

MASTERING THE THERMOSTAT:



Analyzing Attitudes
Towards AC/Heating Usage.

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ENVS 3030 – Spring 2025

THEORY OF PLANNED BEHAVIOR (TPB)

The Theory of Planned Behavior (TPB) is a psychological theory that explains how and why people engage in certain behaviors. It is widely used in social psychology and behavioral research, especially for predicting intentional behavior in areas such as environmental actions.

The TPB theory is especially relevant to this study, which explores how people's beliefs, habits, and confidence in managing their AC/heating systems impact their energy-related decisions. By applying TPB, the survey aims to identify what drives intentional thermostat behaviors and how environmental and financial motivations interact with personal control and social influences.

PRELIMINARY OVERVIEW

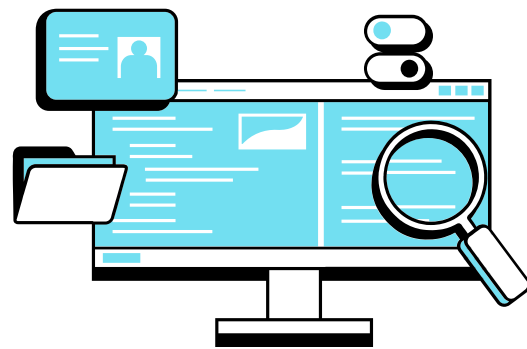
Heating and cooling systems represent a significant portion of residential energy consumption, particularly in regions that experience wide temperature fluctuations across seasons. Thermostats play a central role in managing this energy use, serving as the primary interface between occupants and their climate control systems. With rising concerns over climate change, greenhouse gas emissions, and energy costs, how individuals operate their thermostats has implications not only for household utility expenses but also for broader environmental sustainability. Understanding the frequency, intent, and perceived control behind thermostat adjustments offers critical insight into consumer behavior and its cumulative impact on energy demand.

PRELIMINARY OVERVIEW

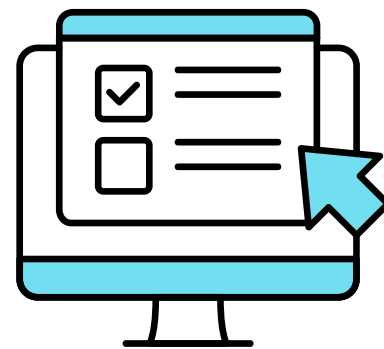
This study investigates the behaviors, attitudes, and perceived control individuals exhibit in managing indoor temperature through thermostat settings. Drawing on survey data, the research examines key motivational factors, including comfort, financial considerations, and environmental responsibility. By identifying common patterns and underlying influences, this project seeks to contribute to a deeper understanding of residential energy use and inform strategies for promoting more sustainable thermostat practices.

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Research



Survey



Analyze

REASERCH QUESTION

I chose to explore thermostat use and energy behavior because it involves a routine action that is often easily forgotten, yet has a direct impact on both the environment and household utility expenses. Heating and cooling costs can be among the most expensive parts of a utility bill, especially in regions with extreme seasonal temperatures.

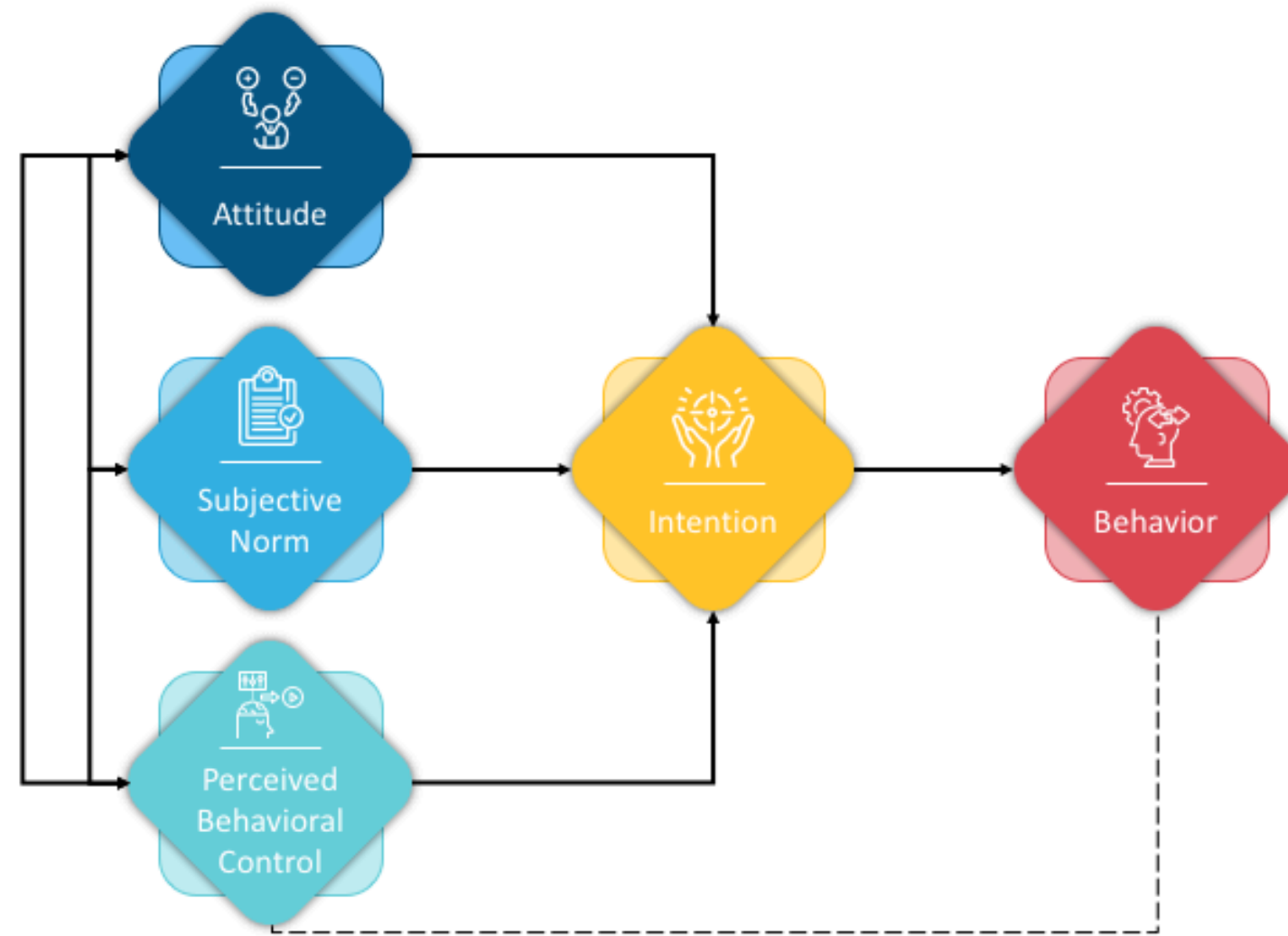


REASERCH QUESTION

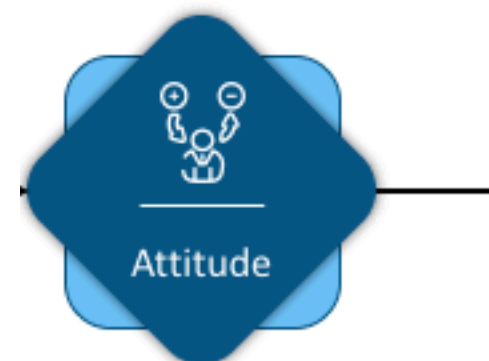
How do individuals' attitudes, behaviors, and perceived control influence their use of AC and heating systems, and what role do environmental and financial concerns play in their thermostat-related decisions?



APPLYING (TPB)

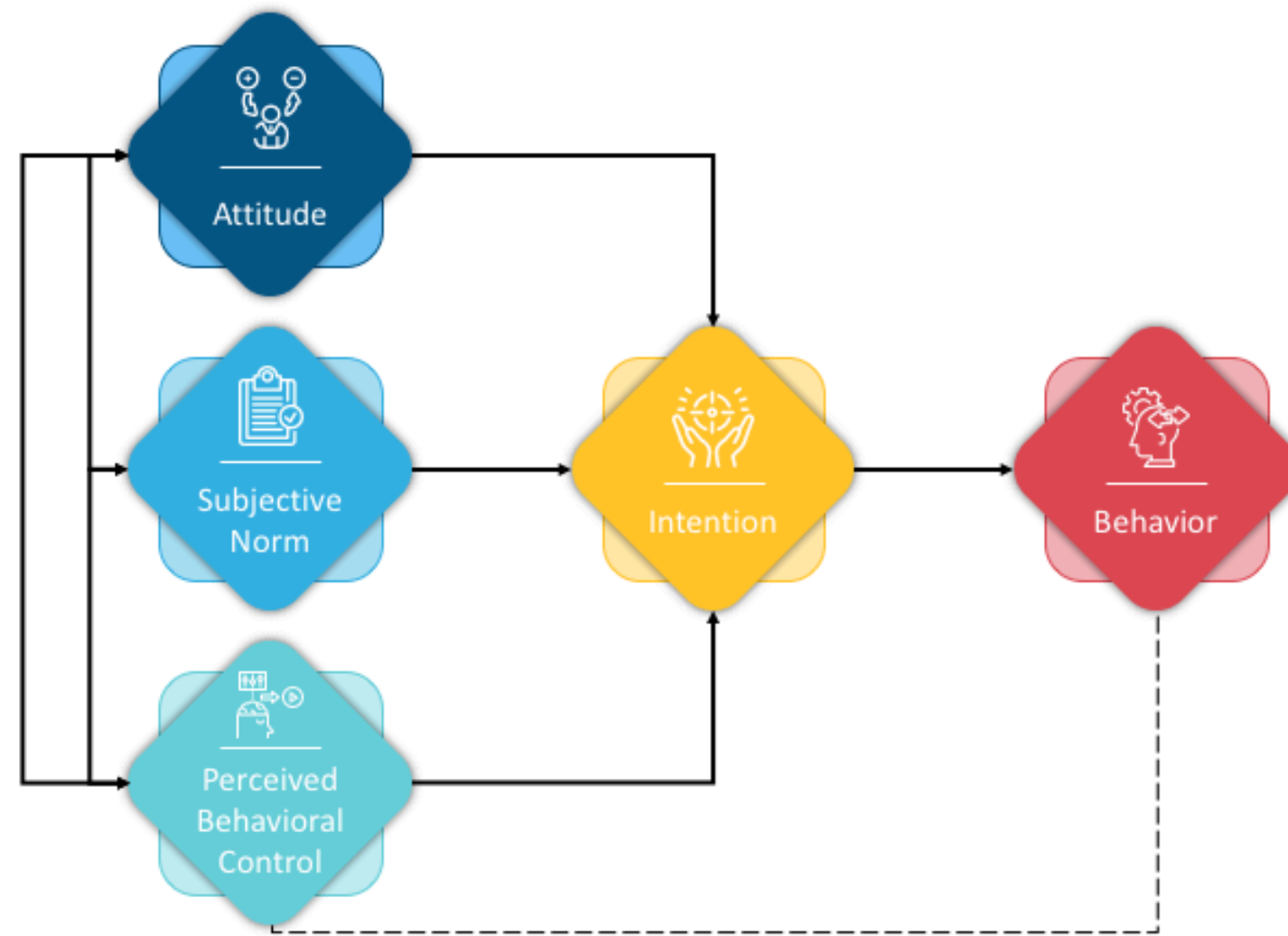


Attitudes:



The survey includes questions that gauge participants' beliefs about the benefits or drawbacks of regulating their AC/heating usage, such as saving money or reducing environmental impact. These responses help assess whether individuals view thermostat management positively or negatively.

APPLYING (TPB)

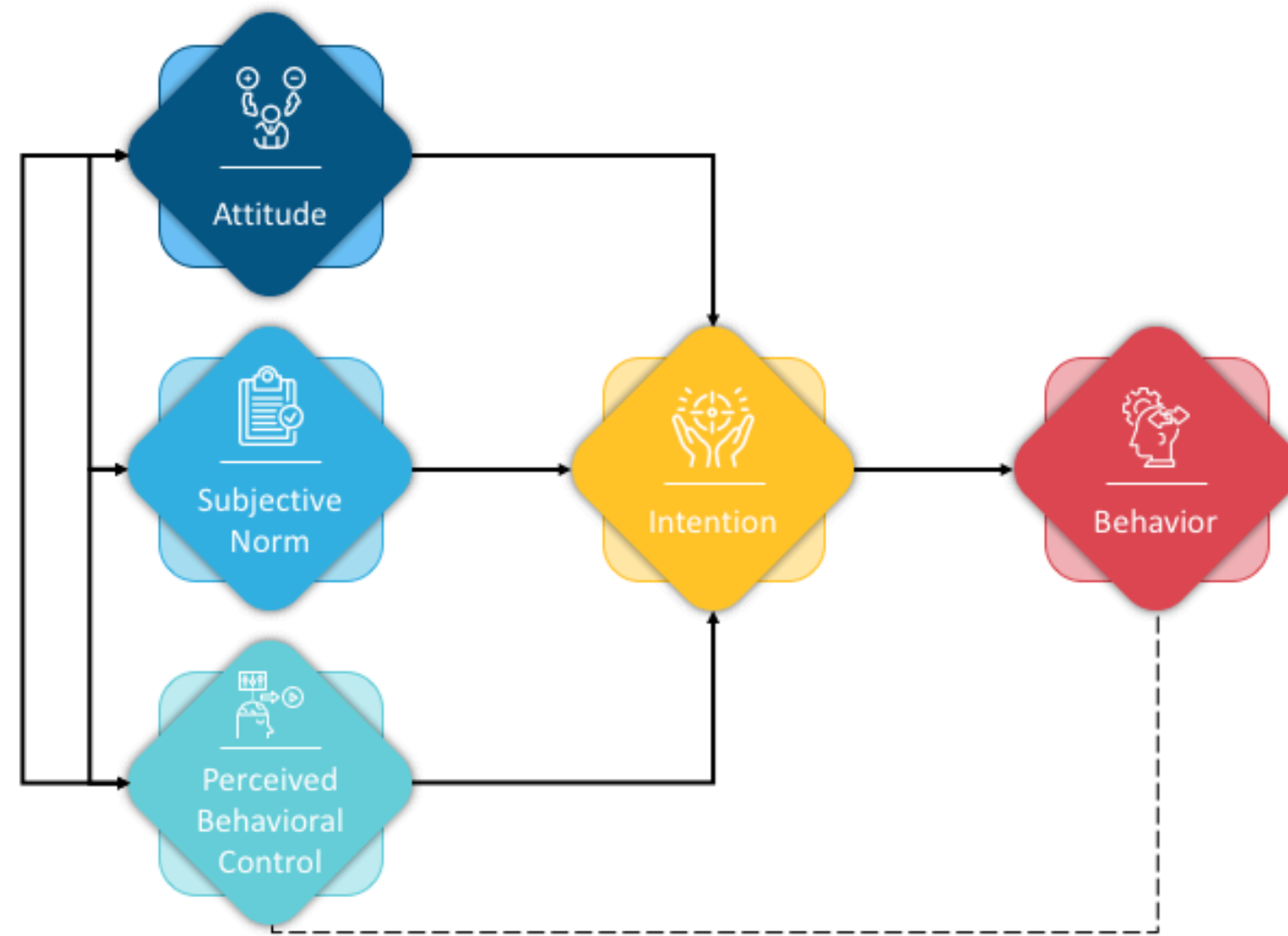


Subjective Norms:



Questions explore how much social influence or perceived expectations from peers, roommates, or society affect thermostat behaviors. This helps determine whether people feel pressure or encouragement from others to conserve energy.

APPLYING (TPB)



Perceived Behavioral Control:



The survey asks about participants' sense of control over their thermostat use, including whether they feel knowledgeable, confident, or equipped to manage their heating and cooling effectively. This identifies barriers or enablers to behavior change.

SURVEY DEVELOPMENT

- The 21-question survey uses likert-scale questions within matrix tables to measure attitudes, norms, and perceived control related to thermostat use.
- It begins with specific demographic questions, such as location and living situation that directly tie into the survey's focus on AC/heating behavior.
- General demographic questions (age, gender, income, education) appear at the end to support broader analysis.
- The survey was distributed to CU Boulder students, friends and family members to gather diverse responses.



Please answer the following questions by sliding the bar to indicate what you believe best represents your average monthly utility costs.

0 20 40 60 80 100 120 140 160 180 200 Monthly Utility Cost \$

My average utility expenses is.



Please answer the following questions by sliding the bar to indicate what you believe best represents your average living temperature.

0 10 20 30 40 50 60 70 80 90 100 Temperature °F

My average living temperature is.

Please rate the following based on your feelings towards them?

(1–Strongly Disagree, 5–Strongly Agree)

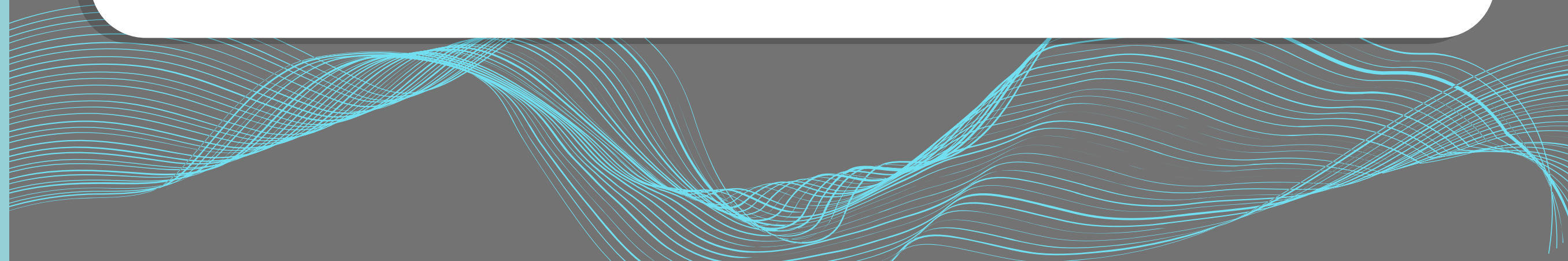
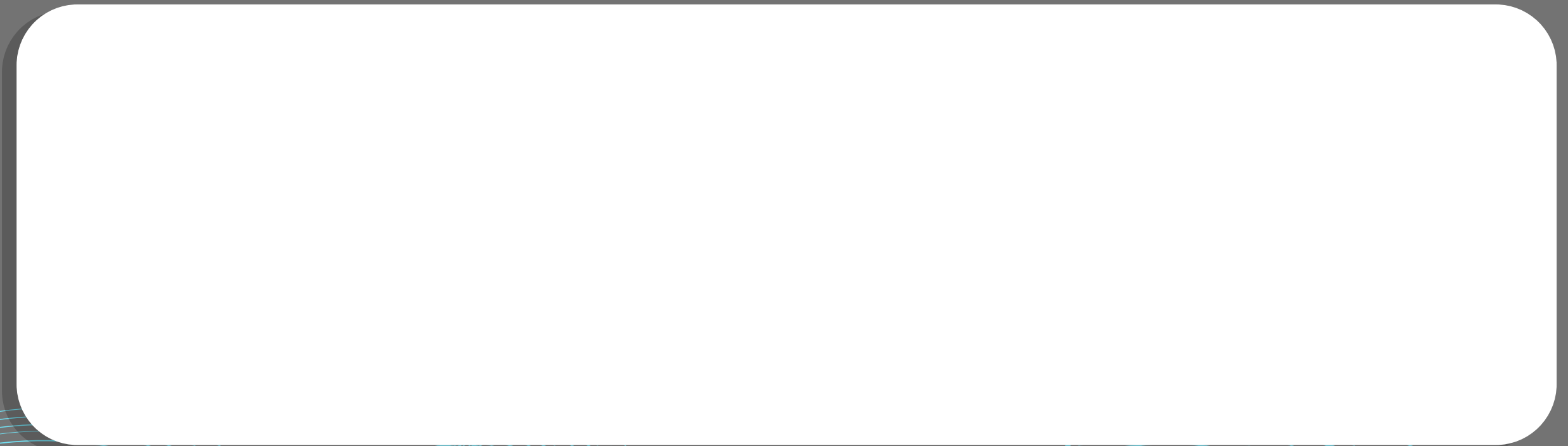
	Strongly Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I find it easy to manage my AC/Heating usage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am motivated to reduce my AC/Heating use to lower environmental impact.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can use alternative ways to reduce my AC/Heating use, such as wearing more or less clothes and opening doors or windows.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I find it difficult to control my AC/Heating in my current living situation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
External factors such as weather or temperature preference makes controlling my AC/Heating use difficult.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Thank you! Your responses to the previous questions are greatly appreciated and play a key role in enhancing our understanding.

We would greatly appreciate it if you could answer a few demographic questions. Your responses will be extremely valuable to our research and significantly improve our ability to analyze the collected data. Of course, you are not obligated to add anything further if you prefer not to.

For example, knowing your age will help us better understand patterns in past and future behavioral intentions related to AC and heating usage.

Key Questions:



Please answer the following questions by sliding the bar to indicate what you believe best represents your average monthly utility costs.

0 20 40 60 80 100 120 140 160 180 200 Monthly Utility Cost \$

My average utility expenses is.



Please answer the following questions by sliding the bar to indicate what you believe best represents your average living temperature.

0 10 20 30 40 50 60 70 80 90 100 Temperature °F

My average living temperature is.

Please rate the following based on your feelings towards them?

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	Strongly Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
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Key Questions:

Attitudes

Please rate the following based on your feelings towards them?

(1–Strongly Disagree, 5–Strongly Agree)

	Strongly Disagree	Somewhat Disagree	Neither agree nor disagree	Somewhat Agree	Strongly Agree
Reducing my AC/Heating utilities is essential to me.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lowering AC/Heating usage helps significantly reduce my utility expenses.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

These questions directly measure the respondent's beliefs about the value and consequences of their behavior. These questions capture the personal importance individuals place on energy-saving actions and reflect their evaluation of the benefits, such as cost reduction. In the context of TPB, these beliefs form the basis for whether someone holds a favorable or unfavorable attitude toward regulating their thermostat use.

Please answer the following questions by sliding the bar to indicate what you believe best represents your average monthly utility costs.

0 20 40 60 80 100 120 140 160 180 200 Monthly Utility Cost \$

My average utility expenses is.



Please answer the following questions by sliding the bar to indicate what you believe best represents your average living temperature.

0 10 20 30 40 50 60 70 80 90 100 Temperature °F

My average living temperature is.

Please rate the following based on your feelings towards them?

(1–Strongly Disagree, 5–Strongly Agree)

	Strongly Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I find it easy to manage my AC/Heating usage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am motivated to reduce my AC/Heating use to lower environmental impact.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can use alternative ways to reduce my AC/Heating use, such as wearing more or less clothes and opening doors or windows.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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For example, knowing your age will help us better understand patterns in past and future behavioral intentions related to AC and heating usage.

Key Questions: Subjective Norms

Please rate the following based on your feelings towards them?

(1–Strongly Disagree, 5–Strongly Agree)

	Strongly Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
Reducing AC/Heating is an expectation.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Excessive AC/Heating usage upsets roommates, friends, and or family.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

These questions assess the degree to which social influences impact behavior. These items explore perceived social pressure from close relationships or broader norms around energy conservation. Within TPB, subjective norms help explain how external expectations—real or perceived—can shape one’s motivation to act in socially acceptable ways, especially in shared living situations where utility use affects others.

Please answer the following questions by sliding the bar to indicate what you believe best represents your average monthly utility costs.



My average utility expenses is.



Please answer the following questions by sliding the bar to indicate what you believe best represents your average living temperature.



My average living temperature is.

Please rate the following based on your feelings towards them?
(1–Strongly Disagree, 5–Strongly Agree)

	Strongly Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I find it easy to manage my AC/Heating usage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am motivated to reduce my AC/Heating use to lower environmental impact.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can use alternative ways to reduce my AC/Heating use, such as wearing more or less clothes and opening doors or windows.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
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For example, knowing your age will help us better understand patterns in past and future behavioral intentions related to AC and heating usage.

Key Questions: Perceived Behavioral Control

Please rate the following based on your feelings towards them?

(1–Strongly Disagree, 5–Strongly Agree)

	Strongly Disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree
I find it easy to manage my AC/Heating usage.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to forget about regulating my AC/Heating use.	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

The questions reflect both a person's confidence in managing their thermostat and the internal barriers they face. Perceived behavioral control in TPB refers not only to capability but also to the ease or difficulty of performing a behavior. These questions reveal whether individuals feel in control of their energy use or if forgetfulness and situational challenges reduce their ability to act intentionally.

RESULTS

What age group do you identify with? 61 ⓘ	
Q16 - What age group do you identify with?	Count
18-21	38%
22-25	31%
26-29	8%
30-39	3%
50-64	11%
64+	8%

What gender do you identify with? 61 ⓘ	
Q18 - What gender do you identify with? - Selected Choice	Count
Male	57%
Female	41%
Genderqueer	2%

What ethnicity do you identify with? 61 ⓘ	
Q19 - What ethnicity do you identify with?	Count
White	87%
Black or African American	10%
Mixed/other	3%

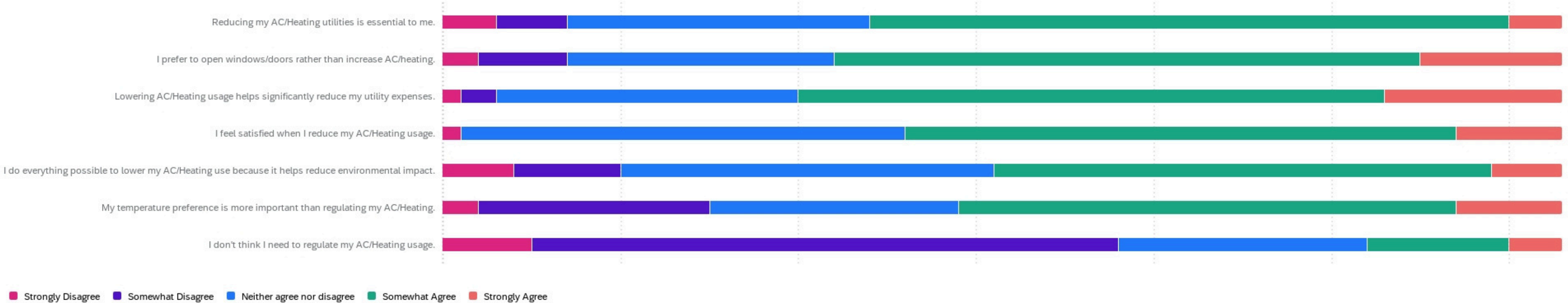
What is your living situation? 63 ⓘ	
Q3 - What is your living situation?	Count
Homeowner	30%
Renting	60%
Dormitory	5%
Other	5%

Do you live with others? (check all that apply) 63 ⓘ	
Q4 - Do you live with others? (check all that apply)	Count
I live alone	14%
I live with roommates	54%
I live with parents	6%
I live with partner	25%
I live with children	11%

- Age Group: 18–21 → 38%
- Gender: Male → 57%
- Ethnicity: White → 87%
- Education Level: Some Bachelor's-level completed → 41%
- Living Situation: Renting → 60%
- Household Composition: Lives with roommates → 54%

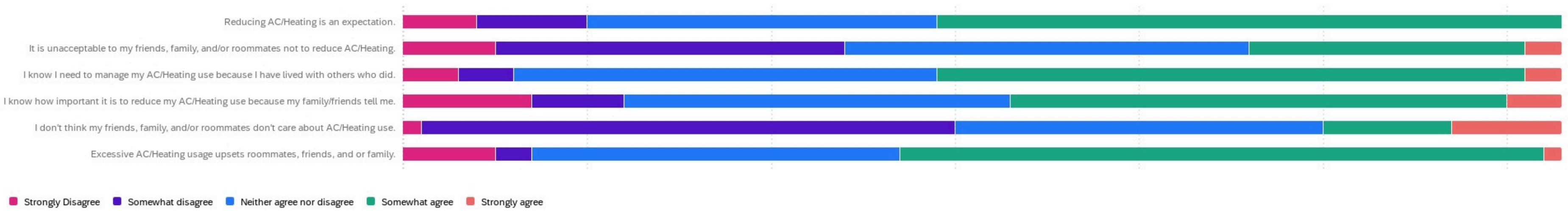
These demographics suggest that thermostat usage is shaped by factors common among young adults in shared living environments. The prevalence of renters and roommate households may indicate limited control over heating and cooling systems, as well as shared responsibility for utility costs. Additionally, the concentration of college-aged individuals with some higher education suggests a potentially higher awareness of environmental issues, though behavior may still be influenced by convenience, peer norms, or forgetfulness.

Please rate the following based on your feelings towards them? (1–Strongly Disagree, 5–Strongly Agree) 63



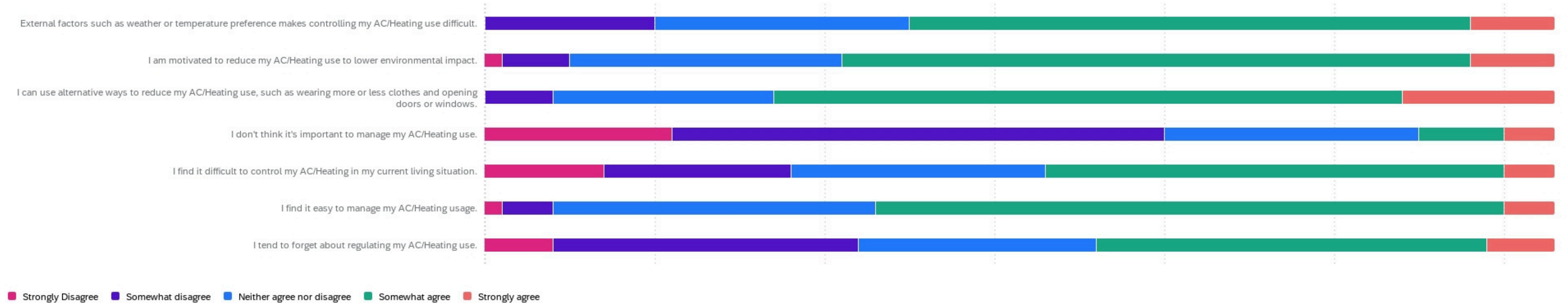
Most participants expressed positive attitudes toward regulating AC and heating use. A majority agreed that reducing usage is essential, cost-effective, and environmentally responsible. Many also reported feeling satisfied when reducing their energy use and preferred natural ventilation—such as opening windows or doors—over adjusting the thermostat. In contrast, only a small number prioritized personal temperature comfort over conservation, and even fewer believed that thermostat regulation was unnecessary. These responses indicate a strong overall willingness to engage in energy-conscious behavior.

Please rate the following based on your feelings towards them?(1–Strongly Disagree, 5–Strongly Agree) 63



The survey responses related to subjective norms show that social influence plays a meaningful role in thermostat behavior. Many participants agreed that reducing AC/heating is an expectation and that excessive usage upsets others, suggesting a strong awareness of social responsibility in shared living spaces. Responses also indicate that people are influenced by their family, friends, or roommates, with many acknowledging that these groups care about energy use and that prior co-living experiences shaped their awareness. Only a small portion believed that others don't care about thermostat habits, reinforcing that perceived social expectations contribute significantly to decision-making.

Please rate the following based on your feelings towards them? (1–Strongly Disagree, 5–Strongly Agree)



The responses related to perceived behavioral control reveal a mix of confidence and challenges in managing AC/heating use. Most participants agreed they could use alternative strategies—like adjusting clothing or opening windows—and felt motivated to reduce usage for environmental reasons. However, many also acknowledged external factors (like weather or preferences) make control difficult, and a notable portion admitted to forgetting to regulate their usage. While several respondents found it easy to manage their thermostat, others indicated that their living situation limits control, suggesting that while awareness is high, practical barriers still affect behavior.

COMPARISONS AND INTERPRETATION

Key comparisons show that most participants have positive attitudes toward reducing AC/heating use, recognizing its environmental and financial benefits. Social expectations also influence behavior, with many feeling pressure from roommates, friends, and family to conserve energy. However, while many feel motivated and capable, others cite barriers like weather, forgetfulness, or limited control in shared or rented spaces. These findings highlight a gap between intention and action, shaped by both personal values and external constraints.



Conclusion and Recommendations

The survey revealed that most participants are motivated to reduce their AC/heating usage and view it as important for both environmental and financial reasons. Social influence and shared living dynamics also play a clear role, reinforcing thermostat habits through group expectations.



Conclusion and Recommendations

What stood out was how many participants expressed strong intentions to conserve energy, yet still struggled with forgetfulness or external factors like weather, highlighting a gap between values and daily behavior.

This confirms that awareness alone isn't enough; practical solutions like reminders, accessible tools, or clearer shared agreements could help bridge that gap and support more consistent energy-saving actions.



**THANK
YOU**

