

# **Understanding Energy Conservation in Laos:** An Examination of Psychological and Socio- Demographic Determinants of Households' Intentions to Adopt Energy Conservation Behaviour

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A 120 point thesis submitted to Victoria University of Wellington in partial  
fulfilment of requirements for the degree of Master of Environmental  
Studies

Victoria University of Wellington  
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March 2023



## Abstract

Over the past decades, Laos has experienced an increase in household energy consumption due to population growth and economic expansion. As the country continues to develop, the demand for energy is expected to grow, presenting a significant challenge for Laos in achieving its target of carbon neutrality by 2050. To achieve a transition towards a low-carbon future, increasing the uptake of energy efficiency and conservation in the home is considered to be a key strategy. However, there is a lack of in-depth research on the factors that motivate households in Laos to engage in energy conservation behaviour. Understanding the key determinants of people's willingness to engage in energy-saving behaviour is vital in informing future policy interventions that aim to encourage households to reduce their energy use.

People's willingness to engage in household energy-saving behaviours can be associated with many factors. Using the Value-Belief-Norm theory (Stern, 2000) as a theoretical framework, this study examined two broad factors that have been recognised in the literature as important in explaining energy conservation behaviour: socio-demographic (such as age, gender, level of education and household characteristics) and psychological factors (such as values, environmental beliefs, and personal norms). The study further explored the role of these factors in predicting the willingness for households to adopt energy conservation behaviour.

A sample of 304 residents in Laos took part in a survey. The results of the quantitative analysis indicated that psychological factors, especially personal norms, awareness of consequences and self-transcendence values, play a significant role in predicting people's willingness to engage in energy-saving behaviour. While a correlation between socio-demographic factors and the willingness to adopt energy-saving behaviour was observed, these factors were not found to be significant in predicting behavioural intentions when the other variables were controlled for in a regression analysis. The findings of this study then, provide useful insights for policy development, particularly in the design of interventions to promote behaviour change related to energy efficiency and conservation.



## Acknowledgements

Firstly, I would like to express my deepest gratitude to my supervisor, Dr. Wokje Abrahamse. Thank you for your unwavering support and guidance throughout this research process. Your expertise, interests and honest feedback were instrumental in not only the completion of this thesis but also in keeping me motivated and determined. It was your course on drivers of human behaviour that sparked my interest in using behaviour change to tackle environmental challenges and is what inspired me to begin this project. Thank you for being patient with me as I navigated my way through SPSS. Your guidance made data analysis my favourite part of this journey.

This thesis would not have been possible without the support of Manaaki New Zealand scholarships for funding my postgraduate degree. Thank you for this life-changing opportunity for me to pursue my passion in environmental studies. I am determined to bring back the skills and knowledge I learned in New Zealand to make a positive impact on my community in Laos.

I also would like to thank the Manaaki New Zealand scholarships support team at Victoria University of Wellington for their ongoing support throughout my studies. To Misa, thank you for your continuous support and encouragement throughout my academic journey.

I would like to express my gratitude to the participants of the questionnaire. Your contribution made this research possible, and it is greatly appreciated. Thank you for your time and effort.

To mum and dad, thank you for your constant emotional support from Laos. Thank you for helping me believe in myself and always encourage me to reach my goals. Your love and support have been my rock and I am forever grateful for the sacrifices you have made to help me succeed. To my partner Micky, thank you for your love and understanding throughout my studies. Without your support during the pandemic, it would have been impossible to cope with the challenges and uncertainties. Thank you.

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## List of Abbreviations

ADB	Asian Development Bank
AC	Awareness of Consequences
AR	Ascription of Responsibility
GEA	Global Energy Assessment
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
NAM	Norm Activation Model
NEP	New Ecological Paradigm
PN	Personal Norms
PVQ	Portrait Value Questionnaire
SE	Self-Enhancement
ST	Self-Transcendence
VBN	Value- Belief-Norm Theory



## Chapter 1: Introduction

### 1.1 Preamble

Energy plays a significant role in the functioning of the contemporary lifestyle as it is essential for nearly all daily activities. People use energy directly through the use of gas, fuel, and electricity, or indirectly through the energy that is embedded in the production, transportation, and disposal of products, such as food and clothing (Abrahamse & Steg, 2009). Despite efforts to promote renewable energy sources, fossil fuels such as coal and oil remain the primary energy source worldwide (IEA, 2021a). The burning of fossil fuels is a major contributor to the rising levels of greenhouse gases, especially carbon dioxide, in the atmosphere (IPCC, 2014). Current demand for energy has caused a rise in global energy consumption, which has resulted in a number of negative environmental impacts, including climate change, air pollution and natural resources depletion (GEA, 2012). Thus, a shift in the way energy is generated and used is crucial in reducing human impacts on the environment, for example through transitioning from the use of fossil fuels to renewable energy sources, and improving energy efficiency (IPCC, 2014).

Energy efficiency has been identified as a key strategy to address the growing demand for energy consumption (GEA, 2012; IEA, 2021b; IPCC, 2014). Energy efficiency generally refers to “using less energy to produce the same amount of services or useful output” (Patterson, 1996, p. 377). This can be achieved by using advanced technologies that are designed to be more energy efficient. For example, by replacing compact fluorescent light bulbs (CFL) with light-emitting diode bulbs (LED) or upgrading to energy-efficient appliances such as refrigerators and air conditioners, less energy is consumed while providing the same level of comfort and functionality. Using energy more efficiently decreases the demand for energy, which in turn creates greater flexibility in the production and distribution of energy (GEA, 2012).

### 1.2 Household Energy Use

The residential sector plays a significant role in global energy consumption and greenhouse gas emissions. The residential sector is responsible for the third-highest consumption of energy globally, accounting for 27% of the total energy consumed (Nejat et al., 2015). Furthermore, the residential sector accounts for 17% of total

carbon dioxide emissions, making this sector a significant contributor to climate change impacts (Nejat et al., 2015). Thus, increasing energy efficiency in the residential sector has been identified as a crucial area of focus in efforts to mitigate the effects of climate change (GEA, 2012; IEA, 2021b; IPCC 2014). In this research, household energy use refers to electricity used for household appliances, space cooling and lighting (IEA, 2018). Energy use for household transportation and energy embedded in food, packaging and clothing are not included in this definition of household energy use.

The rise in household energy consumption is driven by a number of factors, including demographics, economics, culture, and technology (Vlek, 2000). Technological advancements, for example, have led to an expanding and diverse range of electrical appliances being available to households. Although appliances have been designed to consume less energy over time, the growing trend of owning and utilising more electronic devices has counteracted these initial savings (IEA, 2022). The increased consumption of material goods, as a result of modern human activities, has placed pressure on the efforts to reduce carbon emissions and achieve sustainability.

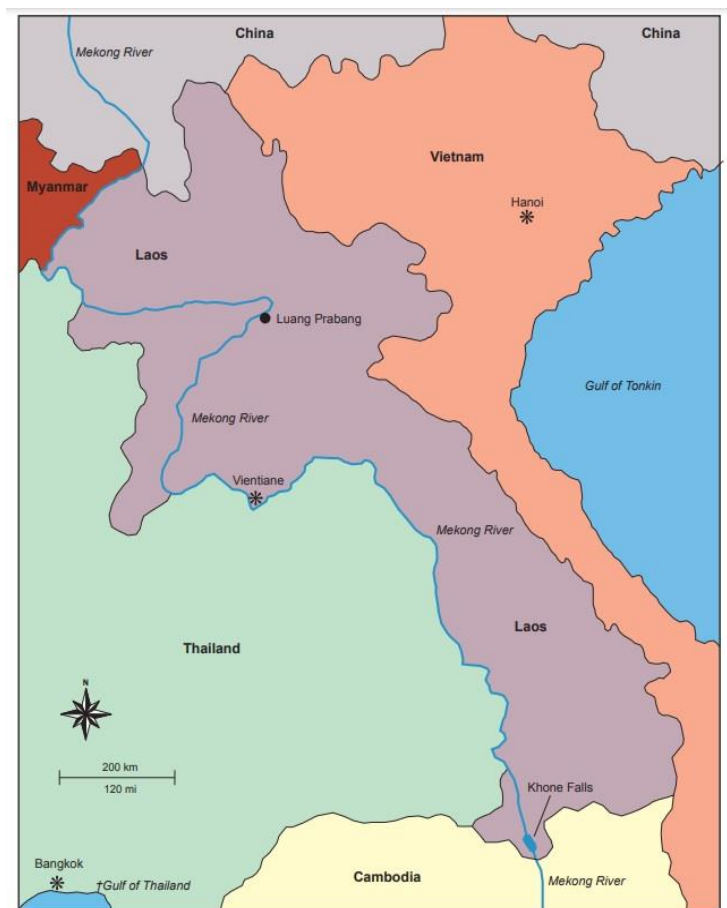
Government policies can play a key role to promote energy efficiency and conservation at the household level by encouraging people to change their energy consumption behaviours (Steg, 2008). Various campaigns aimed at raising awareness of household energy use and promoting behavioural change have been implemented in many countries in order to motivate residents to adopt energy conservation measures (IEA, 2022). These campaigns have targeted different types of energy conservation behaviours, such as encouraging the use of energy-efficient appliances, reducing the use of air-conditioning, and reducing shower times.

In Laos, despite the target of achieving national energy savings of 10% by 2025, the country has not yet established a comprehensive policy to promote energy efficiency and conservation (ADB, 2019; IEA, 2022). In view of this, this thesis aims to explore and examine the key determinants of energy conservation behaviours of households in Laos. This study will investigate what factors motivate people's willingness to save energy at home, providing a unique opportunity to gain insights for the future development of energy-saving intervention campaigns in Laos.

### 1.3. Energy Consumption in Laos

The Lao People's Democratic Republic, commonly known as Laos, is a country located in Southeast Asia. It has a total land area of 236,800 square kilometres and is divided into 18 provinces with Vientiane as the capital (Ministry of Energy and Mines, 2020). The country is known for its mountainous terrain and the Mekong River, which runs through much of its border with Thailand. Laos also shares borders with Vietnam, Cambodia, Myanmar, and China. The population of Laos is relatively small compared to other Southeast Asian countries. As of 2021, its population was reported to be around 7 million people (Lao Statistics Bureau, 2022).

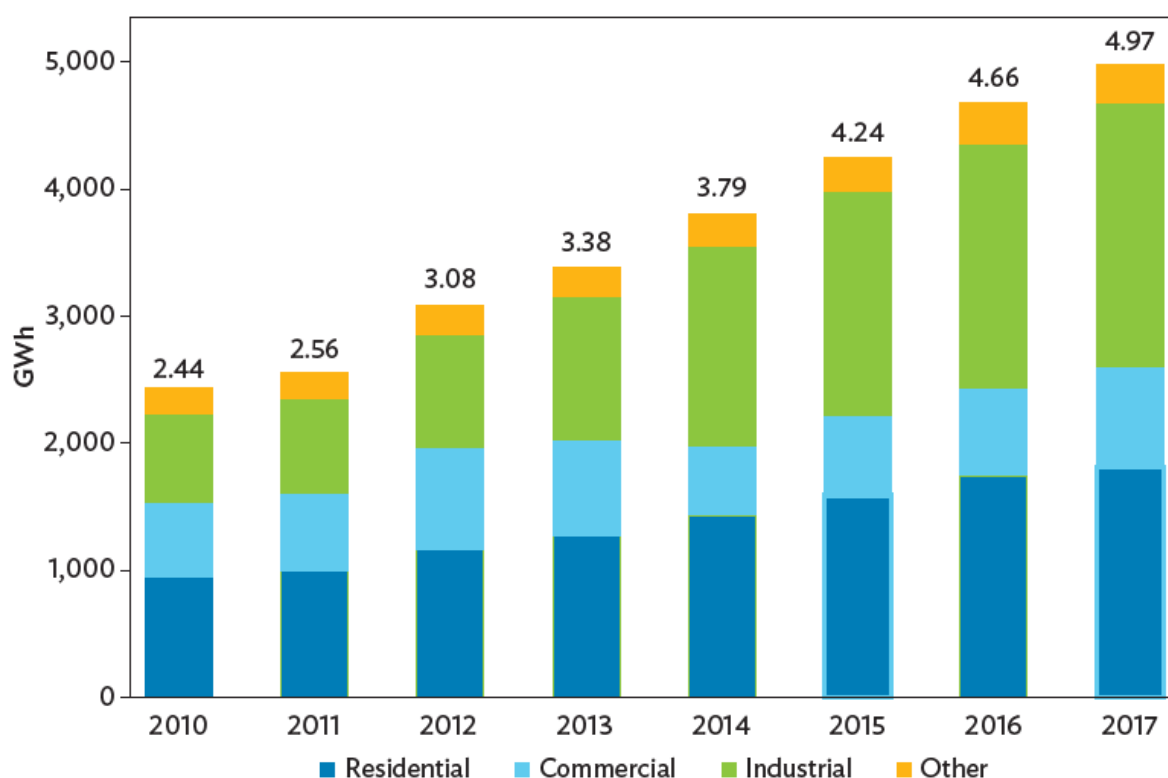
**Figure 1.1 Map of Laos Displaying the Route of Mekong River**



Source: Olson & Morton (2018)

Since the country began the implementation of a free market economic policy in 1986 that opened the door for global trade, Laos has experienced significant economic growth in the form of foreign trade, investments, and cooperation with regional and global economies all of which has reduced poverty in the nation (Ministry of Energy and Mines, 2020). This economic reform policy involved reducing trade barriers and encouraging foreign investment in various sectors such as agriculture, mining and manufacturing (Hatthachan, 2012). Nonetheless, Laos is still considered to be a low-income country, with a gross domestic product (GDP) per capita of USD2,595 in 2021 (Lao Statistics Bureau, 2022). Recently, the economy of Laos has been gradually transitioning from agricultural activities towards more diversified industries, including services and manufacturing. As this new economy grows however, the demand for energy also increases. The demand for energy in Laos is largely driven by industrial and residential sectors. Energy consumption in the residential sector grew at a rate of 9.8% from 2010 to 2017, accounting for 37% of total consumption (ADB, 2019). Figure 1.1 below shows the country's energy consumption by different sectors.

**Figure 1.2 Energy Consumption in Laos by Sector from 2010 to 2017**



Note: GWh = gigawatt per hour. Source: ADB (2019)

The geographical and hydrological characteristics of Laos provide a significant opportunity for hydropower development on the Mekong River. In fact, nearly 100% of the national electricity production is generated by hydropower (Geheb & Suhardiman, 2019). The development of hydropower has also contributed to the economy of Laos through its export to neighbouring countries such as Thailand and Vietnam (ADB, 2019). However, whilst hydropower is argued to be a renewable, 'clean' and 'green' source of energy, the construction of hydroelectric dams has caused severe social and environmental impacts. Thus, even though electricity generation in Laos is sourced from renewables, it is still crucial for people to reduce their electricity consumption. The construction of dams on the Mekong River and its tributaries has resulted in displacement of local communities, loss of traditional livelihoods, and impacts on fish migration and aquatic biodiversity (Sivongxay et al., 2017; Soukhaphon et al., 2021). To illustrate, the construction of the Don Sahong dam in Southern Laos has disrupted fish migration routes due to its location at a crucial migration channel (Soukhaphon et al., 2021). Since its construction, the dam has caused a significant impact on livelihoods as locals, who rely on fish for their main source of food, have experienced decline in fish catches.

What is more, energy demand is expected to increase gradually as the country continues to develop to meet its target of graduating from its current status as being a 'least-developed' country by 2026 (Ministry of Planning and Investment, 2021). It is predicted that the total energy consumption in Laos will experience an annual growth rate of 4.7% from now until 2040 (Ministry of Energy and Mines, 2020). This projected increase in energy demand presents a significant challenge for Laos, as the country also aims to reduce energy consumption by 10% for the period through 2025 (IEA, 2022a).

Energy efficiency and conservation are considered to be important policies for reducing energy consumption and achieve the national energy savings target (ADB, 2019). In line with this objective, the government of Laos has set a target to achieve carbon neutrality by 2050 (IEA, 2022b). Laos is in the early stages of developing and implementing national strategies for energy efficiency and conservation. A department dedicated to promoting energy efficiency and conservation was recently established and assigned the responsibility of advancing energy efficiency and conservation initiatives in the country (Ministry of Energy and Mines, 2022). Despite the progress

made in the institutional establishment, there remains a significant amount of work that needs to be done in order to effectively promote and implement these policies throughout the country. Such a situation presents a unique opportunity for this research to investigate the factors that encourage people's willingness to conserve energy.

#### 1.4 Research Aims and Questions

The overarching aim of this research is to identify and explore the key determinants of people's willingness to engage in energy conservation behaviour in Laos. The reason Laos was chosen as the study location is the lack of literature regarding on what motivates people to reduce household energy consumption in the context of low-income countries in Southeast Asia. This study then aims to investigate the relationships between psychological and socio-demographic factors in shaping people's willingness to engage in energy-saving behaviour in Laos. As Laos is currently at an early stage of developing its energy efficiency and conservation strategy, the findings of this study will provide useful insights for future policy interventions.

A quantitative method is utilised to answer the research questions as outlined in Table 1.1 below.

**Table 1.1 Research Questions**

Research Questions
<b>Research question 1:</b> How are values, environmental beliefs, and personal norms associated with the willingness to adopt energy-saving behaviour in Laos?
<b>Research question 2:</b> How are socio-demographic characteristics associated with the willingness to adopt energy conservation behaviour in Laos?
<b>Research question 3:</b> What role do psychological and socio-demographic factors play in influencing household energy conservation in Laos, both in efficiency and curtailment behaviour?



## 1.6 Thesis Preview

The following table provides a brief description of the structure and contents of each chapter of this thesis.

**Table 1.2 Thesis Chapter Summaries**

Chapter	Summary
<b>2. Factors related to energy conservation behaviour</b>	This chapter first discusses two types of energy conservation behaviours. A review of relevant literature is later presented in order to explore the relationships between socio-demographic and psychological factors and household energy conservation behaviour.
<b>3. Theoretical framework: values, beliefs, personal norms</b>	This chapter examines past studies that have used psychological theories to examine the relationship between energy conservation behaviour and willingness, as well as the underlying psychological factors such as values, environmental concern, beliefs, and norms. Based on the theoretical approach of this project, hypotheses are posed for each research question to establish a clear direction for this study.
<b>4. Methodology</b>	This chapter provides a comprehensive overview of the research process, including the research design, the development of the survey and the measures included in the questionnaire. Chapter four also includes information on the survey participants and the statistical methods used in the study.
<b>5. Results</b>	The results chapter presents the findings in order of the research questions. Each result section provides a detailed explanation of the statistical analysis, including addressing the assumptions of each test, and presents

	the results for the three questions posed. The concluding remarks summarise the extent to which each hypothesis is supported by the findings.
<b>6. Discussion</b>	The discussion chapter synthesises the literature review and the findings of this study to examine the wider implications of the results. The limitations of the study are discussed, followed by suggestions for future research. The conclusion of the chapter provides recommendations for policy based on the findings of this study.
<b>7. Conclusion</b>	The conclusion chapter restates the purpose of this study, provides a summary of key findings of this thesis, and highlights its contributions towards future studies in energy conservation.
<b>References</b>	Complete reference of all sources presented in APA 7th style
<b>Appendix A</b>	Ethical approval letter
<b>Appendix B</b>	The survey questionnaire used in the research including participants information sheet in English and Lao

## Chapter 2: Factors Related to Energy Conservation Behaviour

### 2.1 Introduction

There is great potential for households to contribute to energy conservation by encouraging residents to engage in energy-saving behaviour. Increasing energy efficiency and energy conservation in the residential sector is considered to be a key strategy to reduce greenhouse gas emissions in several European countries (Trotta et al., 2018). Current efforts to reduce energy consumption have been primarily focused on improving efficiency, especially by encouraging the uptake of efficient technologies (IEA, 2022). Improving efficiency means using technology and practices that require less energy to achieve the same or better results. For example, using LED light bulbs instead of traditional incandescent bulbs can significantly reduce energy consumption while still providing the same amount of light. On the other hand, a growing number of studies have suggested that the adoption of curtailment behaviour is also important because it requires no or low monetary investments and is accessible to all households. This can include simple actions such as turning off lights when leaving a room or reducing thermostat settings.

Since households play an important role in contributing to energy conservation, it is necessary to identify the key factors that encourage people to engage in energy-saving behaviour. There are many factors that correlate with people's willingness to adopt energy conservation behaviour. Research findings indicate that this willingness is particularly driven by socio-demographic and psychological factors (Abrahamse & Steg, 2009). As discussed in the previous chapter, there is a relative lack of research investigating the key determinants of people's willingness to adopt energy conservation behaviour in the context of Southeast Asian countries such as Laos. Therefore, this research focuses on understanding the key determinants of energy conservation in Laos and in doing so, this research will contribute to filling this knowledge gap. Firstly however, a broader discussion on the types of energy conservation behaviour will help contextualize this research.

## 2.2 Efficiency and Curtailment Behaviour

It is believed that households can reduce energy consumption by adopting two types of behaviours: efficiency and curtailment behaviours (Dietz et al., 2009; Gardner & Stern, 2008). Improving efficiency actions in residential energy use is considered to be a key strategy to reduce energy consumption (Reyna & Chester, 2017). The adoption of efficiency behaviours is typically a one-time change, but it also requires a high monetary investment (Gardner & Stern, 2008). Examples of these behaviours include purchasing energy-efficient appliances or installing home insulation (Karlin et al., 2014). Curtailment behaviours, on the other hand, involve no or low-cost actions, but they need to be done frequently in order to achieve energy savings (Abrahamse, 2019). Such behaviours include reducing the use of air conditioners or unplugging electrical appliances when not in use. While the adoption of curtailment behaviours usually requires no financial investments, it can involve the loss of comfort and amenities (Abrahamse, 2019; Karlin et al., 2014).

Several scholars have argued that efficiency behaviours are more effective in achieving energy savings than curtailment behaviours. A study by Gardner and Stern (2008) has compared how much energy can be saved by performing efficiency and curtailment actions for households in the United States. Their results revealed that efficiency behaviours can generally save more energy and are more effective in reducing emissions than curtailment behaviours. For example, the study shows that using compact fluorescent bulbs can produce electricity savings of up to 4% but turning off lights all night can only save electricity by 0.5% (Gardner & Stern, 2008). In addition, several government-funded programmes aim to increase energy savings by promoting the uptake of energy efficiency, such as subsidies for energy efficient appliances. Policy interventions such as financial subsidies are largely introduced because they are less complex to implement than behavioural change campaigns and offer effective results (IEA, 2021b). By providing tangible incentives for adopting sustainable practices, such as tax credits or rebates for energy-efficient appliances, financial subsidies can encourage individuals and organizations to adopt pro-environmental behaviours without requiring significant changes to existing infrastructure or systems. For example, the national residential lighting program in the Philippines provided free installation of compact fluorescent lights (CFL) for

households nationwide (ADB, 2015). By 2013, nine million CFLs were distributed, and the national energy consumption was reduced by 236 gigawatt per hour (Gwh).

Other scholars, however, have argued that the adoption of efficiency behaviours does not always result in the amount of energy savings that economic models would predict. An energy-efficient appliance, for instance, can still consume a lot of energy when people use it more frequently compared with their regular appliance. This occurrence is called a rebound effect, where energy efficiency gains are not as high as anticipated when energy-saving products are not used in an efficient manner (Schleich & Dütschke, 2014). Schleich and Dütschke (2014) studied German households and found that replacing regular light bulbs (incandescent lamps) with LEDs or CFLs resulted in a rebound effect of 6%, primarily due to extended use times and higher luminance levels. Therefore, while technological innovations are important to reduce the use of energy, it is also crucial to take people's behaviour into consideration.

In order to understand energy conservation behaviour, a more detailed discussion its determining factors is required. The following section discusses previous research exploring the relationships between socio-demographic and psychological factors and household energy conservation behaviour.

## 2.3 Socio-Demographic Factors

Research on household energy use and energy-saving behaviour has found that several types of factors can influence energy-usage behaviour. Household energy use appears to be positively associated with socio-demographic factors, in particular the level of income and household size (Abrahamse & Steg, 2009; 2011; Gatersleben et al., 2002). Households with higher income and more members tend to consume more energy. Thus, this suggests that socio-demographic factors may create opportunities or barriers for energy use (Abrahamse & Steg, 2011).

Evidence in the literature indicates that there is a positive correlation between socio-demographic factors and energy conservation behaviour. Socio-demographic characteristics such as age, income, level of education and household structure are considered to be important factors. For instance, Yue and colleagues (2013) investigated the determinants of energy-saving behaviour intentions among Chinese households. The study examined different influencing factors, which include socio-

demographics, awareness of energy conservation, ability to change behaviour, and contextual factors. The results were based on an online survey that was distributed to 638 households. According to the findings, socio-demographic characteristics such as age, gender, income level, household structure, and educational background significantly influenced energy-saving behaviour.

Seniority was found to be positively related to energy-saving behaviour, as older residents (especially retired people) were more willing to reduce energy use at home (Wang et al., 2011; Yue et al., 2013). Yue and colleagues (2013) argued that one possible reason for the positive relationship between seniority and energy-saving behaviour is because older people may be more aware of life's challenges and budgetary constraints, giving them more motivation to adopt energy-saving behaviour. Specifically in the context of China, where the 'Great Chinese Famine' from 1959 to 1961 affected millions of people, Yue et al. (2013) suspected that many older individuals may have developed a greater appreciation for saving. In contrast, Yue and colleagues (2013) found that older residents were found to be less willing to adopt energy-efficiency behaviour, such as investing in energy-efficient products, when compared to younger residents.

Regarding income level, Yue et al. (2013) found a positive correlation between the level of income and households' willingness to engage in energy-saving behaviour. Household income level was also found to be related to the adoption of energy conservation behaviour in previous studies (Poortinga et al., 2004; Sardianou, 2007; Urban & Ščasný, 2012). In a study conducted by Yue and colleagues (2013), households with a lower income were more likely to adopt curtailment behaviour, while those with higher income were more willing to invest in energy-efficient technologies. One possible reason for this could be that engaging in energy-efficiency behaviour may require a certain level of financial capacity and some households may not be able to afford the upfront costs associated with energy-efficient products or services (Yue et al., 2013). As a result, households with lower income may be more willing to engage in energy curtailment behaviour, which involves less costly changes to daily habits and routines.

In the same study, Yue and colleagues (2013) found that household structure has a significant influence on energy conservation behaviour. Specifically, households that

consisted of several family members, especially with children and parents, were more likely to participate in energy-saving behaviour. This finding is consistent with previous research conducted on the topic, including a study by Yang et al. (2016). One possible explanation for this finding is families are likely to have higher costs of living and utility bills, leading to a stronger motivation for energy-saving (Yue et al., 2013). Families also have more opportunities to communicate information about energy conservation, and parents may feel a sense of responsibility to set a good example for their children (Yue et al., 2013).

Furthermore, the study from Yue and colleagues (2013) revealed a significant positive correlation between the level of education and household energy-saving behaviour. Specifically, household residents who were relatively highly educated (with bachelor's degree and above) were more willing to adopt energy efficiency behaviour, but not curtailment behaviour. This finding is consistent with a study conducted by Poortinga et al. (2003) in the Netherlands, which found that participants with lower level of education were more willing to engage in household energy curtailment behaviour. The researchers suggested that the correlation between lower education levels and greater willingness to engage in curtailment behaviour may be explained by the fact that respondents with lower education levels in this study also have lower incomes (Poortinga et al., 2003). Curtailment behaviour typically requires minimal or no expenses, making it a more accessible option for those who may not have the financial resources to invest in energy efficiency measures.

The observed relationship between education level and energy-saving behaviour highlights the importance of considering socio-demographic factors in energy conservation research, particularly in developing countries. Such insights can be especially relevant in country like Laos, where educational attainment and income levels differ significantly from Western countries.

Previous studies have shown that homeownership play an important role for households to engage in energy-saving behaviour, especially efficiency behaviour (Barr et al., 2005; Lillemo, 2014). For instance, a study conducted by Barr et al. (2005) on the relationship between situational factors and energy conservation behaviour in Devon found that owning a residence is positively associated with more investments in home insulation and energy-efficient heating appliances. The authors suggested

that homeownership may give individuals a sense of connection and control of their home, which further encourage them to consider investing more in energy efficiency (Barr et al., 2005).

For some socio-demographic variables, however, the research findings appear to be mixed. While a number of studies have shown that the relationship between gender and energy-saving behaviour seems to be insignificant (Poortinga et al., 2003; Urban & Ščasný, 2012; Whitmarsh & O'Neill, 2010; Yue et al., 2013), other research suggest that women are more willing to adopt energy conservation behaviour than men (Barr et al., 2005; Jansson et al., 2009; Lee et al., 2013). For example, Lee and colleagues (2013) conducted a study to examine gender differences in household energy conservation behaviour among 303 residents in the United States. The study showed that women were more likely to engage in energy curtailment behaviour, such as turning off lights when leaving a room, and efficiency behaviour, such as investing in energy-efficient light bulbs. While the underlying reasons for this gender difference in energy-saving behaviour remain unclear, the authors suggest that it may be due to differences in values and attitudes towards the environment between men and women (Lee et al., 2013).

The association between household structure and energy conservation behaviour is also not conclusive. While Yue and colleagues (2013) found that households with children are more likely to engage in energy-saving behaviour, research conducted by Peters (1990) and Weihl and Gladhart (1990) revealed that families with children are less likely to engage in curtailment behaviour (e.g., lowering thermostat settings) if that means it could decrease the comfort of the children. The relationship between household characteristics and energy conservation behaviour is diverse due to potential variations in context between studies, particularly given that these investigations have been conducted in different countries. Understanding the contextual differences that shape the relationship between household characteristics and energy conservation behaviour is particularly important in the context of Laos, as it can inform the development of targeted interventions that take into account the unique characteristics of households in Laos.



## 2.4 Psychological Factors

A growing body of research seeks to understand energy conservation behaviour through the lens of psychological theories. As discussed above, changes in energy use and energy savings may depend on factors that serve as barriers or opportunities for conservation. To illustrate, income is deemed to be a key factor that influences a decision to engage in energy efficiency behaviours. In this case, households with higher income have more 'real' opportunities to purchase energy-efficient technologies and invest in home insulation. In the same way, the decision to engage in curtailment behaviour requires conscious effort to act in order to achieve energy savings (Abrahamse & Steg, 2009). It is believed that such conscious efforts require a certain amount of planning and deliberation, hence they may be strongly associated with psychological factors (Abrahamse & Steg, 2011). For instance, research findings suggest that the willingness to reduce energy use of households is positively associated with 'perceived behavioural control' (Abrahamse & Steg, 2011; Chen et al., 2017; Pals & Singer, 2015). Perceived behavioural control refers to people's perception of their ability to do the behaviour (Abrahamse, 2019). In this case, the intentions to reduce energy use may be predicted by the 'perceived' opportunities or capabilities of the households to engage in energy conservation behaviour.

A number of studies have found that different psychological variables are important predictors of energy-saving behaviour and intentions (Abrahamse & Steg, 2009; 2011; Fornara et al., 2016; Karlin et al., 2014; Pals & Singer, 2015; Yeboah & Kaplowitz, 2016). An example can be seen in a study conducted by Fornara and colleagues (2016) who found that values related to the 'self-transcendence' dimension (i.e., concern for others and of nature) appeared to be positively associated with households' willingness to invest in improving household efficiency. Conversely, other studies have found that self-enhancement values (i.e., values corresponding to power and achievement) are positively related with greater household energy consumption (Guerin et al., 2000; Poortinga et al., 2004). These psychological factors would be interesting to explore in the context of Laos especially in the interpretation of what 'self-transcendence' may mean for Lao people given this is a Western term.

Environmental concern has been found to be positively related to energy conservation behaviour (Karlin et al., 2014; Poortinga et al., 2004). Research conducted by Karlin

and colleagues (2014) suggested that that people's level of environmental concern is significant in predicting energy conservation behaviour. That is, households that showed higher levels of environmental concern were more likely to engage in energy curtailment behaviours. In addition, some authors have found that people with high level of environmental concern tend to display a strong 'awareness of consequences' regarding energy-related issues and tend to feel more responsible for saving energy (Ibtissem, 2010, Yeboah & Kaplowitz, 2016). However, there are large differences between environmental knowledge and campaigning in Western countries and countries such as Laos. Therefore, psychological factors would have to be contextualised within the culture of Laos, which is something this research intends to do.

Finally, personal norms are seen to be strong predictors of energy conservation behaviour and intentions within various energy behaviour studies (Harland et al., 1999; Fornara et al., 2016; Ibtissem, 2010; Wang et al., 2018; Yeboah & Kaplowitz, 2016). The study conducted by Wang and colleagues (2018) revealed that households with strong personal norms showed more positive intentions to participate in energy-saving behaviours. They further argued that residents with high personal norm would feel more obligated and responsible to save energy, while wasting energy would make them feel guilty and not comfortable. How personal norms influence energy conservation behaviour can be explained by the Norm Activation Model (NAM), which will be discussed in the next chapter.

## 2.5 Summary

It is important to distinguish between the different types of behaviours – efficiency and curtailment – as they exhibit distinct attributes and determinants. The literature suggests that, at a household level, socio-demographic factors may be more relevant for explaining people's engagement in efficiency behaviours, whereas psychological factors may be more relevant for curtailment behaviours. In addition, the willingness to adopt energy-saving behaviour is strongly predicted by psychological variables in addition to socio-demographic variables. The next chapter examines past studies that have utilised psychological theories to explore the relationship between energy conservation behaviour and willingness, and the underlying psychological factors such as values, environmental concern, beliefs, and norms.

## Chapter 3: Theoretical Framework: Values, Environmental Beliefs and Personal Norms

### 3.1 Introduction

The literature outlines a number of psychological factors related to pro-environmental behaviour as well as energy conservation behaviour. This chapter discusses psychological variables that have been used widely to determine the key motivators of energy conservation behaviour, namely values, environmental concern, environmental beliefs (such as awareness of consequences, and ascription of responsibility) and personal norms, and how they have potential for being contextualised within the country of Laos. It is argued that values influence human behaviours because they act as a guiding principle in life. Hence, this chapter examines in depth the relationship between values and energy conservation behaviour. The relationship between environmental beliefs, personal norms and energy conservation behaviour is then discussed. Drawing on Schwartz' values theory, the Value-Belief-Norm theory, and the norm activation theory, this chapter concludes with the main research questions and corresponding hypotheses that are examined in this study.

### 3.2 Values

#### 3.2.1 Understanding Human Values

Over the past decades, a number of studies have examined the extent to which values affect human behaviour. Values are conceptualised as “desirable trans-situational goals” (De Groot & Thøgersen, 2018, p. 168) that motivate behaviour and serve as guiding principles in people's lives (Schwartz, 1992). Generally, values represent what is important to us (Schwartz, 2012). Therefore, values are seen to influence different beliefs and norms, which in turn affect actual behaviour (Steg et al., 2012).

It is believed that values focus on different targets including personal, social, and environmental. Stern (1993) argued that values can be characterised into three types: altruistic, biospheric and egoistic. Altruistic values represent the individual's concern for the collective well-being or welfare of other people. On the other hand, egoistic

values reflect the individual's personal interest. Biospheric value orientation refers to the individual's concern for the nature and non-human species (Steg & De Groot, 2012; Stern et al., 1993; Stern, 2000). Previous studies have found people who strongly endorse altruistic and biospheric values are more likely to engage in pro-environmental behaviours (Choi et al., 2015; Nordlund & Garvill, 2003; Poortinga et al., 2004)

In addition, Schwartz's theory of basic values is one of the most widely used in research related to pro-environmental behaviour (De Groot & Steg, 2008; Ghazali et al., 2019; Steg et al., 2005; Yeboah & Kaplowitz, 2016). Research conducted by Schwartz has found strong empirical evidence across many different cultures, which indicates that values are universal (Schwartz, 1992; 1994; Schwartz et al., 2001). To elaborate, Schwartz argued there are three such universal values that many societies share, namely, the "needs of individuals" according to our biology, our need for organised social interaction and our requirement for "the smooth functioning" of such structured societies or social groupings (Schwartz, 1994, p. 21). It is one of the purposes of this research to explore whether such universal values are indeed universal by examining them within the context of Laos given there is, from my own research, little is known about pro-environmental behaviour in Southeast Asian countries.

From these universal requirements, Schwartz (1992; 1994) proposed there are 56 general values which can be grouped into ten motivational types. For example, the value type of 'power' includes values such as authority, wealth, and social power, which collectively represent "social status and prestige, control or dominance over people and resources" (Schwartz, 2012, p. 5). Table 3.1 below describes the full list of value types and their defining goals.

**Table 3.1 Value Types and Definitions (adapted from Schwartz, 2012)**

<b>Types of Values</b>	<b>Defining Goals</b>
<i>Self-Direction</i>	Independent thought and action-choosing, creating, exploring (creativity, freedom, choosing own goals, curious)
<i>Stimulation</i>	Excitement, novelty and challenge in life (a varied life, an exciting life, daring)
<i>Hedonism</i>	Pleasure or sensuous gratification for oneself (pleasure, enjoying life, self-indulgent)
<i>Achievement</i>	Personal success through demonstrating competence according to social standards (ambitious, successful, capable, influential)
<i>Power</i>	Social status and prestige, control or dominance over people and resources (authority, wealth, social power)
<i>Security</i>	Safety, harmony, and stability of society, of relationships and of self (social order, family security, national security, clean, reciprocation of favours)
<i>Conformity</i>	Restraint of actions, inclinations, and impulses likely to upset or harm others and violate social expectations or norms (obedient, self-discipline, politeness, honouring parents and elders)
<i>Tradition</i>	Respect, commitment, and acceptance of the customs and ideas that one's culture or religion provides (respect for tradition, humble, devout, accepting my portion in life)
<i>Benevolence</i>	Preserving and enhancing the welfare of those with whom one is in frequent personal contact (helpful, honest, forgiving, responsible, loyal, true friendship, mature love)
<i>Universalism</i>	Understanding, appreciation, tolerance, and protection for the welfare of all people and for nature (broad-minded, social justice, equality, world at peace, world of beauty, unity with nature, wisdom, protecting the environment)

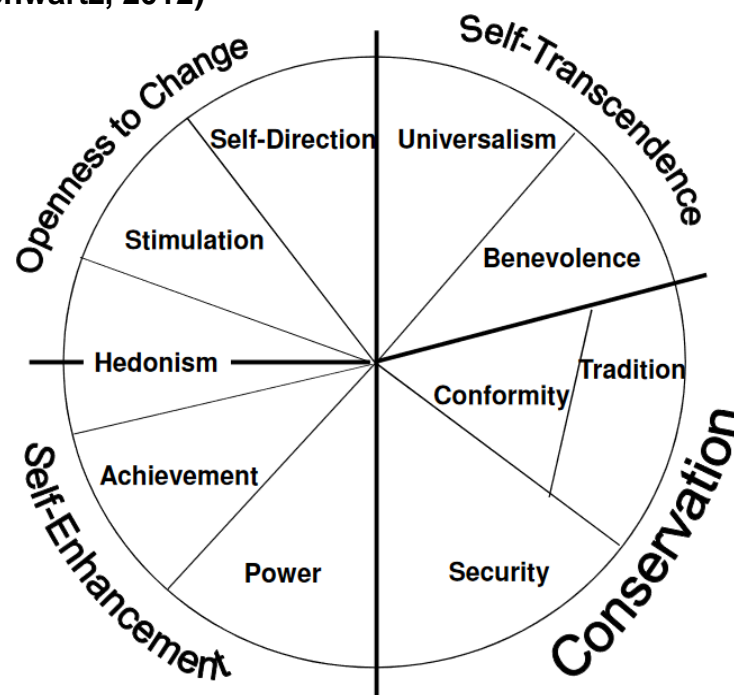
### 3.2.2 The Structure of Value Relations

In addition, Schwartz states that these ten value types can be categorised into two dimensions based on their relationships to each other. The first dimension is openness to change versus conservation. The openness to change dimension emphasises an inclination for change, and openness for new actions and ideas (De Groot & Thøgersen, 2018). Values comprising this dimension are that of stimulation and self-direction. In contrast, conservation values reflect self-restriction, placing importance on social order and resistance to change (Schwartz et al., 2012). Values comprising this dimension include tradition, conformity, and security.

The second dimension contrasts self-enhancement and self-transcendence values. According to Schwartz (2012), self-enhancement values emphasise “the pursuit of one’s own interests and relative success and dominance over others” (p. 8). The underlying motivational goals of this value dimension are power and achievement. On the other hand, self-transcendence values emphasise a strong concern of other people and the environment. Values related to this dimension can be seen in benevolence and universalism values.

Figure 3.1 below represents the model that shows oppositions between competing values.

**Figure 3.1 Model of Relations Among Ten Motivational Values and Two Dimensions (Schwartz, 2012)**



### 3.2.3 Values and Energy Conservation Behaviour

A number of studies have found that people who hold values that go beyond one's self-interests, such as self-transcendence values, are more likely to engage in pro-environmental behaviours. For example, Yeboah and Kaplowitz (2016) investigated the influence of psychological factors on energy conservation behaviour among students at Michigan State University. They hypothesised that values could be strongly associated with energy-saving behaviour. In their study, values were measured by the shortened version of Schwartz's (1992) universal value scale. Only self-transcendence and self-enhancement value items were used in their study to evaluate participants' value orientations as they showed strong correlation with pro-environmental behaviour in past studies. Openness to change and conservation value orientations were not included in the measurement. The result of this study showed that self-transcendence value orientation was positively associated with energy-saving behaviour (Yeboah & Kaplowitz, 2016). The findings of this research are also consistent with Schwartz' basic human value framework that suggests self-transcendence values would be positively related to pro-environmental behaviour. Apart from a focus on the welfare of other people, the self-transcendence dimension also reflects the idea of protecting the environment and unity with nature (Schwartz, 2012).

People who endorse self-enhancement values were found to be less likely to engage in energy-saving behaviour (Poortinga et al., 2004; Yeboah & Kaplowitz, 2016). For instance, a study conducted by Poortinga and colleagues (2004) revealed that the more strongly households endorsed self-enhancement values, the less likely they were to adopt in-home energy-saving behaviour, especially curtailment behaviours. This finding is consistent with other research, in which values related to power and achievement (also described as egoistic values) were correlated with a greater energy use (Abrahamse & Steg, 2011).

However, Steg and De Groot (2012) argued that values related to achievement can sometimes promote energy-saving behaviour. It is believed that individuals who prioritise their own outcomes and achievements are more likely to consider the cost and benefits of their actions, therefore they can act in a pro-environmental manner to achieve the benefits. This is exemplified in the work undertaken by Miroso et al. (2013)

that investigated the relations between values and household energy use and energy-saving behaviour. They discovered that achievement values are significant in determining energy-efficient behaviours, particularly in the investments of electrical appliances. The results also showed that while financial benefits are the main motivation, other factors such as convenience and situational factor (such as the availability of energy-efficient products) are also important. This finding is supported by the work of Poortinga and colleagues (2004), that values and energy conservation can be influenced by contextual factors.

In addition, the openness to change dimension is found to be correlated with pro-environmental behaviour (Gilg et al., 2005; Stern et al., 1999). This value dimension reflects the thoughts and feelings of readiness for change (i.e., self-direction and stimulation value types). This connection is also evident in energy-saving behaviour where those who strongly endorse openness to change values are more likely to engage in energy-saving behaviour (Ghazali et al., 2016).

The conservation value dimension reflects the idea of self-restriction and resistance to change, which includes the value types of security, conformity, and tradition. Previous research revealed that people who strongly endorse conservation values are less likely to be concerned with the environment and engage in pro-environmental behaviour (Braito et al., 2017; Schultz et al., 2005). In addition, the study conducted by Abrahamse and Steg (2011) found that conservation values are positively correlated with energy consumption at home, suggesting that the more households endorse conservation value, the more energy they use. However, there is a lack of research examining the relationship between conservation values and people's willingness to adopt energy-saving behaviour.

Although a direct relationship between values and behaviours may exist, this relationship may also be indirect where other variables mediate this relationship. Some researchers have argued, for example, that values alone may not directly predict environmentally significant behaviour, but that this relationship is mediated through a number of variables (Abrahamse & Steg, 2011; Dietz et al., 2005; Steg et al., 2005, Stern, 2000). The mediating variables are positioned in between an independent variable (i.e., values) and an outcome variable (i.e., energy conservation behaviour) to help explain the underlying relationship between the dependent and outcome



variable (Mackinnon, 2015). These mediating variables include socio-demographic factors such as level of income and education. For example, individuals may greatly endorse altruistic and biospheric values, but their behaviours or actions do not always result in a pro-environmental manner unless other variables such as higher education or income are present (Nordlund & Garvill, 2002).

An example can be seen in a study conducted by Kennedy and colleagues (2009) on the gap between environmental values and pro-environmental behaviour in Canada. Their findings showed that more than half of their sample (72.3%) reported that barriers such as money, time, knowledge, and their perceived control over their actions and decisions prevented them from adopting pro-environmental behaviour. This study highlights, again, the need to contextualise such behaviour in countries with generally lower income and education levels such as Laos which is the focus of this research. The situation becomes even more complex when adding other mediating factors such as environmental concern, beliefs and personal norms (Poortinga et al., 2004; Nordlund & Garvill, 2003). The role of those factors is discussed in the following section.

### 3.3 Environmental Concern

How values transfer into actual behaviour can be explained by looking at mediating factors such as the level of environmental concern that a person possesses. Environmental concern has many definitions, but arguably the most comprehensive definition is Dunlap and Jones' (2002) argument that "the degree to which people are aware of problems regarding the environment and support effort to solve them and/or indicate a willingness to contribute personally to their solution" (p. 485). According to Stern and colleagues (1995), environmental concern acts as a mediating factor in the relationship between people's values and general beliefs and potentially shaping behaviour. For example, research across multiple cultures has found that people who prioritise self-enhancement values (power, achievement), and give less importance to self-transcendence values (benevolence, universalism), appeared to be less concerned with environmental issues (Schultz et al., 2005).

The New Ecological Paradigm (NEP) developed by Dunlap and colleagues (2000) has been widely used to measure people's perception of the relationships between humans and the natural environment. For instance, people who endorse the NEP

believe that there are limits to growth and that humanity should not have the right to rule over nature (De Groot & Thøgersen, 2018) (see Appendix B, Part 2, from question 1 to 15 for the full list of NEP items). Various studies have found a positive relationship between NEP and in-home energy conservation behaviour (Karlin et al., 2014; Poortinga et al., 2004), particularly when mediated by specific beliefs such as the awareness of consequences and the ascription of responsibility (Yeboah & Kaplowitz, 2016).

### 3.4 Beliefs and Personal Norms

The adoption of pro-environmental actions often comes with high costs and efforts. In this situation, the feeling of moral obligation plays a key role in influencing people to act pro-environmentally. A number of studies have focused on the role of moral or personal norms in predicting pro-environmental behaviour (De Groot & Steg, 2009; Thøgersen, 2006). The Norm Activation Model (NAM) is considered to be one of the most well-studied models to explain how personal norms influence environmental behaviours (Schwartz, 1977). The NAM suggests that pro-environmental behaviour is driven by moral obligation, as people with strong personal norms feel compelled to act in environmentally responsible manner (Van Der Werff & Steg, 2015). It is assumed that, regardless of personal inconvenience or financial costs, people with strong personal norms are motivated to act pro-environmentally because they feel obligated to do so (Van Der Werff et al., 2013).

The NAM proposes that personal norms are activated when two factors occur (Van Der Werff & Steg, 2015). Firstly, individuals need to be aware of the consequences of the environmental problems. This factor is also known as awareness of consequences or AC beliefs. Secondly, individuals need to have feelings of responsibility that they can reduce the impacts of such environmental problems. This factor is called ascription of responsibility or AR beliefs. The NAM explains the relationships between behaviour and the three variables in a causal link (Steg & Nordlund, 2018). For instance, in the context of energy use, if an individual is aware that environmental problems (i.e., resource depletion, climate change) is caused by energy consumption (AC beliefs), such awareness will strengthen their feelings of responsibility to contribute to resolve the problem (AR beliefs). Then, that sense of responsibility will

activate feelings of moral obligation (personal norms), which will in turn lead to energy conservation behaviours (De Groot & Steg, 2009; Steg & De Groot, 2010).

The NAM appeared to be successful in explaining pro-environmental behaviour (Stern, 2000). Personal norms have been found to be a strong predictor of pro-environmental behaviour in many contexts (Harland et al., 1999; Jansson et al., 2011; Nordlund & Garvill, 2003; Steinhorst et al., 2015). In addition, energy conservation behaviour was found to be strongly connected to personal norms in various studies (Ibtissem 2010; Fornara et al., 2016; Van Der Werff & Steg, 2015; Yeboah & Kaplowitz, 2016). For example, personal norms were found to be significant in predicting behavioural intention to improve household energy efficiency, and the adoption of curtailment behaviour in the home (Fornara et al., 2016; Van Der Werff & Steg, 2015).

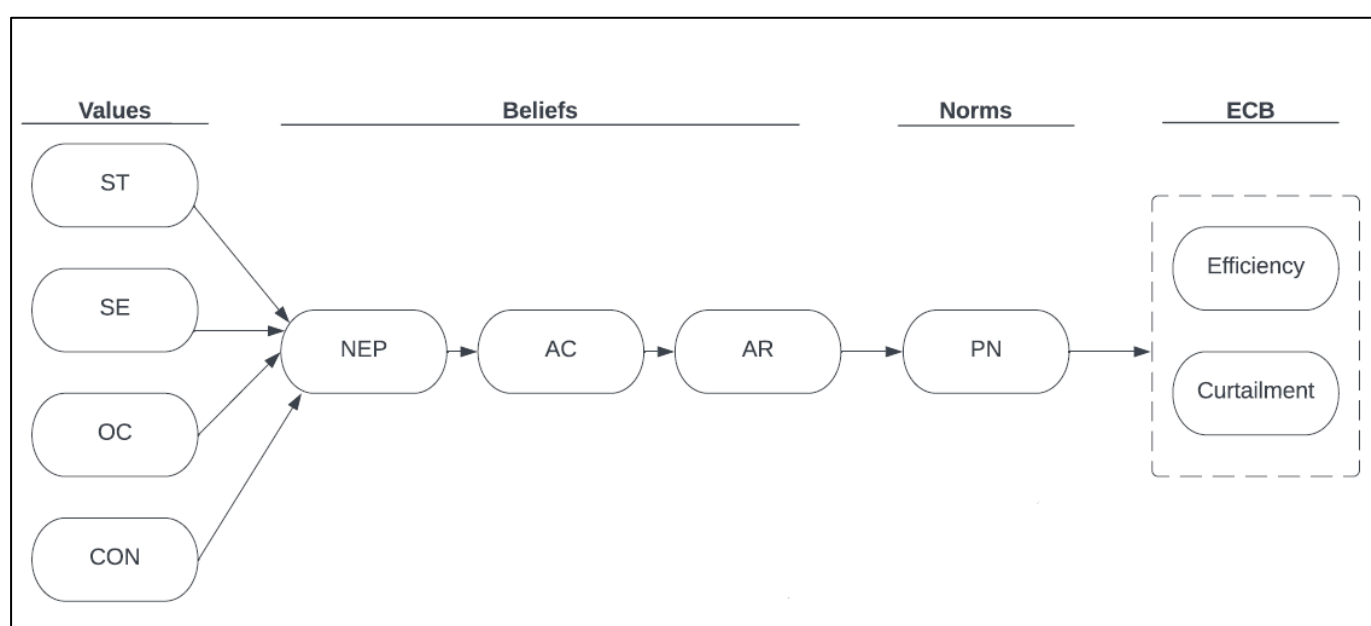
### 3.5 The Link Between Values, Environmental Concern, Beliefs and Personal Norms

Stern and colleagues (1999) established the Value-Belief-Norm (VBN) theory that connects values theory, the New Ecological Paradigm (NEP) and the Norm Activation model (NAM). They proposed that the relationships between values, beliefs, personal norms, and pro-environmental behaviour can be explained by a causal chain. The VBN theory assumes that people are likely to act pro-environmentally when they have strong personal norms. Similar to the NAM, strong personal norms are associated with two types of beliefs, when people are aware of the negative consequences of the environmental issues (AC beliefs), and their feelings of responsibility to the minimise those consequences (AR beliefs). Stern (2000) proposed a connection between the NAM and the NEP, by suggesting that the NEP can be viewed as a common understanding of ecology, which can inform individuals' beliefs about the consequences of environmental problems and their sense of responsibility to address these issues.

Figure 3.2 represents a causal chain of the variables in the VBN theory. The VBN causal link begins with general values, in which the theory proposes that self-transcendence and openness to change values are positively related, and self-enhancement and conservation values are negatively related to ecological worldviews (NEP). Next, it is believed that strong ecological worldviews affect the beliefs regarding

environmental consequences (AC) and this, in turn, further affects the individuals' belief in their responsibility for the problems (AR). AR subsequently influences personal norms, which in turn are believed to be associated with engagement in pro-environmental behaviours.

**Figure 3.2 A Schematic Representation of The VBN Theory as Applied to Energy Conservation Behaviour Adapted from Stern, 2000**



Note: ST is self-transcendence, SE is self-enhancement, OC is openness to change, CON is conservation, NEP is New Ecological Paradigm, AC is awareness of consequences, AR is ascription of responsibility, PN is personal norms, ECB is energy conservation behaviour

The VBN theory has been used to explain different types of environmentally significant behaviour, such as green consumer behaviour (Choi et al., 2014), the willingness to reduce car use (Nordlund & Garvill, 2003), the acceptability of energy policies (Steg et al., 2015), environmental citizenship behaviour (Yeboah & Kaplowitz, 2016), and household energy conservation behaviour and intentions (Abrahamse & Steg, 2011; Fornara et al., 2016; Ghazali et al., 2019; Ibtissem, 2010). Fornara and colleagues (2016), for instance, applied the full VBN model to explain the relationships between different types of factors and household's intentions to adopt energy efficiency behaviours. They found that the VBN variables were significant in explaining the relationships with the intentions to improve household energy efficiency. This finding

corresponds with Stern (2000), who argued that the VBN model may be better able to explain behaviours that are driven by pro-environmental intent. To illustrate, Stern (2000) argued that there is a difference between intent-oriented behaviour and impact-oriented behaviours. Intent-oriented behaviours are those that are driven by a person's motivations and values, while impact-oriented behaviours are those that are driven by a desire to produce a specific outcome (Stern, 2000). This idea aligns with previous environmental behaviour models, such as the theory of planned behaviour proposed by Ajzen (1985), which assumes that behaviour is intentional and that these intentions are formed through a conscious process where people consider the consequences of their behaviour and the normative context in which it occurs. Stern (2000) suggests that the VBN model is better suited to explaining intent-oriented behaviours, as it takes into account people's values and beliefs, which are important drivers of pro-environmental behaviour.

In addition, some studies have confirmed the mediating relationships between the variables in the VBN framework and energy conservation behaviour. Ibtissem (2010) applied the variables from the VBN model to investigate the extent to which energy conservation behaviour at a household level is associated with the activation of personal norms. The study found that altruistic and biospheric values were positively associated with the belief in the consequences of energy conservation, while the opposite is evident for individuals who strongly endorse ecocentric (values that prioritise the preservation of the natural environment, regardless of its impact on human interests or needs) and egoistic values. In addition, the study found that the more a person is aware of the consequences of energy conservation, the more that person feels responsible to help mitigate the problems. In turn, people who assume more responsibility to solve the problems also feel morally obligated to adopt energy-saving behaviour, as evidenced by their self-reported behaviours.

### 3.6 Summary and Research Questions

The literature reviewed in this chapter highlights the significance of psychological factors that are used to explain people's motivations to reduce energy consumption at a household level. The VBN theory has been widely applied in multiple studies to examine the relationships between people's values, beliefs, and norms and several pro-environmental behaviours. How these factors associated with different types of

pro-environmental behaviours may differ depending on contexts and cultures which is one of the reasons why this research intends to focus on Lao energy conservation behaviour.

The relationships between psychological and socio-demographic factors and residential energy-saving behaviour have been widely studied, but predominantly in the context of Western countries. Therefore, another reason for the focus of this research is because, to my knowledge, there are few studies that have investigated the socio-demographic and psychological factors that are associated with energy use and energy-saving behaviour in the context of Southeast Asia. This, study, then presents an opportunity to develop a deeper understanding of energy conservation behaviour and its determinants in the context of developing countries such as Laos.

The theories and relationships presented in the existing research leads to three questions and five hypotheses as listed in Table 3.2 below:

**Table 3.2 Research Questions and their Corresponding Hypotheses**

Hypotheses and research questions derived from theoretical literature
<b>Research question 1:</b> How are values, environmental beliefs, and personal norms associated with the willingness to adopt energy-saving behaviour in Laos?
<b>Hypothesis 1:</b> Self-transcendence and openness to change values will be positively related to the willingness to adopt energy conservation behaviour. Self-enhancement and conservation values will be negatively associated with the willingness to energy conservation behaviour.
<b>Hypothesis 2:</b> High environmental concern (NEP), strong awareness of consequences (AC) and ascription of responsibility (AR) will be positively related to the willingness to adopt energy saving behaviour.
<b>Hypothesis 3:</b> Strong personal norms will be positively associated with the willingness to adopt energy conservation behaviour
<b>Research question 2:</b> How are socio-demographic characteristics associated with the willingness to adopt energy conservation behaviour in Laos?

**Hypothesis 4:** There is a positive correlation between socio-demographic characteristics and the willingness to adopt energy conservation behaviour at home.

**Hypothesis 5:** The willingness to adopt energy conservation, curtailment and efficiency behaviour varies with different socio-demographic factors. Women, older residents, higher income households, larger households are more likely to engage in energy-saving behaviour at home.

**Research question 3:** What role do psychological and socio-demographic factors play in influencing household energy conservation in Laos, both in efficiency and curtailment behaviour?

**Hypothesis 6:** Psychological factors will be more strongly associated with curtailment behaviours and socio-demographic factors will be more strongly associated with efficiency behaviours.

## Chapter 4: Methodology

### 4.1 Introduction

This chapter provides an overview of the quantitative approach undertaken in this study. It starts by discussing the research epistemology and then explaining the research method in detail, including the design of an online survey, the process of data collection, the recruitment of participants and the measurement of key variables. The initial results of some statistical analysis are reported as these form the basis for the main analysis described in the next chapter. In addition, the ethical considerations and the process of ethics approval are briefly discussed. Lastly, the final section presents the type of quantitative analyses that will be used to answer the key research questions of this thesis.

### 4.2 Epistemological Position

This research uses a quantitative approach as the overarching method to examine the research questions posed in the thesis. Quantitative research is grounded in positivism, which assumes that the objective truth and knowledge about the world can be empirically studied through scientific methods (Wheeldon & Ahlberg, 2012). Positivism acknowledges that the knowledge of people's opinions and beliefs can be developed by objectively quantifying and measuring data regarding social phenomena (Kitchin & Tate, 2013). These social phenomena include attitudes and beliefs, social behaviours, and demographic patterns. For example, the aim of this research is to understand and explain patterns and relationships between variables within a group of participants in Laos using a systematic and empirical approach.

Recently, there has been a shift towards post-positivism (Panhwar et al., 2017). Unlike positivism, post-positivists argue that human knowledge is imperfect and not necessarily objective. Instead of assuming that objective truth can be discovered, post-positivists aim to study social phenomena scientifically while recognising that truth can only be approximated (Creswell, 2012; Panhwar et al., 2017). For example, from a post-positivist perspective, the study of human behaviour can only determine the probability of potential outcomes. To illustrate, a study on the relationship between human values and energy conservation behaviour may find that there is a correlation



between the two, but it cannot establish a definite cause and effect relationship. The study can only suggest (rather than say for sure) that people who prioritise self-transcendence values (concerning the welfare of other people and the environment) are more likely to engage in energy-saving behaviour. In this way, post-positivism recognises the limitations of human knowledge and aims to provide probabilistic answers to complex social questions, rather than absolute truths.

Furthermore, within a post-positivist epistemology, researchers use empirical observation and measurement to verify hypotheses and theories (Creswell, 2012). This means that a particular social phenomenon can be explained by observing the potential cause that predicts the effect or outcome (Creswell, 2012). This research uses a post-positivist epistemology in that it seeks to determine the probable relationships between energy conservation behaviour and socio-demographic and psychological factors, while recognising the complexity of human perceptions and individual experiences of energy consumption.

### 4.3 Quantitative Survey Research

This research uses a quantitative method as it aims to explore the drivers of human behaviour in respect of energy use of a large number of people. Quantitative research uses data to try to quantify and explain why a phenomenon is occurring, for example, by measuring people's attitude towards energy conservation. It has been predominantly used to seek explanations by testing theoretical frameworks and hypotheses (Bloomfield & Fisher, 2019). The quantitative approach adopted in this research will help to explain the relationships between household energy-saving behaviour and psychological and socio-demographic factors. To help examine these relationships, this thesis research uses surveys to try and measure (and quantify) these factors.

In quantitative research, surveys are commonly used as they are a useful tool to collect information from people and are useful for creating data sets that measure variables across many individuals (De Vaus, 2013). For this study, measuring these variables can help explain what variables are important motivators for people to engage in energy conservation behaviour. A survey tool was therefore employed for data collection. The survey was used to measure the variables from the Value-Belief-Norm

theory (outlined in the previous chapter) to explore the most significant determinants of people's willingness to adopt household energy conservation behaviour in Laos.

The aim of the quantitative questionnaire was to measure the relationships between psychological and socio-demographic determinants and people's willingness to adopt household energy conservation behaviour in Laos. The previous chapter highlighted relevant research and studies that collectively build an understanding of the determinants related to energy conservation behaviour. This thesis uses the Value-Belief-Norm theory to provide measures of people's value orientations, environmental beliefs, and personal norms. As outlined in the previous chapter, the first research question pertains to the role of these factors in shaping the willingness of individuals to engage in energy conservation behaviour. The second research question explores the relationships between socio-demographic characteristics and energy conservation behaviour. The third research question aims to measure the relative importance of psychological and socio-demographic variables in predicting people's willingness to engage in energy conservation behaviour.

#### 4.4 Ethical Considerations

Ethics approval was sought from the Victoria University of Wellington Ethics Committee prior to conducting the online survey. Ethics approval was obtained on 16<sup>th</sup> August 2022. The ethics approval memo is attached in Appendix A. The principal ethical consideration of this research was to ensure that all responses from survey participants would be anonymous and confidential, and that the data obtained was only accessible by the researcher and the supervisor of this thesis. Information with regards to participants' rights and information about the questionnaire was provided to participants prior to the start of the survey (see Appendix B). Participants were asked to consent in taking part in the research before starting the survey. Participants also had the opportunity to see a summary of the data results which was posted on 28<sup>th</sup> November 2022 on the study Facebook page called "Energy Conservation Behaviour in Laos".

## 4.5 Research Design

### 4.5.1 Methods

The use of an online tool was considered to be the most effective and feasible way to gather the required information. It enabled recruitment of a large sample size with ease and minimal cost (Sue & Ritter, 2007). Convenience sampling is a form of nonprobability sampling method that is most commonly used in behavioural science (Gravetter & Forzano, 2012; Mellenbergh, 2019). It is considered to be an acceptable method as long as the target population is clearly defined, and inferences are drawn accordingly (Gravetter & Forzano, 2012). For example, since the sample is not representative of a larger populations, it would not be feasible to draw conclusions about the Laos population as a whole.

Another advantage of using internet-based surveys is automation, in which the error in capturing responses and entering data can be minimised (Ball, 2019). The online survey used for this research was generated by 'Qualtrics', an internet-based survey building platform provided by Victoria University of Wellington free of charge for students. Qualtrics software also offers a wide range of options and settings that can be applied to construct this type of survey.

An online survey is considered to be a suitable way to collect data for this research because residents in Laos are generally well connected to the internet. According to Lao Statistics Bureau (2022), 62% of the population in Laos have access to the internet. In addition, the use of social media platforms has risen in Laos. For instance, it is expected that there are 3.5 million Facebook users in Laos as of 2022 (Kemp, 2022). Therefore, administering the survey online and using Facebook to recruit survey participants seemed to be an effective way to share the survey quickly across a large number of people.

However, the main limitations of online surveys are that they can create an issue of self-selection bias and under-coverage. Self-selection bias means that respondents volunteer to participate in the surveys and they may be more likely to take part in surveys about topics that are of interest to them. It also means that the researcher has little control over the sample selection process (Bethlehem, 2010). Another limitation

is under-coverage, which means web-based surveys may not target wider population groups (Bethlehem, 2010). Given that 38% of the population in Laos is not connected to the internet, this means certain groups of people could not be reached via the online survey. Another concern is that online survey tools can limit its applicability to only those who are willing to spend time to complete the online questionnaire. Hence, it is crucial to acknowledge that the results from this research may only represent a specific group (i.e., internet users who perhaps have a particular interest in the topic of energy conservation) in the population in Laos.

### *Language*

The questionnaire was provided in both English and Lao languages. Existing measures to be used for data collection such as the Schwartz' Portrait Value Questionnaire (PVQ) to measure value orientations was available in English at the time of this study. The beliefs measures, including the New Ecological Paradigm (NEP) scale, Awareness of Consequences (AC), Ascription of Responsibility (AR), as well as the Personal Norms (PN) items, were also available in English. The questionnaire was then translated into Lao by the researcher who is a native Lao speaker. The Lao version of the questionnaire was also revised by a professional interpreter to ensure the accuracy and clarity of the translation. The interpreter was asked to read through all survey questions and provide feedback on the questionnaire. Based on their feedback, the researcher made some modifications, including rephrasing some questions and substituting specific words, to ensure the Lao version accurately reflected the content of the English version.

Qualtrics offered the use of two languages (English and Lao) to ensure that the sample would not be biased against people who only spoke one of them. Participants had the option of choosing their preferred language at any time while completing the survey through a language tab of each page (i.e., they could switch languages at any time). This allowed participants to compare the survey questions in both languages if they needed further clarification or a better understanding of a particular question. As suggested by the professional interpreter and participants from the pilot study (for details, see the next section), it is assumed that some participants might find this dual language feature useful to clarify some technical terms (i.e., 'ecological crisis', 'the law of nature') that were used in this survey as part of existing measures of key concepts.

### *Pilot Survey*


A pilot survey was launched on the 23<sup>rd</sup> of June until the 30<sup>th</sup> of June 2022 to test the logic of the survey and the clarity of the questions. The survey was sent to 10 participants, most of whom had English as their second language. Four of the participants were asked to take the Lao version of the survey to test that the translation was comprehensible. Participants were asked to take the survey on their mobile phones and computer laptops to check the displays and ease of access. It was expected that respondents from the younger population (such as University students) were likely to complete the survey from their mobile phones, hence testing its accessibility is important. The participants reported that it took 10-15 minutes to complete the survey taken via the computer screen and 15-20 minutes taken by the mobile phones. Based on the constructive feedback and comments from the pilot survey participants, the survey was revised accordingly. The revisions included additional details in the description of each section and the rewording of some questions. Some words were replaced in the Lao version for better clarity and accuracy.

### *Promotion and Recruitment*

A simple Facebook page called “Energy Conservation Behaviour in Laos” was created so as to centralise a place for the survey to be accessed. The Facebook page has helped to establish an effective online presence of the study and organise promotional efforts. It was also used to create a paid advertisement to reach wider audiences across the country. The paid advertisement ran for 14 days between the 23<sup>rd</sup> of August to the 6<sup>th</sup> of September 2022. The information posted on the Facebook page consisted of screening questions targeting participants who are currently in Laos and who use electricity at home. It also includes a brief information about the purpose of the survey, an estimated time to take the survey, and the opportunity to enter a prize draw. This was followed by the survey link which took participants directly through to the information page at the beginning of the survey, hosted by Qualtrics. The advertisement on Facebook was provided both in Lao and English (see Figure 4.1).

As part of the recruitment process, the researcher travelled to Laos between the 5<sup>th</sup> to 26<sup>th</sup> of September 2022. While in Laos, over 200 posters were placed around Vientiane at public park, local coffee shops, University and college campuses including the National University of Laos, Souphanouvong University, Vientiane - Hanoi

Figure 4.1: Facebook Suggested Post

**Energy Conservation Behaviour in Laos**  
August 23 at 11:09 AM · 🌐

[English Below]




ທ່ານກຳລັງອາໄສຢູ່ປະເທດລາວຫຼືບໍ່? ທ່ານນຳໃຊ້ໄຟຟ້າຢູ່ເຮືອນຫຼືບໍ່? ການປະກອບຄໍາເຫັນຂອງທ່ານອາດຊ່ວຍໃນການວາງແຜນການສົ່ງເສີມການປະຢັດພະລັງງານໃນອານາຄົດ! ບົດສຳຫຼວດນີ້ ແມ່ນຢາກຊອກຫາບັດໃຈສຳຄັນ ທີ່ເຮັດໃຫ້ຄົນປະຢັດການນຳໃຊ້ພະລັງງານ (ໄຟຟ້າ) ໃນຄົວເຮືອນ. ແບບສອບຖາມ ຈະໃຊ້ເວລາ 15-20 ນາທີ ໃນການຕອບ. ທຸກຄຳຕອບ ແມ່ນບໍ່ສາມາດລະບຸຕົວຕົນໄດ້. ທ່ານສາມາດກົດເຂົ້າລິ້ງນີ້ເພື່ອຕອບແບບສອບຖາມ [https://vuw.qualtrics.com/jfe/form/SV\\_d4ocp9tpuM6D286](https://vuw.qualtrics.com/jfe/form/SV_d4ocp9tpuM6D286)

ທ່ານຍັງສາມາດລຸ້ນຮັບ voucher ຈາກ Foodpanda ມູນຄ່າ 200,000ກີບ ລວມທັງໝົດ 5 ລາງວັນ ຖ້າທ່ານຕອບຄຳຖາມຈົບຈົບ. ຖ້າທ່ານມີຄຳຖາມ, ສາມາດຕິດຕໍ່ ນາງ ໃດແອນ ພົມສຸພາ ທີ່ອີເມວ [phomsodian@myvu.ac.nz](mailto:phomsodian@myvu.ac.nz)

Are you currently living in Laos? Do you use electricity at home? You can help shape the future of energy conservation campaigns in the future by participating in this survey!

This research aims to explore what motivates residents in Laos to save energy at home. The online survey will take 15-20 minutes to complete. This survey is anonymous and confidential. Please follow this link to enter the survey [https://vuw.qualtrics.com/jfe/form/SV\\_d4ocp9tpuM6D286](https://vuw.qualtrics.com/jfe/form/SV_d4ocp9tpuM6D286)


Also, if you complete the survey, you will go in the draw to win one of five 200,000kip Foodpanda vouchers. For further information or questions, please contact Diane Phomsoupha at [phomsodian@myvu.ac.nz](mailto:phomsodian@myvu.ac.nz)



**THINK. ACT. SAVE.**

**WE ALL HAVE THE POWER!**

**Energy Conservation Behaviour in Laos**  
Surveyor

 Send message

Friendship Technical Vocational College and Rattana Business Administration College. This effort aimed to attract a wide range of participants. As an encouragement for participation and a way to thank the participants, participants had the opportunity to enter a draw to win one of five food and grocery vouchers, worth 1 million Lao Kip in total (approximately NZD106) once they had completed the survey. Five respondents were drawn randomly at the close of the survey as the winners of the prize.

Participants were also recruited through a snowball sampling method. The researcher reached out to her former colleagues and friends through emails and social media channels inviting them to take part in the survey and spread it among their networks. Different social media platforms were used to recruit participants. Two posts were made on the researcher's personal Facebook and LinkedIn accounts. The invitation to complete the survey was also shared in several Facebook groups, which led to more responses.

The main limitation of this referral method is selection bias, which can be a potential issue when participants are recruited based on factors that are not representative of the population as a whole. In the context of this research, the limitation is that participants were recruited based on the researcher's resources and contacts, which could mean that they might be more interested in the topic of energy consumption and behavioural change. As a result, conclusions drawn from the responses of this study might be limited and might not represent the behaviours of the wider population.

### *Survey Development*

The first page of the online survey provided information about the researcher and the research as discussed in the ethical considerations subsection of this chapter. The opening question was that of the participant's age, to ensure that people who are involved in the survey are 18 years old and over. In a situation where participants were younger than 18 years old, they were automatically redirected to the end of the survey, and they were thanked for their time. This process was to ensure that data would only be captured by those who were eligible to take part.



The online survey consisted of mainly closed ended questions. Some open ended questions were also available for participants to add their own answers that were not indicated in the choices via an “other, please specify” option (for example, their reason why saving energy at home is important). There was also one open ended question at the end of the survey, inviting respondents to give any feedback or comments they had on the topic. The results of this question are reported in the ‘Results’ chapter of this thesis.

A full copy of the survey (in English and Lao) is provided in Appendix B.

#### 4.5.2 Measures

The questionnaire was divided into four parts. In the first part, participants were asked about their values. In the second part, participants were asked about their beliefs, which included their ecological worldview, awareness of consequences, ascription of responsibility and personal norms. Following this, participants were asked about their willingness to perform energy-saving actions to conserve energy at home. The survey then concluded with some background questions, which asked about their age, income, education level, household characteristics and energy consumption. Figure 4.2 below shows the survey structure.

**Figure 4.2 Survey Structure**

<b>Part 1:</b> <b>Values Orientations</b>	Measured 4 higher order values: conservation vs openness to change, self-transcendence vs self-enhancement via the Portrait Values Questionnaire (PVQ)
<b>Part 2:</b> <b>Beliefs and Personal Norms</b>	Measured Ecological Worldviews (NEP), Awareness of Consequences (AC), Ascription of Responsibility (AR) and Personal Norms (PN)
<b>Part 3:</b> <b>Energy Conservation Behaviours</b>	Measured the willingness to adopt energy-saving activities at home, and the motivations and barriers to perform those actions
<b>Part 4:</b> <b>Socio-demographic Information</b>	Age, income, level of education, household characteristics, energy consumption



## Part 1: Measuring Value Orientations

The design of the questions to measure value orientation was adapted from Schwartz' basic human value framework. Schwartz' Portrait Value Questionnaire (PVQ) was used as it is recommended for online surveys (Schwartz, 2012). In addition, the PVQ has been extensively applied and validated worldwide across multiple populations and languages (Schwartz & Cieciuch, 2022).

The PVQ presents different statements as a way to measure ten value types and four higher value dimensions outlined in Chapter 3. The PVQ developed by Schwartz has several versions, but this study used the revised 21-item version which was used in the European Social Survey (Schwartz, 2003a). This version was selected because it captures the measurement of all value dimensions. It was also practical in terms of time taken to complete the survey. There are six items to measure openness to change and conservation value dimensions. There are five items to measure self-transcendence value and four items to measure self-enhancement value. The full list of the value dimensions and associated questions is outlined in Table 4.1.

**Table 4.1 List of 21 PVQ Against Their Value Types and Dimensions**

Value Types	Portrait Statements	Value Dimensions
<b>BENEVOLENCE</b>	12. It's very important to her to help the people around her. She wants to care for their well-being.	<b>SELF-TRANSCENDENCE</b>
	18. It is important to her to be loyal to her friends. She wants to devote herself to people close to her.	
<b>UNIVERSALISM</b>	3. She thinks it is important that every person in the world should be treated equally. She believes everyone should have equal opportunities in life.	
	8. It is important to her to listen to people who are different from her. Even when she disagrees with them, she still wants to understand them.	
	19. She strongly believes that people should care for nature. Looking after the environment is important to her.	

<b>SELF-DIRECTION</b>	1. Thinking up new ideas and being creative is important to her. She likes to do things in her own original way.	<b>OPENNESS TO CHANGE</b>
	11. It is important to her to make her own decisions about what she does. She likes to be free and not depend on others.	
<b>STIMULATION</b>	6. She likes surprises and is always looking for new things to do. She thinks it is important to do lots of different things in life.	
	15. She looks for adventures and like to take risks. She wants to have an exciting life.	
<b>HEDONISM</b>	10. Having a good time is important to her. She likes to “spoil” herself.	<b>SELF-ENHANCEMENT</b>
	21. She seeks every chance she can to have fun. It is important to her to do things that give her pleasure.	
<b>ACHIEVEMENT</b>	4. It's important to her to show her abilities. She wants people to admire what she does.	
	13. Being very successful is important to her. She hopes people will recognise her achievements.	
<b>POWER</b>	2. It is important to her to be rich. She wants to have a lot of money and expensive things.	<b>CONSERVATION</b>
	17. It is important to her to get respect from others. She wants people to do what they say.	
<b>SECURITY</b>	5. It is important to her to live in secure surroundings. She avoids anything that might endanger her safety.	
	14. It is important to her that the government ensures her safety against all threats. She wants the state to be strong so it can defend its citizens.	
<b>CONFORMITY</b>	7. She believes that people should do what they are told. She thinks people should follow rules at all times, even when no-one is watching.	

	16. It is important to her to always behave properly. She wants to avoid doing anything people would say is wrong.	
<b>TRADITION</b>	9. It is important to her to be humble and modest. She tries not to draw attention to herself.	
	20. Tradition is important to her. She tries to follow the customs handed down by her religion or her family.	

The PVQ is based on statements that describe a person's "goals, aspirations, or wishes that point implicitly to the importance of a single value" (Schwartz, 2003a; p. 273). For example, "It is important to her to get respect from others. She wants people to do what she says" is one item which represents the value of 'power'. Respondents were then asked to indicate how much this person is like or not like her on a 6-point Likert scale with 1 = "Not like me at all", 2 = "Not like me", 3 = "A little like me", 4 = "Somewhat like me", 5 = "Like me" and 6 = "Very much like me".

The PVQ frames each question from a third person perspective. This allows the respondents to compare themselves to each portrait through inference (Schwartz, 2003a). Furthermore, the PVQ questions are designed to be gender specific in their portrait statements with the use of he/she/they pronouns. The English version utilised the gendered version of the question. However, the gendering language was not used in the Lao version. This is due to the fact that in the Lao language referring to a third person cannot be gendered, meaning the same third person pronoun was used instead of he/she/they pronouns. The respondents who decided to complete the survey in English were asked their gender and then received their version of values questions (male, female, or gender diverse). Respondents who chose to complete the survey in the Lao language only received one version ('they' version) of the questions.

The internal reliabilities of each value dimension are outlined in Table 3.2 below. Cronbach's alpha values for the four higher order dimensions are considered acceptable ( $\alpha > .70$ ) and consistent with previous literature on value types and their dimensions (Schwartz, 2003a; Vecchione et al., 2015; Versakano et al., 2009).

**Table 4.2: Reliability of the Four Higher Order Value Dimensions**

<b>Value Dimensions</b>	<b><i>N</i></b>	<b>Mean Score (out of 6)</b>	<b>SD</b>	<b>Cronbach's Alpha Coefficient (<math>\alpha</math>)</b>
Self-Transcendence	301	4.299	.84	.781
Openness to Change	300	4.296	.79	.775
Self-Enhancement	301	4.081	.87	.703
Conservation	301	4.313	.75	.731

For analysis, Schwartz (2007) recommended centring the value scores for each respondent. The purpose of centring value score is to remove individual's differences in their use of the response scale. The centred scores reflect individual's value priorities by generating the importance of each value over other values. This was done by calculating the mean score from all of the 21 value items of each respondent, and then subtracting this score from the mean of each value type score (Schwartz, 2003b). These centred value scores were used for correlation analysis but and uncentred scores were used for regression analysis.

## Part 2: Measuring Beliefs and Personal Norms

Individual beliefs were measured by three components, which include environmental concern, awareness of consequences (AC) and ascription of responsibility (AR). In order to measure respondent's ecological concerns, Dunlap's New Ecological Paradigm (NEP) was utilised (Dunlap et al., 2000). The NEP scale has been widely employed worldwide to measure an individual's level of environmental concern (Dunlap, 2008).

The NEP has been developed into several versions. The revised NEP comprises 15 items, which reflect on how the respondents view human interaction with and governance of nature. Respondents were asked to indicate how much they agree or disagree with each statement on a 5-point Likert scale. Examples of items are "We are approaching the limit of the number of people the Earth can support", "The Earth has

plenty of natural resources if we just learn how to develop them". Respondents were asked to rate their level of each statement from 1 = "Strongly disagree", 2 = "Disagree", 3 = "Unsure", 4 = "Agree", 5 = "Strongly agree".

Prior to computing mean scores, relevant items were recoded to ensure a higher score reflects a higher level of environmental beliefs. The mean NEP score from the sample was  $3.436 \pm 0.4588$  ( $N = 274$ ; mean  $\pm$  standard deviation), with an acceptable internal reliability of  $\alpha = .742$ . This internal reliability score is consistent with existing research that studied the reliability and validity of the revised NEP scale (Cordano et al., 2003; Hawcroft & Milfont, 2010).

Six questions were used to examine respondents' beliefs regarding the consequences of their actions (AC) and their feelings of responsibility for causing environmental problems (AR). The questions were adapted from previous research (Ghazali et al. 2019; Ibtissem 2019; Yeboah & Kaplowitz 2016) and were revised to fit the local Lao context. The statements used to assess the respondents' AC reflected the extent to which they believed their energy-saving actions can contribute to mitigating the effect of global warming (e.g., "Conserving energy helps reduce the effect of global warming"). The statements concerning AR reflected the extent to which respondents felt responsible for energy related issues (e.g., "I feel jointly responsible for the energy problems"). Respondents were then asked to indicate to the extent they agreed using a 5-point Likert scale the same as the NEP scale (1 = Strongly disagree to 5 = Strongly agree). The mean AC score from the sample was  $3.897 \pm 0.724$  ( $N = 294$ ), with an adequate internal reliability of  $\alpha = .794$ . Similarly, the mean AR score from the sample was  $3.844 \pm 0.701$  ( $N = 294$ ), with an acceptable Cronbach's Alpha score of .806.

The measurement of respondents' personal norms (PN) was adapted from Steg et al. (2005). Steg and colleagues (2005) used nine items to measure PN, however, only six items that focused on problems on energy use were used in this survey. The statements reflect the extent to which respondents felt morally obligated to save energy, for example, "I feel personally obliged to save as much energy as possible" and "If I would buy a new appliance (e.g., a refrigerator), I would feel morally obliged to buy an energy efficient one". The participants were then asked to rate how much they agree or disagree using a scale ranging from 1 = Strongly disagree to 5 = Strongly

agree. Participants reported feeling somewhat obligated to save energy, with the mean score of  $3.899 \pm 0.638$  ( $N = 294$ ) and Cronbach's alpha value of .844.

### Part 3: Willingness to Adopt Energy Conservation Behaviours

The survey respondents were presented with 12 statements regarding the willingness to adopt different energy conservation actions or behaviours in the home. Two items concerning efficiency behaviours reflect respondents' willingness to invest in energy-saving technology, for example, "use energy-efficient appliances or electrical appliances (such as refrigerator, washing machine, air conditioner, water heater, light bulbs" and "install ceiling insulation to keep your house cool". Ten items regarding curtailment behaviours asked respondents about their habitual energy use, for example, "switch lights off in unused rooms" and "reduce the use of air conditioner". The survey items about people's willingness to adopt energy-saving behaviours were synthesised from previous studies (Karlin et al., 2014; Murphy, 2016; Poortinga et al., 2004) and adapted to reflect the context of Laos. Respondents were asked to indicate how willing they would be to adopt each of the behaviours. A 6-point Likert scale was used, ranging from 1 = very unwilling, 2 = somewhat unwilling, 3 = not sure, 4 = somewhat willing, 5 = very willing, 6 = already do. The responses of 'already do' were excluded from the final analyses. The mean ECB value for the remaining responses is  $4.407 \pm 0.969$  ( $N = 288$ ) with an internal reliability value of  $\alpha = .936$ .

In addition, respondents were presented with a list of motivations and barriers to adopt energy-saving behaviours at home. A list of 6 motivations were given, for example, "To save money" and "It's good for the environment". Blackwell's (2009) study on residential electricity conservation behaviour in New Zealand formed the basis of the scale to measure motivations. In addition, four barriers were given to participants in order to examine what the reasons are that prevented them from adopting energy-saving habits (e.g., "Too many investments" and "Not convenient or too much effort"). Participants were asked to indicate how important these motivations and barriers are from a 5-point Likert scale, ranging from 1 = Not important, 2 = Somewhat important, 3 = Not sure, 4 = Important, 5 = Very important.

## Part 4: Socio-Demographic Information

The final section of the survey included a series of socio-demographic questions to examine respondents age, income, level of education, household characteristics and energy use. These questions were asked to help determine the characteristics of the sample, as well as to explore whether there is a relationship between socio-demographic factors and people's willingness to adopt energy-saving behaviour. Previous studies have shown that socio-demographic factors are significant in influencing energy-saving behaviour at home (Martinsson et al., 2011; Poortinga et al., 2003; Urban & Ščasný 2012; Yue et al., 2013).

The sample consisted of 111 females (36.51%) and 193 males (63.49%) indicating that male respondents were overrepresented. The 21-30 age group had the highest percentage in the sample (43.3%), followed by 31-40 age group (41.9%). The sampled population was relatively highly educated, with 43% holding a bachelor's degree and 18.3% holding a postgraduate degree. Most respondents identified their household size as being small to medium, with 55.6% reported having 2 to 4 occupants in the household and 23.9% reported having 4 to 6 people in their household. Households in the sample consisted of father and/or mother, husband and/or wife and children. The income distribution showed the sample having low to medium annual household earnings. 24.3% of people reported earning between 50,000,000 to 200,000,000 Lao Kip (NZD 5,359 – 21,438) per year, and 21.8% people reported earning between 200,000,001 to 400,000,000 Lao Kip (NZD 21,438 – 42,876) per year. The sample also showed a high level of home ownership, with 53.4% of the respondents reported owning their dwellings. The household energy consumption during hot and cold months (rainy and dry seasons) did not show a much of a difference. 48.5% of the respondents reported paying for electricity bills around 210,000 to 600,000 Lao Kip (NZD 20 – 55) during cold months (dry season) and 47.6% reported paying around 210,000 to 800,000 Lao Kip (NZD 20 – 73) during hotter months (rainy season).

### 4.5.3 Analysis

IBM's Statistical Package for the Social Sciences (SPSS23) was used for analysis. Raw data was first exported from Qualtrics and then were cleaned and recoded in SPSS. New variables were created, and internal reliability scores were computed. The associations between variables were computed through correlation analysis using

Pearson product-moment correlation coefficient. A model of predictive power of factors contributing to energy behaviours was estimated using multiple linear regression analysis. The detailed results of these statistical analyses are reported in the “results” chapter of this thesis.

## 4.6 Summary

This chapter outlined the methodological approach taken in this thesis to answer the research questions. The research aimed to investigate the factors that are associated with people's willingness to adopt energy conservation behaviour in Laos. To do so, an online survey was developed and administered to measure socio-demographic and psychological determinants of people's willingness to adopt energy conservation behaviour. The data collected from the survey was examined, cleaned, and evaluated for reliability. Once it was determined that the scales used in the survey were reliable, further analysis was performed to answer the research questions and test the hypotheses.



## Chapter 5: Results

### 5.1 Introduction

The results are organised in accordance with the research questions and hypotheses outlined in Chapter 3 of this thesis. The first question starts with the results that describe the associations between the willingness to adopt energy conservation behaviours and the key psychological variables from the VBN theory. The relationships between socio-demographic variables and the willingness to adopt energy conservation behaviour, including efficiency and curtailment behaviour are then presented. Finally, the predictive relationships between the VBN variables, socio-demographic variables and efficiency and curtailment behaviours were examined via regression analysis.

### 5.2 Psychological Factors Related to Energy Conservation Behaviour

**Research question 1:** How are values, environmental beliefs, and personal norms associated with the willingness to adopt energy-saving behaviour in Laos?

**Hypothesis 1:** Self-transcendence and openness to change values will be positively related to the willingness to adopt energy conservation behaviour. Self-enhancement and conservation values will be negatively associated with the willingness to energy conservation behaviour.

**Hypothesis 2:** High environmental concern, strong awareness of consequences and ascription of responsibility will be positively related to the willingness to adopt energy saving behaviour.

**Hypothesis 3:** Strong personal norms will be positively associated with the willingness to adopt energy conservation behaviour

A Pearson's product-moment correlation coefficient was calculated to identify the relationships between values, environmental concern, beliefs, personal norms, and the willingness to adopt energy conservation behaviour. Table 5.2 lists the correlation coefficients between these variables. The variables were also evaluated for normality by using the Kolmogorov-Smirnov and Shapiro-Wilk test. However, the variables were all found to be not normally distributed ( $p < .05$ ). Therefore, a Spearman's correlation analysis (a non-parametric statistic) was performed in order to assess whether the

non-normality of the data would affect the results. The Spearman's test showed similar results to the Pearson's correlation analysis. For ease of interpretation, the Pearson's correlation coefficient will be presented here.

A brief reminder of how each variable was measured can be seen in Table 5.1 below.

**Table 5.1 Measurements of each Psychological Variable adapted from The Value-Belief-Norm Theory**

Variable	Measurement
Values	Scale from 1 (not like me at all) to 6 (very much like me). The centred scores were used as outlined in section 4.5.2
Environmental Concern Awareness of Consequences Ascription of Responsibility Personal Norm	Average scores based on a scale from 1 (strongly disagree) to 5 (strongly agree)
Energy Conservation Behaviour	Average scores based on the willingness to perform the behaviours on a scale from 1 (very unwilling) to 6 (already do)

Table 5.2 displays the correlations between the four value dimensions in accordance with Schwartz's theory of basic values discussed in Chapter 3. In line with Schwartz' value dimensions, the correlations indicate that value measures that oppose each other on the higher order value dimensions present strong negative relationships. To illustrate, respondents who more strongly endorse self-enhancement values are seen to have lower self-transcendence values ( $r = -.511, p < .01$ ), and those with stronger conservation values tend to have lower openness to change values ( $r = -.531, p < .01$ ).

As expected, there is a positive correlation between self-transcendence values and the willingness for households to engage in energy conservation behaviour ( $r = .261, p < .01$ ). In contrast, self-enhancement values were found to be negatively associated

with the willingness to engage in energy-saving behaviour ( $r = -.184, p < .01$ ). These results align with general findings from the literature, particularly with respect to self-transcendence values, which are typically associated with stronger pro-environmental behaviours. Surprisingly, the relationship between openness to change values ( $r = -.020, p = .731$ ) and conservation values ( $r = -.058, p = .323$ ) and willingness to engage in energy conservation behaviour was not statistically significant.

**Table 5.2: Correlation Statistics of Psychological Variables and Behaviours**

Variable	M	SD	N	1	2	3	4	5	6	7	8
1 Self-Transcendence	4.42	.421	301								
2 Self-Enhancement	4.01	.515	301	-.511**							
3 Openness to Change	4.29	.361	301	-.267**	-.241**						
4 Conservation	4.31	.347	301	-.227**	-.222**	-.531**					
5 Environmental Concern	3.435	.458	294	.289**	-.136*	-.043	-.113*				
6 Awareness of Consequences	3.896	.724	294	.183**	-.094	-.028	-.064	.373**			
7 Ascription of Responsibility	3.843	.700	294	.091	-.021	-.098	.031	.302**	.675**		
8 Personal Norm	3.898	.637	294	.200**	-.052	-.064	-.086	.401**	.754**	.691**	
9 Willingness to engage in Energy Conservation Behaviour	4.407	.968	288	.261**	-.184**	-.020	-.058	.378**	.585**	.528**	.598**

Note: All variables were measured on a scale where a lower score means strongly disagree and a higher score means strongly agree. \*\* Correlation is significant at the 0.01 level (2-tailed) \*Correlation is significant at the 0.05 level (2-tailed)

In line with the literature, a positive correlation between environmental concern and self-transcendence values was found ( $r = .289, p < .01$ ). This suggests that participants who more strongly endorse self-transcendence values tend to have higher levels of environmental concern. The opposite relationship was found with respect to environmental concern and self-enhancement values, indicating a negative relationship between the two variables ( $r = -.136, p < .05$ ). The relationship between

environmental concern and conservation values appeared to be negative ( $r = -.113$ ,  $p < .05$ ). This finding suggests that respondents who more strongly adhere to tradition and security values are less likely to show concern for the environment.

Environmental concern and the willingness to adopt energy-saving behaviour at home was found to be positively and significantly related ( $r = .378$ ,  $p < .01$ ). This result suggests that participants who hold a greater level of environmental concern are more willing to engage in energy-saving behaviour. However, environmental concern was the variable with the lowest positive correlation with energy conservation behaviour. As expected, the relationship between awareness of consequences and willingness to save energy is statistically significant and strong ( $r = .585$ ,  $p < .01$ ). In addition, there is a strong positive correlation between the level of ascription of responsibility and willingness to engage in energy saving behaviour ( $r = .528$ ,  $p < .01$ ). This suggests that people with higher levels of awareness of consequences and stronger feelings of responsibility express a higher degree of willingness to save energy at home.

Personal norms show a significant and strong positive correlation with the willingness to adopt energy conservation behaviour ( $r = .598$ ,  $p < .01$ ). It appeared that of all the psychological variables, personal norms were associated most strongly with participants' willingness to engage in energy conservation behaviours. Additionally, personal norms were found to be strongly positively correlated with awareness of consequences ( $r = .754$ ,  $p < .01$ ) and ascription of responsibility ( $r = .691$ ,  $p < .01$ ).

In relation to research question 1, the hypotheses were largely confirmed. As predicted, two higher value dimensions showed similar results to previous literature in terms of their relationships with the willingness to adopt energy energy-saving behaviour. However, openness to change and conservation values displayed no significant relationship with the willingness to adopt energy-saving behaviours. This result is contrary to what was expected as past studies have shown that openness to change values are the motivator for people to engage in pro-environmental behaviours. In addition, hypothesis 2 and 3 can be confirmed since there was a positive relationship between the level of environmental concern, awareness of consequences, ascription of responsibility, personal norms and the willingness to adopt energy conservation behaviour.

## 5.3 Socio-Demographic Factors

**Research question 2:** How are socio-demographic characteristics associated with the willingness to adopt energy conservation behaviour in Laos?

**Hypothesis 4:** There is a positive correlation between different socio-demographic characteristics and the willingness to adopt energy conservation behaviour at home.

**Hypothesis 5:** The willingness to adopt energy conservation, curtailment and efficiency behaviour varies with different socio-demographic factors. Women, older residents, higher income households, and larger households are more likely to engage in energy-saving behaviour at home.

The relationship between socio-demographic factors and the willingness to adopt energy conservation behaviour was assessed by Pearson's correlation coefficient. The correlations of the variables and their statistical significance are listed in Table 5.3 below.

**Table 5.3 Correlation Statistics Between Socio-Demographic Variables and Willingness to Adopt Energy Conservation Behaviour**

	Variable	M	SD	N	1	2	3	4	5	6
1	Age	2.54	.739	284						
2	Gender	1.30	.557	320	.111					
3	Education	3.62	1.078	284	.252**	.151*				
4	Household Size	2.28	.782	284	.090	.021	.273**			
5	Household Income	3.35	1.990	284	.150*	-.059	.080	-.035		
6	Household Status	2.20	.960	284	-.040	.031	.178*	.138*		
7	Willingness to Engage in Energy Conservation Behaviour	4.48	.968	288	.125*	.217**	.177**	.195**	.034	.079

Note: For gender, 1 represents 'male' and 2 'female'. \*\* Correlation is significant at the 0.01 level (2-tailed) \*Correlation is significant at the 0.05 level (2-tailed)

The results show that there is a positive correlation between age and the willingness to adopt energy conservation behaviour ( $r = .125, p < .05$ ). This means that older participants expressed a stronger willingness to engage in energy conservation. Gender is positively and significantly associated with energy conservation behaviour ( $r = .217, p < .01$ ), with female respondents tending to be more willing to adopt energy conservation behaviour. Intentions to adopt energy conservation behaviour also shows a positive correlation with education ( $r = .177, p < .01$ ) along with the size of one's household ( $r = .195, p < .01$ ).

To determine whether there is a difference between men and women concerning their willingness to engage in efficiency and curtailment behaviours, independent samples *t*-tests were performed. The homogeneity of variances was assessed by Levene's test for equality of variance and was assumed for both outcomes (efficiency  $p = .569$ ; curtailment  $p = .472$ ). Normal distribution of the data was assessed by Q-Q plots and Shapiro-Wilk tests. The normality of the data was however not satisfied with unequal distribution for both dependent variables. Nevertheless, *t*-tests are considered to be robust for not normally distributed data (Levin & Fox, 2011). People's willingness to adopt efficiency behaviours differed between men ( $N = 173, 4.19 \pm 1.00$ ) and women ( $N = 102, 4.57 \pm 1.07$ ). The mean difference was  $-.374$  (95% CI,  $-.626$  to  $-.121$ ),  $t(273) = -2.915, p = .004$ . The same result was seen in people's willingness to adopt curtailment behaviours, between men ( $N = 173, 4.31 \pm .98$ ) and women ( $N = 102, 4.68 \pm .95$ ), with a mean difference of  $-.366$  (95% CI,  $-.606$  to  $-.126$ ),  $t(273) = -3.005, p = .003$ .

The difference in people's willingness to engage in energy efficiency and curtailment behaviours between age group, level of education, household sizes, and income and household statuses was assessed by using a one-way independent analysis of variance (ANOVA). Normality of the data set was assessed by using Q-Q plots and Shapiro-Wilk tests. The tests indicate that overall, the data are approximately normally distributed. The homogeneity of variances was assessed through Levene's test for equality of variance, which was assumed for efficiency behaviours  $p = .08$  and curtailment behaviours  $p = .24$ . Results from the one-way ANOVA are presented in Table 5.4 below.

**Table 5.4 Variance and Means Analysis of Energy Conservation Behaviour Under Different Demographic Characteristics**

Characteristics	Range	Efficiency behaviours			Curtailment behaviours		
		<i>M</i>	<i>SD</i>	<i>p</i>	<i>M</i>	<i>SD</i>	<i>p</i>
<b>Age</b>	18-20	4.29	.83	.355	4.27	1.16	.069
	21-30	4.21	1.11		4.27	1.04	
	31-40	4.44	.98		4.59	.91	
	41 and above	4.22	1.28		4.55	1.08	
<b>Level of education</b>	Secondary school	3.54	1.27	.006	4.19	.83	.004
	High school	4.10	.93		4.00	1.20	
	Vocational college	4.19	1.10		4.32	.98	
	Bachelor's degree	4.44	.97		4.52	.90	
	Master's degree	4.57	1.09		4.79	1.03	
	Doctorate	3.50	1.41		3.78	1.31	
<b>Household size</b>	Under 2 people	3.91	1.24	.007	4.12	1.31	.013
	2 - 4 people	4.34	.99		4.37	.95	
	4 - 6 people	4.25	1.04		4.56	.88	
	Over 6 people	4.89	1.03		4.93	1.04	
<b>Annual household income (in Lao kip)</b>	Under 50 million	4.21	1.01	.210	4.59	.94	.092
	50 – 200 million	4.50	.92		4.29	1.00	
	200.1 - 400 million	4.10	1.10		4.22	1.01	
	400.1 – 600 million	4.43	1.14		4.61	1.00	
	600.1 – 800 million	4.65	1.08		4.77	.65	
	800.1 – 1 billion	4.11	1.02		4.12	1.01	
	Over 1 billion	4.15	1.10		4.24	1.38	
<b>Household status</b>	Rent	4.17	.92	.384	4.29	.81	.052
	Own debt-free	4.37	1.16		4.50	1.03	
	Own with mortgages	4.21	1.04		4.21	1.04	
	Own by parents	4.48	.95		4.73	1.16	

It could be seen that there was a statistically significant difference between people's willingness to adopt energy efficiency behaviours and the levels of education ( $F(5, 278) = 3.363$ ,  $p = .006$ ) as well as with curtailment behaviours ( $F(5, 278) = 3.507$ ,  $p = .004$ ). For efficiency behaviours, Tukey's HSD test for multiple comparisons found that the mean value of respondents with a secondary certificate was significantly lower than respondents with a Master's degree ( $p = .040$ ). The mean difference was -1.030 (95% CI, -2.034 to -.027). This result suggests that respondents with a master's degree were more willing to adopt efficiency behaviour than those with a secondary certificate. Concerning curtailment behaviours, the mean value of respondents with a high school certificate was significantly lower than respondents with a master's degree

( $p = .007$ ). The mean difference was  $-.784$  (95% CI,  $-1.426$  to  $-.142$ ). This result also suggests that participants with a master's degree express a stronger willingness to engage in curtailment behaviour than those with a high school certificate.

Household size is seen to be associated with people's willingness to adopt efficiency behaviours ( $F(3, 280) = 4.169$ ,  $p = .007$ ) as well as curtailment behaviours ( $F(3, 280) = 3.686$ ,  $p = .012$ ). Larger households that consist of more than six members ( $4.89 \pm 1.03$ ) were more willing to engage in efficiency behaviours than people who live by themselves ( $3.91 \pm 1.24$ ). The same results were seen in the willingness to adopt curtailment behaviours between households with over six members ( $4.93 \pm 1.04$ ) and people who live alone ( $4.12 \pm 1.31$ ). The data was assumed for equal variances but not for normal distribution. Therefore, a Kruskal-Wallis H test (a non-parametric test) was performed. The results confirmed the statistical difference with both dependent variables, with efficiency behaviours  $H(3) = 12.47$ ,  $p = .006$  and curtailment behaviours  $H(3) = 9.77$ ,  $p = .021$ .

For efficiency behaviours, Tukey's HSD test for multiple comparisons found that the mean value of households with under 2 people (i.e., people who live alone) was significantly different from that of households with over 6 members ( $p = .003$ ), 95% C.I. =  $[-1.7028, -.2513]$ . For curtailment behaviours, Tukey's HSD test for multiple comparisons found that the mean value of respondents who live alone was significantly different from that of households with over 6 members ( $p = .013$ ), 95% C.I. =  $[-1.5109, -.1273]$ .

There was no significant difference between households' income levels and people's willingness to adopt efficiency and curtailment behaviours. A one-way ANOVA determined that there were no statistically significant differences in efficiency behaviours between the levels of income,  $F(7, 276) = 1.388$ ,  $p = .210$ , nor curtailment behaviours,  $F(7, 270) = 1.776$ ,  $p = .092$ . The same result was found for the difference of household status, in that home ownership was not significantly associated with people's intentions to adopt efficiency behaviours  $F(3, 280) = 1.153$ ,  $p = .384$ , and curtailment behaviours,  $F(3, 280) = 2.614$ ,  $p = .052$ . There was also no significant difference between age groups and the willingness to adopt efficiency ( $F(3, 280) = 1.086$ ,  $p = .355$ ) and curtailment behaviours ( $F(3, 280) = 2.388$ ,  $p = .069$ ).



Based on these findings, the hypotheses can be partly confirmed. In relation to hypothesis 4, it can be observed that different age groups, gender, levels of education and household sizes are positively and significantly correlated with people's willingness to adopt energy conservation behaviour. It can be inferred that women were more willing to engage in both energy efficiency and curtailment behaviours than men. Also, respondents with higher level of education expressed a stronger willingness to engage in both types of energy-saving behaviour. Additionally, larger households were more willing to engage in energy efficiency and curtailment behaviours.

## 5.4 The Role of Psychological and Socio-Demographic Factors

**Research question 3:** What role do psychological and socio-demographic factors play in influencing household energy conservation in Laos, both in efficiency and curtailment behaviour?

**Hypothesis 5:** Psychological factors will be more strongly associated with curtailment behaviour and socio-demographic factors will be more strongly associated with efficiency behaviour.

Research question 3 sought to determine the predictive nature of psychological and socio-demographic variables on energy conservation behaviour. It was hypothesised, based on prior literature, that psychological variables will strongly predict people's willingness to adopt curtailment behaviours, whereas socio-demographic variables will strongly predict the willingness to adopt efficiency behaviours. To test these hypotheses, a hierarchical regression analysis was conducted. The psychological determinants represented by the four value dimensions including self-transcendence (ST), self-enhancement (SE), conservation (CON) and openness to change (OC) values; environmental beliefs including environmental concern (NEP), awareness of consequences (AC), ascription of responsibility (AR); and personal norms (PN) were grouped in Model 1. The socio-demographic variables including gender, age, education, household income, size and status were grouped into Model 2 of the regression analyses. There were three outcome variables: efficiency, curtailment, and

the overall conservation behaviour which is the combination of efficiency and curtailment behaviours.

The assumptions for multiple regression analysis were evaluated for multicollinearity, homoscedasticity, linearity, and normality in all regression analyses. The assumption of multicollinearity was not violated, with the variance inflation factors (VIF) for all variables below than 10 and the tolerance statistics all greater than 0.1. The assumption of homoscedasticity was assessed by a visual inspection of the scatterplots of the residuals against the predicted values. The pattern consistent with homoscedasticity can be observed. The assumption of linearity was met as assessed by Predicted-Probability (P-P) plots. The normality of residuals was assessed through Shapiro-Wilk test and inspection of Q-Q plots. The data was, however, not normally distributed. Therefore, the robust method of 'bootstrapping' was used to overcome the violation of this assumption (Field, 2018). Bootstrapping treats the sample as a population and then samples this population 1000 times to gain an estimate for the parameters. The results presented below are the bootstrap regression results.

The results for research question 3 are organised into two separate tables, the first displays the regression results for willingness to engage in energy conservation behaviour, followed by willingness to engage in energy efficiency and curtailment behaviours. Table 5.5 represents a summary of the regression results for the energy conservation behaviour. Model 1 shows the psychological variables were able to explain 43.8% of the variance in the willingness to adopt energy conservation behaviour ( $R^2 = .438$ ,  $p < .001$ ). The strongest predictor of the willingness to adopt energy conservation behaviour was personal norms ( $B = .296$ ,  $[.033, .545]$ ,  $p = .021$ ). In line with the literature, ascription of responsibility ( $B = .222$ ,  $[.054, .406]$ ,  $p = .024$ ) and awareness of consequences ( $B = .281$ ,  $[.124, .441]$ ,  $p = .002$ ) were significant in predicting the willingness to adopt energy conservation behaviour. In addition, when the other variables were held constant, the more strongly people endorsed self-transcendence values ( $B = .228$ ,  $[.074, .393]$ ,  $p = .006$ ), the more likely they were to engage in energy conservation behaviour. The opposite can be seen for self-enhancement values ( $B = -.151$ ,  $[-.285, .006]$ ,  $p = .041$ ): people who strongly endorsed self-enhancement values were less likely to express the intention to engage in energy conservation behaviour.

**Table 5.5: Bootstrapped Regression Results for Energy Conservation Behaviour. Confidence Intervals and Standard Error Based On 1000 Bootstrapped Samples.**

	<i>Energy Conservation Behaviour</i>							
	R <sup>2</sup>	$\Delta R^2$	B	SE B	95% CI		$\beta$	p
					Lower	Upper		
<b>Model 1</b>	.438	.438						<.001
ST			.228	.079	.074	.393	.195	.006
OC			.075	.086	-.110	.236	.061	.365
SE			-.151	.071	-.285	.006	-.137	.041
CON			.033	.083	-.134	.190	.025	.709
NEP			.209	.134	-.036	.475	.100	.098
AC			.281	.080	.124	.441	.210	.002
AR			.222	.092	.054	.406	.162	.024
PN			.296	.126	.033	.545	.195	.021
<b>Model 2</b>	.460	.033						.019
ST			.192	.083	.037	.359	.164	.020
OC			.071	.089	-.115	.237	.058	.402
SE			-.123	.069	-.258	.030	-.112	.082
CON			.029	.087	-.151	.192	.022	.724
NEP			.145	.124	-.081	.386	.069	.243
AC			.285	.085	.125	.460	.213	.002
AR			.205	.087	.032	.370	.149	.019
PN			.314	.127	.062	.565	.206	.016
Gender			.227	.094	.038	.405	.130	.018
Age			.098	.059	-.016	.215	.075	.098
Education			.031	.045	-.060	.122	.034	.498
HH Size			.085	.065	-.036	.225	.069	.190
HH Income			-.006	.023	-.049	.038	-.013	.765
HH Status			-.026	.043	-.113	.052	-.025	.578

The addition of socio-demographics variables resulted in a small but not statistically significant increase in the explanatory power of the model ( $R^2 = .460$ ,  $R^2$  change = .033,  $p = .019$ ) with respect to people's willingness to engage in energy-saving behaviour. Personal norms remained the strongest predictor of the willingness to adopt energy conservation behaviour when all other variables were controlled for ( $B = .314$ , [.062, .565],  $p = .016$ ). Ascription of responsibility ( $B = .205$ , [.032, .370],  $p = .019$ ), awareness of consequences ( $B = .285$ , [.125, .460],  $p = .002$ ) and self-transcendence values ( $B = .192$ , [.037, .359],  $p = .020$ ) also remained significant in predicting the willingness to adopt energy conservation behaviours. Gender was the only variable from socio-demographics that was significant in predicting people's willingness to

adopt energy conservation behaviour ( $B = .227, [.038, .405], p = .018$ ). As expected, women were more willing to engage in energy-saving behaviour in the home.

Table 5.6 summarizes the regression analysis for willingness to engage in energy efficiency and curtailment behaviours separately. For efficiency behaviour, Model 1 shows that only 28.5% of the variability in the efficiency behaviour could be explained by psychological variables ( $R^2 = .285, p < .001$ ). Only environmental concern ( $B = .303, [.120, .581], p = .007$ ) and personal norms ( $B = .399, [.108, .687], p = .009$ ) were significant predictors of willingness to engage in efficiency behaviours. When socio-demographic variables were added in Model 2, the explained variance of the efficiency behaviour slightly increased to 30.2%, which was not statistically significant ( $R^2 = .302, R^2 \text{ change} = .031, p = .052$ ). Environmental concern ( $B = .399, [.108, .687], p = .009$ ) and personal norm ( $B = .405, [.077, .691], p = .008$ ) remained the only positive significant predictors of efficiency behaviours when the other variables were controlled for. Gender also remained a significant variable in predicting the behaviour, with women more willing to adopt efficiency behaviours ( $B = .268, [.307, .513], p = .030$ ).

Regarding curtailment behaviours, Model 1 shows that 42.7% of the variability in the curtailment behaviour can be explained by psychological variables ( $R^2 = .427, p < .001$ ). Awareness of consequence was the strongest predictor of the curtailment behaviour ( $B = .322, [.146, .481], p < .001$ ), followed by personal norm ( $B = .276, [.007, .539], p = .041$ ), and ascription of responsibility ( $B = .232, [.039, .433], p = .030$ ). In contrast to efficiency behaviours, variables from the value theory were significant in predicting curtailment behaviours. The more strongly respondents endorsed self-transcendence values, the more they were willing to engage in curtailment behaviours ( $B = .252, [.087, .414], p = .002$ ). Also, willingness to engage in curtailment behaviours was negatively related to self-enhancement values ( $B = -.192, [-.337, -.049], p < .001$ ).

When socio-demographic variables were included in Model 2, the explained variance of curtailment behaviour moderately increased to 44.7% ( $R^2 = .447, R^2 \text{ change} = .031, p = .016$ ). Awareness of consequence were the strongest predictor of the behaviour ( $B = .322, [.141, .482], p < .001$ ) when other variables were held constant. This result suggests that as the mean personal norms increased by one unit, the mean curtailment behaviours scores increase by 0.32 units. Personal norms ( $B = .296, [.019, .554], p = .032$ ), ascription of responsibility ( $B = .215, [.020, .427], p = .033$ ) and

self-transcendence values ( $B = .218, [.046, .382], p = .014$ ) remained positive predictors of willingness to engage in curtailment behaviour. Similar to Model 1, respondents who more strongly endorsed self-enhancement values were less willing to adopt curtailment behaviours ( $B = -.162, [-.308, -.025], p = .018$ ). None of the socio-demographic variables were significant, apart from gender ( $B = .219, [.029, .401], p = .023$ ). This finding suggests that women are more willing to engage in curtailment behaviours at home, when the other variables are controlled for.

**Table 5.6 Bootstrapped Regression Results for Energy Efficiency and Curtailment Behaviour. Confidence Intervals and Standard Error Based on 1000 Bootstrapped Samples.**

	<i>Efficiency</i>								<i>Curtailment</i>							
	R <sup>2</sup>	R <sup>2</sup> Δ	B	SE	95% CI		β	p	R <sup>2</sup>	R <sup>2</sup> Δ	B	SE	95% CI		β	p
					Lower	Upper							Lower	Upper		
<b>Model 1</b>	.285	.285						<.001	.427	.427						<.001
ST			.109	.107	-.110	.314	.085	.313			.252	.081	.087	.414	.207	.002
OC			.046	.098	-.143	.233	.034	.631			.081	.092	-.095	.272	.064	.376
SE			.071	.089	-.113	.245	.059	.426			-.196	.071	-.337	-.049	-.170	<.001
CON			.029	.117	-.182	.268	.021	.807			.033	.092	-.153	.203	.025	.741
NEP			.303	.114	.120	.581	.131	.007			.191	.147	-.080	.506	.087	.177
AC			.076	.107	-.136	.287	.052	.459			.322	.084	.146	.481	.231	<.001
AR			.172	.106	-.041	.372	.115	.104			.232	.100	.039	.433	.162	.030
PN			.399	.147	.108	.687	.240	.009			.276	.134	.007	.539	.174	.041
<b>Model 2</b>	.302	.031						.052	.447	.031						.016
ST			.062	.115	-.165	.282	.048	.583			.218	.084	.046	.382	.179	.014
OC			.041	.104	-.162	.244	.031	.702			.077	.097	-.103	.271	.061	.432
SE			.095	.087	-.081	.260	.079	.273			-.167	.072	-.308	-.025	-.145	.018
CON			.029	.122	-.193	.283	.020	.816			.029	.094	-.166	.208	.022	.772
NEP			.241	.107	.064	.489	.105	.026			.126	.136	-.136	.405	.058	.337
AC			.100	.109	-.114	.316	.068	.362			.322	.088	.141	.482	.231	<.001
AR			.156	.104	-.046	.354	.104	.132			.215	.097	.020	.407	.150	.033
PN			.405	.149	.077	.691	.243	.008			.296	.137	.019	.554	.186	.032
Gender			.268	.122	.037	.513	.140	.030			.219	.096	.029	.401	.120	.023
Age			.040	.074	-.107	.186	.028	.580			.110	.063	-.010	.233	.080	.080
Education			.059	.059	-.056	.176	.060	.319			.025	.046	-.070	.110	.027	.573
HH Size			.055	.079	-.107	.199	.041	.510			.091	.068	-.040	.232	.071	.181
HH Income			-.025	.028	-.083	.033	-.046	.361			-.002	.023	-.046	.047	-.005	.923
HH Status			-.015	.052	-.118	.083	-.013	.786			-.028	.047	-.117	.060	-.026	.573

Hypothesis 5 can be partially confirmed by the results. The predictive power of the psychological variables in all regression models was greater than that of socio-demographic variables. Personal norms and awareness of consequences were the two strongest predictors of the willingness to engage in all types of energy conservation behaviour. In contrast to expectations, socio-demographic variables were not significant in predicting willingness to adopt efficiency behaviours.

## 5.5 Self-Reported Motivations and Barriers for Willingness to Adopt Energy Conservation Behaviour

Respondents were asked about their motivations to engage in energy-saving behaviour in their homes. The most common response was that they believe “it’s the right thing to do” ( $M = 3.93$ ,  $SD = .883$ ), followed by the belief that “it’s good for the environment” ( $M = 3.90$ ,  $SD = .959$ ). These results showed that the majority of the respondents feel that their motivations to engage in energy-saving behaviour are driven by both a sense of personal responsibility and a desire to positively impact the environment. Conversely, motivations such as “it’s expected of me” ( $M = 3.71$ ,  $SD = .950$ ), “it’s what my friends and family are doing” ( $M = 3.71$ ,  $SD = .925$ ) and “to save money” ( $M = 3.70$ ,  $SD = 1.033$ ) were among the least motivating factors for engaging in energy-saving behaviour. These results showed that the majority of respondents prioritise moral and environmental considerations over social pressure or financial savings when it comes to their willingness to engage in energy-saving behaviour.

**Table 5.7 Motivations for Households Conserve Energy at Home**

Motivations	N	M	SD
To save money	288	3.72	1.033
It’s good for the environment	285	3.90	.959
It’s what my friends and family are doing	285	3.71	.925
It’s good for my family health and well-being	285	3.88	.874
It’s expected of me	286	3.71	.950
It would be the right thing to do	286	3.93	.883

Respondents were also asked about their barriers to adopt energy-saving behaviour in their homes. The results showed that "out of habit" was the most commonly reported barrier ( $M = 3.39$ ,  $SD = 1.072$ ), followed by "not convenient (or too much effort)" ( $M = 3.34$ ,  $SD = 1.090$ ). These results showed that habit and convenience are important barriers for the majority of respondents in their willingness to adopt energy-saving behaviour in their homes. Moreover, a number of respondents reported that access to energy-efficient products and services is challenging in Laos, which is another barrier to adopting energy-saving behaviour. In addition, "I don't see my friends and family do these things" ( $M = 3.31$ ,  $SD = 1.114$ ), "too many investments" ( $M = 3.25$ ,  $SD = 1.097$ ) and "it's not expected of me" ( $M = 3.22$ ,  $SD = 1.178$ ) were among the least reported barriers that prevent households to engage in energy-saving behaviour.

**Table 5.8 Barriers for Households Conserve Energy at Home**

Barriers	<i>N</i>	<i>M</i>	<i>SD</i>
Too many investments	285	3.25	1.097
Not convenient (i.e., too much effort)	285	3.34	1.090
Out of habit	284	3.39	1.072
I don't see my friends and family do these things	284	3.31	1.114
It is not expected of me	282	3.22	1.178

## 5.5 Results Summary

**Table 5.9 Research Questions and Results Summary**

	Results Summary
1	How are values, environmental beliefs, and personal norms associated with the willingness to adopt energy-saving behaviour in Laos?



	<p>The results showed that self-transcendence values were positively associated with the willingness to adopt energy-saving behaviour. Self-enhancement values were negatively correlated with the willingness to adopt energy conservation behaviour. However, openness to change and conservation values displayed no significant relationship with the willingness to adopt energy-saving behaviour. As expected, personal norms showed the strongest positive correlation with the willingness to engage in energy-saving behaviour, followed by awareness of consequences belief, ascription of responsibility belief and environmental concern.</p>
<b>2</b>	<p><b>How are socio-demographic characteristics associated with the willingness to adopt energy conservation, efficiency, and curtailment behaviours in Laos?</b></p>
	<p>There is a positive and significant correlation between gender, age, level of education and household size and the willingness to adopt energy-saving behaviour. The results showed no significant correlation between the willingness to adopt energy conservation behaviour and household income and household status. The findings showed that women were more willing to engage in both efficiency and curtailment behaviours than men. Respondents with higher level of education were more likely to engage in both types of energy-saving behaviours. Additionally, larger households were more willing to engage in energy efficiency and curtailment behaviours. The results showed no statistical difference between age groups, household income and home ownership status in the willingness to adopt energy efficiency and curtailment behaviours.</p>
<b>3</b>	<p><b>What role do psychological and socio-demographic factors play in influencing household energy conservation in Laos, both in efficiency and curtailment behaviours?</b></p>
	<p>The psychological variables from the Value-Belief-Norm theory explained greater variance in energy conservation, efficiency and curtailment behaviours. Personal norms was the strongest predictor of the willingness to engage in all types of energy conservation behaviour. Gender is the only socio-demographic variable that showed significant predictive ability in energy conservation, efficiency, and</p>

	curtailment behaviours. In contrast to expectation, socio-demographic variables were not significant in predicting willingness to adopt efficiency behaviours.
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## Chapter 6: Discussion

### 6.1 Introduction

This thesis research aimed to identify and explore the determinants of people's willingness to engage in household energy conservation behaviour in Laos. As such this research contributes to the current scientific understanding of household energy conservation behaviour and provides insights into the relationships between psychological and socio-demographic factors and the willingness to adopt energy-saving behaviour. This chapter discusses the findings of the research in the order of the research questions presented above, examining them in the context of relevant literature to seek explanations for results found in the research. This chapter also explores the limitations of this study while identifying potential areas for further research. Finally, chapter 6 concludes by providing a set of policy recommendations based on the research findings.

### 6.2 Relationships between Psychological Factors and The Willingness to Conserve Energy Saving Behaviour

#### ***How are values, environmental beliefs, and personal norms associated with the willingness to adopt energy-saving behaviour in Laos?***

The Value-Belief-Norm theory of environmentalism (Stern, 2000) was used in this thesis to conceptually frame the determinants of people's willingness to save energy in their homes in Laos. The relationship between the psychological factors and the willingness to engage in energy-saving behaviour was examined through correlational analyses. A significant positive correlation was found between self-transcendence values and the willingness to conserve energy. As Schwartz's value theory suggests, a negative relationship between people's willingness to conserve energy and self-enhancement value was observed. Such a finding indicates that respondents who more strongly endorsed values that included a concern for people and the environment expressed greater willingness to engage in energy conservation behaviour. In contrast, people who more strongly endorse self-enhancement values (associated with power and wealth) were less willing to conserve energy. This result is consistent with

Schwartz' value theory, which suggests that motivations focused on personal interests are often in conflict with those that prioritise the well-being of others (Schwartz, 2012). The negative association between self-enhancement value and people's willingness to adopt energy conservation behaviours aligns with the studies conducted by Poortinga et al. (2004) and Nguyen et al. (2016), which both found that people who showed lower endorsement of self-enhancement values were more willing to engage in household energy-saving behaviour.

In contrast to expectations, the study found no significant relationship between openness to change and conservation values and people's willingness to engage in energy-saving behaviour. The study had hypothesized that openness to change values would be positively correlated with energy conservation behaviour, as this value orientation embodies a readiness for change. Additionally, the study had expected conservation values, which reflect self-restriction and resistance to change, to be negatively associated with energy-saving behaviour. Although prior research has shown that openness to change values are positively associated with pro-environmental behaviour (Gilg et al., 2005; Stern et al., 1999) and conservation values are negatively related to pro-environmental behaviour (Braitto et al., 2017; Schultz et al., 2005), these relationships did not emerge in this study. One possible explanation for this finding may be because self-transcendence and self-enhancement values were identified as the most significant variables in explaining energy-saving behaviour (Ibtissem, 2010; Miroso et al., 2013; Yeboah & Kaplowitz, 2016).

In terms of value orientations, it can be seen that people who prioritise self-transcendence values over self-enhancement values are more likely to adopt energy-saving behaviour, irrespective of their adherence to openness to change or conservation values. This suggests that efforts to promote energy conservation behaviour, particularly in Laos, may be more effective if they focus on appealing to values concerning the welfare of others and the environment. Nonetheless, further research is needed to better understand the relationship between different value orientations and how they influence energy-saving behaviour in different contexts.

The concept of environmental concern has been widely studied in order to understand the factors that can motivate households to adopt energy-conserving behaviour. Correlation analysis from this study showed that environmental concern was

significantly and positively related to the willingness to adopt energy conservation behaviour. This finding is consistent with past studies that found positive relationships between environmental concern and willingness to adopt energy-saving behaviour (Karlin et al., 2014; Poortinga et al., 2004).

In addition, the results showed strong and significant correlations between awareness of consequences, ascription of responsibility, personal norms and people's willingness to engage in energy-saving behaviour. These results are consistent with other research, which found positive relationships between those variables and energy-saving behaviour and willingness to engage in energy-saving behaviour (Ghazali et al., 2019; Ibtissem, 2010; Nordlund & Garvill, 2003; Steg et al., 2005; Yeboah & Kaplowitz, 2016). The findings suggest that if people are more aware of the negative environmental consequences of their energy use, they are more likely to take responsibility and feel more obligated to reduce their energy consumption. This result was reflected in the strong correlation found between personal norms and people's willingness to conserve energy. Personal norms were the most strongly related variable with people's willingness to engage in energy-saving behaviour. This finding is consistent with previous research that found strong relationships between personal norms, household energy-saving behaviour and intentions (Fornara et al., 2016; Ibtissem, 2010; Yeboah & Kaplowitz, 2016). This finding supports the Value-Belief-Norm (VBN) theory and the norms activation model (NAM), which argued that personal norms play a key role in activating pro-environmental behaviour.

### 6.3 Socio-Demographic Factors and The Willingness to Adopt Energy Conservation Behaviours

#### ***How are socio-demographic characteristics associated with the willingness to adopt energy conservation behaviour in Laos?***

Based on the results of the correlation analysis, it appears that the willingness to adopt energy conservation behaviour is significantly associated a variety of socio-demographic factors, including gender, age, level of education and household size. However, the results showed no significant correlation between the willingness to adopt energy conservation behaviour and household income and household status.

The findings from this study showed that women were more willing to engage in both efficiency and curtailment behaviours. Yet, the research findings on the relationship between gender and energy conservation behaviour are mixed. While a study conducted by Poortinga et al. (2003) found that gender was not significantly correlated with people's intentions to adopt energy efficiency and curtailment behaviours, other studies found that women are more likely to engage in both types of energy-saving behaviours (Barr et al., 2005; Jansson et al., 2009). These mixed findings suggest that the relationship between gender and energy conservation behaviour is complex and may be influenced by a variety of factors such as cultural differences, education levels and social status. For example, in Laos, women are traditionally responsible for household chores that often require the use of energy, hence they may be more aware of the importance of conserving energy in the home. Although women in this study showed a higher willingness to engage in energy-saving behaviour, further research is required to understand the relationships of these factors and their associations with energy-saving behaviour.

The results from a one-way ANOVA showed that there was a significant difference between the level of education that the respondents had obtained and their intentions to save energy at home. It was revealed that people with postgraduate degrees were more willing to engage in energy efficiency and curtailment behaviours than people who had lower educational qualifications. This outcome is contrary to previous studies, which found no significant differences in education backgrounds and intentions or energy-saving behaviour, especially curtailment behaviours (Poortinga et al., 2003; Sardianou, 2007; Wang et al., 2018). Given that environmental protection and energy conservation education is much more available at tertiary level studies, such an outcome suggests that a lack of environmental education in the current primary and secondary education system in Laos could be one reason why people are less likely to demonstrate energy efficiency and curtailment behaviours (Oepen, 2021). Thus, incorporating education about energy conservation in schools could potentially promote energy-saving practices that could lead to a reduction of energy consumption.

The results of this study showed a significant correlation between household size and people's willingness to adopt energy conservation behaviour. Similar to previous studies, larger households were found to be more likely to adopt both types of energy-saving behaviour (Barr et al., 2005; Yue et al., 2013). Yue and colleagues (2013) found

that families with children are more motivated to engage in energy-saving behaviour because they are more concerned about household expenses, as well as wanting to set a good example for their children.

Contrary to many previous research studies (Poortinga et al., 2004; Sardianou, 2007; Umit et al., 2019; Urban & Ščasný, 2012), this study found that household income was not significantly related to the adoption of energy-saving behaviour. Commonly, previous research found that households with a lower income tend to adopt energy-saving curtailment behaviours, while those with higher incomes are more likely to invest in energy-efficient technologies. However, this study found that household income was not a significant factor in the intentions to adopt energy-saving behaviour, suggesting that financial considerations may not play a major role in a household's decision to engage in energy-saving behaviour or invest in energy efficiency in Laos.

In addition, household status did not significantly correlate with people's willingness to save energy in the home. This result is surprising because past research has revealed that homeownership is an important factor for households to engage in energy efficiency behaviours (Barr et al., 2005; Lillemo, 2014). For example, owning a residence is positively related to more investments in home insulation and energy-efficient appliances. Because homeownership may give individuals a sense of connection and control of their home, which further encourages them to consider investing more in energy efficiency (Barr et al., 2005). Although the results of this study showed a high percentage of homeownership, the correlation between energy-saving intentions and ownership status was not evident.

Lastly, this research found a positive correlation between people's willingness to engage in energy-saving behaviour and age, where older residents were more willing to conserve energy in their homes. This finding is consistent with previous research that found a positive relationship between seniority and energy savings (Wang et al., 2011; Yue et al., 2013). One possible explanation for this outcome may be that older people may experience greater financial pressures and household spending, leading them to make greater effort in reducing energy consumption.

## 6.4 The Role of Psychological and Socio-Demographic Factors

In this study, regression analysis was used to determine the relative importance of psychological factors and socio-demographic factors. The psychological variables adapted from the VBN theory were able to explain 43.8% of the variance in people's willingness to adopt energy conservation behaviour. The inclusion of socio-demographic variables resulted in a small increase in the explained variance but not statistically significant. Personal norm was the strongest predictor of people's willingness to engage in energy-saving behaviour, followed by awareness of consequences, ascription of responsibility and self-transcendence values. Additionally, respondents reported that "it would be the right thing to do" was their top motivation for engaging in energy-saving behaviour. This finding is consistent with other research that used the VBN framework, which found that personal norm is the strongest predictor of energy conservation behaviours (Ibtissem 2010; Van Der Werff & Steg, 2015; Yeboah & Kaplowitz, 2016).

The variables from the VBN theory were able to significantly predict the willingness to adopt curtailment behaviours. The addition of socio-demographic variables led to a small increase in the explained variance but not statistically significant. Awareness of consequences was the strongest predictor of people's willingness to engage in energy curtailment behaviours. Regression analysis revealed that environmental concern was not a significant predictor of the willingness to adopt energy curtailment behaviours when other factors were controlled for. Environmental concern was found to be an important predictor of curtailment behaviours in previous studies (Karlin et al., 2014; Never et al., 2022). However, those studies did not include other variables such as values, environmental beliefs and personal norms that may also correlate with people's willingness to adopt energy curtailment behaviours. This finding highlights the significance of considering various factors in predicting people's willingness to adopt energy curtailment behaviours to gain a more comprehensive understanding of why people decide to adopt energy-saving behaviour.

The psychological variables were significant in explaining the variance in people's willingness to engage in energy efficiency behaviours. However, the addition of socio-demographic variables resulted in a small but insignificant increase in the amount of explained variance. Contrary to what was hypothesised, all socio-demographic



variables, apart from gender, were found not significantly related to the willingness to adopt energy efficiency at home. This finding differed from previous research in the OECD and European countries that found households with higher income are more likely to invest in energy-efficient solutions (Ameli & Brandt, 2015; Fornara et al., 2016; Umit et al., 2019). This does not appear to be the case in the context of Laos. One possible explanation for this outcome may be the lack of affordable energy-efficient products and services in the country. As Steg (2008) suggested, this type of situational constraint is considered to be an important factor that prevents people's from engaging in energy efficiency behaviours. Unlike in developed countries, accessing modern energy-efficient technologies such as home insulation and energy-efficient lightings in Laos can be difficult. This explanation also aligns with what was reported by several respondents of the survey, who indicated that although they are willing to invest in energy efficiency, the energy-efficient products and services are not readily available.

## 6.5 Limitations and Future Research

### 6.5.1 Sampling Method

One limitation of this study is the sampling method. As discussed in the methodology chapter, convenience sampling in the form of online surveys can be a useful method for gathering data and testing theories for this type of project. The sample size of 304 people in this study was considered acceptable, but it was not representative of the Laos population because it consisted only of residents with access to the internet, and who have high levels of education. Men were also overrepresented. Despite the efforts to include participants with diverse range of socio-demographic characteristics, achieving a sample that is truly representative of the population was too challenging for this thesis research. Nevertheless, it is not uncommon for studies to use non-representative samples, such as those obtained through convenience sampling. For example, studies conducted by Yeboah and Kaplowitz (2016) and Choi et al. (2015) used online surveys as a method of data collection.

Another issue with the sampling method used in this study is the potential of selection bias, which occurs when the respondents who choose to participate in a survey are more likely to have a particular interest in the topic of the survey. In this case, because participation was completely voluntary, it is possible that the respondents who chose to participate were more interested in energy conservation. The high scores on the

level of awareness of consequences and other related constructs also indicated that households who participated in the study were already motivated to conserve energy. Therefore, this means that the findings of this study are not necessarily generalisable to the larger population.

To improve the representativeness of the sample in future research, a probabilistic sampling method could be used to reach a wider and more diverse sample. The use of probabilistic sampling in future research could also increase the sample size. An increase in a sample size could lead to a more varied and complex picture of the relationship between psychological and socio-demographic factors regarding energy conservation behaviour, and a more nuanced understanding of the willingness to engage in energy conservation behaviour.

### 6.5.2 Self-Reported Responses Bias

Another limitation of this study that should be acknowledged is that responses bias may have occurred because of the use of self-reported data. For instance, the use of self-reported measures of values, as measured by Schwartz' values questionnaire, may be subject to response bias. This means that respondents may have responded to questionnaire items in a way that reflected the values they believe they should be answering, rather than their true values. However, the use of Schwartz' PVQ questionnaire was designed to minimise the self-response bias because it frames each statement from a third person perspective. This allowed the respondents to compare the values described in the questionnaire to their own values, which may help reduce the tendency for them to respond in a way that they think is socially desirable.

### 6.5.3 Future Research

During the planning process, a number of measures were considered but ultimately not included. The variables from the Theory of Planned Behaviour, such as perceived behavioural control, social norm, and attitude, are prominent in prior research assessing people's intentions to engage in energy conservation behaviour (Abrahamse, 2019). Assessing people's belief in their ability to change their behaviour and measuring social norms, attitudes, and knowledge of energy conservation, would be worth investigating in future research as together these factors would provide a rich

nuanced understanding of energy conservation behaviour. However, this thesis did not have the scope to include these variables. Nevertheless, it would be worth investigating these variables in future research. One method for collecting such data could be by employing a qualitative approach given that qualitative research methods have the capacity to generate more nuanced understandings, particularly in the context of Laos where this topic has not been studied. Additionally, it is important to adjust the survey instrument according to local language and culture to ensure that the questions are comprehensible and culturally appropriate for the study population. Regardless, the findings of this thesis can serve as a foundation for future research on how psychological and socio-demographic factors are associated with people's willingness to adopt energy conservation behaviour. This study served as a preliminary investigation in this topic that has not been explored previously in Laos.

## 6.6 Policy and Research Implications

While I cannot draw conclusions about causality based on these findings, they offer some useful insights for developing strategies to promote household energy conservation behaviour in Laos. Behavioural change plays a significant role in household energy conservation efforts. Policy interventions that target behavioural change tend to be more effective when they focus on the key determinants of the behaviours and removing any barriers that prevent change (Van Valkengoed et al., 2022). In order to maximise the effectiveness of these future interventions, it is important to identify the factors that either encourage or discourage people's willingness to engage in energy-saving behaviour.

The results from this research showed that psychological determinants are strongly related to people's willingness to adopt energy conservation behaviours in the home. Future intervention efforts should therefore focus on these factors. A key finding of this research indicated that people who adhere to self-transcendence values and are more aware of the consequences from their energy use, tend to feel a greater sense of responsibility for their actions, leading to a feeling of moral obligation to engage in energy-saving behaviour. Therefore, public campaigns and educational programs that focus on strengthening self-transcendence values while highlighting the impacts of excessive energy consumption, can encourage a sense of responsibility and personal norms, which as this study suggests, is a significant predictor of people's willingness

to adopt energy conservation behaviour. As argued by Steg and Vlek (2009), it is believed that when people acquire new knowledge, their attitudes and beliefs about certain topics may change, which can then lead to changes in their behaviour. In a similar vein, education campaigns that focus on environmental consequences might result in attitude and behaviour change.

This study found that the lack of availability and accessibility of energy-efficient technologies in Laos may prevent certain households from adopting energy efficiency behaviours. Such contextual barriers are considered to be a significant challenge for people to engage in pro-environmental behaviours (Steg, 2008). In the case of Laos, policymakers can consider collaborating with manufacturers and retailers to increase the availability of energy-efficient products, potentially by providing incentives such as rebates or subsidies. Additionally, the government can provide financial support for the establishment of distribution networks for energy-efficient products, making them more readily accessible to consumers across the country. For example, in China, the government provides subsidies for manufacturers of energy-efficient products such as air conditioners and light bulbs to make them more affordable to consumers (Zheng & Zeng, 2013). This policy has been effective in increasing the market share of energy-efficient products, which contribute to a reduction of energy consumption.

Another interesting finding of this study is that gender appeared to be a significant predictor of people's willingness to save energy at home. Further research is required to examine the unique motivations of males and females to conserve energy in the home in Laos. As suggest by Du and Pan (2022), using the same energy-saving interventions for both men and women may not be effective given the fact that men and women demonstrated different motivations for energy conservation. Therefore, it is important to design tailored energy-saving interventions for both males and females. For example, campaigns targeted towards men could emphasise on the importance of their contribution to energy savings in the home and encourage them to take an active role in adopting energy-saving practices.

## 6.7 Chapter Summary

The research and analysis have led to a number of conclusions about the relationships between psychological and socio-demographic factors and people's willingness to adopt energy conservation behaviour in the home. The findings of this study reinforce

previous research that found psychological variables play a significant role in predicting people's decisions to engage in energy conservation behaviours. However, the expected relationships between socio-demographic factors and people's willingness to engage in efficiency behaviours was not supported by the results of this study. The findings have implications for the design of energy conservation intervention efforts to promote in-home energy-saving behaviour in Laos. Limitations of the study have been acknowledged, and future studies are suggested to address these limitations.

## Chapter 7: Conclusion

The growing demand for energy has resulted in an increase in global energy consumption, exacerbating the impacts of climate change. A shift in the current energy systems is vital to achieve a low-carbon future. One way to reduce the global energy consumption is by improving energy efficiency across all sectors. The residential sector, in particular, is a major contributor to the rise in energy consumption (Nejat et al., 2015). Addressing energy consumption in homes through energy efficiency and conservation measures is therefore a crucial step towards mitigating the impacts of climate change and promoting sustainability.

As a developing nation, Laos has experienced an increase in household energy consumption due to population growth and economic development (ADB, 2019). The rise in household energy use presents a significant challenge for the country to meet its commitments of carbon neutrality by 2050 (IEA, 2022b). Encouraging households to adopt energy efficiency and conservation behaviour is widely regarded as a key strategy for many European nations to reduce energy consumption (IEA, 2022a). However, there is a lack of in-depth research on the factors that motivate households in Laos to engage in energy conservation behaviour. Understanding the key determinants of people's willingness to engage in energy-saving behaviour is vital in informing policy interventions that aim to encourage households to reduce their energy use.

The aim of this study was to contribute to the literature on energy conservation behaviour in Laos and Southeast Asia more broadly. This study explored the relationship between psychological and socio-demographic factors and people's willingness to engage in household energy-saving behaviour. Using the Value-Belief-Norm theory as a guiding theoretical framework, the psychological factors included values, environmental beliefs, and personal norms. Socio-demographic factors included age, gender, level of education and household characteristics. These variables were examined in order to gain a deeper understanding of motivational factors that drive energy conservation behaviour in residential settings and to provide insights for future policy interventions effort in Laos.

A number of psychological determinants were found to be related to people's willingness to adopt energy-saving behaviour. Personal norm was the most strongly related variable with people's willingness to engage in energy-saving behaviour. A significant positive correlation was also found between self-transcendence values and the willingness to conserve energy. Conversely, self-enhancement values were negatively associated with willingness. Openness to change and conservation values were not significantly related to the willingness to engage in energy-saving behaviour. These findings suggest that respondents who more strongly endorsed values that reflect concern for people and the environment expressed greater willingness to engage in energy conservation behaviour. This study also showed that environmental concern was positively related to willingness to adopt energy-saving behaviour. In addition, the results showed strong and significant correlations between awareness of consequence, ascription of responsibility and people's willingness to engage in energy conservation behaviour.

People's willingness to adopt energy conservation behaviours was significantly associated with a number of socio-demographic factors, including gender, age, level of education and household size. The results of this study indicated that women were more willing to engage in both energy efficiency and curtailment behaviours as compared to men. Respondents with higher level of education were also more likely to engage in both types of energy-saving behaviours. Furthermore, larger households were more willing to engage in energy efficiency and curtailment behaviours.

The findings of this research suggest that psychological variables play a significant role in determining people's willingness to engage in energy-saving behaviour. Thus, future initiatives that aim to promote energy conservation should focus on these factors. This study found that individuals who prioritise self-transcendence values and are aware of the consequences of their energy use tend to feel a stronger sense of responsibility and moral obligation to conserve energy. By promoting these values through public education campaigns and highlighting the impact of energy consumption, a sense of personal responsibility and norms can be encouraged, which has been shown to be a strong predictor of energy conservation behaviours. As Steg and Vlek (2009) have argued, when people gain new knowledge, their attitudes and beliefs on certain topics may shift, leading to changes in their behaviour.

Socio-demographic variables were not significant in predicting people's willingness to engage in efficiency behaviours. This is contrary to previous research in other countries, where socio-demographic factors such as household income and homeownership appeared to be a significant factor in influencing people's intentions to invest in energy efficiency in the home. In this study, household income was not a predicting factor as expected. This indicates that motivations for engaging in energy efficiency behaviour in this context may not necessarily stem from financial considerations but could come from other sources. The results of this study indicate that a shortage of energy-efficient technology options in Laos may prevent some households from adopting energy-saving behaviour. Contextual barriers, such as cost and availability pose a significant challenge for individuals to adopt environmentally conscious practices. To address this issue, policymakers can work with manufacturers and retailers to improve the availability of energy-efficient products by offering incentives such as rebates or subsidies. The government can also support the creation of distribution networks that make these products easily accessible to consumers throughout Laos.

In summary, the outcome of this study highlights the importance of considering a wider range of factors that are associated with intentions to adopt energy conservation beyond socio-demographic factors when developing strategies to promote the adoption of energy efficiency and conservation behaviour. In the Lao context, this research shows that personal norms, values and beliefs are significant, and these insights can be used for future policies and interventions aimed at promoting energy conservation in households. Changing behaviour is a crucial aspect of conserving energy in households. To make these efforts successful, it's essential to target the important factors that influence behaviour and remove any obstacles preventing change.



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## Appendix A: Ethics Approval Letter



VICTORIA UNIVERSITY OF  
**WELLINGTON**  
TE HERENGA WAKA

Phone 0-4-463 6134

Email rhonda.shaw@vuw.ac.nz

TO	Diane Phomsoupha
FROM	Associate Professor Rhonda Shaw, Convenor, Human Ethics Committee
DATE	16/08/2022
PAGES	1
SUBJECT	<b>Ethics Approval Number: 30363</b> <b>Title:</b> Exploring the determinants of household energy conservation behaviour in Laos

Thank you for your application for ethical approval, which has now been considered by the Human Ethics Committee.

Your application has been approved from the above date and this approval is valid for three years. If your data collection is not completed by this date you should apply to the Human Ethics Committee for an extension to this approval.

Best wishes with the research.

Kind regards,



A/Prof Rhonda Shaw

Convenor, Te Herenga Waka—Victoria University of Wellington Human Ethics Committee

### **Household Energy Conservation Behaviour Survey**

Welcome to the Household Energy Conservation Behaviour survey and thank you for taking your time to participate. If you decide not to participate, thank you for considering this request.

#### **Who am I?**

My name is Diane Phomsoupha and I am a Masters student at Te Herenga Waka—Victoria University of Wellington. The information obtained from this research project will be used in my Masters thesis and might also be used for publication in journals and/or presented at conferences. The data obtained from this research might be shared with other researchers for future publication. This project is being supervised by Dr Wokje Abrahamse and has been approved by the Te Herenga Waka—Victoria University of Wellington Human Ethics Committee (approval number 30363).

#### **What is the aim of the project?**

In this study, I am examining the role of socio-demographic factors (such as age, gender, and income) and people's motivations (such as values and beliefs) to see how important they are in people's decisions about in-home energy use. In doing so, I will gain an understanding of the key factors that are associated with energy consumption behaviours in the home, which can be useful for the design of energy conservation campaigns.

#### **How can you help?**

You have been invited to participate because you are currently residing in Laos. If you agree to take part, you will complete a survey. This online survey will take about 15 to 20 minutes and consists of four main parts. Firstly, the survey will ask you questions about your values. Secondly, we will ask you about your opinions about the environment. Then, you will be asked to answer some questions regarding your energy saving behaviours at home. Some background questions about your household characteristics and energy consumption will also be asked at the end of the survey. You can complete the survey anytime and at your convenience, but preferably in one go, although you can come back to it if needed.

Also, by completing this survey you will have the opportunity to go into the draw to win 200,000 kip worth of food and grocery voucher from Foodpanda. Good luck!

### **What will happen to the information you give?**

This research is anonymous. This means that nobody, including the researchers will be aware of your identity. By answering it, you are giving consent for us to use your responses in this research. Your answers will remain completely anonymous and unidentifiable. Once you submit the survey, it will be impossible to retract your answer. Please do not include any personal identifiable information in your responses.

### **If you have any questions or problems, who can you contact?**

If you would like to see an aggregate summary of the results, please visit the study Facebook page called “Energy Conservation Behaviour in Laos”. If you have any questions, either now or in the future, please feel free to contact either me or my supervisor: Student: Diane Phomsoupha, [phomsodian@myvuw.ac.nz](mailto:phomsodian@myvuw.ac.nz); Supervisor: Dr Wokje Abrahamse, Senior Lecturer at the School of Geography, Environment and Earth Sciences, +64 44635217, [wokje.abrahamse@vuw.ac.nz](mailto:wokje.abrahamse@vuw.ac.nz)

### **Human Ethics Committee information**

If you have any concerns about the ethical conduct of the research you may contact the Te Herenga Waka—Victoria University of Wellington HEC Convenor, Associate Professor Rhonda Shaw, by emailing [hec@vuw.ac.nz](mailto:hec@vuw.ac.nz).

Do you consent to take part in this research and proceed to the survey?

- ☐ Yes
- ☐ No

If No is selected, then skip to end of survey

Are you 18 years old and over?

- ☐ Yes
- ☐ No

If No is selected, then skip to end of survey



## Part 1: Your values

First, we would like to ask you a few questions about your values. These are broad, guiding principles in people's lives. Answering these questions will provide us with a better understanding of the views that are important to you personally. There are no right or wrong answer, we are interested in your opinion.

Please choose which gender you most strongly identify with. From here, you will be directed to the associated version of the questionnaire.

- ☐ Male
- ☐ Female
- ☐ Non-binary
- ☐ Prefer not to say

Here we briefly describe different people. Please read each description and think about how much that version **is** or **is not** like you.

	Not like me at all	Not like me	A little like me	Somewhat like me	Like me	Very much like me
1. Thinking up new ideas and being creative is important to her. She likes to do things in her own original way. 2. It is important to her to be rich. She wants to have a lot of money and expensive things. 3. She thinks it is important that every person in the world should be treated equally. She believes everyone should have equal opportunities in life. 4. It's important to her to show her abilities. She wants people to admire what she does. 5. It is important to her to live in secure surroundings. She avoids anything that might endanger her safety. 6. She likes surprises and are always looking for new things to do. She thinks it						

<p>is important to do lots of different things in life.</p> <p>7. She believes that people should do what they are told. She thinks people should follow rules at all times, even when no-one is watching.</p> <p>8. It is important to her to listen to people who are different from her. Even when they disagree with her, she still wants to understand them.</p> <p>9. It is important to her to be humble and modest. She tried not to draw attention to herself.</p> <p>10. Having a good time is important to her. She like to “spoil” herself.</p> <p>11. It is important to her to make her own decisions about what she does. She likes to be free and not depend on others.</p> <p>12. It's very important to her to help the people around her. She wants to care for their well-being.</p> <p>13. Being very successful is important to her. She hopes people will recognise her achievements.</p> <p>14. It is important to her that the government ensures her safety against all threats. She wants the state to be strong so it can defend its citizens.</p> <p>15. She looks for adventures and like to take risks. She wants to have an exciting life.</p> <p>16. It is important to her always to behave properly. She wants to avoid doing anything people would say is wrong.</p> <p>17. It is important to her to get respect from others. She wants people to do what she says.</p> <p>18. It is important to her to be loyal to her friends. She wants to devote herself to people close to her.</p> <p>19. She strongly believes that people should care for nature. Looking after the environment is important to her.</p>						
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20. Tradition is important to her. She tries to follow the customs handed down by her religion or her family.						
21. She seeks every chance they can to have fun. It is important to her to do things that give her pleasure.						

## Part 2: Your opinion about the environment

We are interested in your views on the environment. The following question will ask you some questions about your attitudes toward the environment. Please remember that there are no right or wrong answer, we are interested in your opinion.

Please indicate the extent to which you agree or disagree with each of the following statements.

	Strongly disagree	Disagree	Unsure	Agree	Strongly agree
1. We are approaching the limit of the number of people the Earth can support. 2. Humans have the right to modify the natural environment to suit their needs. 3. When humans interfere with nature it often produces disastrous consequences. 4. Human ingenuity will ensure that we do not make the Earth unliveable. 5. Humans are seriously abusing the environment. 6. The Earth has plenty of natural resources if we just learn how to develop them. 7. Plants and animals have as much right as humans to exist. 8. The balance of nature is strong enough to cope with the impacts of modern industrial nations.					

<p>9. Despite our special abilities, humans are still subject to the laws of nature.</p> <p>10. The so-called “ecological crisis” facing humankind has been greatly exaggerated.</p> <p>11. The Earth is like a spaceship with very limited room and resources.</p> <p>12. Humans were meant to rule over the rest of nature.</p> <p>13. The balance of nature is very delicate and easily upset.</p> <p>14. Humans will eventually learn enough about how nature works to be able to control it.</p> <p>15. If things continue on their present course, we will soon experience a major ecological catastrophe.</p> <p>16. Global warming is a problem for society.</p> <p>17. Conserving energy helps reduce the effect of global warming.</p> <p>18. The depletion of energy sources is a societal problem.</p> <p>19. I feel jointly responsible for the energy problems.</p> <p>20. I feel jointly responsible for the depletion of energy sources.</p> <p>21. I feel jointly responsible for global warming.</p> <p>22. I feel personally obliged to save as much energy as possible.</p> <p>23. I feel morally obliged to save energy, regardless of what others do.</p> <p>24. People like me should do everything they can to reduce energy use.</p> <p>25. I feel guilty when I waste energy.</p> <p>26. If I would buy a new appliance (e.g., a refrigerator), I would feel morally obliged to buy an energy efficient one.</p> <p>27. I feel obliged to bear the environment and nature in mind in my daily behaviour.</p>					
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### Part 3: Energy conservation actions

We would like to know about your energy-saving behaviour at home. Listed below are some possible conservation activities you can adopt, or already do, to save electricity use at home. Please indicate how willing you would be to do each action.

	Very unwilling	Somewhat unwilling	Not sure	Somewhat willing	Very willing	Already do
<ol style="list-style-type: none"> <li>1. use energy-efficient appliances or electrical appliances (such as refrigerator, washing machine, air conditioner, water heater, light bulbs).</li> <li>2. install ceiling insulation to keep your house cool.</li> <li>3. unplug appliances (appliances not on stand-by).</li> <li>4. switch lights off in unused rooms.</li> <li>5. set thermostat between 23 to 25 degrees Celsius.</li> <li>6. shower shorter (restrict the length of showers to save electricity).</li> <li>7. buy less electrical devices and appliances.</li> <li>8. use less electrical devices (i.e., TVs, computers).</li> <li>9. reduce the use of air conditioner.</li> <li>10. cool only one communal use room in the house (avoid cooling separate rooms).</li> <li>11. use communally cooling spaces such as cafes instead of cooling personal space.</li> <li>12. cooling house by opening windows.</li> </ol>						

Please indicate to what extent the following reasons are **important** for you to do to save energy at home. There is also space provided to describe your own reason.

	Very important	Important	Not sure	Somewhat important	Not important
1. To save money 2. It's good for the environment 3. It's what my friends and family are doing 4. It's good for my family health and well-being 5. It's expected of me 6. It would be the right thing to do 7. Other reason (please specify) _____					

Please indicate how important these **barriers** would prevent you to save energy at home. There is also space provided to describe your own barrier.

	Very important	Important	Not sure	Somewhat important	Not important
1. Too many investments 2. Not convenient (i.e., too much effort) 3. Out of habit 4. I don't see my friends and family do these things 5. It is not expected of me 6. Other (please specify) _____					

## Part 4: Background questions

Finally, please answer a few questions about yourself, household characteristics and energy consumption. Remember that your responses are anonymous and confidential.

1. What age group do you belong?
  - ☐ 18-20
  - ☐ 21-30
  - ☐ 31-40
  - ☐ 41-50
  - ☐ 51-60
  - ☐ 61-70
  - ☐ 71 and older
  
2. Please estimate your total annual household income in Lao Kip (before tax).
  - ☐ Under 50,000,000
  - ☐ 50,000,000 - 200,000,000
  - ☐ 200,000,001 - 400,000,000
  - ☐ 400,000,001 - 600,000,000
  - ☐ 600,000,001 - 800,000,000
  - ☐ 800,000,001 – 1,000,000,000
  - ☐ Over 100,000,000
  - ☐ Prefer not to say
  
3. Including yourself, how many people currently live in your household?
  - ☐ Under 2 people
  - ☐ 2 - 4 people
  - ☐ 4 - 6 people
  - ☐ Over 6 people
  
4. Who lives in the same household as you? Please tick all that apply.
  - ☐ My husband or wife
  - ☐ My girlfriend, boyfriend, or partner
  - ☐ My father and/or mother
  - ☐ My son(s) and/ or daughter(s)
  - ☐ My brother(s) and/or sister(s)
  - ☐ My friend(s) or flatmate(s)
  - ☐ Other (e.g., my grandmother, my mother-in law) \_\_\_\_\_

5. Which of these best describe your highest educational qualification?
- ☐ Secondary school certificate
  - ☐ High school certificate
  - ☐ Vocational or polytechnic school certificate
  - ☐ Bachelor's degree
  - ☐ Master's degree
  - ☐ Doctorate
6. Home ownership status. Do you rent or own the place/dwelling you live in?
- ☐ Rent
  - ☐ Own debt free
  - ☐ Own with mortgage(s) on it
  - ☐ Other (e.g., your parents own it) \_\_\_\_\_
7. What is your household average monthly electricity bill in Lao Kip, during winter months?
- ☐ Less than 200,000
  - ☐ 210,000 – 400,000
  - ☐ 410,000 – 600,000
  - ☐ 610,000 – 800,000
  - ☐ 810,000 – 1,000,000
  - ☐ 1,010,000 - 1,200,000
  - ☐ 1,210,000 - 1,400,000
  - ☐ 1,410,000- 1,600,000
  - ☐ Over 1,600,000
  - ☐ Don't know
8. What is your household average monthly electricity bill in Lao Kip, during summer months?
- ☐ Less than 200,000
  - ☐ 210,000 – 400,000
  - ☐ 410,000 – 600,000
  - ☐ 610,000 – 800,000
  - ☐ 810,000 – 1,000,000
  - ☐ 1,010,000 - 1,200,000
  - ☐ 1,210,000 - 1,400,000
  - ☐ 1,410,000- 1,600,000
  - ☐ 1,610,000 – 1,800,000
  - ☐ 1,810,000 – 2,000,000
  - ☐ Over 2,000,000



- Don't know

If you have any comments that you would like to add about this topic, please write them here

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If you would like to see a summary of the results of the research, please visit the study Facebook page called "Energy Conservation Behaviour in Laos". The results will be posted towards the conclusion of the research near the end of this year.

If you would like to enter the prize draw, please enter your email address (only one entry per person is allowed). This will be drawn at the conclusion of the survey at the end of October 2022.

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**Thank you for your time spent taking this survey, your participation is very much appreciated!**

## ບົດສຳຫຼວດພຶດຕິກຳການປະຢັດພະລັງງານໃນຄົວເຮືອນ

ຍິນດີຕ້ອນຮັບເຂົ້າສູ່ ບົດສຳຫຼວດພຶດຕິກຳການປະຢັດພະລັງງານໃນຄົວເຮືອນ ແລະ ຂອບໃຈທີ່ທ່ານສົນໃຈ ໃນການຕອບບົດສຳຫຼວດນີ້.

### ຂ້າພະເຈົ້າແມ່ນໃຜ?

ຂ້າພະເຈົ້າຊື່ວ່າ ນາງ ໄດແອນ ພິມສຸພາ ແລະ ບົດສຳຫຼວດນີ້ເປັນສ່ວນນຶ່ງໃນການຂຽນບົດວິທະຍານິພົນ ປະລິນຍາໂທ ດ້ານການສຶກສາສິ່ງແວດລ້ອມ ທີ່ມະຫາວິທະຍາໄລ Te Herenga Waka—Victoria University of Wellington. ຂໍ້ມູນທີ່ໄດ້ຈາກບົດສຶກສານີ້ ອາດຖືກຕີພິມ ແລະ ນຳສະເໜີໃນກອງປະຊຸມ. ບົດສຶກສານີ້ ແມ່ນຊື່ນຳໂດຍ Dr Wokje Abrahamse ແລະ ໄດ້ຮັບອະນຸມັດ ໂດຍຄະນະກຳມະການດ້ານຈັນຍາບັນມະນຸດ ຂອງມະຫາວິທະຍາໄລ Te Herenga Waka—Victoria University of Wellington ເລກທີ 30363.

### ຈຸດປະສົງຂອງບົດຄົ້ນຄວ້ານີ້ແມ່ນຫຍັງ?

ໃນບົດສຶກສານີ້, ຂ້າພະເຈົ້າຕ້ອງການຄົ້ນຄວ້າວ່າ ປັດໄຈ ທີ່ເຮັດໃຫ້ຄົນຕັດສິນໃຈ ໃນການປະຢັດພະລັງງານ ໃນຄົວເຮືອນ, ໂດຍສະເພາະບົດບາດທາງດ້ານ ເສດຖະກິດ-ສັງຄົມ (ເຊັ່ນ ອາຍຸ, ເພດ) ຫຼື ແຮງຈູງໃຈອື່ນ ໆ (ເຊັ່ນ ຄຸນຄ່າ ແລະ ຄວາມເຊື່ອ). ຜົນຂອງການຄົ້ນຄວ້າໃນຄັ້ງນີ້ ຈະສາມາດປະກອບສ່ວນເຂົ້າໃນການວາງແຜນ ການຊຸກຍູ້ໃນການປະຢັດພະລັງງານ ໃນອານາຄົດ.

### ທ່ານສາມາດປະກອບສ່ວນໄດ້ແນວໃດ?

ບົດສຳຫຼວດນີ້ ແມ່ນສຳລັບປະຊາຊົນທີ່ອາໄສໃນຕົວເມືອງຂອງປະເທດລາວ. ບົດສຳຫຼວດນີ້ ມີ 4 ພາກ ແລະ ຈະໃຊ້ເວລາປະມານ 15 ເຖິງ 20 ນາທີ. ພາກທີ 1 ປະກອບມີຄຳຖາມກ່ຽວກັບ ຄຸນຄ່າໃນຕົວຂອງທ່ານ. ພາກທີ 2 ຄວາມຄິດເຫັນຕໍ່ສິ່ງແວດລ້ອມ. ພາກທີ 3 ປະກອບມີຄຳຖາມກ່ຽວກັບ ພຶດຕິກຳ ການປະຢັດພະລັງງານ ໃນຄົວເຮືອນຂອງທ່ານ. ພາກທີ 4 ປະກອບມີຄຳຖາມພື້ນຖານກ່ຽວກັບຕົວທ່ານເອງ. ທ່ານສາມາດບັນທຶກຄຳຕອບ ແລະ ກັບມາສືບຕໍ່ຕອບຄຳຖາມໄດ້, ແຕ່ຈະເປັນການດີ ຖ້າທ່ານ ສາມາດ ຕອບຄຳຖາມທັງໝົດ ພາຍໃນຄັ້ງດຽວ. ທ່ານຍັງສາມາດລຸ້ນຮັບລາງວັນ ມູນຄ່າ 200,000 ກີບ ຖ້າຫາກທ່ານຕອບຄຳຖາມຈົບ.

### ຂໍ້ມູນຂອງທ່ານຈະຖືກຮັບຮູ້ໃສ?

ບົດຄົ້ນຄວ້ານີ້ຈະບໍ່ມີການເປີດເຜີຍຊື່ ໝາຍຄວາມວ່າ ບໍ່ມີໃຜ, ລວມທັງຜູ້ຄົນຄືທ່ານເອງ, ສາມາດຮູ້ ຕົວຕົນ ຂອງທ່ານໄດ້. ຖ້າທ່ານຕອບຄຳຖາມໃນບົດສຳຫຼວດນີ້ ໝາຍຄວາມວ່າ ທ່ານໃຫ້ການຍິນຍອມ ໃນການໃຊ້ຄຳຕອບ ຂອງທ່ານ ໃນບົດວິໄຈ. ທຸກຄຳຕອບຈະບໍ່ມີການເປີດເຜີຍຊື່ ແລະ ຈະບໍ່ສາມາດລະບຸຕົວຕົນໄດ້. ທ່ານຈະບໍ່ສາມາດ ຖອນຄືນ ຄຳຕອບຂອງທ່ານໄດ້ ຫຼັງຈາກທີ່ທ່ານສົ່ງຄຳຕອບຂອງບົດສຳຫຼວດ. ກະລຸນາ ຫຼີກລ້ຽງ ຂໍ້ມູນ ທີ່ສາມາດ ລະບຸ ຕົວຕົນ ຂອງທ່ານ ໃນຄຳຕອບ ຂອງບົດສຳຫຼວດ. ບົດສະຫຼຸບຂອງຜົນໄດ້ຮັບຂອງບົດສຳຫຼວດນີ້ ຈະຖືກຕີພິມໃນເພສ Facebook ທີ່ມີຊື່ວ່າ "Energy Conservation Behaviour in Laos".

### ຖ້າຫາກທ່ານມີຄຳຖາມກ່ຽວກັບບົດສຶກສານີ້ ທ່ານສາມາດຕິດຕໍ່ໃຜ?

ຖ້າຫາກທ່ານຕ້ອງການບົດສະຫຼຸບຂອງຜົນໄດ້ຮັບ, ຫຼື ມີຄຳຖາມກ່ຽວກັບບົດສຶກສານີ້, ທ່ານສາມາດ ຕິດຕໍ່ຂ້າພະເຈົ້າ ຫຼື ອາຈານຜູ້ຊີ້ນຳ ໄດ້ທີ່: ນັກສຶກສາ: ນາງ ໄດແອນ ພິມສຸພາ, [phomsodian@myvuw.ac.nz](mailto:phomsodian@myvuw.ac.nz); ອາຈານຜູ້ຊີ້ນຳ: Dr Wokje Abrahamse, Senior Lecturer at the School of Geography, Environment and Earth Sciences, +64 4 4635217, [wokje.abrahamse@vuw.ac.nz](mailto:wokje.abrahamse@vuw.ac.nz)

### ຂໍ້ມູນຄະນະກຳມະການດ້ານຈັນຍາບັນມະນຸດ

ຖ້າຫາກທ່ານມີຂໍ້ຂ້ອງໃຈກ່ຽວກັບຈັນຍາບັນໃນການເຮັດບົດສຶກສານີ້ ທ່ານສາມາດຕິດຕໍ່ ຫົວໜ້າ ຄະນະກຳມະການຈັນຍາບັນມະນຸດ ຂອງວິທະຍາໄລ Te Herenga Waka—Victoria University of Wellington ຮອງສາດສະດາຈານ ທ່ານ Rhonda Shaw ທາງອີເມວ: [hec@vuw.ac.nz](mailto:hec@vuw.ac.nz).

### ທ່ານມີອາຍຸ 18 ປີຂຶ້ນໄປຫຼືບໍ່?

- ☐ ແມ່ນ
- ☐ ບໍ່ແມ່ນ

### ທ່ານຍິນຍອມ ແລະ ຕ້ອງການເຮັດບົດສຳຫຼວດນີ້ຫຼືບໍ່?

- ☐ ຍິນຍອມ
- ☐ ບໍ່ຍິນຍອມ

## ພາກທີ 1: ຄຸນຄ່າໃນຕົວ

ກ່ອນອື່ນໝົດ, ພວກເຮົາຢາກຖາມກ່ຽວກັບຄຸນຄ່າໃນຕົວຂອງທ່ານ. ຄຳຖາມນີ້ຈະຊ່ວຍໃຫ້ເຮົາເຂົ້າໃຈ ສິ່ງທີ່ທ່ານຖືວ່າສຳຄັນ. ມັນບໍ່ມີຄຳຕອບຖືກ ຫຼື ຜິດ. ພວກເຮົາພຽງແຕ່ສົນໃຈໃນຄວາມຄິດເຫັນຂອງທ່ານ.

ກະລຸນາເລືອກເພດຂອງທ່ານ.

- ☐ ຊາຍ
- ☐ ຍິງ
- ☐ ເພດທາງເລືອກ
- ☐ ບໍ່ຕ້ອງການບອກ

ຕໍ່ໄປນີ້ແມ່ນປະໂຫຍກທີ່ຊີ້ບອກຄຸນລັກສະນະຂອງຄົນແຕ່ລະປະເພດ. ກະລຸນາອ່ານແຕ່ລະປະໂຫຍກ ແລະ ໃຫ້ເລືອກວ່າປະໂຫຍກນັ້ນ ໆ ຄື ຫຼື ບໍ່ຄື ກັບທ່ານຫຼາຍໜ້ອຍປານໃດ.

	ບໍ່ເລືອກ	ເລືອກ	ເລືອກໜ້ອຍໆ	ເລືອກປານກາງ	ເລືອກ	ເລືອກໜ້ອຍໆ
<p>1. ການຄິດຫາໄອເດຍ ແລະ ເປັນຄົນມີຄວາມຄິດສ້າງສັນ ແມ່ນສໍາຄັນກັບລາວ. ລາວເປັນຄົນທີ່ ມັກເຮັດຫຍັງ ໃຫ້ມີເອກະລັກ</p> <p>2. ຄວາມຮັ່ງມີສໍາຄັນສໍາລັບລາວ. ລາວຕ້ອງການມີເງິນຫຼາຍ ແລະ ມີສິ່ງຂອງມີລາຄາ</p> <p>3. ລາວຄິດວ່າມັນສໍາຄັນຫຼາຍ ທີ່ທຸກຄົນ ຄວນຖືກ ປະຕິບັດຢ່າງ ເທົ່າທຽມກັນ. ລາວຄິດວ່າທຸກຄົນ ຄວນມີ ໂອກາດ ຢ່າງເທົ່າທຽມກັນ.</p> <p>4. ການສະແດງອອກເຖິງຄວາມສາມາດ ແມ່ນສໍາຄັນສໍາລັບລາວ. ລາວຕ້ອງການໃຫ້ ຄົນຍ້ອງຍໍໃນສິ່ງທີ່ລາວເຮັດ.</p> <p>5. ການອາໄສໃນສະຖານທີ່ທີ່ປອດໄພແມ່ນສໍາຄັນສໍາລັບລາວ. ລາວ ຫຼີກລ້ຽງໃນສິ່ງທີ່ເປັນອັນຕະລາຍ</p> <p>6. ລາວມັກໃນສິ່ງທີ່ແປກໃໝ່. ລາວຄິດວ່າການເຮັດສິ່ງໃໝ່ ໆ ໃນຊີວິດ ແມ່ນສໍາຄັນ.</p> <p>7. ລາວຄິດວ່າທຸກຄົນຄວນເຮັດໃນສິ່ງທີ່ຖືກບອກໃຫ້ເຮັດ. ລາວຄິດວ່າ ທຸກຄົນ ຄວນປະຕິບັດຕາມກົດລະບຽບທຸກເວລາ, ເຖິງວ່າ ບໍ່ຖືກ ຕິດຕາມ ກວດກາ.</p> <p>8. ການຟັງຄໍາຄິດເຫັນທີ່ແຕກຕ່າງ ແມ່ນສໍາຄັນສໍາລັບລາວ. ລາວ ຕ້ອງການເຂົ້າໃຈຄົນອື່ນ ເຖິງວ່າລາວຈະບໍ່ເຫັນດີ.</p> <p>9. ການເປັນຄົນຖ່ອມໂຕ ແມ່ນສໍາຄັນສໍາລັບລາວ. ລາວພະຍາຍາມ ບໍ່ຊອກຫາຄວາມສົນໃຈມາໃສ່ໂຕລາວ.</p> <p>10. ການມີຊ່ວງເວລາທີ່ດີ ແມ່ນສໍາຄັນສໍາລັບລາວ. ລາວ ມັກຕາມໃຈຕົນເອງ.</p> <p>11. ການຕັດສິນໃຈເອງ ໃນສິ່ງທີ່ລາວເຮັດ ແມ່ນສໍາຄັນສໍາລັບລາວ. ລາວມັກເປັນອິດສະຫຼະ ແລະ ບໍ່ເພິ່ງພາຄົນອື່ນ.</p>						

<p>12. ການຊ່ວຍເຫຼືອຄົນອ້ອມຂ້າງ ແມ່ນສໍາຄັນສໍາລັບລາວ. ລາວເອົາໃຈໃສ່ກັບການເປັນຢູ່ທີ່ດີຂອງເຂົາເຈົ້າ.</p> <p>13. ການປະສົບຄວາມສໍາເລັດ ແມ່ນສໍາຄັນສໍາລັບລາວ. ລາວຢາກໃຫ້ຄົນເຫັນເຖິງຄວາມສໍາເລັດຂອງລາວ.</p> <p>14. ການທີ່ລັດຖະບານໃຫ້ຄວາມສໍາຄັນກັບຄວາມປອດໄພ ແລະ ປ້ອງກັນໄພຂົ່ມຂູ່ ແມ່ນສໍາຄັນສໍາລັບລາວ. ລາວຕ້ອງການໃຫ້ປະເທດເຂັ້ມແຂງ ແລະ ສາມາດປົກປ້ອງປະຊາກອນ.</p> <p>15. ລາວຊອກຫາການພະຈົນໄພ ແລະ ມັກຄວາມສູງ. ລາວຕ້ອງການມີຊີວິດທີ່ຕື່ນເຕັ້ນ.</p> <p>16. ການປະຕິບັດຕົນຢ່າງຖືກຕ້ອງ ແມ່ນສໍາຄັນສໍາລັບລາວ. ລາວລຶກລັງງານກະທຳທີ່ຈະເຮັດໃຫ້ຄົນອື່ນເຫັນວ່າ ບໍ່ຖືກຕ້ອງ</p> <p>17. ການໄດ້ຮັບຄວາມນັບຖືແມ່ນສໍາຄັນສໍາລັບລາວ. ລາວຕ້ອງການໃຫ້ຄົນເຮັດໃນສິ່ງທີ່ລາວບອກ.</p> <p>18. ຄວາມສື່ສັດກັບໝູ່ ແມ່ນສໍາຄັນສໍາລັບລາວ. ລາວຕ້ອງການອຸທິດຕົນເອງ ກັບຄົນທີ່ຂ້ອງສະໜິດສະໜົມ</p> <p>19. ລາວມີຄວາມເຊື່ອວ່າທຸກຄົນຕ້ອງເອົາໃຈໃສ່ກັບສິ່ງແວດລ້ອມ. ການປົກປັກຮັກສາສິ່ງແວດລ້ອມ ແມ່ນສໍາຄັນສໍາລັບລາວ.</p> <p>20. ປະເພນີແມ່ນສໍາຄັນສໍາລັບລາວ. ລາວນັບຖືໃນຫຼັກການທາງສາດສະໜາ ແລະ ໃນຄອບຄົວ.</p> <p>21. ລາວຊອກຫາທຸກໂອກາດເພື່ອຄວາມມ່ວນຊື່ນ. ການເຮັດໃນສິ່ງທີ່ມີຄວາມສຸກ ແມ່ນ ສໍາຄັນສໍາລັບລາວ.</p>						
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## ພາກທີ 2: ຄວາມຄິດຂອງທ່ານຕໍ່ກັບສິ່ງແວດລ້ອມ.

ພວກເຮົາສົນໃຈໃນຄວາມຄິດຂອງທ່ານຕໍ່ກັບສິ່ງແວດລ້ອມ. ກະລຸນາເລືອກວ່າທ່ານເຫັນດີ ຫຼື ບໍ່ເຫັນດີ ກັບປະໂຫຍກດັ່ງລຸ່ມນີ້. ພວກເຮົາສົນໃຈໃນຄວາມຄິດເຫັນຂອງທ່ານເທົ່ານັ້ນ ສະນັ້ນ ມັນບໍ່ມີຄໍາຕອບ ທີ່ຖືກ ຫຼື ຜິດ.

	ບໍ່ເສຍໃຈ ບໍ່ເສຍໃຈ	ບໍ່ເສຍໃຈ ບໍ່ເສຍໃຈ	ບໍ່ເສຍໃຈ ບໍ່ເສຍໃຈ	ບໍ່ເສຍໃຈ ບໍ່ເສຍໃຈ	ບໍ່ເສຍໃຈ ບໍ່ເສຍໃຈ
<ol style="list-style-type: none"> <li>1. ພວກເຮົາກຳລັງກ້າວເຂົ້າສູ່ຂີດຈຳກັດຂອງໂລກ ທີ່ສາມາດຮອງຮັບຈຳນວນປະຊາກອນທີ່ເພີ່ມຂຶ້ນ.</li> <li>2. ມະນຸດມີສິດໃນການປ່ຽນແປງທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ ໃຫ້ເປັນໄປຕາມຄວາມຕ້ອງການ</li> <li>3. ຜົນຮ້າຍທີ່ຕາມມາມັກເກີດຂຶ້ນເມື່ອເມື່ອມະນຸດ ເຂົ້າແຊກແຊງທຳມະຊາດ</li> <li>4. ຄວາມສະຫງວນຂອງມະນຸດ ຈະສາມາດເຮັດໃຫ້ໂລກມະນຸດ ຢູ່ລອດຕໍ່ໄປໄດ້</li> <li>5. ມະນຸດກຳລັງທຳຮ້າຍສິ່ງແວດລ້ອມຢ່າງໜັກໜ່ວງ</li> <li>6. ໂລກມະນຸດ ມີຊັບພະຍາກອນທຳມະຊາດຢ່າງພຽງພໍ ຖ້າຫາກວ່າຄົນເຮົາຮຽນຮູ້ທີ່ຈະນຳໃຊ້ມັນ</li> <li>7. ພຶດ ແລະ ສັດ ມີສິດໃນການອາໄສຢູ່ໃນໂລກ ເທົ່າກັບມະນຸດ</li> <li>8. ຄວາມສົມດຸນຂອງທຳມະຊາດ ແມ່ນເຂັ້ມແຂງພໍໃນການຮັບມືກັບ ຜົນກະທົບຈາກ ບັນດາປະເທດອຸດສະຫະກຳ</li> <li>9. ມະນຸດ ຍັງຕ້ອງຂຶ້ນຢູ່ກັບກົດເກນຂອງທຳມະຊາດ (law of nature) ເຖິງແມ່ນວ່າເຮົາຈະມີຄວາມສາມາດພິເສດ</li> <li>10. ວິກິດການທາງດ້ານນິເວດວິທະຍາ (ecological crisis) ທີ່ມະນຸດກຳລັງປະເຊີນຢູ່ ແມ່ນເປັນຄຳເວົ້າທີ່ເກີນຈິງ</li> <li>11. ໂລກມະນຸດ ເປັນຄືກັບຍານອາວະກາດ ທີ່ມີພື້ນທີ່ຈຳກັດ</li> <li>12. ມະນຸດ ແມ່ນຖືກກຳນົດມາເພື່ອປົກຄອງທຳມະຊາດ</li> <li>13. ຄວາມສົມດຸນຂອງທຳມະຊາດ ແມ່ນບອບບາງ ແລະ ຖືກລົບກວນໄດ້ງ່າຍ</li> <li>14. ມະນຸດ ຈະສາມາດຮຽນຮູ້ໃນການຄວບຄຸມທຳມະຊາດ</li> <li>15. ຖ້າຫາກວ່າ ທຸກຄົນຍັງດຳລົງຊີວິດແບບທີ່ເປັນຢູ່ ເຮົາຈະພົບກັບວິກິດການທາງດ້ານສິ່ງແວດລ້ອມທີ່ຍິ່ງໃຫຍ່</li> <li>16. ພາວະໂລກຮ້ອນ ແມ່ນບັນຫາຂອງສັງຄົມ</li> <li>17. ການປະຢັດພະລັງງານ ຊ່ວຍຫຼຸດຜ່ອນ ຜົນກະທົບ ຂອງ ພາວະໂລກຮ້ອນ</li> <li>18. ການຫຼຸດລົງຂອງແຫຼ່ງພະລັງງານ ແມ່ນບັນຫາຂອງສັງຄົມ</li> <li>19. ຂ້ອຍຮູ້ສຶກມີຄວາມຮັບຜິດຊອບຕໍ່ກັບບັນຫາກ່ຽວກັບພະລັງງານ</li> </ol>					

20. ຂ້ອຍຄວາມຮູ້ສຶກ ມີຄວາມຮັບຜິດຊອບ ຕໍ່ກັບການຫຼຸດລົງ ຂອງແຫຼ່ງພະລັງງານ 21. ຂ້ອຍມີຄວາມຮູ້ສຶກຮັບຜິດຊອບຕໍ່ກັບພາວະໂລກຮ້ອນ 22. ຂ້ອຍມີຄວາມຮູ້ສຶກສ່ວນໂຕວ່າ ຕ້ອງປະຢັດພະລັງງານ ໃຫ້ຫຼາຍທີ່ສຸດ 23. ຂ້ອຍຮູ້ສຶກວ່າລາວມີພັນທະທີ່ຕ້ອງປະຢັດພະລັງງານ, ໂດຍບໍ່ສົນໃຈວ່າຄົນອື່ນປະຕິບັດແນວໃດ 24. ບຸກຄົນຄືກັບຂ້ອຍ ຄວນເຮັດທຸກຢ່າງ ເພື່ອຫຼຸດຜ່ອນ ການນຳໃຊ້ ພະລັງງານ 25. ຂ້ອຍຮູ້ສຶກຜິດໃນເວລາທີ່ລາວນຳໃຊ້ພະລັງງານຢ່າງສິ້ນເປືອງ 26. ຖ້າວ່າຂ້ອງຕ້ອງການຊື້ເຄື່ອງໃຊ້ໄຟຟ້າໃຫມ່ (ເຊັ່ນ ຕູ້ເຢັນ) ຂ້ອຍ ຮູ້ສຶກວ່າຂ້ອຍມີພັນທະໃນການຊື້ອັນທີ່ປະຢັດພະລັງງານ 27. ຂ້ອຍຮູ້ສຶກມີພັນທະທີ່ຈະ ຄິດເຖິງທຳມະຊາດ ແລະ ສິ່ງແວດລ້ອມ ໃນທຸກ ໆ ພຶດຕິກຳໃນແຕ່ລະມື້ຂອງຂ້ອຍ					
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### ພາກທີ 3: ກິດຈະກຳທີ່ປະຢັດພະລັງງານ

ປະໂຫຍກດັ່ງລຸ່ມນີ້ ແມ່ນ ກິດຈະກຳທີ່ທ່ານສາມາດປະຕິບັດ ເພື່ອປະຢັດພະລັງງານໃນຄົວເຮືອນ. ກະລຸນາ ລະບຸວ່າທ່ານມີຄວາມຕ້ອງການທີ່ຈະເຮັດກິດຈະກຳລຸ່ມນີ້ ຫຼາຍໜ້ອຍປານໃດ.

	ບໍ່ສ່ຽງ ໄພ	ບໍ່ສ່ຽງ ໄພ	ບໍ່ສ່ຽງ ໄພ	ສ່ຽງ ໄພ	ສ່ຽງ ໄພ	ສ່ຽງ ໄພ
1. ນຳໃຊ້ ເຄື່ອງໃຊ້ໄຟຟ້າທີ່ປະຢັດພະລັງງານ (ເຊັ່ນ ຕູ້ເຢັນ, ຈັກຊັກເຄື່ອງ, ແອບັບອາກາດ, ເຄື່ອງເຮັດນ້ຳຮ້ອນ, ຫຼອດໄຟ) 2. ຕິດຕັ້ງແຜງກັນຄວາມຮ້ອນເທິງເພດານ 3. ຖອດປັກໄຟໃນເວລາທີ່ບໍ່ນຳໃຊ້. 4. ມອດໄຟໃນຫ້ອງທີ່ບໍ່ໄດ້ນຳໃຊ້ 5. ບັບອຸນນະພູມແອ ໃນລະຫວ່າງ 23-25 ອົງສາ 6. ຫຼຸດຜ່ອນເວລາໃນການອາບນ້ຳເພື່ອປະຫຍັດໄຟຟ້າ						

7. ຫຼຸດຜ່ອນການຊື້ເຄື່ອງໃຊ້ໄຟຟ້າ						
8. ຫຼຸດຜ່ອນການນຳໃຊ້ອຸປະກອນໄຟຟ້າ (ເຊັ່ນ ໂທລະທັດ, ຄອມພິວເຕີ້)						
9. ຫຼຸດຜ່ອນການນຳໃຊ້ແອບັບອາກາດ						
10. ນຳໃຊ້ເຄື່ອງປັບອາກາດແຕ່ຫ້ອງດຽວໃນເຮືອນ (ຫຼືກລັງງານປັບອາກາດຫຼາຍຫ້ອງ)						
11. ນຳໃຊ້ສະຖານທີ່ທີ່ເປີດແອໃນສາທາລະນະ ເຊັ່ນ ຮ້ານກາເຟ ເພື່ອຫຼຸດຜ່ອນການເປີດແອຢູ່ເຮືອນ						
12. ເປີດປ່ອງຢ້ຽມ ເພື່ອຄວາມເຢັນ						

ກະລຸນາ ເລືອກວ່າ ເຫດຜົນດັ່ງລຸ່ມນີ້ ສຳຄັນສຳລັບທ່ານໃນການປະຢັດພະລັງງານໃນຄົວເຮືອນ ຫຼາຍໜ້ອຍປານໃດ.  
ທ່ານສາມາດບອກເຫດຜົນຂອງທ່ານເອງ ທີ່ບໍ່ໄດ້ລະບຸໃນຕາຕະລາງ.

	ບໍ່ສຳຄັນ	ສຳຄັນ ເລາະເລາະ	ບໍ່ເໝາະ	ສຳຄັນ	ສຳຄັນ ຫຼາຍທີ່ສຸດ
1. ເພື່ອປະຢັດເງິນ					
2. ເພາະວ່າມັນເປັນປະໂຫຍດຕໍ່ກັບສິ່ງແວດລ້ອມ					
3. ເພາະວ່າມັນເປັນສິ່ງທີ່ ໝູ່ເພື່ອນ ແລະ ຄອບຄົວຂອງຂ້ອຍ ກຳລັງປະຕິບັດຢູ່					
4. ເພາະວ່າມັນເປັນປະໂຫຍດຕໍ່ ສຸຂະພາບຂອງ ແລະ ຄວາມເປັນຢູ່ທີ່ດີ ຂອງຄອບຄົວຂ້ອຍ					
5. ເພາະວ່າມັນເປັນສິ່ງທີ່ຄົນອື່ນຄາດຫວັງຈາກຂ້ອຍ					
6. ເພາະວ່າມັນສິ່ງທີ່ຖືກຕ້ອງ ທີ່ຂ້ອຍຈະຕ້ອງເຮັດ					
7. ບໍ່ຮູ້/ບໍ່ມີເຫດຜົນ					
8. ເຫດຜົນອື່ນ ໆ (ກະລຸນາລະບຸ) _____					



ກະລຸນາ ເລືອກວ່າ ອຸປະສັກໃນການປະຢັດພະລັງງານໃນຄົວເຮືອນ ດັ່ງລຸ່ມນີ້ ສໍາຄັນສໍາລັບທ່ານ ຫຼາຍໜ້ອຍປານໃດ. ທ່ານສາມາດບອກອຸປະສັກຂອງທ່ານເອງ ທີ່ບໍ່ໄດ້ລະບຸໃນຕາຕະລາງ.

	ບໍ່ສໍາຄັນ	ໄມແກນເອີ້ນ	ປານໃດ	ສູງ	ສູງທີ່ສຸດ
1. ເພາະວ່າຕ້ອງລົງທຶນຫຼາຍເກີນໄປ					
2. ເພາະວ່າບໍ່ສະດວກ (ຫຼື ໃຊ້ຄວາມພະຍາຍາມຫຼາຍເກີນໄປ)					
3. ເພາະວ່າບໍ່ແມ່ນນິໄສຂອງຂ້ອຍ					
4. ເພາະວ່າຂ້ອຍບໍ່ເຫັນໝູ່ເພື່ອນ ແລະ ຄອບຄົວ ປະຕິບັດສິ່ງເລົ່ານີ້					
5. ເພາະວ່າມັນບໍ່ແມ່ນສິ່ງທີ່ຄົນອື່ນຄາດຫວັງຈາກລາວ					
6. ອຸປະສັກອື່ນ ໆ (ກະລຸນາລະບຸ) _____					

#### ພາກທີ 4: ຄໍາຖາມພື້ນຖານ.

ຄໍາຕອບຂອງທ່ານຈະບໍ່ສາມາດລະບຸຕົວຕົນຂອງທ່ານໄດ້ ແລະ ຈະຖືກເກັບເປັນຄວາມລັບ

1. ທ່ານຢູ່ໃນກຸ່ມອາຍຸໃດ?

- 18-20 ປີ
- 21-30 ປີ
- 31-40 ປີ
- 41-50 ປີ
- 51-60 ປີ
- 61-70 ປີ
- 71 ປີຂຶ້ນໄປ

2. ລາຍຮັບໂດຍປະມານຂອງຄົວເຮືອນຂອງທ່ານ (ກ່ອນເສຍພາສີ) ແມ່ນເທົ່າໃດ?

- ຕໍ່າກວ່າ 50,000,000 ກີບ
- 50,000,000 - 200,000,000 ກີບ
- 200,000,001 - 400,000,000 ກີບ
- 400,000,001 - 600,000,000 ກີບ
- 600,000,001 - 800,000,000 ກີບ

- 800,000,001 – 1,000,000,000 ກີບ
- ຫຼາຍກວ່າ 1,000,000,000 ກີບ
- ບໍ່ຕ້ອງການບອກ

3. ໃນຄົວເຮືອນຂອງທ່ານມີສະມາຊິກຈັກຄົນ (ລວມເຖິງຕົວທ່ານ)

- ຕ່ຳກວ່າ 2 ຄົນ
- 2 - 4 ຄົນ
- 4 - 6 ຄົນ
- ຫຼາຍກວ່າ 6 ຄົນ

4. ແມ່ນໃຜອາໄສຢູ່ໃນຄົວເຮືອນດຽວກັນກັບທ່ານ?

- ຜົວ ຫຼື ເມຍຂອງຂ້ອຍ
- ແຟນ ຫຼື ຄູ່ຊີວິດຂອງຂ້ອຍ
- ພໍ່ ແລະ/ຫຼື ແມ່ຂອງຂ້ອຍ
- ລູກຊາຍ ແລະ/ຫຼື ລູກສາວຂອງຂ້ອຍ
- ອ້າຍ ແລະ/ຫຼື ເອື້ອຍຂອງຂ້ອຍ
- ໝູ່ຂອງລາວ
- ອື່ນ ໆ (ເຊັ່ນ ແມ່ເຖົ້າຂອງຂ້ອຍ, ແມ່ຍ່າຂອງຂ້ອຍ) \_\_\_\_\_

5. ການສຶກສາສູງສຸດຂອງທ່ານແມ່ນຂັ້ນໃດ?

- ມັດຖະຍົມສຶກສາ
- ອຸດົມສຶກສາ
- ວິຊາຊີບ
- ປະລິນຍາຕີ
- ປະລິນຍາໂທ
- ປະລິນຍາເອກ

6. ສະຖານະການຄອບຄອງເຮືອນຂອງທ່ານ. ທ່ານກຳລັງເຊົ່າ ຫຼື ເປັນເຈົ້າຂອງ ເຮືອນທີ່ທ່ານອາໄສຢູ່?

- ເຊົ່າ
- ເປັນເຈົ້າຂອງໂດຍບໍ່ມີສິນເຊື້ອຄ້າງຢູ່
- ເປັນເຈົ້າຂອງໂດຍມີສິນເຊື້ອຄ້າງຢູ່
- ອື່ນ ໆ (ເຊັ່ນ: ພໍ່ແມ່ຂອງທ່ານເປັນເຈົ້າຂອງ) \_\_\_\_\_

7. ຄ່າໄຟ້ຟ້າລາຍເດືອນ ໂດຍສະເລ່ຍຂອງຄົວເຮືອນຂອງທ່ານ ໃນຊ່ວງລະດູແລ້ງ (ໜາວ) ແມ່ນເທົ່າໃດ?

- ຕ່ຳກວ່າ 200,000 ກີບ
- 210,000 – 400,000 ກີບ
- 410,000 – 600,000 ກີບ
- 610,000 – 800,000 ກີບ
- 810,000 – 1,000,000 ກີບ
- 1,010,000 - 1,200,000 ກີບ
- 1,210,000 - 1,400,000 ກີບ
- 1,410,000- 1,600,000 ກີບ
- ຫຼາຍກວ່າ 1,600,000 ກີບ
- ບໍ່ຮູ້

8. ຄ່າໄຟ້ຟ້າລາຍເດືອນ ໂດຍສະເລ່ຍຂອງຄົວເຮືອນຂອງທ່ານ ໃນຊ່ວງລະດູຝົນ (ຮ້ອນ) ແມ່ນເທົ່າໃດ?

- ຕ່ຳກວ່າ 200,000 ກີບ
- 210,000 – 400,000 ກີບ
- 410,000 – 600,000 ກີບ
- 610,000 – 800,000 ກີບ
- 810,000 – 1,000,000 ກີບ
- 1,010,000 - 1,200,000 ກີບ
- 1,210,000 - 1,400,000 ກີບ
- 1,410,000- 1,600,000 ກີບ
- 1,610,000 – 1,800,000 ກີບ
- 1,810,000 – 2,000,000 ກີບ
- ຫຼາຍກວ່າ 2,000,000
- ບໍ່ຮູ້

ຖ້າຫາກທ່ານມີຄຳເຫັນເພີ່ມເຕີມ ກ່ຽວກັບຫົວຂໍ້ນີ້, ທ່ານສາມາດລະບຸໄດ້ໃນລຸ່ມນີ້

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ຖ້າທ່ານຕ້ອງການຮັບຮູ້ກ່ຽວກັບຜົນໄດ້ຮັບຂອງບົດສຳຫຼວດນີ້ ທ່ານສາມາດເຂົ້າໄປເບິ່ງໃນເຟສບຸກເຜດ “Energy Conservation Behaviour in Laos”. ຜົນໄດ້ຮັບຂອງບົດສຳຫຼວດຈະຖືກຕີພິມໃນເຜດ ໃນລະຫວ່າງຂອງທ້າຍປີ.

ຖ້າທ່ານຕ້ອງການເຂົ້າຮ່ວມໃນການຈັບລາງວັນ, ກະລຸນາລະບຸອີເມວຂອງທ່ານລຸ່ມນີ້ (ໜຶ່ງຄົນຕໍ່ໜຶ່ງລາງວັນເທົ່ານັ້ນ). ການຈັບລາງວັນຈະຈັດຂຶ້ນໃນທ້າຍເດືອນ ຕຸລາ 2022\_\_\_\_\_

**ຂອບໃຈສຳລັບການປະກອບສ່ວນຂອງທ່ານ  
ໃນການເຮັດບົດສຳຫຼວດສະບັບນີ້!**