

# ОТРАСЛЕВЫЕ И МЕЖОТРАСЛЕВЫЕ КОМПЛЕКСЫ

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## ANALYSIS OF CONSUMER BEHAVIOUR IN REGIONAL ENERGY CONSUMPTION <sup>1</sup>

*Consumer behavior is perceived as an investment which does not yield results in the short run. The traditional economic theory of customer preferences is based on four main elements: customer income, the market price of goods, customer preferences, and behavioral assumption about the maximum of achievable benefits. Even though it sometimes might seem that equalizing energy consumption with behavior is not possible, it can often be described as consequences of behavior, such as turning off the lights or thermostat level reduction for saving power. Our paper demonstrates how the psychological concept of consumer behavior effects energy consumption. It provides recommendations about the incorporation of the idea of uncomplicated information availability for consumers taking into consideration their long-term habits. The novelty of this study is that psychological concept of consumer behavior effects energy consumption in each of the region, therefore, it is recommended to incorporate the idea of uncomplicated information availability for consumers taking into consideration long-term habits. The problem analyzed in the article is how consumer behavior influences energy consumption. The aim of the article is to analyze the consumer behavior in energy consumption. The objectives of the study are two-fold: i) to analyze the element of consumer behavior from the theoretical point of view, and ii) to investigate the patterns of energy consumption. The methods of the study are a logical and comparative analysis of literature, graphics, synthesis, and deduction. Our results and findings can be used by the stakeholders and policy-makers in preparing regional development economic policies and in designing the energy consumption strategies in the framework of the regional development.*

**Keywords:** customer behavior, regional development, preferences, behavioural economics, energy consumption, regional economy, energy saving, energy policy, rational information, comparative analysis

### Introduction

Entering the new century has challenged a great scale of people's behaviour and attitudes. But no matter in which field a business company operates, its customers always remain in its focus. A growing body of research literature suggests that non-financial performance measures are leading indicators of financial performance [1]. Consumer behavior should be understood as an investment, which does not produce results in the short run.

The traditional economic theory of customer preference is based on four main elements: customer income, the market price of goods, customer preferences and behavior assumption about the maximum of achievable benefit. When there exists a limited income, the customer chooses the preferred goods by using the method to ensure obtaining the maximum benefit which is also allowed by her limited income [2].

It is important to detail several elements, such as realized customer rationality. The classical users or consumers usually are those who maximizes their benefit from various purchase options. Seeking to get the highest benefit consumer needs

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ities prospective customers undertake in searching, selecting, valuing, assessing, supplying and using of products and services in order to satisfy their needs and desires”.

In this particular case, Hsu, Huang & Swanson [8] demonstrated a conceptual model of interrelationships among grocery store image, travel distance, customer satisfaction, and behavioral intentions (see Figure 1 below).

400 respondents assessed 25 statements with seven points Likert scale and SPSS-AMOS 17.0 was employed to conduct structural equation. It was concluded that total distance has a positive impact on satisfaction and it was also found out that even though store image is an important construct, but it's indirect influence which stems from customer satisfaction to behavioral intention is weigh bigger than the direct effect. This means, that customer values the great variety of elements before making a decision. Therefore, an offer should be rationally based also regarding the green behaviour.

Moreover, Choy, Lam & Lee [9] presented the conceptual model (see picture below) serves as a guide to have an understanding, how essential the relationships among these three objects are and develop long-term strategies.

The provision of the conceptual model contributes for practitioners. It offers a positive relationship between customer satisfaction and service quality and it's both dimensions (technical and functional qualities), also provides the positive impact of customer satisfaction towards behavioral intentions.

Since the model includes the construct of service quality it is worthwhile to elaborate on this notion. For instance, the author Mele [10] states that nowadays there is an obvious shift from “goods dominant” logic to a “service dominant” logic. Additionally, Edvardsson, Ng, Min, Firth and Yi [11] note that “...the value of service is defined by its process in fulfilling a need or desire, and thus customer experiences are evoked. A positive experience with service leaves a lasting impression, even when the process itself has terminated” (p. 544). “Interestingly, Rangarajan, Kennedy & Murti [12] indicate the fact of revealing service quality associations with customer satisfaction, but research are still hardly working to confirm the relationship between these two dimensions.

Chowdhary and Prakash [13] give the established instrument service quality of Parasuraman, Zeithaml & Berry consisting of five dimensions which can help to examine the relative weight that customers can give to each of the factor. So, the determinants are:



**Fig. 2.** Interrelationships among customer satisfaction, service quality and behavioral intentions. Source: Choy, J.,Y., Lam S.Y., Lee, T.,C. [9]

– *Tangibles*. The extent to which physical attributes (e.g. facilities, equipment, personnel, and communication materials) are readily observable by customers. These were alluded to previously in the description of the physical environment.

– *Reliability*. The ability to perform the promised service dependably.

– *Responsiveness*. The willingness to help customers and provide prompt service.

– *Assurance*. The knowledge and courtesy of employees and their ability to convey trust and confidence.

– *Empathy*. The caring, individualized attention provided to customers.

According to Viulet [14], the previously mentioned determinants state that service quality is the most influential element for customer satisfaction and repurchasing process.

But the visualized model of Figure 3 incorporates technical and functional quality. Rahman, Khan & Haque [15] elaborate the functional and technical dimensions by noting that: “Technical quality refers five relevant factors namely employees’ technical ability, employees’ knowledge, technical solutions, computerized systems, and machine quality. On the other hand, functional quality denotes the overall process of the service” (p. 203). While Akhtar [16] adds that functional quality includes: behavior, attitude, accessibility, appearance, customer contact, internal relationship and service-mindedness. The author’s pro-

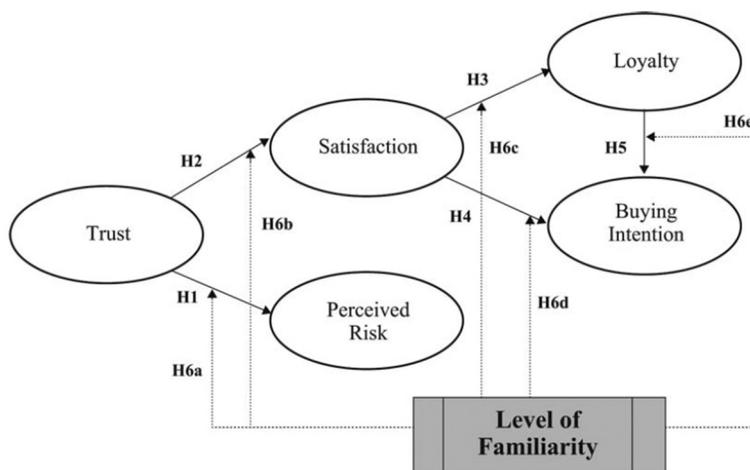


Fig. 3. The research model of PDO products. Source: C. F. Herrera, C. F. Blanco [27]

posed model reveals that in order to achieve customer satisfaction there should be a match between expected service and perceived service.

Moreover, Bolton & Lemon, [17], Ranaweera & Neely [18] state that price perception definitely has a strong impact on the future behavioral intentions. The monitoring of customer satisfaction is also valuable due to its affect on customer behavior which can be seen as a signal to retain clients. Hence, the broader analysis would contribute on proposing not only sophisticated but also applicable models and proposals which would serve as a tool to attract clientele and enhance the overall customer pool. As customer satisfaction could be used for the future behavior prediction [6], so, it should not be considered as a non-durable object, on the contrary, it should be implemented in every single activity due to its wide network of interrelationships with loyalty, word-of-mouth, profitability, market share. And therefore, should be regarded as a tool to obtain a competitive advantage.

What is more, trust is also stated as a significant element in behavioral intentions. A body of various literature has described the concept of trust. But as a result, it has a wide list of different definitions. In addition to this, Ackerman [19] state that: “that the goal in today’s business environment is to create win-win relationships between all players, building long-term trust” (p. 20).

Of course, relationships evolve over time, so does the concept of trust, and interestingly, Haris and Dibben, [20] provide the stages of trust development:

– *Calculus-based trust*. Nooteboom [21] adds that trust could be considered as the rational evaluation of the credibility of the counterpart. According to Lewicki and Bunker [22] in this particular phase: “Trust is based on a calculation – comparing the costs and benefits of creating and

sustaining a relationship versus the costs and benefits of severing it” (p. 3).

– *Knowledge-based trust*. According to Buttle [23] “the parties interactive history” (p. 15). Generally, this type of trust occurs when a person has gathered enough information and is able to forecast other party’s behavior. Moreover, regarding Robbins, Judge, Odendaal, and Roodt [24] mostly organizational relationships are based exactly on this particular stage of trust. It is also stated that the more communication and regular interaction are, the more trust is developed. Moreover, Thompson [25] provides the idea that reputation is also an important element due to the fact that partners operate in the specific community in which they already have built their reputation and are eager to maintain it.

– *Identification-based trust*. It is the highest level of trust. Thompson [25] puts emphasis on mutual trust and points out: “Identification-based trust means that other people have your value system – shared interests, values and reactions to jointly experienced stimuli” (p. 199). Parties can rely on one another and no additional surveillance and monitoring are needed [26; 40]. On the other hand, it is not only mutual trust, but also mutual understanding. Through enhanced identification partners are able to identify the emotional makeup of other people, recognize emotions and moods, and are skillful enough in treating people according to their emotional reactions, so in overall it could be associated with one of the components of emotional intelligent – empathy.

The empirical evidence of trust significance in consumer behaviour could be exemplified by the past research. An interesting research was conducted by Herrera & Blanco [27], who concentrated on the consequences of consumer trust in protected denomination of origin (PDO) food products. The distinguishing feature of this struc-

tural equation model is the fact that trust splits into two branches: satisfaction and perceived risk, and quite the same part of the framework was taken by Johnson, Bardhi and Dunn [28] where trust is the antecedent of satisfaction in the context of self-service technology, meanwhile, the majority of empirical studies propose on the other way around where satisfaction is the antecedent of trust.

Since Herrera & Blanco [27] aimed to measure the impact of familiarity on the associations of perceived risk, trust, satisfaction, loyalty and buying intention, they used a series of statements based on a seven-point Likert scale and the respondents were asked to indicate their level of agreement or disagreement with selected statements. Regarding the structural equation model, it was indicated the relationship among these constructs and further it was noted that the higher the experience with PDO products, the higher the impact trust has on satisfaction.

So, it is obvious that consumer behavior is affected by the wide range of factors. But through nurturing trust, customer satisfaction, improving service quality can result in better interactions and value creation.

### Energy Consumption

It can be stated that equalizing energy consumption with behavior is not possible, on the other hand, it can be described as consequences of behavior, such as turning on the lights or thermostat level reduction [29]. The impact of household

Table

Energy Saving Behavior Types	
Behavior Types	Examples
Productive behavior	Investments with clear nature — Ceiling Insulation — Walls insulation — Double windows installation
The behavior which decreases energy consumption	Recurring operational actions — Turning off the light — Keeping windows closed — Turning off equipment

Source. Abrahamse et. al. (2005). [31]

behaviors is enormous. Households are one of the largest final energy users in the EU, accounting for 26.2 % of total energy consumption in 2001. In 2002, households contributed 10 % of CO<sub>2</sub> emissions in the EU-15. [30]

It is important to mention that authors divide the two types of energy consumption in households, the Table below show the types of energy saving behaviour.

It is worth mentioning that these behavior types may be considered from the economic perspective, as an example can be taken that the consumption behavior can be related to the monetary aspect. Or on the other hand, the energy consumption can be seen as value approach, as an example energy consumption behavior may be influenced by saving the environment that persons are cared about.

According to Geller [32], there is still not clear which behavior type – the productive behav-

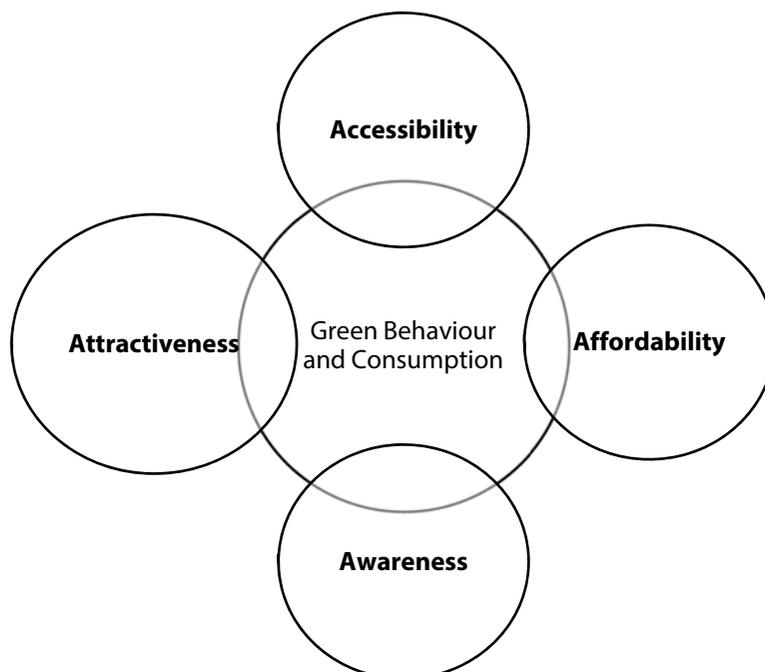


Fig. 4. Four A's which focus on the necessary conditions to improve green consumption and behaviour. Source. The science of Environment policy. Future Brief: Green behaviour, October 2012. [29]

ior or the behavior which decrease energy consumption is more effecting on energy saving. It is also said that behavior that deceases energy consumption creates the conditions for developments of behavior changes in the long term perspective. However, the author Abrahamse et. al. [31] states that productive behavior is more effective when seeking for energy saving and environmental sustainability.

Nevertheless, there is an environmental awareness and concern, mostly this does not translate into a real action — behaviour [33]. Green behaviour is the shared responsibility of individual citizens, public authorities and industry. [34]

There is so called „pro-environmental or green behaviour“, which identifies the behaviour that minimizes harm to the environment as much as possible, or even benefits it. [31; 42] Practical examples could be identified as energy use minimisation and waste reduction. Addressing Cushman-Roisin, [35] idea it means ‘doing good and avoiding bad’.

The Four ‘A’s This approach is rooted in social marketing and identifies the Four A’s which focus on the necessary conditions to improve green consumption and behaviour:

- *Accessibility* — green products and services must be easy accessible, which may also include cancelling products that are damaging to the environment.

- *Affordability* — sustainable consumption must be affordable for everyone, especially low-income households.

- *Attractiveness* — sustainable consumption needs to be translated into clear personal benefits, such as better health and improved quality of life.

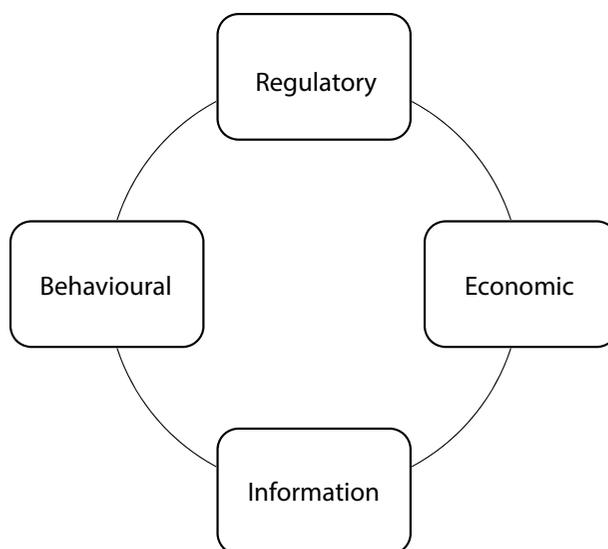
- *Awareness* — sustainable consumption requires a level of environmental knowledge, for example, gained through information brochures and educational handouts.

An approach similar to the Four ‘A’s has been adopted by the international company Unilever in its five levers of behaviour change, which propose that the desired behaviour must be made understood, easy, rewarding, desirable and habitual.

Sonigo et al. [34] have identified four main categories of policy tool that can be used to encourage green behavior.

- *Regulatory* — this takes obligatory tools that prohibit or limit particular products behaviour, and requirements, such as mandatory labelling.

- *Economic* — taxes, incentives, subsidies, penalties or grants for green enterprises, market-based instruments that influence purchasing decisions.



**Fig. 5.** Four main categories of policy tool. Source. *Science of Environment policy. Future Brief: Green behaviour, October 2012.* [29]

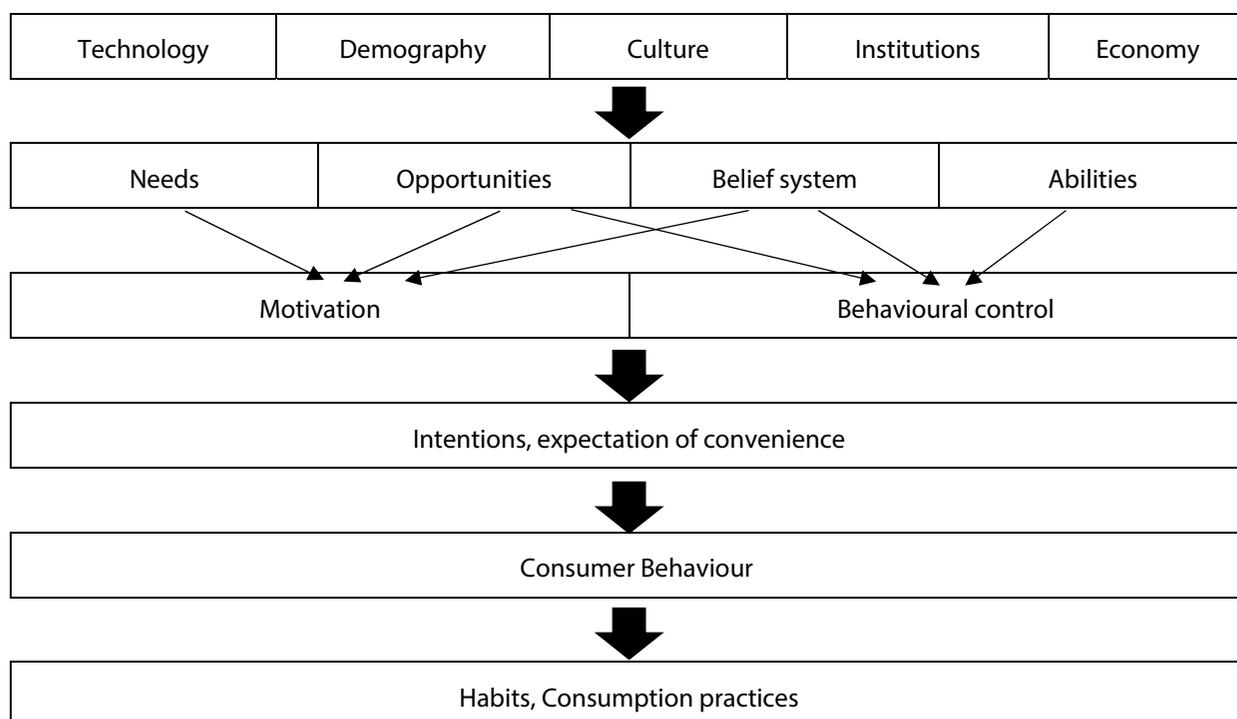
- *Information* — such as product labels and information on energy bills.

- *Behavioural* — tools or nudges aimed at influencing consumer behaviour by leading individuals to make choices that are better for the environment (e. g. pro-environmental alternatives, such as paperless billing)

It does not matter, if the behavior is based on clear nature of investments, or it is recurring operational activities, on both sides the behavior of each individual is affected by social or individual factors. Evaluating from the macro level perspective, development of technologies, economic growth, demographical and institutional factors, development of culture make an influence on our behavior in long run. On the other hand evaluating from the perspective of micro level the factors such as motivation, opportunities and possibilities influence on the behavior in individual level. [31] Also it is worth to mention that the behavior of individuals is affected by habits and some routine procedures which are made automatically, not thinking and spontaneously. Summing up, influencing factors can be grouped into internal (attitudes, norms, and beliefs) and external (institutions, rules, regulations). All in all, a collaboration of two main groups would result in green behavior realization.

### Consumer Behavior and the Use of Energy

According to many sources [36], energy efficiency measures that are implemented in Europe mainly involve technological solutions and interventions, also these measures have to rely on customers or in other words energy consumers by adjusting their energy consumption behavior. This



**Fig. 6.** Factors influencing consumer behaviour. Source. EEA Technical report [36]

section is conducted to synchronize the energy consumption and customer behavior. To identify behavior models are necessary to analyze and understand the actions of consumers including the reasons of making these actions. The model is described in Figure 6.

Figure 6 above offers an explanation of needs, opportunities, belief system and abilities:

- Consumer needs include: Relations, development, comfort, pleasure, work, health, privacy, money, status, safety, nature, freedom, leisure, justice;

- Consumer opportunities include: Availability, advertisement, prices, marketing strategies, social norms;

- Consumer belief system: values;

- Consumer abilities include: Financial, temporal, spatial, cognitive, physical.

The important points to be underlined in the figure above is that various factors that make an influence on human behavior in practice are dynamic. However, the large scale of literature defines energy efficiency measures and behavior change as static factors. Energy saving or efficiency measures and human behavior change over time making consumer behavior the process irrational and in most of the cases unpredictable.

Researchers from social science sphere are working to increase the understanding about individual and social responses on the surroundings. Also, the researches were made to investigate people's influence on the usage of energy in accordance to energy efficiency behavior change

initiatives. As an example can be taken Elizabeth Shove [41] whose research show social norms including cultural and economic factors make an influence on routine consumption. The author states that not only habits change, but also standardization of consumption patterns usually influenced by businesses interests lead to energy consumption. Also „green“ beliefs and actions force society for a more sustainable way of life. Current consumption of energy shows that people are not aware of routines and habits. She states that the concentration of attention should be added not to the particular individual but to the whole community's social norms on resource consumption and the environment.

Also, there is a high correlation between infrastructure and behavior. People choice depend on energy infrastructure, such as heating systems, smart grids and etc., which can be defined as part of person's normal life [38]. However, going deeper into the energy consumption influenced by human behavior the important role is played by using the feedback of energy consumption to optimize it [37; 39].

According to Darby [43], feedback is the main element in effecting learning on energy consumption and saving. This tool makes an influence on the long-term learning process that changes consumers' attitude in energy consumption. The ways of providing energy consumption feedback to the consumer:

- Direct feedback: consumer learns by analyzing and paying, direct consumer influence;

— Indirect feedback: learns by reading and reflecting, influence through provided additional information directly related with consumer;

— Inadvertent feedback: learns by receiving information which is not directly relevant to the consumer;

— Energy audit: surveys that are made or initiated by the consumer to increase the understanding or knowledge about his/her consumption potential.

All in all, energy consumption is influenced by human behavior and energy usage feedback is an important tool to optimize this consumption.

### Conclusions

Overall, it can be concluded that the traditional economic theory of customer preference is based on four main elements: customer income, the market price of goods, customer preferences and behavior assumption about the maximum of achievable benefit.

In order to ensure the rational decision, the availability of information is important, including the costs and the benefits that customer is going to have. Behavior that decreases energy consumption creates the conditions for developments of behavior changes in the long-run perspective. Energy consumption behavior is affected by habits and some routine procedures which are made automatically, not thinking and spontaneously.

Behavior influencing factors are grouped into internal (attitudes, norms, and beliefs) and external (institutions, rules, regulations).

Consumer behaviour can be described as a set of activities prospective customers undertake in searching, selecting, valuing, assessing, supplying and using the products and services in order to satisfy their needs and desires.

Customer satisfaction should be implemented in every single activity due to its wide network of interrelationships with loyalty, word-of-mouth, profitability, market share. And therefore, should be regarded as a tool to obtain a competitive advantage. "Green" consumer behaviour identifies the behaviour that minimizes harm to the environment as much as possible, or even benefits it.

Initiatives are evidence-based to ensure they encourage the desired behaviour and minimise unintended or rebound effects. Evaluating from the macro level perspective, development of technologies, economic growth, demographical and institutional factors, development of culture make an influence on our behavior in long run. Evaluating from the perspective of micro level the factors such as motivation, opportunities, and possibilities influence on the behavior in individual level. It appears that energy consumption is influenced by human behavior and the feedback on the use of energy represents an important tool for optimizing this consumption.

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