
بسم الله الرحمن الرحيم

“Assessing Determinants of Consumers’ Energy Conservation Behavior in Pakistan”

By

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A research thesis submitted to the Department of Mechanical Engineering,
Capital University of Science and Technology, Islamabad
in partial fulfillment of the requirements for the degree of

MASTER OF SCIENCE in ENGINEERING MANAGEMENT

DEPARTMENT OF MECHANICAL ENGINEERING
CAPITAL UNIVERSITY OF SCIENCE & TECHNOLOGY
ISLAMABAD
March, 2017

CAPITAL UNIVERSITY OF SCIENCE & TECHNOLOGY
ISLAMABAD

CERTIFICATE OF APPROVAL

"Assessing Determinants of Consumers' Energy Conservation Behavior in Pakistan"

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DECLARATION

I hereby declare that this work contains no material that has been accepted for the award of any other degree or diploma in any university or other tertiary institution and, to the best of my knowledge and belief, contains no material previously published written by another person, except where due reference has been made in the text.

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DEDICATION

I dedicate my dissertation work to my Parents, Teachers and my Family, who have always prayed for my success, guided me and provided me motivation to keep moving forward and exploring new paths.

A special feeling of gratitude to my loving father, Haji Zia ud Din, and this journey would not have been possible without your loving support and encouragement.

Thank you for your faith in me.

ACKNOWLEDGMENT

In the name of Allah, the most Gracious and the most Merciful, all praises be to Allah for the strengths and His blessing in completing this thesis. I would like to take this opportunity to thank all who helped me through this research work and my years of study at Capital University of Science and Technology, Islamabad.

I am sincerely thankful to my supervisor, Dr. Baseer Qazi, for his invaluable guidance, inspiration and discussions through all stages of this research. Words alone cannot express how important his encouragement and support was during the whole period. Working with him has been a true privilege and a great experience for me. I staunchly believe that the endeavor of my thesis would never have been accomplished without his special personal interest, sparkling suggestions and throughout provoking criticism.

I am grateful to my parents, who have provided a carefree environment for me, so that I can concentrate on my research work and study. I am so lucky to have them as my parents. I would like to acknowledge those who indirectly contributed in this research, your kindness means a lot to me.

All errors in this thesis are my sole responsibility.

(Nadeem Akhtar)

ABSTRACT

Excess energy consumption, i.e., fossil fuels has raised serious concerns for the depleting resources of energy regarding energy security, efficiency and reliability and ultimately led to devastating consequences for the global climate. Worldwide key players have paid attention and focus to resolve the issue by free carbon energies and reduction of carbon emission. Alternative strategies have been implemented on the demand side management especially in the electricity domain and power system. Consumers' energy conservation behavior is identified as one of the most efficient and effective means of reducing energy consumption and thereby reducing emissions.

Several studies have investigated energy conservation and its predictors. Different attributes of energy conservation have been identified. This study, carried out in Pakistan, explores the different determinants of "consumers' energy conservation behavior". It builds on previous models and examines the influence of socio-psycho demographic variables on consumers' energy conservation behavior. A systematic literature review is conducted followed by analysis of primary data, gathered from a survey conducted in Pakistan, specifically Islamabad.

This study examines the influence and impact of six relevant determinants i.e. *income, bill-payment, pricing, perceived consumer effectiveness, moral obligation and pro-environmental behavior* on their *energy conservation behavior* in its both dimensions. Data was collected through questionnaire and online tools from eligible participants at homes, universities and parks in Islamabad, Pakistan. Data were analyzed in SPSS tool in six phases and hypotheses were tested which were formulated after the literature review. Descriptive analysis, reliability analysis, factor analysis by principal component analysis, correlation and regression analysis were conducted and also their mediation effect was tested.

The findings from the results suggest that all the determinants specifically psychological variables influenced energy conservation behavior i.e. energy curtailment and energy efficiency, albeit each in varying strength. Income does not show to have influenced energy curtailment while bill payment influenced energy curtailment. Energy efficiency is not influenced by income as well as bill payment. Perceived consumer effectiveness is the most significant and influential predictor of energy curtailment ($B=0.218$, $p<.05$) followed by bill payment and moral obligation. Moral obligation is the first significant determinant of energy efficiency at ($B=0.275$, $p<.001$) and followed by pricing and bill payment.

The findings of this study have important academic and practical implication and policy implication for consumers and policy makers respectively. Government and private environmental and energy organizations, specifically in Pakistan, would be well advised to use these findings in formulating strategies and developing and designing policies for carbon free green and sustainable energy sources.

Keywords*: Energy conservation behavior, Energy curtailment, Energy efficiency, Bill-payment, Perceived consumer effectiveness, Moral obligation, Pro-environmental behavior, Pricing.*

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LIST OF ACCRONYMS

PAEC	**Pakistan Atomic Energy Commission**
IPPs	**Independent Power Producers**
RPPs	**Rental Power Producers**
PCA	**Principal Component Analysis**
VBN	**Value Belief Norm theory**
ABC	**Attitude Behavior Choice theory**
SMEs	**Small Medium Enterprises**
WAPDA	**Water and Power Development Authority**
UNESCO	**United Nations Economic Scientific Cultural Organization**

CHAPTER # 01

INTRODUCTION

1.1 Study Background

Residential energy consumption accounts for one third of the total consumption. Efforts throughout the world are focusing to secure the energy and climate by reducing the consumption. Eventually energy conservation strategy is recommended on demand side as a better approach for reducing the consumption and making the earth safer. Social scientists, behavioral economists and psychologists have raised these issues and induced research and published work for recommendations for energy conservation (Kirsten Gram-Hanssen, 2013). Energy conservation could be a significant contribution to the energy policy in terms of security of energy supply and affordability of energy by lowering consumers' demand (Michael G. Pollitt, 2011).

Through a systems thinking approach by examining the world, it is evident that both socially and ecologically human are behaving in an unsustainable way. Worldwide industrialization and growing needs of humans due to globalization are pushing humans towards a luxurious lifestyle. The excess combustion of fossil fuel to create energy, the global climate becomes abnormal. It can be seen by the pollution and man-made chemicals which also affect the natural world help in the emission of carbon (CO_2) (Fatih Birol, 2006). Worldwide governments and policy-makers realized the consequences of fossil fuels based energies and are giving attention and focus to resolve the issue by considering the free carbon energies and reduction of carbon emissions, especially in electricity domain and power system. This is also expected to resolve the energy crisis (Fatih Birol, 2006).

1.1.1 Electrical power as an energy

Energy is the heart for overall socio economic and sustainable development of the society. The worldwide depleting energy reserves and increase in overall energy demand have raised concerns regarding energy security, efficiency and reliability. Electricity is the cleanest form of energy ever known to mankind. The modern life and the industrial revolutions are the incentives of electric power which plays the significant role in the human life and society (Ziad Alahdad, 2012).

In the context of increasing demand of electric power, the main generation source thereof, i.e., fossil fuels is insufficient to meet the demands and needs while it also impacts nature. As the current electric power system, traditional electric power grid infrastructure constitutes a multi-level hierarchal structure i.e. multi-state, multi-mode architecture which have served the utility industry more than hundred years. The current electrical power system faces many systematic, operational, management and capacity challenges. As the incumbent system is inefficient and the ageing infrastructure can't fulfill the demands of the modern world. The high peak demand can't be controlled by the incumbent electric power system which results in load shedding resulting from power supply shortages. The old infrastructure affects the whole system and disturbs the life by blackouts and technical failures, subsequently resulting in shutdown of the entire system. The centralized system can't integrate itself with the growing expanding and diverse energy resources and sustainable policy measures (Sunil Luthra, 2014; Fatih Birol, 2006).

In order to fulfill demand supply gap and overcome the energy crisis, we have to increase generating capacity and minimize consumption i.e. quantity of energy. Action should be taken for improving the quality of energy such as improve voltage level. Even distribution of energy such as changing the consumption pattern of energy by changing the consumption behavior of consumers (Kafait Ullah, 2013).

1.1.2 Pakistan and Pakistan's energy situation

In Pakistan, main electricity producers are Water and Power Development Authority (WAPDA), K-Electric (KE) and the Pakistan Atomic Energy Commission (PAEC) while IPPs (Independent Power Producers) and RPPs (Rental Power Producers) also produce electricity. WAPDA is responsible for electricity supply to utilities and further distribution to end users. In Pakistan, Mubashir Qasim. (2014) the household sector is the largest consumer of electricity which represents more than 47% of country's total electricity consumption, while the industrial sector consumes only 27% of the total energy consumption (Pakistan, Ministry of Finance, 2013). In Pakistan, power production, management and consumption sides are responsible for the current electricity shortages.

Energy consumption is directly linked with industrial production, economic expansion and the standard of living in any country. The Government of Pakistan reportedly has not made serious efforts to expand electricity generation capacity to support the country's rapid economic growth

during the past two decades (Khan M.A., 2009). Consequently, when there is demand supply gap in power, the Government balances load management through load-shedding and price-increasing tactics. Persistent power shortages may stagnate the economic growth of the country if the issue remains unsolved (Khan M.A., 2009). Pakistan failed to fulfill the needs of energy for various reasons, including an overreliance on fossil fuels for power generation, swelling oil prices, climate variation, inadequate alternative energy sources and insufficient technological advancement (Theresa Chaudhry, 2010).

1.1.3 Consumer Conservation Behavior

Load management is essential to cover the electricity crisis. Load management includes demand side management, demand response management, time of use and critical peak pricing (Arsalan Arif, 2014). Load management is basically dependent on consumers. To accurately develop strategies for load management, patterns for consumption of consumers should be known as well as consumer behavior should be understood. Consumer behavior and demand for energy is crucial for effective load management (Theresa Chaudhry, 2010). The strategy of energy conservation envisions the elimination of load shedding or minimizing it to a substantial extent. The determinants of energy conservation should be known to formulate a strategy and policy making should be effective (Theresa Chaudhry, 2010).

Household energy conservation has been identified as an effective and efficient mean of reducing emissions. These changes can be made in the immediate term, without economic sacrifice or loss of well-being on the part of consumers (Guagnamo, Stern, & Dietz, 1995). A variety of energy conservation actions are technically and economically viable, widespread adoption is lagging and policy makers are increasingly looking to psychologists for guidance (Lutzenhiser & Gossard, 2000; Wilson & Dowlatabadi, 2007).

Economic theory suggests that consumers are making use of excess energy in order to get comfort and time neglecting the consequences of impacts of choices of consumers of energy on environment and energy issues (Sardianou, 2015). World's related energy problems and their solutions require not only technological advances but also changes in human behavior, and successfully shifting the behavior of consumers in desired direction towards sustainable practices (Ehrhardt-Martinez.).

Energy usage not only depends on the efficiency of technology but also on the consumers choices of life style and habits (Guerra Santin, 2011; Gaspar & Antunes, 2011; Pedersen, 2008). The term energy conservation encompasses a diverse set of specific behaviors related to lighting, laundry, heating, cooling, usage of water and use of electronics devices and technology. Energy conservation behavior is categorized in to "curtailment behavior" (such as limiting use of energy, daily actions, routine works, habits and lifestyle) and "efficiency behavior" (investing in technology and home improvements) (Gardner & Stern, 2002; Abrahamse, Steg, Vlek, & Rothengatter, 2005). Several theoretical and empirical studies focused consumer behavior of consumption and conservation of energy. This energy conservation behavior is linked to socio-psycho demographic parameters which hints at lifestyle and habits. (Wokje Abrahamse, 2011; Wouter Poortinga, 2004). Critical parameters which are usually taken into consideration are:

(i) Socio demographic factors (age, gender, marital status, education, income, and those who pay their bills),

(ii) Psycho demographic factors (values beliefs and attitudes, goals intentions and motives, perceived consumer effectiveness and social norms, moral obligation etc.)

Energy policy addresses the energy saving and reducing emissions by energy conservation, behavioral transformation strategies are necessary. Behaviors that are related to household energy consumption encompasses three broad categories (a) Energy consumption, curtailment and habits (b) Energy efficiency and investments (c) contribution to public good (green energy) and pro-environmental behavior. These three categories are interrelated and affect one another. Pro-environmental attitudes make efficient investments and ultimately reduce consumption in long term (Michael G. Pollitt, 2011).

Behavioral economics states endowment-effect of prospect theory and importance to reference point in relation with energy consumption. Individuals are attached to their routines and daily habits and it is difficult to change their behavior, or else high compensation would be demanded which is not there in case of increase or decrease of regular flat pricing (Michael G. Pollitt, 2011). Michael G. Pollitt. (2011) discusses status quo bias of behavioral economics and states that people with default plan of usage of energy stay the same plan even if it is not optimal for them in case of variation in pricing. Reiss P. (2008) discussing the energy crisis of California in 2000-2001 regarding energy conservation. The prices of electricity were doubled in response to the crisis. The

household energy usage fell down to 13% in 60 days. But after the crisis, when prices rolled back down, energy consumption rebound back and the consumption was more than the former level. IEA (2005) states that pricing is the best scenario in reducing the consumption but it is not feasible politically and it does not affect wealthy people but poor class will suffer.

Environmental significant behavior may be classified as intent oriented and impact oriented. Intent oriented behavior are those which are performed to benefit the environment and the action and intention of the motivator is undertaken. Impact oriented performance of environmental significant behavior also benefit the environment which is concomitant to impact oriented perspective while there is no concern to motivation of the respondent (Wouter Poortinga, 2004). The word of pro-environmental behavior is used for intent oriented perspective and are inter-related to attitudinal behaviors while impact oriented perspective to household energy is related to demographic variables. Environmental behavior (intent oriented and impact oriented) are named as direct behavior and have consequences on household energy such as consumption and conservation. Indirect behavior of environment deal with political context of environment such as policies regarding environment. Psychologists consider the impacts of direct behavior of environment as most influential for Energy use and its conservation and researchers have get its attention. Indirect behavior such as policy support and environmental activism has also large environmental impacts (Stern, Dietz, & Abel, 1999).

Those customers who pay their utility bills may have implications for how to consume energy and how to conserve energy. It shows their involvement. By topping up amount in prepaid meters shows the implication and adjusting their behavior and habits according to top up plan. When needed, another top up of less amount is followed when needed. This strategy modify habits and curtailment, and energy consumption is dropped (Michael G. Pollitt, 2011).

The aim of this study is to compose a profile of energy saving consumers and households in Pakistan with impacts of pricing and pro-environmental behavior on energy conservation behavior. Also to study impacts of moral obligation and perceived consumer effectiveness on energy conservation behavior. Furthermore to develop an empirical model for explaining determinants of consumer energy conservation behavior and impacts of socio-demographic and psycho-demographic factors on energy conservation behavior. Evaluating consumers' decision making process towards consumption and conservation patterns for first time to our knowledge based on

cross sectional data in Pakistan. The purpose is to formulate a strategy not only for sustainable development but also to maintain consumer choices related to their lifestyle.

1.2 Problem Statement

Despite the existing research on *energy conservation*, very limited literature is available and many questions are unanswered. Many of the past studies are conducted in non-Asian countries whereby results achieved are less inclined to be relevant to Asian countries like Pakistan.

Moreover very little empirical research has been conducted on energy conservation particularly in Pakistan. Furthermore, little consideration has been dedicated to understanding factors such as determinants of energy conservation, its predictors and most influencing factors to energy conservation in context of Pakistan. To add to the problem, there is inconsistency in results and lack to generalizability. Therefore, this study is examining all the variables, such as socio demographic and psycho demographic variables as well as their interrelation and mediation effect.

1.3 Research Model

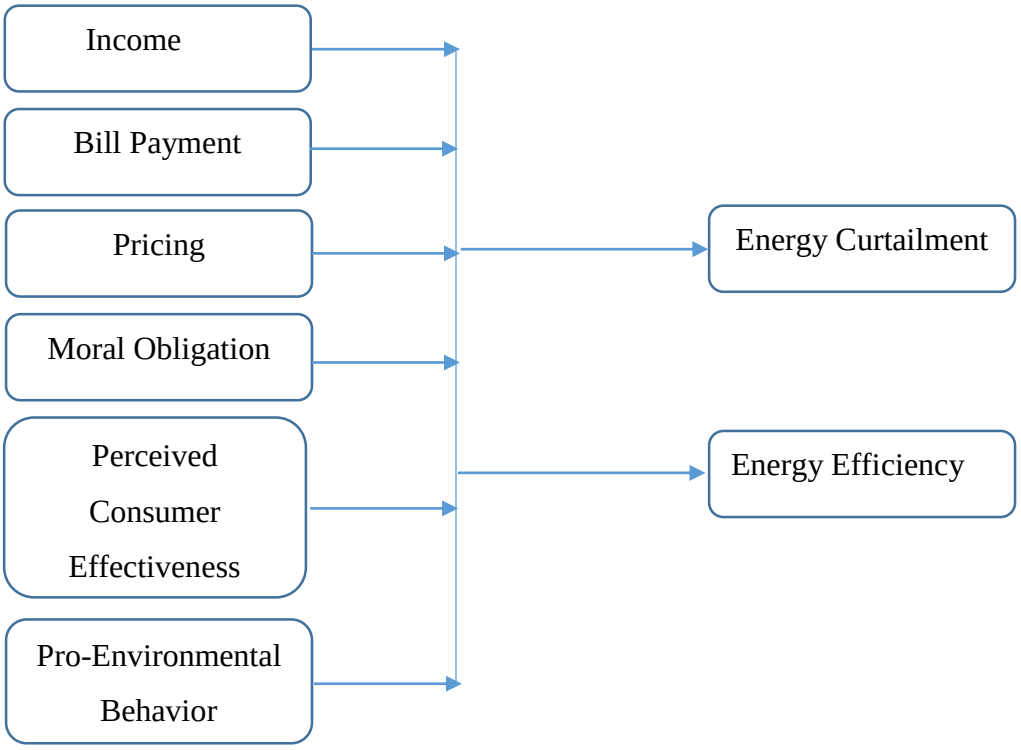

Figure 1.1 The proposed conceptual model for the study.

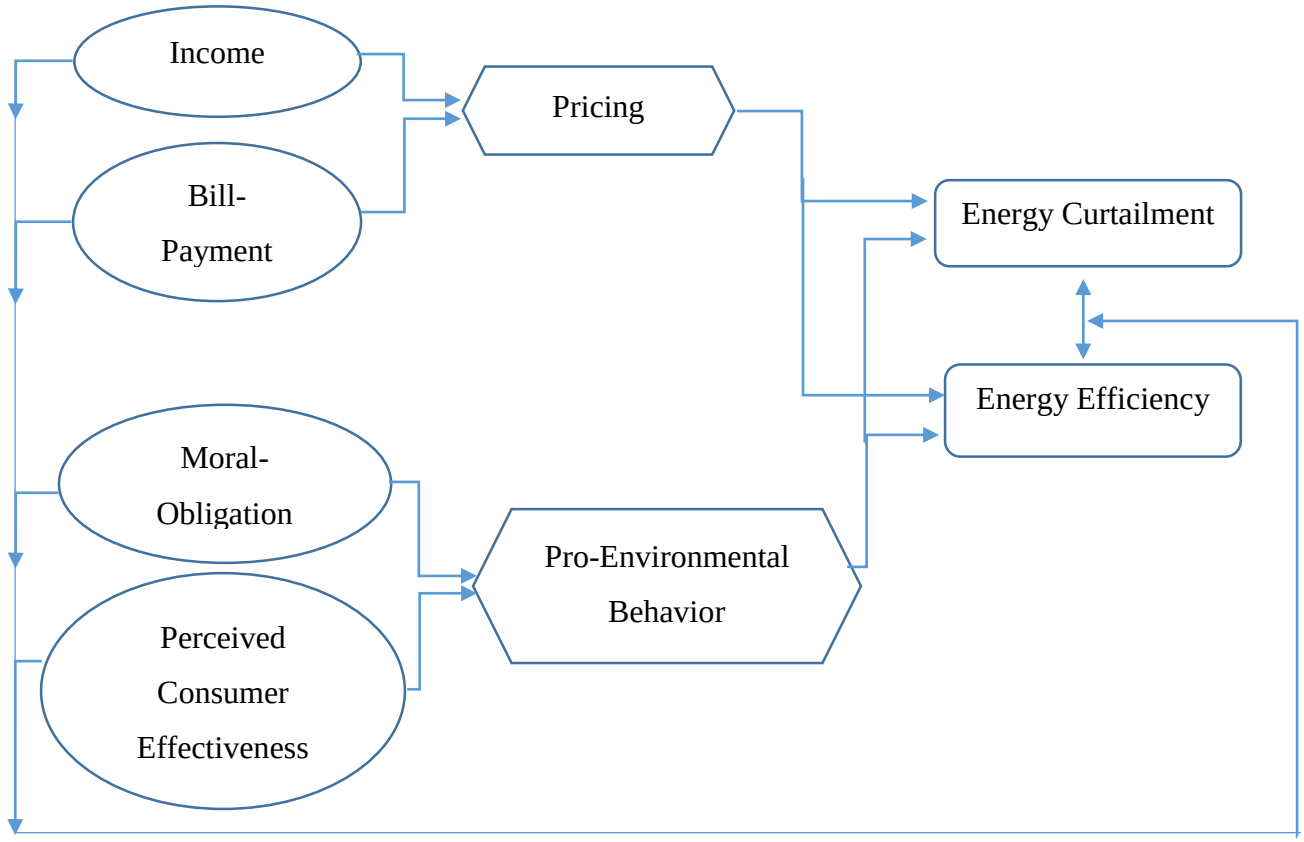

Figure 1.2 The proposed conceptual model for the study through mediation effect.

1.4 Research Questions

1.4.1 Direct Relationship:

Does relationship exists between independent variables and dependent variables? :

1. Does relationship exist between income and energy curtailment?
2. Does relationship exist between income and energy efficiency?
3. Does relationship exist between bill payment and energy curtailment?
4. Does relationship exist between bill payment and energy efficiency?
5. Does relationship exist between pricing and energy curtailment?
6. Does relationship exist between pricing and energy efficiency?
7. Does relationship exist between perceived consumer effectiveness and energy curtailment?
8. Does relationship exist between perceived consumer effectiveness and energy efficiency?
9. Does relationship exist between moral obligation and energy curtailment?

10. Does relationship exist between moral obligation and energy efficiency?
11. Does relationship exist between pro-environmental behavior and energy curtailment?
12. Does relationship exist between pro-environmental behavior and energy efficiency?

1.4.2 Relationship through Mediation:

Does relationship exists between independent variables and dependent variables through mediation? :

1. Does pricing mediate the relationship between Income and Curtailment?
2. Does pricing mediate the relationship between Income and Efficiency?
3. Does pricing mediate the relationship between Bill Payment and Curtailment?
4. Does pricing mediate the relationship between Bill Payment and Efficiency?
5. Does pro-environmental behavior mediate the relationship between perceived consumer effectiveness and curtailment?
6. Does pro-environmental behavior mediate the relationship between perceived consumer effectiveness and efficiency?
7. Does pro-environmental behavior mediate the relationship between moral obligation and curtailment?
8. Does pro-environmental behavior mediate the relationship between moral obligation and efficiency?

1.5 Research Objectives

Objective of this study is to find out the impact of socio-psycho demographic variables on energy conservation behavior in its both dimensions such as energy curtailment and energy efficiency. Specifically income and bill payment are considered in socio-demographic variables. Psycho demographic variables includes pricing of electricity, perceived consumer effectiveness and moral obligation. Pro environmental behavior is essential to investigate. Also investigating the impact of mediating variable such as pricing and pro environmental behavior is examined.

1.6 Significance of Study

This study examines the determinants and predictors of energy conservation and will be well explained. The impact and influence of socio-demographic and psycho-demographic variables on energy conservation will be well understood. It will help in the policy formation for green and

sustainable energy. To sustain the life style and comfort of consumers with sustainable energy is important and this study will help to sustain these priorities.

1.7 Plan of Study

First part of study comprises of introductory text regarding energy conservation context and situation of contemporary world with situation of Pakistan related to energy crisis and carbon emission. Independent and dependent variables are discussed with research questions and research objectives. Second part of this study gives insight of the existing literature and their findings regarding past studies to energy conservation techniques and its determinants and variables covered in past studies. Third part comprises of methodology, data collection and validated variables. Fourth part discusses the finding and results of data analyses and its interpretation. Finally fifth part of study discuss conclusion, theoretical and practical implication, policy recommendation and future research directions.

CHAPTER # 02

LITERATURE REVIEW AND THEORETICAL BACKGROUND

2.1 Energy Conservation behavior

Energy consumption and conservation is related to human behavior and human choices. Human behavior related to consumption has been studied for the last decades. Behavioral values and attitude have been examined in a range of different theoretical perspectives. A variety of conceptual models have been hypothesized and evaluated to study the influence of different predictors on decision making and action (Frederiks, Stenner, & Hobman, 2015). Attitude behavior and external condition (ABC) attitude behavior choices, Guagnamo, Stern, & Dietz. (1995) and value belief norm (VBN) theory, Stern, Dietz, & Abel. (1999) explains the pro environmental behavior and specifies it to the residential household energy consumption and conservation (Abrahamse W. &., 2011). The ABC attitude, behavior and choice model generally entails that individual behavioral choice is the principal driver of reducing consumption in accordance to the conservation approach of energy (Shove, 2010). Identification of different predictors on household energy usage (consumption) and reduced usage (conservation) has been identified.

Behavioral model Van Raaij & Verhallen. (1983) of residential energy use and socio-psychological model Costanzo, Archer, & Pettigrew. (1986) of energy conservation behavior links consumer patterns of energy with house related activities. Residential energy consumption is influenced by technology, unconscious habits and their lifestyle (Gram-Hanseen, 2014). Several studies indicate the interaction of life style and habits as the cause of energy usage and conservation (Lutzenhiser, 1993). Life style patterns are structured as a consequence of enduring activities of socio-psycho demographic factors (Weber, 2000).

Identifying the predictors, studying consumption and conservation patterns, consumer behavior and to predict individual preference is so complex that it is difficult to capture in a single framework (Frederiks, Stenner, & Hobman, 2015). There is no single conceptual model that is inclusive and consistent of all explanation which is accepted by scholars (Frederiks, Stenner, & Hobman, 2015). Lack of well designed, consistent and rigorous conducted empirical research,

makes it impossible to draw conclusions regarding precise causality factors for energy consumption, conservation and consumer behavior (Frederiks, Stenner, & Hobman, 2015).

Several theoretical and empirical studies focused consumer behavior of consumption and conservation of energy. This energy conservation behavior is linked with social-psycho demographic parameters which hints at lifestyle and habits (Wokje Abrahamse, 2011; Wouter Poortinga, 2004). Energy conservation is categorized in two main dimensions as energy curtailment and energy efficiency. This categorization is based on frequency and cost. The curtailment is termed as frequent and low cost behaviors while efficiency is termed as costly infrequent behavior. The efficiency behavior demands to spend money and invest in efficient technologies and curtailment behavior asks to give up comfort and suffer. This is a difficult choice to either invest or either suffer and change our life style and give up comfort which also depends on financial means (Beth Karlin, 2014; Cialdini R.B, 2003).

2.1.1 Energy Curtailment

The life style concept has been periodically addressed in relation to the social and behavioral aspects of energy consumption. Lutzenhiser & Gossard. (2000) defines life style as "distinctive modes of existence that are accomplished by persons and groups through socially sanctioned and culturally intelligible patterns of action". This implies a specific cluster of social culture demographic behavior patterns of consumers that influence consumption and conservation of energy. A substantial form of literature shows that behavior is often guided by habits (Marechal, 2010). Convincingly it is stated that every individual have their habits (routinized form of actions) and attitude towards habits as generally relying on the decision making shown in qualitative analysis (Gram-Hanseen, 2014).

Psychological studies reveal that in performing actions related to consumption of energy, people do not consider environmental impacts and cognitive behavior. Another important element is that domestic energy consumption is not visible so people don't care at that time (Abrahamse, Steg, Vlek, & Rothengatter, 2005). People do not require a lot of cognitive effort to make decisions related to actions of energy consumption (Jackson, january 2005). All together this suggests that people do not require much intentional effort in behavior to everyday energy consumption (Marechal, 2010).

Consumption differences accounts for social and behavioral patterns of lifestyle factor than income (Sanquist, Orr, Shui, & Bittner, 2012). Lifestyle preference and choices makes consumer to use and conserve energy in a specific way (Sobel, 1981). The ABC attitude, behavior and choice model generally entails that individual behavioral choice is the principal driver of reducing consumption in accordance to the conservation approach of energy (Shove, 2010).

Life style analysis treats energy consumption as a set of behavioral practices in time and space context. Energy consumption is influenced by life style and many aspects of life style are socially developed and reinforced by complex context which takes place in everyday life Wilhite & Lutzenhiser. (1999), e.g., region of residence, size of house, use of cooling and heating, use of technology, size of family, corresponding appliances usage etc.

A survey has been conducted by Marechal. (2010) in which questions are asked from households related to habits and their importance in consumption has been assessed. 519 households were participants. Participants of the study were asked whether they think that their daily behavior concerning the use of electricity (lighting, electric appliances, etc.) are guided by habits, automatism? Habits are often unconscious and different from actual behavior in according to motivation and intention (Hodgson, 2007).

2.1.2 Energy Efficiency

Energy conservation can be obtained by changing behavior towards lifestyle patterns by adopting energy efficient measures such as investing in technology and replacing old appliances by new efficient ones. Laitner & McKinney. (2009) categorize human behavior according to efficiency measures. Infrequent and low cost behavior by replacing the old appliances such as installing compact fluorescent lamps (CFLs) and maintaining old appliances to make it efficient by changing their oil etc. Switching lights to efficient energy savers and LED, new technology of lighting system, and may be thought of as energy stocktaking behaviors and lifestyle choices (Laitner & McKinney., 2009). Actions involves one time behavior such as high investment in efficient appliances and technology are referred as consumer behavior with technology choices and purchasing decisions. Technology allows consumers to make adjustment to their habits and routines or adopt efficient technology to make energy consumption visible to them (Ehrhardt-Martinez.). Consumer change their patterns or adopt efficient technologies depends on their socio-demographic factors.

Although, several researchers Barr, Gilg, & Ford. (2005); Van den Berg, (2008) have integrated different perspectives to advance the literature and resolve inconsistent findings, many interrelated variables explain individual preferences and differences towards energy consumption and conservation (Abrahamse & Steg, 2009; Gram-Hanseen, 2014). These explanatory variable include a range of

(i) Socio-demographic factors (age, gender, marital status, education, income, and those who pay their bills),

(ii) Psycho demographic factors (values beliefs and attitudes, goals intentions and motives, perceived consumer effectiveness and social norms, moral obligation etc.)

2.2 Socio-demographic factors and Consumers' Energy Conservation Behavior:

Household energy consumption and conservation is highly associated with socio-demographic variables. Opportunities and constraints when people confront with activities significantly influence how a particular consumer uses energy at a particular time or how they behave in a particular situation (Frederiks, Stenner, & Hobman, 2015). There are many variables which can be predicted but the more influential are age, gender, household income, education, awareness and those who pay their bills by themselves as home ownership.

Several studies have investigated the predictors of residential energy conservation as a whole or individual energy conservation behaviors. Researchers have found consistent results for relationship of income and gender as significant to curtailment and efficiency while inconsistent results are founded for education and age for relationship with efficiency and curtailment (Beth Karlin, 2014). Studies have also investigated housing related variables in relation with dimensions of energy conservation. Housing related variables include building age, home type, home ownership, home size, and home occupancy are also found to predict energy conservation (Black & Elworth., 1985).

2.2.1 Age

Research supports a positive association of age and energy consumption, as energy consumption increases with increase in age. Children do not need separate rooms and have no more activities related to energy consumption. Adults use electronic devices and consume energy more as compared to children. It may be because older people don't care of cost benefit ratio and are less

likely to adopt energy efficiency measures in accordance to comfort and life style (Abrahamse W. &., 2011). Older people require more heating/cooling for comfort as compared with youth. Some research concludes that there is no consistency in the association of age and consumption behavior while some argue that older people are more energy conservers and committed to sustainable energies (Barr, Gilg, & Ford, 2005; Guerra Santin, 2011). Researcher have also correlated the relation of age and consumption behavior with income and household life cycle and shows curvilinear relationship (Frey & LaBay, 1983). Hence, there is no conclusive evidence for age as predictor of energy consumption and conservation behavior (Frederiks, Stenner, & Hobman, 2015). Positive relationship between age and curtailment is indicated while no significant result is indicated for efficiency (Black & Elworth., 1985). No significant relationship exist between age and energy conservation for curtailment and negative relationship exist between age and energy conservation for curtailment behavior (Poortinga W, 2003).

2.2.2 Gender

Gender may not affect household energy usage. It is minimally and statistically insignificant. However, research indicates that women behave more environment-friendly and intentionally their attitude is positive Abrahamse W. (2011) while some research conclude that women wants to conserve energy but are limited to their activities and routine work and for rearing up their children (Oparaocha & Dutta, 2011). There is no significant relationship exist between gender and energy conservation for both its dimensions, i.e., energy curtailment and energy efficiency behavior Black & Elworth. (1985) and same results were also indicated in Poortinga W. (2003) study of no existence of relationship. Positive relationship exist between gender and both dimensions of energy conservation, i.e., energy curtailment and energy efficiency (Cialdini R.B, 2003).

2.2.3 Education

Studies have shown significant effects of education on energy usage which is due to increased knowledge and awareness to pro-environmental behavior (Poortinga, Steg, & Vlek, 2004). Poortinga W. (2003) tested the relationship and find out that there is negative relationship between education and curtailment dimension of energy conservation while positive relationship for efficiency behavior dimension of energy conservation (Beth Karlin, 2014). Positive relationship exists between education and energy curtailment dimension of energy conservation and no significant relationship exists between energy efficiency and education (Black & Elworth., 1985).

2.2.4 Income

Income is one of the strongest socio-demographic predictors of energy consumption and conservation. Household income is positively related to residential energy consumption as well as to consumer behavior as behavior changes from time to time and is dependent on income (Abrahamse W. &., 2011; Frederiks, Stenner, & Hobman, 2015). People with high income use more appliances and have a positive relationship with energy consumption. Energy conservation is categorized in behavior (curtailment) and efficiency measures. High income consumers' behavior is negatively associated to conservation (curtailment) while capacity to enhance efficiency i.e. advancing technology is positively correlated to income of household in conservation of energy (Sardianou, 2007). Poortinga W. (2003) argues that technical improvements are more acceptable for those with high incomes, while least to low income consumers. Norwegian households shows variation in energy saving on the basis of income when electricity price increases Ljones A. (1992); low income consumers save energy while high income consumers do not react. Low income household generally do not prefer to change their appliances as it will save money for them in long term, but have to spend bulk at a time, which shows time-varying discount. The consumers prefer the near future instead for discount in far future (Michael G. Pollitt, 2011). Negative relationship exists between income and energy curtailment dimension of energy conservation while positive relationship exists between income and energy efficiency dimension of energy conservation behavior (Poortinga W, 2003). No significant relationship exists between income and energy curtailment behavior of energy conservation while positive relationship exists between income and energy efficiency dimension of energy conservation behavior (Black & Elworth., 1985; Dillman, 1983).

2.2.5 Bill Payment

Those customers who pay their utility bills may have implications for how to consume energy and how to conserve energy. It shows their involvement. By topping up amount in prepaid meters shows the implication and adjusting their behavior and habits according to top up plan. When needed, another top up of less amount is followed when needed. This strategy modify habits and curtailment, and energy consumption is dropped (Michael G. Pollitt, 2011).

2.3 Psycho-demographic factors and Consumers' Energy Conservation Behavior:

Person specific psychological factors have strong effects on energy consumption and conservation. Some of the most common influential predictors are value beliefs and attitude, motivational construct (goals and intentions), knowledge and awareness to both environment and energy issues, subjective appraisal (cost/benefit ratio trade-offs, perceived behavioral control), personality tendency (self-efficacy, locus of control), and personal and social norms, moral obligation and perceived consumer effectiveness (Van Raaij & Verhallen, 1983; Wilson & Dowlatabadi, 2007). Some other psychological predictors include concern for energy situation, environmental concern, financial motivation, environmental protection and social and descriptive norms (Cialdini R.B, 2003). Normative social structure may also have an influence on consumer behavior towards energy. Research indicates that people behaves in similar ways as other around them. People believes in injunctive and descriptive norms. (Barr, Gilg, & Ford, 2005)

Psycho demographic factors don't always lead directly to energy conservation as there always lies a knowledge-action gap, intention-action gap, value action-gap and attitude-action gap (Frederiks, Stenner, & Hobman, 2015). Energy related knowledge reflects one's level of understanding of energy crisis, awareness and consequences of energy usage, energy prices and cost and energy conservation and its consequences (Van Raaij & Verhallen, 1983). Knowledge and awareness are positively associated with energy conservation and pro environmental behavior (Herberlein & Warriner, 1983). Knowledge and awareness do not routinely translates into behavioral change as there lies knowledge-action gap (Anker-Nilssen, 2003). Values beliefs and attitudes also do not directly translate into consumption and conservation behavior consistently as it is linked with other socio demographic factors as there lies value action-gap and attitude-action gap (Marechal, 2010; Anker-Nilssen, 2003). Decrease in personal comfort and changing lifestyle quality may entails a strong influence on energy consumption and conservation and may reduce the likeliness of energy conservation behavior (Samuelson & Biek, 1991).

2.3.1 Pro-Environmental Behavior

Pro-Environmental Behavior means that any action undertaken to enhance the quality of environment. Individuals perceive environmental issues as one of the most devastating factor and challenge of the modern era. The attitude-behavior relationship of consumer in regards to pro-environmental behavior is important to study (The Ninh Nguyen, 2016).

Environmental significant behavior may be classified as intent oriented and impact oriented. Intent oriented behavior are those which are performed to benefit the environment and the action and intention of the motivator is undertaken. Impact oriented performance of environmental significant behavior also benefit the environment which is concomitant to impact oriented perspective while there is no concern to motivation of the respondent (Wouter Poortinga, 2004). The word of pro-environmental behavior is used for intent oriented perspective and are inter-related to attitudinal behaviors while impact oriented perspective to household energy is related to demographic variables. Environmental behavior (intent oriented and impact oriented) are named as direct behavior and have consequences on household energy such as consumption and conservation. Indirect behavior of environment deal with political context of environment such as policies regarding environment. Psychologists consider the impacts of direct behavior of environment as most influential for energy use and its conservation and researchers have got its attention. Indirect behavior such as policy support and environmental activism has also large environmental impacts (Stern, Dietz, & Abel, 1999).

Generally consumers with higher level of environmental concern engage in pro-environmental behavior as compared with consumers with lower level of environmental concern. Studies find that holding positive attitude and pro-environmental values results in energy conservation (Kollmuss & Agyeman, 2002). Such consumers pay more for eco-friendly products. Consistent with the notion, many people believe in pro environmental behavior but are unable to limit their household activities and cannot reduce their energy usage (Frederiks, Stenner, & Hobman, 2015). A recent Vietnamese study published suggests that consumer consciousness of environmental problems promote sustainable behavior and are active in conservation behavior (The Ninh Nguyen, 2016).

2.3.2 Moral Obligation

Moral obligation indicates a personal internal state construct which means to what extent an individual feels the sense of personal responsibility, to what extent a person act morally or immorally when facing an ethical situation. Individuals perform the specific behavior because of the social and personal norms in order to do what is right and wrong (Shaw D, 2015). Intrinsic motivations induced consumers to act in a responsible way due to personal norms. Self-expectation

and moral obligation motivates people to act environmental friendly and are engage in conservation behaviors.

Moral obligation is the core competent of value belief norm theory that motivates individual to act responsible and conserve energy for the benefit of environment and reduce their demands (Stern, Dietz, & Abel, 1999). People feel morally obliged to engage in environmentally responsible behavior as demonstrated by several empirical studies. Black & Elworth. (1985) conduct a survey and reveals that energy conserving activities are highly influenced by consumers' sense of obligation to engage in energy curtailment and energy efficiency behavior. Moral obligation is the predominant basis for actions concerning environment friendly behavior and energy conservation by all means such as energy curtailment and energy efficiency as well as recycling (Van der Wreff E, 2015).

We may expect that pro-social, altruistic and motivated consumers are inclined towards energy conservation but actual behavior is linked with other moderating factors, as there lies an intention-action gap (Marechal, 2010; Anker-Nilssen, 2003). Personal norms encourage energy conservation; one who is motivated and feel its responsibility in full accordance with moral obligation may minimize its consumption and can go for sustainable energy (Frederiks, Stenner, & Hobman, 2015; Abrahmse & Steg, 2009).

2.3.3 Pricing

Economic and behavioral cost benefit tradeoffs may influence energy consumption and conservation to select course of action that yields to high benefits for low cost Samuelson & Biek. (1991), i.e., in terms of cost, time, effort, comfort, convenience, etc. Research in behavioral economics shows that people are always vulnerable to cognitive biases and heuristics in their decision making and behavioral choices (Frederiks, Stenner, & Hobman, 2015).

Pricing variation can be used to encourage users to change their behaviors to reduce energy consumption (Breukers, 2013). Many researcher have stressed the importance of price on energy saving behavior. Black & Elworth. (1985) examined the effects of energy prices on conservation actions which involved energy efficiency and curtailment of energy services. Dillman. (1983) clarified that there is statistically significant relationship between energy prices and conservation

measure that individual prefer to adopt. Long. (1993) supported that high rising billings were incentives to the energy saving behavior.

Held. (1983) revealed the fact that household conservation is possible only for wealthy people who can afford energy efficiency measures by examining household in US. Price increasing measure is consider as a non-voluntary conservation of energy. Norwegian households shows variation in energy saving on the basis of income when electricity price increases Ljones A. (1992); low income consumers save energy while high income consumers do not react. More awareness of prices of electricity may encourage users towards energy conservation (Breukers, 2013).

Behavioral economics states endowment-effect of prospect theory and importance to reference point in relation with energy consumption. Individuals are attached to their routines and daily habits and it is difficult to change their behavior, or else high compensation would be demanded which is not there in case of increase or decrease of regular flat pricing (Michael G. Pollitt, 2011). Michael G. Pollitt. (2011) discusses status quo bias of behavioral economics and states that people with default plan of usage of energy stays with same plan even if it is not optimal for them in case of variation in pricing. Reiss P. (2008) discussing the energy crisis of California in 2000-2001 regarding energy conservation. The prices of electricity were doubled in respond to the crisis. The household energy usage fell down to 13% in 60 days. But after the crisis, when prices rolled back down, energy consumption rebound back and the consumption was more than the former level. IEA (2005) states that pricing is the best scenario in reducing the consumption but it is not feasible politically and it does not affect wealthy people but poor class will suffer.

However further research is needed to know about the impacts of pricing under the consideration of mediating factors such as socio-demographic and psycho-demographic factors.

2.3.4 Perceived Consumer Effectiveness

Perceived consumer effectiveness is defined as a belief that each person effort can make a difference in regards to the stated statement. It is related to the self-efficacy and locus of control as well as perceived behavioral control, which have influence on ones' own thought patterns and behavior. This concept leads to the behavior and perception that individuals' effort can make a desirable change to the expected outcome or it does not matter (Ajzen I & Fishbein M, 1997).

Perceived consumer effectiveness is the significant determinant in energy conservation in two dimensions; either in solving the environmental issues as well as to do effort in solving energy crisis. Contradictory results are found in literature to the relationship and association of perceived consumer effectiveness to energy conservation (The Ninh Nguyen, 2016). Generally consumers who believe that their efforts can have significant impact on environment and society are more likely to engage in energy conservation in both dimensions i.e. in energy curtailment behavior as well as in energy efficiency behavior by purchasing eco-friendly products (Kim Y, 2005). No significant result is found between perceived consumer effectiveness and environmental commitment ultimately in energy conservation; neither in any green purchasing behavior nor in curtailing their comfort and lifestyle (Dagher GK, 2014).

Barr, Gilg, & Ford. (2005) examined the level of comfort with people of different characteristics. 60% environmentalists were willing to change their behavior and 20% environmentalist show importance of comfort. On the other hand 25% non-environmentalist show willingness to sacrifice their comfort and more than 60% shows importance of comfort at their homes.

CHAPTER # 03

RESEARCH METHODOLOGY

From the idea of energy conservation behavior to efficient use of energy, several studies and researches are conducted (Abrahmse & Steg, 2009; Frederiks, Stenner, & Hobman, 2015). People engage in energy conservation "dimensionally" and these dimensions may have different predictive profiles, but the variables and behaviors tested as well as the findings are not consistent as reported. Clear conclusion are not drawn from the previous studies. (The Ninh Nguyen, 2016; Beth Karlin, 2014). This limited research study extends on past study and literature in its scope of dimensions and variables tested in an effort to further understand the relationships.

3.1 Research Design

3.1.1 Method

For this study, inductive and deductive approaches both are used. Inductive approach is used and literature review is conducted. Hypotheses are developed from literature review according to deductive approach. Constructs are operationalized using validated items and data is collected and analyzed (The Ninh Nguyen, 2016). Quantitative method is chosen as it is usually associated with deductive approach and investigates the relationship between different proposed variables (Saunders M, 2012). Structured questionnaire is designed to collect data for Research Survey. Such methodology is common in social sciences and behavioral sciences (Cabuk S, 2014). The study itself is exploratory and explanatory, both in nature.

3.1.2 Cross sectional study

Studies can be cross sectional or longitudinal with reference to time skyline. In cross sectional or one shot studies, information is gathered at a solidarity point and afterward investigation is done to discover previous results. While longitudinal study involve information gathering at different times, for example, information is gathered at different time slots from the specimen and collected more than once and are multi shot concentrates. Thus this research is a cross sectional study as suggested by the way of the study and the survey is collected once at a single shot.

3.1.3 Unit of examination

Unit of examination is the real question that is being researched in a study. The unit of examination can be an individual, group, gathering and association or an organization and so on. It I the "what" or "who" that is being concentrated on. It shows the level from whom information accumulation is done and examination is accomplished. For the purpose of this study, the unit of examination for investigation is the people of Islamabad, Pakistan.

3.2 Measures

Items from the existing and validated scales are selected and adopted to operationalize the construct of proposed conceptual model. Existing validated scales are selected for six constructs. A Likert-type scale is used anchored at 1 for strongly disagree and 5 for strongly agree to rate respondents' perception for each item of the four determinants of independent variables and each item of the two constructs for dependent variables. 2 is used for disagree or slightly disagree and 4 for agree or slightly agree while 3 is used for neutral such as neither disagree nor agree (Van der Wreff E, 2015).

This study presents results from analyses of the survey, i.e. energy conservation behavior and its predictors as well as demographic data in the start of the survey questionnaire. The variables examined in this study are described below.

3.2.1 Socio-Demographic variables:

Abrahamse W. (2011) socio-demographic questions are included in the survey questionnaire to determine the characteristics and representativeness of sample and to test the relationships with energy conservation behaviors. Traditional demographic data include age, gender, marital status, education, income, and bill payment. As the study is concerned with energy conservation behavior, two demographic variables such as income and bill payment are used as independent variable and their relationship with dependent variable as energy conservation i.e. energy curtailment and energy efficiency.

3.2.2 Psycho-demographic variables:

A series of questions are included to test for psych-demographic variables identified in previous research as predictive of curtailment and efficiency behavior. Questions are grouped with in four

general categories: i.e. pricing, pro-environmental behavior, perceived consumer effectiveness, and moral obligation.

Each construct is operationalized as follow:

3.2.2.1 Pricing

To measure "pricing" and respondents dependability on pricing, three items are adopted from Beth Karlin. (2014) study. These items are intended to elicit respondents' views on willingness to reduce their consumption of electricity and pay attention towards reducing their electricity bills.

3.2.2.2 Pro-Environmental Behavior

The Ninh Nguyen. (2016) four items are selected for construct of "pro-environmental behavior". These items intend to elicit the respondents' views on willingness to reduce their consumption to protect the environment and anti-pollution approaches. The fifth item of the construct from Beth Karlin. (2014) study indicates the severity of environmental impact on home energy use.

3.2.2.3 Perceived Consumer Effectiveness

"Perceived consumer effectiveness" is operationalized on three items from study of (The Ninh Nguyen, 2016). The selected three items intent to elicit the respondents' perception of their capabilities of conservation of energy and protecting the nature.

3.2.2.4 Moral Obligation

Respondents' "moral obligation" is measured by adopting four items from The Ninh Nguyen. (2016) study. These items intend to elicit respondents' feelings on their obligations towards energy conservation for the sake of solving energy crisis problems and protect the environment in their daily behaviors.

3.2.3 Energy Conservation Behavior

The dependent variable is measured by two constructs such as "energy curtailment" and "energy efficiency" (Beth Karlin, 2014). The two dependent constructs are widely used in previous studies and are well known dimensionally examined.

3.2.3.1 Energy Curtailment

"Energy curtailment" construct is measured by five items. Two items are adopted from The Ninh Nguyen. (2016) which elicit respondents' behavior to conservation of water and electricity by their

usage of water while taking shower and washing dishes etc. Two items are adopted from Beth Karlin. (2014) study which elicit respondents' behavior on the excess usage of electricity in their room lights by turning off the lights when not in use. Shutting down electric appliances when not in use and stand by their laptops and PCs or fully unplugged and totally shut down their appliances.

3.2.3.2 Energy Efficiency

"Energy efficiency" as another construct of the dependent variable is measured by four items. Three items are adopted from Beth Karlin. (2014) study which intends to elicit respondents' views on the purchasing behavior of the new technology and switching to efficient products. Electricity efficient heavy appliances like refrigerators, air conditioning and kitchen accessories are important to respondents and their behavior of switching to new technology to reduce their consumption. Infrequent behavior is examined in the efficiency variable.

3.3 Data collection

3.3.1 Population

The population for this present study are generally energy consumers. Specifically Pakistani energy consumers are considered and those living in Islamabad.

Data is gathered from eligible participants at universities, homes and parks in Islamabad. Survey questionnaire were distributed among students and faculty as well as other members and staff at different universities such as Capital University of Science and Technology (CUST), Comsats Institute of Information Technology (CIIT), Quaid-e-Azam University (QAU). Respondents are randomly selected and they are presented with the informed consent statement and requested to voluntarily complete the questionnaire at site or at their convenience. Respondents were assured that their anonymity and privacy would be respected and their data would be kept confidential. They were also assure that there is no right or wrong answer as just on about their perception. These procedures assisted in minimizing respondents' evaluation apprehension and social desirability in providing responses (Podsakoff PM, 2003).

An online survey method is used. An online questionnaire was designed in Google Docs and the google doc form is attached with Google Drive. In survey design, multiple screens and a simple layout was used to maximize survey completion. The survey takes approximately maximum 15-20 minutes to be completed and respondents were asked to share with their friends. A thankful

note was given to all the participants at the end of the design. Participants were recruited via several online recruitment tools i.e. Email, Facebook, Google Account, Linked In and other social media accounts. Online sampling is relatively a new method. Internet samples are as diverse as more traditional samples and their response rates and findings are consistent with traditional methods and generalizable across presentation formats (Kaplowitz M. D, 2004).

3.3.2 Sample

It is difficult to gather information from whole populace in an exploration. Consequently information is gathered from the specimen who are the gathering agent components, which demonstrates the attributes of the entire populace. Results can be summed up for entire populace. Choosing sample from population is carefully considered. Most of the authors use an average sample of 290 respondents to analyze the results. Some authors recommend 20 respondents per variable. According to confidence interval formula, with 95% confidence interval, statisticians recommend 384 sample size with 5% error (Dillman D.A., 2002).

Duration of the data collection was two months i.e. September 2016 and October 2016. A total of 421 samples were collected. 97 distributed samples while 324 online samples were collected. Out of these 421 samples, 17 cases were samples were removed as incomplete and incorrect. Hence the final 404 samples are effective with missing data for further analyses.

3.3.3 Sampling technique

For this present study, convenience sampling technique is used; the form of non-probability sampling where no probabilities are attached. So the sampling techniques used is convenience based. This kind of examining method is essentially utilized as part of exploration concentrates in the area of sociology. It permits the specialist particular information gathering on the premise of accessibility of subjects being considered. For this study, the particular method is chosen as because of limited time and thus it is assumed that the data collected from the samples is the representative of the entire population.

3.4 Preliminary Analysis

Analysis is conducted in six phases. First descriptive analysis is conducted to know the profile of different respondents, their mean and standard deviation are calculated. Frequency distribution is examined with all demographic variables.

Secondly, reliability analysis Churchill GA. (1979) for the items scale of all four constructs of independent variables are checked and their cronbach's alpha is examined. If it is less than 0.70, then item detected is deleted for constructs. Reliability analysis for items scale of dependent variables are also checked and the same procedure is applied. Internal consistency of all item scale is checked.

At third step, factor analysis Podsakoff PM, (2003) is conducted after reliability and for the selected item questions, factors are formulated. Their composite variables (outcome variables) are created for further analyses. Factor analysis is conducted on all six constructs for their corresponding items using Oblimin rotation with Kaiser Normalization to identify behaviors grouped together empirically based on all of the survey responses.

Outcome variables are created based on the factor analysis by method of Principal Component Analysis. Fourth, a series of bivariate correlations Arpita K. (2014) are performed on the socio-demographic and psycho-demographic predictor variable to determine which variables may predict different dimensions of energy conservation of energy curtailment and energy efficiency. The analysis is conducted to investigate the linear association between energy conservation and its socio-demographic and psycho-demographic determinants.

At fifth step, regression analysis is conducted to identify which variables are predictive of the identified dimensions. Multiple regression analysis Allen P. (2012) is conducted to check different model and outfit for demographic variables and psychographic variables. Multiple regression analysis is used to examine the relationships between a single dependent variable and multiple independent variables.

At last, regression analysis for mediation model is checked with mediation effect, and the relationships are considered with mediation effect between independent variables and dependent variables.

3.5 Data analysis tool

IBM SPSS Statistics program (SPSS 17.0) is used to statistically analyze the data.

CHAPTER # 04

ANALYSIS & SURVEY RESULTS

4.1 Descriptive Statistics

Descriptive statistics are statistics that quantitavely describe or summarize features of a collection of information. Descriptive statistics enable us to present the data in a more meaningful way, and helps us in interpreting the results.

Descriptive Statistics

		Age	Gender	Marital Status	Income	Education	Bill Payment
N	Valid	404	404	403	398	404	404
	Missing	0	0	1	6	0	0
Mean		1.69	1.30	1.36	1.74	2.93	1.67
Median		2.00	1.00	1.00	2.00	3.00	2.00
Mode		2	1	1	1	3	2
Std. Deviation		.581	.460	.481	.805	.814	.471
Variance		.337	.211	.231	.648	.662	.221
Skewness		.164	.866	.586	.514	-.034	-.730
Std. Error of Skewness		.121	.121	.122	.122	.121	.121
Kurtosis		-.602	-1.257	-1.664	-1.273	-1.124	-1.475
Std. Error of Kurtosis		.242	.242	.243	.244	.242	.242
Range		2	1	1	2	3	1
Minimum		1	1	1	1	1	1
Maximum		3	2	2	3	4	2

Table 4. 1 Descriptive Statistics

Table 4.1 depicts mean, median and standard deviation of data. Parameters values are shown for all demographic variable as well as diversity is shown for all targeted groups. Acceptable range for normal distribution, according to skewness is -1 to +1, and for kurtosis is -3 to +3. Skewness and Kurtosis ranges are given for all targeted variables and diversity in data is shown. Data is normally distributed.

4.1.1 Characteristics of sample

Characteristics of sample for the survey respondents' is important to be discussed. It shows the summary of the collection of information. The diversity of respondents' profile for 404 sample is discussed with reference of socio-demographic variables such as gender, age, and marital status, education, income and bill payment.

Frequency distribution tables are given for each socio-demographic variable separately, which are as follow:

4.1.1.1 Gender:

The first demographic factor used for the study is gender and under given table discussed the sample with reference to gender. As gender is dichotomous variable whose values are either male or female?

Table 4.2 represents the demographic composition of sample in terms of gender. The table shows that sample is diverse in terms of gender as male and female both are the part of sample. 70 percent of respondents are male while 30 percent of respondents are female. Male respondents are double of female as male are easily approachable.

4.1.1.2 Age:

The second demographic factor used for the study is age and under given table discussed the sample with reference to age. For age variable, respondents are categorized in three categories i.e. 15-25, 26-40, and respondents who are 41 and above 41.

Table 4.3 depicts the demographic composition of sample in terms of age. The table shows that sample is diverse in terms of age. 37 percent of respondents are aged in between 15 and 25 years. 57 percent respondents lies between 26 and 40 as sample was mostly dependent on mature respondents, so this age category was highly preferable. 6 percent of respondents lies in the category of 41 and above, as it was difficult to collect responses from them due to limitation of their time.

4.1.1.3 Marital status:

The third demographic factor used for the study is marital status and under given table discussed the sample with reference to marital status. As marital status is dichotomous variable in nature whose values are either single or married.

Table 4.4 depicts the demographic composition of sample in terms of marital status. The table shows that sample is diverse in terms of marital status. Single as well as married respondents are part of the sample. 64 percent of respondents are single while 36 percent of respondents are married. Single respondents are double of married as the respondents are mostly colleagues and students who are easily approachable.

4.1.1.4 Education:

Data is collected mostly from students and faculty of diverse educational background. The literacy rate in Pakistan is about 55% according to the United Nations, Economics Scientific and Cultural Organization (UNESCO) and Pakistan stands at 160th in total countries of the world.

Table 4.5 depicts the demographic composition of sample in terms of educational background. The table shows that sample is diverse in terms of education. 1.5 percent of respondents are literate and according to this survey literate are those whose education background is below graduation, i.e. illiterate and intermediate. 32.5 percent respondents are graduated as sample was mostly dependent on mature respondents, and the survey was almost online with reference to my personal account among colleagues and friend list, was easily approachable to complete the survey. 38 percent of respondents are masters, and 28 percent respondents are highly educated as the survey done in the campuses of different universities and faculty was involved in survey.

4.1.1.5 Income:

The fifth demographic factor used for the study is income and under given table discussed the sample with reference to income. Income factor is also used as an independent variable which is important in further analysis of the study. According to study, hypothetically energy conservation is dependent on income, so that's why income is also considered as independent variable.

Table 4.6 depicts the demographic composition of sample in terms of income. Respondents' income is categorized in three standards. The table shows that sample is diverse in terms of income. 49 percent of respondents lies below 40 thousand. 28.5 percent respondents lies between 40 and 80 while 22.5 percent of respondents lies in the category of 81 thousand and above.

4.1.1.6 Bill Payment:

The sixth factor used for the study is bill payment and under given table discussed the sample with reference to bill payment. This factor is not considered in previous studies, but according to the

need of this study, this factor is considered as socio-demographic factor for this study. The factor is also used as independent variable for the study. As bill payment is dichotomous variable in nature whose values are either myself or other family member?

Table 4.7 depicts the demographic composition of sample in terms of bill payment. The variable is designed to know the respondent profile in term of their electricity bill payment that either paid by respondents itself or paid by its other family member. The table shows that sample is diverse in terms of bill payment. 33 percent of respondents paid their bills by themselves while 67 percent respondents do not pay their bills by themselves as mostly respondents are not living independently and their electricity bills are paid by their family members mostly as parents.

4.2 Reliability Analysis

Reliability analysis Churchill GA. (1979) for the items of all four constructs of independent variables and two constructs of dependent variables are checked and their cronbach's alpha is examined. If it is less than 0.70, then item detected is deleted for constructs. Also corrected item-to-total correlations are also crossed check and are greater than 0.5. Internal consistency of all the measures of items are checked. All questions are adoptive.

Details of reliability for all constructs are given as follow:

4.2.1 Pricing

The pricing variable contain three items on 5 point Likert scale questionnaire developed by Beth Karlin. (2014) study. These items are intended to elicit respondents' views on willingness to reduce their consumption of electricity and pay attention towards reducing their electricity bills.

Cronbach's (coefficient) alpha of 0.75 with response options ranging from strongly disagree to strongly agree. This value shows internal consistency is strong and acceptable, no need to delete any item.

4.2.2 Pro-Environmental Behavior

The Ninh Nguyen. (2016) four items are selected for construct of "pro-environmental behavior". These items intend to elicit the respondents' views on willingness to reduce their consumption to protect the environment and anti-pollution approaches. The fifth item of the construct from Beth Karlin. (2014) study indicates the severity of environmental impact on home energy use.

Cronbach's (coefficient) alpha of 0.514 on five items scale with response options ranging from strongly disagree to strongly agree. It is not the acceptable range for internal consistency. The second item scale detected is deleted and cronbach's alpha of 0.699 is achieved while 0.705 cronbach's alpha is achieved on standardized items on 4 items scale. This value shows internal consistency is strong and acceptable.

4.2.3 Perceived Consumer Effectiveness

"Perceived consumer effectiveness" is operationalized on three items from study of (The Ninh Nguyen, 2016). The selected three items intent to elicit the respondents' perception on their capabilities of conservation of energy and protecting the natural environment.

Cronbach's (coefficient) alpha of 0.766 with response options ranging from strongly disagree to strongly agree. This value shows internal consistency is strong and acceptable, no need to delete any item.

4.2.4 Moral Obligation

Respondents' "moral obligation" is measured by adopting four items from The Ninh Nguyen. (2016) study. These items intend to elicit respondents' feelings on their obligations towards energy conservation for the sake of solving energy crisis problems and protect the environment in their daily behaviors.

Cronbach's (coefficient) alpha of 0.726 with response options ranging from strongly disagree to strongly agree. This value shows internal consistency is strong and acceptable, no need to delete any item.

4.2.5 Energy Curtailment

"Energy curtailment" construct is measured by five items. Two items are adopted from The Ninh Nguyen. (2016) which elicit respondents' behavior to conservation of water and electricity by their usage of water while taking shower and washing dishes etc. Two items are adopted from Beth Karlin. (2014) study which elicit respondents' behavior on the excess usage of electricity in their room lights by turning off the lights when not in use. Shutting down electric appliances when not in use and stand by their laptops and PCs or fully unplugged and totally shut down their appliances.

Cronbach's (coefficient) alpha of 0.432 on five items scale with response options ranging from strongly disagree to strongly agree. It is not the acceptable range for internal consistency. The fifth item detected is deleted and Cronbach's alpha of 0.781 is achieved while 0.804 cronbach's alpha is achieved on standardized items on 4 items. This value shows internal consistency is strong and acceptable.

4.2.6 Energy Efficiency

"Energy efficiency" as another construct of the dependent variable is measured by four items. Three items scale is adopted from Beth Karlin. (2014) study intends to elicit respondents' views on the purchasing behavior of the new technology and switching to efficient products. Electricity efficient heavy appliances like refrigerators, air conditioning and kitchen accessories are important to respondents and their behavior of switching to new technology to reduce their consumption. Infrequent behavior is examined in the efficiency variable.

Cronbach's (coefficient) alpha of 0.376 with response options ranging from strongly disagree to strongly agree. It is not the acceptable range for internal consistency. The fourth item scale detected is deleted and cronbach's alpha of 0.635 is achieved while 0.690 cronbach's alpha is achieved on standardized items on 3 items scale. This value shows internal consistency is not enough strong but acceptable.

4.2.7 Summary of scale Reliability

Table 4.8 Summary of scale Reliability

S. No	Variable	Reliability Cronbach's alpha
1.	Pricing	0.754
2.	Pro-Environmental Behavior	0.699
3.	Perceived Consumer Effectiveness	0.766
4.	Moral Obligation	0.726
5.	Energy Curtailment	0.781
6.	Energy Efficiency	0.635

Table 4. 2 Summary of scale Reliability

Table 4.8 depicts the scale reliability cronbach's (coefficient) alpha of all six constructs of independent and dependent variables. Reliability cronbach's (coefficient) alpha of pricing is 0.75, pro-environmental behavior is 0.69, perceived consumer effectiveness is 0.76, moral obligation is 0.72, energy curtailment is 0.78 and energy efficiency is 0.63. Cronbach's alpha values ranges from 0.63 to 0.78 for constructs as shown in table 4.8. Also corrected item-to-total correlations are greater than 0.5. Hence it is reasonable to assume that all measures have good and strong internal consistency.

4.3 Factor Analysis

Factor analysis is a data reduction technique used to eliminate redundancy from data. Factor analysis Podsakoff PM. (2003) is conducted after reliability and the selected items scale factors after reliability are formulated. Their composite variables (outcome variables) are created for further analyses. Factor analysis is conducted on all eight constructs for their corresponding items scale. Potential effects of common method bias on the measures used is assessed. Outcome variables are created based on the results of factor analysis.

One component for each construct is extracted with Principal Component Analysis (PCA). The unrotated factor solution explained the variance of each component for item scales. Extraction is based on Eigen values greater than 1. Direct Oblimin rotation with Kaiser Normalization is used to identify behaviors grouped together empirically based on all of the survey responses.

Table 4.9 Component Matrix[a] & Total Variance Explained

Component		Component	Initial Eigenvalues		
		1	Total	% of Variance	Cumulative %
1	Pricing B1	.744	2.030	67.672	67.672
2	Pricing B2	.846	.569	18.954	86.626
3	Pricing B3	.846	.401	13.374	100.000

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Table 4. 3 Factor Analysis for Pricing

For pricing, the three items checked in reliability analysis are taken. Table 4.9 depicts; the component extracted are .744, .846 and .846. Eigen value greater than 1 i.e. 2.030 explained total variance of 67.67%. The variable is saved in data sheet for further analysis of correlation and regression.

Table 4.10 Component Matrix[a] & Total Variance Explained					
Component		Component	Initial Eigenvalues		
		1	Total	% of Variance	Cumulative %
1	Pro-Environmental Behavior A1	.773	2.130	53.254	53.254
2	Pro-Environmental Behavior A3	.668	.786	19.641	72.896
3	Pro-Environmental Behavior A4	.796	.629	15.723	88.619
4	Pro-Environmental Behavior A5	.673	.455	11.381	100.000
Extraction Method: Principal Component Analysis. a. 1 components extracted.					

Table 4. 4 Factor Analysis for Pro Environmental Behavior

For pro-environmental behavior, the four items checked in reliability analysis are taken. Table 4.10 depicts; the component extracted are .773, .668, .796 and .673. The only Eigen value greater than 1 i.e. 2.130 explained total variance of 53.25%. The variable is saved in data sheet for further analysis of correlation and regression.

Table 4.11 Component Matrix[a] & Total Variance Explained					
Component		Component	Initial Eigenvalues		
		1	Total	% of Variance	Cumulative %
1	Perceived Consumer Effectiveness C1	.759	2.055	68.492	68.492
2	Perceived Consumer Effectiveness C2	.872	.594	19.808	88.300
3	Perceived Consumer Effectiveness C3	.848	.351	11.700	100.000
Extraction Method: Principal Component Analysis. a. 1 components extracted.					

Table 4. 5 Factor Analysis for Perceived Consumer Effectiveness

For perceived consumer effectiveness, the three items checked in reliability analysis are taken. Table 4.11 depicts; the component extracted are .759, .872, and .848. The only Eigen value greater than 1 i.e. 2.055 explained total variance of 68.4%. The variable is saved in data sheet for further analysis of correlation and regression.

Table 4.12 Component Matrix[a] & Total Variance Explained					
Component		Component	Initial Eigenvalues		
		1	Total	% of Variance	Cumulative %
1	Moral Obligation D1	.772	2.222	55.541	55.541
2	Moral Obligation D2	.796	.790	19.753	75.295

3	Moral Obligation D3	.786	.535	13.371	88.666
4	Moral Obligation D4	.612	.453	11.334	100.000

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Table 4. 6 Factor Analysis for Moral Obligation

For moral obligation, the four items checked in reliability analysis are taken. Table 4.12 depicts; the component extracted are .772, .796, .786 and .612. The only Eigen value greater than 1 i.e. 2.222 explained total variance of 55.5%. The variable is saved in data sheet for further analysis of correlation and regression.

Table 4.13 Component Matrix[a] & Total Variance Explained

Component		Component	Initial Eigenvalues		
		1	Total	% of Variance	Cumulative %
1	Energy Curtailment E1	.831	2.533	63.331	63.331
2	Energy Curtailment E2	.872	.662	16.554	79.885
3	Energy Curtailment E3	.787	.529	13.228	93.113
4	Energy Curtailment E4	.680	.275	6.887	100.000

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Table 4. 7 Factor Analysis for Energy curtailment

For energy curtailment, the four items checked in reliability analysis are taken. Table 4.13 depicts; the component extracted are .831, .872, .787 and .680. The only Eigen value greater than 1 i.e. 2.533 explained total variance of 63.3%. The variable is saved in data sheet for further analysis of correlation and regression.

Table 4.14 Component Matrix[a] & Total Variance Explained

Component		Component	Initial Eigenvalues		
		1	Total	% of Variance	Cumulative %
1	Energy Efficiency F1	.882	1.877	62.556	62.556
2	Energy Efficiency F2	.849	.786	26.187	88.742
3	Energy Efficiency F3	.615	.338	11.258	100.000

Extraction Method: Principal Component Analysis.

a. 1 components extracted.

Table 4. 8 Factor Analysis for Energy Efficiency

For energy efficiency, the three items checked in reliability analysis are taken. Table 4.14 depicts; the component extracted are .882, .849, and .615. The only Eigen value greater than 1 i.e. 1.877 explained total variance of 62.5%. The variable is saved in data sheet for further analysis of correlation and regression.

4.4 Correlation Analysis

Outcome variables are created based on the factor analysis by method of Principal Component Analysis. A series of bivariate correlations Arpita K. (2014) are performed on the socio-demographic and psycho-demographic predictor variable to determine which variables may predict different dimensions of energy conservation of energy curtailment and energy efficiency. The analysis is conducted to investigate the linear association between energy conservation and its demographic and psychographic determinants.

Correlation analysis is the appraisal of relationship between two or more variables. Relationship coefficients range from -1.00 to +1.00. +1.00 indicates positive strong relationship while -1.00 indicates strong negative relationship. On the off chance that there is no relationship between variables, then zero appears. Pearson connection is normally utilized kind of relationship coefficient, which otherwise is called item minute connection or straight relationship.

4.4.1 Bivariate correlation among socio-demographic variables

Table 4.15 Pearson's Correlations

		Energy Curtailment	Energy Efficiency	Age	Gender	Marital Status	Income	Education	Bill Payment
Energy Curtailment	Pearson Correlation	1							
	Sig. (2-tailed)								
Energy Efficiency	Pearson Correlation	.395**	1						
	Sig. (2-tailed)	.000							
Age	Pearson Correlation	.054	-.068	1					

	Sig. (2-tailed)	.278	.175						
Gender	Pearson Correlation	-.002	.040	-.238**	1				
	Sig. (2-tailed)	.974	.421	.000					
Marital Status	Pearson Correlation	.119*	.120*	.475**	-.033	1			
	Sig. (2-tailed)	.017	.016	.000	.514				
Income	Pearson Correlation	-.026	-.069	.336**	-.175**	.456**	1		
	Sig. (2-tailed)	.603	.174	.000	.000	.000			
Education	Pearson Correlation	-.050	-.063	.373**	.071	.261**	.401**	1	
	Sig. (2-tailed)	.312	.206	.000	.152	.000	.000		
Bill Payment	Pearson Correlation	-.104*	.022	-.407**	.220**	-.408**	-.463**	-.328**	1
	Sig. (2-tailed)	.036	.660	.000	.000	.000	.000	.000	
**. Correlation is significant at the 0.01 level (2-tailed).									
*. Correlation is significant at the 0.05 level (2-tailed).									

Table 4. 9 Pearson's correlation for Socio-demographic variables

Table 4.15 Shows correlation between demographic variables, i.e., gender, age, education, marital status, income and bill payment and dependent variables such as energy curtailment and energy efficiency.

Age is negative significantly associated with gender (r= -.238; p< .01) and bill payment (r= -.407; p< .01) while positive significantly associated with marital status (r= .475; p< .01), income (r= .336; p< .01) and education (r= .373; p< .01). Also age is insignificant positively associated with energy curtailment (r= .054) while insignificant negatively associated with energy efficiency (r= -.068).

Gender is negative significantly associated with income (r= -.175; p< .01) while positive significantly associated with bill payment (r= .220; p< .01). Gender is insignificant positively associated with education (r= .071) while insignificant negatively associated with marital status (r= -.033). Also Gender is insignificant negatively associated with energy curtailment (r= -.002) while positively associated with energy efficiency (r= .040).

Marital status is negative significantly associated with bill payment (r= -.408; p< .01) while positive significantly associated with income (r= .456; p< .01) and education (r= .261; p< .01). Also marital status is positive significantly associated with energy curtailment (r= .119; p= 0.17, p< .05) and energy efficiency (r= -.120; p= 0.16, p< .05).

Education is negative significantly associated with bill payment (r= -.328; p< .01) while positive significantly associated with income (r= .401; p< .01). Also education is insignificant negatively associated with energy curtailment (r= -.050) and energy efficiency (r= -.063).

Income is negative significantly associated with bill payment (r= -.463; p< .01). Also income is insignificant negatively associated with energy curtailment (r= -.026) and energy efficiency (r= -.069).

Bill Payment is significantly negative associated with energy curtailment (r= -.104; p= 0.36, p< .05) while insignificantly positive associated with energy efficiency (r= .022).

Energy curtailment is significant positively associated with marital status (r= .119; p= 0.17, p< .05). Energy curtailment is insignificant positively associated with age (r= .054), while insignificant negative associated with gender (r= -.002) and education (r= -.050). Also energy curtailment is insignificantly negative associated with income (r= -.026) and significantly negative associated with bill payment (r= -.104; p= 0.36, p< .05).

Energy efficiency is significant positively associated with marital status (r= .120; p= 0.16, p< .05). Energy efficiency is insignificant positively associated with gender (r= .040), while insignificant negative associated with age (r= -.068) and education (r= -.063). Also energy efficiency is insignificantly negative associated with income (r= -.069) and insignificantly positive associated with bill payment (r= .022).

4.4.2 Bivariate correlation among psycho-demographic variables

Table 4.16 **Pearson's Correlations**

		pro-environmental behavior	pricing	perceived consumer effectiveness	moral obligation	energy curtailment	energy efficiency
	Pearson Correlation	1					

pro-environmental behavior	Sig. (2-tailed)						
Pricing	Pearson Correlation	.406**	1				
	Sig. (2-tailed)	.000					
perceived consumer effectiveness	Pearson Correlation	.306**	.361**	1			
	Sig. (2-tailed)	.000	.000				
moral obligation	Pearson Correlation	.326**	.353**	.664**	1		
	Sig. (2-tailed)	.000	.000	.000			
energy curtailment	Pearson Correlation	.207**	.266**	.340**	.298**	1	
	Sig. (2-tailed)	.000	.000	.000	.000		
energy efficiency	Pearson Correlation	.270**	.394**	.344**	.396**	.395**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	
**. Correlation is significant at the 0.01 level (2-tailed).							
*. Correlation is significant at the 0.05 level (2-tailed).							

Table 4. 10 Pearson's correlation for Psycho-demographic variables

Table 4.16 shows correlation between psycho-demographic variables i.e. pricing, pro-environmental behavior, perceived consumer effectiveness and moral obligation and dependent variables such as energy curtailment and energy efficiency.

Pricing is positive significantly associated with pro-environmental behavior (r= .406; p< .01), perceived consumer effectiveness (r= .361; p< .01) and moral obligation (r= .353; p< .01). Also pricing is significant positively associated with energy curtailment (r= .266; p<.01) and energy efficiency (r= .394; p<.01) both.

Pro-environmental behavior is positive significantly associated with perceived consumer effectiveness (r= .306; p< .01) and moral obligation (r= .326; p< .01). Also pro-environmental behavior is significant positively associated with energy curtailment (r= .207; p<.01) and energy efficiency (r= .270; p<.01) both.

Perceived consumer effectiveness is positive significantly associated with moral obligation (r= .664; p< .01). Also perceived consumer effectiveness is significant positively associated with energy curtailment (r= .340; p<.01) and energy efficiency (r= .344; p<.01) both.

Moral obligation is significant positively associated with energy curtailment (r= .298; p<.01) and energy efficiency (r= .396; p<.01) both.

Energy curtailment is significantly positive associated with pricing (r= .266; p<.01), perceived consumer effectiveness (r= .207; p<.01) and moral obligation (r= .298; p<.01) as well as energy efficiency also is significantly positive associated with pricing (r= .394; p<.01), perceived consumer effectiveness (r= .270; p<.01) and moral obligation (r= .396; p<.01).

Table 4.17 Summary of Pearson's Correlations

	Energy Curtailment	Energy Efficiency
Gender	-.002	.040
Age	.054	-.068
Marital Status	.119*	.120*
Education	-.050	-.063
Income	-.026	-.069
Bill Payment	-.104*	.022
Pricing	.266**	.394**
Pro-Environmental Behavior	.207**	.270**
Perceived Consumer Effectiveness	.340**	.344**
Moral Obligation	.298**	.396**

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

*. Correlation is significant at the 0.05 level (2-tailed).

Table 4. 11 Summary of Pearson's Bivariate Correlations

4.5 Regression Analysis

Linear regression analysis is conducted to identify which variables are predictive of the identified dimensions. Multiple regression analysis Allen P. (2012) is conducted to check different model and outfit for socio-demographic variables and psycho-demographic variables. Multiple regression

analysis is used to examine the relationships between a single dependent variable and multiple independent variables. Regression analysis is used to identify variation in the unique value of dependent variable when any independent variable is varied while other independent variables are held constant. Multiple Regression allows to determine the overall fit (variance explained) of the model and the relative contribution of each of the predictors to the total variance explained (Lund, n.d.).

Table 4.18 Multiple Regression on Energy Curtailment Behavior

Variable	Model 1		Model 2		Model 3	
	B_a	B_b	B_a	B_b	B_a	B_b
Constant	-.146		.562		.922	
Gender	.035	.016	.040	.018	-.016	-.007
Age	.053	.031	.033	.019	.006	.004
Education	-.122	-.099	-.121	-.098	-.175*	-.141
Marital Status	.271*	.130	.286*	.137	.064	.031
Income			-.141	-.113	-.087	-.070
Bill Payment			-.280*	-.132	-.208	-.097
Pricing					.066	.066
Pro-Environmental Behavior					.075	.076
Perceived Consumer Effectiveness					.210**	.210
Moral Obligation					.131	.131
R	.149		.200		.410	
R^2	.022		.040		.168	
R^2 Change			.019		.128	
F	2.259		2.707		7.616	
Sig	.062		.014		.000	
B_a. Unstandardized Coefficients						
B_a. Standardized Coefficients						

Table 4. 12 Regression model for Energy Curtailment

Table 4.18 depicts a three step regression model is utilized to analyze the dimension of energy curtailment. The predictor variables in the model explained a total variance of 16.8% in energy curtailment. Socio-demographic variables explained 2.2% of variance which is not significant.

Two other demographic variables such as income and bill payment added, and explained a variance of 1.9% which is significant at ($p < .05$). Overall fit of model 2 is $R^2 = .040$ and explains 4% variance in energy curtailment behavior. Additional explanation is provided by psycho-demographic variables which add 13% variance and total variance of 16.8% is explained with statistically significance of ($p < .0005$) so R^2 is .168***. Perceived consumer effectiveness is the most significant predictor. The relative contribution to the overall fit is mostly predicted by perceived consumer effectiveness followed by bill payment, moral obligation and education.

Table 4.19	**Multiple Regression on Energy Efficiency Behavior**					
Variable	Model 1		Model 2		Model 3	
	B_a	B_b	B_a	B_b	B_a	B_b
Constant	.021		.059		.244	
Gender	.041	.019	-.023	-.010	-.106	-.049
Age	-.233*	-.134	-.230*	-.131	-.145	-.083
Education	-.085	-.069	-.044	-.036	-.094	-.075
Marital Status	.420***	.201	.529***	.253	.136	.064
Income			-.154*	-.123	-.072	-.058
Bill Payment			.019	.009	.205	.095
Pricing					.229***	.228
Pro-Environmental Behavior					.087	.087
Perceived Consumer Effectiveness					.076	.075
Moral Obligation					.275***	.273
R	.197		.225		.522	
R^2	.039		.051		.272	
R^2 Change			.012		.221	
F	3.981		3.463		14.015	
Sig	.004		.002		.000	
B_a. Unstandardized Coefficients						
B_a. Standardized Coefficients						

Table 4. 13 Regression model for Energy Efficiency

Table 4.19 depicts a three step regression model utilized to analyze the dimension of energy efficiency behavior. The predictor variables in the model explained a total variance of 27.2% in energy efficiency. Socio-demographic variables explained 3.9% of variance which is significant

at (p< .01). Two other demographic variables such as income and bill payment added, and explained a variance of 1.2% which is significant at (p< .01). Overall fit of model 2 is R^2= .051 and explains 5% variance in energy efficiency behavior. Marital status is the most significant predictor in model 1 and model 2 when other variables are held constant. Additional explanation is provided by psycho-demographic variables which add 22% variance and total variance of 27.2% is explained with statistically significance of (p< .0005) so R^2 is .272***. Moral obligation is the most significant predictor followed by pricing. The relative contribution to the overall fit is mostly predicted by moral obligation followed by pricing, bill payment, age and marital status.

4.6 Regression Analysis with Mediation Model

Mediation is a hypothesized causal chain in which one variable affects a second variable that in turn, affects a third variable. The intervening variable, M mediator which mediates the relationship between predictor and outcome. Baron R. & David A Kenny. (1986) proposed a four step approach in which several regression analysis are conducted and their significance at each step is examined. The significance of X on Y is checked in 1st step. In step 2, significance of X on M and significance of M on Y is checked in step 3. If relationships are insignificant in first three steps, then there is no mediation, if mediation exist then we move to step 4 and check for partial or full mediation. Step 4 suggests that if effect of M remain significant, then we check for significance of X, if X significant, than partial mediation while if X is insignificant then full mediation lies in the relationship. Regression analysis for mediation model is checked with mediation effect, and the relationships are considered with mediation effect between independent variables and dependent variables.

Mediation analysis are carried out to check mediation effect of pricing and to check the full or partial mediation of pricing between income and energy curtailment. In first step of regression, there is no significant relationship (Sig .603) between income and energy curtailment and no mediation exist in the relationship, also there is no significant relationship (Sig .174) between income and energy efficiency and no mediation exist in the relationship.

Mediation analysis are carried out to check mediation effect of pricing and to check the full or partial mediation of pricing between bill payment and energy efficiency. There is no significant relationship (Sig .660) between bill payment and energy efficiency and no mediation exist in the relationship.

Table 4.20 Pricing mediating Bill Payment and Energy Curtailment					
	B	Sig	R	R^2	Dependent variable
Step 1					
Bill Payment	-.222	.036	.104	.011	Energy curtailment
Step 2					
Bill payment	-.518	.000	.244	.059	Pricing
Step 3					
Pricing	.266	.000	.266	.071	Energy curtailment
Step 4					
Pricing	.256	.000	.269	.072	Energy curtailment
Bill Payment	-.089	.398			

Table 4. 14 Pricing mediating Bill Payment and Energy Curtailment

Table 4.20 depicts mediation analysis that is carried out to check mediation effect of pricing and to check the full or partial mediation of pricing between bill payment and energy curtailment. Bill payment is statistically significant associated with energy curtailment and pricing as well as pricing is also significantly associated with energy curtailment. In fourth step, pricing is still significant by controlling bill payment, so mediation is supported and by controlling pricing, bill payment remains insignificant, which stated that full mediation is supported in the relationship.

Table 4.21 Pro-Environmental Behavior mediating Perceived Consumer Effectiveness and Energy Curtailment					
	B	Sig	R	R^2	Dependent variable
Step 1					
Perceived Consumer Effectiveness	.340	.000	.340	.116	Energy curtailment
Step 2					
Perceived Consumer Effectiveness	.306	.000	.306	.094	Pro-Environmental Behavior
Step 3					
Pro-Environmental Behavior	.207	.000	.207	.043	Energy curtailment

Step 4					
Perceived Consumer Effectiveness	.306	.000	.327	.128	Energy curtailment
Pro-Environmental Behavior	.113	.021			

Table 4. 15 Pro-Environmental Behavior mediating Perceived Consumer Effectiveness and Energy Curtailment

Table 4.21 depicts mediation analysis that is carried out to check mediation effect of pro-environmental behavior and to check the full or partial mediation of pro-environmental behavior between perceived consumer effectiveness and energy curtailment. Perceived consumer effectiveness is statistically significant associated with energy curtailment and pro-environmental behavior as well as pro-environmental behavior is also significantly associated with energy curtailment. In fourth step, pro-environmental behavior is still significant by controlling perceived consumer effectiveness, so mediation is supported and by controlling pro-environmental behavior, perceived consumer effectiveness remains significant. As both variables are significant, which stated that partial mediation is supported in the relationship.

Table 4.22 Pro-Environmental Behavior mediating Perceived Consumer Effectiveness and Energy Efficiency					
	B	Sig	R	R^2	Dependent variable
Step 1					
Perceived Consumer Effectiveness	.344	.000	.344	.118	Energy Efficiency
Step 2					
Perceived Consumer Effectiveness	.306	.000	.306	.094	Pro-Environmental Behavior
Step 3					
Pro-Environmental Behavior	.269	.000	.270	.073	Energy Efficiency
Step 4					
Perceived Consumer Effectiveness	.289	.000	.385	.148	Energy Efficiency
Pro-Environmental Behavior	.182	.000			

Table 4. 16 Pro-Environmental Behavior mediating Perceived Consumer Effectiveness and Energy Efficiency

Table 4.22 depicts mediation analysis that is carried out to check mediation effect of pro-environmental behavior and to check the full or partial mediation of pro-environmental behavior between perceived consumer effectiveness and energy efficiency. Perceived consumer effectiveness is statistically significant associated with energy efficiency and pro-environmental behavior as well as pro-environmental behavior is also significantly associated with energy efficiency. In fourth step, pro-environmental behavior is still significant by controlling perceived consumer effectiveness, so mediation is supported and by controlling pro-environmental behavior, perceived consumer effectiveness remains significant. As both variables are significant, which stated that partial mediation is supported in the relationship.

Table 4.23 Pro-Environmental Behavior mediating Moral Obligation and Energy Curtailment

	B	Sig	R	R^2	Dependent variable
Step 1					
Moral Obligation	.298	.000	.298	.089	Energy curtailment
Step 2					
Moral Obligation	.326	.000	.326	.106	Pro-Environmental Behavior
Step 3					
Pro-Environmental Behavior	.207	.000	.207	.043	Energy curtailment
Step 4					
Moral Obligation	.258	.000	.320	.102	Energy curtailment
Pro-Environmental Behavior	.123	.016			

Table 4. 17 Pro-Environmental Behavior mediating Moral Obligation and Energy Curtailment

Table 4.23 depicts mediation analysis that is carried out to check mediation effect of pro-environmental behavior and to check the full or partial mediation of pro-environmental behavior between moral obligation and energy curtailment. Moral obligation is statistically significant associated with energy curtailment and pro-environmental behavior as well as pro-environmental behavior is also significantly associated with energy curtailment. In fourth step, pro-environmental behavior is still significant by controlling moral obligation, so mediation is supported and by

controlling pro-environmental behavior, moral obligation remains significant. As both variables are significant, which stated that partial mediation is supported in the relationship.

Table 4.24 Pro-Environmental Behavior mediating Moral Obligation and Energy Efficiency					
	B	Sig	R	R^2	Dependent variable
Step 1					
Moral Obligation	.399	.000	.396	.157	Energy Efficiency
Step 2					
Moral Obligation	.326	.000	.326	.106	Pro-Environmental Behavior
Step 3					
Pro-Environmental Behavior	.269	.000	.270	.073	Energy Efficiency
Step 4					
Moral Obligation	.351	.000	.420	.176	Energy Efficiency
Pro-Environmental Behavior	.148	.003			

Table 4. 18 Pro-Environmental Behavior mediating Moral Obligation and Energy Efficiency

Table 4.24 depicts mediation analysis that is carried out to check mediation effect of pro-environmental behavior and to check the full or partial mediation of pro-environmental behavior between moral obligation and energy efficiency. Moral obligation is statistically significant associated with energy efficiency and pro-environmental behavior as well as pro-environmental behavior is also significantly associated with energy efficiency. In fourth step, pro-environmental behavior is still significant by controlling moral obligation, so mediation is supported and by controlling pro-environmental behavior, moral obligation remains significant. As both variables are significant, which stated that partial mediation is supported in the relationship.

Table 4.25 Hypotheses and its Results		
Hypotheses	Statements	Results
H_1	Income negatively influence Energy Curtailment.	Accepted

H_2	Income positively influence Energy Efficiency.	Rejected
H_3	Bill Payment negatively & significantly influence Energy Curtailment.	Accepted
H_4	Bill Payment negatively influence Energy Efficiency.	Rejected
H_5	Pricing positively & significantly influence Energy Curtailment.	Accepted
H_6	Pricing positively & significantly influence Energy Efficiency.	Accepted
H_7	Pricing mediate the relationship between Income and Energy Curtailment.	Rejected
H_8	Pricing mediate the relationship between Income and Energy Efficiency.	Rejected
H_9	Pricing mediate the relationship between Bill Payment and Energy Curtailment.	Accepted
H_{10}	Pricing mediate the relationship between Bill Payment and Energy Efficiency.	Rejected
H_{11}	Perceived Consumer Effectiveness positively & significantly influence Energy Curtailment.	Accepted
H_{12}	Perceived Consumer Effectiveness positively & significantly influence Energy Efficiency.	Accepted
H_{13}	Moral Obligation positively & significantly influence Energy Curtailment.	Accepted
H_{14}	Moral Obligation positively & significantly influence Energy Efficiency.	Accepted
H_{15}	Pro-Environmental Behavior positively & significantly influence Energy Curtailment.	Accepted
H_{16}	Pro-Environmental Behavior positively & significantly influence Energy Efficiency.	Accepted
H_{17}	Pro-Environmental Behavior mediate the relationship between Perceived Consumer Effectiveness and Energy Curtailment.	Accepted
H_{18}	Pro-Environmental Behavior mediate the relationship between Perceived Consumer Effectiveness and Energy Efficiency.	Accepted
H_{19}	Pro-Environmental Behavior mediate the relationship between Moral Obligation and Energy Curtailment.	Accepted
H_{20}	Pro-Environmental Behavior mediate the relationship between Moral Obligation and Energy Efficiency.	Accepted

Table 4. 19 Hypotheses and its Results

CHAPTER # 05

DISCUSSION, IMPLICATION & CONCLUSION

5.1 Discussion

This study assesses both theoretical and empirical validity of dimensional approach of energy conservation to understand, predict and promote energy conservation behavior. A review of previous literature support significant results for dimension of energy conservation behavior such as energy curtailment and energy efficiency behaviors (Black & Elworth., 1985; Beth Karlin, 2014). Several authors acknowledge the distinction between energy curtailment and energy efficiency, but not as clearly consistent with socio-demographic and Psycho-demographic variables. The categorization of energy conservation behavior is based on attributes of frequency and cost. The frequent low costly behaviors referred as energy curtailment and infrequent costly behavior such as energy efficiency. Energy curtailment behavior asks to give up comfort and change life style while energy efficiency behaviors demands to spend money in order to get efficient.

Encouraging and accelerating energy conservation behavior, we sought to better understand the determinants of consumers' energy conservation behavior. To assess the impacts of socio-demographic factors and psycho-demographic factors on energy conservation behavior is important. Literature has shown different impacts inducing energy conservation behavior in mostly developed countries, but lack of generalizability to the developing countries and specifically to Pakistan, this study is particularly in this attempt. Specifically to determine the determinants of energy conservation behavior, the impacts of pricing of electricity, consumers' pro-environmental behavior, perceived consumer effectiveness and moral obligation to the energy conservation behavior is observed. As the socio-demographic factors affects the consumer behavior, so the impacts of income, bill payment, age, gender, marital status and education to energy conservation behavior is also studied. Income and bill payment are also checked independently.

Our finding reveals by bivariate correlation, none of the socio-demographic variables significantly influence energy conservation behavior except marital status. Marital status significantly influence both energy curtailment and energy efficiency behaviors. This results of marital status is consistent

with that of Beth Karlin. (2014) of US residents for energy efficiency behavior. Positive relationship exists between income and energy efficiency and negative relationship exists between energy curtailment which is consistent with Beth Karlin. (2014) study as well as same results are shown in (Poortinga W, 2003). Consumers' with high income are engaged in efficiency behavior by investing in efficient technologies and maintaining their high status as well as are educated and aware about energy efficiency measures. Wealthy people do not bother to take measures for curtailment behavior as are not ready to give up the comfort and luxurious life. A negative significant relationship exists between bill payment and energy conservation behavior in curtailment dimension. The consumers who pay their bills by themselves and are aware of their bills and costs of energy are more involved and react in responsible ways to conserve energy, while those who don't pay their bills by themselves do not give any attention to energy conservation behavior. Educated people do not give attention to energy conservation energy as their income level is more than or averagely enough to sustain their needs and demands. Therefore the impacts of education is negative on energy conservation behavior which is also consistent with results of Poortinga W. (2003) while educated consumers are enough aware of environmental problems but that depends upon psychological factors.

Our finding reveals by bivariate correlation, all of the psycho-demographic variables significantly influence energy conservation behavior in both dimensions such as energy curtailment and energy efficiency behavior. A positive significant relationship exists between pricing and energy conservation behavior in both dimensions while the same results were also achieved in Beth Karlin. (2014) study of impact of bill consciousness and financial motivation on energy conservation energy in both dimensions of curtailment and efficiency. In Pakistan, pricing is the main determinant in many aspects of life and people react directly to pricing as most consumers are middle class. A significant and strong positive relationship exists between perceived consumer effectiveness and energy conservation behavior for both dimensions. The same result is also demonstrated in The Ninh Nguyen. (2016) study of Vietnamese context. Pakistani consumers are more optimistic about their perception but lack in practical implication when it comes to real observance. Consumers' moral obligation has also a strong influence on energy conservation behavior and a strong positive significant relationship exists between the variables. The same positive significant results lies in the study in Vietnam (The Ninh Nguyen, 2016). Also in Netherland, the sense of moral responsibility is high in consumers. The results are not consistent

but the relationship consistency is there, because the more and less sense of responsibility is present in different cultures.

Pro-environmental behavior has a strong positive significant relationship with energy curtailment and energy efficiency. The influence of pro-environmental behavior is almost concomitant to behave in energy conservation because of the carbon emissions by fossil fuels energy. Awareness mediate this relationship to know better about the global world environmental issues and global warming. Many studies relates the influence of pro-environmental behavior on energy conservation behavior and promotes the attitude-behavior relationship to this context (Stern, 1992). Conscious and effortful behaviors are as important for energy conservation behavior and it can influence the pro-environmental behavior to be influential on energy conservation.

In this study, socio-demographic variables accounted for 4.0% and 5.1% of total variance in explaining energy curtailment behavior and efficiency behavior respectively. The minimum variance explained by demographic variables, as this study is related to consumer behavior towards energy conservation. Other demographic variables such as home occupancy, dwelling size, home ownership etc. are not included. The variance explained by demographic variable in previous studies is 10% and 26% for curtailment and efficiency respectively (Beth Karlin, 2014). R^2, variance of 28% explained for curtailment and efficiency (Cialdini R.B, 2003). Income and bill payment are the determinant of energy conservation behavior and influence consumer behavior. Both variables explained variance of 1.9% for curtailment behavior and 1.2% for efficiency behavior.

The psychological demographic variables are mostly responsible for variation in energy conservation behavior. Psychological variables account for 13% and 22% of total variance in explaining energy curtailment and energy efficiency behavior respectively. Psychological factors are mostly influential on energy conservation behavior because of the energy conservation is often guided by consumer attitude-behavior (Stern, Dietz, & Abel, 1999). A total variance of 16.8% is explained by social and psycho demographic variables for energy curtailment and 27.2% variance is explained by social and psycho demographic variables for energy efficiency. Perceived consumer effectiveness is the most significant predictor of energy curtailment at ($B=0.218$, $p<.05$) as also shown in The Ninh Nguyen. (2016) study. The second most significant determinant to energy curtailment is bill payment followed by moral obligation and education. Moral obligation

is the first significant determinant of energy efficiency at (B=0.275, p<.001) and followed by pricing and bill payment.

5.2 Practical and Policy Implication

Assessment of determinants of energy conservation behavior with both of its dimensions i.e. energy curtailment and energy efficiency has implications. What kind of strategies should be used for different consumers collectively and individually and when to use such intervening strategies. The findings of perceived consumer effectiveness and moral obligations clearly shows that how people presume energy conservation and environmental issues. People are willing to sacrifice and give up their comforts and want to conserve energy. As the predictor such pro-environmental behavior shows that consumers are willing to conserve energy in order to use the resources efficiently and hinder the global warming. Policy makers should formulate strategies considering perceived consumer effectiveness and moral obligation. Green sustainable energies should be integrated. Awareness about the global warming should flourished at educational levels and in seminars. Awareness campaigns should be promulgated at government and private levels.

People claims of environmental friendly and socially responsible for energy conservation but actually and practically it is difficult to conserve energy, because of never practicing in real. Policy makers should make strategies to give incentives to people for conservation of energy considering not to backlash in the avoidance of intrinsic motivation. As authors have suggested that incentives extort the intrinsic motivations of consumers' sense of responsibility. In this domain, motivation is highly recommended to change consumers' behavior with the effect of their perceived effectiveness with help of media and social media and by repetition of motivation. As people of Pakistan, are enough sensitive and responsible but mostly are unaware of the consequences of high energy consumption, so awareness with different programs is highly recommendable.

Pricing is another influential factor of energy conservation, but again it is not affecting energy conservation in real by observing it clear. Although people are careful towards pricing and are concerned about, consumers are compulsive to pay their high bills either consumers can afford or not but they have to pay. It is recommended for policy makers to formulate strategy for government to obtain pro-consumer strategy. High incentives should be offered on efficient technologies and efficient appliances with tax free and that consumers can afford it to invest in efficient appliances. Utility operators should also critically consider this strategy of normal pricing with providing

efficient technology where people can fix their usage by smart meters and instant feedback. Most of the consumers are unaware of their usage and its cost of energy. The new technology of smart meters and in home displays should be promulgated to consumers at government cost. Regulation of energy with help of media should be organized for consumers.

At last but not at least, promotion of energy conservation through attitude-behavior is important. To cover up the gap of knowledge-action gap and intention-action gap is necessary, which is really a challenge and is highly important. Promotion of energy conservation in terms of their benefits is important with the help of self-efficacy. Serious considerations are required to reduce energy consumption on demand side for the betterment of world with its depleted resources and in order to keep environment clean and green with sustainable development of green energies.

5.3 Limitation and Future Research Direction

This research is done in concordance to MS degree, although, it's a private research with own funding and with limited own self finances. It is not affiliated to any organization or research center with lack of funding. It is totally, the researcher's own effort and utilized his own fund, and in limited time, as time is constraint.

This research is limited to few of the socio-demographic variables as well as few of the psycho-demographic variables. Demographic variables i.e. home dwelling and house ownership, number of rooms can be added. Psychological variables such as self-efficacy, altruistic and biospheric, and egoistic values can be added. The predictors of knowledge-action gap, intention-action gap and attitude-action gap is a broad area which is not undertaken in this research and is also important to known which will broaden the specter of lack of conservation energy despite of all responsible behavior.

This research is only quantitative, while in-depth interviews with experts can broaden the knowledge and research. Other than consumer behavior, qualitative data in spectrum of energy can help in further formulation of strategies and discussion with policy makers can further broaden the research.

The destination of research can limit the generalizability of research as conducted in Pakistan and specifically Islamabad and some of the institutes. This study can be replicated in other cities and

villages as well as the differentiation of urban and rural areas can be included. Limited number of consumers related to middle class or high class also limit this research as no lower class is included.

This study is conducted on individual behavior such as consumer conservation behavior, the collective behavior of societies and inter-related social norms can be studied. Aspects of technology can be studied with respect to number of appliances, type of appliances as they are related to conservation behavior. This study can be replicated to study the behavior of the SMEs, i.e. small medium enterprises, small and large industries. Organizations such as government and private organizations and as well as institutes, schools, colleges and universities behavior and reaction to energy consumption and conservation can be studied.

5.4 Conclusion

This study demonstrate and extend the previous work related to consumers' conservation behavior with its limitations and give directions for further research work as well as recommend policy implication. Findings and results showed the determinants of energy conservation behavior and assessed the most influential determinants and predictors of energy conservation behavior in terms of socio-psycho demographic variables.

Perceived consumer effectiveness and moral obligation are the most desirable behavior for energy conservation. Pro environmental behavior and pricing play a role in energy conservation behavior. Bill payment by self also play a role, as people come conscious towards their energy saving, and be aware to the consequences of carelessness towards energy.

Policy formulation based on green sustainable energy and need for motivation on the basis of moral responsibility for consumers is suggested on the basis of results of significance of pro-environmental behavior and perceived consumer effectiveness. Policy under considering pricing and the strategy for intervention by government and energy utilities should be effective in promoting efficient technology is highly recommendable. Awareness for energy conservation and global warming through media and social media as well as should be promoted in educational institutes.

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Appendix-1

Dear respondent,

I am Nadeem Akhtar, a research scholar at Capital University of Science and Technology. I am collecting data for my research thesis. Title: **"Determinants of Consumers' Energy Conservation Behavior".** It will take your 10-15 minutes to respond to survey and give valuable information. I assure you that your data will be kept confidential and will be used only for academic purpose.

Thanks a lot for your help and support.

Sincerely,

Nadeem Akhtar

Research scholar

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Age	☐ 15-25	☐ 26-40	☐ 41 and above
Gender	☐ male	☐ female	
Marital Status	☐ single	☐ married	
Income	☐ below 40k	☐ 41k-80k	☐ 81k and above
Education	☐ literate	☐ graduation	☐ masters
	☐ Higher education		

My electricity bill is always paid by myself or by my other family member?

Bill payer ☐ myself ☐ other family member

Please indicate the extent to which you agree or disagree with the following statements:

SD. Strongly disagree **D.** Disagree or slightly disagree **N.** Neither agree nor disagree or neutral

A. Slightly agree **SA.** Strongly agree

A	**Pro-Environmental Behavior**	SD	D	N	A	SA
1.	I am concerned about the natural environment.	**1**	**2**	**3**	**4**	**5**
2.	I am severely abusing the natural environment.	**5**	**4**	**3**	**2**	**1**
3.	Environmental impact affects our home energy use.	**1**	**2**	**3**	**4**	**5**
4.	Major social changes are necessary to protect the natural environment.	**1**	**2**	**3**	**4**	**5**
5.	I am willing to reduce my electricity consumption to help protect the environment and solve energy crisis problem.	**1**	**2**	**3**	**4**	**5**
B	**Pricing**					
1.	I pay close attention to my monthly electricity bill.	**1**	**2**	**3**	**4**	**5**
2.	Cost of electricity bill affects our home energy use.	**1**	**2**	**3**	**4**	**5**
3.	I reduce my electricity consumption to save money on my electricity bill.	**1**	**2**	**3**	**4**	**5**
C	**Perceived Consumer Effectiveness**					
1.	I can protect the environment by conserving (electricity) energy.	**1**	**2**	**3**	**4**	**5**

2.	I feel I can help solve natural resource problems by energy conservation.	**1**	**2**	**3**	**4**	**5**
3.	I feel capable of helping protect the environment and solve energy crisis problems by energy conservation.	**1**	**2**	**3**	**4**	**5**
D	**Moral Obligation**					
1.	I feel personal commitment to conserve energy to protect environment.	**1**	**2**	**3**	**4**	**5**
2.	I feel morally obliged to perform energy (electricity) conservation behavior.	**1**	**2**	**3**	**4**	**5**
3.	I feel obliged to solve energy crisis problems in mind in my daily behavior	**1**	**2**	**3**	**4**	**5**
4.	I would feel guilty if I waste energy.	**1**	**2**	**3**	**4**	**5**

	Conservation patterns	**SD**	**D**	**N**	**A**	**SA**
E	**Energy Curtailment**					
1.	I turn off lights when leaving room.	**1**	**2**	**3**	**4**	**5**
2.	I shut down electric appliances when not in use.	**1**	**2**	**3**	**4**	**5**
3.	I totally shutdown my computer and laptop when not in use.	**1**	**2**	**3**	**4**	**5**
4.	I often conserve water while washing dishes, taking shower, brushing teeth.	**1**	**2**	**3**	**4**	**5**
5.	I often use UPS in load shedding hours.	**5**	**4**	**3**	**2**	**1**
F	**Energy Efficiency**					
1.	I switch to energy efficient light bulbs.	**1**	**2**	**3**	**4**	**5**

2.	I purchase an energy efficient heavy appliances like refrigerators, air-condition etc.	**1**	**2**	**3**	**4**	**5**
3.	I keep my air-conditioning on low thermostat.	**1**	**2**	**3**	**4**	**5**
4.	I often use generator in load shedding hours.	**5**	**4**	**3**	**2**	**1**

https://goo.gl/forms/o1lE0aI0iJ1Q8dr82

Appendix-2

Frequency distribution tables:

Table 4.2		Gender			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	282	69.8	69.8	69.8
	Female	122	30.2	30.2	100.0
	Total	404	100.0	100.0	

Table 4.3		Age			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	15-25	149	36.9	36.9	36.9
	26-40	230	56.9	56.9	93.8
	41 and above	25	6.2	6.2	100.0
	Total	404	100.0	100.0	

Table 4.4		Marital Status			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Single	258	63.9	64.0	64.0
	married	145	35.9	36.0	100.0
	Total	403	99.8	100.0	
Missing	System	1	.2		
Total		404	100.0		

Table 4.5		Education			
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Literate	6	1.5	1.5	1.5
	graduation	131	32.4	32.4	33.9
	Masters	153	37.9	37.9	71.8

	higher education	114	28.2	28.2	100.0
	Total	404	100.0	100.0	

Table 4.6 Income

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	below 40k	195	48.3	49.0	49.0
	40k-80k	113	28.0	28.4	77.4
	81k and above	90	22.3	22.6	100.0
	Total	398	98.5	100.0	
Missing	System	6	1.5		
Total		404	100.0		

Table 4.7 Bill Payment

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Myself	133	32.9	32.9	32.9
	other family member	271	67.1	67.1	100.0
	Total	404	100.0	100.0	