



UNIVERSITI PUTRA MALAYSIA

***FACTORS INFLUENCING INTENT-ORIENTED BEHAVIOUR OF
TRANSPORT-ENERGY SAVING MEASURES AMONG PERSONNEL OF
DEWAN BANDARAYA KUALA LUMPUR***

CHAN SHIAU CIN

FEM 2014 37



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KUALA LUMPUR**

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**MASTER OF SCIENCE
UNIVERSITI PUTRA MALAYSIA
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By

CHAN SHIAU CIN

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfillment of the Requirements for the Degree of Master of Science**

June 2014

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirement for the degree of Master of Science

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June 2014

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The major combustion of fossil fuels that releases large volumes of carbon dioxide into the atmosphere have contribute to climate change. To reduce the negative effects of climate change, one should first reduce his or her energy consumption. Energy conservation can be achieved through adoption of technological and behavioural changes. The main purpose of the study was to determine factors that affect intent-oriented behaviour of transport energy-saving measures. The factors investigated were perceived quality of train service, attitude towards energy conservation, perceived efficacy, knowledge of causes and impacts of climate change, and personal norm. A total of 700 self-administrated questionnaires were distributed across 24 main departments and 11 branches office in DBKL using quota sampling method. The final sample for the present study consisted of 403 DBKL personnel. Results indicated that the intent-oriented behaviour of transport energy-saving measures among the DBKL personnel was at moderate level. Likewise, the respondents' possessed moderate to high levels on perceived quality of train service, attitude towards energy conservation, perceived efficacy, knowledge of causes and impacts of climate change and personal norm. Pearson correlation showed that there was no significant relationship between perceived quality of train service and the intent-oriented behaviour of transport energy-saving measures. Attitude towards energy conservation ($r = 0.314, p \leq 0.001$), perceived efficacy ($r = 0.432, p \leq 0.001$), knowledge of causes and impacts of climate change ($r = 0.162, p \leq 0.01$), and personal norm ($r = 0.255, p \leq 0.001$) were found to have significant positive relationships with the intent-oriented behaviour of transport energy-saving measures. The regression model explained 21% of the variance in the intent-oriented behaviour of transport energy-saving measures. Perceived efficacy, attitude towards energy conservation and personal norm are the predictors that were found to significantly affect the intent-oriented behaviour of transport energy-saving measures. On the whole, intent-oriented behaviour was shown to be strongly related to psychological variables, whereas contextual or external variable was not influential. Several implications were drawn from the present study, and these could be utilized by policy makers to plan appropriate programmes and implement policies for transport-related energy conservation.

Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Master Sains

FAKTOR-FAKTOR YANG MEMPENGARUHI KECENDERUNGAN PERILAKU TERHADAP PENJIMATAN TENAGA DALAM PENGANGKUTAN DALAM KALANGAN PEGAWAI DEWAN BANDARAYA KUALA LUMPUR

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Pembakaran bahan api fosil yang membebaskan sejumlah karbon dioksida yang banyak ke atmosfera telah mendorong perubahan iklim. Bagi mengurangkan kesan negatif terhadap perubahan iklim, seseorang sepatutnya mengurangkan penggunaan tenaga terlebih dahulu. Pemuliharaan tenaga boleh dicapai melalui penerimaan teknologi dan perubahan tingkah laku. Kajian ini dijalankan untuk menentukan faktor-faktor yang mempengaruhi kecenderungan perilaku terhadap penjimatan tenaga dalam pengangkutan. Faktor-faktor yang ingin dikenal pasti ialah tanggapan kualiti perkhidmatan tren, sikap pemuliharaan tenaga, tanggapan efikasi, pengetahuan punca dan kesan perubahan iklim, dan norma peribadi. Sejumlah 700 borang soal selidik yang menggunakan cara kendalian sendiri telah diedarkan kepada 24 jabatan utama dan 11 pejabat cawangan di DBKL dengan kaedah persampelan kuota. Terdapat 403 kakitangan DBKL yang mengambil bahagian dalam kajian ini. Dapatan kajian ini mengindikasikan bahawa kecenderungan perilaku terhadap penjimatan tenaga dalam pengangkutan dalam kalangan kakitangan DBKL adalah pada paras yang sederhana. Begitu juga, responden mempunyai tahap sederhana ke tahap yang tinggi dalam tanggapan kualiti perkhidmatan tren, sikap pemuliharaan tenaga, tanggapan efikasi, pengetahuan punca dan kesan perubahan iklim, dan norma peribadi. Pearson kolerasi menunjukkan bahawa tiada perhubungan yang signifikan wujud di antara tanggapan kualiti perkhidmatan tren dan kecenderungan perilaku terhadap penjimatan tenaga dalam pengangkutan. Sikap pemuliharaan tenaga ($r = 0.314$, $p \leq 0.001$), tanggapan efikasi ($r = 0.432$, $p \leq 0.001$), pengetahuan punca dan kesan perubahan iklim ($r = 0.162$, $p \leq 0.01$) dan norma peribadi ($r = 0.255$, $p \leq 0.001$) didapati mempunyai perhubungan positif yang signifikan dengan kecenderungan perilaku terhadap penjimatan tenaga dalam pengangkutan. Model regresi menjelaskan 21% variasi dalam kecenderungan perilaku terhadap penjimatan tenaga dalam pengangkutan. Tanggapan efikasi, sikap pemuliharaan tenaga dan norma peribadi merupakan peramal yang nyata sekali mempengaruhi kecenderungan perilaku terhadap penjimatan tenaga dalam pengangkutan. Secara keseluruhan, kecenderungan perilaku terhadap penjimatan tenaga dalam pengangkutan adalah berkaitan dengan pembolehubah psikologi, manakala pembolehubah luar atau konteks tidak berpengaruh. Beberapa implikasi telah dicadangkan berdasarkan dapatan kajian ini yang mana ini boleh digunapakai dan dirujuk oleh penggubal dasar bagi merancang program-program yang sesuai dan melaksanakan dasar-dasar untuk pemuliharaan tenaga yang berkaitan dengan pengangkutan.

ACKNOWLEDGEMENTS

I would like to express my gratitude to all who have given me tremendous support in accomplishing the study entitled “Factors influencing intent-oriented behaviour of transport-energy saving measures among personnel of Dewan Bandaraya Kuala Lumpur”. The process was not easy but it was definitely a contented experience to me.

First, special thanks go to the Chairperson of my supervisory committee, Associate Professor Dr. Aini Mat Said, for her invaluable guidance and patience throughout the entire process of the study. I am particularly grateful for her tremendous effort and commitment, and she has also helped to transform this vague idea into an organized study, given me a lot of advice and shared her knowledge and invaluable opinions, for which I will greatly appreciate all the time.

My sincere thanks and appreciations also go to Dr. Syuhaily Osman for giving me the most invaluable advice in statistical analyses. I am forever grateful to Mr. Steven Tan Kim Bock for his assistance in data collection at DBKL. Last but certainly not least, I am really grateful to my beloved parents and family members for their understanding, patience, and support during the entire period of my studies.

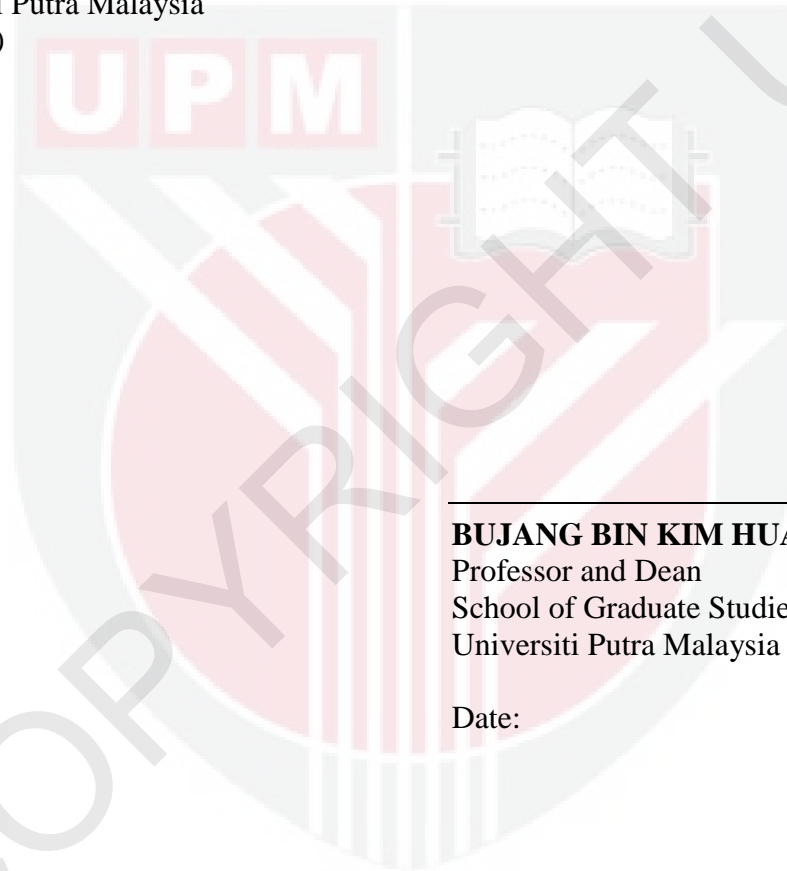
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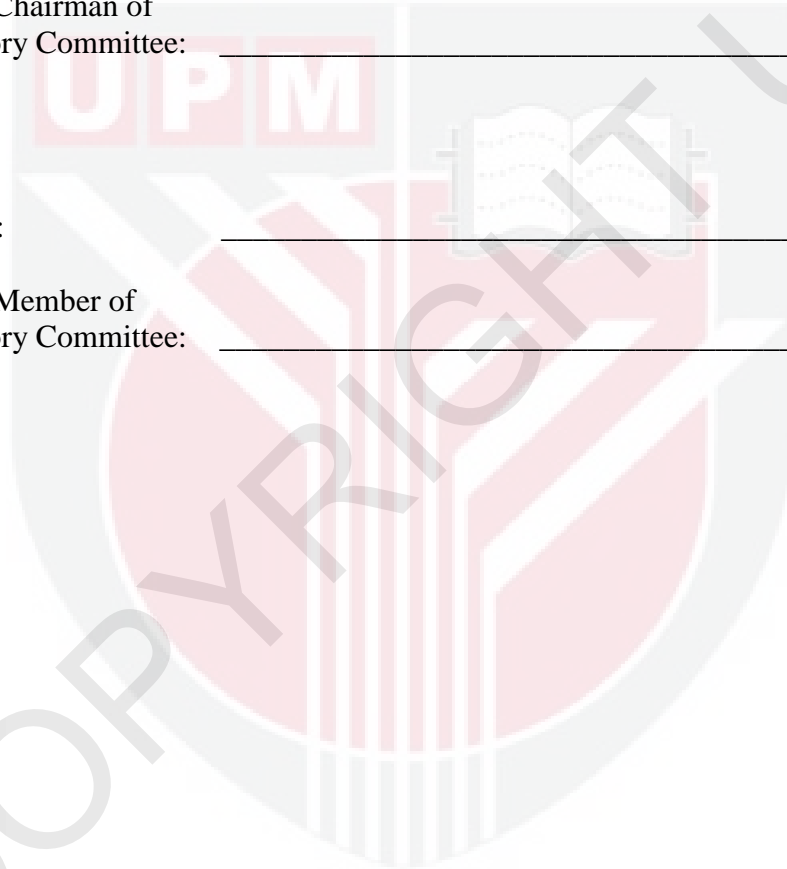


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LIST OF ABBREVIATIONS

ABC	Attitude Behaviour Context
AC	Awareness of consequences
APEC	Asia-Pacific Economic Cooperation
AR	Ascription of responsibility
°C	Degree Celsius
CH ₄	methane
CO ₂	carbon dioxide
CPPS	Centre for Public Policy Studies
DfT	Department for Transport
DOE	Department of Environment Malaysia
EPU	Economic Planning Unit
GDP	gross domestic product
Gg	giga gram
GHG	greenhouse gas
HFCs	hydroflourocarbons
IEA	International Energy Agency
INC	Initial National Communication
IPCC	Intergovernmental Panel on Climate Change
Ktoe	kilo tonne of oil equivalent
MAA	Malaysian Automotive Association
MEGTW	Ministry of Energy, Green Technology and Water
MMD	Malaysian Meteorological Department
MOSTE	Ministry of Science, Technology and the Environment
MRT	Mass Rapid Transit
NAM	Norm Activation Model
N ₂ O	nitrous oxide
NC2	Second National Communication
NEB	National Energy Balance
NEEMP	National Energy Efficiency Master Plan
NEP	New Environmental Paradigm
PBC	Perceived Behavioural Control
PEMANDU	Performance Management and Delivery Unit
PFCs	perfluorocarbons
PN	Personal Norm
SCT	Social Cognitive Theory
SDT	Self-Determination Theory
SF ₆	sulphur hexafluoride
SN	Social Norm
TAM	Technology Acceptance Model
TDM	Transportation Demand Management
TPB	Theory of Planned Behaviour
TPES	Total Primary Energy Supply
TRA	Theory of Reasoned Action
UNDP	United Nations Development Programme
UNFCCC	United Nation Framework Convention on Climate Change
UNICEF	Unite For Children
UNSD	United Nation Statistics Division
VBN	Value Belief Norm

CHAPTER 1

INTRODUCTION

1.0 Background of the Study

Over the past few decades, energy conservation has been an area of study interest within applied social and environmental psychological research. In the 1970s, the oil crisis and an imminent energy shortage was raising concern about a possible depletion of fossil fuels (Abrahamse, Steg, Vlek, and Rothengatter, 2005; Poortinga, Steg, Vlek, and Wiersma, 2003). From the late 1980s and early 1990s, the industrial revolution has involved a large-scale application of fossil fuels for industrial uses. Fossil fuels such as coal, oil and natural gas supply most of the energy needed to run vehicles, generate electricity for industries and households. Therefore, large amount of man-made greenhouse gases (GHGs) was emitted into the atmosphere. The negative consequences of fossil energy use for the environment, in particular climate change, became the principal reason for studying energy conservation nowadays (Poortinga *et al.*, 2003; Gardner and Stern, 2002).

Energy is undeniably crucial to all aspects of development. The production and consumption of energy have various environmental implications (Quadrelli and Peterson, 2007). According to International Energy Agency (IEA, 2009a), energy consumption represents the largest source of emissions, which accounts for over 80% of the global anthropogenic GHGs. The sources of energy can be divided into two groups, namely, renewable energy and non-renewable energy. Renewable energy (e.g., solar, biomass, hydro-electric, geothermal, wind, tidal, wave etc.) comes from natural resources and it replenishes naturally, whereas non-renewable energy (e.g., nuclear, fossil fuels such as coal, petroleum, and natural gas) is an energy source that cannot be renewed and regenerated in a short period of time. The worldwide development is primarily relying on non-renewable energy, commonly referred to as fossil fuels (IEA, 2009a). In fact, energy dominated by direct combustion of fossil fuels has been highlighted as the largest single contributor of carbon dioxide (CO₂) emissions (IEA, 2009a; IPCC, 2007a).

An on-going increase of the world's population and a rapid economic growth are the major driving forces behind the rising energy demand which increases the amount of the present GHGs emissions (IPCC, 2007a). According to the Human Development Report by United Nations Development Programme (UNDP, 2009a), the total population in Malaysia had grown from 18.1 million to 26.6 million (1990-2007). Meanwhile, the annual growth rate of Malaysia's gross domestic product (GDP) per capita at constant prices was 3.4% (1990-2007). Correspondingly, the final energy demand of Malaysia grew by an average of 7.5% per annum from 1990 to 2007 (NEB, 2009). This figure contributed to a comparable amount of CO₂ emissions in

Malaysia, which accounted for an average of 7.3% per annum increase in the same period (IEA, 2009a).

It is important to highlight the fact that Malaysia's energy demand was dominated by two largest segments, namely, the transport and industrial sectors (EPU, 2006). Altogether, the two sectors consumed nearly 80% of the total final energy demand under the Eighth and Ninth Malaysia Plan periods (2000-2010). Both petrol and diesel are the types of energy that are widely used by the transport sector, whereas, gas and electricity are the main forms of energy consumed by the industrial sector (EPU, 2010a). As indicated earlier, the transport sector (40.6%) was the largest energy user in 2000. In addition, CO₂ emissions (31%) from transportation were also indicated to be the highest compared to those of the other sectors (Azman, Siti Indati, Radin Diana, and Komathi, 2006). However, the data showed that the total final energy use by the industrial sector (42.6%) had surpassed the transport sector at 36.5% in 2008 (EPU, 2010a). As the transportation systems in Malaysia are still predominately relying on petroleum products (fuel, gas, etc.), the transport sector is expected to remain as one of the major energy consumers and emitters of GHGs in the Tenth Malaysia Plan's period (2011-2015).

Transportation is an essential precondition for a country's development and improvement of people's quality of life (Masjuki, Mohd Rehan, and Mahlia Indra, 2005). The modes of transportation in Malaysia are classified into four main types, namely, road, rail, maritime, and aviation. According to World Bank (2010), road transport represents 19% of the total energy consumption in Malaysia. In other words, road transport consumed half (52%) of the total transport energy demand in 2008. The large use of energy by road transport was attributed to a high ownership and usage of private vehicles (APEC, 2011; Saqr and Musa, 2011). This is particularly due to the fact that public transportation infrastructure in Malaysia has not been well developed to connect the sub-urban areas with the city centres (Saqr and Musa, 2011). As a consequence, the heavy reliance on private vehicles has contributed to the large amount of GHGs emissions in the transport sector.

Since the environmental problem caused by energy is rooted from human behaviour, changes in human attitudes and behaviours are believed to be necessary in order to reduce GHGs emissions. Mitigation effort has dominated the international policy regime by the fact that it takes the root cause into account (Lambrou and Piana, 2006). Some examples of mitigation activities include the use of energy efficient devices and modification of the current patterns of energy production and consumption. It appears that behavioural change is unlikely the sole answer to the environmental problems related to energy use; it must go along with technological change to achieve a balance in the GHGs emissions (Aitken, 2009; Chapman, 2007). Mitigation commitments which serve as quantitative agreements for the countries to reduce GHGs emissions are also crucial to achieving carbon neutrality. As a developing country, Malaysia has agreed to a voluntary reduction of up to 40% by the year 2020 compared to the levels outlined in 2005, subject to assistance from

developed countries in terms of technology and adequate financing particularly on energy (United Nations, 2009).

1.1 Statement of the Problem

Human beings, who have been trusted upon the fossil fuels such as coal, oil and gas in order to meet the energy needs for ages, are now facing with the challenges of climate change. There is a general consensus among scientists around the world that fossil fuels usage, which involve releases of large amount of GHGs (especially CO₂) into the atmosphere, have been caused a shift in the climate system. Among other, the combustion of fossil fuels in power generation, industrial, transport, residential, and agriculture sectors has contributed huge emissions of CO₂ from these activities. In this regard, the high fossil fuel use, particularly by power generation and the transport sector, is certainly going to significantly influence the trends in the global atmospheric CO₂ concentration.

Transportation is one of the major human activities that presently rely almost entirely on petroleum oil, a type of fossil fuel that cannot be renewed and regenerated. Fossil fuels such as oil, coal and gas provide 82% of the world's energy requirement and have been identified as the largest single contributor to increase CO₂ emissions (IPCC, 2007a). The data showed that a significant amount of total CO₂ emitted results from direct combustion of transport fuels. For example, the report by International Energy Agency (IEA, 2009b) showed that transport accounts for about 23% of energy-related CO₂ emissions and it was predicted to grow by 45% in 2030. Transport therefore constitutes an important target sector for energy conservation. Among the modes of transport, road transport is the largest user of energy in all countries (IEA, 2009b) including Malaysia where it accounts for almost 31% of the CO₂ emissions (Azman *et al.*, 2006).

Statistics from Malaysian Road Transport Department (JPJ, 2011) indicate that approximately 20 million motor vehicles plied Malaysian roads at the end of 2010, with passenger cars and motorcycles took up 9.1 million (46%) and 9.4 million motor vehicles (47%), respectively. Private motor vehicle ownership has been steadily increasing yearly in the country. It was reported that there was an increase of 10.53% in passenger cars sales in 2010 (MAA, 2011). This increase consequently affects energy use and ultimately contributes to the rise in CO₂ emissions. Malaysia is the 26th largest source of GHGs emitter in the world, a position that places it within the ranks of industrialized nations (UNSD, 2010). CO₂ emission of Malaysia is relatively high compared to the world average and other Southeast Asian countries. The challenge now is how to cater for the rising demand of transportation needs while at the same time reducing the impacts of transport on the environment.

Given the rise in transport ownership and usage, it appears that a great number of people are less likely to shift away from their current mode towards more sustainable modes, especially public transport. Moreover, some of the studies have shown that people are more willing to adopt domestic energy conservation and recycling than to make changes in their travelling patterns to save energy (DfT, 2009; Whitmarsh, 2009; Patchen, 2006). In fact, why would some people be willing to take certain actions to control or reduce CO₂ emissions while many others are doing actions or things that further worsen this matter? The answer to this question lies in a wide variety of factors that could promote or inhibit different pro-environmental behaviours. These include personal capabilities (such as knowledge and skills), external or contextual forces (including social, economic, institutional, and political factors), attitudinal factors (including norms, beliefs, and values), and habit or routine (Stern, 2000).

It is also noticed that intention is one of the factors cause of pro-environmental behaviours. It often serves to mediate the association of all other psychosocial variables with pro-environmental behaviour (Ajzen, 1991). Without intention, pro-environmental actions most frequently will not be carried out due to the fact that psychosocial variables which are rarely and directly connected to actual behaviour (Anable, Lane, and Kelay, 2006). Thus, the predominant focus in the current study has been on intention. A previous study has shown that behavioural intention on energy-savings is critically dependent upon attitude and perceived behavioural control (Abrahamse and Steg, 2009). Studies have also shown that knowledge is a powerful predictor of behavioural intention (Bord, O'Connor, and Fisher, 2000), and those who perceive responsibility for tackling GHGs emissions are the ones who are more willing to reduce energy use (Whitmarsh, 2009). In addition, behavioural intention on energy-saving is also influenced by the existence of transport infrastructure; those who have positive views about the quality of public transport are much more likely to use it (Whitmarsh, 2009). Since the existing literatures have proven the significant relationships between these factors and behavioural intention, they are the key factors chosen for this study.

1.2 Research Questions

The present study attempts to answer following research questions:

1. Are DBKL personnel willing to make changes in their transport use of energy, in particular adopt specific technological devices or behavioural change for transport energy-saving?
2. Are there any significant positive relationships between external factor (perceived quality of train service) and internal factors (attitude towards energy conservation, perceived efficacy, knowledge of causes and impacts of climate change, personal norm) with DBKL personnel's intent-oriented behaviour of transport energy-saving measures?

3. What are the significant factors (perceived quality of train service, attitude towards energy conservation, perceived efficacy, knowledge of causes and impacts of climate change, personal norm) influencing DBKL personnel's intent-oriented behaviour of transport energy-saving measures?

1.3 Objectives of the Study

1.3.1 General Objective

The aim of this study was to determine the factors influencing intent-oriented behaviour of transport energy-saving measures among the DBKL personnel in Kuala Lumpur, Malaysia.

1.3.2 Specific Objectives

In more specific, this study was carried out:

1. To gauge DBKL personnel's intent-oriented behaviour of transport energy-saving measures.
2. To gauge DBKL personnel's perceived quality of train service (external factor) as a mean of transport energy-saving measures.
3. To gauge DBKL personnel's attitude towards energy conservation, perceived efficacy, knowledge of causes and impacts of climate change, personal norm (internal factors).
4. To examine the relationship between external factor (perceived quality of train service) and internal factors (attitude towards energy conservation, perceived efficacy, knowledge of causes and impacts of climate change, personal norm) with DBKL personnel's intent-oriented behaviour of transport energy-saving measures.
5. To examine whether perceived quality of train service, attitude towards energy conservation, perceived efficacy, knowledge of causes and impacts of climate change, and personal norm are significant predictors of the DBKL personnel's intent-oriented behaviour of transport energy-saving measures.

1.4 Hypothesis

The following hypotheses were postulated in this study:

- Ho1: There is no significant relationship between perceived quality of train service and DBKL personnel's intent-oriented behaviour of transport energy-saving measures.
- Ho2: There is no significant relationship between the attitude towards energy conservation and DBKL personnel's intent-oriented behaviour of transport energy-saving measures.
- Ho3: There is no significant relationship between perceived efficacy and DBKL personnel's intent-oriented behaviour of transport energy-saving measures.
- Ho4: There is no significant relationship between knowledge of causes and impacts of climate change and DBKL personnel's intent-oriented behaviour of transport energy-saving measures.
- Ho5: There is no significant relationship between personal norm and DBKL personnel's intent-oriented behaviour of transport energy-saving measures.
- Ho6: Perceived quality of train service, attitude towards energy conservation, perceived efficacy, knowledge of causes and impacts of climate change, and personal norm are not significant predictors of the intent-oriented behaviour of transport energy-saving measures.

1.5 Significance of the Study

On the theoretical aspect, this study was important because it integrated in a single study both the beliefs and moral theories to explain the intent-oriented behaviour of transport energy-saving measures. Apart from this, this study is important as it investigated the willingness of the DBKL personnel to make changes in their transport use of energy, based on adopting of specific technological devices or behavioural change. More importantly, the study on DBKL personnel's intent-oriented behaviour of transport energy-saving measures is important because so far the findings on this particular construct have been based on the researches conducted in western countries and no extensive study has particularly been conducted to determine the personnel's willingness to conserve for transport energy in Malaysia.

Although there are some energy policies indirectly favour transport-related energy conservation, there is still a lack of concern for transport energy efficiency by the government of Malaysia. As reported, the National Energy Efficiency Master Plan

(NEEMP), which was finalized by the Ministry of Energy, Green Technology and Water (MEGTW), only covered three main economic sectors to stabilize energy consumption against economic growth, which included industrial, commercial, and residential sectors (APEC, 2011). However, the transport sector is not included in this energy efficiency plan. Therefore, the findings from the study can be utilized by policy makers to plan appropriate programmes and implement policies for transport-related energy conservation (such as induce purchasing or adopting energy efficient devices or green technology) in order to reduce of CO₂ emissions.

In general, the current research findings were expected to provide a key to a better understanding of the factors influencing the DBKL personnel's intent-oriented behaviour of transport energy-saving measures. Moreover, the findings of this study were anticipated to improve the understanding of how these factors could affect intent-oriented behaviour of transport energy-saving measures towards the issue. With respect to the findings, it can help policy makers to develop suitable educational programmes and transport policy measures, thereby benefit to the individuals as well as public at large. For example, the educational programmes or campaigns focus on transport-related energy conservation would expectedly enhance the knowledge of individuals or public about the environmental issue arising from energy use and heighten their awareness to equip energy efficient products as well as changing of transport behaviour for the sake of environment.

On the other hand, it can act as a reference material for future studies which focus on a similar issue. To the future researchers, this study can provide baseline information on the recent status of transport energy and its impact on the environment. In addition, this study would help future researchers to have a deeper understanding to the said intent-oriented behaviour and open in development of this study. By the study findings, they will come up with easier and powerful related factors associate with intent-oriented behaviour of transport energy saving measures. It is anticipated that this study would generate a great deal of interest among academic.

1.6 Conceptual Framework of the Study

The present study focused on determining whether DBKL personnel are willing to make changes in their transport use of energy, and what are the most influencing factors affecting the intent-oriented behaviour of transport energy-saving measures. There are various different conceptual and theoretical frameworks associate with pro-environmental behaviour. The conceptual framework (Figure 1.1) for this study was developed by integrating concepts drawn from Ajzen's (1991) Theory of Planned Behaviour (TPB) and Schwartz's (1977) Norm Activation Model (NAM). These classical theories offer the best available account in explaining intuition to behave when compared with other prevelant theories. More specifically, the present study explores the influence of the attitude and perceived efficacy of the TPB, personal norm of the NAM, and knowledge in predicting intent-oriented behaviour of transport energy-saving measures. The study also aims to compare the explanatory power of TPB and NAM for the intent-oriented behaviour of transport energy-saving

measures. On the other hand, the external factor, i.e., perceived quality of the existing train service is selected in the current study. It is important to note that trains are considerably more energy efficient than buses given the high passenger-carrying capacity and release less damaging compounds into the atmosphere (Strickland, 2006; Zumerchik, 2000). In addition, it seems that data on rail services ridership is analysed once a year by EPU (2006) but statistics on bus ridership is unavailable as there are few bus operators are privately run and services are highly fragmented in Kuala Lumpur (Chan and Kasipillai, 2007). As such, only train service was selected and used to measure this factor in this study.

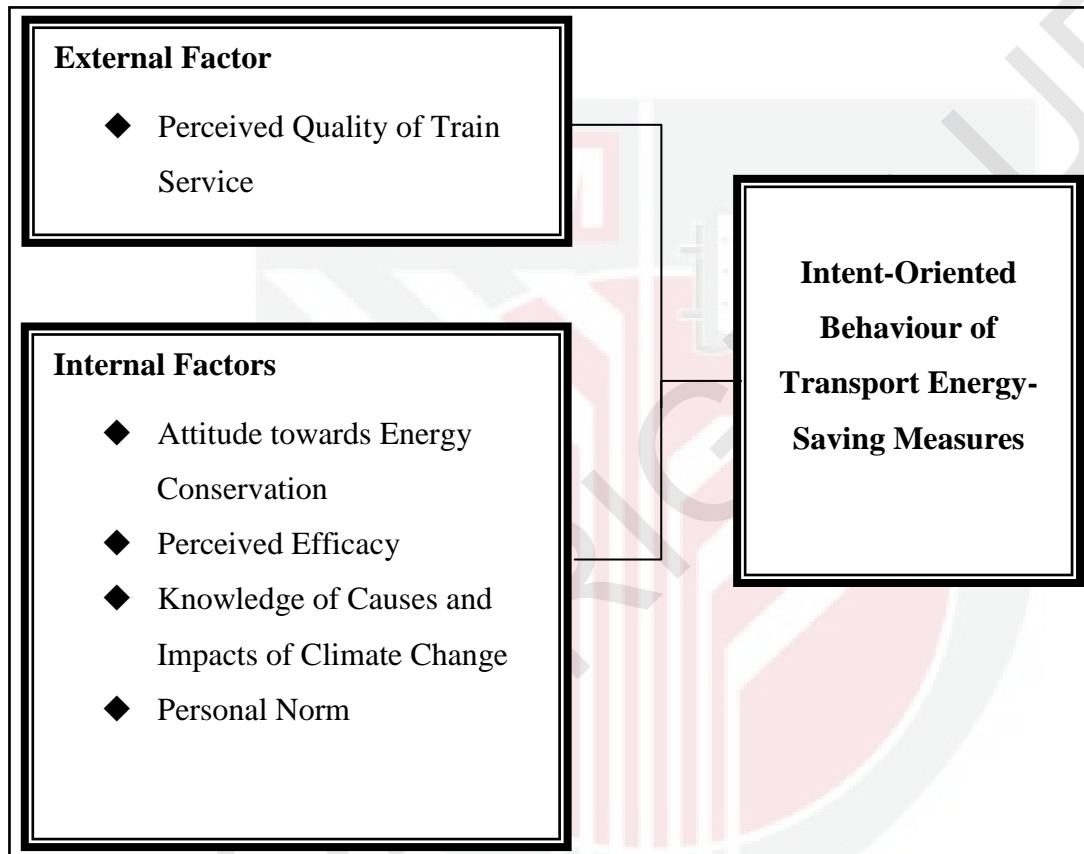


Figure 1.1. Conceptual Framework

1.7 Definition of Terminology

1.7.1 Intent-Oriented Behaviour

Conceptual: Behaviour that is carried out with the intention to benefit the natural environment (Stern, 2000).

Operational: An individual's intention to adopt technical devices or behavioural changes in order to save transport energy.

1.7.2 Quality of Public Transport Service

Conceptual: Public transportation service quality provided by the government in order to give more convenience towards people for urban and rural areas to move (White, 2002).

Operational: The quality of train transport service in Kuala Lumpur that includes the key components related to vehicle characteristics and safety, route-related and status, as well as time-related and comfort

1.7.3 Attitude towards Energy Conservation

Conceptual: Attitude towards behaviour refers to an individual's positive or negative appraisal of a particular behaviour (Ajzen, 1991).

Operational: An individual's degree of evaluation reaction related to transport energy conservation action, which comprises the components of affective and cognitive engagement towards energy conservation.

1.7.4 Perceived Efficacy

Conceptual: Self-efficacy refers to people's beliefs of their capabilities or abilities to perform courses of action necessary to attain designated types of outcomes (Bandura, 1986).

Operational: An individual's perceived ability to take energy-saving action and to persist with that action to reduce CO₂ emissions.

1.7.5 Knowledge of Climate Change

Conceptual: Knowledge is constructed, organized, and recalled in memory termed as 'mental representations' which can guide judgments and decisions (Wyer, 2007).

Operational: The knowledge of climate change consists of the causes of fossil fuels and its impacts related to human and the environment.

1.7.6 Personal Norm

Conceptual: Personal feelings of moral obligation based on one's self-expectation (Schwartz, 1977).

Operational: Personal moral obligations to engage in prosocial behaviour to reduce energy use.



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