

A study of consumer purchase decision of electrical home appliance with emphasize on marketing mix and electric energy sustainability.

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Marketing mix, buying factors, energy efficiency, consumer perception, electric energy sustainability.

Abstract

Electric energy field drives the economy of a nation across the globe. Electric energy plays a crucial role in overall rapid developments, innovations and in facilitating comfort while carrying out any task with electrical appliances all around. It helps to reduce the time required to perform any task and human physical efforts to a great extent.

Other aspect of it is , considerable amount of electric energy is consumed in residential area. One of the ways to achieve sustainability in the electric energy resource is through achieving energy efficiency when it is being used in residential sectors. There is a scope to conserve around 50 % of the available energy by achieving energy efficiency. Keeping this in view, the research study has been performed considering various marketing aspects in providing energy efficient electrical home appliances.

Findings of this study reveal that there is an influence of demographic, socio-economic factors, marketing mix, buying situational factors and consumer perception towards electric energy sustainability on the purchase of electrical home appliances. The study also recommends consumer precise literacy regarding the benefits of energy efficient appliances.

Introduction

Electric energy is the most crucial part in human civilization across the globe. Each individual on the mother earth need electric energy to carry out daily household chores. Currently there are many developments and improvements taking place as far as economy, gross domestic product, spending power of individuals is considered .This has lead to increase in energy requirement. Energy requirement is increasing year on year, it would be almost double in the business as usual scenario. However this affects environment, health, leads to pollution and exhaustion of fossil fuels . This signifies the need for the initiatives to arrive at electric energy sustainability by achieving energy efficiency through electrical home appliances in residential sector.

Marketers have a major role to play by providing energy efficient electrical home appliances to all segments possible. This will lead to achieve energy efficiency to a great extent. The reason being, around half of the total energy generated is consumed in residential area. In this scenario it is evident that there should be marketing efforts need to be taken to achieve energy efficiency. Hence study of demographic , socio economic factors, marketing mix, identifying important buying factors becomes important. It is interesting to see whether demographic and socio-economic factors such as age , income , occupation, gender , marital status have influence on the purchase of energy efficient electrical home appliances . It is seen that attractive promotion and advertisement have a crucial role in influencing consumer purchase decision. When consumers are at a dealership to purchase an appliance, it will be useful to know whether there are some situational buying factors which influence their purchase decision. Presently consumers are more aware about electric energy sustainability. It is beneficial for everyone. A relationship between consumer perception towards energy sustainability and their actual purchase of energy efficient electrical home appliance is also valuable to know.

Literature review

Dr. G Sugunavalli (2019) - Consumers prefer convenient home appliances. In present scenario of electrical home appliances market, there are no constraints remained as it used to be 15 years before, that majority of the electrical home appliances consumers belong to higher class. Middle class families also buy costly electrical home appliances having good quality.

Suneel Sharma et al(2017) - The objective of this research was to find out the influence of five factors; these are technology, privacy and control, awareness, social factors and interoperability. While buying, consumer need awareness on usage of the appliances .They also need to be briefed up about longterm appliance benefits. There are five factors that influence consumer

purchase intention; interoperability, privacy and control, technology, awareness and social factor. Marketers should pay attention to interoperability, privacy and control while providing appliance information to consumers. This helps in sales conversion.

S.Manivasagan et al (2016) - Family members play an important role in making an appliance purchase decision. They are attracted towards attractive advertisements rather than just sales talk . Hence marketers should focus on advertising so that it attracts consumers. Incentives may be given along with the appliance in order to attract the consumers. This will result in increase in sales. Manufacturers must try to improve quality and performance feature of the product because consumers are influenced by the same .

Dr. Debasis Ray et al (2015) - The study was carried out regarding influences of internal and external buying factors on customers' purchase decision of electrical home appliances . It has evaluated the factors on age, gender, education, occupation, social, class, status and convenience, self concept and their influence on consumer purchase decision. It is found that occupation, life style, psychographic factors, and value are significant influencing factors .This are useful for market segmentation. Marketers should focus consumers on the basis of occupation and life style .The study also suggests quality and product features are crucial factors for purchase decision.

M.S.Susai Raj et al (2015) - Consumers are aware of various appliance brands. Demographic factors such as qualification, income and occupation influence consumer buying behavior

towards the purchase of home appliances. Consumers have given priority to brand , quality, price durability and celebrity endorsement .There is significant relationship between monthly income and the purchase of refrigerator and washing machines. Presently in this digital world, home appliance is not a luxury item but a necessity.

Tanushree Banerjee et al (2015) –The study is done to understand the factors influencing purchase of star rated appliances . Consumers make the final purchase decision for star rated appliances on combination of variables. The study has evaluated important buying factors as considered by consumers while purchasing star rated appliances. Here decision variables considered are ; brand name, appliance label, looks; suggestions from their family and friends , influence of salesperson, their own research prior to the purchase; festival offers, easy installment schemes and free gifts. The decision variables such as consumers' prior research on appliances and free gifts are important in influencing their purchase decision for a star rated appliance.

Anne Immonen et al (2020) – This research study consists of determination planned program of energy companies. This ascertains the supportive situation for electric energy sustainability. The results have lead to identify the current situation of consumer attitudes regarding future scenario. It is also known, their readiness to be proactive in energy market. The results lead energy marketers to plan their future business and address the relevant issues. Majority of consumers are keen for the development in energy sector. More than half of the respondents have positive views towards smart devices. These consumers are ready to change their energy consumption pattern. Quarter of the respondents have concerns regarding the environment also. They hope that such initiatives will support in reducing Co2 emissions. Lack of knowledge and prior experiences are clearly seen in consumer responses. The companies should emphasize on consumer education. This would lead to convert into active consumer participants in residential energy sector.

P. Janaki et al (2013) - The study shows that education and income of the respondents are the two socio-economic variables which have significant association in all the stages of consumer buying process. Education helps to impart knowledge and understanding. Effective marketing mix elements, comprises of product mix; appearance, quality, product performance,

energy efficiency and band name . Effective promotion mix is; attractive advertising, word of mouth and celebrity endorsements. Place mix should consist of; trustworthiness of dealer, appliance installation and door delivery. Price mix should have composition of reasonable price, credit and offers.

Scope of the study

Selected appliances are considered for the study. These are air conditioner, refrigerator, washing machine, television, fans and water heater .

The study is carried out in Pune city.

The survey is carried out among consumers of the electrical home appliances.

Demographics factors, marketing mix and consumer perception towards electric energy sustainability and purchase decision are considered as area of the study.

Limitations

The study is based on the data provided by consumers and it is assumed to be unbiased.

The study has considered only the residential sector.

Research Methodology

Research design: Descriptive Research Design

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Sampling: Simple random sampling

Sample size: 654

Research instrument: Questionnaire

Questions: Multiple choices, dichotomous questions, rating scale and Likert scale and one open ended.

Primary data: Consumers of electrical home appliances

Secondary data: Research papers, research articles, multiple sources on internet, reports on electric energy.

Objectives

1. To study demographic factors with reference to the purchase of energy efficient electrical home appliances.

Demographic factors considered for the study are: Age, Gender, Income, Marital status and Profession. Out of all these factors, income influences the purchase of star rated electrical home appliances.

		Crosstab						
		Income						
		1-5	5.01-10	10.01-15	15.01-20	Above 20	Total	
Purchased EEA	No	Count	40	22	26	16	3	107
		% within Purchased EEA	37.4%	20.6%	24.3%	15.0%	2.8%	100.0%
		% within Income	12.8%	11.7%	26.5%	32.0%	60.0%	16.4%
Yes	Count	273	166	72	34	2	547	
		% within Purchased EEA	49.9%	30.3%	13.2%	6.2%	0.4%	100.0%
		% within Income	87.2%	88.3%	73.5%	68.0%	40.0%	83.6%
Total	Count	313	188	98	50	5	654	
		% within Purchased EEA	47.9%	28.7%	15.0%	7.6%	0.8%	100.0%
		% within Income	100.0%	100.0%	100.0%	100.0%	100.0%	100.0%

The income groups 5.01-10 and 1-5 lakhs per annum have purchased to a maximum extent of 88.3% and 87.2% respectively % within income as seen in the table. Other income groups 10.01-15 and 15.01-20 and Above 20 lakhs per annum have purchase percentage ; 73.5%, 68.0% and 40.0 % . Young generations are in the income group 1-5 and 5.01-10 lakhs per annum. These consumers have purchased energy more energy efficient electrical home appliances than the other.

2. To study marketing mix with reference to the purchase of energy efficient electrical home appliances.

Percentage of responses on Likert scale were obtained for marketing mix; product, price, place and promotion.

Variables considered for the product mix are: appliance safety, appliance capacity, appliance size and appliance look.

		\$ProductMix Frequencies		
		Responses		Percent
		N	Percent	of Cases
Product Mix^a	Strongly disagree	119	4.50%	18.20%
	Disagree	122	4.70%	18.70%
	Can't say	463	17.70%	70.80%
	Agree	1159	44.30%	177.20%
	Strongly agree	753	28.80%	115.10%
Total		2616	100.00%	400.00%
a. Group				

Variables of price mix are: Appliances price, spare part price and service charges.58% of consumers (% costly + % very costly) say that the appliances are costly. It is seen from the following table.

\$PriceMix Frequencies				
		Responses		Percent
		N	Percent	of Cases
Price Mix^a	Not costly at all	78	4.00%	11.90%
	Not costly	290	14.80%	44.30%
	Can't say	451	23.00%	69.00%
	Costly	858	43.70%	131.20%
	Very costly	285	14.50%	43.60%
Total		1962	100.00%	300.00%
a. Group				

Variables of the place mix are; convenient dealership location, conveniently placed appliances, easily visible online, convenient to move across in dealership and shopping complex.

\$PlaceMix Frequencies				
		Responses		Percent
		N	Percent	of Cases
Place Mix^a	Strongly disagree	90	2.80%	13.80%
	Disagree	564	17.20%	86.20%
	Can't say	514	15.70%	78.60%
	Agree	1697	51.90%	259.50%
	Strongly agree	405	12.40%	61.90%
Total		3270	100.00%	500.00%
a. Group				

Variables for advertising and promotion are; company website, newspaper, Magazine, television, handout, commercial website, social media, offers and discount.

\$PromotionMix Frequencies				
		Responses		Percent
		N	Percent	of Cases
Promotion Mix^a	Strongly disagree	182	3.50%	27.80%
	Disagree	638	12.20%	97.60%
	Can't say	940	18.00%	143.70%
	Agree	2537	48.50%	387.90%
	Strongly agree	935	17.90%	143.00%
Total		5232	100.00%	800.00%
a. Group				

The responses, 'strongly agree' and 'agree' facilitate to understand consumers degree of favorable response towards product mix, price mix, place mix and promotion mix.

3. To determine buying factors for the purchase of electrical home appliances

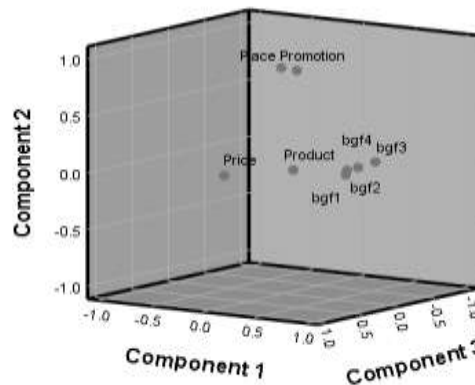
Factor analysis by principle component matrix is carried out to determine the situational buying factors and marketing mix. Apart from marketing mix elements, other factors are situational buying factors.

Rotated component matrix method is used to determine situational buying factors.

Rotated Component Matrix^a			
	Component		
	1	2	3
Warranty	0.766	0.082	0.217
Customer support	0.793	0.052	0.272
Finance scheme	0.707	0.08	-0.259
Ease in buying	0.79	0.092	0.101
Product	0.486	0.106	0.559
Price	0.019	0.052	0.844
Place	0.032	0.89	0.077
Promotion	0.156	0.873	0.036

Extraction Method: Principal Component Analysis.
 Rotation Method: Varimax with Kaiser Normalization.
 a. Rotation converged in 4 iterations.

Component Plot in Rotated Space



4. To determine a relationship between consumer perception towards electric energy sustainability and their actual purchase of energy efficient electrical home appliances.

One-Sample t-Test is used to test whether a population mean is significantly different from the hypothesized value (3). Higher the difference in mean and the test value (3) on five points Likert scale, positive is the outcome. Here negligible mean differences are seen with p-value less than

0.05. In addition to this, mean difference values are positive. This indicates, consumers have favorable perception towards electric energy sustainability.

One-Sample Test						
Test Value = 3						
Consumers' electric energy sustainability perception	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence	
					Lower	Upper
Favorable Government	17.46	653	0	0.7	0.59	0.75
Manufacturing	22.34	653	0	0.8	0.75	0.89
Dealerships take efforts	18.17	653	0	0.7	0.61	0.76
Electrical home	24.97	653	0	1.0	0.88	1.03
Favorable Market	26.59	653	0	0.9	0.86	1

Mean values of consumer perception are as seen in the table .

Descriptive Statistics			
Consumers' electric energy sustainability perception	Mean	Std. Deviation	N
Favorable Government policies	3.67	0.981	654
Manufacturing companies take efforts	3.76	0.925	654
Dealerships take efforts	3.69	0.968	654
Electrical home appliances are energy efficient	3.92	1.046	654
Favorable Market dynamics	3.87	0.853	654

Correlation of consumer perception towards electric energy sustainability and their actual purchase of energy efficient electrical home appliance are shown below.

Correlations							
Consumers' electric energy sustainability perception except column one		Purchased Energy efficient appliance	Favorable Government policies	Manufacturing companies take efforts	Dealerships take efforts	Electrical home appliances are energy efficient	Favorable Market dynamics
	Pearson Correlation	1	.135**	.230**	.152**	.509**	.353**
	Sig. (2-tailed)		0.001	0	0	0	0
	N	654	654	654	654	654	654

** . Correlation is significant at the 0.01 level (2-tailed).

The elements Energy efficient electrical home appliances are available in the market has a strong strength of relation with the purchase, that is 0.509 as compared to other elements. It is followed by favorable market dynamics, 0.353.

Dealership take efforts has low strength of relationship; 0.152.

Hypotheses Testing

Ha I. There is an association between consumer demographics and purchase of energy efficient electrical home appliances.

Demographics	Percentage	Value	df	Pearson Chi-Square Asymptotic Significance (2-sided)
Age	a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 9.25.	1.435 ^a	3	0.697
Gender	a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 31.00.	.863 ^a	1	0.353
Income	a. 2 cells (20.0%) have expected count less than 5. The minimum expected count is .86.	41.833 ^a	4	0.000
Marital status	a. 0 cells (0.0%) have expected count less than 5. The minimum expected count is 31.85.	.182 ^a	1	0.731

From the table above it is seen that, there is significant association between Income and purchase of energy efficient electrical home appliances of the consumers as the p value is 0.00 i.e. less than 0.05. Hypothesis is accepted in this case of 'Income'.

There is no association between Purchase of energy efficient appliance and Age, Gender and Marital status as their p values are 0.69, 0.35 and 0.73 respectively which are more than 0.05.

Ha II. There is a significant relationship between purchase of energy efficient electrical home appliances and Marketing mix

Purchase – Marketing mix

Table 13

		Correlations			
		Product	Price	Place	Promotion
Purchased Energy efficient appliance	Pearson Correlation	.479**	.332**	.124**	.133**
	Sig. (2-tailed)	0	0	0.002	0.001
	N	654	654	654	654
** . Correlation is significant at the 0.01 level (2-tailed).					
* . Correlation is significant at the 0.05 level (2-tailed).					

Here the hypothesis that, 'There is significant correlation between the purchase of appliance and marketing mix.' is accepted.

It is also seen that there is significant correlation between purchase of the appliance and Product mix and Price mix as their correlation values are 0.479 and 0.332 respectively.

The strength of correlation between purchased of the energy efficient electrical home appliance and place and promotion are 0.124 and 0.133. These marketing mix elements have weak strength with the purchase of the appliance.

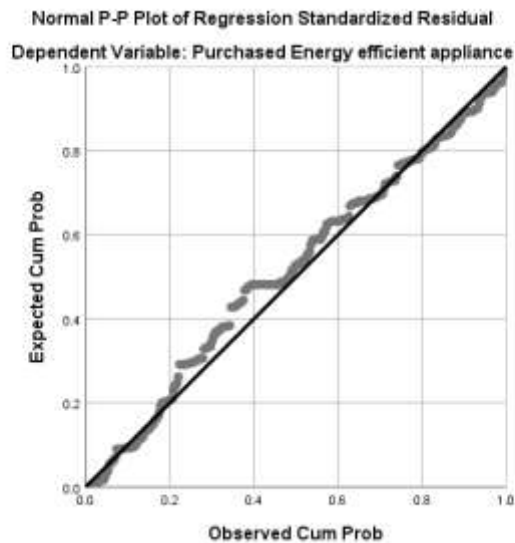
Ha III. Consumer perception towards electric energy sustainability influences their purchase decision for energy efficient electrical home appliances.

Model Summary^b				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.558 ^a	0.312	0.307	0.775
a. Predictors: (Constant), Favorable Market dynamics, Dealerships take efforts, Electrical home appliances are energy efficient, Favorable Government policies, Manufacturing companies take efforts				
b. Dependent Variable: Purchased energy efficient appliance				

From the table it is seen that R Square value = 0.312. Hence it is concluded that there is low impact of consumer perception towards electric energy sustainability on their actual purchase of the appliance.

ANOVA^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	176.346	5	35.269	58.724	.000 ^b
	Residual	389.185	648	0.601		
	Total	565.531	653			
a. Dependent Variable: Purchased Energy efficient appliance						
b. Predictors: (Constant), Favorable Market dynamics, Dealerships take efforts, Electrical home appliances are energy efficient, Favorable Government policies, Manufacturing companies take efforts						

The hypothesis that , ‘Consumer perception towards electric energy sustainability influences their purchase decision for energy efficient electrical home appliances’, is accepted . p value is less than 0.05 that is 0.00



Findings

Income influences the purchase of star rated electrical home appliances. Respondents with different income slabs; 1 to 5 lakhs, 5.01 to 10 lakhs and 10.01 to 15 lakhs have the extent of 87.2% and 88.3 % and 73.5% within income group for star rated appliance purchased.

One of the important reason behind this is, young generation are purchasing in present cenario.I this scenario , there are more enrgy efficient electrical home appliances.

Elder generations have already purchase the appliances in past, when there was not much awareness and prevalence of energy efficient appliances.

Age, Gender and Marital status have no significant influence on the purchase of star rated appliance.

Percent cases for product mix, the responses , ‘agree’ and ‘strongly agree’ are 44% and 28% , for price mix; ‘costly’ and ‘very costly’ are; 43.7 % and 14.5 % , for place mix ‘agree’ and ‘strongly agree’ are ; 51.9 % and 12.4 % and for promotion ‘agree’ and ‘strongly agree’ are 48.5 % and17.9 % respectively.

Important situational buying factors i.e. the factors that influence consumer purchase decision when they are at dealership, determined are ; warranty - 0.766, customer support - 0.793, finance scheme – 0.707 and ease in buying – 0.790.

R square value = 0.312 signifies that, though consumers have favorable perception towards electric energy sustainability, it does not lead to a definite purchase of energy efficient electrical home appliance.

Even if all the programs and effective policies are implemented by the Government for optimum utilization of energy, it is not visible in the correlation analysis.

Conclusion and Discussion

The factor, ‘Income’ has an association with the purchase of energy efficient electrical home appliance. The consumers having income around 10 lakhs per annum , buy star rated electrical home appliances, even if their prices are higher than the appliances not having star rating .

A benchmark can be set for acceptance level of marketing mix based on the responses , ‘Agree’ and ‘Strongly agree’ . Please refer Tables 3, 4, 5 and 6. And the marketing mix which is below the desired level can be paid attention to.

Majority of the consumers say that the energy efficient electrical home appliances are costly. It should be tried to be minimized. There are areas such as component cost, imports, logistics, technological developments which can be considered to minimize the cost of the appliance.

Buying situational factors; warranty, customer support, finance scheme and ease in buying can be tried to be focused and always tried to be made them effective.

Efforts can be made to convert a favorable consumer perception towards electric energy sustainability into their assured purchase of the energy efficient appliance. Dealership can take effective steps to have favorable consumer perception regarding their efforts. One of the better options is through effective marketing strategies based on buying factors and marketing mix.

Further scope of research

A further scope of the research in this area of energy efficient appliance purchase can be mentioned as ;

A research study can be carried out considering maximum possible socio economic and demographic factors and their association with the appliance purchase.

A study that can carried out which would determine the relationship between buying factors and purchase of energy efficient appliance can be carried out.

A study can be done on the efforts for favorable consumer perception towards electric energy sustainability and its assured impact on purchase of energy efficient electrical home appliances.

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