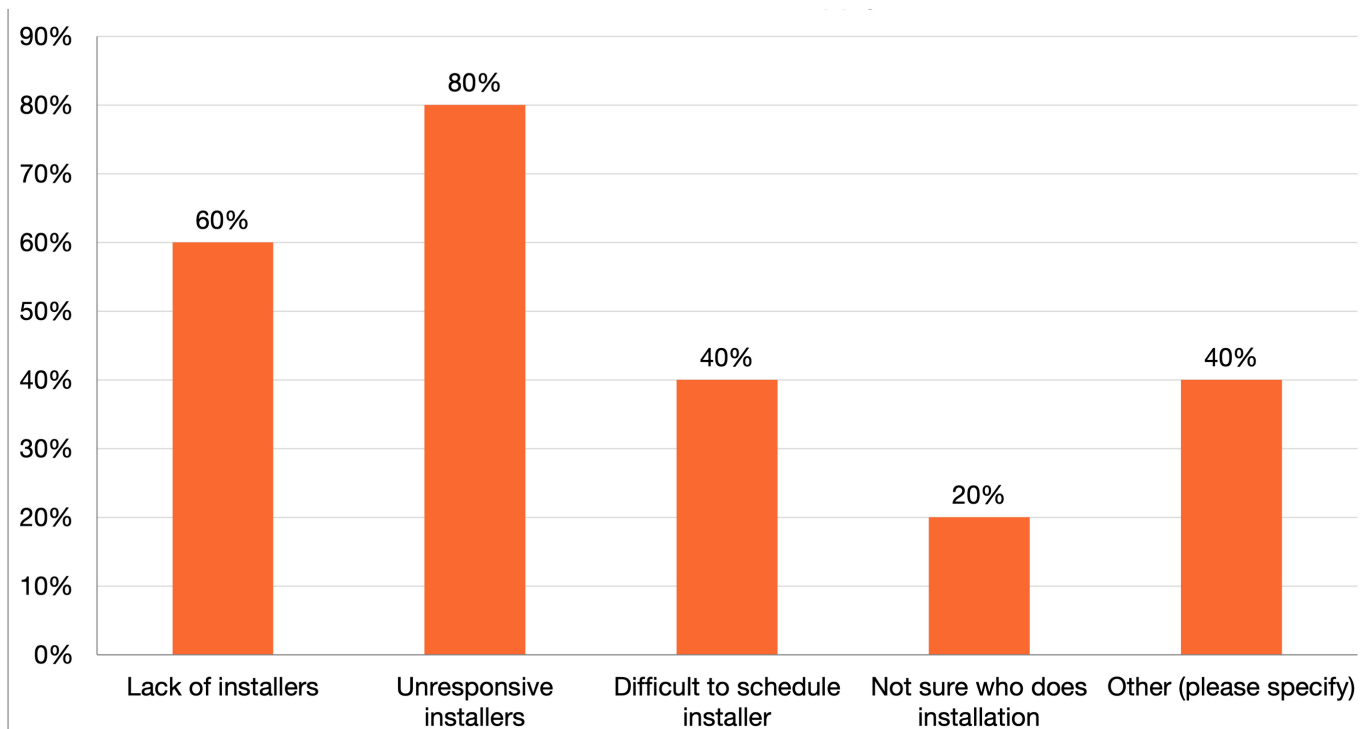


Figure 43: If yes, why? (select all that apply)



Note: Because respondents were prompted to select all options that may apply, response totals do not necessarily sum to 100%.

Figure 44: How much did you know about ductless heat pumps prior to signing up for Thermalize Juneau?

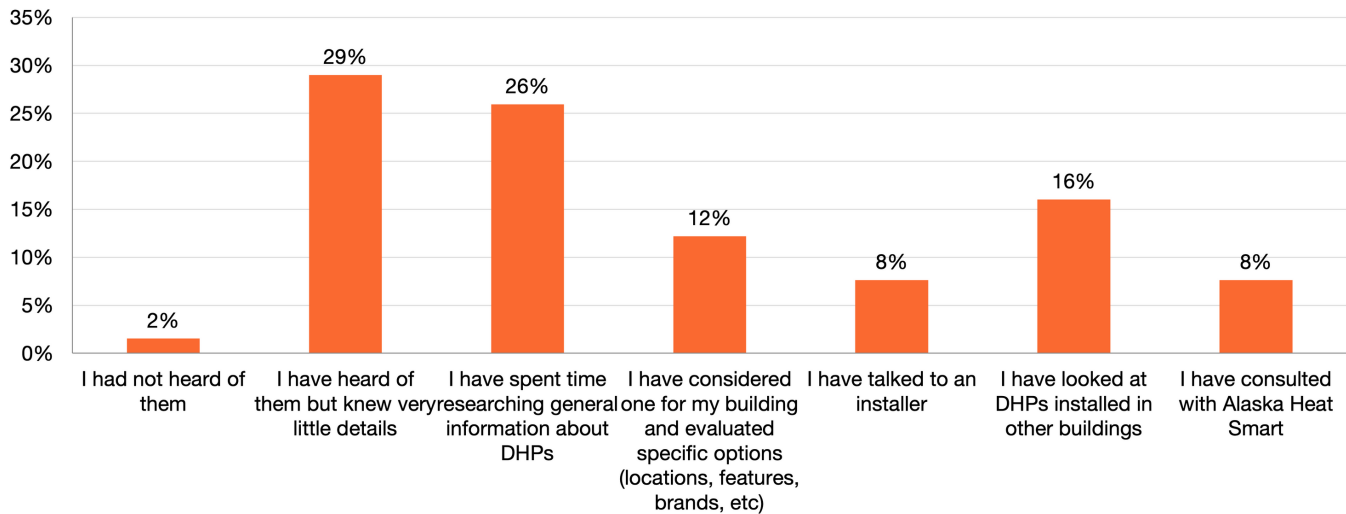


Figure 45: Did you know what a thermalize campaign was prior to learning about Thermalize Juneau?

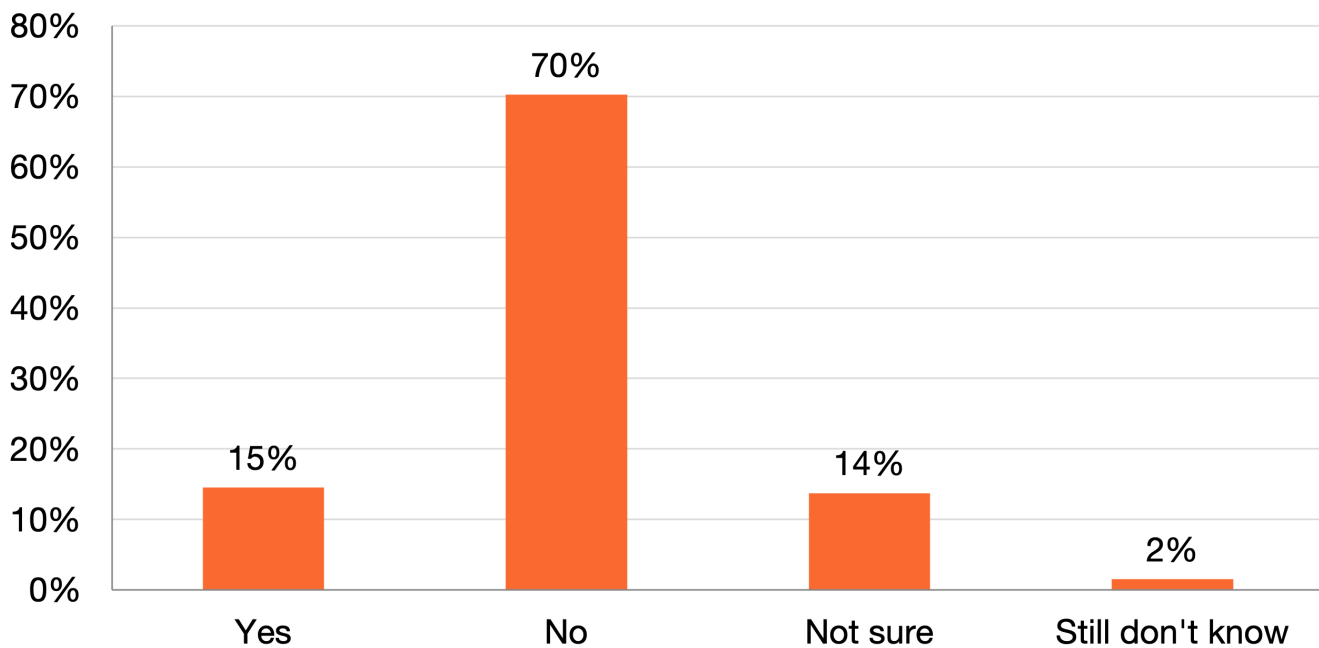


Figure 46: Are you aware of any of the solarize campaigns that have happened in Alaska over the past few years?

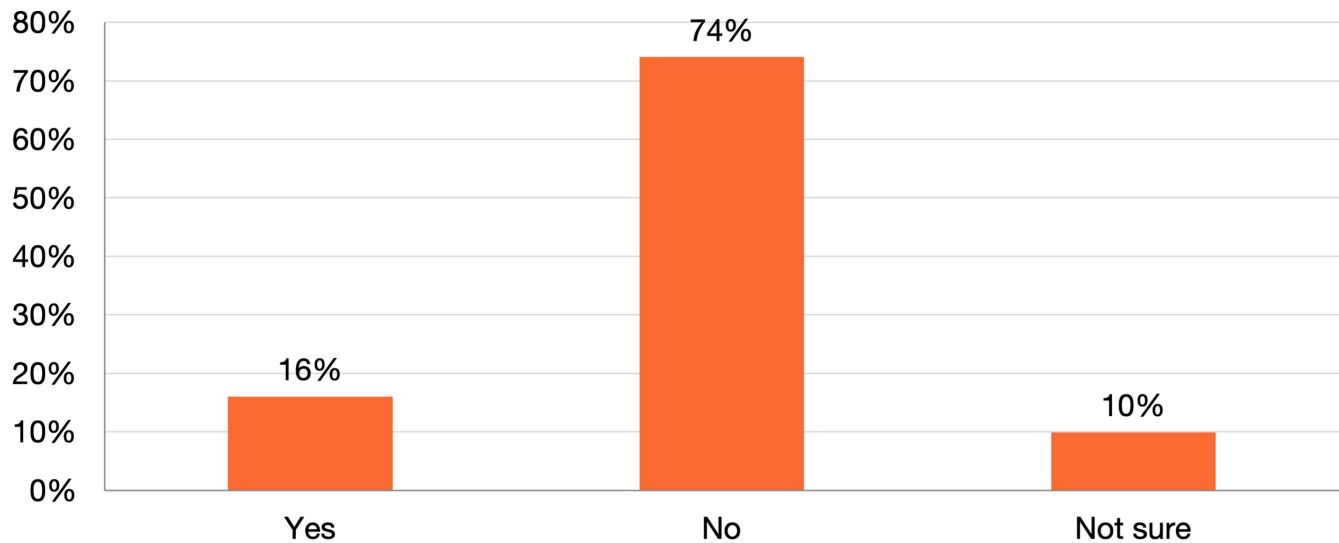


Figure 47: Have you heard about the Juneau Carbon Offset Fund and its work to install heat pumps in qualified housing units?

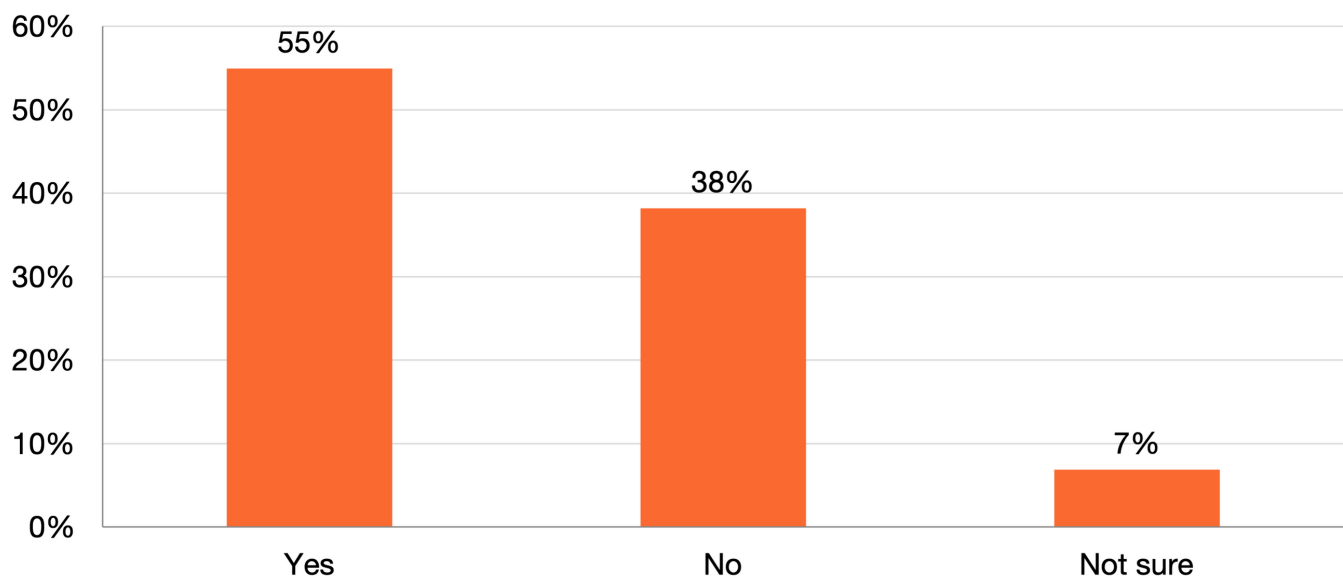


Figure 48: Are you aware that the City and Borough of Juneau has set a goal to reach 80% renewable energy for heating and transportation by 2045?

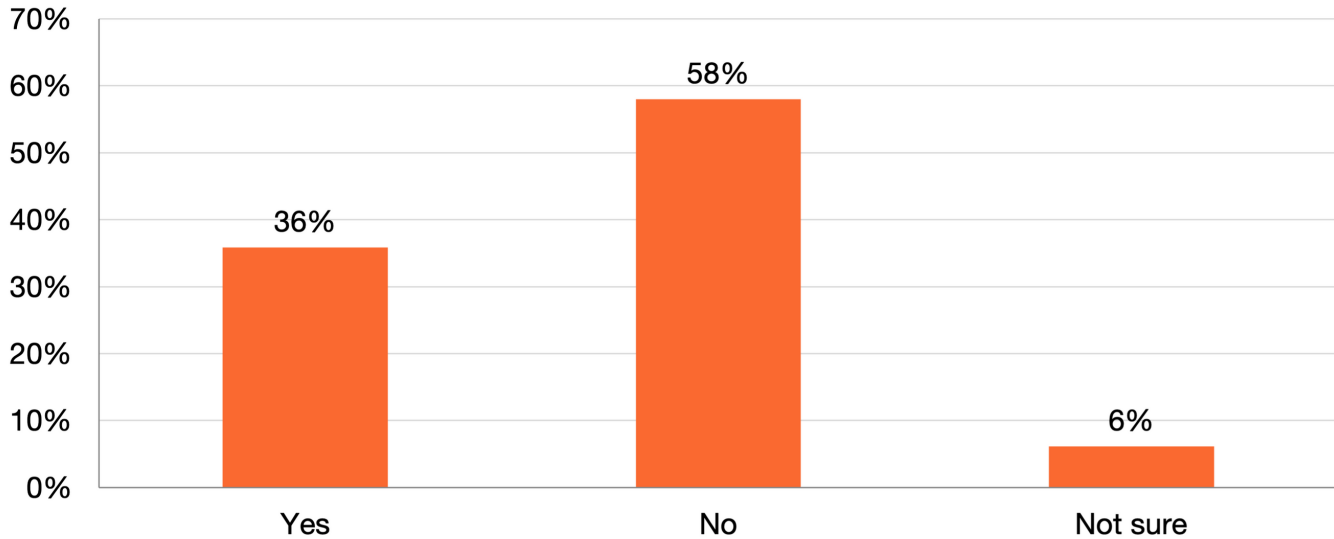


Figure 49: Are you considering replacing your heating appliance(s) (such as boiler, furnace, woodstove, etc.) with a heat pump(s) entirely, or using the heat pump(s) in addition to the current heating appliances?

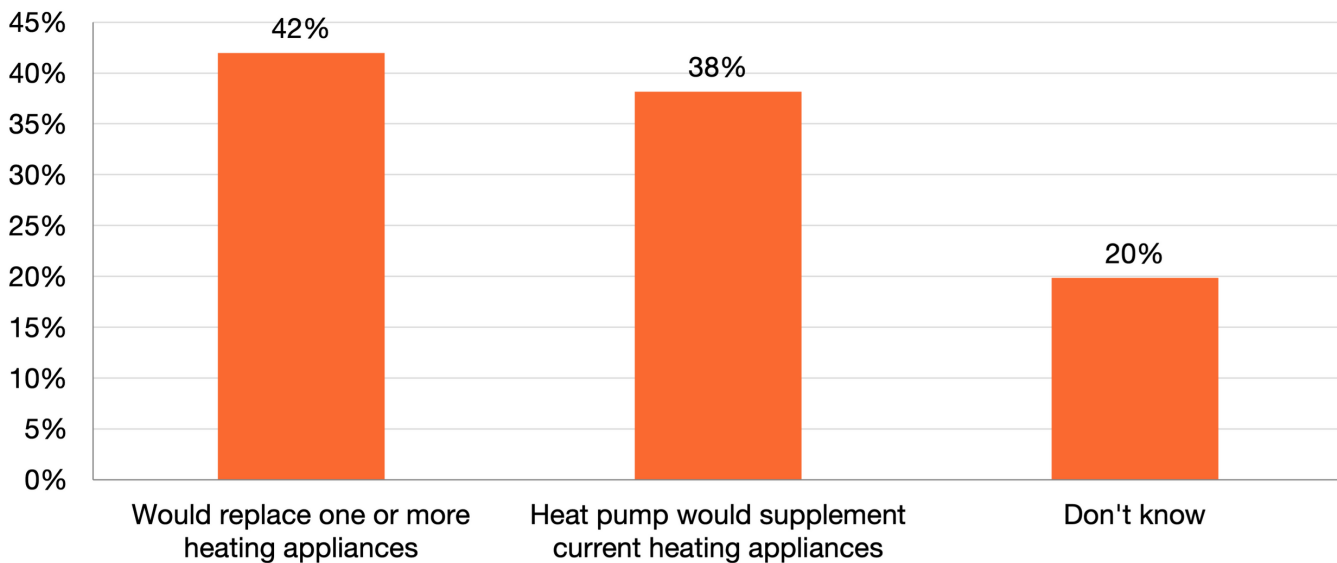


Figure 50: Is this building a residence, business, or other non-residential building? (If you are a landlord, please select business.)

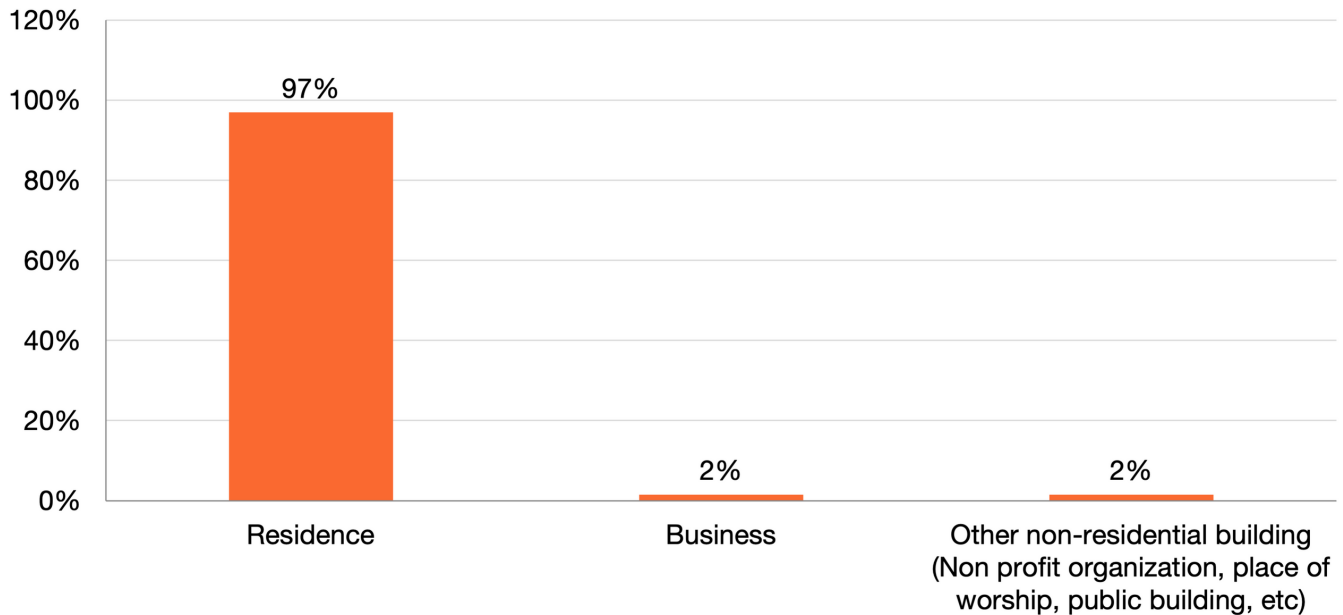


Figure 51: For this building, which of the options below is a higher priority for you or your organization?

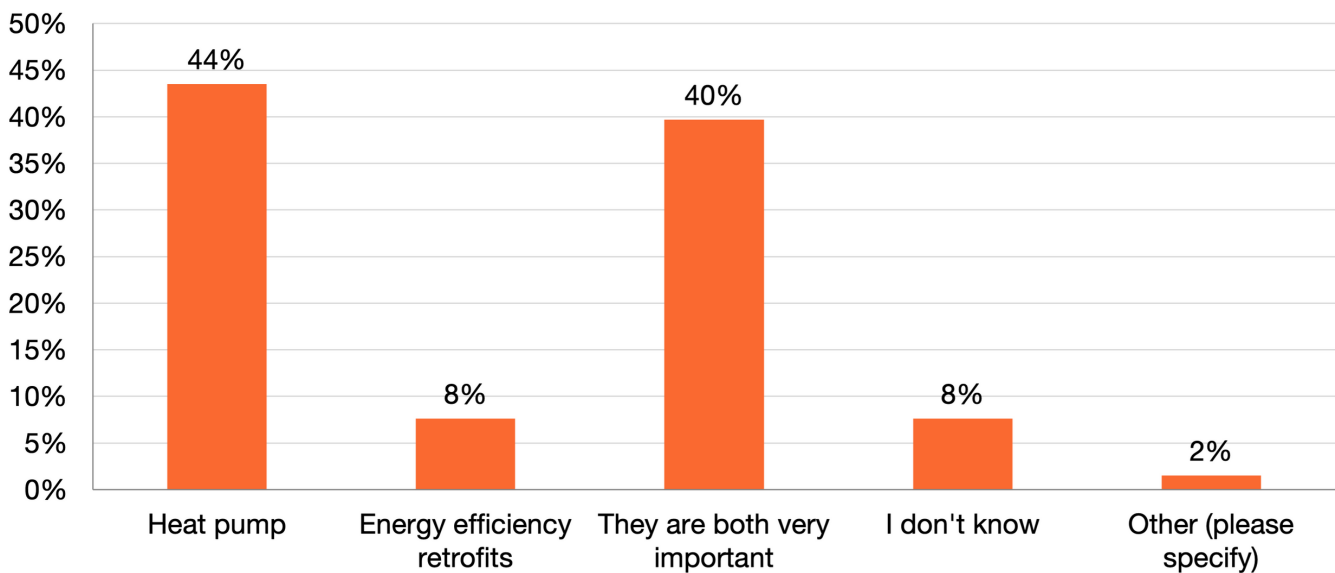
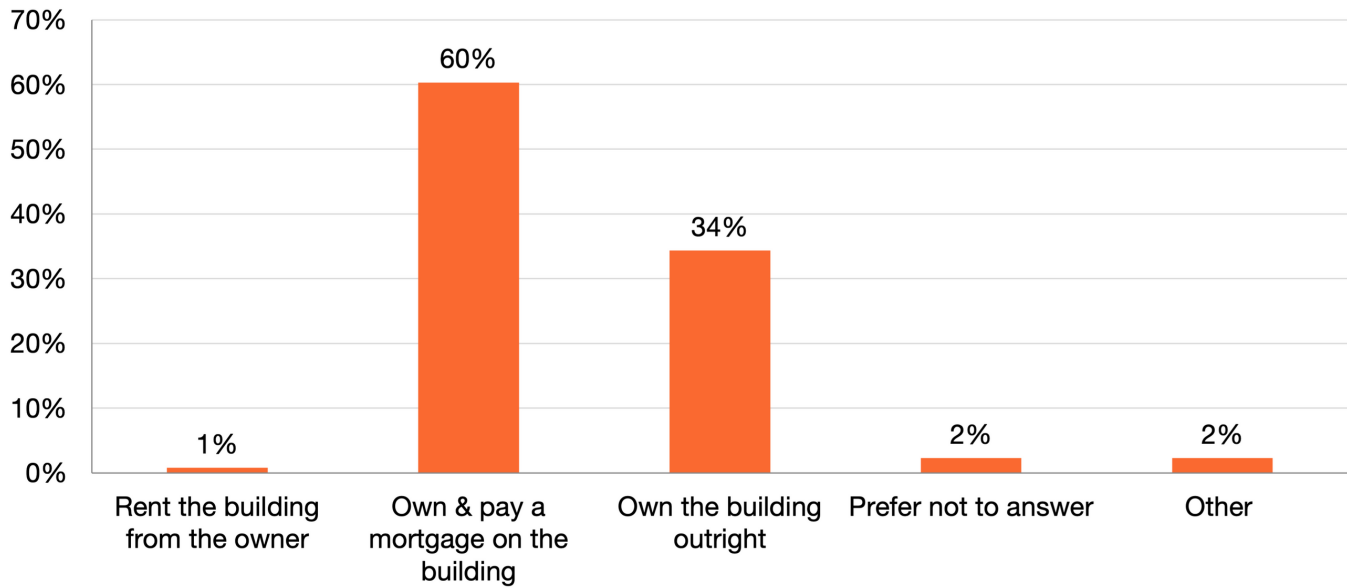


Figure 52: Please select the option that best describes the building's ownership status. I or my organization:



Appendix C: Strategies to Promote Equity and Inclusion

The impacts of a changing climate have been shown to disproportionately impact low-income communities and communities of color.⁹ Communities of color in the United States have a 24-27 percent higher energy burden, which refers to the percentage of a household's income that is spent on their home energy bill.¹⁰ These communities are also less likely to have clean energy technology. A 2019 study compared the amount of rooftop solar units installed in census districts with the same median household income. The study found that Black-majority and Hispanic-majority neighborhoods have respectively 69 percent and 30 percent less rooftop solar installed when compared to neighborhoods with no racial majority. In contrast, white-majority neighborhoods have 21 percent more rooftop solar installed than neighborhoods with no racial majority.¹¹

Clean energy campaigns are an effective way to increase clean energy technology in a given community. However, Alaska's solarize campaigns and other clean energy campaigns have found additional work is essential to effectively engage low and moderate income households and households of color.¹² Prioritizing equity from the very beginning and implementing strategies to address barriers is critical to ensure that a campaign is not exacerbating existing inequalities.

Although the top barrier to installing energy efficiency or renewable energy technologies is often the initial financial burden, there are many other factors that contribute to its inaccessibility. The following are some examples of these hurdles:

- Disparities in homeownership
- Local regulatory barriers
- Lack of infrastructure to support clean energy retrofits
- Public awareness and information barriers (such as language barriers and information formats inaccessible to those with disabilities)
- Lack of experienced professionals in a given area
- Limited time available (outside of school, employment, family or caregiver responsibilities)
- Lack of access to resources such as reliable internet^{10,12}

It is important to thoroughly understand what specific barriers might be present in the community of focus for an energy campaign or program, and structure the campaign to address them so that all groups feel able to participate.

⁹ Reidmiller, D.R., C.W. Avery, D.R. Easterling, K.E. Kunkel, K.L.M. Lewis, T.K. Maycock, and B.C. Stewart. (2018) USGCRP: Impacts, Risks, and Adaptation in the United States: Fourth National Climate Assessment, Volume II. U.S. Global Change Research Program, Washington, DC, USA, 1515 pp.

¹⁰ Shaver, Lacey & Shea, Ryan. Solarize Campaigns: Helping Communities of Color Access Rooftop Solar. RMI. July 28, 2020.

¹¹ Sunter, D.A., Castellanos, S. & Kammen, D.M. (2019) Disparities in rooftop photovoltaics deployment in the United States by race and ethnicity. *Nat Sustain* 2, 71–76 . <https://doi.org/10.1038/s41893-018-0204-z>

¹² Bollinger, B., & Gillingham, K. (2020) Wherever the Sun Shines. Yale School of the Environment. Retrieved from <https://environment.yale.edu/news/article/wherever-the-sun-shines-bringing-solar-to-low-and-middleincome-communities>.

There is no single metric that can report the equity of a particular energy campaign or program. Instead, it involves a multi-faceted approach that looks at different aspects of the project. There are four separate components that must be considered and analyzed to develop an understanding of the project's equity and ensure it is accessible to all. These components are described below, based on a compilation of several sources, and consider equity and participation in the context of an energy campaign such as Thermalize:^{13,14}

Groundwork Equity – This type of equity involves forming a deep understanding of historical disparities and how that has shaped modern equity issues present in the community today. This will help inform the populations that the campaign should center and what should be considered when planning the campaign. It will also allow for a better understanding of the impact the campaign has had on the equity of the region when looking at the long-term equity.

When looking at the history of inequity in an area, energy campaign planners should consider if and how different groups have been treated throughout history, if certain groups have been marginalized, if there are perceived injustices, and how this past has informed relationships today. It is also important to consider if there have been past energy campaigns or programs.

After forming an understanding of the past, planners can move on to analyzing the current state of energy equity in the community and how that might influence the program structure. The assessment might include looking at the current demographics of the area, the energy burden of different populations, and what current discrepancies exist. This information can help program planners structure the energy campaign or program in a way that can reach and center groups with the highest energy burden.

Planning Equity – Planning equity concerns the process of preparing the clean energy campaign and ensuring that planners listen to and consider communities experiencing energy burden when structuring outreach and recruitment. Important considerations during planning include: if marginalized groups were able to attend any planning meetings or if barriers existed regarding the time, childcare, or access to the invitation; if the campaign targeted those with high energy burden; if program or campaign leadership included members from diverse communities; the priority of the campaign or program; and if the campaign or program aimed to create benefits for all communities. Planners should also consider benefits or harms outside of the energy sector from program activities, and if there might be bias in the outreach materials. Finally, it is important to realize that planning equity can be improved as planners consider new information and make changes rather than simply waiting for hindsight after the campaign ends.

Distributional Equity – This type of equity concerns how the energy campaign is carried out and how the technology is distributed. Throughout the program, it must be ensured that all the communities are being reached and provided the resources they need. This includes providing extra assistance to groups that may face added barriers. Considerations for this type of equity include: if energy-burdened communities are

¹³ Martín, Carlos, and Jamal Lewis. The State of Equity Measurement.

¹⁴ Romero-Lankao, Patricia, and Erin Nobler. (2021) "Energy Justice: Key Concepts and Metrics Relevant to EERE Transportation Projects." Renewable Energy, <https://afdc.energy.gov/files/pdfs/energy-justice-key-concepts.pdf>.

participating in the campaign process and feeling supported as they do so; if financial support is being provided to lower the participation barrier for low-income households; if all participants can understand educational materials; and if there is a trend in the populations that finish the complete program versus dropping out during the process. Similarly to the planning stage, the staff of an energy campaign or program should constantly pay attention to these considerations and be willing and ready to adapt the program to better suit all groups.

Long-Term Equity – This type of equity refers to the importance of continuing to monitor the impacts of the clean energy campaign to track if outcomes are different for different demographics and if outcomes match project goals. Outcomes can include energy savings, money savings, increased health or comfort in the home, and more. While some outcomes can be measured quantitatively, other more qualitative measures require staying in contact with participants to learn how they were affected.

All four types of equity must be assessed to understand the equity of the entire program and if participation was open to all. Community engagement is essential for planning and assessing an energy program as it leads to a sense of trust and legitimacy with the community and ensures that energy programs understand and can meet local needs. The four types of equity can be translated into steps a campaign can take to increase equity and participation. Program staff can carefully consider each type of equity and work to build an understanding of the community they are working with, establish trust with that community, and ultimately create a sense of belonging for everyone to participate in the program or campaign and feel comfortable recruiting their friends and neighbors.