

Socio-Cultural Challenge Regarding to Energy Efficiency Policies in Buildings Sector of Iran

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Abstract

Energy consumption range has been critically increased in the recent decades and prone to energy use decline specifically in buildings known as critical component to dispense carbon mitigation commitments. The deeply clear relationship between the Socio-Cultural Shackles and the pattern of energy efficiency in building industry is manifested according to studies done experimentally. In order to develop a viable program for improving the culture of energy thrift, it is very important to study and resolve the issue of the Socio-Cultural shackles and potentialities. Based on the research of Hellriegel Jackson and Slocum (1999), The community typically resists the improvement of domain attitudes and behaviors. The present paper investigates the Socio-Cultural shackles against the energy efficiency model imparted to building for the first time in Iran, therefore analysis of Socio-Cultural shackles helps us to find out a framework for correcting the attitudes to energy consumption trends in every community. Understanding the social and cultural impediments it would lead us to discover better the available social sources to mark up the energy efficiency dedicated to the building industry. In order to explore the social restraints discussed in the present article, the writer conducted three hundred interviews with consumers, architects, lawmakers and constructors. These interviews are based on the primitive literature of the social psychology in light of available issues encompass the energy efficiency commonly applicable in the building industry.

Key words: Socio-Cultural shackles, Energy efficiency, Buildings, Iran

INTRODUCTION

Energy consumption trends experience steps up trends in the recent decades on one hand and manifestation of economic development on the other hand possibly to decrease the price of energy in the countries with fossil fuels such as Iran. This is why it has not been used and saved correctly by Iranian industry owners and private consumers. Following emergence of the energy crisis in the seventy decade, the logical use of energy was leading proposition devised by countries, it means to put aside fossil energy as a major principal resolution and they

decided to pursue the component of energy optimization seriously in one of the major elements of energy consumption that is residential buildings. [1]

Iran is among the countries with possessing of abundant energy resources and after 1913, has always been considered as one of the main oil exporters in the world. Because Iran is located between the two great resources of energy (The Caspian Sea in the north and the Persian Gulf in the south), it plays deeply role in the world. Iran with endowed with almost 10 percent of total oil resources and almost 16 percent of total natural gas resources of the world, it stands third place in the ranking of countries with preserving the largest scale of oil resources, Iran stands second place in the ranking of countries retaining the largest voluminous bulk of natural gas resources in the world. [2]

Iran emerged enrichment with great sources of energy. Its proven oil reserves are 89.7 billion barrels. With reserves to production ratio of 72.7 in 1999, Total refining capacity in 1999, handled by nine refineries estimated more than 1.35 million barrels per day. This potentiality previously concentrated in southwestern part of Iran, but now it is planned to get an even spread throughout the country. Statistics of energy end-use in the different sectors of activities show that residential & commercial have the highest share (38.4%), followed by transport 26.1%, industry (24.7%), agriculture (4.2%) and others (6%). [3]

In Iran, potential energy efficiency and reforming pattern of energy consumption in different parts have been created up to one third or %33 whose income has been estimated annually almost five billion dollars that is equal to the total development budget of Iran. [4] According to the published statistics, energy consumption in Iranian buildings is about 2.5 to 4 times as much as that of other countries. [5] At present, a considerable part of national sources of Iran that the share of building is about %67 to %70 and it is possible to save energy in a building from 10 to 30 percent. [6] At least the 10 percent of total energy used in Iran can be saved through energy efficiency programs applicable in the administrative buildings.

Different factors such as lack of standard buildings, negligence of the 19th national regulations, misusing of effective and Insulator construction materials and equipment for reducing energy wasting in a building and finally the lack of cultural promotion regarding energy thrift, turns most of Iranian buildings the greatest source of energy vantage but lack of versatile technical principles resulted in preventive of energy prodigality. [7]

The major carriers of energy in Iran contain natural gas, gasoline, gas oil, kerosene and liquid gas that are used in different parts of Iran but most of the energy consumption of Iran comes from hydrocarbon, so that 98 percent of primary energy consumption of Iran rooted in those sources. Unfortunately, most of the state subsidies are also paid off for hydrocarbon carriers. Energy issue has not been resolved seriously in Iran and prevented its real value by obvious and secret public subsidies.

In recent years, the importance of energy thrift is truly sensible, hence it has been revealed as an absolute and inevitable obligation. The rate of fuel consumption is ever rising increasingly, so that, it does not correspond to economic growth, it surpasses the medium amount use in other countries. The internal consumption has been so accelerated, thus reckless on devising a mandatory oil source development; Iran could not export it in several previous years. [8]

Energy wasting of building part is generally related to quality of building systems and consuming energy. In Iran, the modern technology has not been applied to provide a strategy to analyze consuming energy, which are used in buildings and thermo systems or devices, which create the greatest part of energy consumption due to very low heating output. Although it has been done to decrease the energy consumption in this part, there is a long distance between the individual consumption in this part and standard individually of the world and it is very necessary to develop utility planning to control the energy consumption in this subpart. Compiling the criteria of energy reference is the technique of consumption control in the final different parts of use. These criteria in the building and residential blocks could be explained in the form of the following three groups. [9]

- Building crusts
- System and facilities of light
- Furniture or equipment

ENERGY EFFICIENCY IN BUILDINGS

Decades after the first energy crisis in 1970s, building energy efficiency have drawn attention for research all over the world. [10] Building components such as Heating, Ventilation and Air-Conditioning (HVAC) system, equipment, lighting and envelope affect building energy consumption. HVAC system is a major consumer of energy in commercial buildings, especially in hotels and retail sector, and thereby, it has drawn attention of building owners to reduce energy bills. [11] Energy Conservation Building Code (ECBC) and advance Energy Efficiency Measures (EEMs) beyond ECBC specifications were implemented such as building envelope, Heating, Ventilation and Air- Conditioning (HVAC) system and lighting system for estimating energy saving potential. [12]

Socio-cultural aspects of energy thrift in buildings

Reducing energy use in buildings is a critical component of meeting carbon mitigation commitments. There are several ways of goal fulfillment; each one emphasizes actions by a different set of stakeholders. Much of the work in this area follows a physical, technical, and economic model of the building blocks of environment. [13] Energy use in buildings has also been considered as a social issues rather than a technological one. [8]

How societies are motivated to use or conserve energy has been a topic addressed sporadically by social scientists for more than a century [9]. From these attitudes, reducing energy use in buildings requires changes in the entire context of society. [14]

Achieving a 'step-change' in energy efficiency behaviors will require enhanced knowledge of behavioral drivers, and translation of this knowledge into successful intervention programs. [15] Other various studies involving the application of energy information with feedback directly tied to people's own behavior have shown that such an action can be quite efficient for lowering residential energy use (Gardner and Stern 1996, Berntsson 2003, Staats and Harland 1995, Widegren-Dafgard 1991). These implications originated in experimental situations or practices, so the more targeted information is, the more efficient it appears. [16]

According to studies, there is a clear relationship between the Socio- Cultural shackles and the pattern of energy efficiency. There are a plenty of instructions referred to energy efficiency including application of rules as an accomplishment of the foreign leverage, the accurate implementation of governmental rules, using the new technologies and energy management in

different parts of consumption. By resorting to applying techniques and engineering facilities it is necessary to reconsider the socio-cultural attitudes to energy consumption, meanwhile the course of correction should be based on the scientific methods and accomplishment of social and psychological purposes as guidelines for logical energy consumption in the building industry.

This article investigates the Socio- Cultural issues referred to energy efficiency for the first time in Iran. The analysis of social and cultural issues helps us to find a framework for correcting the attitude to energy consumption in society. Knowing the social and cultural issues causes the available social sources to be known more extensively for promoting the trends of the energy efficiency in the building industry.

In order to explore the social restraints in this article, the writer has conducted three hundred interviews with consumers, architects, lawmakers and constructors. These interviews are based on the primitive literature of the social psychology corresponding with available issues in energy efficiency of the building industry.

Analysis of Socio-Cultural shackles of energy thrift in buildings

The correct and logical use of energy and its productions depend on the man's behavior. Although the different solutions, including environmental design, applying different rules and enforcing the power have been materialized by the experts and source of external authority, threat or obligation, using the new technology, etc. many experts believe that the encouragement of saving is the best method, so the major duty of social sciences and psychology has been focused on this issue to find a positive and proper ways of decreasing use of energy.

Accordingly energy thrift can be considered as a human temperament and behavior, so any kind of action such as reasonable or unreasonable energy consumption demonstrates various justifications. The consumer may act deliberately or not, however, his or her behavior is the reflection of some factors. Any kind of change, formation and creation can be affected by various factors such as social manners, learning, earlier experiences in family, school, personal differences and finally one's attitude and beliefs.

Formation the thrift behavior of people laid in their conception and notion so any kind of change in invariable behaviors rooted in elementary changes in the viewpoints. According to the results of many American studies on the optimum designed buildings, the successful designs of technology for reducing energy consumption depend strongly on the consumers' views and behaviors.

Therefor the attitudes are the vital indicators of behavior. Should the interaction of people are altered with their utter and changed based on their views; it will be a very attractive strategy to affect attitudes related to energy thrift.

Van Raaij and Verhallen (1983), two experts hold that the relationship between attitudes and behavior of energy thrift can be empowered by the concepts such as:

1- Having the responsibility, 2- Thinking about effective individual participation, 3- The equation of cost-profit, 4- Knowing the related results to acting of energy thrift, including the pollution of environment and lack of sources for the future generations. [17]

But more than that positive attitudes led to saving action, many conditions should be fulfilled which we will try to interpret the definition, relationship, methods and behaviors of changing attitudes in the next chapters.

What is the attitude? The attitude is a central part of individuality. Most people have died due to their attitudes and beliefs.

Being disagreed with animal tests, to be a supporter of human rights and being an ecologist and to be a follower of recycling materials and controlling the population, all are different examples and models of attitudes.

Attitudes have been inferred dramatically incongruent.

The attitude is naturally psychic and nervous element, which is organized by experience and affects the person's reflections more directly and vividly against instituted devoid things or environments.

The attitude is a constant or lasting system, which includes a known element, feeling element and tending to action.

In addition, attitude elements emerged with three features:

- Every attitude contains a distinct essence, event or situation whose objective alluded to saving energy consumption strategy which counted as very useful tool for mitigating the contamination of the environment.
- The attitudes usually can be evaluated directly and knowable in positive or negative moods. (The management of energy consumption is an effective incentive to reduce the contamination of the environment in order to reinforce the viable development).
- Attitudes usually have a considerable durability and stability (it means that one respects the energy thrift as a behavior in all of his or her life aspects).

The social and Cultural shackles in optimization of energy consumption have made a lot of energy ruins known as the greatest source of energy losses in the building industry. The patterns of consumption correcting need to be a well-preserved culture and that is why all people should be abiding by correction of consumption attitudes.

In order to develop a viable program for creating the culture of energy thrift in building industry, the Socio- Cultural shackles and capacities should be studied and identified. These Socio- Cultural shackles lead to construction of buildings devoid of any standards of energy efficiency. Psychological resistance factors encourage wasteful energy consumption and impede alternative energy systems. Psychological factors such as comfort, freedom, control, trust, social status, ritual, and habit deeply shape attitudes toward the consumption of energy. [18] In order to improve these practices, the culture of energy efficiency should be corrected. According to (hellriegel jackson and slocum 1999), people generally resist the change of attitudes and behaviors that such issues can be studied in six different groups.

Optional Attention

People pay attention to issues and cases, which correspond with their understanding about the world. In fact, they are drawn more toward elements and components, which they are fond of them. Usually, the other conflicted information would be forgotten.

Studying this feature depicts the energy thrift as strongly affected by lack of sufficient knowledge and information in society. Reckless over familiarity with the issues of the energy advantages by consumers, producers and lawmakers produce negative economic and technical influence on the programs of energy thrift and cause people not to get in contact with the agents of energy efficiency in their neighboring. Consumers who do not have enough information about the way of saving in building industry, they would choose the old methods imparted with more energy consumption for building.

If expansionists, managers and architects are not careful enough about the new technologies and fail to develop them in their daily life, the techniques of energy thrift will go stray and neglected by community. As a result, lack of knowledge, understanding and information in the community of people, makes the politics of energy development deficiency.

According to the studies emerged by the current article, %64 of people deal with building industry, because the techniques of energy efficiency have not been introduced correctly in their community and the sufficient information has not been propagated so they use the previous and obsolete methods.

Habits

Mostly reflection on the external motives is based on the familiar and repetitive fashions. Habits make the affairs easy and help people do some work that need skill and experience. These habits will play an important role in individual abstentions, of course, it should be noted that people will focus on benefits and harms during the process of habits change.

This feature represents that the energy efficiency in the Iranian building industry has been influenced badly by consumerism and the social and cultural energy thrift counted a serious issue. From social point of view, the consumerism in Iran, which usually revealed acceptable has been completely changed from “an abnormality” to “a social behavior”, therefore the behavior has construed a culture or subculture.

The low price of fuel in Iran is one of the most important factors. According to the geographical distribution of fuel sources, there are the different prices and strategies in optimization of energy thrift in the world. The industrialized and developed countries, which depend on imports of fuel, have tried more to save the fuel sources. The developing countries, which do not have enough fuel, have started to save the fuel programs.

But, among these countries, Iran is the second greatest source of fossil energy, and the second country having the gas sources in the world. These factors make the price of energy carrier decrease and consumerism increase.

The culture of energy efficiency has not grown distinctly over some years, because the real value of fuel is not perceived by consumers and they don't need to use the methods of energy thrift and prepare their buildings with the new technologies of energy efficiency.

More consumerism has increased over the years and any kind of change makes it really hard. Because the studies of current article argues that 52 percent of people addressed to building industry in Iran, due to “consumerism habit”, don’t use the new methods of energy efficiency and they prefer to use the obsolete methods with higher energy consumption.

Attachment

Attachment for a man, who has an emotional connection with some people, can be one of the reasons of resistance about attitude change. Specially, if this attachment is storing enough, it will cause one to have a poor self-confidence and until his or her favorite group hates a typical attitude, he or she will reject it or changes his or her attitude hard. Social networks are influential because:

- They are seen as trustworthy their actions are an experiment for friends and associates who monitor outcomes and act accordingly
- Information imitated from friends and associates is a vivid case study, and
- Friends and associates are likely to share socio-economic status and can take similar cost energy actions.

Social reference groups are most important for middle and upper income households. Programs run by community groups influence low-income groups.

The statistical results represent that 67 percent of people addressed by building industry are absolutely dependent on the opinion of the social groups of source about the energy thrift, so that they agree with this attitude that if their neighbors or fellow workers use the methods of energy thrift, they will also take advantage of these methods otherwise, they are not interested in using ones.

Be afraid of unfamiliarity

People are fond of dealing with the familiar tastes, individuals and phenomena. Facing with unfamiliar issues and cases makes them anxious and as a result, affects their trust and they will resist against the acceptance of the new attitudes.

Most of the times the ordinary people cannot simply recognize the methods of energy efficiency in their buildings. These methods make consumers anxious and cause psychic distresses and decrease in their use. 58 percent of People believe that these methods are complicated and difficult and by using them, they will get anxious and nervous.

Economic Factor

Economic and financial issues are important and very powerful factors for individuals’ resistance against attitude change. The changes, which have possibility to disturb individuals’ rate of income, would have been rejected severely by them, even the cases that probably have this risk would be less noticed. As the paper reiterated in 2nd factor, the cheap fuel makes consumerism habit and consumption of fossil fuels increase and the techniques of energy efficiency has been used decreasingly. While the methods of energy thrift and technologies of energy efficiency have much more interests [4]. Primitive habits cost more than the other past methods institute higher energy consumption and this is the one of the most important issues of energy efficiency in Iran.

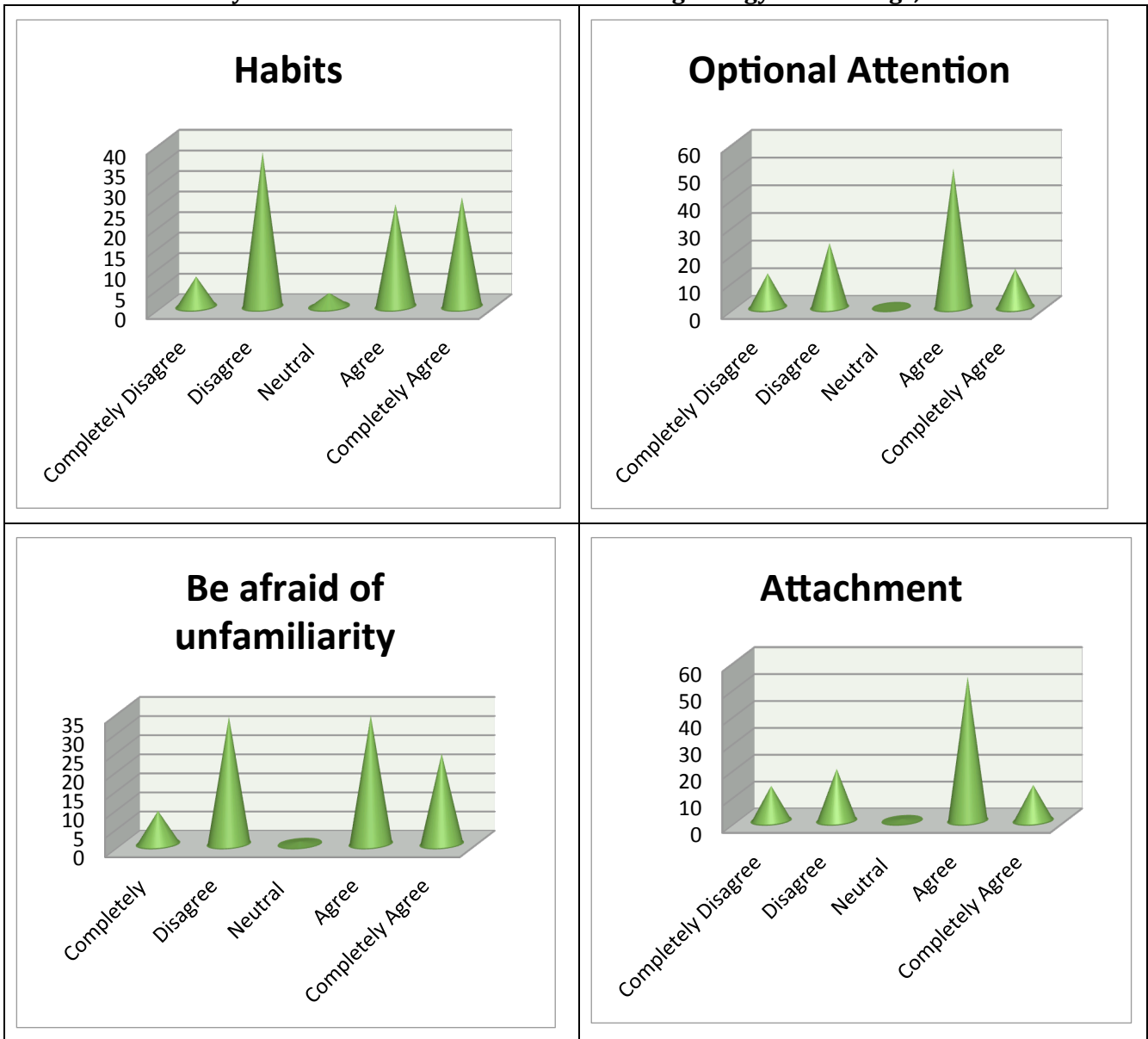
Generally, people tend to have the investments with the cost of the shorter profit instead of having the long-term profit against energy efficiency. Studies show that the 52 percent of people agree with using of these methods, because of the higher primitive cost of equipment, which are not economical or cost-effective.

Regression

People would seek the attitudes that cannot be relinquished. Feeling depression and tension pushes them choosing the situations in which have felt comfort, peace and joy associated with the past. The following chart shows the resistance source against attitude change. Since some of the strategies of energy efficiency are very complicated to be accomplished at the first time, people prefer to use the obsolete methods.

According to this article, 45 percent of people facing with these issues say that they have many deficiencies, which is better to return to previous methods.

Table 1. Analysis of Socio-Cultural barriers of saving energy in buildings, Ref: Authors



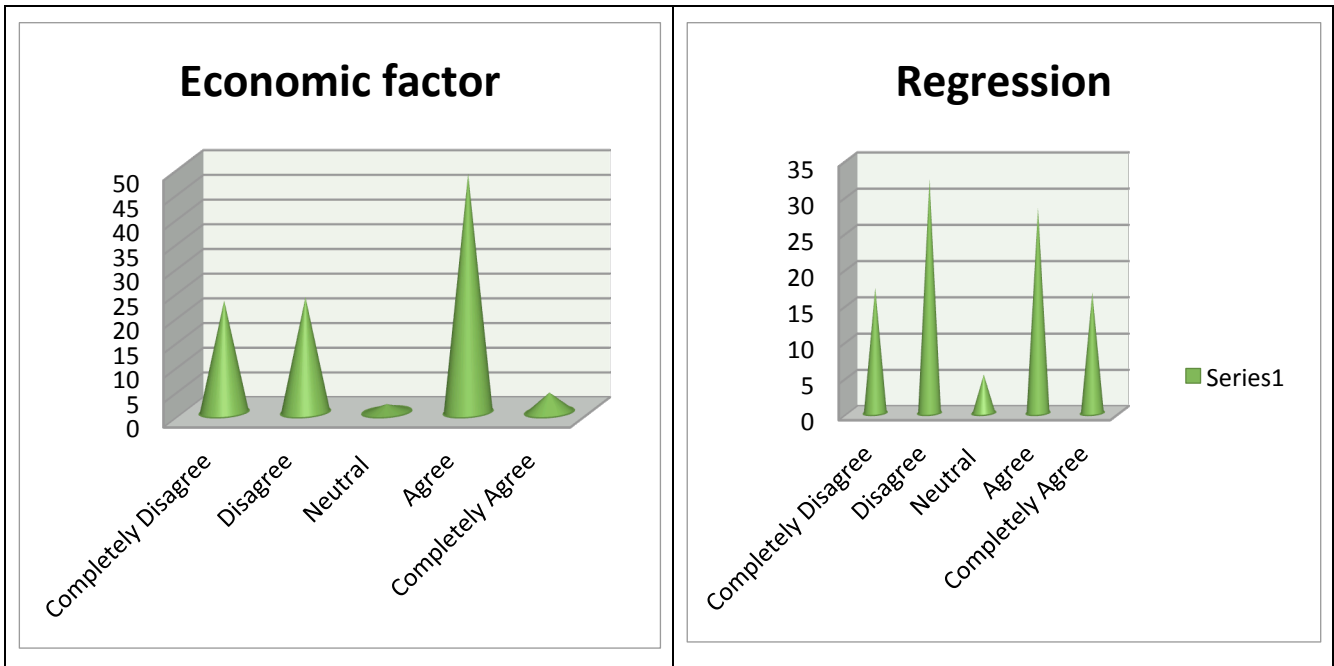
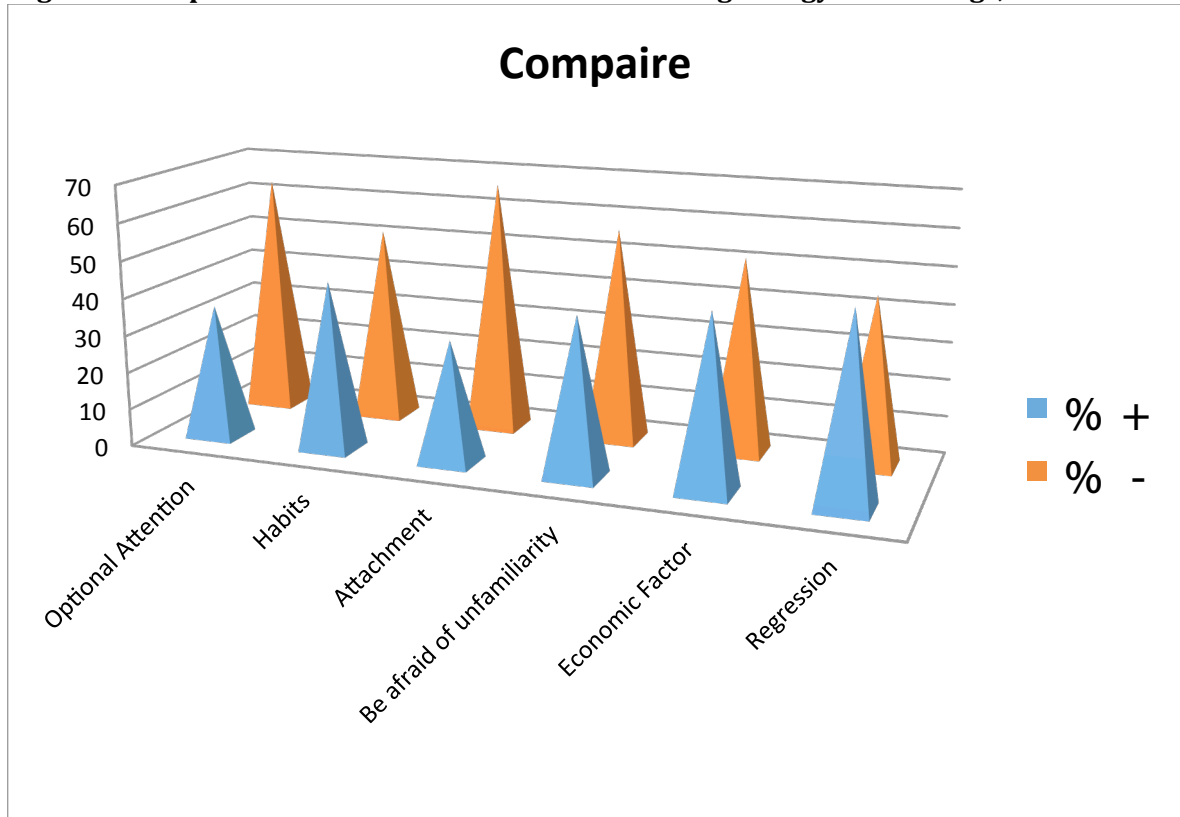


Figure 1 Compare of Socio- Cultural barriers of saving energy in buildings, Ref: Authors



CONCLUSION

According to the outcomes of studies, the energy efficiency is constantly outmoded in Iranian community, since they are irrelevant options for obtaining proper energy strategy consequently community fail to understand how to use them. The analysis of social and cultural issues to undertake energy efficiency would create a framework for improvement of the understanding and awareness of energy consumption. As a result, there are six strategies

for solving these social and cultural issues against the energy efficiency in the building industry.

- Applying the traditional and vernacular methods of energy efficiency; Energy thrift has had a special standing in earlier architectural history of Iran and traditional architecture exploits the methods of energy thrift referred to the harmonious architecture with the territory. For example, Tabatabaei and Borujerdi houses are the buildings, which have much more cultural and social values; hence the strategy of energy efficiency has been used in them perfectly.
- Applying such methods, in this regard to have a close relationship with many people and their past, can be effective for improving energy efficiency, since they are originated in the social and cultural condition and people are fond of using these methods because they are more familiar and adapted with such methods. So, by developing and promoting such methods, we are enable take the main steps toward the energy efficiency in the building industry.
- Applying the informal social networks; Most of the people would speak and consult about the costs and bills of energy tariffs with each other. It is said that applying this method (word-of-mouth) is used for communicating the individual messages to each other. On the other hand, using the religious and social networks can also be effective for improvement of awareness and knowledge toward energy efficiency as a valid and trusted reference cohort.
- Encouraging a public commitment to energy thrift; Commitment strategies can have a long-term effect well and increase “selective attention” to choose energy efficient strategies in their buildings.
- Make energy actions visible to changes habits along the individuals as well.
- Reinforcing a competition trends between groups; Social feedback can bring about more effective affinity if it is emerged competitive impetus. Provide examples of how much energy a consumer or other group is saving compared to an identified competitor in the program.
- Involve the community: Involving members of the community in planning and implementing building energy action can help explain how individuals think about building energy use and the language they use to describe their energy use and they can help decide on the most effective strategies for physical program elements.

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