Prepared by:
Dr. Jill Bueddefeld

Executive Summary

Impact Report for the E3 Energy Efficiency Workshop Series

"Sense of community building - in that you're not alone in this... The lightbulb is going on and we're not alone in this. These workshops help to overcome that"
- Workshop Attendee

Hosted by the Biosphere Institute of the Bow Valley, the Energy Efficiency Education (E3) Workshop Series invited residents from the town of Canmore, Alberta to attend a series of in person workshops on residential energy efficiency solutions. The purpose of the workshop series was to increase knowledge about residential energy options, and to lead to participants taking specific action to improve their homes' energy efficiency.

Workshop 1: Residential Renewable Energy Solutions
(February 20, 2020)

Workshop 2: Efficient Heating and Cooling for your Home
(March 5, 2020)

Workshop 3: Energy Efficient Financial Solutions
(March 26 - online webinar)

The workshops were hosted at the Canmore Civic Centre until the start of the Covid-19 pandemic. The last workshop was converted to an online webinar.

01 Research Design

This research consisted of a **mixed-methods pre-post research design,** which is used when participant numbers are uncertain and the use of surveys alone may not be sufficiently informative. Participants were invited to complete an **online survey** immediately before the workshop and then sent a follow-up survey 2-3 months later, which they completed online.

A sub-sample of participants were invited to also complete a brainstorming activity, called a **personal meaning map,** immediately before and after the in-person workshop in order to gain a more complete understanding of what was learned from the series.

*The final workshop was hosted online as a webinar due to COVID-19. Hence, the study design was adapted to invite participants in the final workshop to complete the survey online only.

02 Workshop Participation

Pre-Workshop
Survey: N = 49 participants
Meaning Map: N = 21 participants

Post-Workshop:
Survey: N = 36 participants
Meaning Map: N = 15 participants

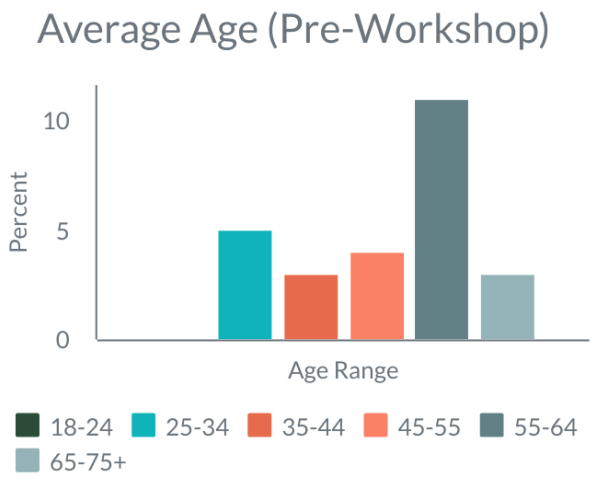
Workshop Attendance:
Workshop 1: 45 people
Online Views: 34

Workshop 2: 38 people
Online Views: 45

Online Workshop: 18 people
Online Views: 75

Participant Demographics

The average age range of pre-workshop survey participants was 55-64, which varied from the follow-up survey participants, where the average age range was 25-34. Low response rates for this question may have skewed the age range.



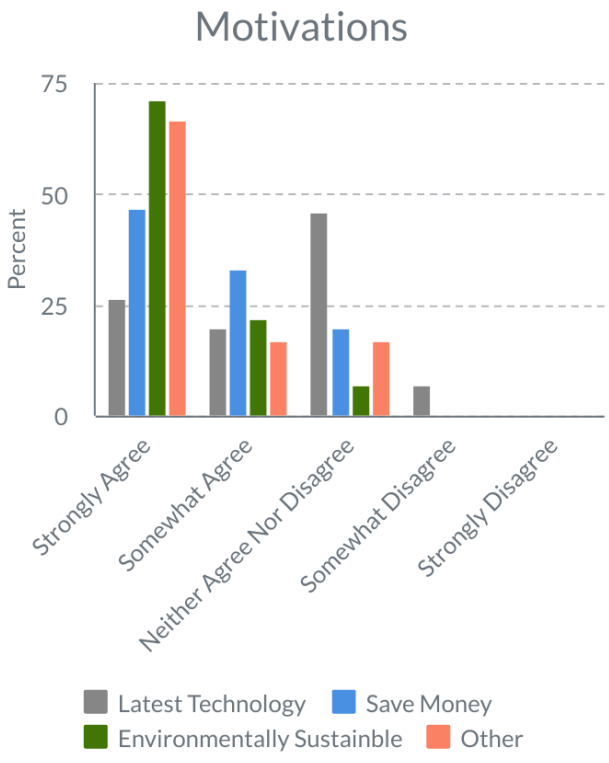
Only the age range demographic variables were notably different between the pre- and post-workshop survey responses. Since survey respondents had to attend a workshop in order to complete the follow-up survey, the data is still representative of the total population of workshop attendees.

The majority of all participants were highly educated, with 35% having obtained a Bachelor's degree and an additional 33% having obtained a Master's degree as well.

Participants were primarily working as paid employees (51%) or were self-employed (25%). The average reported household income was **$97,068 - $150,472.**

Motivation to Learn

Participants were asked "why are you interested in learning more about energy efficiency?"



The majority of respondents indicated that they were interested in learning more about residential energy efficiency **in order to become more environmentally sustainable.**

#2 Efficient Heating and Cooling

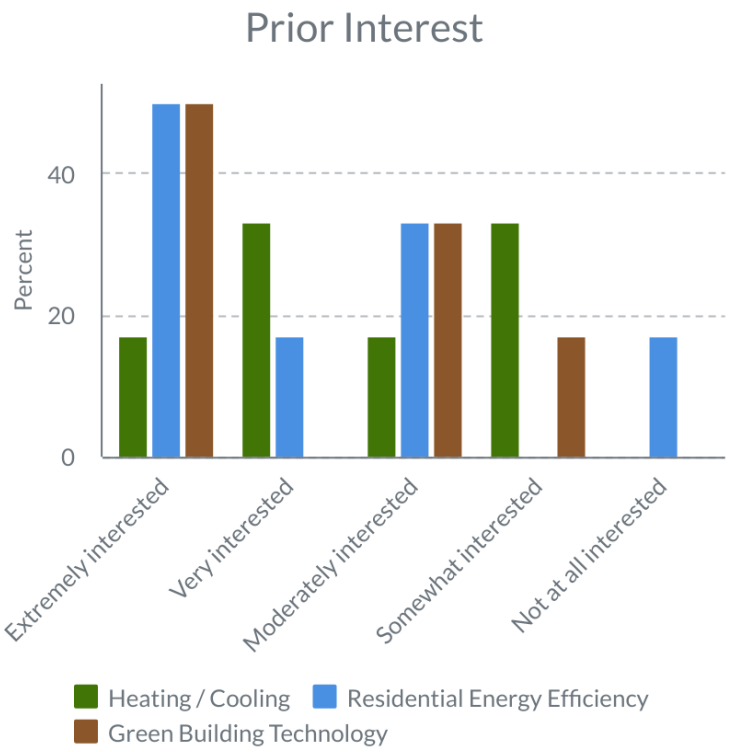
To measure the impact of behaviour change, prior to the workshop participants were asked if they have already used heating or cooling strategies, made efforts to make their home more energy efficient, or if they have used green building technologies.

These results indicate that the workshop audience was already highly engaged and motivated to seek out energy efficient solutions.

Prior Interest and Knowledge

Prior interest and engagement was measured by asking participants to identify how interested they were in the main topics relating to the workshop on efficient heating and cooling.

The responses were more widely distributed for this workshop, where **half of the participants were extremely interested in green building technologies and residential energy efficiency.** The rest of the responses were evenly distributed across topics. **There was notably less pre-workshop interest in passive heating and cooling strategies.**

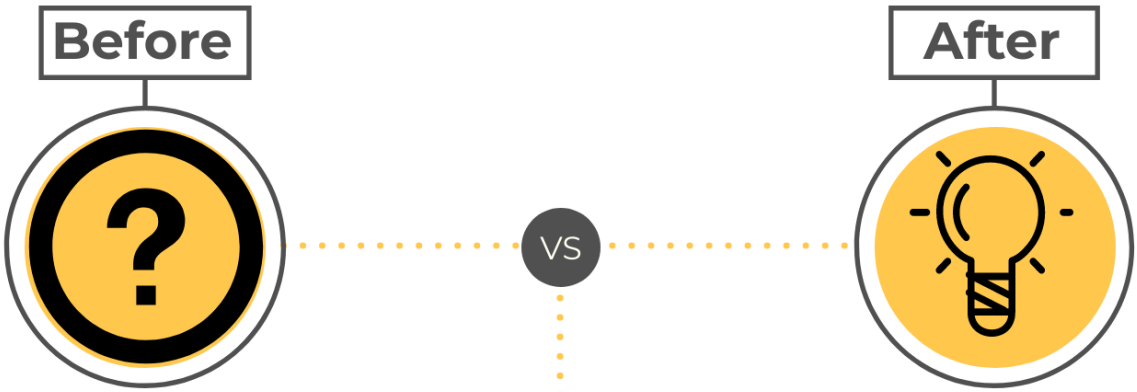


Despite high prior interest and engagement, participants claimed to be only '**moderately knowledgeable' about residential energy efficiency and green building technologies.**

Prior knowledge was the lowest for heating and cooling, where the majority of respondents claimed to be only 'somewhat knowledgeable'.

Knowledge Change: Efficient Heating and Cooling

Participants were asked specific knowledge based details that related to the main objectives of the workshop. **The average responses are presented below**. Responses with a ✓ indicate that the difference between the responses before and after the workshop are statistically significant.



Reduce Energy

Identify 2 ways you can reduce energy consumption?

Before Response: Probably Yes

After Response: Probably Yes

Passive House

List the 5 main principles of passive house design.

Before Response: Maybe

After Response: Maybe

Efficiency

Identify 2 ways to increase the energy efficiency of a pre-existing building.

Before Response: Probably Yes

After Response: Probably Yes

High Performance

Identify 2 common high performance energy efficiency systems.

Before Response: Probably Yes

After Response: Maybe ✓

Envelope

Describe how upgrading the thermal performance of the envelope of your home affects mechanical systems.

Before Response: Probably Not

After Response: Maybe ✓

Barriers: Efficient Heating and Cooling

Nearly all of the barriers identified in the pre-workshop survey were addressed through the workshop, with the exception of the cost of taking action. This means that the workshop was effective at teaching participants how to begin, knowing what actions are effective and make a difference and making them feel more confident that their actions would be supported by friends and family. **33% of participants stated that COVID-19 had prevented them from taking action.**

Barriers

Before

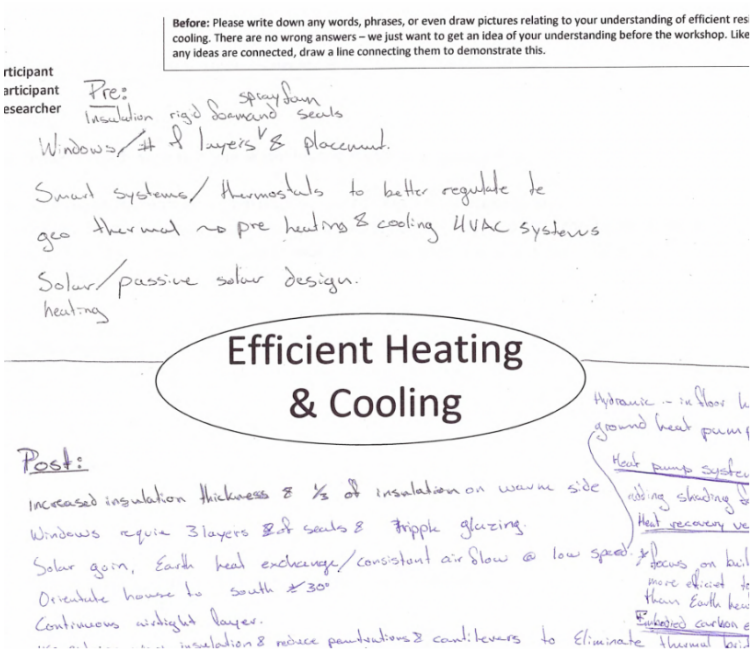
- I don't know where to begin (17%)
- I don't know what actions would be effective (15%)
- The necessary actions cost too much money (0%)
- I'm unsure if my actions will make a difference (17%)
- The necessary actions are too inconvenient or difficult (17%)
- The necessary actions would make my life less comfortable (0%)
- My friends or family won't support my actions (17%)
- My business partners won't support my actions (0%)
- Other (0%)

After

- I don't know where to begin (0%)
- I don't know what actions would be effective (0%)
- The necessary actions cost too much money (17%)
- I'm unsure if my actions will make a difference (0%)
- The necessary actions are too inconvenient or difficult (0%)
- The necessary actions would make my life less comfortable (0%)
- My friends or family won't support my actions (0%)
- My business partners won't support my actions (0%)
- Other (50%)
  Other restrictions related to renting or financial insecurity due to COVID-19.

COVID-19 IMPACT
The follow-up survey took place shortly after quarantine measures were instated. 33% of respondents indicated that COVID-19 had prevented them from taking action in relation to this workshop.

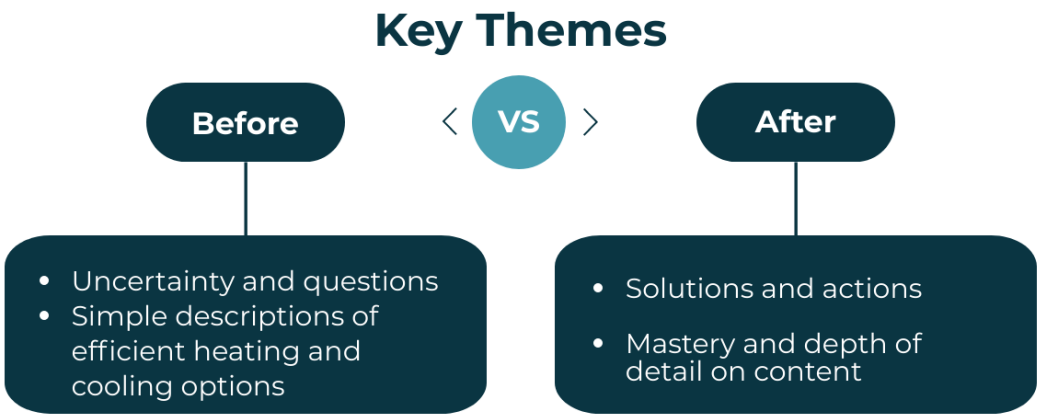
Personal Meaning Map Data



A sub-group of participants were invited to complete a personal meaning map (guided brainstorming activity) immediately before and after the workshops. Different colours of pen were used to identify what was written before and after the workshop.

Personal meaning maps are an effective tool for measuring a broad understanding of what a person learns from an experience. They account for an individual's prior knowledge and interests and provide insight into what they *know* and what is *important* to them, based on what they focus and elaborate on.

All of the personal meaning maps were coded in NVivo, using an inductive process to determine key themes of learning / understanding to compare responses **before and after the webinars.**



The data indicated that the key themes **before the webinar consisted of extensive knowledge about efficient heating and cooling systems**. The other dominant theme in the pre-workshop data was **uncertainty and questions.** Participants came into the workshop with specific questions they wanted to have answered.

After the webinar there was a notable shift to an emphasis on solutions and actions and an increase in the mastery and depth of understanding the content. The responses were more detailed, included more complex phrases and description of how the new knowledge would integrate in their lives. This finding demonstrates that this workshop was effective in providing knowledge to participants who were already well versed in the subject and gave them relevant answers to guide their next steps. This also supports the findings in the survey where attendees demonstrated a high degree of pre-workshop knowledge but had some uncertainty about where to begin or how effective their actions would be.

? Interpreting Findings

The results indicate that participants already had a high pre-workshop level of knowledge. **Significant changes in knowledge were observed for only 2 of the 5 learning objectives**.

The personal meaning map data supports this finding, but provides additional detail. The personal meaning maps indicated that the participants had a **very wide breadth and extent of knowledge about the topic before the workshop.** This suggests that there was a ceiling effect in place - where differences between measures are less noticeable, or less likely to be significantly different, due to high pre-workshop levels.

In general, there were very few barriers reported by the attendees after the workshop. The percentage differences are reported on page 6, as the number of responses was too low to be able to measure significance in a meaningful way. This being said, when comparing the comments and the qualitative data, it is clear that respondents saw far more barriers before the workshop.

Most notably, afterwards participants were no longer uncertain about where to begin and more certain that their actions would make a difference.

This finding is supported in the personal meaning map data which found a **distinct emphasis on solutions, action items, and next steps participants planned to take.**

Q: What action will you take?

The majority of participants responded that they planned to take some form of action after this workshop. The individuals who stated they would not take action described reasons such as currently renting and waiting to build a home. Below are a few quotations from participants:

Do you think you'll do anything differently after this presentation?

"Yes, once I go to build a home. Currently rent. I am in real estate and looking forward to passing this along to other realtors, clients, primarily homeowners - but anyone who's interested."

"Look at various options (not necessarily cheapest) to: improving ground floor insulation through extra insulation, and reducing the size of the patio door to reduce heat loss."

"Yes, order of improvements: maybe envelop our house first, then remove vinyl siding, add insulation and new exterior."

"Will look at heat recovery ventilation a little more closely for our new home. Increased insulation and 'thermal bridge free."

"Good on ya. The first step in creating change is to educate. Then, individuals have the information they need to determine if they want to change"

How did you hear about the workshops?

44%

Heard about the workshops from friends or colleagues.

31%

Heard about the workshops from a social media post.

14%

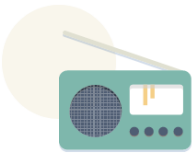
Learned about the workshops from an advertisement in a newspaper.

5%

Learned about the workshops from the SHIFT newsletter.

3%

Heard about the workshops on the radio.



? What would be the other most valuable experiences we could facilitate?

In general all of the open-ended feedback comments were positive, with only one comment that suggested the level of knowledge was not advanced enough.

When asked what other experiences would be valuable participants recommended the following:

- More workshops
- Hard copy summaries of all the companies and their main points
- 2.0 series of workshops that build on further knowledge
- Produce short, high-quality videos to reach more people

? Is there anything else you'd like to share with us?

The comments from all of the open-ended feedback sections of all surveys **were overwhelmingly positive.** One respondent said:

"I appreciate the work of the Biosphere. Bringing in knowledgeable and professional presentations creates opportunities for discussion, pro and con, regarding the topics. Bringing alternative points of view will help create informed decisions."

"Thanks for the great work. The experts you brought in were very good"