IMPACT OF CHANGE MANAGEMENT UPON THE SUSTAINABLE ENERGY CONSUMER'S BEHAVIOUR

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Abstract: In the context of accelerated climate change and depletion of natural resources, the transition to a sustainable economy has become a global priority. Sustainable energy, defined by renewable sources such as solar, wind, hydro and biomass, is the central pillar of this transition. However, the success of implementing sustainable energy depends not only on technology, but also on consumer behaviour and the manner in which consumers accept and adopt the proposed changes. In this sense, change management becomes an essential tool in facilitating this transition. This paper analyses how change management influences consumer behaviour in adopting sustainable energy, identifying the main strategies, barriers and psychosocial incentives that intervene in this process.
Keywords : change, change management, sustainability, environment, sustainable energy.

1. Introduction

The use in excess of resources is unfair to future generations and endangers the balance of the planet. Global climate change has become much more frequent and has devastating consequences through loss of human life, change in relief, or exorbitant material losses.

Environmental protection should make its presence felt, not only theoretically through various regulations, concepts, etc., but especially practically.

The consumer society is currently obliged to capitalize on modern low-carbon technologies (LCT) as smartly as possible, using them to achieve increasingly high sustainable production that satisfies the multiple needs of humanity, but constantly paying attention to reducing pollution and without degrading the environment.

Under the increasing pressures of environmental, social and economic constraints, humanity has begun to understand that if it continues to consume unreasonably, wastefully and ignore the signals of this lifestyle, it will self-destruct. [3].

In such a context, energy has become the key to global development, and the energy sector the command centre of modern society. Sustainable energy sources must increasingly replace sources based on fossil fuels, and the production of solar, wind, hydro, etc. energy is capable of ensuring an increase in the quality of life and limiting pollution, contributing to the formation of a new behaviour of the educated consumer and prepared to live in the smart area. contemporary and future city .

The law of scarcity in economics shows us that human needs are unlimited compared to the resources that are insufficient to satisfy them [5].

Maintaining a balance between human needs and environmental protection is achieved through what we call sustainability [7].

In a broad sense, sustainability is seen as a paradigm for designing the future, in which environmental, social and economic dimensions are in balance, with the aim of improving the quality of life. [2].

Sustainability is also known as the sustainable development of society, which ensures the most appropriate management of existing resources as shown in Figure 1: [15].

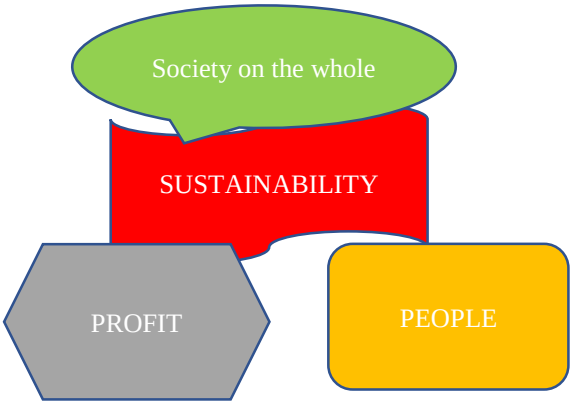

Fig. 1. Sustainability structure, adapted from [15], pg.6.

Based on this structure, the transition from sustainable to renewable is also explained, through which a correct relationship is achieved between people - governance for the correct use of resources between and for each generation with minimizing risks, by implementing appropriate environmental education meant to create a "cradle to cradle" (regenerative) policy.

The application of sustainability in practice is achieved in all areas through the use of sustainable energy, reducing carbon emissions and/or reducing waste, etc. [16].

Sustainability has become a critical priority for societies, economies, and individuals.

Romania, an EU member state, has adheres to the Green Deal, and has to implement the Energy Strategy 2025-2035 with a perspective for 2050 [17].

The progress made so far by Romania in developing sustainable energy is remarkable, but there is still a large share of traditional energy production, for example coal, with over 14% of total energy in 2023.

These advances are also felt by the Romanian consumer, whose purchasing and consumption behaviour has changed in recent years, including towards sustainable energy. It is known that consumer behaviour is influenced by numerous internal and external factors, which can also be partially found in the case of consumer behaviour towards sustainable energy [9].

In this context, change management applied in the field of energy transition generates significant transformations in consumer behaviour, by influencing their attitudes, motivations and perceptions in relation to energy sustainability [14].

Energy consumption is closely linked to psychosocial factors such as attitudes, values, social norms, environmental education and climate risk perception [8]. In order to adopt renewable energy sources, consumers must overcome different types of barriers: cognitive (e.g. distrust of new technologies), financial (high initial investment costs) and social (pressure to conform to current consumption norms).

Studies show that energy consumption decisions are often emotional, influenced by [10]. :

- Trust in authorities and suppliers;
- Level of environmental education;
- Perception of long-term benefits.

A crucial aspect of consumer behaviour is how consumers evaluate the cost-benefit ratio of change. Through communication strategies and properly calibrated incentives, change management fosters a positive perception of the long-term benefits of sustainable consumption [12].

Social preferences or trends manifested in society at a given time have a strong influence. Along with these, information, education, social norms and values influence consumer behaviour towards sustainable energy sources.

Ana Lanero Carrizo points out that while a growing number of consumers are educated and aware of major environmental issues, there is often a gap between their positive attitudes towards sustainability and their actual actions, known as the “attitude-behaviour gap” in sustainability contexts. Lanero Carrizo suggests that education for sustainability and the promotion of responsible consumption can help reduce this gap. [4].

Change management positively influences the level of consumer awareness regarding the impact of conventional energy consumption on the environment and public health. This awareness is an essential element in triggering the motivation to adopt sustainable choices [13].

Along with increasing awareness and involvement, consumers are moving from a passive to an active role in the transition process. Change management supports individual and collective initiatives that promote energy efficiency behaviours, participation in green programs, and support for renewable sources [11].

Change management is often compared to "a road between two worlds" - the present and the future ones - and the change manager is the guide who helps to cross this road. [6].

2. Methodological Aspects

Caraș-Severin county is appreciated by government authorities as being at an early stage but with significant development potential in sustainable energy, and if the deficiencies are overcome, even the EU objectives regarding sustainable energy transition can be achieved, being a central pillar of energy policy.

Conclusive information that can identify the consumption behaviour of Caraș-Severin inhabitants regarding sustainable energy was obtained using a direct qualitative research based on a questionnaire. The questionnaire was applied through the Google Forms platform and included 30 questions of which 25 were content questions and 5 were questions to identify the respondents. The sample studied included 124 respondents, the period of administration of the questionnaire was January 10 - February 10, 2025. Sampling methods were random. The sample structure of 124 respondents included:

- 60.6% male and 39.4% female subjects;
- by age, in first place with 35.4% were respondents from generation Y, 25.3%, generation X, 21.2% generation Z, and in last place, with 18.2%, were those from the baby boomers generation ;
- In terms of education level, respondents with higher and postgraduate education predominated, totalling 48.5%, followed by those with high school education (34.3.7%) and general school (17.2%)
- By area of residence, respondents from urban areas predominated with 68.3%, and 31.7% came from rural areas.
- The majority of respondents (46.5%) have a net income of more than 5,000 lei, 28.3% have a net income between 2574-5000 lei, and 25.3% have a net income below 2574 lei

The direct qualitative research applied to the sample of 124 people aimed to study the following aspects:

Research goal: Identifying consumer behaviour in Caraș-Severin county towards sustainable energy.

Main objective: Measuring the impact of change management towards sustainable energy developed in Caraș-Severin county.

Secondary objectives:

1.what is sustainable energy
2. the benefits of sustainable energy
3. development of products resulting from the use of sustainable energy
4. knowledge of projects (programs) that develop sustainable energy
5. purchase of products that implement (use) sustainable energy
6.digitalization and IT technologies used by sustainable energy
7. perspectives (trends) towards sustainable energy
8. educating the population about sustainable energy
9. pro-consumer attitude towards sustainable energy
10. The attitude of the EU and the Romanian Government towards sustainable energy
11. Involvement of large retailers in the use of sustainable energy

The proposed hypothesis to be tested through qualitative research

H0 was: *the behaviour of consumers in Caraș-Severin County towards sustainable energy is one of acceptance, interest in its use and the effects generated by it.*

3. Research Results

The results obtained from applying the questionnaire to the qualitative research sample of 124 people can be interpreted and analysed as follows:

1. The impact of the energy change in Caraș Severin county is obvious. The phenomenon was also captured by the questions in the questionnaire answered by the respondents, some conclusions in this regard being the following according to the data in the graphs:

a) the respondents participating in the qualitative research know which are the sustainable energy sources produced in Caraș-Severin County as follows:

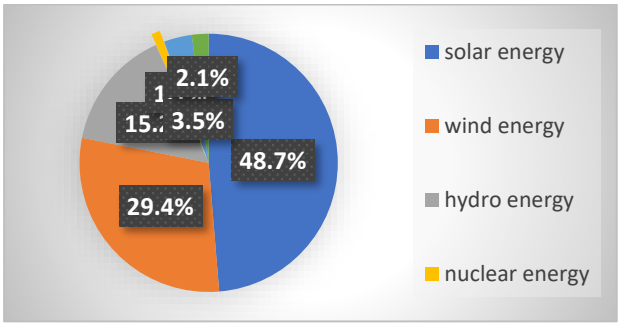

Fig. 2. Sustainable energy sources.

Over 48.7% of respondents correctly chose solar energy as sustainable; 29.4% of respondents chose wind energy as sustainable; 15.2% of respondents chose hydro energy as sustainable and only a small percentage of 1.1% chose nuclear energy as sustainable but which is not produced in Caraș-Severin County.

b) respondents participating in the direct research believe that sustainable energy produced in Caraș-Severin county should be utilized as follows:

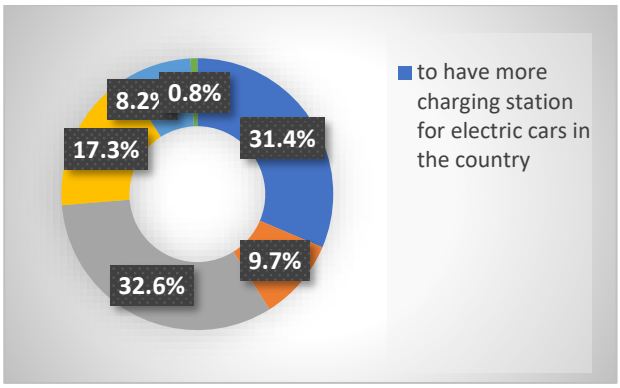

Fig. 3. Ways to valorise sustainable energy.

Over 32.6% of respondents propose that all consumers in the county receive a reduction in energy costs proportional to the amount of sustainable energy produced in the county; 31.4% of them propose that there be more charging stations for electric cars in the county; and a percentage of 8.2% of respondents suggest that this be allocated to the county's economic agents; a small percentage under 0.8% declare that they do not know what utility to give to sustainable energy produced in Caraș-Severin.

2. The use of high technology in the energy sector generates a high degree of reliability and security. The importance of technologies in the development of sustainable sources was also mentioned by respondents participating in the qualitative research as follows:

a) the impact of IT technologies used in optimizing sustainable energy production and consumption was perceived by respondents according to the data in the graph:

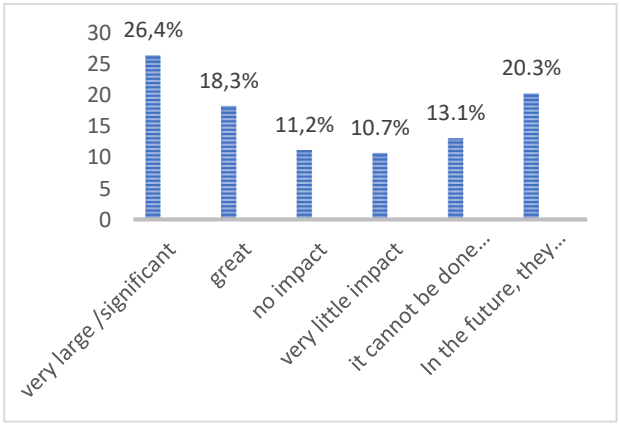

Fig. 4. The impact of IT technologies on sustainable energy.

Over 26.4% of respondents consider the impact of IT technologies in the production and consumption of sustainable energy to be very high/significant; 20.3% of them believe that they will reduce the production costs and then the sales costs of products and services in the future; and 10.7% of them consider a very small impact of IT technologies for optimizing the production and consumption of sustainable energy.

b) the financial support provided by the EU and the Romanian government through specific programs was appreciated by respondents as follows:

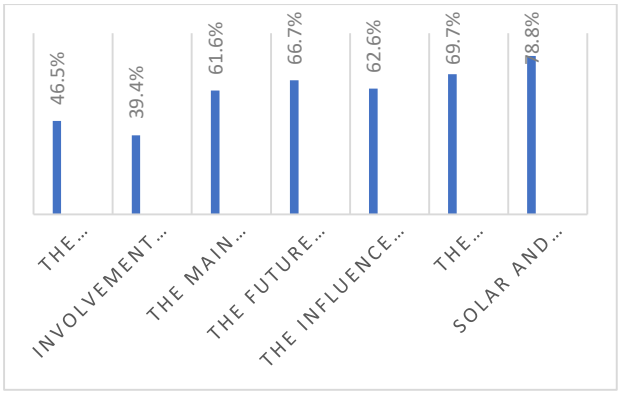

Fig. 5. Financial support.

Over 78.8% of respondents favourably assess that most of the financing for sustainable energy sources is allocated to solar and wind energy; and the fewest, only 39.4% of respondents, appreciate the involvement of the Romanian government in the development of sustainable energy sources. Other assessments made by respondents regarding the financing provided from EU and national sources for sustainable energy were: 69.7% of them appreciate the importance of financing programs; 66.7% of them appreciate the future trends towards sustainable energy; 62.6% of them appreciate the influence of the factors involved in supporting and developing sustainable energy; 61.6% of respondents appreciate that the main objective of the financing programs for sustainable energy is very precise.

3. The use of sustainable energy is becoming increasingly beneficial for the entire world, as it has the ability to integrate innovation into research and thus new opportunities can be identified that will solve the various aspects of the circular economy, effectively improve the ways of reusing resources and pay greater attention to the environment. Pros and cons were also stated by the respondents participating in the qualitative direct research on sustainable energy as follows:

a) The main benefits of sustainable energy identified by respondents were:

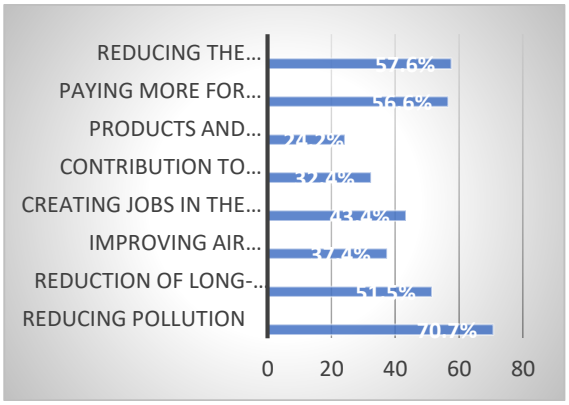

Fig. 6. Benefits of using sustainable energy.

Reducing pollution and living in Caraș-Severin localities in a cleaner air is the main benefit mentioned by over 70.7% of the respondents participating in the research .

Significant percentages of respondents also mentioned other benefits of using sustainable energy, very closely related to reducing pollution, as follows: 57.6% of them mentioned reducing the carbon footprint; 56.6% of them indicated that they would accept to pay a slightly higher price for energy from sustainable sources; 51.1% of them mentioned a beneficial effect by reducing energy costs in the long term; 43.34% believe that jobs can be created in the sustainable energy sector; 32.4% of them point to the contribution made to environmental protection and combating climate change; and 24.2% of respondents believe that products and services can be produced at lower costs.

b) The main drawbacks of sustainable energy identified by respondents were:

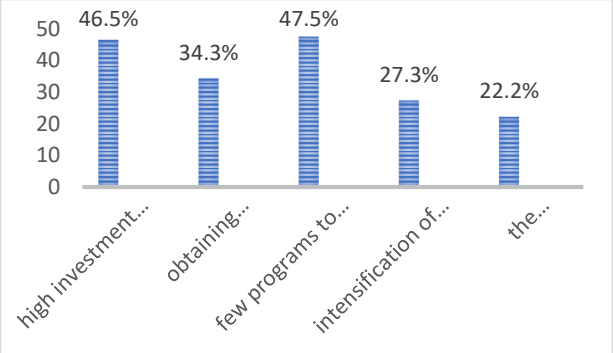

Fig. 7. Drawbacks of using sustainable energy.

For 47.5% of respondents, the main disadvantage of sustainable energy is the existence of a relatively small number of programs supporting the development of products based on sustainable energy; 46.5% of them mention the high costs of investment in the production of sustainable energy; 34.3% of them indicate that products/services can be obtained whose costs are very

high and difficult to access for consumers; 27.3% of them mention the intensification of competition in the energy sector, including unfair competition practices; and 22.2% of them invoke the disappearance of jobs from various traditional sectors of the economy.

4. Respondents participating in the direct research had the following perception regarding the manner in which retailers in Caraș Severin county use sustainable energy.

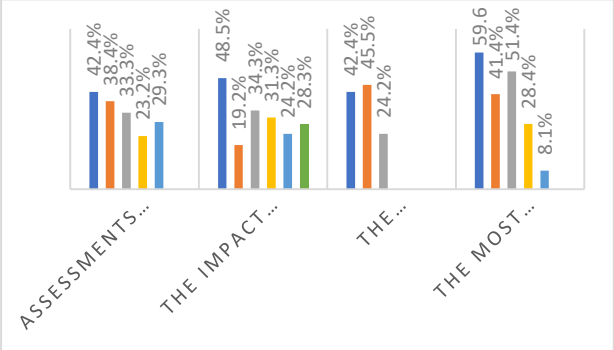

Fig. 8. Ways of using sustainable energy by retailers.

Over 42.4% of respondents believe that retailers in Caraș -Severin county should reduce the prices of certain products if they use sustainable energy to carry out their activities; 38.4% of them mention that they should invest more of their profits in the development of sustainable energy; 33.3% of them believe that they should create as many loyal customers as possible; 29.3% of them request that their customers be informed as much as possible; and 23.2% of them request that retailers that use sustainable energy provide more free services to consumers.

As regards the impact (effects) generated by the use of sustainable energy by large retailers in Caraș-Severin county, respondents indicated as follows: over 48.5% of them the impact should protect the environment more by significantly reducing carbon emissions; for 34.3% of respondents the effect produced should contribute to increasing product costs; for 31.3% of think that the effect would be price reductions that can be applied to the products or services they offer; for 24.2% of them the effect should be a greater involvement of retailers in social responsibility campaigns; and 19.2% of them mentioned that the impact should be towards the safety and improvement of the quality of the products and services they offer to consumers.

As for the percentage of sustainable energy found in the products sold by retailers in Caraș-Severin, respondents made the following assessments: 45.5% of them consider that the products sold by retailers in the county have between 5-15% sustainable energy incorporated in them; for 42.4% of them, the products have less than 5% sustainable energy incorporated; and for 24.2% of them, there is over 15% sustainable energy incorporated in the products sold by retailers in the county.

For 59.6% of respondents, the most important electrical product they use is household appliances ; for 51.4% of them, IT equipment and mobile phones; for 41.4% of them, the car; for 28.4% of them, solar panels; and for 8.1% of them, others.

The data obtained from the direct qualitative research analysed and graphically represented above lead to the acceptance of the hypothesis tested, namely: *consumer behaviour in Caraș-Severin county exhibits acceptability towards sustainable energy, interest in its use and the effects generated by it.*

5. Conclusions

Whatever transformations take place in society globally, they must target consumers. Consumer involvement becomes mandatory in the energy transition proposed by the EUFinancial difficulties and more are causing consumers to be very careful about using sustainable energy sources .Rising energy costs from fossil fuel sources, climate change, and the implementation of modern technologies worldwide are just a few issues whose solution is to accelerate the transition to sustainable energy, a consumer-centred energy transition [20].Based on the theory and practice analysed, it becomes clear that changing the behaviour of sustainable energy consumers is a multidimensional process, involving not only technologies and policies, but also a deep understanding of human psychology. Effective change management must be based on sound theories, culturally adapted and personalized to the socio -economic context. Its integration into national strategies and local initiatives is essential for achieving a sustainable and socially accepted energy transition. Consumer interest in self-generating sustainable energy leads to the creation of an efficient and clean sustainable energy system. Specialists estimate that consumers' shift to sustainable energy can create cost savings of between 40-60% compared to households using energy from fossil fuel sources. Informing, educating, and raising awareness of consumers, as well as facilitating their access to the market for sustainable energy, are essential for implementing an inclusive and economically beneficial sustainable energy system [18].Companies, through the sustainability audit they apply, can become a support of good practices for consumers. More and more companies have invested in sustainable energy sources and some have managed to create products at a high quality level and at prices accessible to consumers [19].

For consumers, the most important advantages obtained from the use of sustainable energy can be: reduced pollution, job creation in areas where there is a sustainable source, including in rural areas, easier maintenance and operating costs, generating benefits for land owners where sustainable energy sources are located; and as disadvantages: intermittent and difficult to predict production, high financial investment for the

commissioning of sustainable energy sources, change of destination of agricultural land especially for photovoltaic panels, possible disruptive effects on the habitat of some bird species, the need to put sources on hold to compensate for power variations, etc. [20].

Romania has embarked on an irreversible process of transition from fossil fuel energy sources to sustainable energy sources, which is important for achieving the objectives set at EU level, for creating a new digital and green economy [21].

Caraș Severin county has remarkable and underexploited potential in sustainable energy sources, and the data resulting from qualitative research show that consumers know the advantages and disadvantages of sustainable energy and are interested in accessing and using it. Change management is an essential tool in the transition to sustainable energy, as it directly influences consumer behaviour and attitudes.

Through well-founded strategies, based on information, participation and reward, resistance to change can be diminished and the adoption of renewable energy sources can be accelerated. In a global context where sustainability is no longer an option, but a necessity, behavioural change supported by effective management becomes the key to success.

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