Cranbrook Environmental Survey – Results and Analysis

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Introduction

In 2022, the City of Cranbrook (City) joined the Agents of Change Project, which was a collaboration and funding agreement with ICLEI Canada. The Agents of Change Project provided support to local governments across Canada in building local volunteer programs that addressed climate change adaptation and mitigation measures that supported Community Climate Action Plans. Local governments such as Cranbrook have the authority to set regulations and policy in support of the Community Climate Action Plan, but volunteers do not, so City of Cranbrook Staff (Staff) determined that the most effective application of a volunteer program is community-based outreach. Staff at the City identified that organizations already existed in Cranbrook with a similar scope, and sought to collaborate with these organizations to ensure a good coordination of efforts, and to gain from the experience in managing volunteer organizations. The community groups involved in this initiative include East Kootenay Climate Hub, Wildsight Kimberley/Cranbrook, Columbia Outdoor School, Columbia Basin Environmental Education Network, and Rocky Mountain Naturalists.

Meeting with the community groups identified some key barriers to successful implementation of the community climate action plan, and also identified that there was a need to understand still what some of the local barriers are in Cranbrook to reducing individuals greenhouse gas emissions. One key barrier identified to outreach efforts is that there has been an erosion of trust in information provided by governments, so community-based outreach efforts could be more effective than outreach provided directly from City communications and media. Staff will continue to communicate via official City channels in conjunction with community-based efforts, and building trust from the community remains an important priority. Another barrier identified is that efforts do exist from a number of groups to perform outreach activities, but these efforts are poorly coordinated and there is very limited collaboration. Developing a network for community organizations, helping to coordinate these organizations, and providing a central, local resource for information that organizations could refer to was agreed to be the most effective use of volunteers and of the funding provided to the project from ICLEI and the City. Work has already been put into developing this network, called “Sustainable Cranbrook”.

Some of the possible barriers identified to individuals’ reduction of greenhouse gas emissions include beliefs and attitudes about climate change, hope or belief about making a difference as an individual, knowledge about measures that could make a difference, and comfort with new and constantly evolving

technologies that reduce greenhouse gas emissions. A survey was developed and administered in Cranbrook that probed these potential barriers. This report outlines the results and the analysis of the survey.

Methods

For the purpose of minimizing the time required by staff to analyze and interpret the data, surveys were run using an online platform only, and used only multiple-choice type questions. Some multiple-choice questions provided an "Other" option for respondents to type in their own answers. The survey did not ask every question to every respondent of the survey. Some questions were only displayed to respondents depending on their answer to the previous question; this was used for cases where a certain response would render their next response irrelevant or of no value. For example, respondents were not asked to select what were barriers to electric vehicle ownership for them if they had indicated earlier that they already drove an electric vehicle. Lists with multiple selections had the order randomized for each respondent to prevent a preference for any selection based on its location in the list.

Responses were analyzed for correlations between the answers of one question to that of another. "Other" responses were manually reviewed, and if they were reasonably similar to an existing option for the question, the response was counted towards that option. Inappropriate "Other" responses, or those not relevant to the question were not counted as a response.

The survey was run for limited times at specific locations, which included the Farmer's Market, College of the Rockies, and City of Cranbrook (staff). These surveys were not run simultaneously, and some small modifications had been made to the survey, where deemed beneficial, between the different administrations of it. The Farmer's Market survey administration was run in conjunction with a pilot community outreach activity, and a tablet was available for participants to use for the survey. The in-person presence for this survey provided the opportunity to observe some potential issues and opportunities in administering the survey.

Participation was incentivized by prize draws for gift cards. The incentivization was to increase the number or responses, but also to reduce the probability of introducing a selection bias based on who would be interested in taking an environmental survey without incentivization. The survey collected no personal information, and efforts were made to disconnect the names gathered for the prize draw from the information entered into the survey to ensure anonymity. The purpose of the anonymity was to discourage respondents from selecting responses based on how it would reflect on them, instead of how they actually feel.

Results and Discussion

Results presented have been aggregated from the different survey administrations.

Demographics

Demographics were collected to identify any correlations that may exist in the response patterns from certain groups. Any such correlations that have been identified have been presented with the discussion for the survey question it pertains to. Figure 1 shows the demographics that were collected.

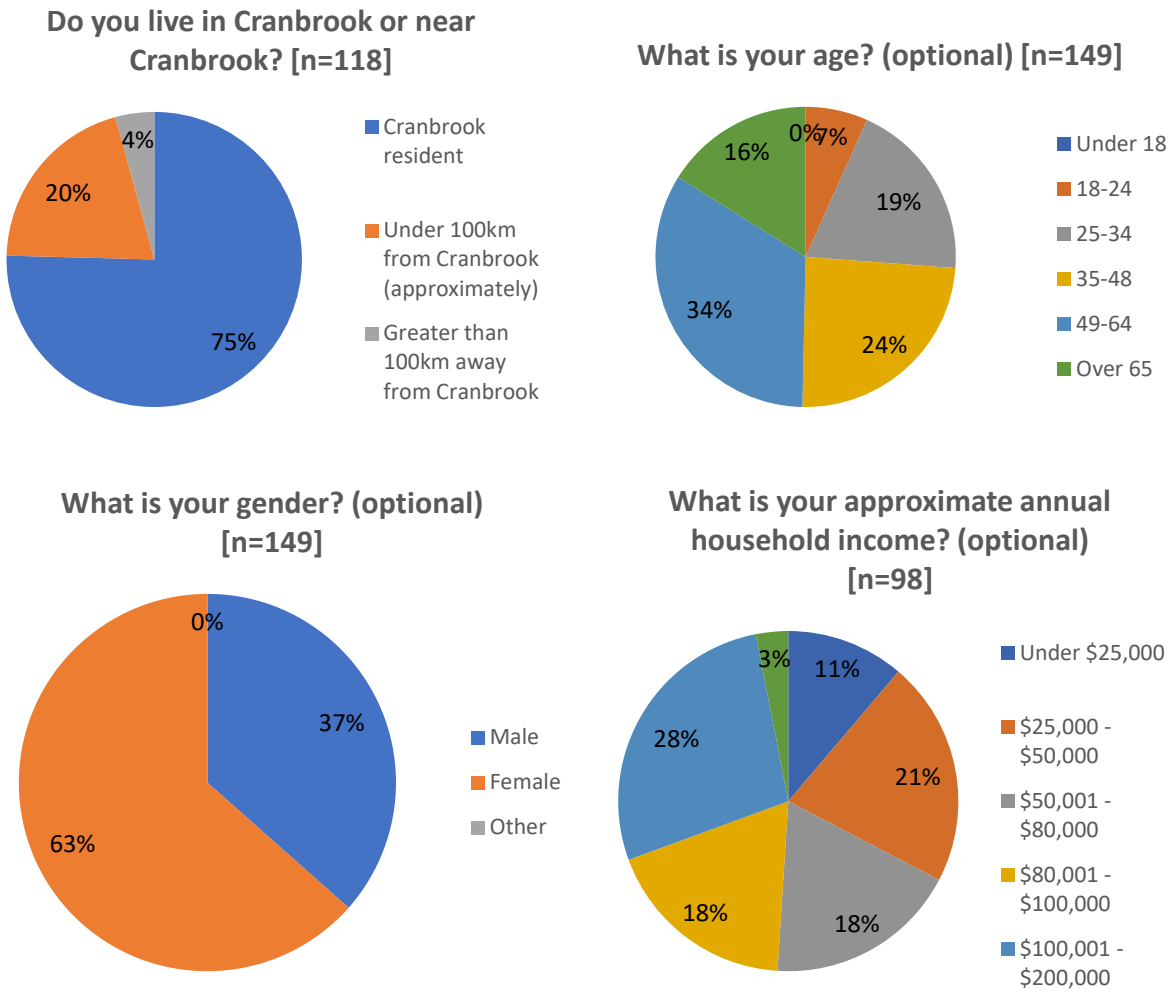

Figure 1: Demographic data collected from survey

Demographic data collected in the survey was compared to demographic data from Statistics Canada. Income represented well what was expected in Cranbrook. A disproportionate number of respondents were female; the exact cause for this isn't known. More data is necessary for people over 65 and people under 18.

Climate Change

Respondents were asked questions about their observations, attitudes and beliefs about climate change. One question requested respondents to share what they have observed around Cranbrook,

shown in Figure 2, and four other questions asked directly what respondents felt and believed about climate change, shown in Figure 3.

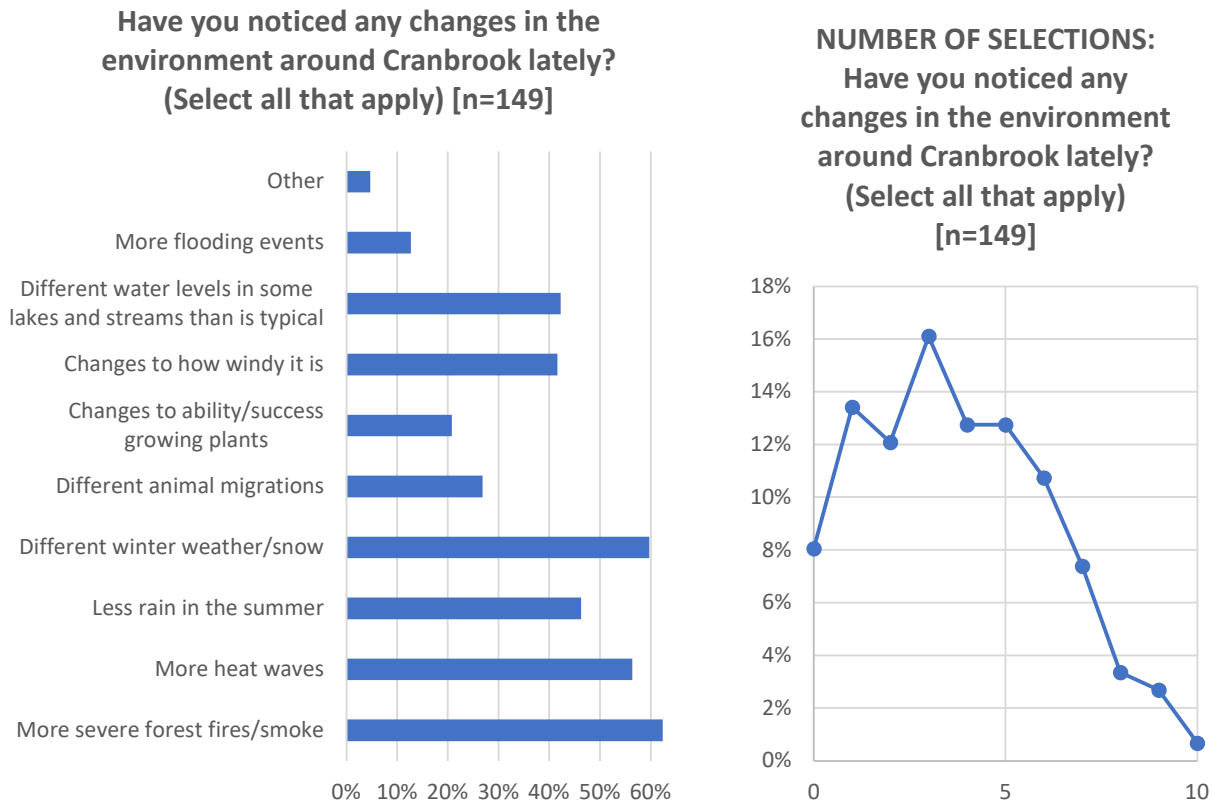

Figure 2: Climate observations around Cranbrook collected from survey are shown on the left, and the distribution of the number of observations selected is shown on the right.

Respondents identified an average of 3.7 changes to the environment around Cranbrook. The number of observations being reported exceeded what had been expected. The data indicates that a majority of people in Cranbrook are seeing or believe they are seeing climate change locally, and that climate change is not just a phenomenon happening somewhere else. A connection was identified between the number of observations entered, and the response provided to the question “Are you worried that climate change could negatively affect your life?”: respondents that believed more strongly that climate change was having effects selected the most number of observations. All respondents that entered “Climate change isn’t happening” reported no observations. It is not known at this time whether lesser observations leads to a lesser impression that climate change is having an impact, or if the belief that climate change is having a lesser impact is causing respondents not to observe or recognize changes.

A total of 94% of respondents identified that they believed climate change was happening, and 88% believed that it is caused by human activities. 71% of respondents believed that climate change is already having a negative impact on them. While only 62% of repondents believed they could make a difference as an individual in reducing the impact of climate change, 95% indicated that if they knew they could make a difference they would want to. From the perspective of public outreach and education, this data indicates that a focus on demonstrating what actions can be taken and how much

of an impact these actions may have a positive effect towards achieving the goals of the Community Climate Action Plan, wheras outreach efforts focusing on convincing people that climate change is real and human caused may not be the most effective focus.

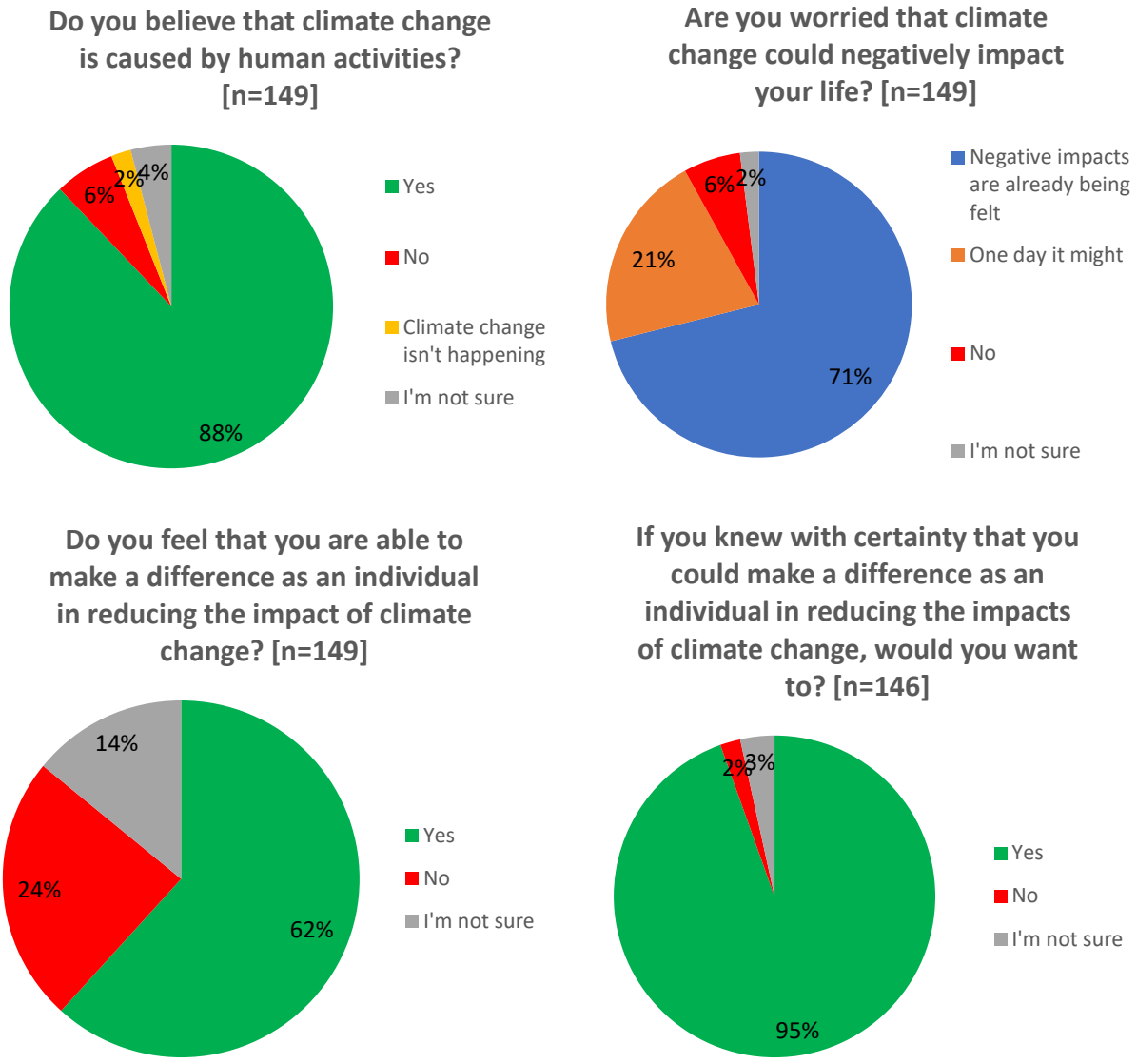

Figure 3: Beliefs and attitudes towards climate change in Cranbrook

A correlation was identified between whether respondents felt that they were able to make a difference as an individual, and the age of the respondent: as age increased, so did the belief that individuals could make a difference. One possible explanation for this could be that financial resources tend to increase with age. No correlation could be found between income and the feeling that an individual could make a difference, however, drawing from savings during retirement may not be considered to be income by respondents, so it was not possible to fully assess the financial situation of respondents.

Home Heating

Heat pumps are currently the most effective technology for producing affordable and clean home heating, so understanding how to support people in Cranbrook with outreach about heat pumps is important for achieving the goals of the Community Climate Action Plan. Respondents were asked about their knowledge about heat pumps and how they believed heat pumps would compare to natural gas heat. Figure 4 shows the responses to the home heating questions.

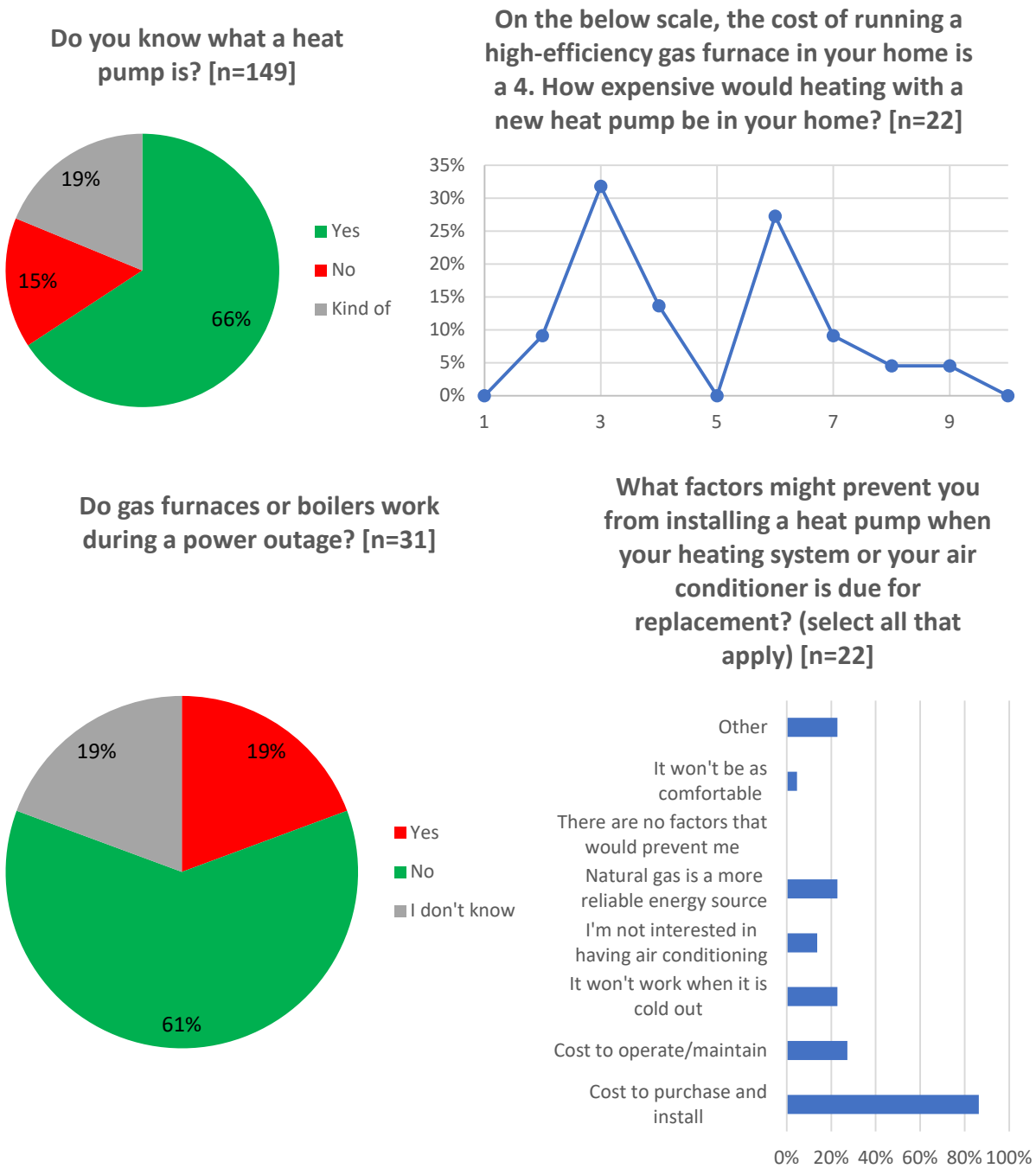

Figure 4: Knowledge about gas and heat pump heating systems

Initial surveys asked only if respondents knew what a heat pump is. The responses initially indicated a good understanding of heat pumps, however heat pumps are technically complicated to fully understand and this was not the expected result; this question may only demonstrated a very basic understanding. In the most recent administration of the survey, additional questions were asked of respondents to test their understanding of heating systems, and also identify barriers to installing heat pumps. The sample size of the additional questions is small at this time so only limited and preliminary observations can be reliably drawn from the data. Correlations between responses to these questions to demographics or the response to other questions could not be made at this time.

Respondents that indicated they understood what a heat pump was were asked how much it would cost to operate, and what might hold them back from installing a heat pump. 41% of respondents indicated that heat pumps would cost less to operate than natural gas, 14% indicated that the operating cost would be equal, 36% indicated that they would cost more than natural gas but less than double, and 9% indicated that they would cost double or more. Pinning a specific correct number to this question is challenging, but an average heat pump in a cold-weather climate like Cranbrook would see reduced operating costs. The large variety in responses suggests that many people who think they understand heat pumps likely do not understand them well. The main reason, and by a large margin, that respondents indicated they may not want to install a heat pump was the cost to purchase and install. Rebates for heat pumps are substantial, and at the time of writing are as much as $11,000 when stacked. On top of the rebates, gas-fired equipment is subject to additional taxes whereas heat pumps are subject to additional tax exemptions in BC. Technology in heat pumps has been improving rapidly, particularly for cold climates, like Cranbrook, so it is hypothesized that outdated information which persists online and with some local contractors is the cause of confusion. Outreach that focuses on heat pumps may be beneficial.

It was hypothesized that natural gas may be perceived as more reliable than electricity for heating, so respondents were also asked about whether gas heating systems work during a power outage. Systems that would actually work to heat an entire home in a power outage are very outdated and extremely rare. Heating systems that have pilot lights instead of electronic ignition have not met energy standards for over a decade; even for systems that do have pilot lights, boilers require pumps, furnaces require fans, and almost every thermostat for gas appliances requires 24VAC and will not be powered by the lower voltage DC battery backup intended to maintain the clock and programming. 39% of respondents believed that their gas appliance would work or were not sure. Helping people in Cranbrook understand that their natural gas system is no more reliable than an electric system may help to reduce the resistance to switching energy source.

Transportation

The two main methods that people in Cranbrook can use to reduce greenhouse gas emissions associated with transportation are by changing modes of transportation from single occupant vehicle, and changing the energy type for vehicles to electric. Respondents were asked about their barriers to driving electric vehicles or riding a bicycle to work. Figure 5 shows the responses to the transportation questions.

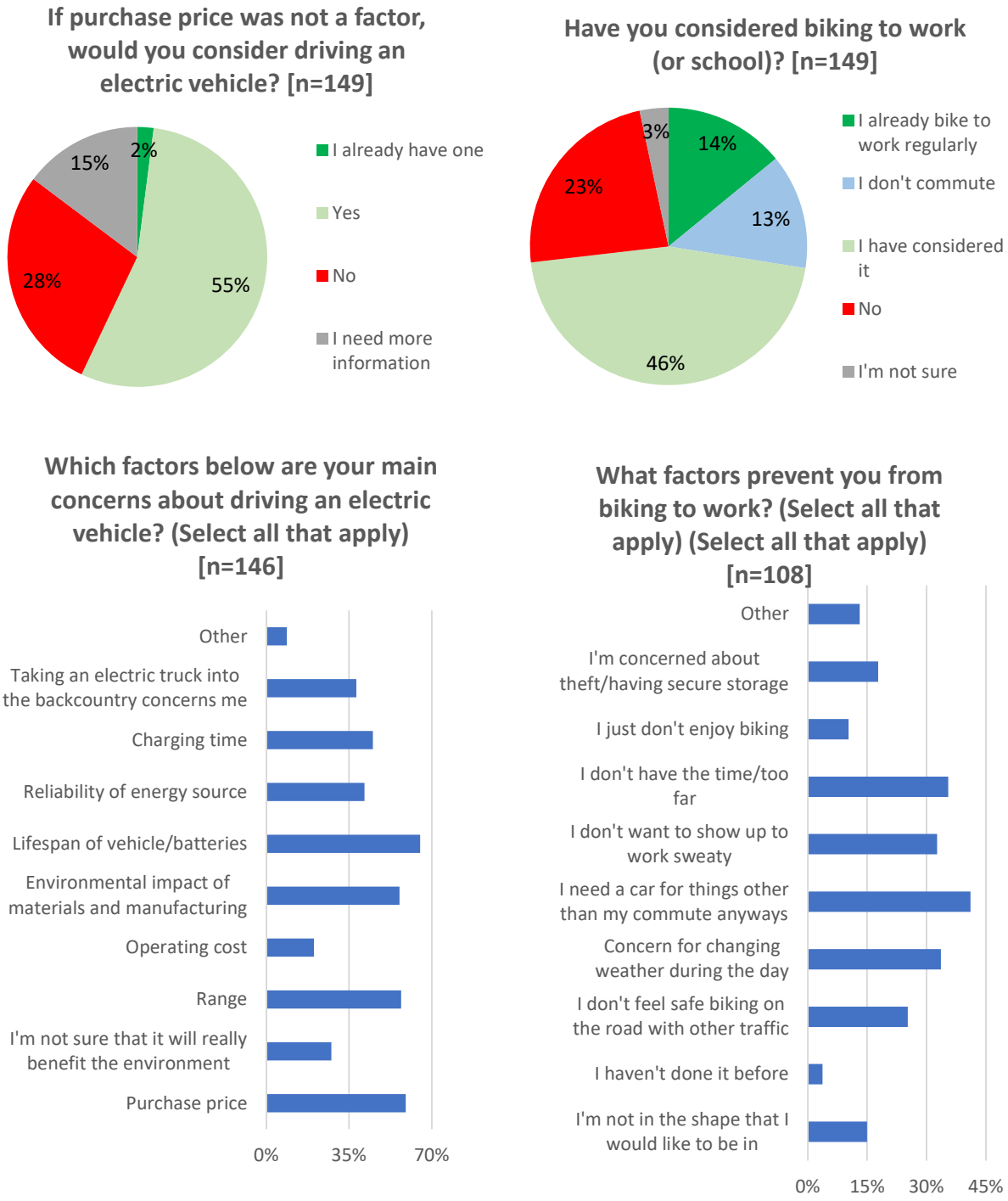

Figure 5: Barriers to cycling and electric vehicle adoption

The survey question about whether respondents would consider driving an electric vehicle specifically asked "if purchase price was not a factor" in order to try to eliminate economics as a factor, and better be able to connect responses to other questions about attitudes and beliefs. Respondents that indicated climate change was caused by human activities, or that negative impacts of climate change were already being felt in their life were more likely to indicate that they would consider driving an electric vehicle.

Whether respondents felt they could make a difference as an individual in reducing the negative impacts of climate change did not impact how likely they were to consider driving an electric vehicle. This indicates that outreach efforts focused on promoting that climate change is real and having an impact would potentially improve electric vehicle adoption more than actually indicating that taking action as an individual even makes a difference. This was not the expected result from the survey.

No correlation could be made between the attitudes and beliefs towards climate change and any specific objection to driving an electric vehicle, or to the number of objections selected. Female respondents selected 22% more objections to electric vehicles than male respondents. Respondents indicating that they would consider driving an electric vehicle selected an average of 3.4 objections, whereas respondents indicating that they would not consider driving an electric vehicle selected an average of 4.5 objections. This data indicates that a lack of information or misinformation specific to electric vehicles is unrelated to an individual's climate beliefs, and that people may be swayed towards considering an electric vehicle by overcoming as little as one of their objections about them. Outreach efforts focused on providing accessible and high-quality information specifically about electric vehicles would likely have a greater effect in promoting the adoption of electric vehicles than any efforts to promote climate change awareness.

The most common barrier selected for cycling to work was needing a car for other things. This specific barrier is difficult to overcome by outreach, as a number of people need a vehicle for work purposes or for transporting children. Some needs for vehicles may only be a perceived need, but this is challenging to determine. The second most common barrier was that the commute would take too long or was too far away. The primary barriers to cycling would be overcome by good community planning more than individual action. Community planning is a long-term process that is outside of the scope of an outreach program. Any outreach effort for cycling would have to focus on the factors most controllable by an individual, which were the least selected responses.

Analysis of the "Other" responses indicated that these questions were narrow by asking about only cycling instead of all forms of active transportation. Statistics Canada data confirms that there are greater than 9 times as many people that walk to work compared to cycling to work in Cranbrook. This question will be posed more broadly in future survey administrations to better encompass all forms of active transportation. There may be a greater opportunity to promote walking than cycling.

Surveys asked no questions about carpooling or bussing, as these were expected to have the least impact for outreach efforts. The number of questions in the survey were limited to maintain a reasonable length of time for the respondents. As more data is collected, some questions may be found to be of no further value; questions about carpooling and bussing may be considered for inclusion at such times.

Waste Reduction

Respondents were asked about their knowledge about the impact of waste reduction. Figure 6 shows the responses to waste reduction questions.

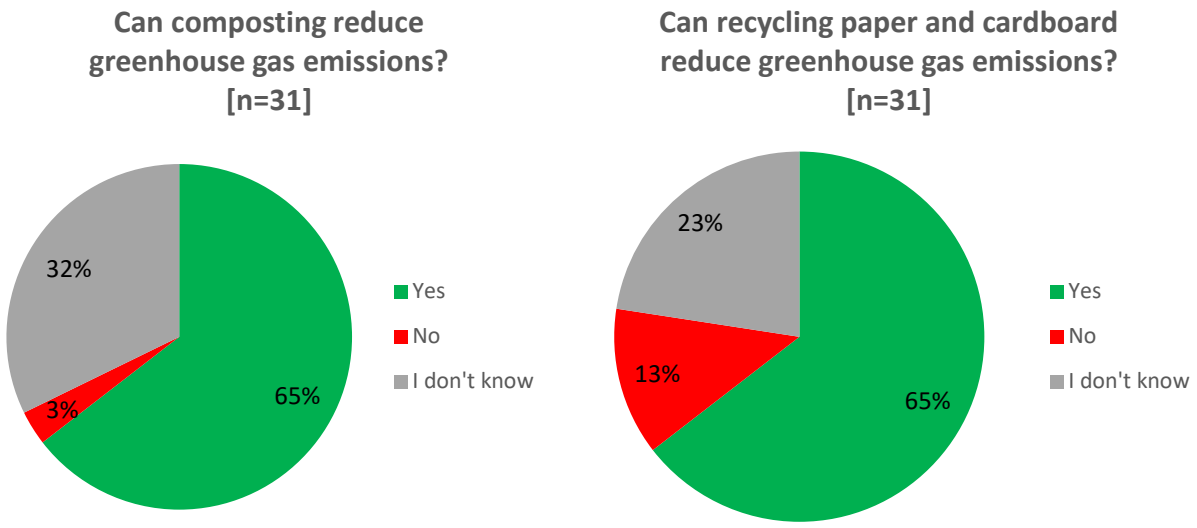

Figure 6: Knowledge about greenhouse gases directly associated with solid waste

Nearly two thirds of respondents correctly answered that recycling and composting reduces greenhouse gas emissions. The impact of direct greenhouse gas emissions from solid waste is small in Cranbrook when compared to transportation and buildings, but the knowledge is easier to present than more technically complicated things like heat pumps and electric vehicles. Education in this area could positively impact the utilization of the existing curbside recycling program, and would also benefit a curbside organics collection program if the City begins such a program in the future.

The sample size for the waste reduction questions is small because the questions were modified for the survey that was administered most recently. The original question unintentionally primed the respondents to answer a certain way, so that data was discarded. More conclusions can be drawn from a larger data set in the future.

Other considerations

A common concern that Staff has heard about switching to electric energy is that there will not be enough of it. Respondents were asked whether they believed there would be enough electricity to replace fossil fuels in order to determine how common this concern is, and these responses are shown in Figure 7. Only one third of respondents believed that there would be enough electricity. The question about whether there would be enough electricity was intentionally asked earlier in the survey than the question about whether respondents thought they could make a difference as an individual, however 62% still indicated that they believed they could make a difference as an individual. It is not known at this time exactly how people think they are going to make an impact while needing fossil fuels. A question may be added for future surveys to try and clarify this.

A correlation was identified between the responses to whether there would be enough electricity and the likelihood of considering an electric vehicle: 78% of respondents indicating that they believed there would be enough electricity also indicated that they would consider driving an electric vehicle, whereas 45% of respondents indicating that they believed there would not be enough electricity indicated that they would consider driving an electric vehicle. No correlation could be identified between whether respondents thought they could make a difference as an individual against climate change and whether they would consider driving an electric vehicle. This data indicates that the concern for the amount of electricity is likely a technical concern about how a lack of energy could render their electric vehicle inoperable due to shortages, and not a concern about whether any difference is made to mitigating climate change. While data does not exist yet to connect the belief of energy availability to considering heat pumps, it is expected that the same correlation would exist.

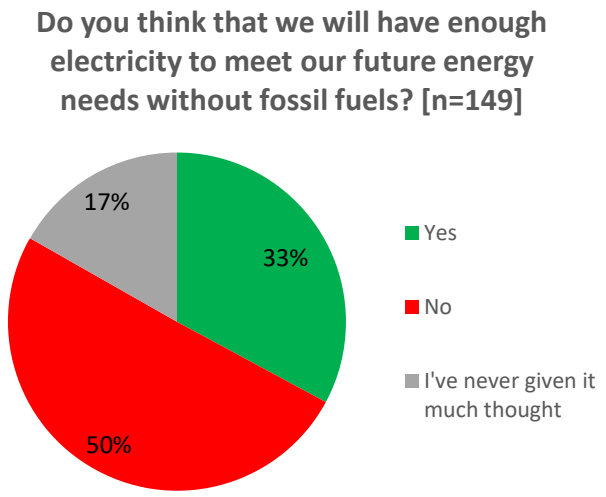

Figure 7: Beliefs about the availability of electricity in BC

Conclusions

Overall, the survey highlighted the importance of addressing specific concerns about how new electrification technologies specifically impacted people's lives. There is a weak connection and much lesser importance to addressing whether climate change is real, or whether doing anything as an individual actually makes a difference. This will be the primary focus of community-based outreach efforts. Changing the beliefs of an individual is much more difficult than improving the knowledge of an individual, so outreach efforts supporting the implementation of the community climate action plan may not be as much of a struggle as initially anticipated. Future survey administrations will make some improvements to the questions, and will be a good tool to track any shifts in the adoption rates of things that will reduce greenhouse gas emissions.

There may be benefit to incorporating more questions relating to climate change adaptation. Less than two thirds of respondents were aware that their heating system would not work during a power outage, and this is only one aspect of emergency preparedness, which is only one aspect of climate change adaptation.