

A Study of the Influence Factors of Purchase Intention of Air Pollution Prevention Equipment

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ABSTRACT

In recent years, due to the trend of environmental protection and the awakening of public awareness, companies need to deal with complex environmental protection issues and challenges. The first thing they face is the prevention of air pollution. When companies face the government air pollution prevention regulations, their attitude to strike a balance between the pressure and the cost of purchasing air pollution prevention equipment is worth to investigate. The purpose of this study was to investigate the effects of environmental awareness, government regulations, attitude toward the behaviour, subjective norms, and perceived behaviour on the purchase intention of air-pollution prevention equipment. Results showed that the environmental awareness, government regulations, attitude toward the behaviour, subjective norms, and perceived behavioural control, simultaneously have significant effects on the purchase intention of air pollution prevention equipment.

Keywords: *Purchase intention, Air pollution prevention equipment, Environmental awareness, Government regulations*

1. INTRODUCTION

In recent years, due to the onset of international environmental protection trends, the public's awareness of environmental protection has increased, and the need to respond to increasingly complex environmental protection issues and challenges has led to adjustments in the management structure of enterprises.

With the rising awareness of environmental protection, people gradually understand the impact of the environment on their own health. The impact of the enterprise on the environment protection during the manufacturing process is the responsibility that the company need to face and bear, which in turn causes the company to operate challenges and issues [1].

In recent years, various industries in Taiwan have gradually attached an importance to the procurement of air pollution prevention equipment due to the adjustment and modification of the company after discovering the seriousness of the violation of the air pollution regulations. Therefore, in such situation the purchase decision was influenced by the professionalism of purchasing equipment, the cost or space considerations, and other environmental factors [2].

Due to the complexity of the air pollution prevention equipment purchase process, enterprise buyers will spend a relatively more time to make decisions. When consumers consider the importance of purchase, they will spend more time to collect the relevant information and confirming the product value in order to reduce the perceived uncertainty risks [3].

The enterprise purchase process is more formalized than the general consumer purchase process, because it contains

more potential factors and is susceptible to other factors. Therefore, it is necessary to make a deeper investigation on the characteristics of an enterprise's purchase behaviour.

Based on the explanation above, it is known that the rise of environmental protection awareness is primarily focusing on air pollution, if it can solve the problem of the enterprise to reduce air pollution, and promote environmental awareness. Thus, this is a win-win situation.

Furthermore, if the air pollution prevention equipment manufacturers can understand the purchasing decision process of their target customers, this will help them to develop a suitable marketing strategy. Therefore, the purpose of this study was to understand the key factors influencing the purchase decision-making.

This study was based on the theory of planned behaviour [4] added with the buyer's environmental awareness and environmental regulations as the predictors of purchase intention. The main purpose of this study was to investigate the effects of environmental awareness, government regulations, attitude toward the behaviour, subjective norms, and perceived behavioural control on purchase intentions.

2. LITERATURE REVIEW

2.1. Environmental Awareness

Environmental awareness is a belief, and each consumer has a different belief [5]. Environmental awareness refers to the reaction of the environment in the human being's mind [6],

it's also the endurance and mentality of the environment [7]. Environmental awareness can generally be divided into two parts, one is to have knowledge about the environment, and the other is to understand the relevant knowledge about environmental protection. At present, we consider consumers who are environmentally conscious to understand the environmental related issues, and obviously comprehend that their living habits have a considerable impact on the environment [8]. Sheehan & Atkinson [9] proposed that the more buyers who attach the importance to participating in environmental issues, the more their choice of green goods will be improved. Many studies also suggested that the buyers' environmental awareness will affect their willingness to purchase green goods.

2.2. Government Regulations

Regulations are issued by various federal government departments and agencies to carry out the intention of legislation enacted by congress. Regulations also function

to ensure the uniform application of the law. Government regulation of firms uses the 'coercive power' of the state to alter firms' pricing, entry, production, investment, and product choice decisions [10]. Government regulations are effective rules that define the bounds of legal behaviour. Government regulation is an increasing concern. Managers are being held responsible for the integrity of their operations and protection of stockholders' interests. Ajzen [4] found that individual behaviour is not completely voluntary. Therefore, when the government promotes air pollution prevention, it will formulate an assessment system and incentives.

2.3. Theory of Planned Behaviour

The Theory of Planned Behaviour (TPB) which was proposed by Ajzen [4] and the structure is showed in Figure 1. The TPB has utilized a framework to analyse the significance of every individual's environmentally friendly behaviour in the greening of events process [11].

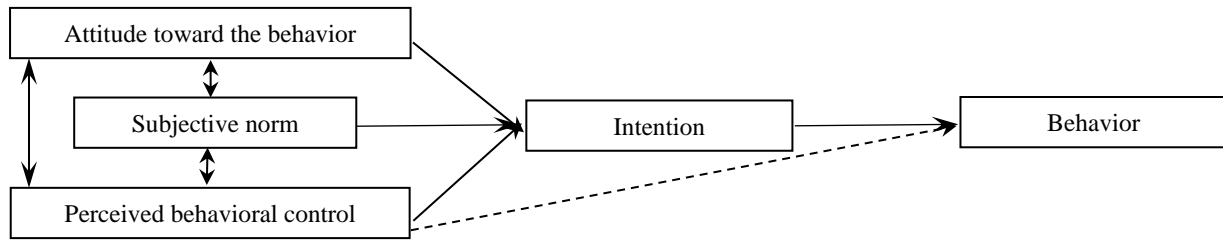


Figure 1 Theory of Planned Behaviour

Attitude toward the behaviour is the degree to which performance of the behaviour is positively or negatively valued. According to the expectancy-value model, attitude toward a behaviour is determined by the total set of accessible behavioural beliefs linking the behaviour to various outcomes and experiences. Attitude is considered one of the most important factors affecting the behaviour [12], and attitude is a complex construction composed of cognition, emotion, and behaviour [13].

Subjective norm is certain undefined standards or rules of conduct established by specific groups [14]. The influencing factors of subjective norms can be: (1) Personal factors: Those who are in close contact with the individual; (2) Information factors: Those who are in close contact with the personal living environment, also known as external environmental factors [15].

Perceived behavioural control refers to people's perceptions of their ability to perform a given behaviour. It is assumed that perceived behavioural control is determined by the total set of accessible control beliefs. To the extent that it is an accurate reflection of actual behavioural control, perceived behavioural control can, together with the intention, be used to predict behaviour. Ajzen [4] divided the control of perceived behaviour into internal and external factors: (1) internal factor refers to the relevant information, technology, ability and personal will, individual differences

or emotions required to take action; (2) External factor refers to the time or opportunity required when taking actions. Ajzen [4] also indicated that the importance of actual behavioural control is self-evident: The resources and opportunities available to a person must to some extent dictate the likelihood of behavioural achievement. The greater psychological interest than actual control, however, is the perception of behavioural control and has an impact on intentions and actions. Perceived behavioural control plays an important part in the theory of planned behaviour. Intention means behaviour that is willing or unwilling to participate in consideration [11]. Ajzen & Driver [16] considered the intention as a necessary process of any behavioural expression and a decision before the behaviour is manifested. Han & Kim [11] also indicated that the TPB is not comprehensive enough to change people's actual behaviour. It should be considered when event organizers plan and operate the event, since the greening event needs support and help from every individual. Ajzen [4] indicated that the evidence concerning the relationship between the intentions and actions has been collected with respect to many different types of behaviours, with much of the work done in the framework of the theory of reasoned-action. Behaviour is the actions and mannerisms made by individuals, organisms, systems or artificial entities in conjunction with themselves or their environment, which

includes the other systems or organisms around as well as the physical environment [17]. It is the computed response of the system or organism to various stimuli or inputs, whether internal or external, conscious or subconscious, overt or covert, and voluntary or involuntary [18]. Ajzen [4] concluded that the intention, perception of behavioural control, attitude toward the behaviour, and subjective norm each reveals a different aspect of the behaviour, and each can serve as a point of attack in attempts to change it.

3. RESEARCH METHOD

3.1. Research Structure

According to the afore literature review, the research framework of present study was structured and showed in Figure 2. There are five independent factors: environmental awareness, government regulations, attitude toward the behaviour, subjective norm, and perceived behavioural control; and purchase intention as the dependent factor.

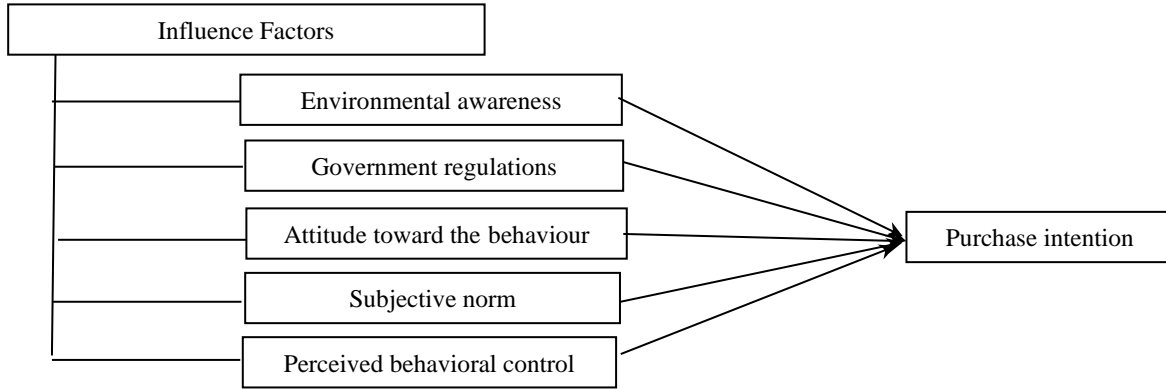


Figure 2 Research framework of present study

3.2. Research Hypothesis

According to the research framework, the research hypotheses of present study are listed below:

- H₁: Environmental awareness has a positive and significant effect on purchase intention.
- H₂: Government regulations has a positive and significant effect on purchase intention.
- H₃: Attitude toward the behaviour has a positive and significant effect on purchase intention.
- H₄: Subjective norms has a positive and significant effect on purchase intention.
- H₅: Perceived behaviour control has a negative and significant effect on purchase intention.

3.3. Questionnaire Design

The questionnaire includes six parts: environmental awareness, government regulations, attitude toward the behaviour, subjective norms, perceived behavioural control, and purchase intention. Each item in the questionnaire is measured with seven-point Likert scale to evaluate the responses of subjects, which ranges from 1 (strongly disagree) to 7 (strongly agree).

3.3.1. Environmental Awareness (EA)

The operational definition of environmental awareness refers to the influence of buyers on purchasing behaviour

and the recognition of environmentally-friendly products to consumers. The questions of environmental awareness refer to Kim & Chung [19] and consist of 4 items.

3.3.2. Government Regulations (GR)

Government regulations mainly comprise the level of understanding of buyers on regulatory requirements and penalties. The questions of government regulations refer to Taylor & Todd [20] and consist of 4 items.

3.3.3. Attitude Toward the Behaviour (ATB)

The operational definition of attitude toward the behaviour is the positive or negative evaluation of the buyers' purchasing behaviour. The questions of attitude toward the behaviour refer to Chen & Tung [21] and consist of 5 items.

3.3.4. Subjective Norm (SN)

The operational definition of subjective norms refers to those directly or indirectly related to the procurement, and belief that the buyer performs a positive or negative evaluation of the procurement behaviour. The questions of subjective norm refer to Ajzen & Fishbein [22] and Taylor & Todd [20] and consist of 6 items.

3.3.5. Perceived Behavioural Control (PBC)

The operational definition of perceived behavioural control, which refers to the planned-behaviour theory, is the extent to which buyers can autonomously judge their ability when they expect to conduct purchasing behaviour. The questions of purchase intention refer to Han et al. [23] and consist of 5 items.

3.3.6. Purchase Intention (PI)

The operational definition of purchase intention is the intentional tendency of the buyer in the planned-behaviour theory. Therefore, the questions of purchase intention refer to Ajzen & Fishbein [22] and consist of 4 items. This study

refers to the subjective evaluation of purchase intentions of the buyers of air pollution prevention equipment.

4. DATA ANALYSIS RESULTS

4.1. Descriptive Statistics

Table 1 shows the results of the Questionnaire-Response Statistics. There are 166 questionnaires that were returned, in which the mean-rating scores are between 4.41 to 6.63, the standard deviations are between 0.8 to 1.56.

Table 2 shows the Pearson-Correlation Coefficient among those factors. The coefficient ranges from 0.49 to 0.76, indicating a medium-to-high correlation.

Table 1 Questionnaire-Response Statistics

Item	N	Mean	SD	Min	Max	Item	N	Mean	SD	Min	Max
EA01	166	5.99	1.29	1	7	SN02	166	5.55	1.17	1	7
EA02	166	6.42	1.01	1	7	SN03	166	5.54	1.17	1	7
EA03	166	5.73	1.19	2	7	SN04	166	5.39	1.37	1	7
EA04	166	6.63	0.8	1	7	SN05	166	5.84	1.17	2	7
GR01	166	4.79	1.5	1	7	SN06	166	5.78	1.24	1	7
GR02	166	4.41	1.47	1	7	PBC01	166	5.23	1.43	1	7
GR03	166	5.91	1.31	1	7	PBC02	166	4.54	1.56	1	7
GR04	166	5.92	1.28	1	7	PBC03	166	5.4	1.27	2	7
ATB01	166	5.96	1.06	1	7	PBC04	166	5.52	1.26	1	7
ATB02	166	6.15	1.04	1	7	PBC05	166	4.88	1.47	1	7
ATB03	166	5.78	1.3	1	7	PI01	166	5.45	1.26	2	7
ATB04	166	5.82	1.22	1	7	PI02	166	5.09	1.45	1	7
ATB05	166	5.53	1.27	2	7	PI03	166	5.49	1.27	2	7
SN01	166	5.63	1.2	1	7	PI04	166	5.42	1.23	2	7

Table 2 Pearson-Correlation Coefficient Among Factors

Factors	Sample statistic			Pearson Correlation					
	N	Mean	Std. Dev.	ECO	GR	ATB	SN	PBC	PI
EA	166	6.19	.89	1.00					
GR	166	5.26	1.02	.49	1.00				
ATB	166	5.85	.95	.75	.56	1.00			
SN	166	5.62	.97	.62	.55	.73	1.00		
PBC	166	5.12	1.12	.55	.54	.65	.74	1.00	
PI	166	5.36	1.18	.60	.52	.66	.76	.76	1.00

4.2. ANOVA and Path Analysis

Table 3 shows the results of ANOVA. The SSR is 157.240, F-value is 68.852 (p < 0.001), which indicates that all predictors simultaneously and significantly affect the dependent variable (PI).

Table 3 ANOVA of Questionnaire-Response Statistics

Model	Sum of Square	df	Mean Square	F	Sig.
Regression	157.240	5	31.448	68.852	.000
Residual	73.079	160	.457		
Total	230.320	165			

4.2.1. Unstandardized Coefficients

Table 4 shows the results of unstandardized coefficients for the factors.

- (1). The unstandardized coefficient of EA to PI is 0.165, which means that each increase in EA by one will cause PI to increase by 0.165 unit.
- (2). The unstandardized coefficient of GR to PI is 0.045, which means that each increase in GR by one will cause PI to increase by 0.045 unit.
- (3). The unstandardized coefficient of ATB to PI is 0.061, which means that each increase in ATB by one will cause PI to increase by 0.061 unit.
- (4). The unstandardized coefficient of SN to PI is 0.408, which means that each increase in SN by one will cause PI to increase by 0.408 unit.
- (5). The unstandardized coefficients of PBC to PI is 0.417, which means that each increase in PBC by one will cause PI to increase by 0.417 unit.

Table 4 Path Analysis

Dep.	Ind.	Unstandardized Coefficients		Standardized Coefficients	t	Sig.	R ²
		B	Std. Error	Beta			
PI	Constant	-0.670	0.385		-1.741	0.082	0.683
	EA	0.165	0.090	0.124	1.833	0.067	
	GR	0.045	0.065	0.038	0.690	0.490	
	ATB	0.061	0.099	0.049	0.615	0.539	
	SN	0.408	0.092	0.335	4.410	0.000	
	PBC	0.417	0.072	0.393	5.759	0.000	

5. CONCLUSION

5.1. Result on PI

- (1). In the EA measure, Question 4 (I think environmental protection is everyone's responsibility) with the highest score (6.63), indicates that the buyers who believe that environmental protection is everyone's responsibility will have higher environmental awareness. Compared with other questions, Question 3 (I am easily attracted to products with environmental

4.2.2. Path Analysis

Table 4 also shows the results of path analysis for the factors.

- (1). The t-value of EA to PI is 1.833 and the p-value is 0.067 (> 0.05), indicating that the impact of EA on PI has not reached a statistically significant level, which means that H₁ was not supported.
- (2). The t-value of GR to PI is 0.690 and the p-value is 0.490 (> 0.05), indicating that the impact of GR on PI has not reached a statistically significant level, which means that H₂ was not supported.
- (3). The t-value of ATB to PI is 0.615 and the p-value is 0.539 (> 0.05), indicating that the impact of GR on PI has not reached a statistically significant level, which means that H₃ was not supported.
- (4). The t-value of SN to PI is 4.410 and the p-value is 0.000 (< 0.05), indicating that the impact of SN on PI has reached a statistically significant level, which means that H₄ was supported.
- (5). The t-value of PBC to PI is 5.759 and the p-value is 0.000 (< 0.05), indicating that the impact of PBC on PI has reached a statistically significant level, which means that H₅ was supported.
- (6). The R² is 0.683 which indicates that those five predictors can explain as much as 68.3% variations in PI.

Furthermore, the regression equation obtained is displayed in Formula 1 below:

$$PI = -0.670 + 0.165 EA + 0.045 GR + 0.061 ATB + 0.408 SN + 0.417 PBC + e \dots\dots\dots (1)$$

- protection claims) with the lowest score (5.73), indicates that the product is not the primary consideration for buyers. The possible reason is that the air pollution prevention equipment manufacturers might increase the price.
- (2). In the GR measure, Question 4 (I think companies that don't meet air pollution prevention standards should be punished) with the highest score (5.92), indicates that the buyers believe that the air pollution prevention equipment should meet the basic government standards. Compared with other questions, Question 2 (I understand the current air pollution emission

standards set by the government) with the lowest score (4.41), indicates that the buyer's knowledge of air pollution emission standards is obviously insufficient, which may be due to insufficient publicity of current government regulations.

- (3). In the ATB measure, Question 2 (I think the use of air pollution prevention equipment can fulfil the environmental responsibility) with the highest score (6.15), indicates that the buyers agree that air pollution prevention equipment can improve the environment. Compared with other questions, Question 5 (I would like to purchase recycled air pollution prevention equipment) with the lowest score (5.53), indicates that the buyers advance towards the purchase of newer and better air pollution prevention equipment. The possible reason is that the efficiency and standards of the recycled equipment might not meet the regulations.
- (4). In the SN measure, Question 5 (Government regulations will affect my purchase of air pollution prevention equipment) with the highest score (5.84), indicates that buyers' subjective consciousness will affect their intention to purchase air pollution prevention equipment because of government regulations. Compared with other questions, Question 4 (My supervisor will agree to purchase air pollution prevention equipment) with the lowest score (5.39), indicates that the buyers regard that the supervisor's willing to purchase air pollution prevention equipment is due to legal reasons, rather than their own environmental awareness.
- (5). In the PBC measure, Question 4 (It's easy for me to buy the air pollution prevention equipment) with the highest score (5.52), indicates that the buyers do not consider the difficulty of purchasing air pollution prevention equipment. Compared with other questions, Question 2 (I have enough knowledge to use air pollution prevention equipment) with the lowest score (4.54), indicates that the buyers regard that although it is easy to purchase the air pollution prevention equipment, they still lack the judgment on whether the air pollution prevention equipment meets the actual needs or regulations. The possible reason is that the buyers might be lack of air pollution prevention knowledge.
- (6). In the PI measure, Question 3 (I would recommend someone to buy air pollution prevention equipment) with the highest score (5.49), indicates that the buyers believe that air pollution control equipment is positive and effective for air improvement. Compared with other questions, Question 2 (I plan to purchase air pollution prevention equipment) with the lowest score (5.09), indicates that the buyers will not actively plan to purchase air pollution prevention equipment because of environmental awareness. The possible reason is that the purchase of air pollution prevention equipment is too professional to understand regarding the knowledge.

5.2. The Main Effect of Factors on PI

The results of regression analysis show the impacts of EA, GR, ATB, SN, and PBC on PI. Among these factors, only the SN and PBC have positive and significant effects on PI. Meanwhile, EA, GR, and ATB have no positive and significant effects on PI.

- (1). The buyers with high EA did not increase their willingness to purchase the air pollution prevention equipment. The possible reason is that the buyers with high EA may not be able to purchase the equipment themselves, thus they need to consider the evaluation of the company and the supervisor.
- (2). The buyers with high understanding about GR did not increase their willingness to purchase the air pollution prevention equipment, because most companies generally choose the air pollution prevention equipment that can meet the minimum standards due to cost considerations.
- (3). The buyers with high ATB also did not increase their willingness to purchase the air pollution prevention equipment. The possible reason is that the performance and standards of the recycled equipment can't meet the latest regulations, and the performance is not sufficient, resulting in poor results.
- (4). The buyers with high SN did significantly increase their willingness to purchase the air pollution prevention equipment. The opinions of friends and supervisors, as well as the government regulations will affect the buyers' willingness to purchase the air pollution prevention equipment.
- (5). The buyers with high PBC also did significantly increase their willingness to purchase the air pollution prevention equipment. The buyers, who have more decision-making power and understanding about the air pollution prevention equipment, will have higher willingness to purchase the product.

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