DETERMINANTS OF HOTEL EMPLOYEES' ELECTRICITY SAVING INTENTION: EXTENDING THE THEORY OF PLANNED BEHAVIOUR[*]

Olawale Fatoki

Department of Business Management, University of Limpopo, Private Bag X1314, Sovenga, 0727, South Africa

Email: olawale.fatoki@ul.ac.za

Abstract. The hospitality industry including hotels makes a significant contribution to job creation and the gross domestic product of many countries. However, the negative environmental effects of hotels include high electricity consumption and emission of green house gases. Employees can help to improve workplace pro-environmental behaviour but the determinants of their electricity saving behaviour has not received thorough empirical investigation. Grounded on on the theory of planned behaviour (TPB), the study examined the determinants of hotel employees' electricity saving intention (ESI). The study extended the TPB by adding two constructs (environmental concern and organisational climate) to the three TPB constructs. Data was collected through the cross-sectional survey method and the Partial Least Square Structural Equation Modelling was used for data analysis. The results showed significant positive relationships between two TPB constructs (attitude and perceived behavioral control) and hotel employees' ESI. In addition, the effects of the two added constructs are significant. Theoretically, the study extended the TPB by adding two constructs and linking them to employees' ESI in the hospitality industry. Recommendations include workplace training on electricity saving.

Keywords: Electricity saving intention; theory of planned behavior; environmental concern; organisational climate; hotels; South Africa

1. Introduction

Environmental sustainability has emerged as a vital component of human and business survival. Human needs for natural resources have doubled in the past fifty years with negative environmental impact. Environmental risks continue to be in the forefront of the results of the annual Global Risks Perception Survey (GRPS) and in 2018 accounted for three of the five major risks by likelihood and four by impact (Bahadure, 2017; World Economic Forum, 2018). In South Arica, electricity generation increased by 2.2% between July 2017 and July 2018 and electricity consumption increased by 1.2% within the same period (Statistics South Africa, 2018; International Energy Agency, 2019). Carbon emissions associated with energy production especially from fossil fuels and consumption are a major part of total emissions and an important driver of global climate change (Zierler, 2017; Tvaronavičienė and Ślusarczyk, 2019). The speed of diversity loss has accelerated and the abundance of species has declined by about 60% since 1970 with negative impact on health and social-economic development (Norton *et al*. 2015; Khan and Chang, 2018). In addition, energy prices have increased in South Africa and around the world and global energy supplies have become less stable. In South Africa, it is anticipated that the price of electricity will rise by 9.41% in 2019/20 and this is expected to double the expected inflation rate of 4.5% (Akpan and Akpan, 2012; Tang *et al*. 2019; National Energy Regulator of South Africa, 2019). Also, public concern about environmental issues has increased and this has stimulated eco-friendly products and services. Green consumption is on the increase as many customers are aware of the effect of their buying decisions on the environment (Chen and Tung, 2014; Verma and Chandra, 2017). Due to external pressure from customers and government and the increase in the cost of electricity, many firms have started to introduce energy saving measures. The participation of employees is crucial for the success of a company's energy saving activities. Energy saving behaviour can be described as the reduction of energy use by individuals. Electricity saving intention can be described as the self-commitment of an individual to participate in electricity saving behaviours. Reducing energy use through conservation is one of the more cost effective ways to significantly decrease greenhouse gas emissions. Electricity saving is a pro-environmental behaviour (Pollard, 2015; Sony and Mekoth, 2018; Ru *et al*. 2018).

Hotels are energy intensive facilities, with high energy costs. The consumption of energy by hotels is higher than other commercial buildings. Energy costs account for 3-6% of overall operating costs of hotels. Hotels are associated with high energy wastage and low energy efficiency with 42% of the energy used to heat and cool spaces in hotels wasted. However, rising energy costs, attention of guests to sustainability and the rise of green movement in the hotel industry have increased the focus of hotels on energy management initiatives (Mensah and Blankson, 2013; Prud'homme, and Raymond, 2016; Cingoski and Petrevska, 2018).

The theory of planned behaviour (TPB) is the most frequently used theory to predict pro-environmental intentions and behaviours (Pollard, 2015; Ru *et al*. 2018). The TPB by Ajzen (1991) posits that intention positively affects actual behaviour and behavioral intention is influenced by three factors namely attitude, subjective norms and perceived behavioural control. Chen and Tung (2014) argue that despite the broad effectiveness of the TPB in explaining pro-environmental behaviour, many studies have enriched the explanatory effect of the theory by adding other constructs. This study extends the TPB by adding two new constructs (environmental concern and organisational climate) to develop a model of electricity saving purchase intention for hotel employees. Researchers on sustainability issues and pro-environmental behaviour should develop a multidisciplinary viewpoint that includes both micro and macro factors (Joshi and Rahman 2015; Sobiegalla *et al*. 2018; Sarma *et al*. 2019).

The study aims to examine the effect of these five variables on hotel employees' electricity saving intention (ESI). The study will contribute to knowledge in the following ways. First, the electricity saving behaviour of individuals has become an emerging area of research. However, extant research at the individual level has focused

on households rather than the workplace (Gao *et al*. 2017; Chang *et al*. 2018). Furthermore, while individuals need to pay for electricity consumption in households, electricity consumption in the workplace is almost free of charge to the employee. This makes electricity more easily wasted in workplaces compared to households (Gao *et al*.2017; Wesselink *et al*. 2017). Second, there is a research gap with respect to employees' electricity saving intention and behaviour in organisations and studies that have used the extended TPB to examine hotel employees' electricity saving intention in South Africa are scarce.

2. Literature review

2.1 Electricity saving behaviours
Electricity saving behaviour can be described as the behaviours performed by individuals to reduce overall electricity use and can be broadly divided into two categories. (1) Habitual energy-saving behaviours: These focus on continuous efforts to reduce electricity use by curtailment measures. Examples of habitual electricity saving behaviours include reducing or avoiding the usage of air-conditioners and turning the power off when appliances are not used (2) one-shot purchasing behaviours: This involves the replacement of old technology with high electricity use with new technology with low energy use and the purchase of more-efficient technology.

2.2 Theory of planned behaviour and electricity saving intention (ESI)
ESI can be described as the self-commitment of an individual to participate in electricity saving behaviours. The TPB is the most commonly used theory to predict pro-environmental behaviour (Pollard, 2015; Ru *et al.*, 2018). The TPB by Ajzen (1991) contends that intention predicts actual behaviour and intention is influenced by attitude, subjective norms and perceived behavioural control. In addition, other variables can be included in the TPB as long that they can be shown to improve the explanatory power of the model and are reasonable to explain a range of behaviour (Ajzen, 1991; Tommasetti *et al*.2018). Two additional constructs (environmental concern and organisational climate) are added as predictors of employees' ESI.

2.2.1 Attitude and electricity saving intention
Attitude towards the behaviour determines the extent to which a person has a favourable or an unfavourable assessment of a certain behaviour. A more favorable attitude towards a certain behavior by an individual should lead to a stronger intention to perform the behavior (Lin *et al*. 2015). Empirical literature is not conclusive about the effect of attitude on pro-environmental behaviour of individuals. Ha and Janda (2014) show that the attitude towards a green product has a strong effect on intention. Greaves *et al.* (2013) find that attitude has a significant positive relationship with the intention to engage in pro-environmental behaviour. The findings of the study by Wells *et al*. (2016) reveal that attitude has a positive effect on environmental behaviour both at home and in the workplace. Wang *et al*. (2014) show that environmental attitudes significantly influence energy-saving behavior. However, studies such as Kaiser *et al*. (1999), Park and Yang (2012) report a weak relationship between environmental attitude and environmental behaviour. If an individual considers electricity saving behaviour in the workplace as beneficial, he/she will hold a positive attitude and this can influence the intention to save electricity (Gao et *al*. 2017; Ru *et al*. 2018). Therefore, a more favorable environmental attitude by an individual should lead to a stronger intention to engage in electricity saving behaviour. Consequently, it is hypothesised that (H1): attitude towards energy saving positively affects employees' ESI.

2.2.2 Subjective norms (SNs) and energy saving intention
SNs indicate the possibility that individuals or groups that are important to an individual will like or dislike the performance of a particular behaviour (Ajzen, 1991). Greaves et al. (2013) find that SNs positively affect employees' intention to switch off computers when leaving their desk for more than one hour and recycle waste at work. The results of the study by Wang *et al*. (2014) show that SNs significantly affect the energy saving intention of city residents. Zierler (2017) argues that the relationship between SNs and intentions and behaviours

is a subject of much debate with varying empirical findings and Armitage and Conner (2001) remark that SNs tend to vary considerably across behaviours. Abrahamse and Steg (2011) find that SNs do not contribute to the explanation of intentions when attitudes and perceived behavioural control are controlled for. However, the opinions of a person or group of importance to an individual may influence the intention of that individual to engage in electricity saving as an employee in the workplace. It is hypothesised that (H2): SNs positively affect employees' ESI.

2.2.3 Perceived behavioural control (PBC) and electricity saving intention
PBC can be described as the perceived difficulty or ease of conducting a behaviour (Ajzen, 1991). There is a significant positive relationship between PBC and intention to use energy savings devices (Pollard (2015; Lin *et al*. 2015). However, Park and Yang (2012) and Kranz and Picot (2012) did not find a significant association between PBC and consumers' intention to adopt smart metering technology. The availability of resources and skill about electricity saving should positively influence behavioural intention. It is hypothesised that (H3): PBC positively affects employees' ESI.

2.2.4 Organizational electricity saving climate (OESC) and electricity saving intention
Organisational climate is a construct that has major implications for understanding human behaviour in organisations. Organisational climate can be described as the shared perception of employees about their work environment, particularly how policies and procedures are translated into tacit guidelines and practices. Pro-environmental organisational climate depicts the perception of employees about their organisations' pro-environmental policies, procedures, and practices (Castro and Martin, 2010; Norton *et al*. 2012). Zientara and Zamojska (2015) find that green organisational climate has a direct impact on organisational citizenship behaviour for the environment in hotels. However, Zhang, Wang and Zhou, (2014) find that OESC does not significantly affect electricity saving intention. This study argues that the positive perception of employees about the pro-environmental organisational climate of their organisation can positively impact on electricity saving intention. It is hypothesised that (H4): OESC positively affects employees' ESI.

2.2.5 Environmental concern (EC) and electricity saving intention
Dunlap and Jones (2002, p 484) define EC as "the degree to which people are aware of environmental problems and support efforts to solve them and/or indicate a willingness to contribute personally to their solution". Li *et al*. (2019) find that EC is significantly positively correlated with the willingness to purchase energy-efficient appliances. EC positively affects people's intention to use a park-and-ride facility (De Groot and Steg, 2007) and consumers' intention to adopt hybrid electric vehicles (Wang *et al*. 2016). EC has a significant positive effect on environmental knowledge, behavioral intention and environmentally friendly behaviour ((Pagiaslis and Krontalis, 2014; Newton *et al*. 2015). It is hypothesised that (H5): EC positively affects employees' ESI.

3. Research methodology

The study followed the quantitative research method and the data was collected through the cross-sectional survey method from participants in the Gauteng Province of South Africa. Participating hotels were conveniently selected from the website of the Tourism Grading Council of South Africa and were contacted by the researcher through a formal letter that explained the purpose of the study. Self-administered questionnaires were completed by employees of the participating hotels (see Appendix). Each participant was given a month to complete the questionnaire and was reminded weekly through emails and phone calls obtained during questionnaire distribution. The researcher pre-tested the questionnaire and the results led to the removal of sensitive information such as the name of the participant or hotel to ensure anonymity. Descriptive analysis and the Partial Least Square Structural Equation Modelling were used to analyse data.

4. Results

4.1 biographical characteristics

Thirty-three out of the forty-two hotels contacted particiopated in the survey. 660 (20 per hotel) questionnaires were distributed to the participants and 342 questionnaires were returned.

Table 1. Biographical information of the respondents.

Biographical Characteristics	Frequency ($N = 342$)
Educational qualification	
Matric	161
Post–Matric qualifications	181
Gender	
Female	163
Male	179
Age (years)	
20 years and less	0
21–30	128
31–40	157
41–50	52
Above 50	5
Work experience	
1–5	160
Above five years	182

Table 1 depicts the biographical characteristics of the survey participants. The results indicated that the majority of the respondents are males, in the 31-40 age bracket and with more than five years work experience.

4.2 Descriptive statistics

Table 2. Descriptive statistics

Construct	Mean	Standard deviation (SD)
Attitude	3.85	1.07
SNs	3.15	1.01
PBC	4.02	1.02
EC	4.05	0.99
OESC	3.90	1.01
ESI	4.40	1.06

The results of the descriptive analysis are presented in table 2. Attitude has a mean score of 3.85 with SD of 1.07. The mean score of SNs is 3.15 with a SD of 1.01. The mean score for PBC is 4.02 with a SD of 1.02. The mean score of ECis 4.05 with a SD of 0.99 and the mean score of OESC is 3.90 with a SD of 1.01. The mean score of ESI is 4.40 with a SD of 1.05.

3.3 Structural equation modelling

3.3.1 Measurement model

Table 3. Convergent validity

Construct	Measurement items	Loading	Cronbach's alpha	Composite reliability	AVE
Attitude (A)	A1	0.84	0.79	0.89	0.70
	A2	0.84			
	A3	0.79			
	A4	0.83			
Subjective norms (SNs)	SNs1	0.88	0.72	0.83	0.66
	SNs2	0.81			
	SNs 3 deleted	0.41			
Perceived behavioral control (PBC)	PBC1	0.84	0.84	0.86	0.69
	PBC2	0.76			
	PBC2	0.80			
Environmental concern (EC)	EC1	0.84	0.77	0.88	0.64
	EC2 deleted	0.49			
	EC3	0.78			
	EC4	0.76			
	EC5	0.83			
	EC6	0.80			
	EC7	0.84			
	EC8	0.86			
Organisational Energy Saving climate (OESC)	OESC1	0.78	0.75	0.91	0.67
	OESC2	0.81			
	OESC3				
Energy saving intention (ESI)	ESI1	0.82	0.81	0.87	0.64
	ESI2	0.78			
	ESI3	0.80			

Table 4. Discriminant validity

Construct	ESI	A	SN	PBC	EC	OESC
ESI	**0.80**					
A	0.79	**0.84**				
SN	0.73	0.77	**0.85**			
PBC	0.64	0.61	0.72	**0.82**		
EC	0.79	0.68	0.72	0.75	**0.82**	
OESC	0.68	0.62	0.71	0.69	0.71	**0.79**

Diagonals in bold represent the square roots of AVEs

Table 3 and table 4 depict the discriminant and the convergent validity. Four constructs (attitude, perceived behavioural control, organisational climate and energy saving intention) have all items greater than 0.708. However subjective norm and environmental concern have one item each with loading below 0.708. The two items were deleted. The results also indicate that the composite reliability is between 0.70 and 0.95, Cronbach's

alpha values for the constructs are above 0.70 and the the square roots of AVEs are higher than the correlations among the latent variables ((Hair *et al*. 2019).

3.3.2 Structural model assessment

Following the suggestions by Hair et al. (2019), the likelihood of common method bias (CMB) was examined. The VIFs for the constructs of the study were lower than 3.3 suggesting that the model is not constrained by CMB (Henseler *et al.,* 2015). The R^2 obtained by the study is 0.521 indicates a high level of predictive accuracy of the model. The original TPB model accounted for 44.9% of the variance. This indicates that inclusion of environmental concern and organisational energy saving climate increased the explained variance by 7.2%. The value of the goodness of fit (GIF) is 0.59 suggesting a good model fit and the (Q^2) using the cross validated communality is 0.56 which supports a predictive model. The effect size, f^2, ranged from 0.01 to 0.12 indicating small to medium effect sizes and the standardised root mean square residual of 0.03 is indicative of a good model fit. The results of the path coefficients and T-statistics using the bootstrapping technique are depicted in table 5.

Table 5. Path coefficient and T-statistics

Hypothesised path	Standardised Beta	T-statistics	Decision
H1 A to ESI	0.307	6.244*	Accepted
H2 SNs to ESI	0.108	0.559	Rejected
H3 PBC to ESI	0.263	6.852*	Accepted
H4 EC to ECI	0.225	3.775*	Accepted
H5 OESC to ECI	0.173	3.284**	Accepted

*P<0.01; ** <0.05

The results H1 (β =0.307, T= 6.244, p<.001). H3 (β= 0.263, T= 7.216, p<.001) and H3 (β =0.263, T= 6.852, p<.001) support significant positive relationships between attitude and perceived behavioural control and electricity saving intention. Thus H1 and H3 are not rejected. The results for H2 (β =0.108, T= 0.559, p>.05) is not significant. Thus H2 is rejected. Environmental concern (β=0.225, T=3.775, p<0.01) and organisational energy saving climate climate (β =0.173, T =3.284, p<0.05) have significant positive relationships with electricity saving intention. Thus H4 and H5 are not rejected.

4   Discussion

Electricity saving behaviour can be described as the reduction of electricity use by individuals and electricity saving intention is the plan of an individual to participate in electricity saving behaviours. The TPB is the most commonly used theory to predict pro-environmental behavioural intentions including electricity saving intention. This study extends the TPB by adding two new constructs (environmental concern and organisational climate) to the three constructs of the TPB. The findings indicated that there is a significant positive relationship between attitude and PBC and ESI. H1 and H3 of the study are supported. The study did not find a significant relationship between SNs and ESI and H2 is not supported. The results also indicated significant positive relationships between two additional constructs (EC and OESC) and ESI. Therefore, H4 and H5 of the study are supported. The findings of this is supported by both theoretical and empirical literature. The TPB shows that attitude and perceived behavioral control can predict behavioral intention. This is supported by the findings of this study. However, the effect of SNs is not significant. Pollard (2015) finds that attitude toward sustainability at work has a strong association with the use of energy savings devices. The study by Wells *et al*. (2016) revealed that attitude has a significant positive positive effect on environmental behaviour both at home and in the workplace. There is a significant positive relationship between PBC and to intention to use energy savings devices (Pollard (2015; Lin

et al. 2015). Gao *et al*. (2017) find that SNs have an insignificant effect on intention to save energy in workplaces. Organisational climate has a positive effect on hotel employees green behaviour in the workplace (Chou, 2014). Li *et al*. (2019) find that environmental concern is positively correlated with the willingness to purchase energy-efficient appliances.

5. Conclusion

This study extended the TPB by adding two new constructs (environmental concern and organisational climate) to the three constructs of the TPB. The study investigated the effect of three TPB constructs and two additional constructs on hotel employees' ESI. The findings indicate that there is a significant positive relationship between attitude and PBC and employees' ESI. The study did not find a significant relationship between SNs and ESI. The findings also indicate significant positive relationships between two additional constructs (environmental concern and organisational electricity saving climate) and ESI.

The findings of the study have some policy implications. Employees must develop a more favorable environmental attitude. Therefore, factors such as turning off lights and air conditioners when leaving the office can help to save electricity. In addition, attending workplace training on electricity saving mechanisms will be a proactive way to reduce electricity consumption. Hotels must also make available resources, knowledge and skills about electricity saving. This can be achieved by the replacement of old technology with high electricity use with new technology with low energy use. The reward of employees must take pro-environmental behaviour into consideration. To improve, organisational electricity saving climate, hotels must develop and communicate their sustainability policy to employees. The limitations of the study include the use of convinience sampling which may lead to sampling bias and the focus on 342 hotel employees in one province limits the generalisability of the findings. Other studies can examine the effect of environmental passion and workplace spirituality on employees' ESI.

References

Abrahamse, W., & Steg, L. (2011). Factors Related to Household Energy Use and Intention to Reduce It: The Role of Psychological and Socio-Demographic Variables. *Human ecology review,* 18(1), 30-40.

Akpan, G.E, & Akpan, U.F. (2012). Electricity Consumption, Carbon Emissions and Economic Growth in Nigeria. International Journal of Energy Economics and Policy, 2(4), 292-306

Ajzen, I., & Fishbein M. (1980). *Understanding Attitudes and Predicting Social Behaviour.* Englewood-Cliffs, NJ: Prentice-Hall

Ajzen, I. (1991). The theory of planned behaviour. Organizational Behaviour and Human Decision Processes, 50(2), 179–211.

Armitage, C. & Conner, M. (2001). Efficacy of the Theory of Planned Behaviour: A meta-analytic review. British Journal of Social Psychology, 40, 471-499. https://doi.org/10.1348/014466601164939

Bahadure, S. (2017). Power of Doubling: Population Growth and Resource Consumption. International Journal of Urban and Civil Engineering, 11(7), 928-935. http://doi.org/10.5281/zenodo.1131471

Banwo, A., & Du, J. (2019). Workplace pro-environmental behaviours in small and medium-sized enterprises: an employee level analysis. Journal of Global Entrepreneurship Research, 9(34), 1-20. https://doi.org/10.1186/s40497-019-0156-4

De Groot, J.I.M., & Steg L. (2007). Values, beliefs and environmental behaviour: validation of an instrument to measure egoistic, altruistic and biospheric value orientations in five countries. Journal of Cross Cultural Psychology 38, 318–332. https://doi.org/10.1177/0022022107300278

Donald, I.J, Cooper, S.R & Conchie, S.M (2014). An extended theory of planned behaviour model of the psychological factors affecting commuters' transport mode use. Journal of Environmental Psychology, 40, 39–48. https://doi.org/10.1016/j.jenvp.2014.03.003

Carrico, A., & Reimer, M. (2011). Motivating energy conservation in the workplace: An evaluation of the use of group level feedback and peer education. Journal of Environmental Psychology, (31), 113-120.

Castro, M., & Martins, N. (2010). The relationship between organisational climate and employee satisfaction in a South African information and technological organisation. South African Journal of Industrial Psychology, 36(1), 1-9. http://doi.org/ 10.4102/ sajip.v36i1.800

Chan, E., Chan, W. & Okumus, F. (2015). Barriers to Environmental Technology Adoption in Hotels. Journal of Hospitality & Tourism Research, 42(5), 829-852. https://doi.org/10.1177/1096348015614959

Chang, W, Zhang, J, Yu, P, & Hu, H. (2018). The theory of planned behaviour as a model for understanding tourists' responsible environmental behaviours: The moderating role of environmental interpretations. Journal of Cleaner Production, 194, 425-434. https://doi.org/10.1016/j.jclepro.2018.05.171

Chen, M, & Tung, P. (2014). Developing an extended Theory of Planned Behaviour model to predict consumers' intention to visit green hotels. International Journal of Hospitality Management, 36, 221-230. https://doi.org/10.1016/j.ijhm.2013.09.006

Cingoski, V., & Petrevska, B. (2018). Making hotels more energy efficient: the managerial perception. Economic Research-Ekonomska Istraživanja, 31(1), 87-101.

Dijkstra, T.K., & Henseler, J. (2015). Consistent and asymptotically normal PLS estimators for linear structural equations. Computer Statistics Data Analysis, 81, 10-23.

Dunlap, R. E., & Jones, R. E. (2002). Environmental Concern: Conceptual and Measurement Issues' In Dunlap, R. E. and W. Michelson (eds.) Handbook of Environmental Sociology, 482-524. Westport, London: Greenwood Press.

Fishbein, M., & Ajzen, I. (1975). Belief, attitude, intention, and behavior: An introduction to theory and research. Reading, MA: Addison-Wesley.

Gao, L., Wang S., Li, J., & Li, H. (2017). Application of the extended theory of planned behavior to understand individual's energy saving behaviour in workplaces. Resource Conservation and Recycling, 127, 107-113. http://dx.doi.org/10.1016/j.resconrec.2017.08.030

Greaves, M, Zibarras, L. & Stride, C. (2013). Using the theory of planned behaviour to explore environmental behavioural intentions in the workplace. Journal of Environmental Psychology (34), 109-120. http://doi.org/10.1016/j.jenvp.2013.02.003

Ha, H.-Y., & Janda, S. (2014). The effect of customized information on online purchase intentions. Internet Research, 24(4), 496-519. https://doi.org/10.1108/IntR-06-2013-0107

Hair, JF, Risher JJ, Sarsstedt, M., & Ringle CM. (2019). When to use and how to report the results of PLS-SEM. European Business Review, 31, 2-24.

Henseler, J., Ringle, C.M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modelling. Journal of the Academy of Marketing Science, 43(1), 115-135. https://doi.org/10.1007/s11747-014-0403-8

International Energy Agency (2019). Global energy demand rose by 2.3% in 2018, its fastest pace in the last decade. https://www.iea.org/newsroom/news/2019/march/global-energy-demand-rose-by-23-in-2018-its-fastest-pace-in-the-last-decade.html

Joshi, Y., & Rahman, Z. (2015). Factors affecting green purchase behaviour and future research directions. International Strategic Management Review, 3(1/2), 128-143, https://doi.org/10.1016/j.ism.2015.04.001

Kaiser, F., Wolfing, S., & Fuhrer, U. (1999). Environmental Attitude and Ecological Behaviour. Journal of Environmental Psychology (19:1), 1-19. https://doi.org/10.1006/jevp.1998.0107

Khan, MI, & Chang, YC. (2018). Environmental Challenges and Current Practices in China—A Thorough Analysis. Sustainability, 10, 1-20. http://doi.org/10.3390/su10072547

Kim, Y, & Han, H. (2010). Intention to pay conventional-hotel prices at a green hotel–a modification of the theory of planned behaviour. Journal of Sustainable Tourism, 18(8), 997-1014. https://doi.org/10.1080/09669582.2010.490300

Kock, N. (2015). Common method bias in PLS-SEM: A full collinearity assessment approach. International Journal of e-Collaboration, 11(4), 1-10. http://doi.org/10.4018/ijec.2015100101

Li, G., Li, W., Jin, Z. & Wang, Z. (2019). Influence of Environmental Concern and Knowledge on Households' Willingness to Purchase Energy-Efficient Appliances: A Case Study in Shanxi, China. *Su*stainability, 11(4), 1073; https://doi.org/10.3390/su11041073

Lin, S Goodsite, M. & Sanderson, H. (2015). Raising Public Awareness: The Role of the Household Sector in Mitigating Climate Change. International Journal of Environmental Research and Public Health, 12, 13162-13178. 10.3390/ijerph121013162

Mensah, I. & Blankson, E.J. (2013). Determinants of hotels' environmental performance: evidence from the hotel industry in Accra, Ghana. Journal of Sustainable Tourism, 21(8), 1212-1231. https://doi.org/10.1080/09669582.2013.776058

National Energy Regulator of South Africa. (2019). Electricity production and consumption. http://www.nersa.org.za/

Newton, JD, Tsarenko, Y, Ferraro, C, & Sands, S. (2015). Environmental concern and environmental purchase intentions: The mediating role of learning strategy. Journal of Business Research, 68(9), 1974-1981. https://doi.org/10.1016/j.jbusres.2015.01.007

Norton, T. A., Zacher, H., & Ashkanasy, N. M. (2012). On the importance of pro-environmental organizational climate for employee green behavior. Industrial and Organizational Psychology: Perspectives on Science and Practice, 5, 497-500. https://doi.org/10.1111/j.1754-9434.2012.01487.x

Norton, T.A., Parker, S.L., Zacher, H., & Ashkanasy, N.M. 2015. Employee green behaviour: a theoretical framework, multilevel review, and future research agenda. Organization and Environment, 28(1), 103-125. https://doi.org/10.1177/1086026615575773

Pagiaslis A., & Krontalis A. (2014). Green consumption behaviour antecedents: environmental concern, knowledge, and beliefs. Psychology and. Marketing, 31, 335–348. https://doi.org/10.1002/mar.20698

Park, N., & Yang, A. (2012). Online environmental community members' intention to participate in environmental activities: An application of the theory of planned behavior in the Chinese Context. Computers in Human Behaviour (28), 1298-1306. 10.1016/j.chb.2012.02.013

Pollard, C.E. (2015). Applying the Theory of Planned Behavior to Computer Energy Saving Behavioral Intention and Use at Work. Twenty-first Americas Conference on Information Systems, Puerto Rico, 2015

Prud'homme, B, & Raymond, L. (2016). Implementation of sustainable development practices in the hospitality industry. International Journal of Contemporary Hospitality Management, 28(3), 609-639. 10.1108/IJCHM-12-2014-0629

Ru X, Wang S, & Yan S. (2018). Exploring the effects of normative factors and perceived behavioral control on individual's energy-saving intention: an empirical study in eastern China. Resource Conservation and Recycling, 134, 91–99. https://doi.org/10.1016/j.resconrec.2018.03.001

Sarma, U., Karnitis, G., Zuters, J., &Karnitis, E. (2019). District heating networks: enhancement of the efficiency. Insights into Regional Development, 1(3), 200-213. https://doi.org/10.9770/ird.2019.1.3(2)

Sony, M., & Mekoth, N. (2018). A qualitative study on electricity energy-saving behaviour. Management of Environmental Quality: An International Journal, 29(5), 961-977. https://doi.org/10.1108/MEQ-02-2018-0031

Statistics South Africa (2018). Electricity generated and available for distribution http://www.statssa.gov.za/publications/P4141/P4141June2018.pdf

Tang, Z, Warkentin, M, Wu, L (2019). Understanding employees' energy saving behaviour from the perspective of stimulus-organism-responses. Resources, Conservation & Recycling, 140, 216-223. https://doi.org/10.1016/j.resconrec.2018.09.030

Tommasetti, A., Singer, P, Troisi, O., & Maione, G. (2018). Extended Theory of Planned Behavior (ETPB): Investigating Customers' Perception of Restaurants' Sustainability by Testing a Structural Equation Model. Sustainability, 10, 1-21. https://doi.org/10.3390/su10072580

Tvaronavičienė, M., & Ślusarczyk, B. (2019). Energy transformation towards sustainability. *Energy transformation towards sustainability* (pp. 1-333) https://doi.org/10.1016/C2018-0-02510-4 Retrieved from www.scopus.com

Verma, V., & Chandra, B. (2017). Intention to Implement Green Hotel Practices: Evidence from Indian Hotel Industry. International Journal of Management Practice, 11(1), 24-32. https://doi.org/10.1504/IJMP.2018.088380

Wang, Z., Zhang, B., & Li, G (2014). Determinants of energy-saving behavioural intention among residents in Beijing: Extending the theory of planned behavior. Journal of Renewable and Sustainable Energy, 6(5), 053127 https://doi.org/10.1063/1.4898363

Wang, S., Fan, J., Zhao, D., & Yang, S. (2016). Predicting consumers' intention to adopt hybrid electric vehicles: using an extended version of the theory of planned behaviour model. Transportation, 43(1), 1-21 https://doi.org/10.1007/s11116-014-9567-9

Wells, V. K., Taheri, B., Gregory-Smith, D., & Manika, D. (2016b). The role of generativity and attitudes on employees home and workplace water and energy saving behaviours. Tourism Management, 56, .63-74. http://dx.doi.org/10.1016/j.tourman.2016.03.027

Wesselink, R, Blok, V., & Ringersma, J. (2017). Pro-environmental behaviours in the workplace and the role of managers and organisation. Journal of Cleaner Production, 168, 1679-1687. 10.1016/j.jclepro.2017.08.214

World Economic Forum. (2018). Global risks report. https://www.weforum.org/reports/the-global-risks-report-2019

Yadav, R., & Pathak, G. (2016). Young consumers' intention towards buying green products in a developing nation: Extending the theory of planned behaviours. Journal of Cleaner Production, 135,732-739. https://doi.org/10.1016/j.jclepro.2016.06.120

Zhang, Y., Wei, Y., & Zhou, G. (2018). Promoting firms' energy-saving behaviours: The role of institutional pressures, top management support and financial slack. Energy Policy, 115, 230–238. https://doi.org/10.1016/j.enpol.2018.01.003

Zhang, Y., Wang, Z., & Zhou, G. (2014). Determinants of employee electricity saving: The role of social benefits, personal benefits and organizational electricity saving climate. Journal of Cleaner Production, 66, 280-287. https://doi.org/10.1016/j.jclepro.2013.10.021

Zientara, P, & Zamojska, A. (2016). Green organizational climates and employee pro-environmental behaviour in the hotel industry. Journal of Sustainable Tourism, 24(6), 1-18. https://doi.org/10.1080/09669582.2016.1206554

Zierler, R. (2017). Energy-saving attitudes and behavioural influences in large organisations: The case of Network Rail. https://pdfs.semanticscholar.org/ff73/21263eaa95edf597cee6d8862f0d17edbe54.pdf

Appendix: Questionnaire

Concept	Survey items	Response category	Adapted from
Attitude	1. I think that saving electricity in my workplace is useful to protect the environment. 2. I think that saving electricity in my workplace is significant to reduce carbon emissions. 3. I think that saving electricity in my workplace is valuable to reduce electricity shortage. 4. I think that saving electricity in my workplace is a wise decision.	I strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree	Ajzen (1991) and Gao *et al.* (2017
Subjective norms	1. My colleagues that that I should save electricity in the workplace. 2. My managers think that I should save electricity in the workplace. 3. Other people that are important to me think that I should save electricity in the workplace.	I strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree	Ajzen (1991) and Gao *et al.* (2017
Perceived behavioral control	1. I think that I am capable of saving electricity in my workplace. 2. I have the knowledge and skill to save electricity in the workplace.	I strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree	Ajzen (1991) and Gao *et al.* (2017

	3. Whether or not I save electricity is completely up to me.		
Environmental concern	1. I am extremely worried about the state of the world's environment and what it means for the future 2. Mankind is severely abusing the environment 3. When mankind interferes with nature, it often produces disastrous consequences 4. The balance of nature is delicate and easily upset 5. Human must live in harmony with nature in order to survive 6. I think that environmental problems are important 7. I think that environmental problems cannot be 8. I think that we should care about environmental problems.	I strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree	Chen and Tung, 2014 and Yadav and Pathak (2015)
Organisational electricity saving climate	1. Electricity saving is encouraged in my workplace 2. My workplace puts value on electricity saving 3. My workplace is actively committed to electricity saving.	I strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree	Zhang *et al.* (2014)
Electricity saving intention	1. I am willing to save electricity in my workplace. 2. I intend to engage in electricity saving activities in my workplace 3. I plan to save electricity in my workplace	I strongly disagree, 2 disagree, 3 neutral, 4 agree, 5 strongly agree	Ajzen (1991), Chen and Tung (2014) and Zhang *et al.* (2014)

Make your research more visible, join the Twitter account of ENTREPRENEURSHIP AND SUSTAINABILITY ISSUES:
@Entrepr69728810