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Sustainable Aspects of Electricity Consumption in Klang Valley

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Abstract

Recently, energy crisis is considered a global issue and the demand for an urgent solution seems inevitable. Residential buildings consume nearly one third of Total National Energy Consumption. Studies show that a significant part of energy use can be avoided through occupants' awareness about energy consumption. In order to discover and understand energy use of Malaysian residents, this paper has identified the residential electricity use behavior and its determinants by an empirical study. The results showed that out of the six introduced IVs of the regression model to predict the electricity consumption behavior only three predictors can significantly contribute to the model.

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Keywords: Human aspects; sustainable architecture; Electricity consumption awareness, Klang Valley

1. Introduction

Generally, residential energy use behaviours are related to heating, lighting, cleaning, cooking and entertainment in the home, such as lowering thermostat settings, using dishwashers, taking a bath, watching TV and so on. To have a comprehensive perspective about human consumption behaviour various fields of research such as psychology, government policies and human behavioural sciences are

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involved. The main aspect and target of the research is to identify the main determinants of energy consumption of building occupants. Studies on residential energy behaviour show that concerns about energy problems are considered to be the most important influencing factor. The impact of occupant on energy consumption in terms of decreasing the overall building energy consumption is considerably of great importance. (Groot et al.2008; Haas et al., 1998; Linden et al., 2006; Branco et al., 2004).

Energy consumption in residential buildings is dependent on building characteristics and occupants' behaviour. The interaction between the occupant and the building (i.e. the control of the heating and ventilation systems) is thought to have a strong influence on energy consumption (de Dear, 2004; Lenzuni, 2008; Karjalalaine, 2007; Lan, 2008; Moujalled, 2008). Socio-demographic characteristics such as the size of households and their relative age, affects the comfort parameters of residential buildings. Other factors such as income, education level and culture might also be related to indoor comfort preferences. The energy consumption in buildings can be further determined by cognitive factors such as attitudes and motivation towards energy saving and environmental concerns (Andersen, 2009; Schreiker & Shukuya, 2009).

Residents' patterns of living may be determined by lifestyle, preferences, attitudes, perceptions of comfort, personal background and household characteristics (Andersen et al., 2009). In a study conducted on residents' behaviour, Andersen et al. (2009) found that ventilation and heating behaviour are influenced by perception, gender and ownership.

Psychologists consider personal norm as a significant determinant for residential energy behaviour. Building residents will feel moral or normative obligation to act residential energy behaviour, and some scholars thought that residents performed pro-environmental behaviour encouraged by morality. Steg and Vleck (2009) considered it was successful to explain low-cost environmental behaviours, but have less explanatory power for behaviours with the high cost or strong constraints, such as reducing car use.

Besides the psychological variables mentioned above, some social contextual or socio-demographics variables have been demonstrated to have an impact on residential energy use behaviour in the literature. These include cost and benefits, inconvenient and unavailability, legal regulations, technology conditions, information, social support and role models, financial strategies and so on. Residential energy use behaviour can also be correlated with some variables related with household characteristics, such as the number of a family member, family type, and family income and so on. For these variables reflect lifestyle and habits of the residents, and accordingly reflect the status of residential energy consumption. For example, Parker, Rowlands and Scott (2005) surveyed the family with children and higher income consumed more energy than other types of families. Abrahamse and Steg (2009) surveyed that family with higher income and more members tended to consume more energy.

In the research of the responsible environmental behaviour, Hines, etc. (1986) defined the environmental responsibility as follows: Individual shows sense of responsibility and moral sense adopting certain environmental behaviour for the environmental problems or to solve environmental problems. Niklas Fransson, etc. (1999), environmental responsibility is defined as follows:

An individual's sense of obligation or duty to take measures against environmental deterioration in general.

In the field of Social Psychology, the classical theory of planned behaviour thought the major determinant affected the realistic behaviour is behaviour intention. In 1991, Ajzen formally presented the theory of planned behaviour, he thought that the causing of behaviour directly depends on the behaviour intention, and the behaviour intention indicated one's motivation on executing certain behaviour, and it reflected one's willingness to pay how much effort and time in order to execute certain behaviour. The behaviour intention is the best direct factor affecting behaviour. After this research, scholars did some researches using the theory of planned behaviour, and they aimed at different problems mostly supported the directly visible positive relationship between behaviour intention and behaviour.