Watt's up? Assessing Habits of Energy Usage in Residence Students Living in Shirreff Hall at Dalhousie University

Piper Penzinger, Abigail Lavoie, Nam H. Nguyen, Gabby Luciano and Julia MacFarlane

Dalhousie University

ENVS 3502

Caroline Franklin

April 7th, 2025

Table of Contents

Abstract

Energy consumption in higher-education campuses is consistently high in campus residential buildings where the students live full-time during the semester(s); making sustainable energy consumption a primary concern. This intensive operational energy consumption creates a dependency on fossil fuels in Nova Scotia, contributing to greenhouse gas emissions and establishing a reliance on non-renewable energy sources to power residential buildings (Canada Energy Regulator 2024). Considering that Dalhousie's Studley campus houses 2300 students a year (Willick 2021), the energy demand to keep residences in operation with this volume of occupants results in highly intensive energy consumption habits in students. We conducted a behavioral study of the students residing in Shirreff Hall of Dalhousie University, seeking to understand how residents perceived their own energy consumption habits and to determine any potential relation of previous residing areas, with a concern for differences within provincial level changes and their effect on individual's perceived energy consumption habits. We collected data using a 40-question Microsoft Forms survey that allowed us to get insight into the behaviors

of individuals. This survey asked participants about day-to-day and weekly habits that would give grounds for inferencing an individual's energy consumption: such as concerns over energy sustainability, personal awareness of energy and phantom loads, habits regarding personal interactions with energy, and barriers to sustainable energy consumption. We used a two-sample unequal variance T-test correlation analysis, responses were analyzed to determine correlations and existing relationships between the residential history of participants, developing substantial reasoning for recommendations that aim to bring to attention how easily phantom loads are lost in residences buildings. This study found no statistical significance in the difference between the mean energy consumption of students from Maritime and Non-Maritime regions, suggesting that geographic origin has no influence on energy consumption habits, more research can be done on this topic. Additionally, we found that key barriers to energy conservation amongst students living in Shirreff Hall include convenience factors, lack of awareness, and absence of financial incentives. Based on our study results, we recommend educating students through proactive educational initiatives (i.e. strategically placed posters), interactive seminars during orientation weeks, and real-time energy consumption reports of the residence as tangible evidence of energy usage.

Key Words

Phantom Loads, Energy consumption habits, Sustainable energy, Behavior, Dalhousie University, Shirreff Hall Residence.

Introduction

Background and Rationale

Energy consumption in buildings is a critical issue that cascades into widespread environmental and economic implications. According to the International Energy Agency (2023), the operations of buildings account for 30% of global energy consumption and 26% of global energy-related emission (8% from direct emissions, 18% from indirect emissions). A substantial amount of these usages are phantom loads, this comes from an appliance that is not in use but still draws power as it is plugged in (Hydro One, 2025).

As climate change impacts become increasingly more severe and frequent (Kemp et al, 2022), reducing energy use in buildings is essential for achieving sustainability goals by reducing greenhouse gas (GHG) emissions, therefore mitigating the effects of climate change.

Fossil fuels, while contributing a substantial amount to energy generation, are a non-renewable resource. We therefore need to be mindful of how we use them. This problem is especially relevant in Nova Scotia, where over half of all energy used (55%) comes from coal and coke (Government of Canada, 2021). The emission of carbon dioxide into the atmosphere through the usage of fossil fuels, such as coal, further enhances the effects of climate change through an increase in the GHG effect. The continued exploitation of these resources is not sustainable for the environment; hence, it is crucial to decrease our reliance on them, starting from being more conscious about our energy usage and mitigating our wastage of a finite resource. In addition, energy costs are also increasing as more accessible fossil fuels are decreasing, forcing us to extract from remote areas (Kreps, 2020). Reaching these remote sources is now requiring more effort, resources and energy, thus increasing the cost of fossil fuels. The Energy Return On Investment (EROI) is the concept of amount of energy yielded for the amount put in (Kreps, 2020). Currently our investments for energy extraction are increasing at a faster and larger rate than the yield of resources is (Kreps, 2020). This increased investment is taking more financial resources, and thus individuals wasting energy is correlated to wasting capital.

Moreover, methods of extracting fossil fuels destroy habitats and cause serious consequences for wildlife. For example, mining causes erosion and potential degradation of water sources, forcing numerous species out from their home and at the same time poisoning our resources (Sonter, 2018). Fossil fuels contribute to climate change since they release GHG's, particulate matter and harmful chemicals (Client Earth, 2022). Overall, the process of extracting, cleaning, transporting fossil fuels and converting it into usable energy can be very wasteful as heat and energy is being lost at every step, signifying how this resource is a double-edged sword, and we should be more diligent when utilizing it.

Universities have a major role in shaping a sustainable future through educating the forthcoming generations, with an influence in GHG emission policies and investments (Yaltan et al. 2014). Universities consume a substantial amount of energy (approximately 50 million GJ in

Canada in 2019 (Statistics Canada, 2022)). If Canadian Universities are to lead by example and spread awareness about sustainable practices to the public, they must reflect on their personal gaps and fill them. The concept of a ‘Sustainable University’ emphasizes minimizing environmental, economic, societal and health impacts of resources used for fuel in teaching and research (Alshuwaikhat, 2008). Universities play a key role in the process to help society transition to a more sustainable lifestyle, therefore, evaluating students' energy consumption habits is important for improving campus sustainability.

Currently, Dalhousie University is already initiating and completing projects to have better energy efficiency across its multiple campuses (Dalhousie, 2022). This Maritime University is integrating 8 of the 17 United Nations Sustainable Development Goals (SDG’s) through new and existing structures within their campuses (Dalhousie University, 2022). Given the goals and our research, we highlight: (3) Good Health and Wellbeing, (4) Quality Education, (7) Affordable and Clean Energy, (11) Sustainable Cities and Communities, (12) Responsible Consumption and Production, (13) Climate Action, and (15) Life on Land (Dalhousie University, 2022). SDG four focuses on quality education; this is needed to understand why phantom loads are a problem and what can be done to reduce them. SDG’s 3, 7, 11, 12 and 13 are all directly correlated. We are a direct reflection of the health of our planet, we need to move towards a more sustainable future that is not reliant on the use of fossil fuels and is responsible through the entire life cycle of energy production. Our earth is finite, we are responsible for maintaining and sharing it. SDG 15 focuses on all of our interconnectedness on land. These goals within the University involved switching lightbulbs to LEDs and other projects focusing on energy refits involving lighting, air filtration, plumbing and heating; initiatives that have been introduced to increase Dalhousie’s energy efficiency (Dalhousie University, 2025). These improvements were undergone in several campus buildings including the Killam Memorial Library, Sir Charles Tupper Medical Building, and the Life Sciences Center (LSC) (Dalhousie University, 2022). Dalhousie has also been awarded Leadership in Energy and Environmental Design (LEED) Gold and Silver Certifications for new buildings, including The Wallace McCain Learning Commons, LeMarchant Place, Mona Cambell and others (Dalhousie University, 2025). In the past, Dalhousie Residence Life staff has hosted “Ecolympics”, to encourage students in the residence buildings to reduce energy usage during a two-week advertising period (Dalhousie University,

2025). However, the maximum reduction of electricity use was only 9% (Dalhousie University, 2025). While Dalhousie is attempting to implement changes to behavioral buildings energy efficiency, it is also up to the students (both residents and otherwise), faculties and staff to participate and contribute as well. Technology can only go as far as the appropriate behaviors of the users, and therefore it is important to understand and observe Dalhousie individuals' energy use habits to recommend better routines to contribute to less waste into phantom loads on campuses.

In this project, we aim to explore if a number of factors can influence these wasteful behaviors, including students living on their own for the first time, their busy schedules and not having to pay power bills.

In this project, we focused on Dalhousie University's residence building, Shirreff Hall, on the Studley campus. These residence halls are targeted towards first year students to better support them in their first year of study. Built in 1923 (making it the oldest operable residence on this campus), this residence is the second largest residential building on this campus, capable of housing four hundred and forty students. Its large population means that a substantial amount of energy goes into operating the building, and without recent retrofits, this can make Shirreff Hall prone to energy wastage to phantom loads. Since these buildings accommodate many students, in operation 24 hours a day for about seven to eight months of the year (without considering summer residence), there are high energy demands for lighting, heating and appliances. Inefficiencies due to poor insulation and consumption of phantom loads, from appliances left plugged in, can result in considerable energy wastage (Hydro One, 2025). We undertook this project to explore the habits of students residing in Shirreff Hall. Through this project, we aimed to inform students living on campus about sustainable energy practices and explore opportunities for integrating these practices into daily life, in support of Dalhousie University's sustainability goals. With a better understanding of how the students utilize the space, it will allow for better planning and management of resources that align with the way energy is truly being used.

Research Questions

We researched the level of awareness students residing in Shirreff Hall have, regarding their energy use and interactions, and how individuals can build an awareness mindset to mitigate the negative environmental impacts of inefficient energy use involving their habits regarding energy consumption. The intention is to help educate students by recommending ways they can be more mindful of their habits surrounding energy use, to decrease phantom loads within their daily lives. These students are at a very influential stage in their lives, where they are building habits that they will carry with them, hopefully through their lives. The question that we aimed to answer is, "What are the energy conservation habits of students residing in Shirreff Hall at Dalhousie University?". Additionally, as a sub-research question, we aimed to explore whether students' previous residence before moving to Halifax influenced their personal energy consumption habits. Specifically, we examined if there is a correlation between living in the Maritime provinces (New Brunswick, Nova Scotia, Newfoundland and Labrador, and Prince Edward Island) versus other non-Maritime locations and their energy usage patterns. Based on our findings on how students currently perceive their energy habits, we curated recommendations regarding their limitations behind behavioral energy use, in order to heighten awareness on phantom loads.

Methods

Study Design

To collect data about student habits and behaviors, we conducted an online survey for students in Sheriff Hall, posters were put up around the residence building as advertisements, as well as in various locations across the Studley campus *(Figure 1.0*). The use of an online survey as a form of measurement can gain a high yield of responses, with a substantial amount of information to ensure our study is thorough, which is both convenient to distribute and collect. This extensive survey contained question types including rating, ranking, selecting what applies, single response, multiple choice and some short answer questions. Having longer interviews may have deterred students from participating, as they have busy schedules and prior commitments. The surveys were conducted through a Microsoft form, accessible through a QR code found on our posters (see Appendix). Recruitment of students in Shirreff Hall was done though posters

distributed throughout campus at locations where Shirreff residence may occur, including the LSC, Sir Janes Dunn Building, Henry Hicks, Killam Memorial Library, Marion McCain Arts and Social Science Building, the Student Union Building (SUB), Kenneth C. Rowe building, and Shirreff Hall *(Figure 1.0).*

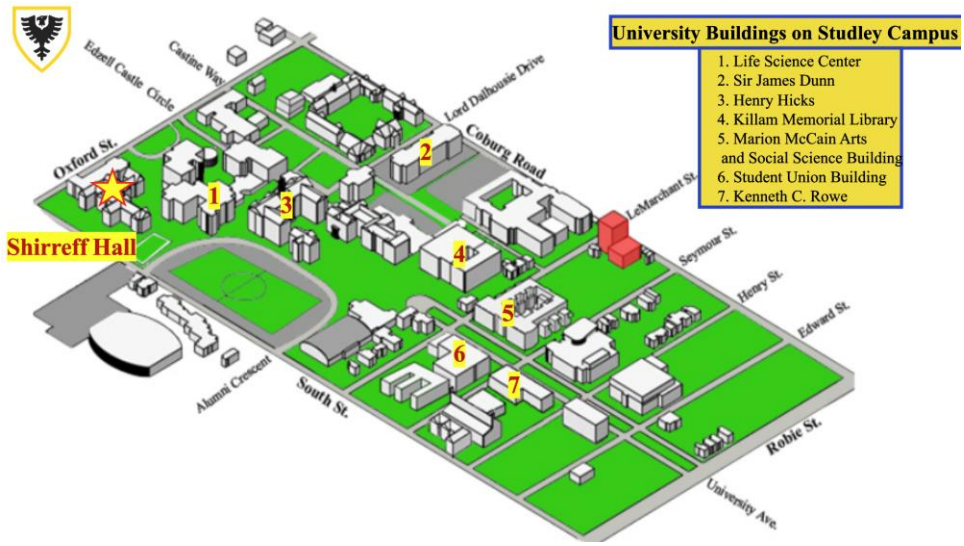


Figure 1.0. Outline of our poster distribution on Studley Campus Dalhousie University, Halifax, Nova Scotia, with Shirreff Hall indicated by a star, all other buildings were numbered in the legend. Image Source: https://web.cs.dal.ca/~arc/contact.html

Along with this, we held in-person recruitment to fill out the online survey near Shirreff Hall. Baseline questions were asked at the start of the survey to help categorize and analyze the data including: if they currently live in Shirreff Hall residence (Appendix; Q1), if this is their first time living on their own (Q6), if they live in a single or double dorm room (Q2), their area of study (Q3), hometown (Q4), and whether it was in a rural or urban environment (Q5). These questions allowed us to make better interpretations of the data collected given this background knowledge. All survey questions can be found in the Appendix. Our group gained ethics approval and permission from the Department of Earth and Environmental Sciences and Sheriff Hall staff to conduct this research. Then, we collected responses for a total of seven days and analyzed the data we collected after that point. Finally, based on our findings, we created recommendations for all students at Dalhousie University based on our sample population of Shirreff Hall residences, to implement and positively influence consumption behaviors to reduce phantom loads lost in Sheriff Hall.

Parameters

Our target population was Dalhousie University students living in Shirreff Hall. We had aimed to survey two hundred and six students over the course of March 10th-18th, 2025. This sample size was chosen based on the sampling frame of four hundred and forty students, a 95% confidence interval, 50% population proportion and 5% margin of error. We used a non-probabilistic randomized sampling with a mix of snowballing. This is non-probabilistic due to the fact that we limited our respondents to Shirreff Hall, however we wanted a randomized and diverse group of students to answer the surveys. There was a mix of snowballing, as we asked students to refer their friends in the building to complete our survey.

Aside from the QR codes on the posters, we recruited outside of Shirreff Hall 5 days for 1.5 hours each day (weather dependent), to encourage students to complete the survey. The aim of these visits was to offset the potential shortcomings from the online survey (people not doing the survey, connection issues), and increase the awareness that we were currently collecting our data. Recruitment happened at multiple different time slots, to account for different schedules of students in our targeted population, improving the accuracy of our sample and how it reflects the true population in our statistical analysis. Visiting on different days increases our chances of reaching students who may have had prior commitments during our initial visit. Additionally, not everyone was comfortable with a long verbal exchange when in person recruitment happened, online surveys on posters provided an alternative way to gather responses. Respondents could scan the code and complete it at their own pace, with responses automatically submitted to the online application. However, some students may have not completed the survey online after scanning the QR code and may have forgotten. By using a mix of strategies, we can gain a wider pool of responses and better understanding of students' lifestyles and habits.

We conducted a two-sample t-test unequal variance for questions seven, eight, and nine in our survey (Appendix). The questions assessed the student's awareness of their personal energy consumption habits (Q7), how concerned the students are about the environmental impact of their energy usage (Q8), and how important it is for them to reduce their personal energy consumption, environmentally (Q9). These three questions are a Likert-scale with ordinal data and were chosen to gain a baseline idea of energy consumption habits of students, while allowing us to run an inferential statistical analysis. The test was used to determine if there was a

significant difference in the mean score of the three questions against the Maritime and non-Maritime regions.

Limitations

During the period of our research study, there have been several limitations that have deterred us from reaching our full potential of this research paper. A challenge we have faced during this project has been our ability to directly reach out to our target audience of the Shirreff Hall residents, limiting our sample size and data analysis. Due to the late approval of our ethics application, we were limited to seven days to collect the results of our survey, which is half of the amount of time we planned to collect responses for. Additionally, we were unable to go inside Shirreff Hall to recruit students for participation due to a No *External Guest* policy in place. Since we were unable to go into the residence hall, we were unable to distribute an email to all the students residing within Shirreff Hall that would have contained a small explanation of our research and the QR code on the poster so they could easily access our survey. This limited the direct exposure of our survey towards the students specifically living in Shirreff Hall and hindered our target for the number of students who responded to our survey. By decreasing our sample size, we risk an inaccurate and unreliable study by not representing the full population (Faber, 2014).

Since our survey was conducted online with self-reported data, there were several open-ended responses that allowed respondents to provide answers that were not indicative of honesty and serious thought, for example, some answers received included “I'm Jewish” or “Cuz” when asked for the reason why they left the lights on during the day. Thus, we did not consider these types of responses to be viable data in our research. This consideration was taken to ensure normality in our data and accuracy in analysis.

Next, grouping students into "Maritime" and "non-Maritime" categories for our data analysis may result in an overlook of more nuanced regional differences.

Results

Our survey was conducted over the span of March 12th to March 18th, 2025. This gave us a total of seven days to collect our data, out of which, we were able to collect fifty-four responses. *Figure 2.1* and *Figure 2.2* below, highlight the distribution of where the students lived prior to moving to Dalhousie University. These descriptive data allowed us to understand the background of our data and allowed us to conduct two sample unequaled variance T-tests between the demographics and energy consumption.

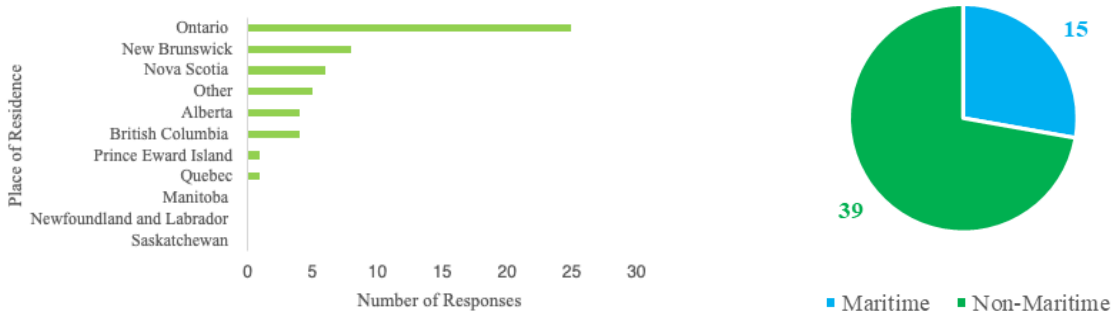


Figure 2.1. (left) Bar chart showing the locations that students resided in prior to moving to Dalhousie University (Q4 from appendix).

Figure 2.2. (right) Pie chart comparing the distribution of responses between Maritime and non-Maritime regions.

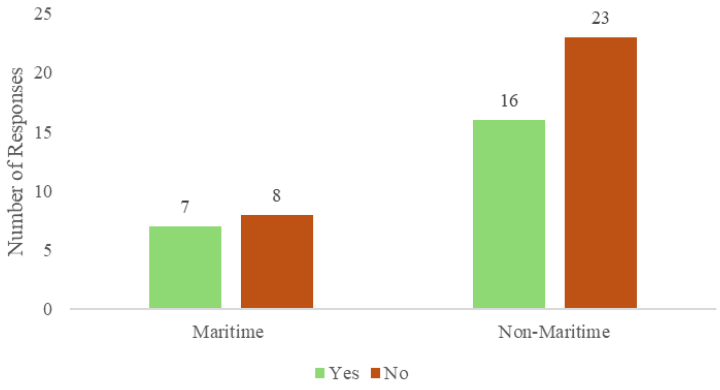
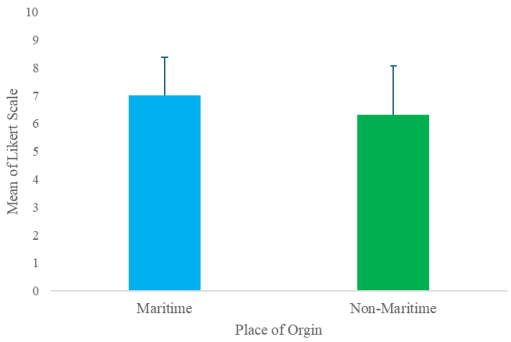


Figure 3.0. Bar chart comparing the results between the Maritime and non-Maritime regions about whether they have heard of the common terms for phantom loads (Q10 from appendix).

We grouped these students into Canadian Maritime regions vs non-Maritime regions with fifteen students from Maritime regions and thirty-nine students from non-Maritime regions. The

result of survey question ten gave us an understanding of Maritime and non-Maritime baseline knowledge of phantom energy (*Figure 3.0.)*. These numbers were used as our sample population size when running our Two-Sample T-Test on Excel *(Figure 2.2).* This test was completed assuming unequal variances due to the different number of responses for Maritime vs non-Maritime students. We ran this question against survey question seven, eight and nine. *Figures 4.0, 5.0,* and *6.0* below summarize the survey results of those three questions based on the regions.



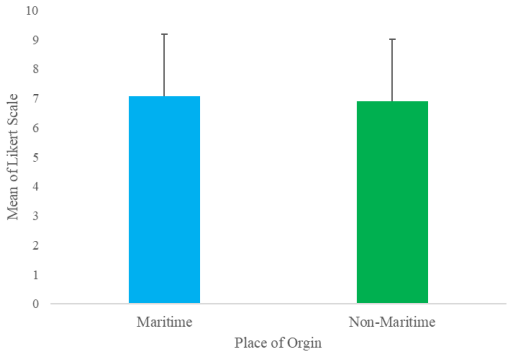
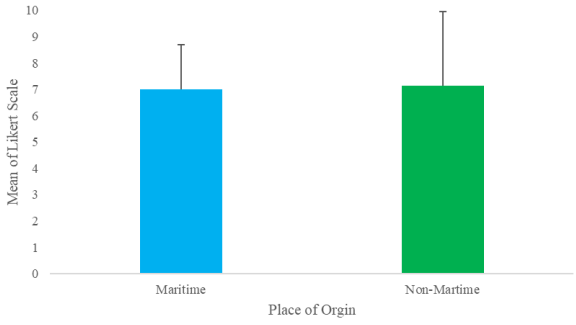


Figure 4.0. (left) Bar chart comparing the distribution of means (+SD) of students living in Shirreff hall who are from the Maritime regions and non-Maritime regions on their personal awareness of their daily energy consumption habits, obtained by conducting two-sample, unequaled variance T-Test (Q7 in appendix).

*Figure 5.0. (right) B*ar chart comparing the distribution of means (+SD) of students living in Shirreff Hall who are from the Maritime regions and non-Maritime regions on their personal concerns about the environmental impacts of their energy usage, results were obtained by conducting two-sample, unequaled variance T-Test (Q8 in appendix).



.

Figure 6.0. Bar chart comparing the distribution of means (+SD) of students living in Shirreff Hall who are from the Maritime regions and non-Maritime regions on how important it is for them to reduce their personal energy consumption, with the concern based on the environmental implications, results were obtained by conducting two-sample, unequaled variance T-Test (Q9 in appendix).

We found that students from the Maritime region have an average score of 7, while non-Maritime students have an average of 6.03. We note that the difference is small, however Maritime students have a slightly higher awareness of their personal energy consumption habits. Next, non-Maritime students have a higher variance (3.06) compared to Maritime students (1.85), indicating more variability in their energy consumption habits.

With our categories sorted between the Maritime regions against the non-Maritime regions, *Figure 2.0* shows how many of our responses in each category have heard of the terms: wasted energy, phantom energy, ghost energy or dead energy; which are the more common names for the more specific term: phantom loads (this also goes by the terms: vampire energy and standby power (David Suzuki Foundation, 2024). Within the Maritime regions, 87.5% of respondents have heard of terms that describe phantom loads, as compared to 69.5% of those in non-Maritime regions who have heard of these terms before *(Figure 2.0)*. Even with a smaller sample size of students coming from Maritime regions, there was a smaller gap between those who have heard of phantom energy and those who have not.

Table 1.0 – How aware are you of your daily personal energy consumption habits Two-Sample T-test Assuming Unequal Variances Results.

	Maritime	Non-Maritime
Mean	7	6.307691
Variance	1.857143	3.060729
Observations	15	39
df	33	
t Stat	1.539261	
P(T<=t) two-tail	0.133276	
t Critical two-tail	2.034515	

Table 2.0 (left) - How concerned are you about the environmental impact of your energy usage Two-Sample T-test Assuming Unequal Variances Results.

Table 3.0 (right)- Environmentally, how important is it to you to reduce your personal energy consumption Two-Sample T-test Assuming Unequal Variances Results.

	Maritime	Non-Maritime
Mean	7	6.897436
Variance	2.857143	7.410256
Observations	15	39
df	33	
t Stat	0.166275	
P(T<=t) two-tail	0.868758	
t Critical two-tail	2.019541	

	Maritime	Non-Maritime
Mean	7.066667	6.897436
Variance	4.495238	7.410256
Observations	15	39
df	33	
t Stat	0.241835	
P(T<=t) two-tail	0.810405	
t Critical two-tail	2.034515	

Next, our survey concluded that the three most common devices in student's dorm rooms are a fan (77% of respondents), a computer (72% of respondents), and a kettle (50% of respondents) (*Figure 7.0.*) Of the respondents who stated they have these devices, we were interested in the percentage of students who never unplug the device when it is not in use, adding to an increased usage of phantom loads daily (*Figure 8.0)*. With the most common devices, 74% of those with a fan, 56% of those with a kettle, and 33% of those with a computer always have these devices plugged in. The least common devices that were present in the rooms of respondents with their resulting percentage of them connected to an energy source are an Alexa/Google Home (9% of respondents, 100% always plugged in) and a heated blanket/heating pad (13% of respondents, 43% always plugged in) (*Figure 8.0*).

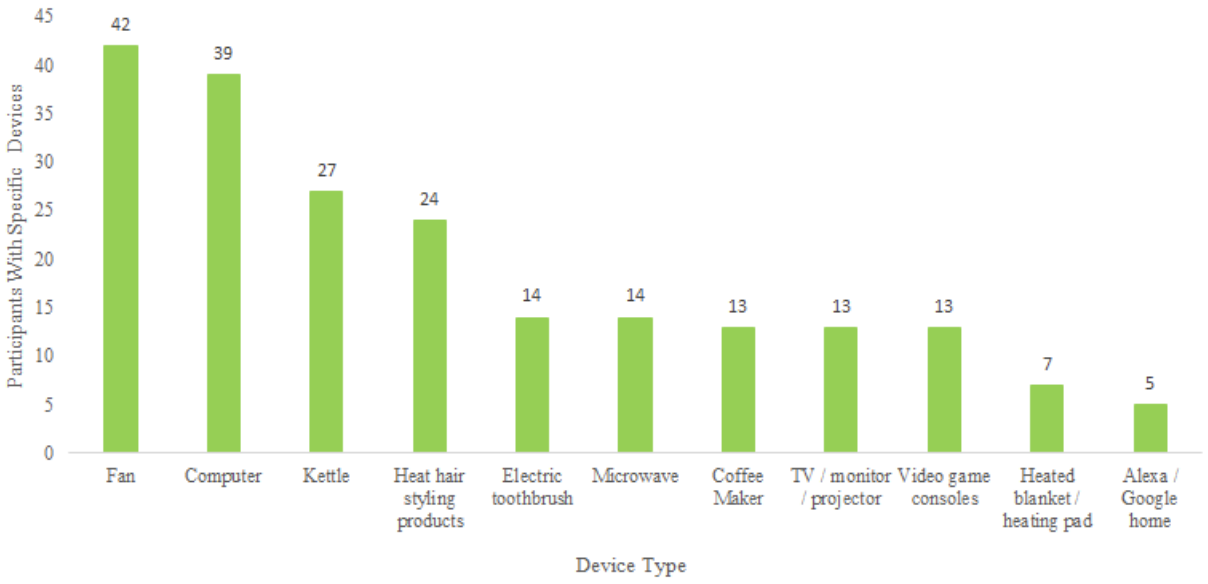


Figure 7.0. Bar chart displaying the distribution of devices students have in their dorm rooms living in Shirreff Hall, showing the number of respondents who selected '*yes'* to having at least one of the eleven given devices in their rooms (Q22 in appendix)

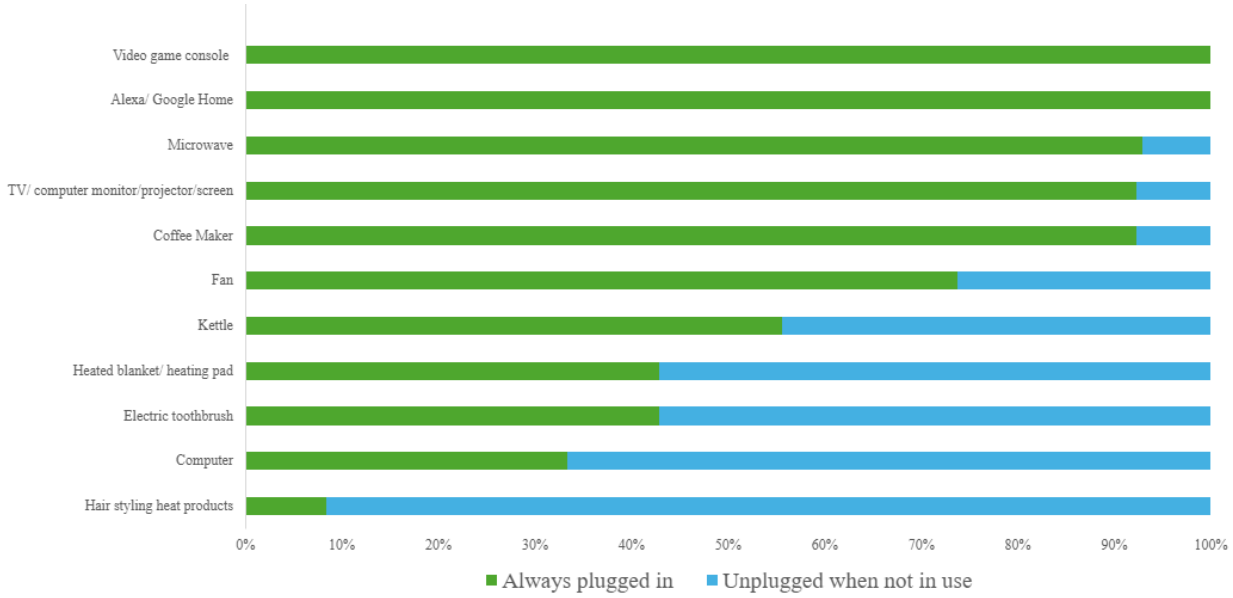


Figure 8.0. Bar chart displaying the device unplugging habits of students living in Shirreff Hall with the devices listed in *Figure 7.0*, comparing the percentage of respondents who selected *'yes'* to having a device and if the device was always plugged in.

Less than half of participants were aware of energy wastage and made a conscious effort to turn off their lights when away, either due to self-awareness or education (*Figure 9.0*). Other reasons for turning off lights included feeling annoyed seeing them left on. Among those who left their lights on, common reasons included forgetting, using light for comfort to feel less lonely or depressed, and concerns about safety.

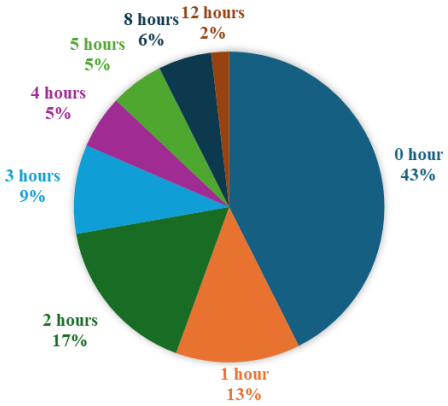
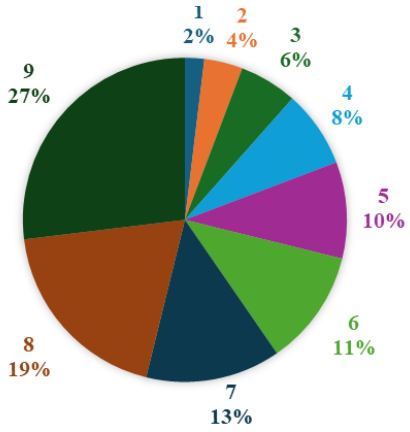


Figure 9.0. Pie chart showing the distribution of responses for the amount of hours lights were left on in residence dorm rooms in Shirreff Hall(Q13).

When looking at shower habits, 27% of participants took 9 showers per week, followed by eight showers per week (19%), while the rest took seven showers or less (*Figure 10.1*). The average shower length among participants was eight minutes (*Figure 10.2*). 61% of participants shower with only hot water, though some mentioned ending their showers with cold water. (*Figure 11.1*). Participants who showered with cold water gave various reasons, such as physical and mental health benefits, helping them wake up in the morning, environmental considerations, or a lack of access to hot water (*Figure 11.2*).



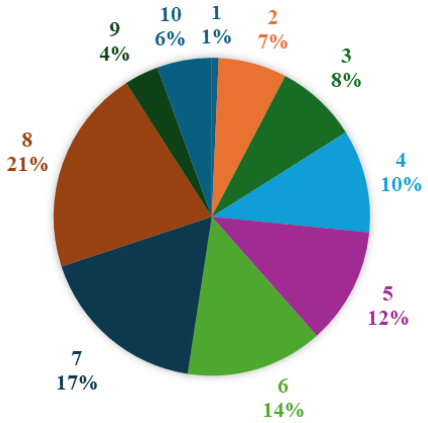
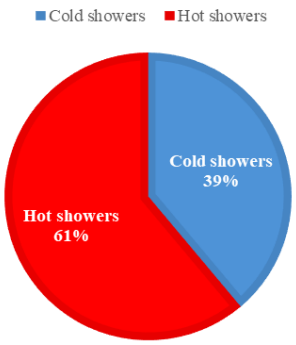


Figure 10.1. (left) Pie chart showing the average number of showers students living in Shirreff Hall take per week (Q15).

Figure 10.2. (right). Pie chart showing the average shower length of students in Shirreff Hall in minutes (Q16).



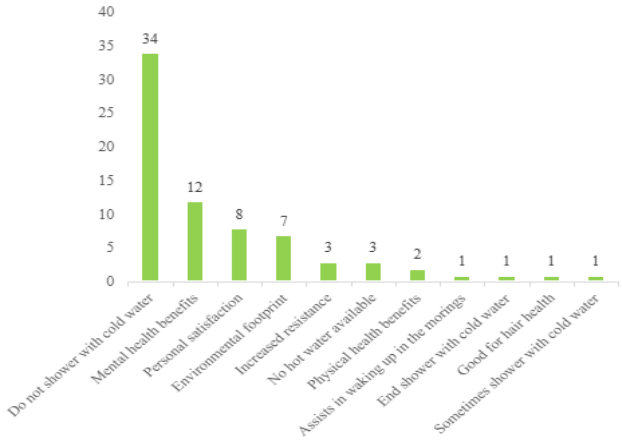
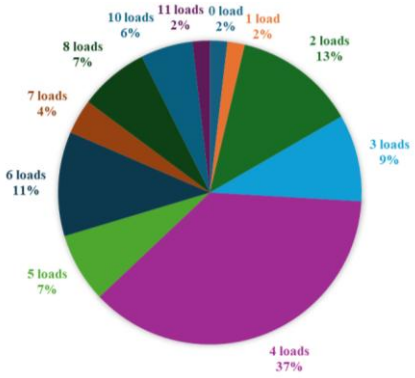


Figure 11.1 (left) Pie chart showing the distribution of students in Shirreff Hall who take hot showers and those who take cold showers (Q17).

Figure 11.2 (right) Bar chart showing the reasons why students in Shirreff Hall take cold showers (Q17).

Laundry habits varied, as most participants do four loads of laundry monthly (37%), while some reported doing up to eleven, others do as little as one *(Figure 12.1*). Most participants (72%) did laundry with cold water, 11% switched between hot and cold, while the rest did laundry with hot water only (F*igure 12.2*).



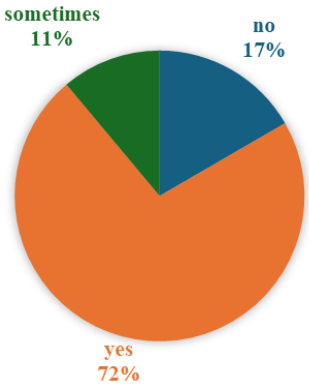
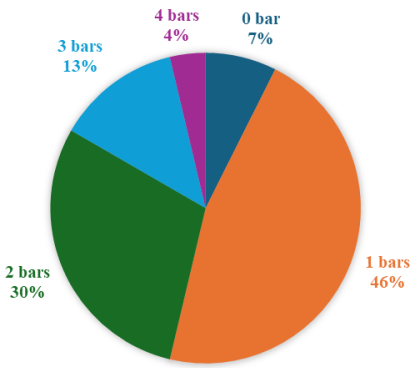


Figure 12.1 (left). Pie chart showing the mean load of laundry done per month by students living in Shirreff Hall (Q18).

Figure 12.2 (right). Pie chart showing the distribution of students in Shirreff Hall who do their laundry with cold water and those who do not (Q19).



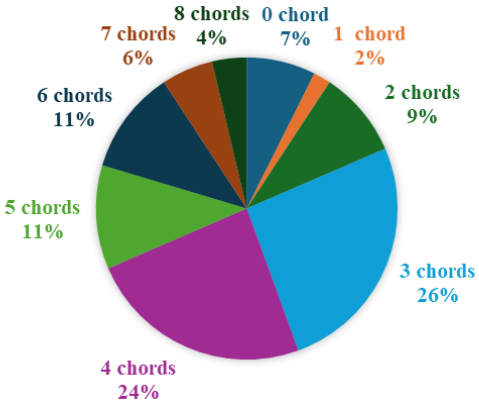


Figure 13.1 & 13.2. Pie charts showing the quantity of power bars students in Shirreff Hall have in their room, and how many chords are plugged in at once (Q20&21).

Regarding power bars, 46% of participants have one in their room. The highest number of power bars reported was four, which made up 4% of the responses, while 7% stated they had none in their room (*Figure 13.1*). 26% of participants have three chords plugged into their power bars, followed by four chords, which make up 24%. A small percentage (4%) of participants had up to eight chords plugged in, while 7% answered zero, this was believed to be the same people who did not have a power bar (*Figure 13.2*).

Figure 14.0. Challenges students face for personal energy conservation. Categories of; Academic life, Accessible information, Building efficiency and design, busy schedules, convenience factors, financial boundaries, limited awareness, lack of education, lack of control in central heating/lights, no monthly personal financial cost, rules and restrictions in residence, social life, Other (Unspecified). The two most significant categories are Convenience factors and Limited Awareness.

When we analyzed the short and long answer questions from our survey, students conveyed that the two largest challenges and barriers restricting participation in personal energy conservation were; convenience (70% of students) and limited awareness (65% of students). While the least frequent challenges selected were social life (4% of students) and financial boundaries (9% of students) (*Figure 14.0).*

Discussion

Despite initiatives, such as the annual “Ecolympics” being held by The Office of Sustainability and the residence office aiming at reducing energy waste and water consumption, many students living in residence are still not aware of the energy wastage that they are contributing to by seemingly normal actions such as unplugging their electronics when not in use, taking long showers, and using inefficient appliances.

The main reason behind the 70% of students who completed our survey that do not conserve energy is due to the convenience of opting for easily accessible actions that require little effort toward caring for the environment (*Figure 14.0).* The choice of these actions is due to being in and out of the dorm room so often, annoyance of unplugging items, and remembering to turn off lights would be extremely tedious multiple times a day. Many also stated that the outlets and power bars are in rather inaccessible areas of their rooms and unplugging them requires them to crawl under beds/desks to unplug and re-plug, with many students expressing this simply was not worth their time or effort. Another large barrier was lack of awareness and education about this topic, many stating that ignorance is bliss, the unknown amount of energy they are using and wasting was not apparent to them, and therefore, not important. Many students expressed that they are not paying hydro or electric bills, since it is included in rent costs of residences, and therefore have zero idea of their usage and how much it costs in real terms. Therefore, they have no financial repercussions to leaving lights on or wasting energy, and do not make it a habit to correct these wasteful behaviors till affected by them. Students stressed the lack of control of their heating and lighting through the residences, many stating that hallways lights are always on, and the heating is typically too hot in some rooms, or too cold in others.

The devices recognized as being most common amongst students (fan, computer, kettle; *Figure 7.0)* have daily uses and reflect both convenience and necessity of university life. Students living in residences have little to no control over the temperature of the establishment and can use a fan to regulate the temperature of their space to their liking and improve airflow (U. S. Department of Energy, n.d.). A computer in contemporary studies is extremely common amongst students and considering the format of Dalhousie's education and delivery to use online learning management systems (D2L Brightspace) this is not an unsurprisingly common device in dorm rooms. According to Energy Sage (Marsh 2024), generally, computers use between 30 and 70 watts of electricity depending on the model. The hours per day a computer is in use has the biggest impact on the total electricity used over time. If we assume a student uses this general computer for eight hours per day, this student is using 2.8kWh (kilowatt-hours) of electricity per week (Marsh 2024) and compounding 146kWh per year. The associated cost with kWh electrical demand of a computer is overlooked by many residents, as the monthly billing is not going directly to the student. StatsCan (2024) shows a glimpse of the extent of Canadian internet and electronic device use, 99.2% of individuals aged 15 to 24 used the internet in 2022 and 86-97%

owning a laptop or computer. The next most common devices are a kettle, hair heat products, a microwave (students may also use this as a clock), and electric toothbrush. The nature of these devices' use is personal and vary on an individual basis, meaning they are very difficult if not impossible to implement communal, shareable modes of accessing (kettle, microwave) and are unsafe for hygienic reasons to do so (hair styling heat products, electric toothbrush). One factor that might deter students from using a shared microwave or kettle in a dorm environment is the uncertain cleanliness and high frequency of its use.

We investigated whether the region students come from before attending Dalhousie University affects their energy consumption habits. We found that since our two-tailed p-value of 0.133 is greater than our significance level of 0.05, the difference between the means is not statistically significant. Additionally, our observed t-statistic of 0.2418 is smaller than the critical value of 2.0345. Therefore, for our study, the regions do not influence the students' behavior when it comes to their daily energy consumption habits. Any differences are likely due to random variation rather than a true effect of geographic background. *Figure 3.0* found that students from the Maritime region have an average score of 7.06 for their concern about their environmental impact, while non-Maritime students have an average of 6.89. Again, non-Maritime students have a higher variance compared to Maritime students for both *Table 2.0* and *Table 3.0*. For *Table 2.0*, we found our two-tailed p-value of 0.81 to be greater than our significance level of 0.05, showing that the difference between the means is not statistically significant. Additionally, our observed t-statistic of 0.241 is smaller than the critical value of 2.03. For *Table 3.0*, similar results were found. Our p-value of 0.868 is greater than 0.05 and our observed t-static 0.166 is smaller than our critical value of 2.019. Therefore, we conclude that for all statical tests completed, there is no statistical significance and the means of the two different groups are not statistically different. Lastly, student behavior may change based on the time of year, such as increased heating use in winter or higher electricity consumption during exam periods (Li. et al, 2024). These factors may also influence the results of our analysis and may lead to self-reporting answers changing throughout the year.

Recommendations

The average worldwide energy consumption of individuals in 2023 was 17,430.11 kWh, an increase of the previous year (Statistica, 2024). Petroleum coke costs 0.39 kg/kWh of resources and coal costing 0.52 kg/kWh of resources (U.S. Energy Information, 2023), being extremely costly resources. Phantom loads can account for up to 10% of a home's energy use (Hydro one, 2025), therefore could account for ~871.5 kWh (considering our household is two people). This would save 339.89 kg of coke or 453.18 kg of coal per person per year. If everyone globally reduced their consumption by a few kilowatt hours, it would save thousands of kg of resources from being wasted, leading to a large difference in our use of fossil fuels. Collectively, this amount will compound as individuals change more of their habits and contribute to reducing emissions.

Regulating energy usage for four hundred and forty people while providing heating, lighting and food services is not an easy task. Individuals within the residences need to improve their energy usage habits such as turning their lights off when not present in their room, unplugging appliance when not in use, and doing laundry with cold water to see a reduction in energy consumption. Students mentioned that one of the most significant improvements that could be made to improve energy conservation within residences was enhanced education about energy waste within the residence. 85% of the students reported that they are living alone for the first time, and if no one is adequately informing them about energy conservation, they rely on other sources that may not be providing information (Q6). If students do not learn about this topic in their areas of study, it would be optimal if Shirreff Hall could provide educational resources for them. These resources can include posters around Shirreff Halls to remind students about habits they should strive for, such as reminders to turn off lights, unplug unused appliances, etc. Educational seminars, games and pamphlets during Orientation week where CATs (Community Assistant Team) can provide further information and tips about energy conservation. Another recommendation would be to include an analysis of energy use within Shirreff Hall and distribute this information to students and have this easily accessible for all other students to see online (see Appendix for mock-up posters and news blasts). As seen in our results, many of our participants state they are unaware of their energy use in real terms/numbers and therefore do not care about conserving it, since they cannot conceptualize it. By analyzing

the energy use and putting consumable forms into residences, this can spark interest, concern, and increase exposure to the topic, to start more discussions about inefficient energy use, where they live in residents may impact their long-term future behavior. Showing the amount of energy used, the amount of resources needed to provide that energy and the cost of this will put these 'invisible' habits into real forms. This can provide education for students that will move out of residence in the future and will start having to pay a hydro bill, and therefore possible ways to mitigate high bills and utilize less energy, and in return less fossil fuels. Intentionally placed posters can serve as a daily reminder of sustainable energy consumption practices for residents and real-time reporting provides tangible insights into usage, resulting patterns of consumption, and aims to invoke change to the individual.

Conclusion

Our research concludes that the key barriers to energy conservation amongst students living in Shirreff Hall Residence include convenience factors, lack of awareness, and absence of financial incentives. Despite acknowledging the widespread use of high-energy-consuming devices, students generally are not perceiving their potentially problematic energy habits due to the lack of direct billing and overall control of Shirreff Hall's heating, lighting, and operational energy. This disconnect fosters a culture of energy indifference, allowing wasteful behaviors to persist unchecked, as residents remain unaware of the true impact of their actions

Our statistical analysis found no significant relationship between students' previous geographic residence and their awareness of energy consumption or behaviors, supporting the notion that these habits are influenced more by their current living conditions and environmental factors than prior regional location/ factors. As a result, energy conservation in residence requires targeted inference to address immediate barriers to students' sustainability.

To address the issue of energy conservation in Shirreff Hall, we recommend educational initiatives done by the residence such as posters, seminars during orientation week, and real-time energy consumption reports to enhance students' awareness and encourage behavioral change to more sustainable consumption. Increasing awareness and promoting accountability are steps to not only reducing Shirreff Hall's overall energy consumption but also cultivate long-lasting

sustainable habits in students - a behavioral change one may carry beyond their time at Dalhousie University, as we continue to navigate sustainability in an increasingly unsustainable world.

Literature Cited

Alshuwaikhat H. M. (2008). An integrating approach to achieve campus sustainability: assessment of the current campus environmental management practices. https://www.sciencedirect.com/science/article/pii/S0959652607002545?via%3Dihub

Canada Energy Regulator. (2024). Provincial and Territorial Energy Profiles – Nova Scotia. https://www.cer-rec.gc.ca/en/data-analysis/energy-markets/provincial-territorial-energy-profiles/provincial-territorial-energy-profiles-nova-scotia.html

Canadians for Affordable Energy. (2019). The Value of Energy -Nova Scotia Canadians for Affordable Energy: Household Research Series. https://d3n8a8pro7vhmx.cloudfront.net/affordableenergy/pages/39/attachments/original/1561658332/CAE07_NovaScotia-report_JN2419_F1.pdf?1561658332

CBC/Radio Canada. (2021, June 22). Dal students scrambling for housing after university limits residence spaces | CBC News. CBCnews. https://www.cbc.ca/news/canada/nova-scotia/dalhousie-university-residence-covid-19-1.6073775

CIET. (2018). Standby Power | Phantom Power Consumption. https://cietcanada.com/news/standby-power/

Clean Technologies Research Institute (CTRI). (2025). Renewable Energy, Storage and Systems. Dalhousie University, Halifax, NS. https://www.dal.ca/dept/ctri/research-areas/energy.html

Client Earth Communications. (February 18, 2022). Fossil fuels and climate change: the facts. ClientEarth. https://www.clientearth.org/latest/news/fossil-fuels-and-climate-change-the-facts/

Credibly Green. (2023, February 16). Hot vs Cold Showers. Credibly Green. https://www.crediblygreen.com/2023/02/16/environmental-impact-of-hot-vs-cold-showers/

David Suzuki Foundation. (2024, November 5). Phantom energy: what it is and how to avoid it. David Suzuki Foundation. https://davidsuzuki.org/living-green/phantom-energy-what-it-is-and-how-to-avoid-it/

Department of Earth and Environmental Sciences. (2025). Past ENVS 3502 Projects. Dalhousie University, Halifax, NS. https://www.dal.ca/faculty/science/earth-environmental-sciences/research/publications-and-theses/past-envs-3502-projects.html

Energy and Green Buildings Plan, 2020-2030, Version 1. (2022). Dalhousie University, Halifax, NS. https://www.dal.ca/content/dam/www/about/mission-vision-and-values/sustainability/energy-green-building-plan.pdf

Energy, water, and green buildings. (2022). Dalhousie University, Halifax, NS. https://www.dal.ca/about/mission-vision-values/sustainability/campus-initiatives/operational-sustainability-plans-and-initiatives/energy-water-green-buildings.html

Existing building upgrades. (2025). Dalhousie University, Halifax, NS. https://www.dal.ca/about/mission-vision-values/sustainability/campus-initiatives/operational-sustainability-plans-and-initiatives/energy-water-green-buildings/existing-building-upgrades.html

Government of Canada (2021) Nova Scotia: Clean electricity snapshot https://www.canada.ca/en/services/environment/weather/climatechange/climate-plan/clean-electricity/overview-nova-scotia.html

How much coal, natural gas, or petroleum is used to generate a kilowatt-hour of electricity?. (2023). U.S. Energy Information. https://www.eia.gov/tools/faqs/faq.php?id=667&t=6#:~:text=Coal%E2%80%931.14%20pounds/kWh,Petroleum%20coke%E2%80%930.85%20pounds/kWh

Huijun Wu, Qianqian Wang, Yuhuan Xu, Yuanyuan Ye, Xiaoyu Zeng. (2023). Coal life-cycle analysis embedded with land–energy nexus of a coal-based city in China. Resources, Environment and Sustainability. 12: 100109 . https://doi.org/10.1016/j.resenv.2023.100109

Faber J, Fonseca LM. How sample size influences research outcomes. Dental Press J Orthod. 2014 Jul-Aug;19(4):27-9. doi: 10.1590/2176-9451.19.4.027-029.ebo. PMID: 25279518; PMCID: PMC4296634.

Facilities Management. (2025) Killam Energy Retrofit. Dalhousie University, Halifax, NS. https://www.dal.ca/dept/facilities/campus-development/projects/KillamEnergyRefit.html

Facilities Management. (2025). Physical Sciences Facility for Green Energy Innovation. Dalhousie University, Halifax, NS. https://www.dal.ca/dept/facilities/campus-development/projects/phsyical-sciences-facility.html

Fields, S. (Dec 6, 2023). Phantom loads: Everything you need to know. Energysage. https://www.energysage.com/energy-management/phantom-loads-overview/#what-is-a-phantom-load

International Energy Agency. (2023). Track building 2021. https://www.iea.org/energy-system/buildings

Josephy, B., Bush, E., Nipkow, J., Kleeli, K., & Glanzmann, S. (n.d.). Cold Wash -Do Prejudices Impede High Energy Savings? Retrieved February 14, 2025, from https://storage.topten.eu/source/files/EEDAL13_Barbara_Josephy_Cold_Wash.pdf

Kemp, L., Xu, C., Depledge, J., Ebi, K.L., Gibbins, G, Kohler, T.A., Rockstrom, J., Scheffer, M., Schellnhuber, H.J., Steffen, W., Lenton, T.M. (August 1 2022). Climate Endgame: Exploring catastrophic climate change scenarios. Proc. Natl. Acad. Sci. U.S.A. https://doi.org/10.1073/pnas.2108146119

Kreps, H, B. (2020). The Rising Costs of Fossil-Fuel Extraction: An Energy Crisis That Will Not Go Away. The American Journal of Economics and Sociology. 79(3): 695-717. https://doi.org/10.1111/ajes.12336

Li J, Et al (2024). Research on the energy saving behaviors of university students based on TPB in a hot summer-cold winter area in China. National Library of Medacine. 10(17):e36995. doi: 10.1016/j.heliyon.2024.e36995

Marsh, J. (2024, November 22). How many watts does a computer use? EnergySage. https://www.energysage.com/electricity/house-watts/how-many-watts-does-a-computer-use/

Martins, F. Felgueiras, C. Smitkova, M. Caetano, N. (2019). Analysis of Fossil Fuel Energy Consumption and Environmental Impacts in European Countries. Energies. 12(6): 964 https://doi.org/10.3390/en12060964

Nova Scotia Power. (2024). Standard Residential Service Rate. https://www.nspower.ca/your-home/residential-rates/standard-residential

Office of Sustainability. March 22, 2024. Announcing the Ecolympics 2024 winners. Dal News. Dalhousie University, Halifax, NS. https://www.dal.ca/news/today/2024/03/22/announcing_the_ecolympics_2024_winners.html

Oil left in the world. Worldometer. (2016). https://www.worldometers.info/oil/

Phantom Power: Maximize energy usage and save more by reducing standby power. (2025). Hydro One. https://www.hydroone.com/saving-money-and-energy/residential/tips-and-tools/phantom-power#:~:text=%22Phantom%22%20or%20%22standby%22,our%20tips%20and%20tricks%20below.

Residence ecolympics. (2025). Dalhousie University, Halifax, NS. https://www.dal.ca/about/mission-vision-values/sustainability/campus-initiatives/get-involved/residence-ecolympics.html

Rusk, B., Mahfouz, T., & Jones, J. (2011). Electricity's "Disappearing Act": Understanding Energy Consumption and Phantom Loads. ProQuest. Tech Directions, 71(1): 22–25. https://www.proquest.com/docview/880553736?pq-origsite=gscholar&fromopenview=true&sourcetype=Magazines

School for Resource and Environmental Studies. (2025). Energy Systems. Dalhousie University, Halifax, NS. https://www.dal.ca/faculty/science/sres/research/research-strengths/energy-systems.html

Sonter, L.J., Ali, S.H., Watson, J.E.M. (2018). Mining and biodiversity: key issues and research needs in conservation science. National Library of Medicine. https://pmc.ncbi.nlm.nih.gov/articles/PMC6283941/

Statista Research Department. (2024). Fossil fule consumption per capita worldwide from 1965 to 2023. Statistica. https://www.statista.com/statistics/1302696/per-capita-fossil-fuel-consumption-worldwide/

Statistics Canada. (2019). Survey of Commercial and Institutional Energy Use: Hospitals and post-secondary campuses. https://www150.statcan.gc.ca/n1/daily-quotidien/220805/dq220805d-eng.htm

Statistics Canada. (2024, August 12). A data snapshot of Canadian youth and Technology. https://www.statcan.gc.ca/o1/en/plus/6782-data-snapshot-canadian-youth-and-technology

The Maids Blog. (2016, November 23). Pros and Cons of Washing Your Clothes in Hot Water. The Maids. https://www.maids.com/blog/pros-and-cons-of-washing-your-clothes-in-hot-water/

U.S. Environmental Information Administration. (October 24, 2023). Coal explained. https://www.eia.gov/energyexplained/coal/

U.S. Department of Energy. (2024). Energy Efficient Window Coverings. Energy.gov. https://www.energy.gov/energysaver/energy-efficient-window-coverings

U. S. Department of Energy. (n.d.). Fans for Cooling. Energy.gov. https://www.energy.gov/energysaver/fans-cooling

Womack, D. Hoponick Redmon, J.H. (April 25, 2016). Disposal Methods for Coal Combustion Residuals. Research Triangle Institute International. https://www.rti.org/impact/disposal-methods-coal-combustion-residuals#:~:text=This%20material%2C%20which%20includes%20coal,be%20recycled%20or%20beneficially%20reused.

Yaltan H. (2014). Energy performance of a university building: Case studies at Sheffield University, UK. Architectural Engineering Technology. https://www.final.edu.tr/docs/jaet-article-2014pdf[1568015068].pdf

Acknowledgements

Our research team would like to thank Dr. Caroline Franklin for providing us with the information and tools needed to complete this research. Additionally, we would like to thank our Teaching Assistant, Chelsea, for providing constructive feedback on this project throughout the semester. As well we would like to extend our appreciation to the students from Shirreff Hall for completing our survey. Finally, we would like to acknowledge that all data collected was conducted on Mi'kma'ki the traditional territory of the Mi'kmaq people.

Appendix

Survey Questionnaire

ENVS 3502 Energy Survey

You are invited to take part in a research study conducted by Environmental Science Undergraduate Students in Environmental Problem Solving II (ENVS 3502) at Dalhousie University. The purpose of this research is to better understand the energy consumption behaviors and attitudes in students in Shirreff Hall at Dalhousie University. This survey will collect data to give insight on these habits and allow us to research, better understand students, and give insight for recommendations in improving habits to decrease energy usage in Shirreff Hall's Residents. This study was reviewed and approved by the Department of Earth and Environmental Sciences at Dalhousie University. If you choose to participate in this research, you will be asked to answer 40 questions (multiple choice, ranking, single/multi answer) taking ~10 -15 minutes, not all of these are required to answer. This study will be open from March 5th, 2025 until March 14th, 2025. These questions will ask you about your personal background (living situation, current study, past residing area, etc) as well as your current energy usage behaviors and attitudes. You are welcome to stop the survey at any time if you no longer want to participate. All you need to do is close your browser. We will not include any incomplete surveys in my analyses. If you do complete your survey and you change your mind later, we will not be able to remove the information you provided as we will not know which response is yours. Your responses to the survey will be anonymous. This means that there are no questions in the survey that ask for identifying details such as your name or email address. The results will be presented in Environmental Problem Solving II 2025 on March 31st 2025 or April 2nd 2025. Our supervisor will keep the anonymous survey information indefinitely as it may be used in future research, as well as the written report will be available for future ENVS 3502 Students and open for public access. The risks associated with this study are no greater than those you encounter in your everyday life. If you would like to see how your information is used, please feel free to visit website [https://www.dal.ca/faculty/science/earth-environmental-sciences/research/publications-and-theses/past-envs-3502-projects.html] under 2025 projects after April 2nd 2025.You should discuss any questions you have about this study with Gabby Luciano and Dr. Caroline Franklin. Please ask as many questions as you like before or after participating. My contact information is gb996507@dal.ca, (647) 507-3152. By completing the following survey you are consenting to allow your answers to be collected and used in the research study. This research was reviewed and approved by the Department of Earth and Environmental Sciences at Dalhousie University.

1. Do you live in Shirreff Hall residence building?
   - ○ Yes
   - ○ No
2. Do you live in a single or double dorm room?
   - ○ Single
   - ○ Double
3. What is your current major/area of study?

Please enter in course code format [ie. ENVS, BIOL etc]

4. Prior to coming to Dalhousie University, where did you reside?
   - ○ Alberta
   - ○ British Columbia
   - ○ Manitoba
   - ○ New Brunswick
   - ○ Newfoundland and Labrador
   - ○ Nova Scotia
   - ○ Ontario
   - ○ Prince Edward Island
   - ○ Quebec
   - ○ Saskatchewan
   - ○ Other: _____
5. Did you live in a rural, suburban or major urban area?

Rural areas have lower population density and are mainly composed of houses.

Suburban areas are those just outside of a major city, mainly composed of houses with a few small shops.

Major urban areas are densely populated with a lot of commercial and industrial activity.

   - ○ Rural
   - ○ Suburban
   - ○ Major Urban
6. Is this your first time living on your own?
   - ○ Yes
   - ○ No
7. How aware are you of your daily personal energy consumption habits?

1 (Least)	2	3	4	5	6	7	8	9	10 (Most)

8. How concerned are you about the environmental impact of your energy usage?

1 (Least)	2	3	4	5	6	7	8	9	10 (Most)

9. Environmentally, how important is it to you to reduce your personal energy consumption?

1 (Least)	2	3	4	5	6	7	8	9	10 (Most)

10. Have you ever heard of the terms before today: **Waste energy**, **Ghost energy**, **Dead energy**, and/or **Phantom energy**?

Phantom loads are electricity that is consumed when something is plugged into an energy source, like a wall outlet or battery, and continuously draws energy when devices are in sleep mode, idle and even when they turned off (David Suzuki Foundation, 2024).
Phantom loads account for 10% of the total household electricity use (Canadians for Affordable Energy, 2019). This also goes by the terms: Vampire power, Standby power and Phantom energy.

- ○ Yes
- ○ No

11. Order from least (1) to greatest (10) what you think are the most common sources of wasted/phantom energy.

Charging cables	1_____ (Least)
Coffee Maker	2_____
Computers	3_____
Consoles	4_____
Fans	5_____
Microwaves	6_____
Mini fridges	7_____
Running water	8_____
TV/Monitors	9_____
String lights/lamps	10_____ (Greatest)

12. Is there any other sources of phantom energy that you would add, that you think we missed?

13. On average, how many hours a day do you leave the lights on when you are not in your room?

Please enter a whole number

14. Why?

Yearly, if you were to keep your 40-watt LED lights on for 16 hours a day this would use 0.64kWh of energy, over the span of 365 days per year this adds up to 233.6 kWh of consumed energy, costing about $4225.824, based on $18.09/kWh, excluding the base fixed charge of delivering the power in the first place (Nova Scotia Power, 2024).

15. On average, how many times are you showering each week?

Please enter a whole number

16. How long of a shower do you typically take on average in minutes?

Please be as exact as possible and refrain from using simple intervals [ie: 5, 10, 15 etc]

Please enter a whole number

17. Do you shower with cooler water temperatures? If yes, what are the reasons?

Hot showers have double the global warming potential than cold showers do, through water that is heated, treated, and reduced time in the shower (Credibly Green, 2023).

- ○ I don't
- ○ Environmental footprint
- ○ Increase resistance
- ○ Mental health benefits
- ○ Personal satisfaction
- ○ No hot water available
- ○ Other _____

18. On average, how many loads of laundry do you do per month?

If you do 3 loads of laundry 2 times a month – answer [6]

Please enter a whole number

19. Do you typically wash your clothes in cold water?

Typically meaning most often, we understand some loads wash better in hot water, like whites, workout gear, bedding or towels, with the intention of getting rid of bacteria.
Washing your laundry with cold water uses 70% less energy (Josephy et al., n.d.). Over time, constant washing in hot temperatures can speed up the degradation of your clothing, can shrink them, and even discolour dyed fabrics (The Maids, 2016).

- ○ Yes
- ○ No
- ○ Sometimes

20. How many power bars and/or extension bars do you have in your dorm room?

Please enter a whole number

21. How many cords do you have plugged in the power bars?

While some power bars are engineered to reduce the number of phantom loads lost to them, many don't, and continue to lose energy through the cables that are left plugged in. It is important to unplug your cables when they are not in use.

Please enter a whole number

22. Which of the following do you currently have in your dorm room? (please select all that apply)

Phantom loads still draw power when a device is off or not in use, the only way to stop this excess wasted energy is unplugging the appliances.

(a) Alexa/Google Home
(b) Coffee maker

(c) Computer
(d) Electric toothbrush
(e) Fan
(f) Hair heat styling products (ex: hair drier, straightener, curling wand, hot curlers etc)
(g) Heated blanket/heating pad
(h) Kettle
(i) Microwave
(j) TV/Monitor/Projector/Screen
(k) Video game console

23. (a) Is your **Alexa/Google Home** always plugged in, even when it is not in use?

Please only answer the corresponding questions to those you have selected above

○ Yes
○ No

24. (b) Is your **coffee maker** always plugged in, even when it is not in use?

Please only answer the corresponding questions to those you have selected above

○ Yes
○ No

25. (c) Is your **computer** always plugged in, even when it is not in use?

Please only answer the corresponding questions to those you have selected above

○ Yes
○ No

26. (d) Is your **electric toothbrush charger** always plugged in, even when it is fully charged?

Please only answer the corresponding questions to those you have selected above

○ Yes
○ No

27. (e) Is your **fan** always plugged in, even when it is not in use?

Please only answer the corresponding questions to those you have selected above

○ Yes
○ No

28. (f) Are your **heat hair styling products** always plugged in, even when it is not in use?

Please only answer the corresponding questions to those you have selected above

Yes
No

29. (g) Is your **heated blanket** always plugged in, even when it is not in use?

Please only answer the corresponding questions to those you have selected above

- ○ Yes
- ○ No

30. (h) Is your **kettle** always plugged in, even when it is not in use?

Please only answer the corresponding questions to those you have selected above

- ○ Yes
- ○ No

31. (i) Is your **microwave** always plugged in, even when it is not in use?

Please only answer the corresponding questions to those you have selected above

- ○ Yes
- ○ No

32. (j) Is your **TV/monitor/screens** always plugged in, even when it is not in use?

Please only answer the corresponding questions to those you have selected above

- ○ Yes
- ○ No

33. (k) Is your **video game console** always plugged in, even when it is not in use?

Please only answer the corresponding questions to those you have selected above

- ○ Yes
- ○ No

34. What do you think are the biggest challenges and barriers in personal energy conservation in University dorms? (Please select all that apply)
    - ○ Academic life
    - ○ Accessible information
    - ○ Building efficiency and design
    - ○ Busy schedules
    - ○ Convenience factors
    - ○ Financial boundaries
    - ○ Limited awareness
    - ○ Lack of education
    - ○ Lack of control in central heating/lights
    - ○ No monthly personal financial cost
    - ○ Rules and restrictions in residence
    - ○ Social life
    - ○ Other _____
35. For Question 34 above, please explain your choice(s).
36. What motivates you to reduce your energy consumption? (Please select all that apply)

- ○ Carbon Footprint
- ○ Competitions and challenges (ex: Ecolympics)
- ○ Desire to be part of the solution
- ○ Ethical concern
- ○ Harming the environment
- ○ Roommate/peer influences
- ○ Sustainability
- ○ Nothing motivates me to reduce my energy consumption
- ○ Other _____

37. For Question 36 above, please explain your choice(s).

38. If you could make changes to reduce energy consumption at Shirreff Hall, what would it be?

39. Do you think communication about energy consumption habits (energy saving tips) could be improved for all students at Dalhousie University? If so, how can it be improved?

40. Can you think of any other strategies that you would find helpful to encourage students to become more mindful about their energy usage?

Poster Distributed

Mock-up News Blast and Poster for Shirreff Hall to Distribute to Students