CONSUMER'S WILLINGNESS TO PURCHASE GREEN HOME APPLIANCES

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Last, but not the least, bountiful thanks to my dear friends whose help and support helped me navigate each stage of the learning process with lesser stress. My heartfelt thanks and gratitude to all the great minds and kind hearts who helped me in this rewarding and fulfilling journey.
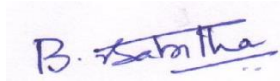
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DECLARATION BY AUTHOR

I hereby declare that this submission is my own work and that, to the best of my knowledge and belief, it contains no material previously published or written by another person nor material which has been accepted for the award of any other degree or diploma of the university or other institute of higher learning, except where due acknowledgment has been made in the text.

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THESIS COMPLETION CERTIFICATE

This is to certify that the thesis on **"Consumer's willingness to purchase green home appliances"** by **B. Sabitha** in Partial completion of the requirements for the award of the Degree of Doctor of Philosophy (Management) is an original work carried out by her under our joint supervision and guidance.

It is certified that the work has not been submitted anywhere else for the award of any other diploma or degree of this or any other University.

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EXECUTIVE SUMMARY

'Energy saving, reducing carbon emissions, rationalising power consumption are some of the topics that are garnering critical attention in global environmental meets and green research. While so much of damage has been done to nature in the course of development, environmental concern is also on the rise which has been partly contributed by the awareness on environmental degradation. Like other countries, the UAE is also combatting this detrimental and regressive issue. The country has been ranking high on energy consumption per capita, emissions per capita and among ecologically wasteful countries in the past decade. There has been a multitude of factors responsible for UAE to rank high on such unsustainability indices, the main reason being the abundant availability of the hydrocarbon reserves leading to cheap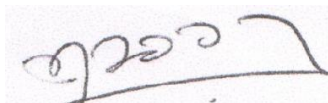er fuel costs, the negligent attitude of the residents towards the surplus reserves and lack of awareness. The UAE is one of the world's major consumer of electricity. In September 2012, the UAE was reported to be using 225% more energy than Europe, and its per capita carbon footprint was four times higher than average worldwide. The country also has the highest energy consumption per capita in the world at 20-30 kilowatt hours per day while the global average is 7-15 kilowatt hours per day.

Realizing the dire need to check the appalling power consumption statistics, the Government along with the utility provider and the corporate rolled out series of green initiatives to inform and educate the consumer on the need to rationalize consumption. The Government took serious measures to uplift the country's green image like that of housing the renewable energy research centre, IRENA and establishing the world's model sustainable city with least emission levels – Masdar on its soil. There were strategic green measures taken which included policy changes and incorporating organisations to facilitate green growth, legislative measures taken to provide a legal framework through regulations that support the country's green agenda, rewards and recognitions to encourage green adoption; all aimed to amend the country's green statistics. Plans are upfront in developing the nation into a hub of alternative energy and green research. With the launch of key initiatives such as the 'Green Economy

for sustainable development', the aim of UAE is to become a world leader in the export and re-export of green products and technologies.

In such a scenario, it is highly imperative to tap all means to bring down the consumption level to normal limits. One such effective measure is to rationalise consumption at user level. Awareness begins at home. A household is the building block of the society and home appliances are the main power consumers in a household. Hence they are the best means to save energy at a household level and achieve a reduction in per capita power consumption. If the household units save energy, the nation saves the energy and thereby the ideal place to initiate the green change at the consumer level is through the home appliances sector. According to the Ecological Footprint Initiative, the household sector is the main contributor to UAE's ecological footprint at 57% and according to the utility provider Dubai Electricity and Water Authority, the residential sector is the second highest power consuming unit. Awareness and adoption of green home appliances can significantly reduce power consumption and offer scope for considerable power savings in the country. Appliances more than 10 years old are clunkers as they use up most of the energy. If consumers replace them with energy efficient appliances, it will not only save billions of kilowatts of energy annually but also billions of tonnes of carbon emissions globally. Most of the home appliances have a longer life. Hence its medium to long term benefits should be weighed while making a purchase decision.

The literature review provided substantial evidence on the potential power and monetary savings that could be achieved by emulating the best practices followed by countries like the US which has saved significantly by switching to energy consumption rated home appliances. Ample research has been done in countries around the world on consumer attitude, behaviour, purchase intention and factors influencing the purchase of green products. The major factors which were reported to be influencing green purchases in most of the research studies done were environmental concern, awareness, preference, price, demographic and psychographic factors. Although the topic was researched more on the generic level as 'green products', limited literature was also available in specific categories like food, consumer durables, FMCG etc. However, the consumer

perspective of saving energy by using green home appliances was found to be a rarity. While research aimed to understand consumer understanding, perceptions and acceptance were richly available in other countries, there was a dearth of such research in UAE context. With the country's staggering consumptions statistics, such research is the need of the hour. Literature review also revealed that the country has a very dynamic consumer electronics market, owing to its strategic location, multicultural environment, higher propensity to spend on consumer electronics, major electronic companies having its presence in the country and the many electronics shopping promoting festivals, big retail chains and higher usage rate. While a series of green campaigns has been initiated by various stakeholders aimed to educate the consumer on the need and benefits of responsible consumption, the influence of these campaigns on the consumer has not been examined. The research gaps identified were clubbed into one gap as "the awareness, preferences and willingness to pay for green home appliances has not explored across demographic segments in UAE" and the study aims to address this gap.

Based on the Research gap, the business problem was ascertained as "Despite various green initiatives and a vibrant consumer electronics market, consumer adoption of green home appliances is still lagging behind contributing to the high power consumption and monetary loss to the individual and the country". Research problem was framed as "How much are consumers aware of, prefer and willing to pay more for green home appliances in UAE?" Subsequently, the research question were formulated as to "what is the level of awareness and preference for green home appliances among the consumers and whether demographic factors affect consumers' willingness to pay more for GHA. Theoretical models were reviewed to study the research questions. The scenario replicates a situation where marketing communication assessment models could be used to assess the impact of various green campaigns targeted at the consumer. The hierarchy of effects model was used to evaluate the awareness, preference and willingness to pay more for the GHA among the consumer. Following the literature review done on communication assessment models, the suitability and applicability of various models was checked against the research

questions and the variant of the AIDA model – the CAB model was found to be most appropriate for studying the consumer awareness, preference and WTP for GHA among the consumers in UAE. The three research objectives were to determine the awareness, preference and influence of demographic factors on WTP for GHA among the Consumers.

Dubai was taken as the sampling area. The sample size was calculated based on Taro Yamane's formula and estimated to be 210. Stratified random sampling was used to represent the Emirate's multicultural strata's and convenience sampling was used to draw responses from each stratum, in proportion to the population. A structured questionnaire which was pilot tested was used as research instrument. Tests of reliability and validity were done to ensure the quality of the research instrument. The primary data was collected over a period spanning three weeks and was subjected to analytical treatments to find answers to the research objectives.

The findings revealed the moderate level of awareness (56%) and a lesser level of preference (51%). WTP more was found to be even lesser (46%). The most preferred premium range was 0-5%. Demographic factors were found to influence the consumer purchase of GHA and the extent of willingness to pay premium among demographic segments was established. Hypothesis testing was done and it was found that among the nine hypothesis formulated, only one (influence of marital status on willingness to pay premium) was failed to be rejected which falls in line with our findings. The findings, 56%-51%-43% also replicate the inverted triangle model of the CAB model which shows tapering effect from awareness to preference to willingness to pay.

The findings of this research could serve valuable inputs in identifying demographic segments which had reported a lower level of awareness. The findings provide vital information in understanding the target group which needs to be informed and made aware on the benefits of going green. The marketing communication strategy could be planned to address this group. Also, the study has highlighted the preference factors and the preferred premium range which could provide insightful information on branding and pricing

strategies. Apart from the social, economic and corporate perspective, the study also has provided valuable inputs to the academia. It has attempted to bridge the research gap and pave the way for a green research study in UAE addressing a serious environmental and cost saving issue. Besides it has also attempted in providing an improvised CAB model with inputs from literature review suitable for evaluating consumer's cognition, affect, and behaviour in purchase in green purchases. The study also contributed by laying down series of suggestions in the role played by Government and utility, in product, pricing , retailing and promotional strategies of the corporate. The study has made a series of recommendations based on the findings as well.

LIST OF ABBREVIATIONS

UAE	:	United Arab Emirates
DEWA	:	Dubai Electricity and Water Authority
ADWEA	:	Abu Dhabi Water and Electricity Authority
GDP	:	Gross Domestic Product
MENA	:	Middle East and North African
ESMA	:	Emirates Authority for Standardisation and Metrology
IRENA	:	International Renewable Energy Agency
SCE	:	Supreme Council of Energy
DCCE	:	Dubai Carbon Centre of Excellence
WGES	:	World Green Economy Summit
DGEF	:	Dubai Global Energy Forum
ADSG	:	Abu Dhabi Sustainability Group
ZFEP	:	Zayed Future Energy Prize
EEA	:	Emirates Energy Awards
MW	:	Megawatts
GCC	:	Gulf Cooperation Council
EQM	:	Emirates Quality Mark
ECAS	:	Emirates Conformity Assessment Scheme
DED	:	Department of Economic Development
MoU	:	Memorandum of Understanding
GHA	:	Green Home Appliances
AIDA	:	Awareness, Interest, Desire and Action
CAB	:	Cognition Affect Behaviour
WTP	:	Willingness to pay
WTPP	:	Willingness to pay premium
ANOVA	:	Analysis of Variance

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CHAPTER 1: INTRODUCTION

1.1 Background

"Green" has been the buzz word ever since the issues such as climatic change, pollution, and resource scarcity started garnering attention and concern at global meets. These issues surfaced as a result of the slackened human attitude towards the environment and started manifesting in different forms creating alarm and an overwhelming surge in concern across the globe. Governments, environmentalists, social activists and researchers started advocating the need for pro-environmental behaviour and corrective action to combat the ill effects caused due to negligent and nonchalant approach towards the environment. High energy consumption, higher ecological footprinting and rising carbon emissions have taken a toll on the energy reserves and environment. It has presented us with this perplexing question that while we think of leaving behind us wealth for the next generations, are we leaving behind a planet capable of sustaining and supporting life for the future generations. There are many factors which have led to the dire status we are in. The easy availability of non-renewable resources, lack of awareness, lack of strong regulatory framework all were contributory forces which led to the negligence towards the environment.

The United Arab Emirates (UAE) has the pride of holding the world's sixth largest oil reserves and the fifth largest natural gas reserves [1]. The hydrocarbon-rich country overlooked the impact of its generous and non-prudential usage of its rich reserves. The need to think about conservation was never felt as shortage was not anticipated. The repercussions surfaced in the form of high ecological and carbon footprinting, as a result of which the country was consistently ranked high among the list of world's ecologically wasteful countries, among countries with high carbon footprinting and energy consumption per capita [2]. Ecological footprint is a way of gauging a country's sustainability by comparing the usage of its natural resources per resident per capita and is denoted as a unit of bio-productive land which is called as the 'global hectare' (gha). The corrective measures and green initiatives that were taken by the Government showed some positive change as the country slided

down from the top position to the third place in 2012. The footprint per person living in the UAE has shown a decline from 9.5 global hectare in 2010 to 8.4 global hectare in 2012. The UAE was placed third in the Living Planet Report 2014 with the ecological footprint going down to 7.75 global hectares per capita. [3]. The world wide fund for nature (WWF) has been producing a report titled 'the living planet report' which is a biennial study focussing on the issue of global ecological footprint. For the past fourteen years UAE has been securing a dominant position in this report. The country ranked high in the list of countries with maximum emissions per capita in the 2000s. There was an increase of 25% in total carbon release between the years 2006 and 2008 as well as a surge of 20% in per capita emissions during this tenure [4]. UAE has been reported to be one among the countries with utmost carbon footprints in the world [5]. As per the UAE State of Energy Report published in January 2015, the country has produced around 20 tonnes of CO_2 emissions per person in 2010, which was 63 percent more than the CO_2 emissions produced per person in 2000. Likewise, the country's per capita greenhouse gas emissions stood at 24.16 tonnes, according to the report. [6]. The UAE released 199.65 million tonnes of carbon dioxide and other greenhouse gases in 2013 according to the Ministry of Energy[6]. The alarming energy consumption statistics of Dubai as provided by the utility (Dubai Electricity and Water Authority) reveal that an average person consumes 20,000 kilowatt-hours of energy per year [7]. This figure is 82 percent higher than the global average and is more than three times the average per capita consumption recorded in the European Union [8]. According to Heliocentris, a German market leader in energy saving solutions, approximately 1.8 billion megawatt hours of energy was utilized by the country to produce an annual GDP of $377 billion in 2013 [9]. This energy equivalent was sufficient for powering all the households in the country for over 15 years and approximately powering a whopping 70 million households a full year [9]. According to a research report by World Resources Institute, the country has extravagantly used 481 tonnes of oil equivalent ("toe") for every $1m of its GDP in 2013. While a country like Japan which has more urban population like UAE only uses 154 toes for every $1 million of GDP which reflects the dire need to rationalise consumption. The energy consumed to

achieve a total annual GDP of $377 billion in 2013 equates to an astonishing 1.8 billion Megawatt-hours [9]. The comparison of consumption figures with the world standards highlight the staggering amount of energy wasted and the potential to curb the wastage.

In spite of these discouraging environmental statistics and global ranking, UAE is resolute on altering its green index and is opting for sustainability in a big way. The Government has initiated series of plans to bring down energy consumption by 30 percent and to produce at least 25 percent of its power requirement from renewable sources like solar energy, clean coal and nuclear energy [8]. The Government has introduced various green initiatives to reduce and rationalise energy consumption. Organisations have been formed under Government directives, strategies have been laid out, awards and prizes have been instituted, stakeholders have been partnered with, energy meets are hosted, green investments are made, public awareness campaigns have been rolled out and green targets have been set. Nature has blessed the country with abundant sunshine and vast sand dunes, a great combination for tapping clean energy. The country is a sleeping giant of renewable energy waiting to be untapped and the place could be a great hub for solar and wind energy.

The Government is unleashing many green initiatives aimed to deflate the emission and consumption statistics. The first state of UAE sustainability report released by the Dubai Carbon Centre of Excellence (DCCE) in February 2016 have enumerated seventeen sustainable development goals (SDGs) surrounding 169 targets and 300 indicators along with many views and expert opinions on the best ways of attaining sustainability[10]. This is just one of the many ongoing green initiatives undertaken by Government along with its various stakeholders to uplift the country's green agenda. Few of the many green initiatives have been enlisted in the following section of the thesis.

1.2 Power Consumption Scenario

The country is at first place in the Middle East and North African (MENA) region and ranked fourth globally for the ease of accessing electricity according to the Doing Business 2015 Report published by the World Bank [11]. The UAE

is one of the world's major consumer of electricity with air conditioning being one of the main power consumers. As of September 2012, the UAE uses 225% more energy than Europe, and it's per capita carbon footprint is four times higher than average worldwide [12]. The country has the highest energy consumption per capita in the world at 20-30 kilowatt hours per day while the global average is 7-15 kilowatt hours per day [13]. The Energy Strategy 2030 aims to bring down the country's dependence on oil and gas [14]. In the last five years, Dubai's demand for energy has increased by 10% and it is forecasted to grow steadily at a pace of 5% until 2020 [15]. Dewa is the only provider of power and water for Dubai's population. Dubai energy statistics is provided in the table below:

Table 1.1 Energy Statistics - Dubai

Figures	Facts
10%	Increase in energy demand in Dubai over past 5 years
30%	Reduction in energy demands being sought by 2030
26,132 MW	Is UAE's total power capacity (2012)
Dh 20M	Being spent to upgrade all Dewa's building into
9656 MW	Is Dubai's total power capacity (2014)
7233 MW	Is Dubai's Peak Demand (2014)
2423 MW	Is Dubai's Reserve Capacity (2014)
677,751	Total base accounts of Dewa (2014)
74%	Residential accounts (2014)

Source: Dewa Annual Statistics 2014

The electricity consumption sector wise has been presented in the chart below wherein it can be noticed that the largest two consumption groups are the commercial sector with 47% followed by the residential sector with 28% consumption [111]. With the Government legislation and regulations, this sector is poised for a slowdown in consumption. Dewa has initiated many green initiatives, listed in the later section of the report, for the residential sector, all aimed to inform and educate the consumer on rational consumption.

Electricity Consumption (GWh)   2014   الكهرباء المستهلكة (جيجاوات ساعة)

- Power Station & Desal Auxillary
3,247
8.45%

- *Others
3,252
8.47%

Industrial
2,684
6.99%

- Residential
10,835
28.20%

- Commercial
18,397
47.89%
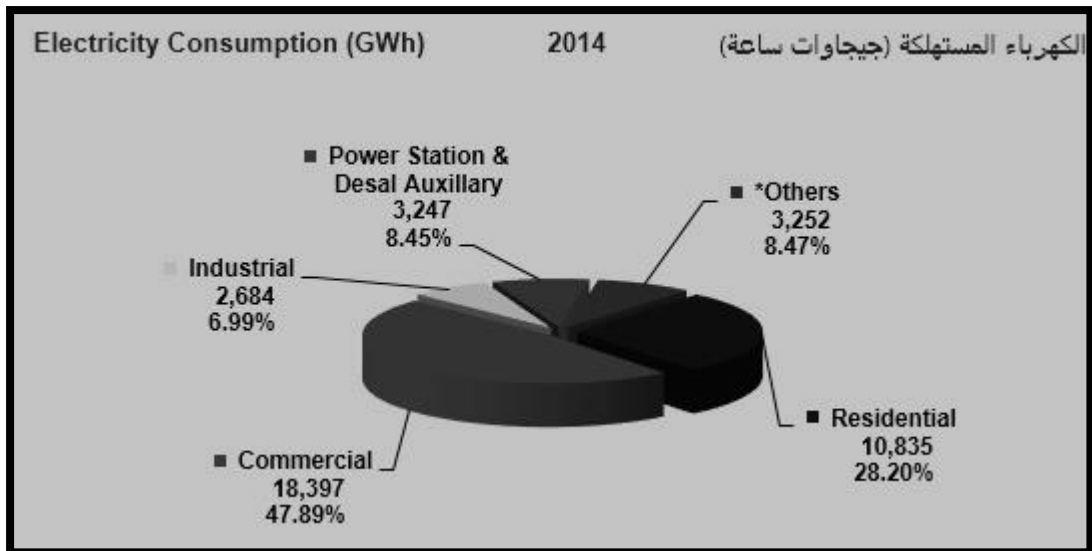
Source: Dewa Annual Statistics 2014

Fig 1.1 Electricity Consumption in Dubai

1.3 Major Green Initiatives undertaken by the Government

Numerous green initiatives are undertaken by the Government to enhance the country's green schema which could be broadly categorized into strategy and policy initiatives, forming organisations, hosting events, instituting awards, green projects, and green regulations. The major green initiatives undertaken, but not limited to, under each category has been enlisted in the following sections.

1.3.1 Strategy and Policy initiatives

Some of the strategy and policy initiatives aimed at fostering a green makeover are presented below:

The UAE was among the first countries to support the Kyoto protocol in 2005, where industrialized countries are obligated to cut down on the emissions of greenhouse gases [16]. From home, the UAE has extended green diplomacy by investing in green energy projects in other countries like Spain, United Kingdom and Mauritania [17].

The UAE Energy strategy has been developed in coordination with federal agencies and departments which will help devise policies and setting targets on the levels of carbon emissions that need to be cut. According to the State of

Energy Report 2015, issued by the Ministry of Energy, the Government plans to reduce carbon dioxide levels by 15% by 2021 to address one of the goals of the UAE vision 2021[18]. The report which was prepared in cooperation with the DCCE and UNDP details the best practices and success stories in improving the energy sector. It emphasizes on improving the share of renewable energy in the energy mix and thus aid in the energy diversification plans, synchronizing the steps towards achieving cleaner, safer and sustainable form of energy as the foundation for improving economic and social progress [19].

The Dubai Integrated Energy Strategy 2030 sketches the diversification plan of the energy mix to include alternate energy sources like natural gas (71%), solar energy (15%), clean coal (7%) and nuclear power (7%). In January 2015, Dubai tripled its share of renewables to 15% in its energy mix in 15 years, 12% from coal and 5% from solar energy to fulfil the electricity needs [20]. Dubai has tripled its target to increase the share of renewables to 15% in its energy mix by 2030. The emirate has increased its 2020 target also by 7% [21].

The Green Economy initiative reaffirms the country's pledge to expand its energy sources and safeguard the environment whilst reinforcing its competitive position. With this step, the country aims to become a leader in export and re-export of green products and technologies [22]. This initiative covers the fields of Green energy, Green Economy, Green city, Green policy and programmes, Green living and Green technology [23].

With the launch of ecological footprint initiative in 2007, UAE has become the third country (apart from Switzerland and Japan) to research on its ecological footprint. This is a great model for nations to gauge their consumption pattern and help in the development of policies aimed at footprint reductions [24].

Vision 2050 Arabia which was framed by UAE Business Council for Sustainable Development (UAE-BCSD) along with the World Business Council for Sustainable Development (WBCSD) will bring together corporations and small and medium-sized enterprises (SMEs) to formulate strategies for running the business in a Greenway [25].

UAE has developed its Green Growth Strategy – Vision 2021 to align the green efforts of the federal government entities and work in unison with the corporate sector to arrive at the targeted level of sustainable development and if it succeeds it will be the best country to live in [26].

National Strategy for Green Growth was developed in 2013 in association with the Prime Minister's office, the Ministry of Environment and Water, the Foreign affairs and the Global Green Growth Institute through its office at Masdar. The steering committee has laid down plans for implementing the green growth oriented strategies on the premises of four important facets that include policy development, data management, building local capacity and implementing of leading pilot projects in the path of green growth [27].

Eco-conscious companies are honored by being listed on the website of Ministry of Environment and Water and are awarded with the prestigious environmental performance card (EPC). The card is presented by the Minister of Environment and Water to promote the concept of green production, reduce carbon emissions during production and save energy and resources. This initiative was launched in 2009 and since then has garnered the attention of more companies. The card is issued after series of inspections and evaluations on meeting the laid criteria [28].

UAE Ecological Footprint Initiative which is a public-private partnership, aims to develop scientific policy recommendations to combat UAE's high carbon emissions and high per capita ecological footprint issues. The other partners in this initiative include: the Ministry of Environment and Water, the EAD, Emirates Wildlife Society - World Wildlife Fund for Nature (EWS-WWF), the Global Footprint Network, and ESMA [29].

Dubai Partnership Agenda (DPA) which was introduced in 2010, is a well-planned step forward to enhance cooperation and boost synergy between the Government and private sectors. It is an interactive platform between the stakeholders which aims to provide policy recommendations to support and promote the Dubai strategic plan of sustainable development [30].

The State of Green Economy Report 2016, written by the DCCE and backed by the UNDP, will highlight a raft of low-carbon initiatives now underway across the emirates [31].

Dubai has its Carbon abatement strategy 2021 aims at reducing the carbon emissions by 16% through introducing many initiatives that will help reach the goal 16% by 2021[32].

Dubai clean energy strategy 2050 which aims to make Dubai the global leader in clean energy and the green economy was launched in November 2015. The strategy includes an AED 100 B investment I the green fund and AED 50 B in the second phase of the solar park by 2030. It aims to provide 75% of the Emirate's energy through clean energy sources and become the city with the smallest carbon footprint in the world by 2050 [33].

Endorsing Paris agreement was a great moment for the country which reinstates UAE's keenness to evolve into a lower carbon model economy. COP21 outlines both risks and rewards for the corporate sector whose role in emission reductions, investments and other ways to help governments achieve the green goals cannot be undermined. Companies are expected to be more transparent on the financial, environmental and social risks and opportunities that they are subjected to because of climate change [34].

1.3.2 Forming or housing Organisations

Incorporating organisations to propel green growth was another strategy adopted to bolster the green march. Some of the organisations formed for this purpose have been enlisted below:

Host to prestigious organizations like organizations like IRENA, the regional office of the Global Green Growth Institute [38] and World Future Energy Summit Meets [39]. Masdar City has been chosen to be the permanent headquarters of the IRENA, a world renowned inter-governmental organization founded to encourage the use of renewable energy worldwide. It has more than 160 participating countries, with around 120 full time members and around 40 countries in process of accession. [37]

UAE's pride possession in the field of renewable energy is the $19B Masdar City Project which was planned to have the least carbon footprint with futuristic cars, lighting on streets, and air conditioning all powered by a 10MW onsite stationed solar power plant. Established in 2006, Masdar is the flag bearer of the country's green strategy. It aims to find solutions to a lot of sustainability issues the country is facing through innovation, research, and development. With more than $ 5 B worth of renewable energy projects underway across the globe, the company is regarded as a leader in the energy-efficient field. [35] [36].

Table 1.2 Facts and Figures on Masdar

Data	Description
1 GW	Clean energy being delivered by Masdar globally
12 %	Of installed capacity of concentrated solar power by Masdar
68 %	Of the Gulf's energy capacity by Masdar
56 %	Reduced energy demand in Masdar city
54 %	Reduced potable water demand
40,000	Residents to live in Masdar city

Source: Masdar website

Dubai Supreme Council of Energy (SCE) was formed to manage all energy related problems, to formulate policies and recommend action plan to ensure energy sustainability. This step is first of its kind in the world wherein a governing body (SCE) has been established to oversee the whole of energy sector. The city of Dubai has this credit to its list. SCE also supervises the progress of the Dubai Integrated Energy Strategy 2030. SCE is developing a blueprint for energy demand management for bringing down the demand of energy by 30% by 2030. This implies conserving 4 gigawatts of power which is equivalent to the production of seven power plants. Member companies of the SCE include Dewa, the Dubai Aluminium Company Limited (Dubal), the Emirates National Oil Company (Enoc), the Dubai Supply Authority (DUSUP), the Dubai Petroleum Corporation, the Dubai Nuclear Energy Committee and the Dubai Municipality[40]

The Ministry of Environment and Water has set up a 'Green Growth Follow-up office' in January 2012 and this sector has recognized seven economic sectors, inclusive of petrochemicals and transportation, and is now working closely with the sector authority and representatives to find out ways to change these sectors to green sustainable areas [38]

The Dubai Carbon Centre of Excellence (DCCE) [41] was formed in the year 2011.It has an important function in safeguarding the emirate's energy security. It provides a range of carbon diminution services and gives recommendations to Government and private organisations. DCCE was established on January 18, 2011, under the SCE to gauge the extent of carbon emissions produced by industrial, government and energy sectors. They aim to investigate CO_2 statistics to record a carbon baseline inventory giving information on carbon output in Dubai. Initial targets for carbon emission levels per annum is 5 million tonnes. The emission levels will be segregated into sectors and after studying the current emission levels, targets will be set and strategy formulated to bring down the emission levels sector wise. DEWA, Dubal and Enoc work with DCCE towards solving the Emirate's carbon problem.

1.3.3 Events promoting Green cause

Events supporting the green cause were also promoted widely, some of which have been presented below

The World Green Economy Summit (WGES) was held in Dubai in April 2015 under the theme Global Partnerships, Sustainable Future. It emphasized on the need for changing to global green economies and aimed to reinforce Dubai as the hub of green economy and sustainable development. [43]

UAE has been marking the Earth Hour along with 150 other countries of the world by turning off the lights and showing their strong commitment towards the green movement and energy conservation. All the iconic structures, utilities like DEWA, ADWEA, government organisations like Abu Dhabi Municipality, a number of private organisations and individuals partake this event annually and movement has witnessed remarkable increase in the participation [44]

Hosting events like the Dubai Global Energy Forum (DGEF) which is a forum for world leaders and professionals to exchange ideas on development, policies, programmes and investment opportunities in Green energy sector. This is in alignment with the Government initiative of 'Green Economy for sustainable development'. The forum targets to position Dubai as a global center for renewable energy and sustainability and is a part of Dubai Integrated Strategy 2030 [45]

Abu Dhabi Sustainability Group (ADSG) which includes Public and private organisations was established to encourage the adoption of sustainable, energy efficient and green practices in corporate sector. Established in June 2008, ADSG is a knowledge sharing consortium encouraging sustainable practices among member companies [46]

The World Energy Forum was first time held outside the headquarters of the UN – in Dubai witnessed world leaders and experts chalking out a plan for safe and clean sustainable energy. Hosting this event was a major achievement for Dubai and represents the country's concern for the green cause [47]. October 22 was declared as the world energy day and an action plan for a new model of sustainable energy was signed at the forum to promote the global adoption of safe renewable sources of energy. October 22 which is the world energy day joins with other important dates like April 22 which is observed all over the world as Earth day and June 5 which is the world environmental day [48].

In November 2015, Dubai joined C40, an exclusive global group of 75 more megacities to fight climate change and actively be a partaker of the knowledge-based network to both offer and glean the latest data on urban planning best practices [49].

Sustainability week is held annually to discuss, debate and promote Sustainability. It is a global platform created aiming to interconnect, promote and accelerate the adoption of green energy and sustainable development. This is the largest gathering on sustainability in the Middle East [42].

1.3.4 Prizes and Awards

Many rewards and awards have been instituted to inspire adoption of green practices and green innovation, some of which are listed below

Launched in 2008, the Zayed Future Energy Prize (ZFEP) is the highest award for outstanding contribution in Energy research for organizations and individuals. The ZFEP is the world's most prestigious renewable energy and sustainability award amounting to $4 Million which celebrates the achievements of SMEs and NGO, large corporations, and individuals which will change the way we live in future [50].

The Emirates Energy Awards (EEA) launched by SCE, is a $ 1 Million award to reward efficient practices and progressive initiatives in the field of energy efficiency, alternative energy, sustainability and safeguarding the environment. This award reflects the UAE 2021 vision and the green economy for sustainable development initiative launched by the Government. The award is aimed to boost the role of the corporate sector and people in energy and resource conservation initiatives [51].

Emirates Environmental Award with prize money worth 1 Million AED was launched in February 2012, to promote eco-initiatives across five categories and is open to corporates, government institutions, civil society, and individuals. Designed to promote the green innovation and practices among the community, the award recognises outstanding achievements in sustainability and energy conservation [52].

The Gaia awards announced during the Big 5 International building and construction show attracts product suppliers all around to participate and wins the "Best Green Product in the Middle East" title. This will further attract the attention of buyers who source energy efficient products in the sector .The Green Build Conference held during the show focuses on sustainability issues in the sector [53].

1.3.5 Green Projects

Numerous green projects are formulated and implemented that are in line with the nation's strategy to alter its position on the sustainability indices. Some of the major projects are presented below:

Around one-third of the greenhouse gas emissions in the country are because of the burning conventional fossil fuels which comes from desalination plants. Abu Dhabi has the record of being the city having world's second highest CO_2 emissions per capita per day and it is because of the fact that 52% of the globe's desalinated water is generated in this region. The pilot project to run these plants on renewable energy is already in place. By June 2016, Masdar will choose its renewable energy partners based upon the results of the current running pilot project and commercialise this revolutionary technology regionally and internationally. Also, Plans are underway to build the biggest solar-powered seawater desalination plant of the world at Ras Al Khaimah [54].

To diversify its energy mix the UAE will build 4 nuclear power reactors at an estimated cost of $ 20 billion and plans to produce 25% of the power requirements from nuclear energy by 2020. The 4 nuclear energy units will start delivering low carbon electricity to the grid by 2020, avoiding emitting about 12 Million tonnes of carbon each year. [55].

Government aided Projects such as the carbon capture and storage project (CCS) [36], Emirates Energy Star Project (EES) [56], Desertec Project [57], Floating Solar Islands [58], Vertical Farming Project [59], Green Parks Project etc. to provide a green uplift to the country.

The Shams-1, the $ 600 Million, 100 MW project, which is the world's biggest concentrated solar power plant developed by Masdar is in the nation's capital - Abu Dhabi. It will greatly support Abu Dhabi's target of providing 7% of its energy from renewable sources by 2020. As soon as it becomes operational it will provide electricity for 20,000 homes, and remove 175,000 tonnes of CO_2 [60]. The power plant has an area of 2.5 square kilometers, with a solar field possessing 258,048 parabolic mirrors. With Shams 1 fully operational, the UAE

will generate 68% of the GCC's renewable energy and 10% of renewable energy at global level. [61].

The construction work on the Dhs 12 billion Mohammad Bin Rashid Al Maktoum Solar Park, stretching over 48 sq km of land, which will generate 2,600 MW of electricity upon completion in 2030, is a true milestone for UAE and will offset carbon emissions by 250,000 tonnes annually. It is estimated that 5% of Dubai's energy needs will be met by this plant upon its completion. This project is aligned with the Dubai Integrated Energy Strategy 2030, to bring down carbon footprint and increase the share of renewables in Dubai's energy mix aimed at 7% by 2020 and 15% by 2030 [62].

New District cooling plants, heralded to be the 'greenest' of its kind is to replace the traditional systems used for the same purpose, thereby reducing the carbon footprint with its eco-friendly technology, will provide residential and commercial towers in Business Bay region of Dubai with 50,000 refrigeration tonnes, or RT, of cooling with an output of 10,000 RT through thermal storage. The new plant is a milestone as it requires only 0.9 KW to produce one RT of cooling when compared to traditional non-district cooling systems that has a requirement of up to 1.8 KW of energy every hour [63].

1.3.6 Green Regulations aimed to save energy

"*Unified Federal regulations are to be released soon in order to put in place strict guidelines for local and federal authorities to deal with energy-related issues as well as to encourage the private sector to invest in energy, research, science and technology*" − Dr. Rashid Ahmad Bin Fahd, UAE Minister of Environment and Water [65].

Accordingly, regulations are being implemented in the country to facilitate green growth and incite a curb on untenable and wasteful resource consumption practices. Some of the regulatory steps taken by the Government have been cited below.

While the Government has taken major green Initiatives in the country, it is also giving a regulatory and legal framework for greening industries and sectors. Some of the legislations passed towards the green cause have been listed below.

The Emirates Quality Mark (EQM) is a differentiation mark given to specific product to establish that it meets set of standards and its production system meets the standards laid by ESMA. The mark indicates to consumers that they can buy and use the product with confidence as its production facilities and the product is of high quality. The organization sets standards, accredits and gives certifications to products; protect end users market and the environment. Emirates Conformity Assessment Scheme (ECAS) is ESMA's product certification Programme, which checks and certifies products that affect public life, health and safety, and products that have an impact on the environment, energy use and UAE Economy. ESMA certifies electrical and gas appliances and sets standards for energy efficiency. ESMA also works closely with international environment organisations and the Middle East Lighting Associations (MELA) on new regulations for energy efficient lighting. ESMA, as mandated by Federal law, is the UAE's standards body responsible for developing the UAE standards, the enforcement of standards through the issuance of technical regulations. ESMA's strategy is to adopt existing international standards where it is applicable to the climatic conditions in UAE. So products certified by ESMA are accepted in other countries which help traders when their products are re-exported to countries where products are regulated. ESMA received a title to represent the UAE as well as other countries in the region as a member of the IECEE CB Scheme, which is an international system for accepting test reports and certificates related to electronics products and its components. Being a recognized body under the IEC CB scheme means that ESMA is considered a competent body and allowed to issue IEC CB certificates to the scope that is approved and this certification is acceptable by the international community. ESMA is the only body in the region that is granted this recognition. ESMA is currently involved in many projects related to safety and sustainability such as safety and energy efficiency regulations for lamps, phasing out of air conditioners using ozone depleting substances as

refrigerants, Energy efficiency standards and labeling for washing machines, refrigerators, air conditioners, etc. [66].

According to the new norms, all electrical appliances which are imported to the country or produced inside the country has to obtain a mandatory certificate of conformity from ESMA before they enter the market [66].

Energy ratings for green washing machines is another step forward towards saving energy. The country will save 2 billion liters of water per year and reduce 42,000 tonnes of CO_2 emissions with the enforcement of the new specifications for washing machines and dryers sold in the market according to ESMA. These appliances will have to comply with the new energy rating system formulated by Esma. The regulations focus on energy efficiency and resource utilization. Depending on their energy efficiency, each appliance will be given an energy sticker with stars, ranging from 5 stars (best) to 1 star (worst). A similar rating system was established for air conditioners in 2012 that allowed only energy efficient ACs to enter the UAE market [67].

The rating system for refrigerators and washing machines is similar to the one used for air conditioners used since January 2012. These appliances will be rated and marked from 'One star to Five star' based on their energy saving ability. The analysis is in progress to determine the cut off marks for the minimum energy performance which happens to be 5.9 for AC's and any product which falls below the cut-off mark is not allowed to be traded in the country. The energy efficient ratings belong to an overall set of standards, which includes all products that have an effect on consumers. The standards pay attention on safety, quality, environmental and cost aspects of the product [56] [68].

From January 2012, it was declared that air-conditioning units that do not comply with an energy efficiency labeling system will not be allowed inside the country. Traders were advised to remove the units from the inventory that were already in the marketplace either by selling or shipping them out of the country by the end of 2012. Electronic links are being introduced in cooperation with the UAE customs for the traders to get access to the computerized system and have all the consent forms and information in advance before shipping the units

to UAE. Initiatives are in progress to urge users to replace their low-efficient units like the case of developing a software on where consumers can check their energy consumption from their current units and the potential for savings. In addition, discussions are being carried out with local governments on speeding up the process of replacing inefficient units Esma has regulations governing standards and energy efficiency of window ACs. Low-efficient window ACs are not allowed to enter the UAE market. New regulations for ductless ACs and air conditioning chillers are in progress [69].

Dubai Customs Department reduced import duties on solar panels and inverters from 5% to 1% in January 2012 to favor the Green growth .The regulatory approach will give the industry the needed boost for a structured growth. [70].

Non energy-efficient light bulbs were banned across the country from mid-2013 as ESMA broadens its range and scope of efficiency standards to include more electrical appliances. The new addition of standards emphasizes on all light bulbs available in the country to be environmental friendly according to the new rating system introduced. These regulations will essentially ban incandescent and halogen bulbs as they use large amount of energy. The first phase of this regulation is being implemented in association with Road and transport authority, municipality and other government departments to replace all street lighting with energy efficient ones. The second step is to replace industrial lighting and flood lights used in sports stadiums and entertainment areas [66] [71].

Regulating indoor lighting standards, a ban on the sale of inefficient bulbs from July 1, 2014, will help save the country AED 668 M annually on energy bills and offset carbon emissions by 940,000 (which has same impact as removing 165,000 cars from the road every year). The lighting has to adhere to the new sets of standards based on environment, safety and efficiency criteria. The legal nixing of high energy consuming bulbs will mainly affect the incandescent forms of lighting which will have to be substituted by CFL, LED, and halogens. The ban will focus particularly on imports because there is no current local production of lighting. The revised lighting standards will bring down the country's energy consumption by 340-500 MW [72].

The new norms for certification of green buildings in UAE have been issued in a book called Dubai Sustainable Communities Initiative Land Department (LD). The sustainability adherence for real estate is granted to real estate projects in the Emirate that comply with the standards laid down at every stage. Obtaining the certificate depends on a group of economic, environmental, social and cultural benchmarks. In order to increase building efficiency, rules have been laid down and will be made compulsory for every new constructions to follow the green building norms [73].

The 'Blue Book' issued by the Commercial Compliance and Consumer Protection (CCCP) of Department of Economic Development (DED) is a reliable source of information for consumers to know their rights and guarantee those rights are safeguarded and complaints duly addressed. The book can be found on the website consumerrights.ae. DED has reinstated that service providers cannot refuse or disrespect the commitments made known to the public in any form. Service providers are expected to deliver what they promise, safeguard customer satisfaction and compensate in case of default. [74].

The law in the offing to monitor energy use: A draft law is being prepared to regulate matters relating to energy efficiency and conservation. Feedback on the proposed law will be obtained from the stakeholders and utilities in the UAE. Inputs from ESMA's rating of electrical appliances will also be evaluated in proposing the draft law. [75].

1.3.7 Certifications in UAE:

Besides these green measures, some of the common certification practices found in UAE supporting the green campaign are as follows

ISO: The International Organisation for Standardisation (ISO) ensures that products and services are safe reliable and of good quality. The popular ISO's include ISO 9000, 14000, 22000 and 26000. [76]

QCC: Abu Dhabi Quality and Conformity Council (QCC) has launched a certification initiative under which household electrical products will be

subjected to design evaluation and independent testing to determine their compliance with health, safety, and environmental stipulations. [76]

CE: The letters CE, or Conformite Europeene, in French implies European Conformity. It assures that the product is checked before being placed on the market and complies by EU safety, health, and environmental protection requirements. [76]

RoHS: The Restriction of Hazardous Substances Directive focuses on restricting some harmful elements usually present in electrical and electronic devises. [76]

1.4 Green Initiatives taken by the Utility towards saving energy

Dubai Electricity and water Authority (DEWA): The utility has unleashed many green initiatives aiming to reduce and rationalize consumption. Some of its operational and consumer-oriented strategies aimed to save energy have been listed below

1.4.1 Operational Strategies

Dewa has invested heavily into increasing efficiency levels and energy conservation in Dubai. It has directed its efforts on bringing down fuel consumption at its power plants. Dewa has managed to produce 400 MW of electricity without the use of additional fuel due to its innovative efficiency drive and it's persistent and efficient strategy that focusses on the sustainability of resources and protecting the environment. [77]

The smart grid initiative launched by Dewa is an electrical grid that employs ICT technology to gather and respond to information, in an automatic way to increase the efficiency, credibility, economics and sustainability of the production and transmission of power. As the new buildings will become a part of the smart grid by default, the old buildings are to be retrofitted to adapt to the smart grid technology. [78]

Dewa is to invest an estimated AED 57 B over the next 3 to 5 years to fully renovate its water and power production and transmission systems in an attempt to make Dubai the world's smartest city. AED 7B will be set aside only for the

development of smart grids and remain as capital expenditure on expanding and improving the network. Through its series of initiatives, Dewa aims to support the vision of Dubai Integrated Energy Strategy 2030 to reduce the energy requirement by 30% in 2030. The energy demand action plan was introduced in the year 2013 which constitutes eight important programmes comprising of new norms for green construction, retrofitting of 30,000 old buildings, district cooling plans, standards and labelling for appliances and equipment, water reuse and efficient irrigation, outdoor lighting and traffic structures to aid energy saving. [79] [80]

DEWA is also fostering the installation of photovoltaic panels and has introduced three projects to endorse the Smart Dubai Initiative. The first step is to connect solar energy to residences and encourage households and building owners to fix photovoltaic (PV) solar panels to produce electricity. The utility will fix smart meters and grids to provide consumers automated and comprehensive readings to know utility bills which will enhance energy efficiency and facilitate comparisons with average standards. The smart meters will encourage the use of renewable sources of energy in all localities and help in comparing energy supplies from consumption to generation. As the third step, Dewa will develop facility for electrical vehicle charging in many places in the emirate which will green the transport sector to a great extent. [79]

Dewa has signed a MoU with IRENA to fulfill its pursuit of diversifying its energy mix by following sustainable energy solutions. The deal aims to encourage utilization of renewable energy and aid in the formulation and implementation of the required policies, energy strategies and regulatory frameworks. [81]

Dewa along with KHDA (Knowledge and Human Development Authority) has instituted annual conservation awards among individuals and institutions under the theme 'For a better tomorrow' [82]

Dewa, through its various energy saving initiatives, has saved 544 kilowatts and Dhs 126 Million in 2012 [83]

Dewa has signed MoU with private companies such as Unilever and LG to promote its green cause. The agreement with Unilever is that Dewa would train Unilever promoters through instructions and sessions on rational use of energy and offer promotional materials on energy saving devices. The arrangement included an agreement from Unilever to activate energy conservation devices, water conservation, encourage conservation packages and support campaigns directed at institutions and residential units. Dewa's agreement with LG Electronics is to help in its plan for environmental sustainability and energy saving through green electronic products and creating awareness of issues relating to sustainability among public, thus paving way towards green lifestyle in the emirate. [84]

Dewa has signed a MoU with First Solar to develop a Programme for training on best solar energy technology in collaboration with the Arizona State University. The move was a part of Dubai Integrated Energy Strategy 2030 towards attaining energy diversification by generating 1% of the Dubai's total power requirement from renewable energy by 2020 and 5% by 2030.These targets were revised as Dubai tripled its targets to increase the portion of renewables by 15% in its energy portfolio by 2030 and 7% in 2020 which was stated in the World Future Energy Summit 2015. [85]

The new green building of Dewa is the biggest Government office globally to have obtained a LEED Platinum rating for green buildings. It has numerous green features, including an onsite 660 kW solar power plant that has helped the building achieve reduction in water consumption by 48% and energy consumption by 66%. [86]

1.4.2 Consumer-oriented conservation strategies

Through its many initiatives, Dewa aims to develop a culture of conservation, build best practices and spread awareness between various sections of the community. Dewa has rolled out more than twenty green initiatives to inform its customers on the need for energy conservation. According to Dewa, just prudential use of utilities resulted in savings of Dhs 177 million approximately

in 2012. The phased out awareness campaign of Dewa had brought in 264 million kilowatts of power savings in 2011 according to estimates. [87]

The Peak load campaign of Dewa was intended to educate the consumers on the need of avoiding the usage of electrical appliances from 12 noon to 5 pm. The campaign created awareness among residential consumers on how they can help reduce the pressure on power generation system by swapping the use of their electric appliances from peak hours to off-peak hours. It was anticipated that the load shifts would contribute to fuel savings in power generation, enhance resource conservation and reduce emissions. Dewa adopts peak load campaign during summer to encourage lower energy consumption in the season. [88]

DEWA has rolled out an educational campaign to save energy among its consumers using environmental friendly safe techniques as part of a comprehensive system that improves both energy and the environment. Apart from distributing pamphlets, posters, and periodic advertisements, Dewa is going one step further to reach its consumers through a door-knocking initiative in some areas of Dubai. Dewa sends its special bus to areas and create awareness by inviting people for interactive conservation presentations inside the bus. Along with free samples of energy saver lamps and water saving devices, Dewa also informs the residents on the need and ways of conserving resources. [89]

As a part of the Carbon footprint campaign launched by Dewa, the company has decided to lists facts and figures about the carbon emissions each customer's monthly energy usage generates on their monthly energy bill. This move is to raise awareness towards responsible energy consumption. [90]

The campaign called 'Do Good to Planet Earth' which was introduced in May 2012, was considered to be one of Dewa's most successful awareness campaigns. It emphasizes the role of individuals, manufacturers, retailers, and regulators in reaching a mutual platform when selecting and buying eco-friendly home appliances. This campaign was aimed at educating the residents on the best rational practices to be adopted while using green home appliances. Appliances included in the campaign were white goods including washing machines, refrigerators, air conditioners and dishwashers. Dewa in

collaboration with its partners provides comprehensive information on eco-friendly home appliances. [91]

Dewa is actively encouraging suppliers to make their green products available and easy to find to make the switch over to green products more convenient and ease for all. One of Dewa's partner, Sharaf DG, has created 'ecozones' in their stores wherein consumers can avail the services of knowledgeable sales personnel who can share information on energy efficiency attributes of the products. Dewa has partnered with major appliances manufacturers and dealers for creating awareness and increasing availability of GHA. Such collaborations have helped the consumers know about the latest energy-conserving products and features available in the market within their reach. [92]

Social media marketing on sites like Facebook and Twitter is also aggressively used by Dewa apart from their official website to spread awareness among consumers on the need, ways and means of saving energy and thereby encouraging responsible consumption. [91]

Another green initiative from Dewa is conducting one week long green events based on the theme 'Dubai Green Week' which coincided with WETEX (Water, Energy, Technology and Environmental Exhibition) and the prominent World Green Economy Summit. Customized forums and programmes were organized to encourage participation from all strata of society [93]

1.5 Motivation or Need for the Research

Sustainability and Green research have been the most favored area of research in the recent times as it has social, economic, health and environmental implications. Besides that, sustainability research also presents scope to enhance our quality of life and positively contribute to the society we live in. Apart from this broad purpose, the specific factors which reinstated the researcher's interest in this specific subject have been enumerated below:

The emission dynamics: In a market research study done in 2010 by British research consultancy Maplecroft UAE ranked one among 183 countries with worst performance in relation to the CO_2 emissions on the carbon polluter's

index. UAE also holds the record of having the highest ecological footprint per capita in the world along with the highest energy consumption per capita, making such studies the need of the hour. [4]

Clean Alternatives: The country is blessed with abundant sunlight all year round and also with a fair high share of hydrocarbon reserves to last for the next 100 years. The study will offer a fresh perspective on how the country is going to balance the two surpluses for its own betterment.

Diversifying Energy Mix: The Government is diversifying its energy mix with renewable forms of energy to avoid the heavy reliance on fossil fuels. Strategies are formulated and policies are implemented towards achieving this goal. The shift of the nation an oil dependent country to a green energy fostering nation would offer deep insights and rich research experience.

Choicest Destination: The UAE is fast emerging as the most sought-after destination for business worldwide. A study by PricewaterhouseCoopers revealed that over 70% of the CEO's in multinational companies are looking at ways to capitalise the lucrative business opportunities and prospects offered by the region. This study is motivated by the curiosity on how the country that has such a conducive business environment tackles this environmental issue. [94]

Ethical Reasons: Sustainability is one of the most critical areas for research as it helps in the transition of the society to a viable future. The study could explore how this small but dynamic nation is impacting the much needed Green transition.

Development Hazards: With so much of development happening in the UAE with each industry vying with the other in carbon emissions, the amount of waste and emissions created in the name of development leaves a distasteful image; highlighting the dire need for such sustainable development studies.

Futuristic: The study is vital from the ecological, economic and ethical point of view. Green marketing not only helps in energy conservation but also leads to eco − innovations that are safe to the environment, sustainable in nature and thrives on green energy.

1.6 Definitions

Green Marketing: According to Henion and Kinnear; [95] Green Marketing is the implementation of marketing programs directed at the environmentally conscious market segment. According to Fuller[96,] Green Marketing is the process of planning, implementing and controlling the development, pricing, promotion and distribution of products in a manner that satisfies the following three criteria: customers' needs are met, organizational goals are attained and the process is compatible with the ecosystems. Green marketing, also referred as sustainable marketing or environmental marketing is designing, promoting, pricing and distributing products and services according to the customers' want and need, with minimal detrimental impact on the natural environment (Grant, 2008; Jain and Kaur, 2004; Kangis, 1992; Pride and Ferrell, 2008) [97-100]. American Marketing Association (AMA) divides the definition of green marketing in three aspects (marketingpower.com): as the marketing of products that are presumed to be environmentally safe (retailing definition), as the development and marketing of products designed to minimize negative effects on the physical environment or to improve its quality (social marketing definition) and finally as the efforts by organizations to produce, promote, package, and reclaim products in a manner that is sensitive or responsive to ecological concerns (environment definition). Polonsky (2011) has defined green marketing as all activities designed to generate and facilitate any exchanges intended to satisfy human needs or wants such that the satisfaction of these needs and wants occurs, with minimal detrimental impact on the natural environment.

Green Consumer: The growth of Green Marketing led to the evolution of Green consumer. *'A Green Consumer can be identified to be one who avoids any product which may harm, damage any living organism cause deterioration of the environment during process of manufacturing or during process of usage, consume a large amount of non-renewable energy, involves unethical testing on animals or human subjects.'* (Elkington, 1994) Vernekar and Wadhwa define the green consumer as a person "who adopts environmentally-friendly

behaviours and/or who purchases green products over the standard alternatives"
(2011, p. 65).

Green Product: A green product is a term that describes a product that protects the environment and replaces artificial ingredients with natural ones. Green products are less harmful to human health and they conserve energy**.** Ottman (2007, p.5) defines green products as typically durable, non-toxic, made from recycled materials, or minimally packaged. According to Enviro news and business, Green Products are those that have less of an impact on the environment or are less detrimental to human health than traditional equivalents. A product that is made, used or disposed in a way that significantly reduces the negative impact that it would otherwise cause to the environment, can be considered as a green product. A green product refers to a product that is typically nontoxic, originally grown, recycle/reusable, not tested on animals, not polluting the environment and minimally packaged; and contains natural ingredients, recycled content and approved chemicals (Ottman 1998[106]; Pavan 2010[107]).

Green Home appliance: Home appliances which have lesser annual operating cost due to their energy saving features are categorized as Green home appliances. GHA include big home appliances (also called as white goods like Refrigerators, AC's, Dishwashers and Washing Machines) that are large and consume substantial electricity and having an active usage life of over 10 years marketed as green with energy-saving benefits.

1.7. Scope of the Study

The scope of the study is to determine the awareness, preference and willingness to pay (premium) for Green home appliances among consumers in UAE. The scope of the study is limited to only major white goods which are big in size and consume a major chunk of electricity in a common household like air conditioners, refrigerators, dishwashers, washing machines and televisions. The study has limited its focus to the concept of Green home appliances (GHA) and has not attempted to isolate and probe consumer responses across product categories.

1.8. Overview of Research Questions

Based on the Research Gap "*Awareness, preference and willingness to pay for Green home appliances across demographics have not been explored in UAE*" identified from the literature reviewed, the following research questions were formulated:

RQ1: What is the level of awareness for green home appliances among the consumers?

RQ2. What is the preference for green home appliances among the consumers?

RQ3. Whether demographic variables affect consumer willingness to pay for green home appliances?

1.9. Overview of the Research Objectives

Accordingly, a three tier Research Objectives were developed based on the three research questions formulated and the three objectives are as follows:

RO1. To determine the awareness level of green home appliances among the Consumers

RO2. To determine the preference for green home appliances among the Consumers

RO3. To determine the extent of consumer willingness to pay for green home appliances across demographic variables

1.10. Overview of the proposed framework

Developing a theoretical framework to address the objectives was achieved by reviewing marketing communication assessment models used to evaluate the influence and effectiveness of communication campaigns on the consumer. The hierarchy of effects models, specifically the AIDA model and its variants were reviewed for its suitability and applicability in the study. The CAB model was finally found appropriate for the study for its simplicity and three tier coherence to the research objectives of the study. Also, literature review of past studies and their findings suggested the successful application of the model in similar studies. Thus the theoretical framework proposed has the CAB model as the core with improvisations based on the observations from the literature review.

1.11 Overview of the Research Methodology

The Research methodology was same for the three objectives. The difference was only in the variables identified to measure the constructs. To represent the multi-cultural demographics of UAE, Stratified Random sampling was used. The sample size was calculated with Taro Yamane's formula and a structured questionnaire was used as a research instrument. Reliability and validity tests were made on the research instrument which was also pilot tested and modified based on the inputs from pilot testing. Data collection spanned for three weeks. Data was collected both by web survey mode and personal interview mode.

1.12 Significance of the Research

The Research study is significant from the academia, utility, and the corporate perspective. In academia, the thesis not only contributes by filling the identified research gaps but also gives a practical application of the communication assessment model – the C-A-B model which has been improvised based on the extensive literature review carried out to suit the study purpose. The application of the three component variants of the hierarchy of effects model to study consumer's awareness, preference and willingness to pay for GHA will add significance to the model and increase its prominence, applicability, and usage even in such trans-disciplinary studies linking power, home appliances and consumer behaviour in future. The study is significant to the utility and concerned governing offices as it gives insightful feedback on the consumer's understanding of the subject and on the effectiveness of the various green campaigns, whether it has achieved its objectives. The demographic profiling would enable the Government body to understand the segment which shows lesser awareness and draft segment specific green awareness campaigns. The Study is significant to the corporate sector as it provides better information on the level of consumer awareness, their preferences and the premium they are willing to pay across demographic profiles. The study also provides information on the influencing role of the important factors which promote green purchases. The findings of the study would encourage collaboration between the utility, the manufacturers and the rating bodies to work in conjunction with energy saving objective.

1.13 Outline of thesis chapters

Chapter 1 provides an over view of the research background highlighting the emission dynamics and power consumption profile of the country, the major green initiatives, investments and legislations taken by the stakeholders, the motivation for carrying out the study, basic definitions, overview of the Research questions, Objectives and Methodology and finally importance of the study in theoretical and practical perspective.

Chapter 2 details the concept of saving energy through Green home appliances (GHA), the role of households in energy consumption, the potential to save energy by switching from conventional models of home appliances to green models, justification through literature review, the macro environment and sector overview of home appliances. Various green initiatives carried out by DEWA, the utility provider to promote rational consumption and green practices including switching to green appliances have been highlighted along with green campaigns carried out by the major market players in the sector and the supportive role played by the Government departments to foster green practices.

Chapter 3 includes the Literature review done under three themes – the conceptual shifts in the green purchase studies, studies identifying the influencing factors in green purchases and the country wise theming of studies. Also, research done in UAE on the topic have been reviewed. Research Gaps identified based on the Literature review, the business problem was ascertained, research problem was laid down and research questions were formulated. Research objectives were developed for the study. The chapter presents the evaluation of various theoretical models and their suitability to study the research objectives. The proposed theoretical framework model – the CAB model has been presented with improvisations based on the inputs from the literature review and after reviewing the suitability and applicability of various communication assessment model used to evaluate the effectiveness of marketing communication on the consumer.

Chapter 4 details the Research Methodology adopted to achieve the objectives. The chapter includes the research design, observational design and sampling

design developed for attaining the research objectives. Sample size estimation, sampling method, research instrument used and tests subjected on the research instrument before data collection, mode of data collection have all been briefed in this chapter

Chapter 5 includes Data analysis and findings, the demographic profiling of respondents, descriptive statistics, quantitative methods and findings in the form of tables and graphs have been presented in the chapter. The chapter also presents the hypothesis testing carried out on the nine hypothesis formulated in the study.

Chapter 6 outlines the Conclusions and recommendations from the study. Summary of findings and answers to the objectives have been presented in the study. Recommendations are suggested for the stakeholders and specific recommendations are presented in the chapter to increase the acceptance of GHA among the consumers. Contribution of the study, its limitations, and direction for future research has been covered in the chapter. Chapter Six is followed by bibliography, a brief note on the author and appendix

1.14 Concluding Remarks

This Chapter presented the grim statistics of the country's power consumption scenario following which series of green measures were initiated by the Government, utility and the corporate sector aiming to reduce power consumption. Series of initiatives were rolled out by the stakeholders to inform and educate the need for rationalising power consumption. Some of the major initiatives have been enlisted in the chapter. The chapter also highlighted the reasons behind the researcher pursuing this study along with the definitions of the main concepts like green marketing, green product and green consumer. The chapter also highlighted the scope of the research study and presented an overview of the research process and framework. The chapter also presented a brief overview on the significance of the research, on how the research would contribute to the industry and academia. A short note on the thesis disposition has also been included by the researcher in this chapter. The following chapter will present the concept of Green home appliances and the role of GHA in saving energy.

CHAPTER 2: GREEN HOME APPLIANCES

2.1 Introduction

In this chapter, the concept of green home appliances has been detailed. The chapter highlights the share of households in the power consumption scenario and how small changes here can bring in the greater result. The potential to save energy and money through the prudent use of energy saving home appliances have been highlighted in this chapter. This chapter also presents an overview on the consumer durable sector, specifically the home appliances sector and the UAE market dynamics at macro and micro level. The various green initiatives taken by the corporate sector to encourage green consumption in UAE and other countries have been highlighted in this chapter. Also, the chapter presents the supportive role played by various Government organisations towards the cause.

2.2. The Role of Households and home appliances in saving energy

Households are responsible for around 75 % of the country's carbon footprint. [108] Home appliances account for a significant portion of household CO_2 emissions. Awareness begins at home. A household is the building block of the society and home appliances are the main power consumers in a household. Hence they are the best bets to save energy at the household level. If households save energy, the nation saves the energy and thereby the ideal place to initiate the green change at the consumer level is through the home appliances sector. According to the Ecological Footprint Initiative, the households account for around 57% of UAE's ecological footprint [110] and according to Dewa, the residential sector is the second highest power consuming unit. [111]
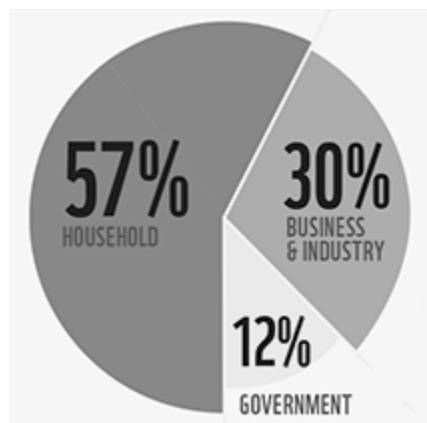
Fig 2.1. UAE Ecological footprint by Sector

Household final consumption expenditure per capita growth (annual %) in the United Arab Emirates was last measured at 28.31 in 2014, according to the World Bank[112]; meaning major white goods such as washing machine, heating, and cooling appliances have become a standard household good in the nation. Heating, Ventilation and air conditioning systems (HVAC) are used frequently in the country because of the high summer temperature. HVAC systems account for a reported 40% of a building's total energy consumption [113].

Studies indicate that lighting and air conditioning account for 65-70% of electricity consumption [114]. Hence in 2013, there were many regulation modifications to improve the standard of household appliances. Green initiatives such as to install energy meters with emissions data at the household level, introducing green consumer electronic appliances, rating the energy consumption of home appliances and banning the use of products that waste a large amount of energy are being enforced in this sector [115].

It is reported that inefficient lamps also contribute to household energy consumption and carbon emission. A Simple example to highlight the fact that small steps could lead to giant rewards observed from the studied effect of the official banning of power – depleting bulbs and enforcement of new lighting standards has been summarized in the table below [116]

Table 2.1 Energy savings from nixing of energy depleting bulbs

Total annual saving in energy bills	AED 668 M
Annual savings on energy bills from Households	AED 452 M
Annual saving of an average villa in Dubai	AED 2,315
Reduction in Carbon emissions	940,000 which is equal of taking away 165,000 cars from the road annually.
Total investment required	AED 732 M
Payback period	13 Months
Annual reduction in energy consumption	340-500 MW

Source: Bibliography [116]

A chart by Energy Star, a US-based Environmental Protection Agency that symbolises energy efficient products and practices worldwide shows that appliances and electronics make up 33% of energy bills, followed by cooling and heating at 55%. About 12% of the bill owes itself to lighting [117].

Another breakdown that presents an overview of the power consumption of home appliances has been presented below. The break gives a broad understanding of the consumption profile and typical energy bill break down [118].
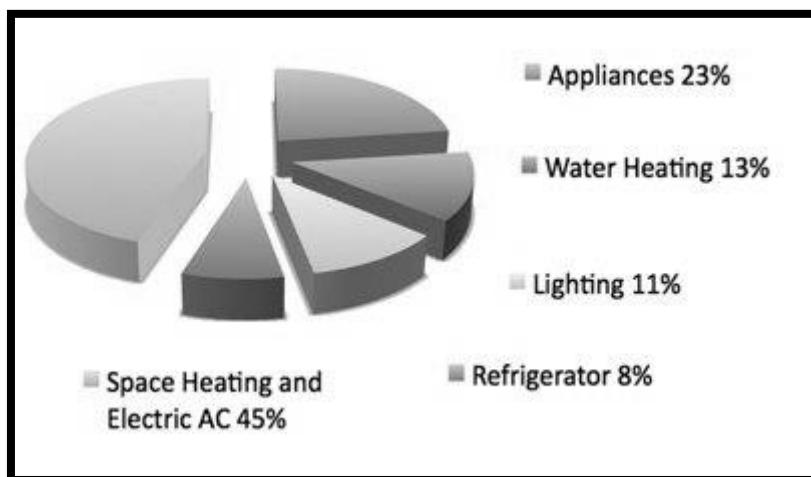
Fig 2.2 Typical Consumption profile breakdown

2.3. Saving Energy with GHA

Green appliances are not only energy efficient but also eco-friendly. Appliances more than 10 years old are clunkers as they use up most of the energy. If consumers replace them with energy efficient appliances, it will not only save billions of kilowatts of energy annually but also billions of tonnes of carbon emissions globally. Most of the home appliances have a longer life. Hence its medium to long term benefits should be weighed while making a purchase decision. With normal usage, a washing machine runs in a household for approximately 10 to 15 years and a refrigerator for at least 15 years. So over the life of the appliance, customers can make a big difference by choosing green products. Over time the use of home appliances impacts household bills and energy footprint

Using green products for heating and cooling requirements will drastically reduce energy consumption. Upgrading the households with CFL or LED

lighting could also conserve energy. Eco-friendly refrigerators are more than 15-20% more energy efficient due to their improved insulation and compressors. Energy saving TVs are 25% more energy efficient than conventional models. Some are even equipped with motion sensors and can turn themselves off when motions are unnoticed. Similarly, a top rated energy efficient washing machine uses a quarter of the energy of the least efficient machine and half the energy of the average machine while saving £8 (50 AED) annually on electricity bills and reduction in CO_2 emissions by 42Kg. A top rated dishwasher would use 40% less energy saving £16 (AED 100) annually on utility bills and 85 kg of CO_2 emissions. A top rated fridge/freezer would save £37 (AED 231) annually on utility bills and 150kg of carbon emissions [119] HVAC are used frequently in the country because of the high summer temperature and account for 40% of a building's total energy consumption [120]. Energy efficient machines could thereby save the consumer significantly on energy consumption and cost. The HVAC models include wireless, remote and programmed controls, and integrated controls that can smartly handle a building's cooling system by assessing people's movement, forecasting weather conditions, and balancing peak and off-peak load schedules and channelizing water use for cooling towers.

Implementation of the star rating system for energy-efficient consumer appliances was started in 2013. Air conditioning products were rated and labelled in early 2013, followed by home laundry appliances in mid-2013. This move was planned to be extended to other categories of consumer appliances also. According to trade reports, this initiative will result in huge energy saving to the country. It was reported that the energy savings may amount to AED 400 M per annum by 2016 from only air conditioning products [120]. When this practice is extended to other categories of home appliances, the savings will be huge for the nation. If people are aware and ready to shift to green home appliances, tonnes of CO_2 emissions could be cut.

The home appliances sector plays a prominent role in taking the Green Marketing Practices to the consumer level in the society. When 'Earth hour' was observed in UAE by turning off the lights for one hour, Dubai alone saved big

on power and carbon emissions by observing earth hour. The year wise savings over just an hour per annum has been presented below [121].

Table 2.2 Savings from Earth hour

Year	Power saved MW	Carbon Emissions Cut
2008	100 MW	60,000 Kg
2009	146 MW	88,000 Kg
2010	170 MW	102,000 Kg
2011	204 MW	122,000 Kg
2012	230 MW	130,000 Kg
2013	200 MW	120,000 Kg
2014	255 MW	153,000 Kg
2015	305 MW	183,000 Kg
2016	222 MW	96,000 Kg

Source: earthhour.org/united-arab-emirates

This information highlights the fact that small steps can lead to big giant leaps. Households are the starting point to cause green shifts. If marking one hour a year could lead to such big power savings, then if the residents use green home appliances in their everyday life, the savings and benefits would be multifold.

2.4. Comparison in Power consumption between green and conventional model of home appliances

The table below compares the average power consumption figures between a conventional appliance and an appliance with energy star rating classified as green.

Table 2.3 Comparison of power consumption between conventional model and green model of common home appliances

Appliance	Average Power Consumption[122] Conventional Model	Power Saving [123] Green Models
Refrigerator*	725 W	15% - 20%
Cloth Washers	350W -500W	20%-50%
Dishwashers	1200 W – 2400 W	25%
Television	100 – 170W	25%
Air Conditioners	1000 W	20% - 50%
Water heaters**	4500W – 5500W	50%
*: frost-free, 16 cubic feet, **: 40 gallon,		

Green home appliances have been reported to save power and reduce carbon emissions. The residential sector being the second largest power consuming sector [111], adoption of green home appliances will help the country to save power immensely. Energy labels, eco-marks, eco-labels green marks, certification of conformity, corporate advertisements are some of the ways by which the consumers can identify green products. Different practices, mostly backed by Government intervention are employed in different countries to grade the appliances based on their power consumption requirement. Energy Star labelling is one such practice adopted in the USA.

According to Energy star if only ENERGY STAR certified refrigerators are sold in the US, the energy cost savings will be more than $1.4 billion per year and 19 billion pounds of annual greenhouse gas emissions could be avoided, which is equal to the emissions from 1.8 million vehicles. Similarly if all cloth washer used in the U.S. had the ENERGY STAR certification, then it will result in savings of 540 million kWh of electricity, 20 billion gallons of water, and 1.4 trillion BTUs of natural gas each year, also leading to energy bill savings worth $250 million, per annum. Likewise, if only ENERGY STAR certified TV, DVD player, and home theatre system are only bought in the U.S, reduction of 2.2 billion pounds of greenhouse gas could be achieved annually which is equivalent to the emissions from more than 200,000 cars. [124]

Similarly, it can be established that if green appliances are only used in UAE, then the country will save significant power. Like Energy star, the ESMA has introduced legislation in 2013 for putting in practise the star based energy rating system to rate the energy consumption of appliances. The star based energy rating system has one to five star labels displayed on the models to indicate the annual electricity consumption and energy efficiency levels, and facilitate comparisons to the consumer. This will enable the consumer to make wise and rational choice of home appliances that will give them power and money savings. Manufacturers who sell high energy consuming appliances are charged a fee according to the star rating system. This initiative is aimed to encourage manufacturers to produce energy saving products [66].

ESMA is educating the public through many awareness campaigns on how non-green home appliances will add on to household costs. It is creating

awareness on its new energy efficiency labelling system which will allow consumers to differentiate efficient and inefficient appliances through the stars ratings and certificates given to them. Better efficiency will lead to lesser energy consumption. If a one-star labelled air conditioning unit can save up to 12 %, a five-star labelled air conditioning unit may save up to 30 percent [125].

UAE is in the process of quantifying the energy and monetary savings the country could yield by ESMA's energy labelling initiatives and consumer adoption of such appliances. The available information reveals that the country proposes to reduce 30 percent of electricity consumption or save approximately Dh250 M per year only through consumer adoption of green air conditioning units [125]. With clean green washing machines, the country will save 2 billion liters of water per year and significant power consumption apart from reducing 42,000 tonnes of CO_2 emissions [125]

2.5. The Market Overview

2.5.1. Macro Environment: The UAE has a very efficient Government along with lightest bureaucracy in the world, as reported by the Swiss-based International Institute for Management Development (IMD) [126]. Besides the country has been ranked first globally for low Government debt, effective corporate boards and quality of air transport by the World Competitiveness Yearbook 2014 [127] In the overall competitiveness ranking of 2014, UAE maintained its 8th position and was ranked above a number of developed countries like Norway, Netherlands, Australia and the UK. [127]

2.5.2. Economic Profile: All UAE Economic Indicators given in the table below are 2015 estimates from CIA World fact book [128].

Table 2.4 UAE Economic Indicators

GDP PPP	$ 641.9 B*	(2015 est.)
GDP – Real growth rate	3%	(2015 est.)
GDP Per Capita (PPP)	$ 67,000	(2015 est.)
GDP by Sector	Agriculture : 0.7%	
	Industry : 49.4%	
	Services : 49.8%	(2015 est.)
Inflation rate (Consumer prices)	3.7%	(2015 est.)

Main Source: CIA World fact book

2.5.3. Consumer Durables Sector

The Consumer Durables industry includes durable goods and appliances for domestic use such as TVs, refrigerators, air conditioners and washing machines. Appliances such as mobile phones and microwave ovens also come under this category. This sector has been booming in the recent years because of factors such as high retail growth, increased demand for real estate and housing, higher disposable income and a surge in the high income group of the population. The industry has major players like Panasonic, LG, Samsung, Bosch, Whirlpool, etc.

The consumer durables industry could be demarcated into two groups: Consumer Electronics and Consumer Appliances. Consumer Appliances can be further classified into Brown Goods and White Goods. (Y.Sharma, 2011) [129] Heavy goods such as ACs, refrigerators, washing machines etc., which used to available only in white enamel finish before (although they are available in different colours now) are termed as white goods[130] while relatively light electronic consumer durables such as TVs, radios, digital media players, and computers are called brown goods [131]

The country is rated high among leading global consumer electronics markets with high domestic demand. The strategic geographic location of the country makes it an international business hub for trade links to the neighboring continents. The cosmopolitan multicultural mix of the population makes it an apt test market for new product launches and marketing initiatives. [132] The numerous electronics focused festivals such as Dubai Shopping Festival (DSF), Dubai Summer Surprises (DSS), Gulf Information Technology Exhibition (GITEX), Consumer Electronics Expo, and trade fairs have all reinstated Dubai's position as a global consumer electronics hub.

2.5.4. Market at a glance

Consumer electronics market of the country is the largest in the Gulf, amounting to approximately 40 % of regional spending with a potential market size of around 2 billion people [133]. With easy accessibility to Asia, Africa, and Europe, the electronics distributors of the UAE serve a potential market of nearly 2 billion consumers [133]. The sector growth has been facilitated by favourable

government policy; like low import duties which have contributed in making UAE a choicest electronics trading destination and a centre for the latest models of consumer goods. The country has an organised distribution chain, efficient sourcing networks, world class logistical facilities and a progressive business environment. UAE's domestic consumer electronics market was estimated at $4.8 billion by the end of 2015 [134]. According to statistics from Dubai Customs, Dubai's trade in consumer electronics has grown from an estimated Dh 24 billion in 2002 to Dh 113 billion in 2011. In 2011 Dubai exported consumer electronics valued approximately Dh 48 billion, which came from imports of Dh 65 billion [135]. An average household in UAE spends around $14,400 per annum. Emirati households reported a higher spending of about $23,000, while Western, other Arab and Asian households reported an annual spending of about $19,500, $13,500 and $10,000 respectively, according to property consultants Colliers International. [136]

A survey conducted by Plug-Ins concluded that consumers in the UAE spend an average of AED 3,000 on consumer electronics per year [137]. This outcome is in line with *BMI*'s data, which estimates the value of the consumer electronics market at around US$4bn in 2013 [138]. The major findings of the second Plug Inns Nationwide online survey comprising of a sample of 1986 respondents representing 52 different nationalities over a period spanning 25 days (February - March, 2014) were: the average annual spend by a household in UAE on electronic items has increased by 62% to around AED 4,875, About 94% of respondents had purchased an electronic equipment in the previous 12 months, Half of the pre-purchase research is being done relying on internet such as visiting company website, looking for reviews in social media etc. and around 50% of the respondents spend around 1-3 hours inside retail stores before purchase. [139] The third version of the Plug-Ins biannual Consumer Electronics survey has developed an index that identifies shoppers purchasing patterns, behaviours, and upcoming trends in the UAE's estimated AED 14 B Consumer electronic market. Major findings from the online survey which comprised of 1974 respondents across 50 nationalities over a month (August - September, 2014) were that the on an average, a household in UAE spends approximately

AED 4,793 per month, 92% respondents reported that they purchased an home appliance in the last 12 months and around 55% of the respondents spend 1-3 hours inside retail stores before their purchase [140].The fourth edition of the survey collected responses from 2,450 respondents across 59 nationalities over a period of two weeks (August - September, 2015) and the main findings were that 91% respondents reported that they made a major electronics purchase in the last one year and there was a marginal decline observed in the average annual spend of a UAE based household on electronics fell from the previous survey and amounted to AED 4,000[141].

The Expo 2020 will add dynamism to the economy, fuel non-oil trade and investments causing a boom in real estate sector. This along with buoyant economic growth, rise in expatriate wealth, increased household consumption and urbanization will increase consumer spending in home appliances.

Euromonitor l reports that the home appliance sector in the UAE records an average spend of US$ 350 (AED 1285) per household which marked 6% growth rate in the spend. Although UAE is the smallest market in terms of absolute sales volume in the region, it is among the top 10 countries in terms of volume growth as it has a forecasted Computed Annual Growth Rate (CAGR) of about 7% from 2014 to 2019 [142]

2.6. Green Campaigns by major companies in the home appliances sector:

The passion towards sustainability has been disseminated to the home appliances sector and consumers. Most manufacturers give great weightage to efficiency in their manufacturing process which leads to lesser energy consumption, lessening pollution, residual waste and using cleaner components with lower environmental hazards. Positive changes have been noticed in product packaging function also wherein many brands are using recycled paper for packing in order to endorse green marketing. The products are subjected to stringent certifications process for rational power consumption and clean green operations. These small but significant and continued efforts along with support from R&D for cleaner, greener, safer and energy efficient products are planned strategic moves towards attaining energy efficiency [143]. The UAE is a regional

headquarter of most of the popular brands due to its stability and re-export facilities making it a gateway to the MENA markets. An overview of the green policy and practices of major industry players have been summarized below

"**LG Electronics** *as a global leader in home appliances recognizes the importance of reducing energy consumption and enriching customers' lives through the creation of a healthier and cleaner environment. Green Innovation and Sustainability are the main fundamentals for all LG Products and we are leveraging our focus on four key areas including reduction of carbon emissions, developing greener businesses, strengthening green product's competitiveness, working with our suppliers and helping to eliminate e-waste around the world*" − D.Y.Kim, President of LG Electronics Gulf FZE.

Greenomics Forum which is a joint effort by Ministry of Environment and Water (MoEW) and LG Electronics aids in discussion and formulation of carbon reduction strategies. A group of experts from around the world would present practical guidelines and recommendations that Governments can adopt to bring down carbon emissions, and will also exhibit and validate the suggestions for carbon reduction through case studies. [144]. LG Electronics green commitment is not just limited to recycling, but making changes to its entire production process and is always looking for green ideas and technologies that will benefit its customers and the society. LG has a full range of energy efficient, eco-friendly products which undergo green product lifecycle management in its making. As a part of LG's drive and commitment to go greener, the company has committed themselves to the 'Green 2020' initiative by which LG will reinforce its green ventures, initiatives and expand to include greener products with green features and static power savings that work to consume less power and thereby reduce energy costs [145].

Samsung has been investing heavily into greening its products. The company adopts a planet-first approach, which considers a product's imprint on the environment and encourages eco-friendly designs across its portfolio. When developing new products, Samsung follows strict environmental standards and looks at how it can incorporate recyclable and eco-friendly materials into each

model. Energy efficiency is a key consideration - a commitment that has led to the development of patented technologies such as vibration reduction technology (VRT) and eco-bubble technology. The company reduced greenhouse gas emissions during manufacturing by 47% since 2008 by adopting renewable energy sources and solar power technology. The packaging is also designed to be more compact, allowing shipment of more products per trip thus cutting fuel consumption and emissions. Samsung's products are accredited with the Emirates Quality Mark. The new air conditioning range contributes energy saving up to 35%. Samsung's latest MT12 and AW3 refrigerators are totally green and delivers the highest energy efficiency to the consumers [146].

Panasonic Corporation is a leading electronic manufacturer in the world, having around 634 companies that offer a broad range of products under their brand name. It produces a wide range of energy efficient products through which it aims to expedite reduction of carbon emissions. It remains active with its green initiatives. Eco Ideas Declaration was implemented in the company in 2010 and is in line with the company's global vision of environmental sustainability and a commitment to become the No-1 Green Innovation Company in the electronics industry by 2018, which also coincides with their 100th year of operation. Panasonic has introduced a new line of green products to the region. This will not only boost the company's bottom line but also set an example for sustainable green growth.

As a part of this campaign, Panasonic Marketing Middle East and Africa (PMMAF) has undertaken a regional campaign to encourage sustainable green lifestyles. Some of the initiatives include carrying out more than 15 educational and corporate social responsibility programmes in the Middle East and Africa, a scholarship programme for students of environmental science at some universities, promotion of green products with energy-saving features into their product line. The company has developed a unique technology – ECONAVI, which equips appliances such as air conditioners, refrigerators and washing machines with intelligent sensors. It comes with Sunlight detection, a feature that can sense weather conditions, reduce cooling power and automatically set the appropriate temperature when the sun goes down. Thus ECONAVI enabled

product can save up to 50% more energy than their counterparts without this technology. The nanoe-G feature found within Panasonic's new range of air conditioners claim to remove 99% of the bacteria, viruses, and mould found within the room it's cooling. The company has set up Eco-care centres in Dubai for electronic waste collection and environmental friendly disposal management. The electronic waste collected at these centres are handed over to the e-waste management companies authorised by Dubai Municipality. It has entered into a collaboration with Dubai Municipality and Environmental Centre for Arab Towns (ECAT) in 2010 with an aim of promoting awareness on environmental issues in the Arab world. The three organisations have committed to cooperate on projects on ecological issues, and promote greener lifestyles. To instil green thoughts in children, the company organises an eco-picture diary competition, which encourages children in the age group of 6 to 15 years to present their green ideas on ways and means to preserve and conserve energy. To develop a green culture among its employees, the company follows an eco-lunch hour initiative monthly wherein all employees enjoy lunch made from organic ingredients and energy efficient cooking methods. Thus the company continues to introduce and expand its Green activity efforts through its products, services, and practices [147].

Siemens has a wide offering of green product range and is active in educating the public on the green benefits of their product range. Siemens ecoExclusive washing machines have the highest EU energy rating of A+++. It is the first in the region which features intelligent water management to conserve the last drop of water, has greater resource efficiency and saves energy. Over the last 15 years, Siemens products have made considerable improvements in energy efficiency. The dishwasher ranges launched in 2013 are said to consume up to 60% less energy compared to dishwashers available in 1997. Likewise in washing machines energy savings are now around 46% and in refrigerators, the latest models help save a phenomenal 57%. Energy efficiency of appliances is of paramount importance and core values at Siemens. Likewise, Siemens flexi induction hobs, steamers, ovens and other appliances are loaded with green features. Besides Siemens cooperates with Dewa to promote resource efficiency

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to that helps consumers to identify the importance of choosing green products [148].

Bosch is currently the leader in the development of energy saving and low consumption home appliances. From concept to crate and beyond, Bosch is committed to greening the product life cycle. In March 2013, Bosch launched 'The Green Star UAE' initiative which aims to provide sustainability by educating people on simple measures they can adopt in their routine to conserve resources and save energy, thus becoming a 'green star' [149].

Haier has been awarded the Emirates Quality Mark for its range of home appliances products and this award reflects the company's commitment to becoming the most energy efficient and environmentally friendly home appliances company according to its management. With 24 manufacturing bases, 21 industrial parks and 5 research and development centre around the world, striking a balance between performance and low energy consumption is the essence of Haier's home appliances products, providing the latest solution without any compromises. As a leading innovator of environment-friendly products and technologies, Haier has been producing technologies that drastically reduce energy such as the smart drive motor and smart dosing technology both delivering the best-rated energy use available with A+++ [150]

Supra The air conditioners from Supra have the five-star energy efficiency rating, the highest standard in the industry as well as the best in class value for money. Powered using the best piston compressors and enhanced with the GoldFin^{TM} anti-corrosive treatment, the Aura air conditioners promise to reduce costs in the longer run enabling a cleaner, greener and healthier lifestyle

Likewise, product range from **GE, JVC, Kenwood, Sony, Sharp, Toshiba, Daewoo** and all leading brands in UAE market have green promises for the consumer.

2.7. Overview of Major Green Campaigns beyond UAE

The following table summarizes some of the major green campaigns adopted by the leading companies in this sector beyond UAE

Table 2.5 Major Corporate Green Campaigns

Sony[151]	Aim 'Road to Zero' environmental strategy, is to attain zero environmental footprint by the 2050.
	Introduce more energy-efficient products and green technologies, encourage a low-carbon and eco-conscious lifestyle among consumers, and adapt more sustainable business practices across our operations through Global Environmental Management System.
	Facilitate proper recycling and energy conservation at Sony sites around the world. With the 'Take Back Program', the Company will take back and recycle any Sony product and/or packaging at no cost to the consumer at certain locations.
	Collaborations with non-profit organizations and educational institutions to encourage a wide range of environmental organizations.
	Promote various environmental programs
Panasonic[147]	Panasonic Kids School Program promotes green programs for kids globally to instil green values in them
	World environment day is celebrated with a many conservation oriented activities and actively promote global Earth Hour Campaign.
	Has ISO14001 certification, an environment management system implemented in its companies in the Middle East region.
Samsung[146]	Eco-vision is : " Creating New Value through Eco-Innovation"
	Has an Eco-Management Committee to plan, implement and overlook Green vision. The committee consists of Environmental Safety Council, Eco Product Council, Environmental Safety Strategy Council and Climate Change working group

	PlanetFirst[TM] principle is a pledge, a thought, and a basic approach that is regarded most important as consumers seek to balance latest technology with greener lifestyle.
Bosch [152]	Sustainability activities under the slogan "NOW" include product innovations / modifications to save energy Offering green solutions at affordable prices to the consumer Introduction of ' Bosch Connect' Regular improvements in reduction of carbon emissions Investments in education, R&D, and public projects
Siemens [153]	Green product innovations through technology Adopts strict environment portfolio whose key features are: energy efficiency, renewable energy, and environmental technology. The Siemens Environmental Portfolio includes ten technology Fields along the entire value chain of electrification each of which offers innovative products, solutions, and services.

Source: Company websites and sustainability reports

2.8. Fostering Green Initiatives

Government organisations continue to foster and unveil new green initiatives, raising awareness among the public on rationalizing energy consumption and the need for going green. Some of the support functions offered by various Government departments have been enlisted below:

Dubai Municipality (DM): Recycling old digital devices has become lot easier with the launch of a mobile app launched by DM. This initiative is aimed to support easy donation, disposal and repair of electronic devices. The app called Taheel (which means refurbish in Arabic) is available both on Android and iOS applications. The slogan adopted is "your old device is gold for others", the digital devices refurbishment center can also be accessed online at ddrc.ae. The objective is to bring down the e-waste in the emirate in a green way, the services offered are: donating devices, requesting for used devices, technical training,

and support to establish a training lab using refurbished devices. Technically supported by Microsoft, the devices are repaired and reused by donating to institutions [154].

Dubai Economic Department (DED): DED in collaboration with the Dubai Green Economy partnership (Dubai GEP), has launched the Green deal Dubai which can be accessed on web link greendeal.ae. It is an e-commerce platform designed as a destination for pre-checked green technologies such as solar panel kits, solar water heaters, water savers etc. The portal will directly link suppliers of green technologies with consumers and facilitate easier market adoption of green products along with financing options [155]

Likewise, numerous green initiatives are fostered and embarked upon by many Government departments, corporate bodies and the utility provider to enhance the awareness of common man on the need to go green and contribute to the ongoing green movement the country is engaging in.

2.9 Concluding Remarks

This chapter has provided substantial literature on the power saving and monetary savings that can be achieved by using Green home appliances (GHA). It has presented statistical evidence to support the claim that power savings can be achieved through GHA. The role and share of households and home appliances in typical power consumption breakdown had been presented to highlight the potential for power savings in this segment. Besides highlighting the role of households in power saving, the chapter has presented an overview of the green initiatives carried by the utility and the corporate bodies in the home appliances sector. The market dynamics presented in this chapter helps us to understand the macro environment and micro environment of the country. The vibrant nature of the UAE consumer electronic market and how small changes in this sector will radiate to other GCC countries have also been reflected here. The chapter also highlighted the supporting role played by some Government bodies in fostering the green cause. The following chapter will support the proposition with literature review carried out around the world.

CHAPTER 3: LITERATURE REVIEW

3.1 Introduction

This chapter elucidates the concept of green marketing, its evolution, and transformation highlighting the changing facets and approaches the concept has witnessed in the past years. An extensive literature review was done under three themes which were aimed to understand the conceptual shifts, the factors influencing green purchases and country wise segregation of studies on green products and purchases. The chapter presents the logical flow of research from identification of factors, to research gaps, ascertaining the business problem, concluding the research problem and reviewing the suitability and applicability of various theoretical models to address the research problem and research questions. The chapter highlights the basis of opting the CAB model among various models reviewed to answer the research questions. The chapter concludes with the proposed model for conducting the study along with the reasoning for adopting the improvised model.

3.2. Evolution of Green Marketing

In the name of development, so much harm had been done to the environment. The issue of sustainability and ethics were overlooked to reap short term profits and quick return on investments. When the impact on the environment started surfacing in the forms of climate change, pollution, energy and resource scarcity to name a few, environmental concerns and energy conservation started drawing attention at global meets. These raising concerns led the way to series of discussions and debates in global meets. Governments along with the stakeholders realized the need to plan and develop strategies to implement green practices to protect the environment. The role of United Nations and its allied organizations in highlighting the dire need to address this critical issue could not be undermined. The Green initiatives were undertaken to spread awareness, channel investments and empower the cause through legislations. Governments started fostering the green initiatives and generate awareness on the need to go green. The evolution of Green Marketing became complete when the corporate sector started adopting, advocating and informing the consumers of its green ideologies. This resulted in creating the much-needed awareness on green

products and green purchases. The corporate sector along with the other stakeholders made an indelible attempt in driving home the green practices to the consumer. It was realized that for a mass movement of change, it should start from the individual and if the individual changes his consumption pattern, then the change can proliferate to all levels. The evolution paved the way for the Green products, Green consumer and Green purchasing in the increasingly environmentally conscious society.

Primarily the aim of Green Marketing was to overcome the fallacies contributed by the traditional marketing, i.e., ignoring the environment, over consumption of resources, improper waste disposal, short product life cycles, focus only on primary need satisfaction lacking futuristic view and improper raw material and process selection [156].These shortfalls were attempted to be overcome and thus evolved the eco-friendly Marketing concept – The Green Marketing

3.3. Going Green in UAE

The Country's rich reserves of hydrocarbons and lack of early awareness on the need to go green were the main causes of the country taking a back seat in its research and practice of Green Marketing. When the country was ranked among countries with highest carbon footprint per capita and among the ecologically wasteful nations [2], policymakers revisited their energy strategy and formulated plans to diversify their energy mix not only for energy conservation but also to alter the image of the nation to that of a proactive, eco-conscious and futuristic nation. The country took immediate steps to house the renewable energy research center, IRENA [37] and establish the world's model sustainable city with least emission levels – Masdar [36] on its soil. Plans are upfront to develop the nation into a hub of alternative energy and green research. With the launch of key initiatives such as the 'Green Economy for sustainable development', the strong ambition UAE is to become number One in the export and re-export of green products and technologies [22]. The green progress of UAE are focused on the following directions:

1. Renewable Energy and Elevating clean fuel energy production

2. Promote investments to enhance the import, export, and re-export of green products and technologies apart from creating job opportunities.

3. Construct green cities and make suitable urban planning policies.

4. Regulatory agenda to bring down carbon emissions

5. Encourage organic agriculture through incentives and rewards.

6. Avoiding wasting and creating awareness on green life through series of policies and programmes aimed at rationalizing energy consumption [157]

Quoting the excerpts from an interview of Shaikh Mohammad published in 'The Business Year: Dubai 2012 edition to highlight the importance given to the green cause [158]:

"Our Green Economy Initiative announced early this year reaffirms our commitment to diversify energy sources and preserve the environment whilst strengthening our competitive position. Through this initiative, we aim to become the world leading centre for the export and re-export of green products and technologies" – His Highness Shaikh Mohammad Bin Rashid Al Maktoum, Vice-President and Prime Minister of UAE and Ruler of Dubai

Green Economy focuses on improved human well-being and social equity, while notably reducing environmental risks and ecological scarcities. Green Economy has the features of low carbon index, is highly resource efficient and imbibes socially inclusivity. Growth is achieved through Government and private investments which target to bring down carbon emissions and pollution, thereby enhancing energy and resource efficiency and preventing the loss or imbalance of biodiversity and ecosystems. [31] [159]

The quote reiterates the prominence levied on green products and technologies by the nation. UAE's green market estimated at USD 1.37 trillion a year is expected to double to USD 2.74 trillion by 2020 according to International Chamber of commerce, UAE Chapter. World Bank Data show that as of 2009, the per capita level of CO_2 emissions in UAE was 22.6 metric tonnes per person

annually [160]. The UAE has set aside $ 62 B to develop renewable energy, through Masdar city, Mohammad Bin Rashid Solar Park and on wind power generation. [161]

3.4. Review of studies on green products

Many Research studies were reviewed based on the keyword searches such as Green products, Green consumer, green purchases, Green home appliances, energy saving home appliances etc. and the studies reviewed were broadly classified into the following themes

3.4.1. Theme 1: The conceptual shifts in studies on Green products / Purchases.

The purpose of this theming was to have a broad understanding of the evolution process of the Green products and purchases along with the shifts in approaches of research studies done on this subject. The conceptual shifts in research studies highlight the path the studies on green products and green purchasing had traversed along the years

Highlights of the Literature Review under Theme 1:

Initial research on Green Marketing dates back to the 1970's wherein the American Marketing Association held an 'Ecological Workshop" which saw many researchers presenting the concept from the ecological balance perspective. Later there was a perceptual shift and the ecology was replaced by environment and further on encompassing the energy and environmental perceptive the Green Marketing evolved.

In the 1970s Studies done in the US began to give marketing an environmental dimension (Kassarjian, 1971[162]; Zikmund and Stanton, 1971[163]; Henion, 1972[164]; Fisk, 1974[165]; Kinnear and Taylor, 1973[166]; Kangun, 1974[167]; Kinnear *et al.*, 1974[168]; Henion and Kinnear, 1976[169]; Perry, 1976[170]; Shapiro, 1978[171], among others). The 1970's witnessed shift on research focus to measuring consumer responses on Green Marketing. Dunlap and Van Liere in 1978[172] developed a NEP scale to measure consumer responses on green

marketing. The NEP – New Environmental Paradigm scale was considered a milestone in Green Marketing research.

The Brundland Report in 1987[173] gave a whole new dimension to the concept of Green Marketing – the dimension of Sustainability. Straughan and Roberts, (1999) claimed that the environmental concerns have traversed across many different phases [174]. What started in the early 1960s as a greening concept, then focus shifted on pollution and energy conservation and later due to heightened social and political pressure, corporates drifted beyond these concepts to accommodate greener paradigms like recycling, alternative packaging, redesigning of the product, and alternative products. From the 1990s, environmental concern started garnering more attention and prominence. In 1999, Fuller gave a three-dimensional approach to the concept integrating customer needs, organizational goals and environmental friendliness [175].

The 2000's witnessed green marketing becoming a multidimensional concept overcoming the fallacies of traditional marketing, with corporate social responsibility, ethical consumerism, sustainability all forming important facades of the concept. As many studies highlighted the influence of individual consumption on environment quality, the authorities and corporates started rethinking the role of consumers in contribution towards solving the problem (Barr and Gilg, 2006[176]; Bonini and Oppenheim, 2008) [177].

The focus started to shift on the Green consumer and the purchasing behaviour. One choice the common person come across every day id the option to buy green or non-green products. This purchasing, termed as green purchasing or environmentally preferable purchasing (EPP) deals with making purchase decision based on its impact on the environment. It also implies the process of weighing all the alternatives and opting for the one which is environmental friendly. (H.V. Hai, N.P. Mai, 2013) [178]

The major reason for the increasing prominence for environmental concern has been attributed to increased media coverage on the issue, greater awareness of environmental problems among the public, the impact of major industry disasters and the increase in the number of activist groups on the environment

(Kalafatis et al. 1999) [281]. Subsequently, customers started thinking about environmental protection as a main factor that should reflect in their buying decisions, increasing. Environmental protection was no longer viewed as a responsibility of Government and corporates, but it was getting the status of a citizen's responsibility (Fraj and Martinez, 2006) [179]. This budding realization and concern over environmental issues led to the creation of a strata of conscious and responsible consumers, i.e. the green consumers.

In a nutshell, the theming enables the researcher to have a broad understanding of the conceptual shifts in this area of study such the starting phase of ecological marketing (Fisk, 1974[165]; Henion and Kinnear, 1976) [169], then moving towards green marketing (Ottman, 1993[180]; Smith, 1998[181]), towards greener marketing (Charter, 1992[182]), then came the environmental marketing (Coddington, 1992[183]; Peattie, 1995[184]), followed by the enviropreneurial marketing (Menon and Menon, 1997[185]) to a refined and more adaptive sustainable marketing (van Dam and Apeldoorn, 1996[186]; Fuller, 1999[175]). These days' companies are primarily concerned about the sustainability issues, with focussed attention on the three important facades - people, profit, and planet. (Makeower, J. 2009) [187]

3.4.2. Theme 2: Factors influencing Green Purchases

One of the most challenging task of marketers and corporations working in the field of green products and services is to identify and determine the factors that promote green consumer behaviour and finally persuade the consumer to buy green products. (Hesami et. Al, 2013) [188]. The purpose of this theming was to group studies done on green products and purchases from consumer perspective thereby identifying factors that influence and facilitate green purchases.

Highlights of the Literature Review under Theme 2

The first survey on Green Marketing was done by Van der Merwe and Oliff [189] in 1990 which studied the consumer interest in green products and the European multinational's response over growing green concerns. The survey revealed that 92% of European multinationals stated to have modified their product over increasing sustainability problems and 85% reported to have altered their

product systems. Other popular studies to measure consumer response to Green marketing along the lines of Vandermerwe and Oliff were those of Callan and Thomas (1992) [190], Doyle (1992) [191], Peattie (1992) [192], Dietz and Stern (1994) [193].

The late 1980s and 90s saw a surge in green consumerism. Eco awareness, rising attention of consumers in green products and the intention to pay for green features paved way to businesses to develop interest in the field of green marketing, which led to some important reforms and innovations (Peattie and Crane, 2005, p. 358) [194].

A study by Mintel in 1995 recorded a small increase in green consumers since the first study in 1990 and stated that a wide gap exists between green concerns and actual consumer purchasing or the 'green purchase [195]. 'This gap was examined and the reason for the gap was identified to be the unwillingness of consumers to compromise on the features of price, quality, availability or convenience over the 'green cause'.

Researchers like D'Souza (2004) [196], Lee (2009) [197], Rahbar and Wahid [198] studied growing consumer interest and established that consumers around the world are increasingly aware and willing to pay more for green attributes. In 2004, Ginsberg and Bloom established that the first step is to understand the consumer preferences, their opinion, and attitude towards green marketing [199]. The authors also developed a model - the green marketing strategy matrix based on their study.

Another survey conducted in 2008 on Portuguese consumers with a sample size of 887 concluded that three segments of green consumers could be identified based on their knowledge and attitude towards eco-friendly products. (Finisterra do Paço et al., 2009) [200]. The neoclassical view stated that consumers purchase green products for self-centred reasons like that of taste, better quality or for health reasons. Contrary to this claim, other research studies revealed that there are self-centred and selfless motives behind green shopping (Thøgersen, 2011) [201]. In a study carried out on 4,000 Europeans across four countries (Denmark, Germany, the UK, and Italy), more consumers were found to buy green products

because of its positive impact on the surrounding. They purchased those products as they were compelled to do so by their recognized beliefs and benefits for the environment (selfless reasons)" (Thøgersen, 2011) [201].

An extensive research on the European attitude towards sustainable consumption was carried out on a sample size of 26,500 respondents in April 2009 which reported 80% of the Europeans believed that a product's impact on the environment is a very crucial factor to consider while making a purchase decision.(Flash Eurobarometer 256 – The Gallup Organisation,2009) [202]

Another survey carried out in February 2012 among a sample size of 1,000 Americans reported that 42% of the sample were not encouraged to purchase green products because of price that acts as a limiting factor (Cone Green Gap Trend Tracker, 2012) [203].

Specific studies that suggest consumer choice can be influenced positively by Green Marketing campaigns were; study by Ottman (1993) [180]which revealed that green consumer can be encouraged by offering extra values and features in the product which can be either cost effectiveness or an eco-friendly solution. A study by Peattie (2001) [204] stated that consumers can be influenced towards green purchases by highlighting the relative advantage of greener products. Study by Mintel (2006) concluded that consumers are willing to pay extra for green products and the basis of this Green buying behaviour is their environmental and energy concerns '[205]

On Green Purchase behaviour, according to Tanner: "Generally, people try to behave positively when they feel threatened by the environment (Tanner, 1999, p. 153) [206]. He states environmental problems are now a growing issue and human behaviour related to this phenomenon is considered as an important element for creating environmental awareness.

Another study made by Coddington (1990, p. 7) examined that 79% of Americans want to consider themselves as environmentalists, 82% state they have recycled, 83% state they have changed their shopping habits to protect the environment, and 67% state that they would be willing to pay 5% to 10% more for environmentally compatible products[207].

The influence of consumer attitude in green purchasing was also explored by many researchers. People's personalities manipulate what attitudes they have toward the environment (Fraj & Martinez, 2006, 2007) [179]. Ajzen & Fishbein [208] (1980, p. 62) demonstrated that there is a strong empirical relation between intention and behavior. They mentioned that an individual's behavior is defined by his intention to perform the behavior, and this intention is a function of his attitude toward the behavior and his subjective norm. Kim and Choi (2005) [209] identified three factors that usually affect consumers' pro-environmental behavior. These three factors are collectivism, environmental concern and perceived consumer effectiveness (PCE). Mostafa (2009) [210] holds altruism, environmental concern, environmental knowledge, skepticism towards environmental claims, environmental attitudes to be the main factors that may affect consumers' green purchasing behavior. According to Beckford et al., (2010) [211] and Chan (2001) [212], green purchase intention is a significant predictor of green purchase behaviour, which means that purchase intention is positively affecting the probability of a customer decision that he will buy green products. Chan and Lau (2002) [213] conducted a cross-cultural research study in China and America, wherein consumers in Shanghai and Los Angeles were surveyed, concluded that the asymmetric influence of green purchasing intention on green purchasing behaviour warrants further attention. Dobson (2007) [214] argues that behaviour change towards sustainable development that is driven by environmental citizenship considerations is more likely to last than behaviour driven by financial incentives.

Awareness was found to be the most important factor influencing green product adoption. Unless consumers are aware of the advantages of green products, manufacturers" attempt to present his product to the market will be rendered futile (Kassaye & Dharmeda 1992) [215]. Green consumers will increase as eco awareness among consumers increases and environmental information is made easily available through eco-labelling schemes, consumer groups and consumer guides (Peattie, 1995) [184]. Laskova (2007) [216],claimed that consumers who are more concerned about the environment demonstrate more favourable outlook towards the environment when compared to consumers who believe they are

not powerful to make an impact on the environment. Such people do not actively partake in activities aimed at environmental betterment. This finding validated the previous research done by Kim and Choi (2005) [209], which reported that environmental concerns and awareness have a strong favourable impact on the consumer's green buying purchasing intentions. This supported the claim that consumers with high environmental concern may be motivated to buy those products which mirror that concern. Mostafa (2009) [210] stressed the significance of environmental concern, knowledge along with other variables which predict the consumer's green purchase behaviour. He further stated that based on environmental concerns green consumers and non- green consumers can be differentiated. Green brands were reported to generate positive responses in specific target groups by creating awareness by providing awareness on green product attributes. Knowing that the brand is green will make the consumer feel better while using it (Patrick Hartmann and Ibanez, 2006) [217]. Roshny Unnikrishnan (2012) [218] in her study on Customer Awareness of Green Marketing and Green Brand Effectiveness" has revealed that the factors such as customer awareness of green brands, customer perception regarding price, availability, greenness and effectiveness were found to be major green purchase influencers. Paco and Raposo (2009) [219] revealed that Portuguese consumers know the environmental challenges, they show their agreement to policies to better the environment, even though sometimes their concerns do not translate into actions. The reason behind this omission of environmental concerns in purchasing behaviour is due to the lack of awareness on the greening (Yam-Tang and Chan, 1998) [220]. Therefore, the need for Government and Corporate interventions to inform and persuade people towards green purchases still exists. A positive relationship between environmental awareness and people's attitude, decisions and lastly participation was observed. Accordingly if awareness of people is increased, it will lead to sustainable consumption behaviour (Fraj and Martinez, 2006 [179]; Haron et al. 2005[221]; Yam-Tang and Chan, 1998[220]). Sammer & Wüstenhagen's (2006) [222] study on Swiss consumers reported that consumers were ready to pay extra for 'A' rated washing machines with the EC Energy label. According to Sutcliffe et al (2008) [223] consumers can be encouraged to adopt green products by making them

aware of concepts like eco-foot printing analysis which will considerably bring down negative impact. Consumer's understanding of their ecological footprint will reduce unsustainable lifestyle practices. In a study done by A.Boztepe (2012) [224], awareness, product features, promotion activities and green price were found to affect green purchasing behaviours of the consumers in a positive way. Demographic characteristics were found to have considerable effect on green purchasing model. Research conducted in the last few years (Lee, 2009, Rahbar and Wahid, 2011, Lee 2008; D Souza 2004) has revealed that consumers are aware and are willing to pay more.

Numerous factors have been found to influence consumer's purchase of green products. Intensive research over years have identified that increased awareness of green issues; magnitude of information available on environmental issues; green advertising by corporates; mounting concern for the environment; surge in popularity of green products are some of the factors. (Cherian & Jacob, 2012) [225]

Ginsberg and Bloom (2004) in their study stated that the primary step is to understand consumer preferences like if the product's green attributes is better selling point to target consumers, if they really like them or look for them. Many studies have shown that to know the green market segment better, there is a need for understanding consumer tendencies and liking towards Green products (Fuller, 1999, p330-331; Coddington, 1993, p83). The Gfk Roper Yale survey (2008) [226] studied the customer preferences of American and Canadian consumers and revealed that most of the Americans are willing to purchase green products, but other features such as price and quality often take more priority. It was also stated that they were ready to pay a premium of 15% to 50% on green products. GfK Roper Yale Survey on Environmental Issues conducted in 2008 aimed to gauge the preferences against environmental knowledge, attitudes, and behaviour of the American and Canadian consumers. It was found that the consumers prefer and trust eco-labels of green products. In a study conducted by N.M.Suki (2013) [227] on the role of awareness on green purchasing decisions in Malaysia established that environmental concern and awareness will lead to a strong preference to purchase green products.

With regard to the relation between Pricing and green product adoption, Price was found to be one of the most influencing factors in a green purchase decision. (Peattie and Crane, 2005) In 1999, a research conducted by Vlosky et.al [228] studied the impact of perceptions, awareness and price on consumer willingness to buy and pay more for environmentally certified forest products. The results of that study suggest that willingness to pay is directly correlated with the environmental consciousness, certifications and perceived importance of those certification. Consumers may feel discouraged to buy green products if they are expensive (Blend and van Ravenswaay 1999[229]; D'Souza et al. 2006) [230]

On the consumer's willingness to pay a premium, Thøgersen recommends to narrow the price gap between green and conventional products (Thøgersen, 2006, p. 1774-1776) [231]. Many Studies have explored consumers WTP for green products across the world. In 1989, a consulting firm named Michael Peters Group, cited in Makeower[187], on US consumers ' interest in buying products and services with fewer negative environmental impacts. The study was conducted by a telephone poll on a sample size of 1000 consumers and found that 89 % of respondents stated that they were concerned about the environmental impact of the products they bought. Nearly 78 % said that they were willing to pay a premium of about 5 % for green products. According to the Roper organisation, an average consumer would be willing to pay 6.6% premium for environmentally safe products (Wasik, 1992) [233]. WTP has been reported by studies done on British, Canadian and Thai Consumers for green products (Prothero, 1990 [234]; Wongtada & Leelakulthanit, 1993 [235]). In few research studies it was found that consumers were ready to pay extra for green products and in some other studies it was suggested that the price difference must be marginal (De Pelsmacker et al., 2009 [236]; Pirani and Second, 2011 [237]; Purohit, 2011 [238]; Vernekar et al., 2011 [239]). The effect of price consciousness, quality consciousness, environmental consciousness and brand loyalty have been examined in a survey made in New-Zealand (Gan et al., 2008, p. 96) [240]. According to a survey conducted in 27 European countries across 27,000 respondents and over 75% of the respondents were willing to pay more for green products and nationality wise, it was observed that the Swedish were willing to pay the highest percentages: 88.8% (Pirani and Secondi, 2011, p. 69). In another

survey on 238 students, 92% of the respondents showed willingness to pay more for green products. Contrary to this, in another survey conducted on a sample of 808 Belgian consumers (students, academic staff, and administrators of Ghent University) only 10% were ready to pay a 27% price premium (De Pelsmacker et al., 2009, p. 363). Mandese (1991) stated that upcoming green market does not guarantee that consumers would purchase green products for premium (cited in Purohit, 2011, p. 95) [238]. Green consumers are also quite price-sensitive. So there is a limit on the readiness to pay more for green products (Morel & Kwakye, 2012) [210]. In many cases, consumers are willing to pay more for eco-friendly products (Barber et al., 2009[242]; Papadopoulos et al., 2010[243]). Consumers are more willing to purchase green products which are not harmful to the environment and natural resources (Chen, 2010) [244].

In a study by David O. Ward (2010) [245] on Consumer's willingness to pay for energy labels on household appliances on US population revealed that consumers were willing to pay a premium for energy saving labels with consumer demographics being a major influencing factor on their WTP. Environmental concern and awareness were found to be positively correlated to their willingness to pay and willingness to pay were motivated by both private (energy cost savings) and public (environmental friendliness) benefits. Consumer willingness to pay (WTP) for eco-labels have been explored by other researchers like Blend and van Ravensway 1999; Loureiro, McCluskey, and Mittlehammer 2002[246]; Bjørner, Hansen, and Russell 2004[247]; Aguilar and Vlosky 2007[248]; Srinivasan and Blomquist 2009[249]).

In a study done by Drozdenko et al [250] on Premium Pricing of green products, it was found that the consumers were willing to pay 9.5% premium on a green music player, 10.4% premium on hybrid cars. Shen and Saijo (2009) [251] studied the effect of the China Energy Efficiency labelling program on Shanghai consumers and the findings revealed that consumers were willing to pay a premium for energy efficiency labels in household appliances. Likewise, similar studies were conducted by Sammer and Wüstenhagen (2006) in Switzerland to determine the importance of the European Energy Label in consumers purchasing decisions. It was found that the European consumers were willing to pay a premium up to 30% on energy saving home appliance

Demographic factors were also found to play a major role in consumers green purchase intention (D'Souza, Taghian, and Khosla, 2007[252]; Promotosh and Sajedul, 2011[253]) Demographics affect consumer behaviour and influence attitudes (Fransson & Gärling, 1999) [254]. Studies done on Australian green consumers reported connecting between demographic profile and attitude towards green labels (D´Souza, Taghian, Lamb & Peretiatko, 2007) [255]. Many such studies have elucidated the impact of demographics on green purchases (Straughan & Roberts, 1999[174]; Kollmuss and Agyeman, 2002[256]; Memery et.al. 2005[257]; Panni, 2006[258]). Studies relating Age and green behaviour revealed mixed findings. While some studies suggested younger people show more readiness to adopt green products (Chan, 1996) [259], there are other studies which suggest older people are more willing to accept green products (Do Paco et. al, 2009[260]; ICOM, 2008[261]; Roberts, 1996[262]; Straughan and Roberts, 1999[174]). There are also few studies which suggested age is not significant to green purchase behaviour (Anderson and Hansen, 2004[264]; Loureirro et. al, 2002[246]; Meyer and Liebe, 2010[263]). On the influence of Gender on green purchases, the studies revealed almost consistent results. Gender was found to be a strong influence with the females exhibiting more green purchase intention (Roberts, 1996[262]; Loureirro et al, 2002[246]; Anderson and Hansen, 2004[264]; ICOM, 2008[261]; Furlow and Knott, 2009[265]). Education was consistently found to be directly linked to green behaviour. Higher educated people showed more green consumption (Chan, 1996[259]; Roberts, 1996[262]; do Paco et al, 2009[260]; Roberts and Straughan, 1999[174]). Regarding the effect of Income on green purchases, while some studies addressed its role as insignificant (Loureirro, 2002[246]; Laroche, 2001[266]; chan 1996[259]; Anderson and Hansen, 2004[264]) while some studies asserted income to be a major influencer (Roberts, 1996[262]; Straughan and Roberts, 1999[174]; do Paco et al, 2009[260]; Meyer and Liebe, 2010) [263] The results of two Harris Interactive studies conducted in 2009 and 2010[267] reveals that the consumer interest in green products is strong irrespective of age, gender, geographic region or economic cycle. Thus the literature review suggests substantial evidence that connects demographic factors to consumer's willingness to adopt green products.

Among the other factors, promotions were found to a major influencing factor in consumer's willingness to purchase green products. Wanninayake and Randiwela (2008, p. 14) [268], in their study has revealed that more than the 50% of respondents stated that promotional activities influences them in their green purchase decisions. Chase and Smith (1992) [269] stated in their study that 70% of consumers can be at times influenced to purchase green products through green claims. According to Ahmad and Juhdi (2008) perception towards organic food, awareness on Government action and support, beliefs about product safety and product friendliness to the environment, product availability and product information are the most instrumental factors that impact consumers green behaviour. Ismail and Panni (2008) [271] stated that the information availability and product availability significantly influence consumers' green behaviour. Availability is the level of ease or difficulty experienced to obtain or consume a specific product. Vermeir and Verbeke (2004) [272] debated that consumer motive to buy green products may not translate into purchasing behaviour due to poor availability. Mainieri et al. (1997) [273] also supported availability stating that inadequate availability is the reason behind consumers' lagging in their pro-environmental behaviour. Ismail and Panni (2008) [271]; Ismail, Panni and Talukder (2006) [274] and Panni (2006) [270] reiterated that the availability of green products is very important to engage consumers into green behaviour. De Pelsmacker et al (2009) [236] studied the reasons behind lesser green consumption and attributed the cause as inadequate availability of green products, disbelief on green assurances and lack of product information.

A study done by Marie Cervellon, Lindsey (2011) [275] stated that consumers do not comprehend the meaning of all terms and labels used to describe green products. They would depend on their past experiences with a similar product, on brand labels, the appearance and feel of the product, reviews from various sources, feedback from social circle, the main benefits marketed by the manufacturer and compare it with their requirement and also their readiness to pay for the product. It has been observed that during the purchase of household appliances, customers also take into consideration the green features of the product. The decision to purchase can get influenced by the benefits offered by the energy efficient product, in the long and short run. (Tanushri Banerjee and

Arindam Banerjee, 2015)[276]. A study on Sustainable consumption by w.young et. Al (2010) [277], investigated the purchasing process for green consumers in relation to consumer technology products in the UK. Data collected from 81 self-declared green consumers revealed that single issue labels (energy rating labels) play a prominent role in the consumer's decision to go green

In a nutshell, based on the above theming of research studies done in this area, it has been observed that the factors that have been time and again referred as major determinants that influence consumer purchase of green products are:

Table 3.1 Factors Identified to influence Green purchases

Independent Variables		Dependent Variable
Awareness (or knowledge of environmental issues, problems, being informed or concerned)	Demographic Factors	**Acceptance** (Demonstrate Favorable behaviour through green purchase)
Preference (Perceived Benefits like quality, availability, Attitude)	Psychographic Factors	

Source: Literature review

Based on the above theming it can also be deciphered that consumer awareness is the prime factor which translates to creating preference towards green products which leads to willingness in the consumer to pay more for the green products and thereby show his acceptance through purchase. The basic transformation process of a consumer to a green consumer can be represented diagrammatically as depicted below
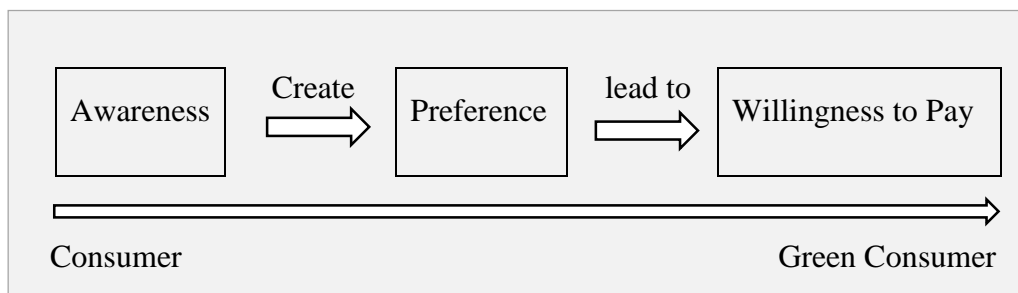
Fig 3.1 Relationship of factors identified to influence Green purchases

Research Gap 1: Although Awareness, Preference and Willingness to pay for Green products have been explored in separate studies, they were not found to be explored in unison and such a study was not found to be done for Green home Appliances

3.4.3. Theme 3: Country wise segregation of studies

The purpose of this theming was to understand the extent of research done on Green products and green purchases in other countries. As there was very less literature available on green products studies were done in UAE, the grouping of studies under this theme provided insightful understanding on the research progress achieved in developed countries, the factors identified to favour green adoption in countries with similar demographic profiles as UAE and the research contribution made by such studies in other countries.

Highlights of the Literature Review done under Theme 3.

Several research has been carried out in USA (Archibald P. Sia, Harold R. Hungerford & Audrey N. Tomera (1986) [278]; Tina Mainier, Elaine G. Barnett, Trisha R. Valdero, John B. Unipan & Stuart Oskamp (1997) [273]; Anja Kollmuss & Julian Agyeman (2002) [256]; Shelton Group (2009) [279]; Tan Booi Chen, Lau Teck Chai (2010) [244] which were aimed to identify the influencing factors on pro-environmental behaviour and barriers to pro-environmental behaviour, Gap analysis, and the influencing role of consumer attitude in green purchases

Studies conducted in United Kingdom by Bodo B. Schlegelmilch, Greg M. Bohlen, Adamantios Diamantopoulos (1996) [280]; Stavros P. Kalafatis, Michael Pollard, Robert East, Markos H. Tsogas (1999) [281]; Tim Cooper (2007) [282]; Gary Akehurst, Carolina Afonso, Helena Martins Gonçalves (2012) [283]; Josephine Pickett-Baker, Ritsuko Ozaki (2008) [284]; Young, W., Hwang, K., McDonald, S. and Oates, C. J (2010) [277]focussed on studying the link between green purchasing decisions and environmental consciousness, analysed the applicability of theory of planned behaviour on green purchases, re-examined the green purchase behaviour and studied on corporate influencers and sustainable consumption.

In China studies conducted by Chan, R. Y. K. (2001) [212]; Ricky Y. K. Chan & Lorett B. Y. Lau (2002) [213]; Ying Kong & Aihua Zhang (2013) [285]; explored the determinants of consumers purchasing behaviour, analyzed the applicability of the theory of planned behaviour and influence of advertising on Green purchase behaviour.

Few studies done in Australia were by Clare D'Souza, Mehdi Taghian and Rajiv Khosla (2007) [252] and Martin Grimmer & Meghann Woolley (2012) [286] studied the environmental beliefs and its impact on the influence of price, quality and demographic characteristics with respect to green purchase intention.

Malaysian green purchases were explored by Mohd Rafi Yaacob and Azman Zakaria (2008) [287]; Booi-Chen Tan (2011) [288]; Mohammad Zakersalehi, Amin Zakersalehi (2012) [289] Khan Md Raziuddin Taufique, Chamhuri Siwar, Basri Talib, Farah Hasan Sarah and Norshamliza Chamhuri (2014) [290].Studies focussed on customer awareness, perception and future, role of knowledge, threat and Perceived consumer effectiveness; synthesis and modelling of Constructs and consumer attitude

Several studies were done in India, of which study done by Yogita Sharma (2011) [129]; Sanjay K. Jain & Gurmeet Kaur (2004) [98]; Savita, Ubba and Kumar, Naresh (2010) [292]; Dr. Anubha Vashisht, Dr. Bharti Wadhwa Prof. Akansha Uppal (2012) [293]; Ravindra P. Saxena, Pradeep K. Khandelwal (2012) [291]; Sourabh Bhattacharya (2012) [294]; Babita Saini (2013) [295]; Gokul Umaraniya (2013) [296]; Dr. B. Nagaraju & Thejaswini H. D (2014) [297] explored different facets of green purchases including changing consumer behaviour, retailing, segmenting and profiling consumers, consumer attitude, consumer perception, green impact on consumer, greening of industries and sustainable growth

Studies on consumers in Hong Kong done by Kara Chan (2000) [232]; Kaman Lee (2010) [197] delved on market segmentation of green consumers, the role of peer influence, local environmental involvement, and concrete environmental knowledge

Researchers in Europe like Heesup Han, Li-Tzang (Jane) Hsu, Jin-Soo Lee (2009) [298], Barua Promotosh and Islam Md. Sajedu (2011) [253]; Aysel Boztepe (2012) [224]; Magali Morel Francis Kwakye (Europe) [241] conducted empirical investigation of the roles of attitudes toward green behaviours, overall image, gender, and age in hotel customers' eco-friendly decision-making process; impact of green marketing on Consumer buying behaviour and green purchasing intention among young consumers.

Many studies were conducted all over the world exploring different facets of green marketing and green purchases like that of Hoàng Văn Hải, Nguyễn Phương Mai (2012) [178] in Vietnam on Environmental awareness and attitude of Vietnamese consumers towards green purchasing, by Narges Delafrooz,Mohammad Taleghani, and Bahareh Nouri. (2014) [299] in Iran on the effect of green marketing on consumer purchase behaviour, by Afzaal Ali & Israr Ahmad (2012) [300] in Pakistan on environment friendly products and factors Influencing the green purchase intentions of Pakistani consumers, by Mohamed M. Mostafa (2006) [301] of Egypt on gender differences in Egyptian consumers' green purchase behaviour and effects of environmental knowledge, concern and attitude

Apart from Australian consumers (D'Souza et al, 2007) [230], role of demographics on nationalities worldwide have been explored widely like US (Roberts.J.A, 1996 [230]; ICOM, 2008 [261]), Canada and Hongkong (Chan.T.S, 1996[259]), Portuguese consumers (do Paco et. al, 2009) [260] Malaysian consumers (Tsen, 2006) [303], Swiss consumers (Meyer et al, 2010) [263] to name a few.

Green purchasing has been widely promoted by many governments and NGOs since the late twentieth century. Germany adopted systematic green public procurement activities in the 1980s followed by other European countries like Denmark (1994), France (1995), UK, Austria (1997) and Sweden (1998). The US EPA developed Guidance for environmental friendly Purchasing, while Japan has passed the Green Purchasing Law in May 2000 to promote green purchasing as national policy. The law mandates all governmental bodies and local governments to follow green purchasing and present the summarized

purchasing reports to the public. In Japan, the Green Purchasing Network (GPN), formed in 1996 to encourage green purchasing, rose from 73 members to more than a 3,000 member organization. After two years, the International Green Purchasing Network (IGPN) was introduced to encourage green purchasing worldwide. The Korean government also issued a Green Purchasing law in 2005 and until now, around 5,400 products have been certified for green purchasing. The Thailand Government departments started green purchasing in 2009. Along with the Government, the consumers are also demonstrating their increasing willingness to adopt green purchasing. Recent worldwide polls show that consumers are increasingly favouring eco products and many of them are ready to swap to more environmentally friendly brands after they are exposed about emerging environmental issues [178]. Many studies have found that the more consumers are aware regarding the societal and environmental issues, the more they are involved in pro-social and environmental behaviours such as green purchasing (Hines et al., 1987[304]; Chan, 1996[259]; Lee and Holden, 1999[305]; Follows and Jobber, 2000[306]; Larouch et al., 2001[266]; Panni, 2006[258]; Junaedi, 2007[307]; Kim, 2011[308]; Shahnaei, 2012[309]).

Several types of research have been conducted on green purchasing intentions. Among these, many researchers have attempted to identify the determinants of consumers' green purchase behavior. Most of them have been conducted in industrialized countries (Bleda and Valente, 2008[310]; Chatterjee, 2009[311]; Chan, 2004[312]; Davis, 1993[313]), but the findings are seemed to be contradictory (Elham, R and Nabsiah, A.Wahid, 2011) [314]. Thereby, it can be understood that the findings may only be relevant only to specific cultural, demographical and geographical context, and period of time. Because of complexity in green purchasing behavior of consumers', generalization does not prove to be correct under different cultural, social and demographical contexts. Strengthening this argument, Elham and Nabsiah (2011) [314], Ottman (1992) [315] and Peattie (1992) [192] reported that demand and attitudes for environment-friendly products are likely to different across different countries, cultures and market segments. Hence the research exploring the various factors which influence the consumers green purchase decisions in emerging Asian markets is considered to be opportune. (A.Ali, I Ahmad, 2012) [300]

3.4.4 Summary of Literature Review

Theme 1: Stages in Evolution and Conceptual shifts

Authors / Associations & year	Concept introduced	Description	Inference / Research Gap
American Marketing Association, (1970's); Henion and Kinnear (1976); Dunlap and Van Liere (1978)	Ecological Marketing, Environmental Marketing	Introduction of the concept. The origin of Green Marketing was as Ecological Marketing highlighting the hazards caused to the ecology. Attempts were made to measure consumer response over a scale.	Identification of different facets of Green Marketing. The initial focus was only on ecological perspective and the shift towards environmental perspective could be observed.
Brundland Report (1987); Roper Corporation (1990); Van der merwe and Oliff (1990); Ottman (1997)	Sustainability, Segmenting green consumer group	Sustainable dimension was given to the Green Marketing. Segmenting Green consumer group based on their attitudes and preferences. Gauge consumer behavior on green purchases	Slow Shift in the concept from environmental perspective to Sustainability and gauging and consumer attitude and behaviour
Fuller (1999); Marylyn Carrigan, Ahmad Attalla (2001); Grant (2007); Connolly and Prothero (2008)	Three dimensional approach, ethical consumerism, consumer needs	Three dimensional approach involving customer needs, organizational goals and environmental friendliness. Tailor practices to suit consumer needs	Focus was only on ethical perspective. Green Behaviour was considered as being ethical and responsible to environment
Rettab,B, Ben Brik, A (2009); J.A.Ottman, E.R.Stafford,	Social Responsibil-ity, Sustainable Consumptio n. Green	Consumer opinion on Green Marketing as a CSR initiative and their willingness to pay more. Ways to improve consumer appeal for	CSR and green shopping dimension was explored. *Green shopping ranged from buying organic food to*

C.L.Hartman (2010)	Shopping, consumer preference	environmentally preferable products	*recyclable product and hence wasn't product specific*
Pradeep Shukla and Bhuwan Gupta (2012)	Green Marketing Issues and Challenges in Current Business scenario	Three segments of green consumers were identified and opportunities of businesses that green marketing has was explored. Key areas and challenges were also explored	The importance of awareness generation was found to be crucial. *Study did not focus on the influencing factors leading to green purchases.*

Theme 2: Factors influencing Green purchases

Archibald P. Sia, Harold R. Hungerford & Audrey N. Tomera (1986)	Selected Predictors of Responsible Environmental Behaviour:	Relative contribution of eight variables in predicting responsible consumption across two groups.	The three major behaviour predictors identified: environmental sensitivity, perceived knowledge and skill. *The variables chosen for the study had narrow demarcation and Responsible environmental behaviour encompassed a whole spectrum of pro environmental actions which was too broad and not clearly defined*
Bodo B. Schlegelmilch, Greg M. Bohlen, Adamantios Diamantopoulos (1986); Tina Mainier, Elaine G. Barnett, Trisha R.	The link between green purchasing decisions and measures of environmental consciousness,	Explores the relationship between variables specific to environmental consciousness to explain consumers' pro-environmental purchasing behaviour. Awareness about environmental impacts of products, specific environmental beliefs of	Environmental consciousness and environmentally-responsible purchasing behaviour were linked. Awareness was found to be a strong influencer. *Only Environmental and demographic*

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Valdero, John B. Unipan & Stuart Oskamp (1997)	environment -al concern	consumers, general environmental attitude scales, demographic variables, and several pro-environment behaviours	*variables were examined in the study*
Stavros P. Kalafatis, Michael Pollard, Robert East, Markos H. Tsogas (1999); Barua Promotosh and Islam Md. Sajedul (2011)	Applicabilit y of Ajzen's theory of planned behaviour	Examines the determinants that influence consumers' intention to buy environmentally friendly products based on Ajzen's theory of planned behaviour. The appropriateness of the theory was tested in two distinct market conditions (UK and Greece)	*The focus of the study was only to explore the applicability of the theory of planned behaviour across two markets*
Chan, R. Y. K. (2001)	Cultural and Psychologic al factors	Examine the influence of various cultural and psychological factors on the green purchase behavior of Chinese consumers. A conceptual model was proposed and subjected to empirical verification with the use of a survey	*Only Psychological factors were addressed as influencing factors on the consumer behaviour. The role of Demographic factors were not studied*
Peattie and Crane (2005);Clare D'Souza, Mehdi Taghia n and Rajiv Khosla (2007) ; Mohd Rafi Yaacob and Azman Zakaria (2008); Booi-Chen Tan (2011); Rashad Yazdanifard Igbazua E Mercy (2011)	Awareness, Price, Quality, Perception, Preference	Consumer's environmental awareness and willingness to pay premium encouraging innovations. Price and quality attributes act as contributors to the formation of green purchase intention.	Awareness, Perception and Price were identified as major influencing factors in green adoption. Future prospects was found to be directly linked with these two parameters. Customers were found to prefer being associated with green companies and were willing to pay more for green benefits.

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Tim Cooper (2007); Yogita Sharma (2011)	Sector specific - Consumer Durables, Marketing mix, Retailing	Studied on life span of consumer durables. Highlighted optimum product life should be given more weightage to maximum product life.	Retailing was found to be a strong influencer in green purchases. *Lifecycle of a product was alone focused upon and identified as a major influencing attribute*
Hans Ruediger Kaufmann, Mohammad Fateh Ali Khan Panni and Yianna Orphanidou (2012); Afzaal Ali & Israr Ahmad (2012); Gary Akehurst, Carolina Afonso, Helena Martins Gonçalves (2012); Hessam Zand Hessami, Parisa Yousefi, Ghazaleh Goudarzi (2013); Khan Md Raziuddin Taufique, Chamhuri Siwar, Basri Talib, Farah Hasan Sarah and Norshamliza Chamhuri (2014)	Integration of factors, Re-examine factors, Develop sustainability index and subject it to empirical testing, Develop green consumer profile, conceptual model. Synthesis of Constructs for Modelling	Assess the factors affecting green purchase Examine the influence of various factors on the green purchase and propose a conceptual model accordingly after subjecting to empirical evaluation. Summation of factors affecting consumer understanding and perception	Awareness, environmental concern, were found to be strong determinants for consumers to prefer green products. *As most of the studies were generic in nature , sector – product emphasis / focus was missing*

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Theme 3: Country based studies

USA:			
Archibald P. Sia, Harold R. Hungerford & Audrey N. Tomera (1986); Tina Mainier, Elaine G. Barnett, Trisha R. Valdero, John B. Unipan & Stuart Oskamp (1997); Anja Kollmuss & Julian Agyeman (2002); Shelton Group (2009); Tan Booi Chen, Lau Teck Chai (2010)	Influencing Factors, Role of awareness and pro environmental behaviour. Barriers to pro-environmental behaviour, Gap analysis, Consumer attitude	Studied the relative contribution selected variables in predicting responsible consumption across two groups. Environmental, Sociological and Psychological models were used to explain the gap between expected behaviour and actual. Environmental and corporate influencers in GPB and the WTP, demographic and environmental factors affecting consumer attitude towards green products.	Studies were mostly at generic level, Sector – Product specific studies on GM was conspicuously missing.

United Kingdom Bodo B. Schlegelmilch, Greg M. Bohlen, Adamantios Diamantopoulos (1996); Stavros P. Kalafatis, Michael Pollard, Robert East, Markos H. Tsogas (1999); Tim Cooper (2007); Gary Akehurst, Carolina Afonso, Helena Martins Gonçalves (2012); Josephine Pickett-Baker, Ritsuko Ozaki (2008); Young, W., Hwang, K., McDonald, S. and Oates, C. J (2010)	Link between green purchasing decisions and environmental consciousness, Applicability of theory of planned behaviour, Sector specific study – consumer durables, Re-examining purchase behaviour. Corporate influencers, Sustainable consumption	Explores the extent to which variables, specific to environmental consciousness, are better able to explain consumers' pro-environmental purchasing behaviour. Testing appropriateness of the theory of planned behaviour across two distinct market conditions. Studied on life span of consumer durables. Highlighted optimum product life should be given more weightage to maximum product life. Influencing GPB through marketing and branding techniques, Attitude – behaviour gap	Measures of environmental consciousness were found to be closely linked to environmentally-responsible purchasing behaviour.
China Chan, R. Y. K. (2001); Ricky Y. K. Chan & Lorett B. Y. Lau (2002); Ying Kong &	Determinants of Consumers Purchasing behaviour, Application of theory of	Influence of various cultural and psychological factors on the green purchase behaviour. A conceptual model was proposed and subjected to empirical	*Only Psychological factors were addressed as influencing factors on the consumer behaviour. The role of*

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Aihua Zhang (2013);	planned behaviour , Influence of Advertising on GPB	verification with the use of a survey. Applicability of Planned behaviour theory in Chinese and American markets. Green ads were found to positively influence GPB	*Demographic factors were not studied*
Australia Clare D'Souza, Mehdi Taghian and Rajiv Khosla (2007); Martin Grimmer & Meghann Woolley (2012)	Examination of environmental beliefs and its impact on the influence of price, quality and demographic characteristics with respect to green purchase intention. Green marketing messages and consumers' purchase intentions	Relationship between the consumers green purchase behaviour using price and quality attributes as contributors to the formation of purchase intention. Construct a model incorporating knowledge, beliefs, demographic profiles and situational variables to facilitate better understanding of green consumers' market segments Examine whether green purchasing behaviour is influenced by marketing communications.	The variables studied were found to exert strong influence on green purchase intentions. *Only the influence of one independent variable (environmental beliefs) was assessed mainly*

Malaysia			
Mohd Rafi Yaacob and Azman Zakaria (2008); Booi-Chen Tan (2011); Mohammad Zakersalehi, Amin Zakersalehi (2012) Khan Md Raziuddin Taufique, Chamhuri Siwar, Basri Talib, Farah Hasan Sarah and Norshamliza Chamhuri (2014)	Customer Awareness, Perception and Future , Role of knowledge, threat and Perceived consumer effectiveness; Synthesis of Constructs for Modelling ; Consumer attitude	Study the awareness and perception on green products through spot survey. Investigate the influence of demographic factors on the two and the buying behaviour of green products. Integration of all factors in modelling and empirical testing; Attitude of Consumer towards GM	Awareness and Perception were found to have great influence on the adoption of green products and the future prospects was found to be directly linked with these two parameters. *Green products were studied at generic level only*
India Yogita Sharma (2011); Sanjay K. Jain & Gurmeet Kaur (2006); Ravindra P Saxena Pradeep K Khandelwal (2008); Savita, Ubba and Kumar, Naresh (2010); Dr. Anubha Vashisht, Dr.	Changing Consumer Behaviour - Consumer Durables and Retailing, Segmenting and profiling consumers Consumer attitude on GPB Consumer Perception, Green	Overview of the lifecycle and marketing mix elements of green products. Role of socio-demographic characteristics in capturing variations present in the environmental consciousness of the consumers, Consumer attitude across demographic factors. Role of Awareness and price on perception. Study the awareness level of	A wide range of study has been done in India and many perspectives have been explored, from consumer, to retailer and business. Awareness and Preference were established as major determinants for green buying. *The study did not focus any specific product category and hence had a general scope*

Bharti Wadhwa Prof. Akansha Uppal (2012); Ravindra P. Saxena, Pradeep K. Khandelwal (2012); Sourabh Bhattacharya (2012); Babita Saini (2013); Gokul Umaraniya (2013); Dr. B. Nagaraju & Thejaswini H. D (2014)	Impact on consumer, Greening of Industries and Sustainable growth	Green Marketing amongst Retailers, Factors effecting consumer buying. Perception of industries in India – towards green philosophy. dimensions of Indian consumers towards GM	
Hongkong Kara Chan (2000); Kaman Lee (2010)	Market Segmentation of Green Consumers, The Role of Peer Influence, Local Environmental Involvement, and Concrete Environmental Knowledge	Segment the market based on the past purchase of environmentally friendly as well as not-so-friendly products and differentiate heavy and light green consumers using demographics and other environmental variables	Peer influence, local environmental involvement, and concrete environmental knowledge were identified as major influencers in green purchases among adolescents*. Only the role of age was explored on GPI, Generic Studies no product specific*
Europe Heesup Han, Li-Tzang (Jane) Hsu, Jin-Soo Lee (2009), Barua Promotosh and Islam Md. Sajedu	Empirical investigation of the roles of attitudes toward green	Study tested the relationships among attitude toward green behaviours (ATGB), overall image (OI), visit intention (VI), word-of-mouth intention	OI was identified as a positive function of ATGB and that tests for metric invariances demonstrated strong relationships among

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(2011); Aysel Boztepe (2012); Magali Morel Francis Kwakye (Europe)	behaviours, overall image, gender, and age in hotel customers' eco-friendly decision-making process; Green Marketing and its Impact on Consumer buying behaviour, Young Consumers GPI	(WOMI), and willingness to pay more (WPM) by considering the effects of gender and age in a green hotel context. Analyzed the role of eco awareness, green product features, price and promotional activities on purchase intention of green products, Test the applicability of the theory of planned behaviour. The influence of 4ps, customer satisfaction and WOM on GPI of FMCG	study variables and demographic factors Awareness and price were found to be major influencing factors
Other Countries Hoàng Văn Hải, Nguyễn Phương Mai (2012) (Vietnam)	Environmental Awareness and Attitude of Vietnamese Consumers Towards Green Purchasing	Interest, Attitude and Awareness towards Green Purchasing was tested in three cities of Vietnam.	Government and Mass media in promoting awareness was identified to have a strong impact on green purchase behaviour. Demographic and Psychographic factors were also found to be major influencers. *The role of price as an influencer in green buying was not explored. No specific product category was focused on*
Narges Delafrooz, Mohammad Taleghani, and	Effect of green marketing on consumer	Study the relationship between green marketing tools (Environmental advertising, eco-labelling, eco-branding	Green Advertisements were found to have the highest impact among the other variables studied on consumer behaviour. *Influence of other independent*

Bahareh Nouri. (2014) (Iran)	purchase behaviour	etc.) and green purchase behaviour	*variables on green purchases were not explored*
Afzaal Ali & Israr Ahmad (2012) (Pakistan)	Environment Friendly Products: Factors that Influence the Green Purchase Intentions of Pakistani Consumers	Examine the influence of various factors on the green purchase and propose a conceptual model accordingly after subjecting to empirical evaluation.	confirmed the influence of Organisations green image, Environmental Knowledge, Environmental Concern and Perceived product price and quality on consumers purchase intentions towards green products. Awareness on Eco friendly products was not established
Mohamed M. Mostafa (2006) (Egypt)	Gender differences in Egyptian consumers' green purchase behaviour: the effects of environmental knowledge, concern and attitude	Study investigated the influence of three cognitive and attitudinal factors on gender differences in green purchase behaviour across Egypt on a large sample size ($n = 1093$)	Identified the influence of the consumer's ecological knowledge, concern, attitudes, altruism, and perceived effectiveness, among other factors, on their intention to purchase green products. Results show that skepticism towards environmental claims is negatively related to consumer's intention to buy green products. Role of Demographic factors were alone analyzed in green purchase behaviour

3.5. Green Research in UAE

When compared to the bountiful research done in this area, meager research was only done on this subject in UAE and the few published ones referred to the private research companies being engaged by corporate houses to raise awareness on their specific eco-friendly product range as in case of Siemens (SHC) which engaged Raee Public Relations - Consultancy when it was all set to launch its range of eco-friendly cordless phones in 2008. An opinion survey was conducted to discover the consumer opinion on green products and spearhead a green campaign to key target audience to leverage eco-consciousness for gaining a dominant market position [316].

Another research done by a research consulting firm Synovate as a part of their Global trends survey (2011), interviewed 22,000 people across 28 countries of which UAE was also a participating country. Respondents were asked about their recycling habits, purchase of organic foods and ecological products. [317]

The Abu Dhabi Environmental Agency (EAD) has been conducting environmental awareness and behavior survey across the emirate of Abu Dhabi since 2008 to determine the level of environment awareness and according to the findings reported the environmental awareness had increased over the three year period from 49% to 58.5% in 2011. Nearly 2000 people representing various nationalities, ages, and industries in the emirate took part in the survey done in 2014. The results showed that 68% of the participants reported pro-environment practices, compared to 55% in the previous year [318]. The survey focused only on one emirate and on resource consumption issues.

A Survey by Dubai Chamber titled Consumer's Social Responsibility, Sustainable consumption and Green Shopping in the UAE by Dr. Bellaid Rettab and Dr.Anis Ben Brik in 2009 focused on consumer opinion on Green Marketing as a facet of Corporate Social Responsibility [319].

An online poll on 'Green Workplaces in Mena' conducted by Bayt.com in June - August 2014 across 7925 respondents revealed a desire in the region to adopt a greener lifestyle, both at work and at home, in the Middle East and North Africa (MENA) region (of which UAE was also studied). According to the poll,

72.5% of respondents considered going green important while a further 23.2% consider it moderately important. Almost 80% stated that they were concerned about the environmental issues such as pollution, conservation of natural resources and so on. Despite low awareness of technical concepts such as carbon footprint, which only 27.7% were aware of, a significant desire for a sustainable living was observed in the region. Major findings of the survey on the home front are presented in the table below [320]:

Table 3.2 Green workplaces in MENA - Survey findings

Figures	Findings
72.5%	Consider going green is important
80%	Concerned about environmental issues
42.3%	Use public transport
71.3%	Believe renewable sources of energy is the future
83.7%	Use energy saving lights at home

Source: Bayt.com

The literature review highlights that are a vast number of studies have been done on different facets of green marketing in developed countries while such studies are far behind in UAE. Research on this topic was conspicuously missing in UAE context. Thereby the Literature Review does not contain many relevant studies from UAE context and study on GHA relevant to the demographics of UAE was found missing. This study aims to address this Research gap

Research Gap 2. Willingness to purchase of GHA across demographic segments has not been explored in UAE

The two research gaps identified during the course of literature review can be combined and summarized as a single research gap as follows:

Research Gap: The awareness, preferences and willingness to pay for green home appliances has not explored across demographic segments in UAE.

3.6. Business Problem (Opportunity)

The opportunity or opportunity loss observed during the course of Literature review on GHA (Chapter 2) highlight the extent of power savings and reduction in carbon emission that can be achieved by switching over from conventional model of a home appliance to a green model. Also, there was substantial

empirical evidence that a green model can offer significant monetary savings to the consumer apart from being environmental friendly. UAE expects to cut down 30 percent of electricity consumption or save approximately AED 250 million per year only through consumer adoption of green air conditioning units and with clean green washing machines, the country will save 2 billion liters of water per year and significant power consumption apart from reducing 42,000 tonnes of CO_2 emissions [125]. The greater will be the monetary and power savings to the consumer and the country if more conventional models are replaced by green models of home appliances. With such green initiatives, the stakeholders aim to save power and bring down the carbon emissions. According to the Minister of Energy, H.H. Suhail Mohammad Al Mazrouei; the UAE Government is seeking to reduce power and water consumption by 10% which will translate into Dh.3.5 billion savings per year [348]

Quoting the words of Dr. Rashid Ahmad Bin Fahd, Minister of Environment and Water, and Chairman of the UAE's Ecological Footprint Initiative (EFI) to highlight the gravity, concern, and importance of the issue: *"Despite the important improvements in results, the UAEs per capita consumption remains high and unsustainable and addressing this effectively requires continued attention and proactive efforts to develop programmes that aim to reduce the consumption with special focus on reduction of carbon footprint "*[349]

Against this backdrop, the Business Problem can be summarized as **despite various green initiatives and a vibrant consumer electronics market, consumer adoption of green home appliances is still lagging behind contributing to the high power consumption and monetary loss to the individual and the country.**

3.7. Theoretical Framework

This research study deals with how the series of green marketing initiatives and campaigns by the Government and corporate bodies has influenced the consumers in terms of creating awareness and preference for green home appliances. Green purchasing behaviour differs from general purchasing behaviour which is driven by an assessment of a product's benefits and costs that are of immediate relevance and gratification only to the individual

consumer. But green behavior is unlikely to offer instant gratification and the outcome can be felt or assessed only in the course of time (like energy saving, clean environment etc.) that often benefits society as a whole (Mc Carty and Shrum, 2001[321]; Kim and Choi, 2005[209]). The Study aims to identify if the ongoing green campaigns have influenced the consumers positively and consumers have adopted green purchasing. Based on the factors identified during the course of literature review and the relationship deduced among the major factors, consumer willingness to purchase green home appliances can be considered positive if:

1. Consumers are aware of Green home appliances (GHA)
2. Consumers prefer Green home appliances over conventional appliances.
3. Consumers are willing to pay more for Green home appliances.

Thus Green Purchase can be represented as a function of these three attributes

Green Purchases = f {Awareness, Preference, WTP}

Awareness: Knowledge, understanding, perceptions

As stated by Yaacob and Zakaria (2008), awareness includes human perception and cognitive reaction to a condition or event. Awareness does not necessarily mean understanding, but reflects a phase of being conscious of, a feeling, opinion or perception [287].

Preference: interest and liking

Preference is to have a particular interest or liking on a specific product over other available alternatives. Consumers would demonstrate preference for green products if they have enough awareness of the green attributes and their benefits. The knowledge or awareness, which is one of the factors that might create preferences for consumers to make purchases for green products [322]

Willingness to pay premium: Demonstrate acceptance of green products by paying more

Price premium has been defined as "a percentage over the willingness to pay for the base commodity" (Sedjo and Swallow, 1999) [323]. Thus, in the case of GHA, if an appliance marketed as green commands a price premium, then some consumers are willing to pay some percentage over and above what they are willing to pay for the base commodity without the green tag. The willingness to pay a price premium usually has been explained by both psychological variables

as well as demographic variables. Our focus here is on the influence of demographic variables on consumers' willingness to pay a premium.

3.7.1. Assessing Awareness, preference, and WTP for GHA

The suitability and applicability of various models available to assess the influence of the various green initiatives undertaken by the stakeholders to create awareness, preference, and willingness to pay were compared and reviewed. The AIDA model was found to relate more to the study. The summary of the suitability and applicability check of popular theoretical models that could be used to evaluate the influence of marketing communications has been substantiated and presented in the table below.

Table: 3.3 Applicability check of Models relevant for the study

Popular Models	Applicability of the model to study the awareness, preference, and WTP
D-R-I-P Model *Differentiate, Reinforce, Inform, and Persuade*	☒ Not applicable because the sequence of the model does not align with study context
Innovation Adoption Model *Awareness – Interest – Evaluation – Trial – Adoption*	☒ Not applicable though it deals with stages of awareness to purchase as it is more of stimulating attitudinal changes
RACE Planning Reach – Act – Convert – Engage	☒ Not applicable as the Key Performance Indicators suggested are more suitable for digital marketing campaigns
Hierarchy Effects Model *Awareness – Knowledge – Liking – Preference – Conviction – Purchase*	☑☒ Not wholly applicable because the hierarchy of effects has a longer detailed version that does not cohere with the study context
AIDA *Attention – Interest – Desire – Action*	☑ The Sequence relatively aligns with the study context

Source: Models of Communication effect [324]

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3.7.2. The AIDA Model

Designed by Strong in 1925, AIDA is an acronym for the Attention or Awareness, Interest, Desire, and Action. It is a model used to assess the impact of marketing communications on the audience. The AIDA Model identifies cognitive stages an individual goes through during the buying process for a product or service. AIDA depicts the hierarchy of response and illustrates the stages from which a buyer learns about product and eventually purchases it. [325]
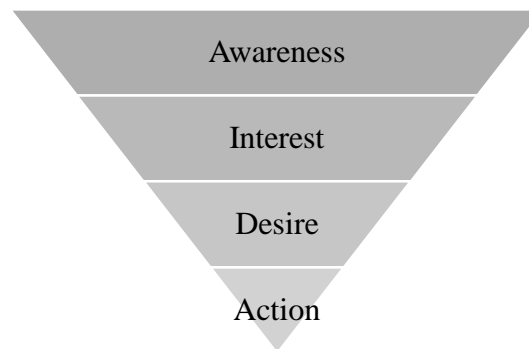
Fig 3.2. The AIDA Model

3.7.3. Variants of AIDA Model

Many variants of AIDA were developed in the following years like as in early 1911, Arthur.F.Sheldon added 'permanent satisfaction' as the final step in the Lewis/Strong model to create AIDAS, Samuel.R.Hal in 1915 added a variant - AICCA followed by Robert. E.Ramsay in 1921 with AIDCA. Some of the major variations of AIDA model has been presented in the table below [326] [344]

Table: 3.4 Variants of AIDA model

AIDEA	*Attention – Interest – Desire – Evidence – Action*
AIDCAS	*Attention – Interest – Desire – Conviction – Action - Satisfaction*
AIDAS	*Attention – Interest – Desire – Action – Satisfaction*
AICCA	*Attention – Interest – Confidence – Conviction – Action*
AIDCA	*Attention – Interest – Desire – Conviction – Action*
AIDAR	*Attention – Interest – Desire – Action – Retention*
ACCA	*Attention – Comprehension – Conviction – Action*
CAC	*Cognitive – Affective – Conative*
CAB	*Cognition – Affect – Behaviour*

Source: Literature Review

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The AIDA model with many variations was used by researchers and writers for over 60 years after its publication during which the nomenclature was changed many times with addition or deletion of stages from its predecessor model. Hovland and Rosenberg (1960) [343] developed an attitude model comprising of three components: cognitive, affective, and conative. According to them, cognitive component refers to the thoughts or beliefs, the affective component consists of positive or negative feelings or emotions, and the behavioural component refers to the actions or intentions to act towards the attitude object. On the premises of this model, advertising hierarchy of effects model was developed by Lavidge and Steiner (1961) which is presented below [344].

Model Stage	Model Order
	Purchase
Conative	‖
	Conviction
	‖
	Preference
Affective	‖
	Liking
	‖
	Knowledge
Cognition	‖
	Awareness

Fig 3.3. The Lavidge and Steiner Model

According to this marketing communications model, the consumer passes through a sequence of stages from initial awareness (cognitive stage) to liking, preference, and conviction (affective stage), and to actual purchase (behavioural stage). It implies that in order to reach the last stage of the purchase decision, a buyer has to pass through the cognitive (awareness and knowledge), affective (liking, preferences), and behavioural actions to purchase the favourable products or services. The marketing communication is crucial in informing, educating and directing the right information to the existing and prospective consumers to evoke their interest and facilitate purchase actions eventually.

This process has to be undergone when the marketer is considering to attract and convince the consumers to shift from buying conventional products to green products. (Cherian & Jacob, 2012) [225]

3.7.4. The CAB Model

The consumer purchase decision process was revised to the C-A-B paradigm with its hierarchical flow of effects from cognition, through Affect to Behaviour by Holbrook, O Shaughnessy and Bell in 1990. [346]. The CAB model which stands for Cognition (Awareness or learning), Affect (feeling, interest or desire) and behavior (action) is a variant of the CAC model wherein Cognition refers to the consumer's thinking, beliefs or awareness about the product. Affect includes emotions, moods, feelings or attitudes which could be favorable or unfavorable in creating an interest or preference for the product. Behaviour refers to the physical action of the consumer that can be directly observed or measured by others. [324]

3.7.5. CAB model application in Green purchases studies

The three-tier model was supported by several research studies (Rosenberg and Hovland, 1960; Ostrom, 1969; Kothandapani, 1971) wherein the three components were found to be strongly intercorrelated. [345] To study people's response to eco-friendly products, Maloney and Ward (1973) [327] advocated the importance of determining their knowledge or awareness of the environment (ecological knowledge), the impact it has on them like how they feel about it (ecological effect) and what commitment they are willing to make (Action or intention) [327]. The study outline broadly rested on the CAB model. Researchers who followed the model claim that an individual's ecological behaviour is highly dependent on his ecological knowledge, affect, and intention (R. Y. K. Chan &Yam, 1995) [328]. This view is in line with the classic behavioural proposition that cognition, affect, and conation or Behaviour are three important components in determining corresponding behaviour (Bagozzi, Tybout, Craig, & Sternthal, 1979 [329]; Breckler, 1984 [330]; Rosenberg, 1956 [331]). In the next section, studies highlighting the possible relationship between the constructs – Cognition and Affect upon Behaviour has been explored.

Cognition and Behaviour: Literature suggests a positive relationship between the constructs – Cognition (knowledge, awareness) and behaviour (e.g., Hoch

& Deighton, 1989[332]; Park, Mothersbaugh, & Feick, 1994) [334], Dispoto (1977) [335] and Kilkeary (1975) [336]. In a meta-analysis of 128 previous studies, Hines, Hungerford, and Tomera (1987) [304] noted an average correlation of 0.30 between ecological knowledge (Cognition) and behaviour. This moderately (yet statistically significant) positive association was also observed in Grunert's (1993) [333] study concerning the purchase of green foods. (R.Y.K.Chan, 2001) [212], Cohen (1973) [337], and Arbuthnot and Lingg (1975) [338] revealed that ecological knowledge would take the role of a mediating variable for ecological attitudes and behaviour. Davis (1993) [313] and Synodinos (1990) [339] also concurred that increased knowledge of environmental issues might lead to a more positive and favourable ecological attitude.

Affect and Behaviour: Similarly more consistent empirical evidence was found reiterating the positive relationship or association between Affect and behaviour (Dispoto, 1977[335]; Li, 1997[340]; Maloney &Ward, 1973[327]). Benton (1994) [341] termed such affect as an ecological concern, which involves an individual's degree of emotional attachment to ecological issues. Kinnear, Taylor, and Ahmed (1974) [166], and Schwepker and Cornwell (1991) [342] further maintained that ecologically concerned consumer's attitudes must express concerns for ecology. In general, empirical studies have demonstrated a significant positive relationship between ecological intention and behaviour (cf. Li, 1997[340]; Maloney &Ward, 1973[327]). In addition, the aforementioned meta-analysis has reported an average correlation of 0.49 between the two variables (Hines et al., 1987) [304]. These findings support the classic behavioural proposition that intention is the most immediately relevant predictor of corresponding behaviour (cf. Ajzen &Fishbein, 1980) [208].

Of the many variants of communications assessment models discussed here, the CAB model was found to be most appropriate for this study. Literature review suggests that the model has been used by researchers to measure the constructs addressed in the study. Therefore it is adopted to study the consumer's willingness to purchase green home appliances in the UAE because of its simplicity and the three component sequence which coheres to the factors that are to be studied – awareness, preference, and willingness to pay.

3.8. The proposed Model

The following model is not comprehensive but inclusive of the factors identified in t8e course of the literature review.
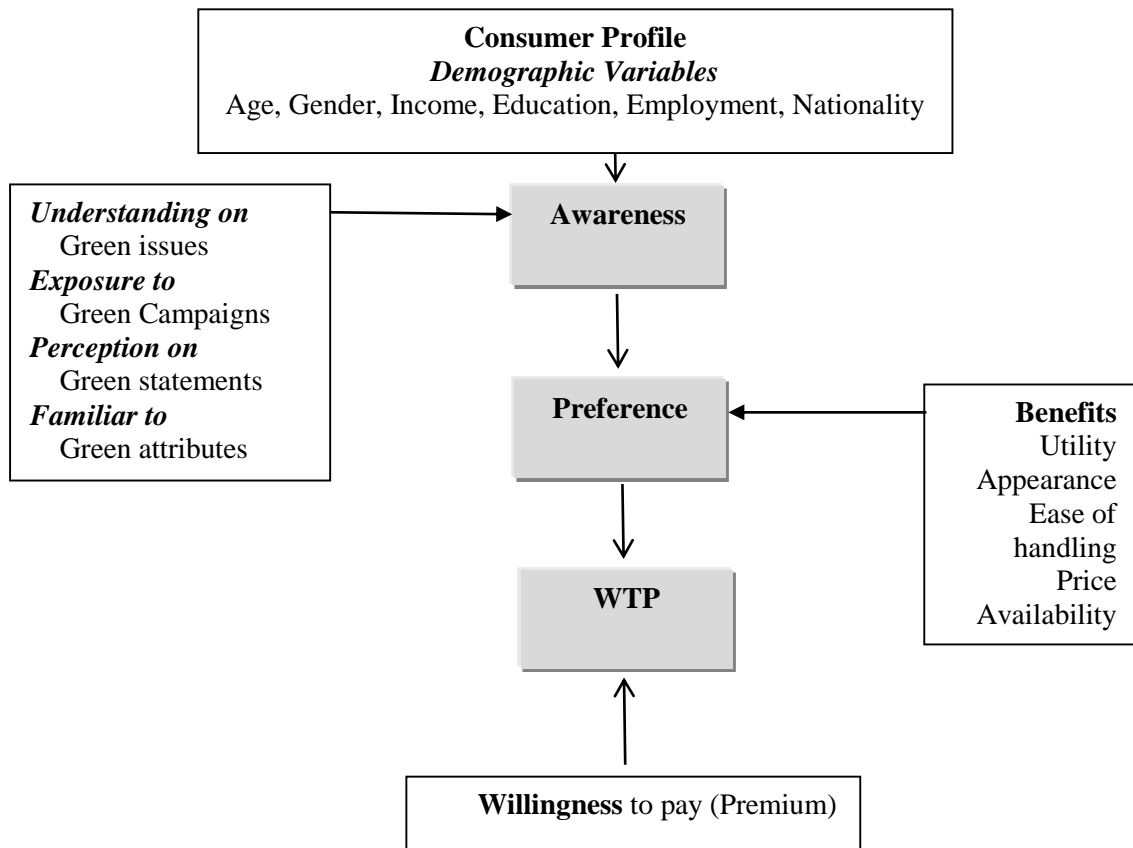
Fig 3.4. The proposed theoretical framework model

3.9. Research Problem

A research problem reflects on the area of concern, a situation to be improved upon, an obstacle or difficulty to be removed, or a troubling question that exists in scholarly literature, in theory, or in practice that points to the need for meaningful understanding and deliberate investigation. A research problem does not state how to do something, offer a vague or broad proposition, or present a value question [347].

The problem: The following facts have been highlighted in Chapter 1 and 2 of the thesis that:

- The per capita power consumption of UAE is much higher than the global average and households are significantly contributing to it.

- The Green home appliances save energy substantially in comparison to their conventional models.

Series of green initiatives were unveiled to rationalize power consumption and save energy thereby improving the country's green index by various stakeholders. While the green initiatives have been periodically carried out, the impact of these campaigns in terms of generating awareness, preference, and willingness to pay for Green home appliances has not been explored. This forms the core of the research problem of the study which can be summarized as *How much are consumers aware of, prefer and willing to pay more for green home appliances in UAE?*

3.10. Research Questions:

Based on the research gap, the following three research questions were identified.

1. What is the level of awareness for green home appliances among the consumers?
2. What is the preference for green home appliances among the consumers?
3. Whether demographic variables affect consumer willingness to pay for green home appliances?

3.11 Concluding Remarks

The theming and reviewing the literature helped in understanding the Research gaps. Literature review also helped in identifying the important variables influencing green purchases on the basis of which the business problem was ascertained. On the premises of business problem and research gap, research problem and research questions were formulated. The theoretical framework for addressing the research question was arrived at by evaluable the marketing communication assessment models. The suitability and applicability of the models against each model was evaluated against the study objectives and the CAB model was found to be appropriate because of its coherence to the three tier objective of the research.

CHAPTER 4. RESEARCH METHODOLOGY

4.1 Introduction

This chapter presents the research methodology adopted to attain the objectives. It features the research treatment subjected to the study at every stage with justification. It also presents the overview of theory and quantitative methods used to decipher information from the data collected. The research design which is the framework that encompasses all the methods used and procedures adopted for collecting and analyzing data is highlighted in the following sections. According to Kinnear and Taylor 1996, a research design is the blue print that is followed to complete the study and it ensures that the study is relevant to the problem and will use economical procedures. The usual steps involved in research design process are as below

```
┌─────────────────────────────────────────────────────────────┐
│                 Define the Information Needed                 │
└─────────────────────────────────────────────────────────────┘
                               ▽
┌─────────────────────────────────────────────────────────────┐
│  Design the Exploratory, Descriptive and / or Causal phases  │
│                    of the Research                           │
└─────────────────────────────────────────────────────────────┘
                               ▽
┌─────────────────────────────────────────────────────────────┐
│         Specify the measurement and scaling procedures       │
└─────────────────────────────────────────────────────────────┘
                               ▽
┌─────────────────────────────────────────────────────────────┐
│                  Construct a Questionnaire                    │
└─────────────────────────────────────────────────────────────┘
                               ▽
┌─────────────────────────────────────────────────────────────┐
│       Specify the Sampling process and the Sample Size       │
└─────────────────────────────────────────────────────────────┘
                               ▽
┌─────────────────────────────────────────────────────────────┐
│              Develop a plan for Data Analysis                 │
└─────────────────────────────────────────────────────────────┘
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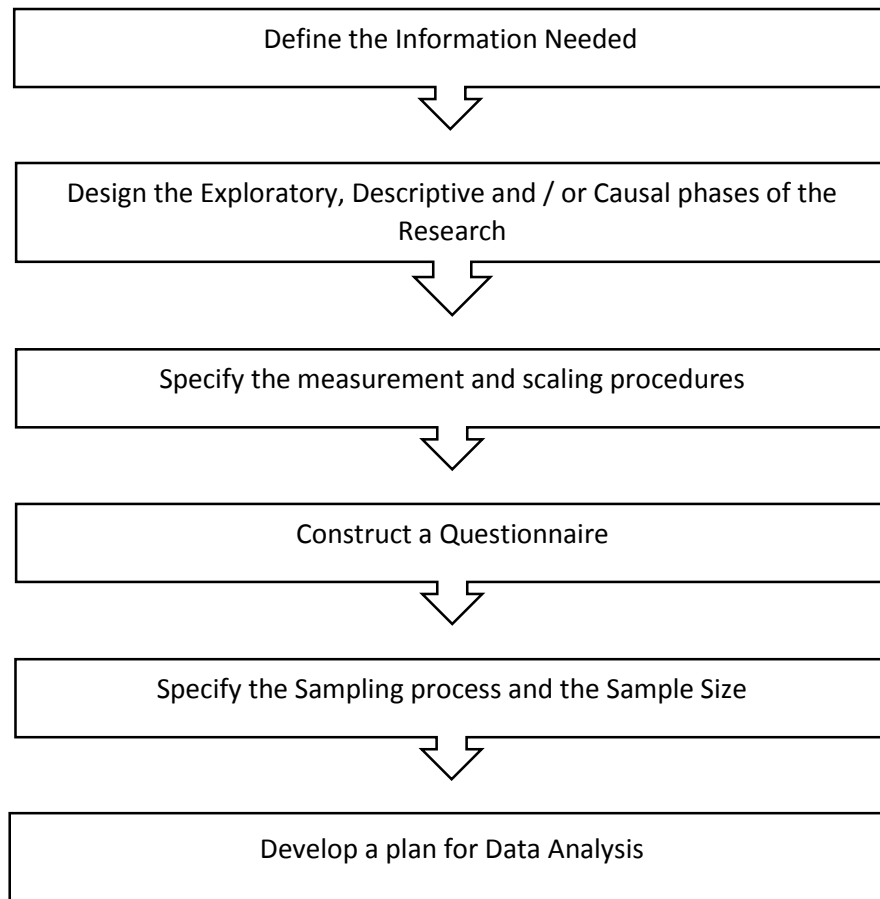
Fig 4.1 Research Design

The study is a descriptive research quantitative study as the objective is to determine the awareness, preference and WTP (premium) among the consumers. From the extensive literature review in the previous chapter, the **Business problem** was deciphered as "Despite various green initiatives and a vibrant consumer electronics market, consumer adoption of green home appliances is still lagging behind contributing to the high power consumption and monetary loss to the individual and the country"

On the premises of the Business problem, the **Research Problem** was formulated as **"**How much are consumers aware of, prefer and willing to pay more for green home appliances in UAE?"

The following **Research Questions** (RQ) were framed to approach the research problem

RQ1. What is the level of awareness for green home appliances among the consumers?

RQ2. What is the preference for green home appliances among the consumers?

RQ3. Whether demographic variables affect consumer willingness to pay for green home appliances?

The following sections outline in detail the research design, the observational design, sampling design and data analysis methods used to accomplish each objective.

4.2. Research Objectives

The research objectives include:

RO1: To determine the awareness level of green home appliances among the Consumers

RO2: To determine the preference for green home appliances among the Consumers

RO3: To determine the extent of consumer willingness to pay for green home appliances across demographic variables

4.3. Research Process

The framework followed to obtain answers to the research questions is represented diagrammatically in Fig 4.2.

```
                              ┌─────────────────────────┐
                              │    Literature Review    │
                              └─────────────────────────┘
                                          ↓
┌──────────────────┐      ┌─────────────────────────┐
│  Expert Review   │ ←→   │ Identification of variables │
└──────────────────┘      └─────────────────────────┘
                                          ↓
┌──────────────────┐      ┌─────────────────────────┐
│    Pilot Test    │ ←    │   Questionnaire Design  │
└──────────────────┘      └─────────────────────────┘
         ↓                                ↓
┌──────────────────┐      ┌─────────────────────────┐
│Instrument Reliability│ → │   Final Questionnaire   │
│ Instrument Validity │    └─────────────────────────┘
└──────────────────┘                      ↓
                              ┌─────────────────────────┐
                              │     Data Collection     │
                              └─────────────────────────┘
                                          ↓
                              ┌─────────────────────────┐
                              │      Data Analysis      │
                              └─────────────────────────┘
                                          ↓
                              ┌─────────────────────────┐
                              │       Conclusion        │
                              └─────────────────────────┘
```
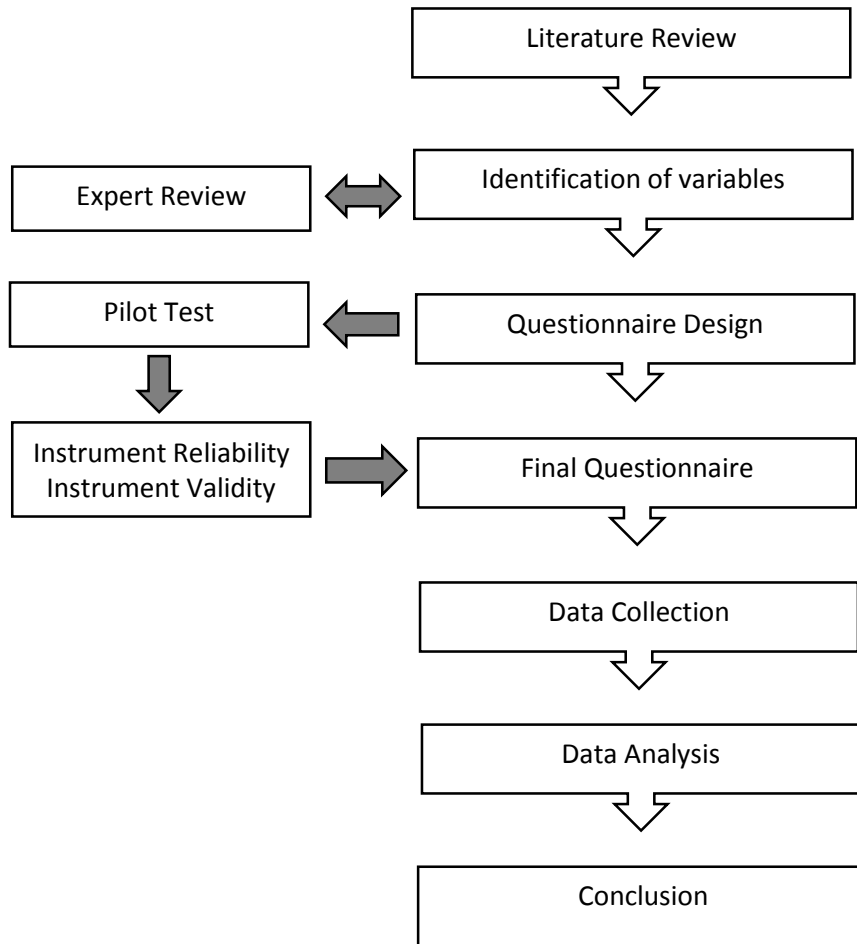
Fig 4.2 Research Process

4.4. Hypothesis Formulation

The following Research hypothesis (H_a) were formulated based on the three research questions

Hypothesis H_{a1}: Consumers are aware of Green home appliances

Hypothesis H_{a2}: Consumers prefer Green home appliances

Hypothesis H_{a3}: Demographic variables affect consumer's willingness to pay (premium) for Green home appliances

4.5. Sample Size

The Sample size for the study has been calculated by using Taro Yamane (Yamane, 1973) formula with 95% confidence level

$$n = \frac{N}{1 + N\,(e)^2}$$

Where n = sample size,

N = population size,

e = sampling error assumed as 0.05

Applying Taro Yamane's formulae to derive the sample size for the survey on the Dubai population of 2.1 Million, a sample size of 210 is derived for the survey.

4.6. Sampling Method:

Stratified Random Sampling has been used in the study. The Sample represented strata's of Dubai's population demographics – the national and the expatriate population and a simple random sample was drawn from each stratum.

Table: 4.1 Dubai Population Demographics

Dubai Population	Population* Statistics	Sample Statistics
Total	2.1 M	210
UAE Nationals (20%)	0.3 M	40
Expatriate (80%)	1.6 M	170
Asians	1.2 M	89
Expatriate Arabs	0.3 M	56
Others	0.1 M	25

Source : AME info

4.7. Research Instrument:

A structured Questionnaire (Appendix A1) was adopted as a research instrument to conduct the study. The Questionnaire had five sections each dedicated to the following theme.

4.7.1. Section 1: Consumer's demographic profile

Consumer demographic profiling was done across gender, age group, education, monthly income, marital status and nationality

4.7.2. Section 2: Determining the Awareness

Awareness was assessed using four parameters as identified and presented in the proposed research model in Chapter 3, Fig 3.4. The following type of questions was used to evaluate consumer's awareness.

Table: 4.2 Awareness assessment

Parameter	Assessed by	Type of Question
Exposure	Heard / not about GHA	Dichotomous Question
Understanding	Perception on factual statements on GHA	Three-point Likert scale with 1 as Agree, 2 as Neutral and 3 as Disagree
Familiarity	Familiar with the green attributes	Dichotomous Question
Recollect	Recollect GHA brands	Open-ended Question

4.7.3. Section 3: Determining the Preference

Preference for GHA was assessed using the following two parameters and addressed with the question types as given in the table below

- Liking / look for green features while buying Home appliances
- Regard Power saving as 'most important' feature

Table: 4.3 Preference assessment

Parameter	Type of Question
Liking/ look for features	Dichotomous Question
Importance of Power Saving attribute	Three-point Likert scale with 1 as Least Important, 2 as Important and 3 as Most Important

Besides this, other preference criteria of consumers as proposed in the research framework in chapter 3 were also explored. A three-point Likert scale was used to gauge the importance of attributes like price, availability, durability, warranty, promotions, brand name and power saving assurances through quality labels, certifications etc. Similar to product attributes, consumer preference across green brands and preference across product categories was also evaluated using ranking method in the questionnaire

4.7.4. Section 4: Extent of Consumers' willingness to pay (Premium)

Extent of consumer's willingness to pay was assessed using Willingness to pay and the extent of premium willing to pay.

Table: 4.4 WTP assessment

Parameter	Type of Question
Willingness to pay premium	Dichotomous Question
Extent of premium willing to pay	Drop down menu with premium range option

4.7.5. Section 5: The future prospects.

Information on future prospects was collected to have a prognosis on GHA among consumers. Dichotomous questions were used to analyze the opinion on information availability, influence of green campaigns on the consumer and prospects of buying GHA. An open-ended question was used to extract information on ways and means of making GHA more appealing to the consumer.

4.8. Quality of the Research Instrument

4.8.1. Reliability: The internal consistency of the instrument was assessed using Cronbach alpha method

Cronbach's alpha (α) was calculated using the formula:

$$\alpha = \left[\frac{K}{(K-1)}\right] * \left[1 - \left[\frac{Sum\ of\ item\ variances}{(SD)^2}\right]\right]$$

Where, K = number of items = 7 (four items for awareness, two for preference and one for extent of premium willing to be paid) (Table 4.2, 4.3 and 4.4)

Sum of item Variances computed = 10.9, SD = Standard Deviation = 5.683

Substituting the values in the equation we get:

$$\alpha = [7/(7-1)] * \left[1 - \left[\frac{10.9}{(5.683)^2}\right]\right]$$

Cronbach's alpha = 0.7729

4.8.2. Validity: Validity of the Research instrument has been assessed by using face validity, construct validity and criterion validity. *Face validity* is a simple form of validity where you apply a superficial and subjective assessment of whether or not your study measures what it is supposed to measure by means of expert opinion [353]. Face validity of the questionnaire was checked by experienced corporate research consultants and academicians at UPES. Evaluation of construct validity requires examining the relationship of the measures being evaluated with variables known to be related or theoretically related [351]. The theoretical relationship of the variables has been established in the literature review. The statistical relationship between the variables have been established with the help of a correlation matrix presented below. The 3 r values being positive establish the positive relation between the constructs.

Table 4.5 Correlation Matrix

Variables	Awareness	Preference	WTP
Awareness	1		
Preference	**0.696**	1	
WTP	**0.673**	**0.549**	1

Criterion Validity provides evidence about how well the scores of the measure correlate with other measures or similar underlying constructs that are established to be theoretically related [351]. Having established the theoretical relation of the constructs and correlation between them, the scores of the measure follow a tapering effect from awareness, through preference to WTPP substantiating the relationship established. Criterion Validity (Predictive) addresses if the data could accurately predicts or forecasts the measures. Scores on the measure obtained on the survey could predict the levels of awareness, preference, and WTP (premium).

4.8.3. Pilot Testing Questionnaire: The questionnaire was pilot tested with 10 respondents [352] who represent the sample to evaluate the effectiveness of the instrument and identify anomalies if any. It was found out that the term 'Green home appliances' generated some confusion among respondents, hence a short explanation - 'home appliances with energy saving features' was provided in brackets. Also, the multiple choice question addressing the annual income was changed to monthly income to suit the convenience of the respondents.

4.9. Data Collection

Data collection was done using two modes – web survey mode using google docs and supervised mode engaging an Arabic – English translator trained at handling the questionnaire specifically for the Arabic (only) speaking portion of the sample. Data collection spanned for three weeks in April, 2015. *Ethical Considerations* were upheld by briefing the participants the aim of the study, seeking permission for time and information and not invading their privacy during the course of data collection.

4.10. Summary of Research Methodology

The Research Methodology followed for the attaining the three objectives are summarized in the tables below

Table: 4.6 Research Methodology for Objective 1

RO 1	To determine the awareness level of green home appliances among the Consumers
Research Design	Descriptive Research Quantitative Study
Observational Design	Variable Identification through Literature Review (Understanding on Green issues, Exposure to green campaigns, Perception on Green statements, Familiarity to Green attributes)
Operational Design	Questionnaire Preparation, Pilot testing Questionnaire
Sampling Design	Stratified Random sampling (strata based on nationality) Sample size estimated based on Taro Yamane's formula as 210
Data Analysis	Z test for Hypothesis testing, Descriptive Statistics

Table: 4.7 Research Methodology for Objective 2

RO 2	**To determine the preference criteria for green home appliances among the Consumers**
Research Design	Descriptive Research Quantitative Study
Observational Design	Variable Identification through Literature Review (Utility, Price, Ease of handling, Appearance, Availability)
Operational Design	Questionnaire Preparation Pilot testing Questionnaire
Sampling Design	Stratified Random sampling (strata based on nationality) Sample size estimated based on Taro Yamane's formula as 210
Data Analysis	Z test for Hypothesis testing, Descriptive Statistics

Table: 4.8 Research Methodology for Objective 3

RO 3	**To determine the extent of consumer willingness to pay for the green home appliances across demographic parameters**
Research Design	Descriptive Research Quantitative Study
Observational Design	Variable Identification through Literature Review (Demographic Variables – Age, Gender, Income, Education, Employment, Nationality)
Operational Design	Questionnaire Preparation Pilot testing Questionnaire
Sampling Design	Stratified Random sampling (strata based on nationality) Sample size estimated based on Taro Yamane's formula as 210
Data Analysis	Two-way ANOVA, Descriptive Statistics

4.11. Concluding Remarks

This chapter has outlined the research methodology for attaining each objective with details on research design, observational design, operational design, sampling design and data analysis method followed. The overall research framework, theoretical premises, scientific paradigms, expert opinion and analytical tools have been used in conjunction to find answers to the research questions. Extensive literature review helped in identifying the important variables based on which research questions, research objectives and hypothesis of the study was formulated. The research methodology was found to be almost same for all the three objectives with respect to research design, operational design and sampling design. Research treatment differed only with respect to observational design and data analysis. The following chapter outlines the data analysis methods carried out to achieve the objectives

CHAPTER 5. DATA ANALYSIS

5.1 Introduction

This chapter details the quantitative methods adopted to extract the desired information from the data collected. The chapter aims to answer the three questions reflected in the research objectives, to determine the awareness level, preference, and willingness to pay (premium) for GH.A. The data was tabulated and analyzed using MS Excel 2013. Data was collected from 210 respondents. The chapter gives the overview of the demographic profile of the respondents along with the findings with respect to each objective.

5.2. Section A: Demographic Profiling

Demographic Profiling was done across the following parameters: age group, gender, education, monthly income, marital status and nationality. It was found that the sample was slightly over-represented by the male population at 59%. 33% belonged to the *26 yrs to 35 yrs* group and 49% were *Graduate / diploma holders* at 49%. 38% of respondents had monthly income *less than 15K AED*. 69% were married and 42% were Asian Expatriate population.

Age: Respondents were categorized into five age groups as presented in the table below. 33% belonged to the 26 yrs to 35 yrs group, 27% belonged to the 36 yrs to 45 yrs group followed closely by 25% of 18 yrs to 25 yrs group which implies 85% of the sample was distributed in the 18 yrs to 45 yrs age group.

Table: 5.1 Age Distribution

Age Group	Count	Percent
18 to 25 yrs	53	25%
26 to 35 yrs	69	33%
36 to 45 yrs	56	27%
46 to 55 yrs	21	10%
Above 55 yrs	11	5%
Total	210	
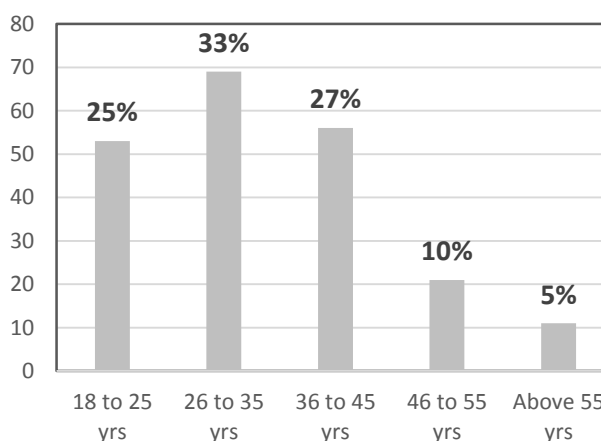
Fig 5.1. Demographic Profiling - Age

Gender: The sample was slightly over-represented by the male population at 59%. Female population only constituted 41% of the sample taken.

Table: 5.2 Gender Distribution

Gender	Count	Percent
Male	124	59%
Female	86	41%
Total	210	
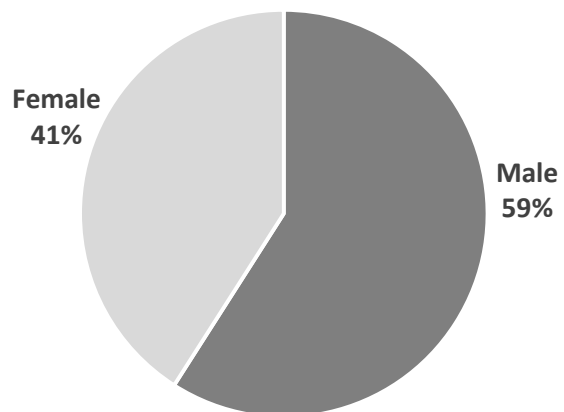
Fig 5.2. Demographic Profiling - Gender

Educational Qualification: 49% of the respondents were Graduate / diploma holders and 38% were post graduates which implies 87% of the sample were graduates and post graduates.

Table: 5.3 Education

Education	Count	Percent
Hr. Secondary	22	10%
Graduates	102	49%
Post Graduates	79	38%
Ph.D	7	3%
Total	210	
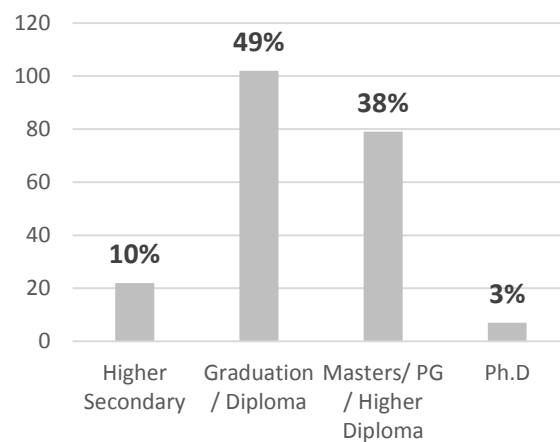
Fig 5.3. Demographic Profiling - Education

Income: 38% of respondents had monthly income less than 15K AED followed by 30% of the sample falling in the monthly income group of 15K to 29K AED. 68% of the sample consisted of middle and lower income groups.

Table: 5.4 Income Distribution

Income Group	Count	Percent
Less than 15K	79	38%
15K to 29K	63	30%
30K to 44K	34	16%
45K to 59K	21	10%
60K & above	13	6%
Total	210	
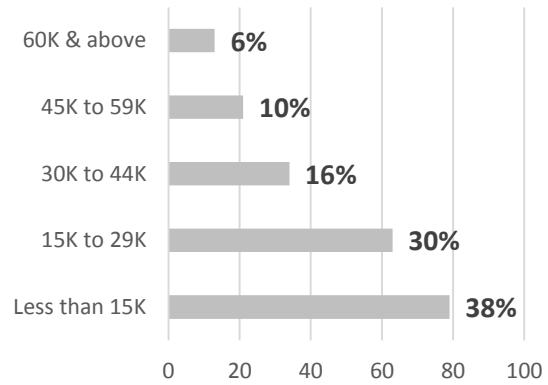
Fig 5.4. Demographic Profiling - Income

Marital Status: 69% were married while 31% were single.

Table: 5.5 Marital Status

Marital Status	Count	Percent
Married	144	69%
Single	66	31%
Total	210	
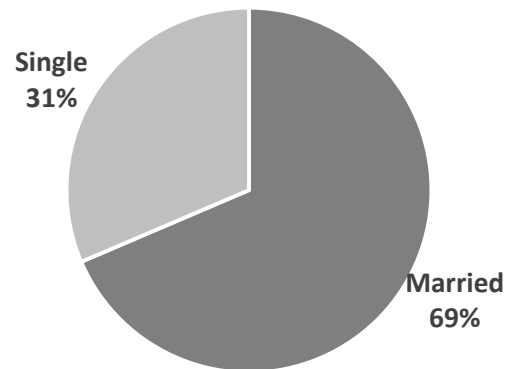
Fig 5.5. Demographic Profiling – Marital Status

Nationality: 42% were Asian Expatriate population, 27% were Arab expatriates. The sample proportion represented the population proportion as discussed in the sample design in chapter 4.

Table: 5.6 Nationality

Nationality	Count	Percent
Emiratis	40	19%
Asians	89	42%
Arabs	56	27%
Others	25	12%
Total	210	
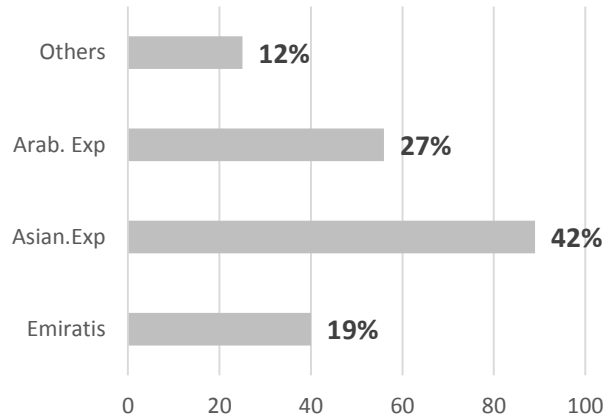
Fig 5.6. Demographic Profiling - Nationality

Environmental concern: 66% of the sample were concerned about Environmental issues (like Energy conservation, Carbon emissions, climatic change, resource scarcity, Global warming). 24% of the sample expressed high concern over the environmental issues while 42% expressed moderate concern.

Table: 5.7 Environmental Concern

Concern	Count	Percent
Yes	138	66%
No	72	34%
Total	210	
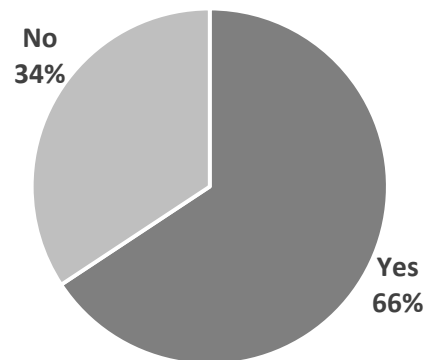
Fig 5.7. Environmental Concern

Table: 5.8 Level of Concern

Level of Concern	Count	Percentage
Low	72	34%
Medium	88	42%
High	50	24%
Total	210	
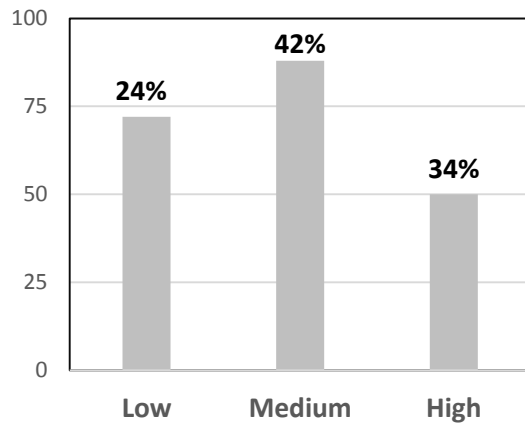
Fig 5.8. Level of concern

Recollect Green Campaigns: 61% of the respondents could recollect green campaigns. Of the many green campaigns, DEWA's green campaigns had the highest recall rate of 40%.

Table: 5.9 Recollect green campaigns

Recollect	Count	Percent
Yes	129	61%
No	81	39%
Total	210	

Fig 5.9. Recollect Green Campaigns

Table: 5.10 Common Green campaigns Recollected

Green Campaigns	Count	Percentage
DEWA	51	40%
Leading brands	42	33%
Social Campaigns	36	28%
Total	129	100%
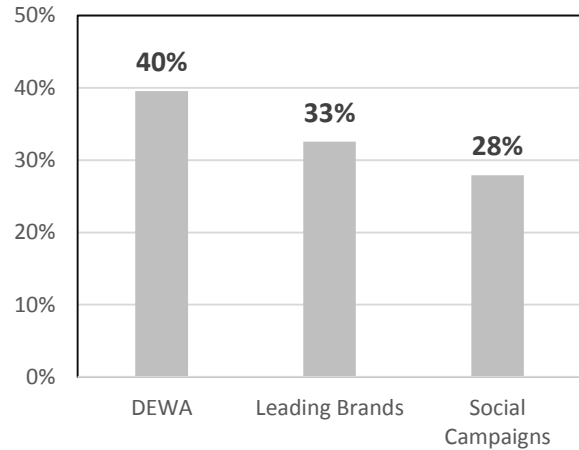
Fig 5.10. Green campaigns Recollected

5.3. Section B: Awareness

RO1: To determine the awareness level of GHA among the Consumers

Awareness was assessed using four parameters identified during the literature review as presented in Table 4.2, Chapter 4. The table below summarizes the positive responses across the four parameters on the basis of which awareness level of the sample was established

Table: 5.11 Determining Awareness level

Awareness Variables	N	%
Heard about GHA	123	59%
Understanding on GHA	97	46%
Familiarity on green attributes	124	59%
Recollect brands offering GHA	121	58%
Mean Score	**56%**	

Heard about GHA: 59% of the respondents reported to have heard about GHA and the print media (newspaper and magazines) was identified as the first source of information on GHA at 34% followed by internet and social networks at 22%.

Understanding: Six factual statements were developed based on the literature review to assess the understanding level of the sample. 46% agreed on the factual statements on GHA which imply 46% have right perception on GHA.

Among the people who disagreed on the three point Likert scale, 25% of the respondents disagreed with the statement - GHA saved money in the longer run.

Familiarity to green attributes: 59% of the respondents were familiar with the green attributes. The least familiarity was reported for ESMA labelling at 30% which might be because it is only gaining momentum now.

Recollecting GHA brands: 58% of the respondents could recollect brands offering GHA. LG and Panasonic were two brands mentioned most as the brands offering GHA range.

The awareness level was established as the mean score across the four parameters at 56%

Table: 5.12 Awareness across Demographic variables

Demographic variables	N	Heard	Understand	Familiar	Recollect	Avg
Age group						
18 to 25 yrs	53	45%	32%	52%	45%	44%
26 – 35 yrs	69	61%	45%	61%	59%	57%
36 – 45 yrs	56	61%	50%	58%	59%	57%
46 – 55 yrs	21	67%	59%	67%	67%	65%
Above 55 yrs	11	82%	76%	73%	72%	78%
Gender						
Male	124	59%	42%	59%	57%	54%
Female	86	58%	52%	60%	58%	57%
Education						
Hr .Sec	22	14%	0	31%	14%	15%
Grad / Dip	102	46%	36%	55%	45%	46%
Masters /PG	79	84%	69%	69%	82%	76%
Ph.D	7	100%	95%	100%	100%	99%
Monthly Income						
Less than 15K	79	49%	35%	56%	48%	47%
15K – 29K	63	63%	49%	58%	63%	58
30K – 44K	34	71%	58%	64%	67%	65%
45K – 59K	21	48%	44%	59%	48%	50%
60K & Above	13	77%	71%	71%	77%	74%

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Marital Status						
Single	66	53%	39%	56%	52%	50%
Married	14 4	61%	50%	60%	60%	58%
Nationality						
Arab Expats	56	50%	42%	57%	50%	50%
Asian Expats	89	66%	50%	58%	64%	60%
Emiratis	40	50%	38%	61%	50%	50%
Others	25	64%	57%	63%	64%	62%

Across demographic variables, awareness level was found to be increasing from lower to higher age group. It was lowest at 44% in the *18 – 25 yrs* group while it was highest at 78% in the *above 55 years* group. Awareness level was almost same across the genders with *females* at 57%, slightly above the *males* which were at 54%. Education, as expected, had a direct relationship with awareness level – the higher the education, the higher the awareness level. While the awareness level was only 15% among *higher secondary* educated portion of the sample, it was almost 100% among *Ph.D. holders*. Awareness level was observed to be highest among the highest monthly income bracket (*60K AED and above*), followed by the *30K to 44K AED* group at 65%. Awareness level was found to be lowest in the *less than 15K AED* group at 47%. Awareness level among *married* people was found to be better than *singles*, at 58%. Among Nationality, the *Asian Expatriates* and '*Others'* (westerners & other countries) better than the *Emirati* and *Arab expatriates*. The awareness level among the former group was over 60% while among the latter two groups was only 50%.

5.4. Section C: Preference

RO2: To determine the preference for GHA among the Consumers

Preference for GHA was assessed using the two parameters listed below:

- Liking / look for green features while buying Home appliances

- Regard Power saving as 'most important' feature

The table below summarizes the positive responses across the two parameters on the basis of which preference for GHA of the sample was established

Table: 5.13 Determining Preference

Preference Variables	N	%
Look for green features	121	58%
Power saving feature – most important	91	43%
Mean Score	**51%**	

Look for: 58% of the respondents stated that they "look for" green features while buying home appliances. Among respondents who reported that they don't look for green features, the main reason stated by 31% of the respondents was 'being expensive'.

Power saving - most important: 43% of the respondents reported that power saving feature is the most important feature they look for in the category

The preference level was established as the mean score across the two parameters at 51%

Attribute rating: The preference rating of product attributes on a three-point Likert scale showed that Price was rated by 71% of the respondents as 'most important' criteria followed by Durability at 60% and features and utility at 58%. 44% of the respondents considered 'appearance' to be the least important feature while making a home appliance purchase.

Main constraints: 'Being Expensive' and 'Not Convinced with the green claims' reported by 31% and 22% of the respondents respectively were found to be the main constraints limiting preference towards GHA.

Preferred brands: LG and Panasonic brands were mentioned by most of the respondents when asked to mention the brands offering GHA in the market.

Preference across Product categories: When asked to rank the importance of green features across the five product categories on a five-point Likert scale, the order of preference of green features was found to be (from most to least): Air conditioners, refrigerators, washing machines, dishwashers, and televisions.

Table: 5.14 Preference across Demographic variables

Demographic Variables	N	Look for	Power saving – Most Important	Avg
Age group				
18 to 25 yrs	53	45%	36%	41%
26 – 35 yrs	69	59%	35%	47%
36 – 45 yrs	56	59%	57%	58%
46 – 55 yrs	21	67%	43%	55%
Above 55 yrs	11	82%	64%	73%
Gender				
Male	124	57%	45%	51%
Female	86	58%	41%	49%
Education				
Hr .Sec	22	14%	18%	16%
Grad / Dip	102	45%	43%	44%
Masters / PG	79	82%	48%	65%
Ph.D	7	100%	71%	86%
Monthly Income				
Less than 15K	79	48%	43%	46%
15K – 29K	63	63%	44%	54%
30K – 44K	34	68%	44%	56%
45K – 59K	21	48%	29%	38%
60K & above	13	77%	62%	69%
Marital Status				
Single	66	52%	35%	55%
Married	144	60%	47%	54%
Nationality				
Arab Expats	56	50%	25%	38%
Asian Expats	89	64%	61%	62%
Emiratis	40	50%	15%	33%
Others	25	64%	68%	66%

Across Demographic variables respondents, the preference level was assessed across all segments. The oldest age bracket of *'above 55 years'* was found to prefer GHA more than others while the youngest age bracket (*18 – 25 yrs*) reported the lowest preference level. Among Gender classification, *male* were found to prefer GHA by 51%, slightly more than *females* at 49%. Like awareness, preference also improved along with education level. A *Higher Secondary* educated portion of the sample reported the lowest preference for GHA at an alarming 16% while it improved to 86% among *Ph.D. holders*. Preference was observed higher in the highest monthly income bracket of *'Above 60K'* AED' by 69% while it was found lowest in the *'less than 15K'* income bracket at 46%. Preference was observed to be almost same irrespective of the marital status with just a 1% difference between *Singles* (55%) and *married* (54%). Among nationality, the '*Others*' category reported the highest preference at 66% closely followed by the *Asian Expatriates* at 62%. The *Emiratis* registered the lowest preference for GHA at 33%, closely followed by the *Arab Expatriates* at 38%.

5.5. Section D: Willingness to Pay (Premium)

RO3: To determine the extent of consumer's willingness to pay for GHA across demographic variables

Extent of consumer's willingness to pay was assessed by the following two parameters

- Willingness to pay
- Extent of premium willing to pay

Only 46% of the respondents stated they were willing to pay a premium for GHA. The demographic characteristics of this section of the sample are summarized in the table below

Table: 5.15 WTP across Demographic variables

Demographic Variables	n	WTP	Less than 5%	5% to 10%	Above 10%
Age group					
18 to 25 yrs	53	30%	38%	38%	25%
26 – 35 yrs	69	49%	38%	41%	21%
36 – 45 yrs	56	52%	52%	24%	24%
46 – 55 yrs	21	38%	50%	25%	25%
Above 55 yrs	11	82%	33%	67%	0

Gender					
Male	124	44%	42%	35%	24%
Female	86	48%	44%	39%	17%
Education					
Hr .Sec	22	14%	33%	67%	0
Grad / Dip	102	34%	51%	31%	17%
Masters / PG	79	66%	37%	40%	23%
Ph.D	7	86%	50%	17%	33%
Monthly Income					
Less than 15K	79	33%	46%	31%	23%
15K – 29K	63	56%	46%	29%	26%
30K – 44K	34	56%	47%	42%	11%
45K – 59K	21	48%	20%	70%	10%
60K & above	13	46%	33%	33%	33%
Marital Status					
Single	66	42%	36%	32%	32%
Married	144	47%	46%	38%	16%
Nationality					
Arab Expats	56	34%	37%	32%	32%
Asian Expats	89	54%	46%	35%	19%
Emiratis	40	43%	29%	53%	18%
Others	25	48%	58%	25%	17%

The extent of willingness to pay was assessed across demographic variables. WTP was observed highest in the *Above 55* age group at 82% and 67% in this group reported to be willing to pay up to 10% premium for the green features. WTP differed by a narrow range between the male and female. WTP was observed more among females at 48% and males at 44%. Irrespective of the Gender, both of them opted the *less than 5%* premium range as their choice. WTP was found to increase as the education level increased and highest WTP was observed among the Ph.D. holders at 86% of which 50% were willing to pay to the extent of (up to) 5%. The least WTP was observed among the higher secondary qualified with just 14%. WTP was found more in the monthly income bracket of 15K – 44K AED at 56%, of which 47% of the respondents were willing to pay up to 5% premium. WTP was found least among the

lowest income bracket of less than 15K AED at 33%. WTP was found more among a married portion of the sample at 47% compared to the singles while both the groups opted the less than 5% premium add up as the extent of their willingness to pay. Asian expatriates exhibited the highest WTP at 54% and the least was observed among the Arab expats at 34%. Among the 43% of the Emiratis who exhibited WTP, it was observed that 53% were willing to pay to an extent of 10% more for the green features.

Overall WTP and Extent of willingness to pay premium across the sample can be summarized as
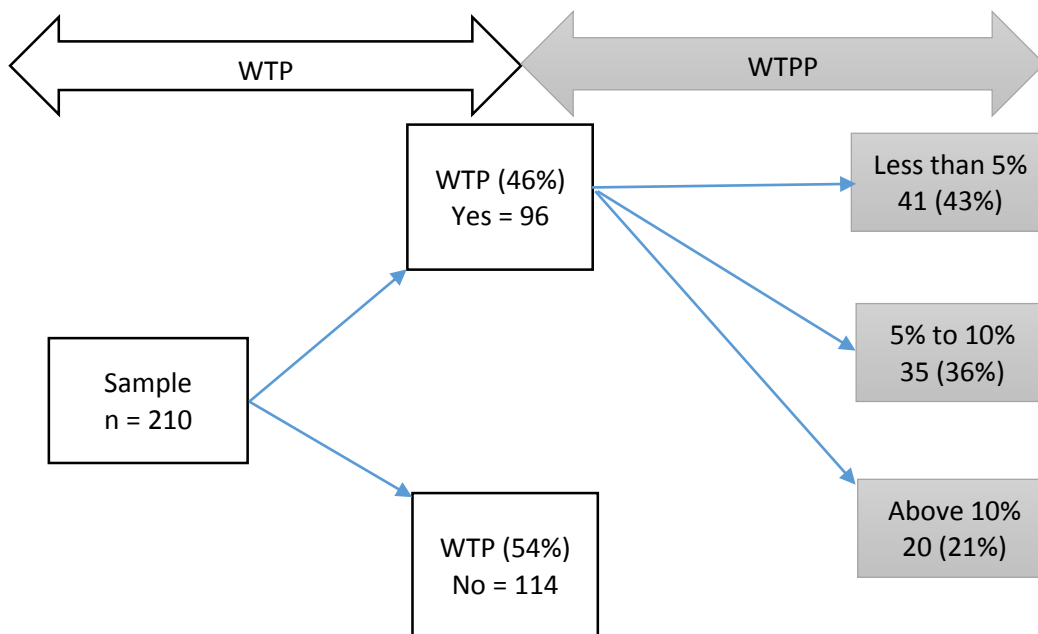
Fig 5.11. WTP and WTPP

Relationship between the three factors

Awareness, Preference, and WTP exhibited a positive relationship as observed during the literature review. The correlation matrix has been presented in Table 4.5 in Chapter 4 to substantiate the claim. All the three **r values** were found to be positive and hence the positive relationship among the three variables could be confirmed.

5.6. Hypothesis Testing

Hypothesis 1: H_o: Consumers are not aware of GHA

Hypothesis 2: H_o: Consumers do not prefer GHA

Hypothesis 3: H_o: Demographic variables do not affect the extent of consumer's willingness to pay premium

Hypothesis 1 and 2 were tested using Z –test. Descriptive Statistics and z test statistic of consumer response data are presented for awareness and preference in the table below

Table: 5.16 Hypothesis 1 & 2 Testing

Descriptive Statistics	Awareness	Preference
Mean	6.8905	1.0095
Standard Error	0.3295	0.0518
Standard Deviation	4.7756	0.7513
Sample Variance	22.8061	0.5645
Sum	1447	212
Count	210	210
Z test (p value)	**0.51**	**0.42**

The Z test gives a p-value greater than 0.05 for both the cases. As $p > 0.05$, the two alternate hypothesis H_a are accepted and can be established that consumers are aware of GHA and prefer GHA. Besides the study finding reveal 56% awareness level and 51% Preference for GHA which strongly supplements our alternate hypothesis 1 & 2,

Hypothesis 3 was tested using ANOVA – Two factor. Six demographic variables were identified in literature review (age, income, education, nationality, marital status and gender) to be major influencers in green purchase decisions. Each variable identified was tested against Consumer's willingness to pay premium. Hence the hypothesis 3 had six sub hypothesis and the relationship between each demographic variable and WTPP was assessed.

a. Age vs. Extent of Consumer's willingness to pay (premium)

H_o: *Age does not affect extent of Consumer's willingness to pay (premium)*

Sample Distribution:

Table: 5.17 WTPP across age

Percent	18 to 25 yrs	26 to 35 yrs	36 to 45 yrs	46 to 55 yrs	Above 55 yrs
Less than 5%	6	13	15	4	3
5% to 10%	6	14	7	2	6
Above 10%	4	7	7	2	0

Table: 5.18 Statistics Summary – Age and WTPP

SUMMARY	Count	Sum	Average	Variance
Less than 5%	5	41	8.2	29.7
5% to 10%	5	35	7	19
Above 10%	5	20	4	9.5
18 to 25 yrs	3	16	5.3333	1.3333
26 to 35 yrs	3	34	11.3333	14.3333
36 to 45 yrs	3	29	9.6667	21.3333
46 to 55 yrs	3	8	2.6667	1.3333
Above 55 yrs	3	9	3	9

Table: 5.19 ANOVA Two-factor – Age and WTPP

Source of Variation	SS	Df	MS	F	P-value	F crit
Premium Percent	46.8	2	23.4	3.911	0.0654	4.45897
Age	184.933	4	46.233	7.727	0.0077	3.8378
Error	47.866	8	5.983			
Total	279.6	14				

Observation: From the table, it can be noticed that:

Premium Percentage *F value (3.911) < F Critical (4.459), P-value (0.06) > 0.05* which implies the sample does not exhibit statistically significant difference across percent variations

Age *F Value (7.727) > F Critical (3.838)*, *P-value (0.007) < 0.05* which confirms statistically significant difference across the varying age group of the sample

Conclusion: *Ho is rejected. Age does seem to affect the extent of consumer's willingness to pay (premium).*

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b. Income vs. Extent of Consumer's willingness to pay (premium)

H$_o$: Income level does not affect extent of Consumer's willingness to pay (premium)

Sample distribution

Table: 5.20 WTPP across Income

Percent	Less than 15K	15K to 29K	30K to 44K	45K to 59K	Above 60K
Less than 5%	12	16	9	2	2
5% to 10%	8	10	8	7	2
Above 10%	6	9	2	1	2

Table: 5.21 Statistics Summary – Income and WTPP

SUMMARY	Count	Sum	Average	Variance
Less than 5%	5	41	8.2	38.2
5% to 10%	5	35	7	9
Above 10%	5	20	4	11.5
Less than 15K	3	26	8.6667	9.3333
15K – 29K	3	35	11.6667	14.3333
30K – 44K	3	19	6.3333	14.3333
45K – 59K	3	10	3.3333	10.3333
60K & above	3	6	2	0

Table: 5.22 ANOVA Two-factor – Income and WTPP

Source of Variation	SS	Df	MS	F	P-value	F crit
Premium Percent	46.8	2	23.4	3.754	0.0708	4.4589
Income	184.933	4	46.233	7.417	0.0084	3.8378
Error	49.866	8	6.233			
Total	281.6	14				

Observation: From the table, it can be noticed that:

Premium Percentage (Rows) F value (3.754) < F Critical (4.459), P-value (0.07) > 0.05 which implies the sample does not exhibit statistically significant difference across percent variations

Income F Value (7.417) > F Critical (3.838), P-value (0.008) < 0.05 which confirms statistically significant difference across varying income group

Conclusion: *Ho is rejected. Income does seem to affect the extent of consumer's willingness to pay (premium).*

c. Education vs. Extent of Consumer's willingness to pay (premium)

H$_o$: Education does not affect extent of Consumer's willingness to pay (premium)

Sample Distribution

Table: 5.23 WTPP across Education

Percent	Higher Sec	Grad / Dip	Masters	Ph.D
Less than 5%	1	18	19	3
5% to 10%	2	11	21	1
Above 10%	0	6	12	2

Table: 5.24 Statistics Summary – Education and WTPP

SUMMARY	Count	Sum	Average	Variance
Less than 5%	4	41	10.25	91.5833
5% to 10%	4	35	8.75	86.9167
Above 10%	4	20	5	28
Higher Sec	3	3	1	1
Grad / Dip	3	35	11.6667	36.3333
Masters	3	52	17.3333	22.3333
Ph.D	3	6	2	1

Table: 5.25 ANOVA Two-factor – Education and WTPP

Source of Variation	SS	df	MS	F	P-value	F crit
Premium Percent	58.5	2	29.25	2.7931	0.1389	5.1433
Education	556.6667	3	185.5556	17.7188	0.0022	4.7571
Error	62.8333	6	10.4722			
Total	678	11				

Observation: From the table, it can be noticed that:

Premium Percentage *F value (2.793) < F Critical (5.143), P-value (0.138) > 0.05* which implies the sample does not exhibit statistically significant difference across percent variations

Education ***F Value (17.718) > F Critical (4.757), P-value (0.002) < 0.05*** which confirms statistically significant difference across the groups with different educational levels.

Conclusion: ***Ho is rejected. Education does seem to affect the extent of consumer's willingness to pay (premium).***

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d. Nationality vs. Extent of Consumer's willingness to pay (premium)

H_o: Nationality does not affect extent of Consumer's willingness to pay (premium)

Sample Distribution

Table: 5.26 WTPP across Nationality

Percent	Arab Expats	Asian Expats	Emiratis	Others
Less than 5%	7	22	5	7
5% to 10%	6	17	9	3
Above 10%	6	9	3	2

Table: 5.27 Statistics Summary – Nationality and WTPP

SUMMARY	Count	Sum	Average	Variance
Less than 5%	4	41	10.25	62.25
5% to 10%	4	35	8.75	36.25
Above 10%	4	20	5	10
Arab Expats	3	19	6.3333	0.3333
Asian Expats	3	48	16	43
Emirati	3	17	5.6667	9.3333
Others	3	12	4	7

Table: 5.28 ANOVA Two-factor – Nationality and WTPP

Source of Variation	SS	df	MS	F	P-value	F crit
Premium Percent	58.5	2	29.25	2.8849	0.1325	5.1432
Nationality	264.6667	3	88.2222	8.7014	0.0133	4.7571
Error	60.8333	6	10.1389			
Total	384	11				

Observation: From the table it can be noticed that:

Premium Percentage *F value (2.884) < F Critical (5.143), P-value (0.132) > 0.05* which implies the sample does not exhibit statistically significant difference across percent variations

Nationality **F Value (8.701) > F Critical (4.757), P-value (0.013) < 0.05** which confirms statistically significant difference across the nationality groups.

Conclusion: ***Ho is rejected. Nationality does seem to affect the extent of consumer's willingness to pay (premium).***

e. Marital Status vs. Extent of Consumer's willingness to pay (premium)

H_o: Marital Status does not affect extent of Consumer's willingness to pay (premium)

Sample Distribution

Table: 5.29 WTPP across Marital Status

Percent	Married	Single
Less than 5%	31	10
5% to 10%	26	9
Above 10%	11	9

Table: 5.30 Statistics Summary – Marital Status and WTPP

SUMMARY	Count	Sum	Average	Variance
Less than 5%	2	41	20.5	220.5
5% to 10%	2	35	17.5	144.5
Above 10%	2	20	10	2
Married	3	68	22.6667	108.3333
Single	3	28	9.3333	0.3333

Table: 5.31 ANOVA Two-factor – Marital Status and WTPP

Source of Variation	SS	Df	MS	F	P-value	F crit
Premium Percent	117	2	58.5	1.1662	0.4616	19
Marital Status	266.6667	1	266.6667	5.3156	0.1476	18.5128
Error	100.3333	2	50.1667			
Total	484	5				

Observation: From the table, it can be noticed that:

Premium Percentage F *value (1.166) < F Critical (19)*, *P-value (0.461) > 0.05* which implies the sample does not exhibit statistically significant difference across percent variations

Marital Status ***F Value (5.315) < F Critical (18.512)***, ***P-value (0.147) > 0.05*** which the sample does not exhibit statistically significant difference across varying marital status

Conclusion: ***Failed to reject H_0. Marital Status does not seem to affect the extent of consumer's willingness to pay (premium)***

f. Gender vs. Extent of Consumer's willingness to pay (premium)

Hₒ: Gender does not affect extent of Consumer's willingness to pay (premium)

Sample Distribution

Table: 5.32 WTPP across Gender

Percent	Female	Male
Less than 5%	18	23
5% to 10%	16	19
Above 10%	7	13

Table: 5.33 Statistics Summary – Gender and WTPP

SUMMARY	Count	Sum	Average	Variance
Less than 5%	2	41	20.5	12.5
5% to 10%	2	35	17.5	4.5
Above 10%	2	20	10	18
Female	3	41	13.6667	34.3333
Male	3	55	18.3333	25.3333

Table: 5.34 ANOVA Two-factor – Gender and WTPP

Source of Variation	SS	Df	MS	F	P-value	F crit
Premium Percent	117	2	58.5	50.1429	0.0196	19
Gender	32.6667	1	32.6667	28	0.0339	18.5128
Error	2.3333	2	1.1667			
Total	152	5				

Observation: From the table, it can be noticed that:

Premium Percentage *F value (50.142) > F Critical (19)*, *P-value (0.019) < 0.05* which implies the sample does exhibit statistically significant difference across percent variations

Gender F *Value (28) > F Critical (18.512)*, *P-value (0.033) < 0.05* which implies the sample exhibits statistically significant difference across Gender variations

Conclusion: *Ho is rejected. Gender does seem to affect the extent of consumer's willingness to pay (premium).*

Summary of Hypothesis Testing: The summary of the hypothesis testing has been presented in the table below. It can be observed that except for the marital status, all other demographic variables considered in the study are found to influence the extent of consumers' willingness to pay a premium.

Table: 5.35 Summary of Hypothesis Testing

Hypothesis	Reject / Failed to Reject
H_o1: Consumers are not aware of GHA	Rejected
H_o2: Consumers do not prefer GHA	Rejected
H_o3: Demographic factors do not affect the extent of consumer's willingness to pay (premium)	
H_o3a: Age does not affect extent of Consumer's willingness to pay (premium)	Rejected
H_o3b: Income level does not affect extent of Consumer's willingness to pay (premium)	Rejected
H_o3c: Education does not affect extent of Consumer's willingness to pay (premium)	Rejected
H_o3d: Nationality does not affect extent of Consumer's willingness to pay (premium)	Rejected
H_o3e: Marital Status does not affect extent of Consumer's willingness to pay (premium)	Failed to Reject
H_o3f: Gender does not affect extent of Consumer's willingness to pay (premium)	Rejected

5.7 Section E: Future Prospects

When asked whether enough information was available on GHA, 49% replied affirmatively while more than half of the sample were of the opinion that enough information on GHA was not available.

26% of the respondents remarked that the green campaigns have made them more knowledgeable while 22% remarked that these campaigns have prompted them to seek more information on GHA

On their intention to buy GHA in their next purchase, 68% replied positively while 29% were undecided as they chose to respond 'May be'. Only 3% replied negatively.

Regarding information availability, around half of the respondents surveyed were of the opinion that there was enough information available on GHA which implies more than half of the sample felt there was dearth of information.

When asked about the impact of the ongoing green campaigns on them, one – fourth of the sample remarked that the available information has made them more knowledgeable while around one-fifth of them remarked that these campaigns have prompted them to seek more information on GHA

On their intention to buy GHA in their next purchase, more than two-third of the sample replied positively while more than one – a fourth of the sample were undecided. Only a marginal three percent replied negatively
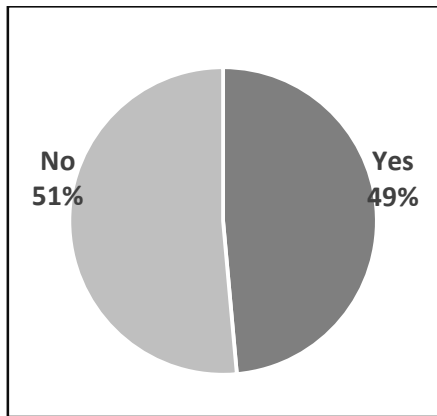

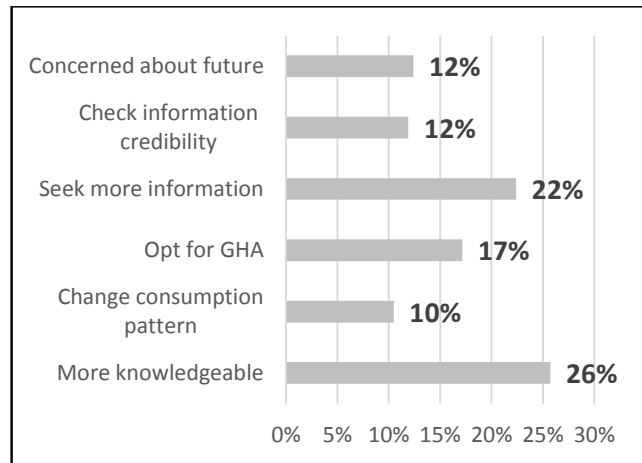Fig 5.12. Whether enough information was available

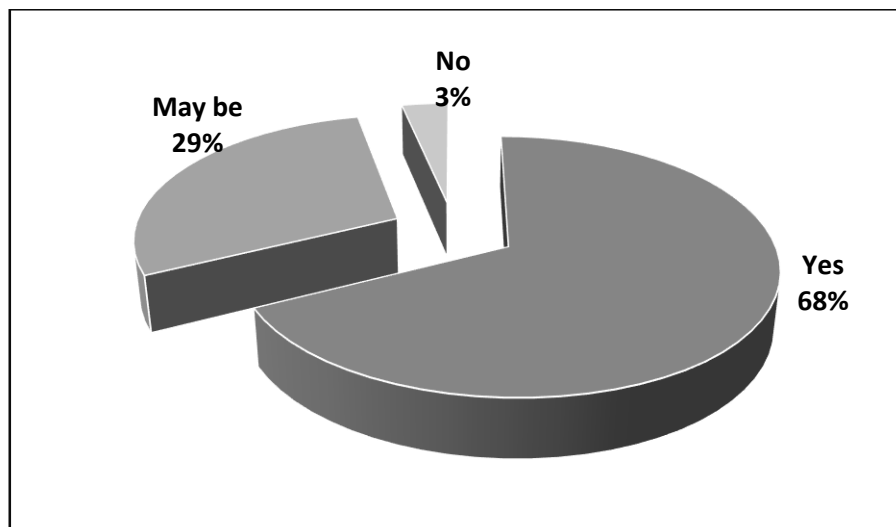Fig 5.13. Information available has made me..

Fig 5.14. Prospects of buying GHA in next purchase

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5.8 Concluding Remarks

This chapter has achieved in answering the research questions and the awareness level, preference and willingness to pay was established at 56%, 51% and 46% respectively. It was found that demographic variables influence the extent of consumers' willingness to pay a premium. WTP and WTPP were assessed across demographic variables. Hypothesis testing for the first two hypothesis was done with Z test which gave a p-value greater than 0.05 which favors the alternate hypothesis that consumers are aware of GHA and prefer GHA. Besides the study finding reveal 56% awareness level and 51% of preference also supplements the alternate hypothesis. The third hypothesis was tested using ANOVA Two-factor. Each demographic factor was treated as an independent variable and tested against the dependent variable – WTPP. Among the six demographic factors considered (age, income, education, nationality, gender and marital status), all the demographic factors except marital status were found to affect consumers' willingness to pay more.

The summary of findings, when presented diagrammatically, replicates the 'funnel or inverted triangle' appearance of the CAB model as presented in the figure below
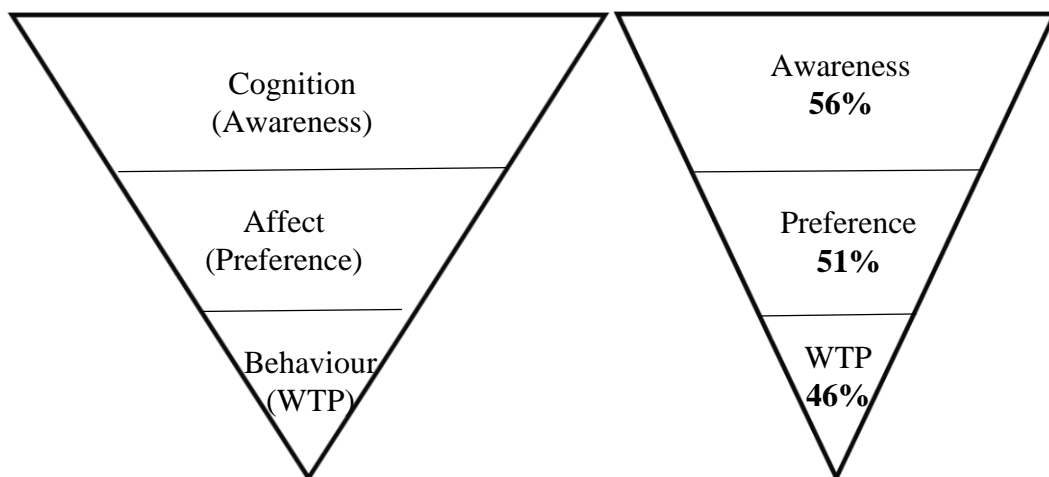

Fig 5.15. Findings summary replicating CAB model

Thereby it can be concluded that the research objectives have been achieved. The study provided many valuable suggestions and recommendations which have been detailed in the next chapter

CHAPTER 6. CONCLUSIONS AND RECOMMENDATIONS

6.1 Background

Further to UAE's high ranking among countries with high power consumption per capita, several green initiatives were deliberated by the Government, utility provider and corporate sector aiming to educate and inform the consumers on the dire need and ways to rationalise power consumption. Literature review has provided substantial evidence that using green home appliances (GHA) or energy saving home appliances contributes to power saving and monetary saving for the nation and consumer. Major factors influencing green purchases were identified to be awareness, preference and willingness to pay (premium). This study was carried out to understand consumer's willingness to purchase Green home appliances on the premises of these factors. The CAB model with improvisations was adopted to determine the awareness, preference and WTP (premium) for GHA among consumers in UAE. Sample size of 210 was derived using Taro Yamane's formulae. Stratified random sampling method was used and data was collected using a structured questionnaire. Following data analysis and findings, this chapter presents the major conclusions and recommendations from the study.

6.2 Conclusions

Environmental concern was observed to be higher as more than 60% of the respondents reported to have high concern on Environmental issues. Around 60% of the respondents were able to recollect some green campaigns.

The study revealed moderate level of awareness and preference for GHA. More than 50% of the respondents reported awareness and preference for GHA. It was observed that there was lesser willingness to pay (premium) as only around 45% of respondents were only willing to pay (premium) and the extent of premium willing to be paid was also found to be very low (0-5%).

Hypothesis testing for awareness and preference using Z test gave a p-value greater than 0.05 which favors the alternate hypothesis that consumers are aware of GHA which also support the study findings. ANOVA Two-factor was used to test the significance of Demographic variables on consumers willingness to

pay (Premium) for GHA. Each demographic factor was treated as an independent variable and tested against the dependent variable – WTPP. Among the six demographic factors considered (age, income, education, nationality, gender and marital status), all the demographic factors except marital status were found to affect consumers' willingness to pay more.

Awareness, preference and WTP was lower among the lower age groups, lower income group and lower educated group. While the awareness level was almost same across gender, preference was noted slightly higher among males. Awareness and preference was observed lower among the Emirati and Arab Nationals. WTP was observed more among the Emiratis and lower among the Arab Expatriates. Prospects of GHA purchases was observed to be promising with the Government bodies making rating mandatory on home appliances.

6.3 Recommendations

Around two-fifths of the respondents (41%) reported that they have not heard about GHA. Assuming the amount of money and efforts spent in green campaigns by the stakeholders, this figure is discouraging. The survey has attempted to probe the demographic profiles and narrowed down on segments wherein lower awareness, preference and WTP were observed. Green campaigns could be strategically executed and attuned to improve the lower scores reported among specific segments of the sample. Similarly, more than half of the sample did not have the right perception on GHA (54%) which is quite alarming. This advocates the need to revisit the communication strategy adopted so far and create the right perception among the consumers on GHA. This section presents the various recommendations deciphered by the researcher during the extensive literature review and research process to make more consumers opt for GHA. As only moderate level of awareness, preference and WTP (premium) was recorded during the survey, the researcher recommends the following measures which have been broadly classified as Government interventions and corporate interventions to enhance wider consumer acceptance of GHA.

6.3.1 Government Intervention: Credibility over green claims, compliance from a Government backed rating body and strict norms to discourage the sale of power consuming home appliances were the common concerns and suggestions observed during the study. The following initiatives from the Government are recommended accordingly to make GHA more appealing.

- As respondents were found to be apprehensive on the green claims and assurances made by the marketeers, rigorous intervention by the regulatory body to monitor, assess and validate power saving assurances is recommended

- Create more awareness on ESMA among the consumers, on its role and functions as familiarity on it was found to be very low among the respondents. This publicity would not only create awareness on ESMA, but also create awareness on the energy rating system which is in nascent stage in UAE.

- Regulatory framework to make energy rating by ESMA mandatory for all categories of home appliances and such ratings to be displayed on the product as presence of energy labels endorsed by a Government body will improve credibility on GHA which was found to be a major deterrent factor in GHA adoption.

- The current system of nationality based power tariff system wherein the Emiratis pay a lower power tariff if replaced with consumption based tariff system, would help in more responsible consumption and awareness across all segments as high power consumption and lower awareness has been observed in this segment.

- Incentives, subsidies, and grants for companies and retailers offering or dealing with GHA will not only promote GHA but also discourage the sale of conventional models as purchasers were found to spend considerable time in the retail stores before making home appliances purchasers and retail staff were found to be major influencers in their decision making.

- Creating awareness on GHA should be made a mandatory requirement for companies as a part of their CSR activities which will also bring a check on companies dealing in conventional power consuming models of GHA.

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- As timely reminders reinstating the benefits of GHA was opined to be a common suggestion to make GHA more appealing, the Utility could consider highlighting the Power saving benefits of GHA on the utility bills which would increase awareness and 'reach 'of GHA.

- The utility provider (DEWA) could consider linking household power consumption to source on utility bills through smart meters giving a breakdown on power consumption as respondents stated clarity and more information on their consumption pattern would encourage them to save more power.

- As credibility on green claims was found to be a limiting factor, publishing list of GHA with energy saving ratings in the media by the rating body will serve as a credible reference guide for potential GHA purchasers

6.3.2 Corporate Intervention: The following recommendations have been suggested based on the suggestions made by the respondents to make GHA more appealing to them.

Product: Credibility on green products and visible product distinction features that highlight power saving benefits were the most commonly suggested recommendation to make GHA more appealing. Accordingly, the following recommendations have been made to overcome these concerns.

- Power saving feature of the product should be displayed on the product itself so that it garners more attention

- Product endorsements and quality certifications by the regulatory body or Government institution will add more credibility to GHA

- Visible product differentiation method (like a green color) should be adopted between a power saving model and conventional model and it should be communicated to consumers through marketing campaigns

- Packaging should be used as a visual merchandising method to highlight power saving benefits.

- Efforts should be made to make power saving an integral product feature available to the consumer at no extra cost.

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Pricing: Consumers were found to be highly price sensitive and high price was found to be the major deterrent factor in GHA purchases. Based on the price suggestions and opinions from the respondents, the following measures are recommended to facilitate more GHA purchases.

- GHA should be made available at the same price of a conventional model.
- Discounts or rewards on GHA purchases could be given by companies.
- Schemes like offering instalment plans with zero interest program for refurbishing homes with GHA will increase GHA purchases.

Place: Availability was rated as 'most important' product attribute by the respondents. 'Not easily available' was also reported as a major reason for not preferring GHA. Hence, some of the recommendations to improve on the availability of GHA are presented below:

- GHA should be made easily available in all retail outlets along with conventional models
- Retail outlets could adopt category management strategies by developing green stalls or green corners displaying only GHA range of products.
- Retail outlets could adopt visual merchandising strategies by displaying the benefits of using GHA at POS.
- The Shop sales staff should be trained to promote GHA and make people aware of the benefits.

Promotions: Promotions were rated as an important product attribute in GHA purchases. Besides 'increase advertisements' being the commonly suggested recommendation to increase the awareness of GHA, there was a smaller portion of respondents who were not exposed to any kind of marketing communication on GHA or felt enough information was not available on the same. In light of these findings, the following are some of the recommendations to increase the promotions and thereby facilitate more GHA purchases.

- Advertisements on GHA highlighting the economic, social and health benefits of using them would create more awareness.

- Positioning GHA as a 'responsible citizen's choice' or a 'wise man's choice' as it saves power for the nation and money for the consumer would help in wider acceptance of the concept.

- Strategies like offering guaranty / warranty only for GHA brands will not only promote GHA purchases but also discourage purchase of non-green models

- Rebranding or co-branding GHA for its energy saving feature by the utility provider or regulatory body will increase credibility on GHA

- Introduction of loyalty points or exchange offers between conventional model and Green model of the home appliance will facilitate more consumer purchases of GHA.

- Social media marketing could be used aggressively to promote awareness on the need and benefits of using GHA

- Shopping festivals and exhibitions, which attract big influx of visitors, should be aggressively exploited to spread awareness on GHA

Segment with lower measures: Awareness and preference were found to be lower in the demographic segments of age group (18 – 25 yrs), less educated group (higher secondary), lower income groups (less than 15 k) and among Emiratis and Arab Expats. By targeting the awareness campaigns at these groups the prospects of GHA purchases and power savings could be improved further. Awareness campaigns in the local language, Arabic media, and educational institutions could be considered as means to target these segments.

Positive Correlation between variables: As awareness, preference, and WTP exhibited positive correlation, it can be stated that increase in awareness would lead to improvement in preference and WTP. Hence improving the awareness of GHA will improve the preference and WTP among the consumers. Also, the gap observed between awareness, preference level and WTP could be bridged by educating the consumers on the long term benefits of using GHA. By highlighting the advantages of using GHA, right perception on GHA would be built which will lead to more preference level and the premium part, if charged wouldn't be limiting factor in the purchase of GHA as it was found now.

Converting prospects to consumers: As around one fourth of the sample were found to be undecided when asked on the likeliness of opting for a GHA in their next purchase, these 'May be's' could be converted to 'will be's' by targeting the campaigns at this segment which would further increase the share of GHA in the market.

6.4 Implications of the Research

The Research study is significant from the academia, utility, and the corporate perspective. In academia, the thesis not only attempts to offset the identified research gaps but also gives a practical application of the communication assessment model – the C-A-B model which has been improvised based on the extensive literature review carried out to suit the study purpose. The application of the three component variant hierarchy of effects model to study consumer's awareness, preference and willingness to pay for GHA will add significance to the theoretical model and increase its prominence, applicability and usage even in such trans-disciplinary studies like this study linking power, home appliances and consumer behaviour in future. The model developed could be used to study the cognition – affect – behaviour of consumers in response to marketing campaigns with the variables identified as assessing criteria. As a part of theoretical implications the study also supports the past studies done on green products in developed countries wherein concern, awareness and preference were recorded while preparedness to pay premium was found on the lower side. The study is significant to the utility and concerned governing offices as it gives insightful feedback on the consumer's understanding of the subject and on the effectiveness of the various green campaigns, whether it has achieved its objectives. The demographic profiling and findings would enable the Government body to understand the segment which shows lesser awareness and draft segment specific green awareness campaigns. The Study is significant to the corporate sector as it provides better information on the level of consumer awareness, their preferences and the premium they are willing to pay across demographic profiles. The study also provides information on the influencing role of the important factors which promote green purchases. The findings of

the study would encourage collaboration between the utility, the manufacturers and the rating bodies to work in conjunction with energy saving objective.

6.5 Limitations of Research

This study is specific to UAE population only. Data was collected only from the urban population of Dubai. Due to language and access barriers, the study did not include the responses of the traditional ethnic groups of the country and rural areas which is a limitation of the study.

The study was limited only to major home appliances. Home appliances is a broad category and consumer electronics is even broader. The study did not isolate and probe for awareness, preferences, and WTP across product category.

While green product offers series of benefits, the scope of the study was limited to explore consumer understanding on the energy saving benefits of GHA

6.6 Direction for future research

Many past studies in developed countries have explored the role of psychographic variables that affect WTP in purchases of green products. This study if conducted in UAE on GHA would add more to the research repertoire.

Study on market segmentation based on green purchase behaviour and developing communication strategy accordingly will help in developing effective marketing campaigns

Study on assessment of various communication strategies and identifying the most effective strategy in raising green awareness among consumers

Barriers to acceptance of green products among consumers

Green initiatives are fervently undertaken in the transportation, construction and power sectors in UAE. Research could focus on green transportation, green buildings and green power contribute to improving UAE's green index on sustainability charts

The scope and barriers to the use of renewables in UAE would be futuristic and valuable to the country

Study on recycling of electronic waste could provide perceptive knowledge in an important area of sustainability

Consumer awareness of energy ratings and labels available in UAE could provide useful information

The country has a great influx of tourists every year from all over the world. Green tourism in UAE could be a beneficial and visionary research to the hospitality industry and the country

The objectives of the study were to determine the awareness, preference and willingness to pay (premium) for GHA among consumers. Awareness, preference and WTP was observed to be 56%, 51% and 46%. The most preferred premium range was observed to be 0-5%. Demographic variables were found to influence GHA purchases. Demographic segments which reported lower awareness, preference and WTP have been identified and recommendations have been given to improve the responsiveness towards GHA.

As concern over environmental issues was found to be on the higher side, educating the public about the long term benefits of using GHA on energy and cost savings will result in more GHA purchases. This will bring down the per capita consumption levels and save energy. The combined continued efforts of the stakeholders in creating awareness on GHA would definitely pave positive results in the form of more GHA purchases and increased power and monetary savings to the consumer and the country.

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BRIEF NOTE ON THE AUTHOR

Ms. B. Sabitha is a Post graduate in Business Administration (MBA) and is a University Rank holder- Gold Medalist in BBA from University of Madras. She has around fifteen years of experience in Research and Strategy. With work experience in India and UAE, in private and public sector; the author currently manages a research consultancy based in Sharjah. She has two publications to her credit which have been listed below

Title of Paper	Name of Journal	ISSN No.	Volume and Issue	Year
Consumer Willingness to purchase Green home appliances in UAE	The International Journal of Business and Management	ISSN 2321 – 8916	Volume III, Issue VI	June, 2015
Role of Demographic Factors on Consumer's Willingness to Pay Premium for Green Home Appliances in UAE	Journal of Global Research Computer Science and Technology **(JGRCST)**	ISSN 2349-5170	Volume-III, Issue-IX	August 2015.

QUESTIONNAIRE

Dear Respondent, I am a Ph.D Research Scholar doing a study on Consumer's willingness to purchase green home appliances. Kindly spare 5 minutes of your valuable time and fill the questionnaire with appropriate responses. Please answer all questions. Your response will be used for study purpose only and will be treated with utmost confidentiality. Thank you in advance!

Section A: Basic Information

(Information collected for categorization purpose only.)

Please indicate your age group   Choose an item.

Please indicate your Gender   Choose an item.

Please indicate your highest completed level of education   Choose an item.

Please indicate your occupation   Choose an item.

Please indicate your monthly income (in AED)   Choose an item.

Please indicate your marital status   Choose an item.

Your Nationality is _____

Section B : AWARENESS

Understanding on green issues

1. Are you concerned about the energy and environmental issues being discussed these days? [▾]
    If yes, Please indicate your level of concern on the following green issues?

Green Issues	Low	Medium	High
Energy conservation	☐	☐	☐
Carbon emissions	☐	☐	☐
Climatic change	☐	☐	☐
Resource scarcity	☐	☐	☐
Global Warming	☐	☐	☐

Exposure to green campaigns

2. Have you heard about 'Green Home appliances' before? [▾]
    (Green home appliances are appliances with energy saving benefits)

If yes, How did you come to know of Green Home appliances?

Television	☐	Word of mouth	☐
Newspaper and Magazines	☐	Social campaigns	☐
Internet and social networks	☐		
Any other source, Please specify :			

If No, What would you suggest to create awareness on green home appliances?

_____

_____

3. Can you recollect any marketing communication (advertisements) that highlighted any means of energy / power conservation [No ▼]

If yes, please specify details

_____

(Organisation / Brand / Product Category)

_____

4. Have you come across the following campaigns

Campaigns	Yes	No
Avoid using appliances between 12 noon and 4 pm		
Encourage using energy saving appliances		
24°C Campaign		
Green appliances advertisements		

Perception on green statements

5. In your opinion, which description best suits a 'Green home appliance'?

Description	Agree	Neutral	Disagree
Green appliances save energy			
Green appliances are environment friendly			
No harmful elements or process involved in manufacture of Green appliances			
No harmful elements or process involved in marketing or packaging of Green appliances			
Green appliances reduce carbon emissions			
Green appliances save money in longer run			
Is all the above			
Is None of the above			

Familiarity to green attributes

6. Are you familiar with the following terms in the context of a 'Green home appliance'?

	Yes	No
ESMA Label		
Eco label mark		
Green mark		
Star mark		
ISO Mark		
Conformity by a rating body		

Section C: PREFERENCE

7. Do you look for 'green' features while buying any home appliances ▢

If yes, kindly indicate the importance of the following features when you choose a green appliance over a normal one

	Least Important	Important	Most Important
Brand Name			
Extent of power saving			
Features and utility			
Appearance			
Price			
Availability			
Durability			
Promotions			
Warranty and after sales service			
Power saving Assurances (Quality mark / certifications etc.)			
Any other, Please specify			

If No, kindly give the reason for not preferring green home appliances

Not convinced about Green assurances	
Being Expensive	
Not easily available	
Happy with the current model	
UAE has enough resources. So no need to save power	
Any Other, Please specify	

8. Which of the following brands in your opinion have green appliances to offer in their product category?

Panasonic	☐	Samsung	☐	Bosch	☐
Siemens	☐	LG	☐	Supra ☐	
Any other, Please specify :					

9. Your most preferred brand for green home appliances is: _____

10. Rank 1 to 5 in order of your preference for green features among the following product categories

ACs	Refrigerators	Washing Machines	Dish Washers	TVs

(Hint : Rank 1 for the group where you feel power saving could be achieved most and Rank 5 for the least)

Section D: ACCEPTANCE (WILLINGNESS TO PAY)

11. Are you willing to pay a premium for the green features in home appliances?
[▼]

If yes, by what percentage on price? (Please indicate with a ✓ mark)

Less than 5%	Up to 10%	10 – 20%	More than 20%
☐	☐	☑	☐

If No, what do you suggest to make green appliances acceptable to you?

_____

_____

Section E: FUTURE PROSPECTS

12. Do you think there is enough information available to you on green appliances?

[▼]

13. Have these green campaigns made you:

	Yes	No
More knowledgeable on energy conservation	☐	☐
Seek information on green alternatives	☐	☐
Change your Power consumption pattern	☐	☐
Opt for energy conserving devices	☐	☐
Look for greener alternatives	☐	☐
Any other change, please specify		

14. In your next purchase of home appliances, would you choose a green appliance?

[▼]

15. How according to you can green home appliances be made more appealing to you?

_____

_____

End Note: Thank you for your valuable time !