

Consumer Behaviour when Purchasing Household Appliances from the Aspect of Energy Consumption in the Times of Crisis

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ABSTRACT

The key to success of producers of energy saving household appliances is in respecting the consumers' changed way of thinking and behaviour and their individual needs after the times of crisis and recession. Nowadays, consumers have total control over buying household appliances and a far larger choice. Consumers of household appliances, whose consumption was the driving force before the times of crisis and recession, today, when making a decision about buying household appliances take more factors into consideration, which makes their decision far more complex. From the aspect of household appliances consumers changed values and motives, the key trends are: insisting on simplicity, household appliances producers' social responsibility, ethical business, demand for energy saving products, loyalty etc. With the appearance of energy saving household appliances and appliances that do not pollute the environment the consumers have been questioning their consumer habits and turning towards »the green way of life«. The climate changes on the planet have reached a level when every consumer becomes aware of the importance of utilising less harmful energy sources and household appliances that save energy resources. With a short overview of the times of crisis and recession as well as consumer habits in the times of crisis the aim of this paper is to establish motives and attitudes of household appliances consumers and establish the level of awareness of respondents and their perception of energy saving household appliances and appliances that encourage environmental care.

Key words: crisis, energy saving household appliances, consumer, environmental care, Croatia

Introduction

At the turn of the last century we became aware that the future technical and technological development whose main objective is acquiring material wealth through exploitation and poornatural resources management leads to the development, which as a consequence poses a permanent threat to the environment and would eventually put our very survival under question. The governments worldwide, regardless of the world economic crisis, initiated the introduction of laws and regulations aimed at environment protection by stimulating sustainable production and usage of energy efficient household appliances. The key to success of sustainable development is consumer decisions. It is vital to influence the behaviour of household appliances consumers, raise their awareness about social responsibility regarding environment preservation and protection and electrical energy consumption.

Regardless of the extremely difficult economic situation worldwide, the production of energy efficient household appliances has had an impact on dramatic changes in all areas of life and has lead to serious changes in today's consumer habits, the decision-making process about buying household appliances as well as changes in consumers' lifestyles, how they spend their time (activities), what they consider to be of importance in their environment as well as how they perceive the world around them. According to the research, household appliances account for over a quarter of total electrical energy consumption. The information about the attitude and lifestyle of consumers who buy energy efficient household appliances enables producers better positioning on the household appliances market, not only from the aspect of meeting the needs but also from the aspect of reduced energy consumption. The increase in the market share of

energy efficient appliances can be achieved in several different ways:

- Encouraging the purchase of energy efficient household appliances
- Discouraging the purchase of energy inefficient household appliances
- Fostering research, development, production and marketing of more energy efficient products compared to the existing products on the market¹.

As a result of efficient energy performance the increased demand for energy has been slowed down, which in turn reduces the need for building new energy generation plants that constitute large capital investments and burden the state budget considerably more than the systematic incentive for cost effective measures that encourage the purchase of energy efficient household appliances².

The recession and the consequences of recession on the household appliances market

After years of economic growth in the autumn of 2008 the world was hit by the biggest economic crisis since the Great Depression in the early 1930s. The world economy crisis, the beginning of which is linked to the crisis in the real estate and loan markets in the USA, very quickly affected the household appliances market and spread with various intensity to other parts of the world. At that time, after several successful years, household appliances retailers faced a new business challenge. Consumers, regardless of what product they wanted to buy, stopped making purchases above their means. The first years of the crisis and recession mark the decrease in customer loyalty, reduced consumption on the household appliances market. It was all a consequence of problems on the property market, the unemployment and unfavourable loan conditions, which lead to an automatic postponement of household appliances purchase. In such situations consumers give up on the planned purchase not only of household appliances, but also flats, cars and after that, products of occasional consumption, and they direct spending towards really necessary products³. That is, the fall in prices of residential and business buildings developed as a result of globalisation into the world mortgage crisis. Local building societies found themselves in the red as a result of dramatic fall in the real estate book value. The decrease in property value increased the risk of investments and the consumption of more permanent assets, i.e. resulted in the fall in the demand for household appliances. The decreased consumption of household appliances led to the decreased demand for the import of household appliances. Consequently, in Croatia in the period crisis and recession, the business activity of household appliances import comes to a halt that spreads and turns into stagnation. Stagnation in the retail of household appliances on the Croatian market leads to a minimal demand for household appliances and the postponed purchase decision.

The economy of Croatia is burdened with serious structural problems, the lack of development strategy

and utilisation of existing resources, which in the last few years has had an impact on the development of new products, a very low efficiency when using existing resources and the non-economic valorisation of the contribution the resources have in the making of GDP. So even after the crisis and recession Croatia doesn't have a serious manufacturer of energy efficient household appliances and consequently, the complete supply of household appliances is based on the imports. Therefore, the property market crash has caused a decreased demand for household products consequently causing the fall in the net retail network from 4.0 to 2.7% marking a negative sales revenue in the period of crisis and recession also causing importers of household appliances to suffer revenue losses.

Consumer segmentation based on ecological awareness

The market of household appliances is not a homogeneous market; there are notable differences between consumers of household appliances. The segmentation of energy efficient household appliances market can be performed based on:

- Characteristics of consumers of energy efficient household appliances (geographical, demographical, social-economic, psychographic consumer characteristics)
- The reaction of consumers to energy efficient household appliances (systems of preferences, attitudes, motivation as well as the expected savings brought by energy efficient household appliances)⁴.

The Hartman Group, a Washington based consultancy, has developed a market segmentation model according to consumers' lifestyle named »From the Core to the Periphery« (Figure 1).

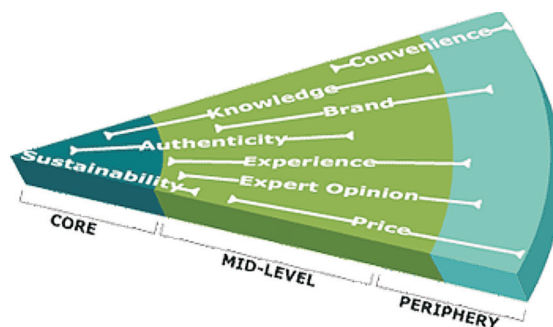


Fig. 1. Consumer segmentation model – The Hartman Group
 Source: Hartman grupe, <http://www.hartman-group.com/approach/world-model>

When making a purchase decision dominating factors for the »Periphery« consumers are the price, brand and convenience while for the consumers closer to the »Core« the main role is the so-called sustainability as a dimension that includes authenticity, knowledge and the influence of expert opinion. The consumers in the core and the mid-level parts of the sphere constitute a large target

group as the manufacturers of household appliances are turning to eco or environment protection marketing in the production and placement of new energy efficient appliances lines, and are abandoning the model of communication oriented towards economic development exclusively. In this way they are raising awareness of social responsibility towards ecological consequences in consumers of household appliances. The effort is to achieve this turnaround through changed attitudes, lifestyle and the perceived way in which socially and environmentally responsible consumers want to satisfy their needs when bringing a decision about purchasing household appliances from the aspect of energy consumption.

Nowadays, manufacturers of household appliances need to increase the offer in order to provide consumers with a choice of sustainable consumption, while taking into consideration and respecting social, demographic, economic, cultural, technological and psychological factors that determine consumer behaviour. From the aspect of energy consumption, consumers need to be additionally informed, educated and influenced through integrated marketing communication as well as through government mechanisms, which impose on present-day consumers the social responsibility of purchasing and using products that are in compliance with environment protection standards. Nowadays, when making a purchase decision, consumers in the developed countries are increasingly demonstrating the willingness to pay a higher price for energy efficient household appliances and ecologically healthy products, regardless of the crisis and recession. The main creators of sustainable development atmosphere in consumers are: the government, local authorities, natural and legal persons, NGOs, citizens' associations as well as consumers themselves.

Production costs of energy efficient household appliances based on the principle of sustainable production are considerably higher than the production costs of the same or similar household appliances produced using non-sustainable methods. Therefore, through various incentive measures, the governments are trying to encourage the development of consumer awareness towards this type of energy efficient products. The comprehension of the importance of using energy efficient products and personal attitudes towards the ways of energy consumption are extremely important criteria that provide added value to this very consumer who understands and respects them. Energy efficiency labelling of household appliances has an indirect task to raise consumers' awareness about realistic energy usage with the aim of influencing consumer purchase decisions about energy efficient household appliances.

In the field of labelling in compliance with the energy efficiency measures, Croatia has established a legal framework that is only partly aligned with the EU directives. Energy labels attract the attention of potential consumers and inform them about the energy consumption of a purchased household appliance. The prescribed standardisation of energy labels and independent testing of appliances enables manufacturers of energy efficient

household appliances better positioning on the market on the one hand, and on the other, protects consumers from inaccurate claims of manufacturers and/or retailers about energy savings. With the help of labels consumers are provided with accurate information about a household appliance energy consumption, which makes the consumer's household appliance purchase decision more rational since it includes the energy price during the appliance's lifecycle. In terms of communicating with consumers, energy efficiency labels need to be visually attractive and need to provide consumers with complete and precise information regarding energy savings. According to the research of the Ministry of the Economy, Labour and Entrepreneurship, 68.3% of the population is not familiar with the system of energy labelling of household appliances, and 75.5% pays absolutely no attention to energy efficiency when purchasing energy efficient household appliances. Household appliances must have two distinct types of labels:

- Comparative labels
- Additional labels - in order meeting the criteria.

Comparative labels are oriented towards the labelling based on household appliances energy efficiency class, based on different categories of efficiency and based on reaching the prescribed value of energy efficiency. EU categories of energy efficiency are presented in Table 1.

TABLE 1
EU CATEGORIES OF ENERGY EFFICIENCY¹

Consumption relating to the referred appliance	Category
<55%	A
55–75%	B
75–90%	C
90–100%	D
100–110%	E
110–125%	F
>125%	G

In some EU countries energy labelling was introduced in the early 1970s. Directive 92/75/EEC on mandatory energy labelling of household appliances was brought in 1992, and the obligation to pass acts enforcing the directive was imposed on national parliaments. From 1994 to 2002 eight directives for different household appliances were brought. In Croatia regulations on mandatory energy efficiency labelling were introduced in 2005.

Consumers in the times of crisis and recession

The changes that have taken place and the modern environment producers of household appliances are changing the general buying habits of consumers as well as the habits, needs and behaviour patterns of consumers of household appliances. The consumer, in the aftermath of crisis and recession, is a complex being whose

purchase decision about household appliances is motivated and stimulated by a whole array of determinants. The present-day consumer, regardless of the product he/she is buying, is not a passive observer of his/her environment but on the contrary, he/she influences the changes and reacts to manufacturers' activities. Nowadays, the consumer culture creates values, beliefs and modern behavioural patterns. Economic crisis has had a profound impact on consumer buying behaviour, which is especially prominent in the area of household appliances purchases, which in the times of crisis and recession challenge the loyalty to a present household appliance brand. The economic falls that have marked the past six years are stressful in their very nature and they create in consumers the need for simplicity. A large number of consumers have no option but to be frugal. However, regardless of the fact that the number of those who make a good living is constantly growing, but are saving at the same time, caution, fear, planning and frugality are the attributes that best describe the consumer of energy saving household appliances. A relatively new consumer profile appeared on the market before the crisis and recession had escalated and introduced new decision-making models. The essence is that the consumers turned towards healthier and less extravagant lifestyles regardless of the product they were buying. In the time before the crisis and recession dissatisfaction with excess consumption was created in the aware and ecologically sophisticated consumers, especially regarding natural resources or energy consumption.

The bottom line is that ecologically aware and sophisticated consumers, who are essentially more educated consumers, gave priority to a healthier and less extravagant lifestyle. They are oriented towards recycling, purchasing energy efficient household appliances, they teach their children traditional values – and creating new consumer models who tries to save energy, is very careful about which model of household appliance he/she buys and tries to have a simple and quality lifestyle. In the period before the crisis and recession and the then prevailing market circumstances made this very consumer more agile and completely changed his/her behaviour model. The years before the crisis and recession were marked by consumer behaviour model who when making a purchase decision tries to maximise his/her usefulness and is ready to replace the present manufacturer of household appliances. The usage of energy efficient household appliances in the decade after the crisis and recession has shown a tendency of growth and if the government institutions get involved in the affirmation of this market then we can expect to see the »fever of frugality«. The largest number of expert forecasts in the most economically developed countries points towards significant changes and a total abandonment of present household appliances and replacing them with energy efficient ones.

The issue of environment protection is deeply embedded in the consciousness of consumers who around the world are increasingly turning towards ecological products and services. Specifically this consumer profile when

making a buying decision about energy efficient household appliance is willing to pay a higher price for such an appliance in order to do something good and positive for themselves and their families as well as for »the whole world«. Additionally, consumers referring to the economic crisis, analyse every purchase decision, which is especially prominent when it comes to buying household appliances. Nowadays, a purchase decision itself is a very long process of learning in which the consumer has acquired knowledge about what kind of household product they need and the benefits it will bring them. This leads to a conclusion that especially those consumers who buy household appliances with which, from the aspect of energy consumption, they save energy, are the ones that respect and value, quality and authenticity of those very household appliances. With this they enter the group of price sensitive consumers, regardless of the fact that the household appliances market has been greatly hit by the recession it has primarily influenced consumer habits and not only in the sense of how much they spend but also how they spend money. Consumers' qualities of being critical, choosy, active and informed all come into focus during the purchase decision process when those very consumers, regardless of the product's characteristics taken into consideration when buying a household appliance, face the consequences of the crisis. The consumer's behaviour when buying household appliances from the aspect of energy consumption will depend on the crisis duration and its outcome⁵.

If the recovery is fast, consumers will most likely quickly adjust to the quantity of money they have and will buy energy efficient household appliances. Even the category of consumer traumatised by the crisis will begin to perceive the value of these products and will make a decision to buy them.

The aim of consumer research when purchasing household appliances from the aspect of energy efficiency is oriented towards understanding and explaining the motivational framework, factors that influence the decision on energy efficient household appliances as well as the needs of consumers that influence the choice and purchase of a particular household appliance. The better we understand the perception process and the decision-making process when buying energy efficient household appliances, the more accurate we can be in recognising the factors that influence the purchase decision about buying energy efficient household appliances. The dynamics of the demand for energy efficient household appliances will depend on the perception of the crisis and recession elements on the market. Further, through research the information on market segment structure is collected as well as the information on its demographic characteristics, lifestyle, habits, ecological awareness, preferences, attitudes etc., factors that influence the decision about buying energy efficient household appliances. When a consumer is buying an energy efficient household appliance he/she is buying an appliance's complete personality that comprises not only product elements, but also the perception of the environment, energy efficiency, i.e.

the product that contributes to saving energy. The purchase of energy efficient household appliances consists of an image that the consumer creates about sustainable development, benefits that the usage of such products bring, people who use it, profile of a person contributing to society and the concept of sustainable development by using energy efficient appliances. The aim of research is to gain insight into and understand the behaviour of consumers of energy efficient household appliances from three angles: the first one studies consumers of household appliances through socio-economic characteristics, the second one takes into consideration the quantity of information and knowledge that consumers have about energy efficient household appliances, ways of saving water and energy etc., while the third angle includes values, lifestyles, personality features, and attitudes to energy efficiency.

The aims of research were:

- Get an insight into consumers' opinions and attitudes on energy efficiency priority measures.
- Survey the willingness of potential consumers to invest in the measures of energy efficiency with and without government subsidies.
- Discover where the trend of demand for energy efficient products is going.
- Establish whether there is attitude reconsideration regarding energy efficient household appliances.
- Establish in what way the trend of turning towards green life influences consumers.
- Establish whether there is loyalty to verified brands.
- Find out to what extent the category of social responsibility influences consumers' motives.
- Establish if the crisis and recession have had an impact on individual consumers' needs.

Materials and Methods

The survey method through a questionnaire was applied in order to explain the motives and attitudes in the behaviour of energy efficient household appliances consumers and their motives and attitudes to priority measures of energy efficiency as well as the other factors that influence the choice of such products. Closed questions with a selection of answers, open questions, and closed questions with a selection of modalities measured by Likert scale of five items were used in designing the questionnaire. The survey sample were consumers (male and female) in the younger age group (18–35 years of age), and the mature age group (36–75 years of age) selected from an appropriate sample in the Zagreb city area, who are potential consumers of energy efficient household appliances. Additionally, electronic instrument »Google Spreadsheet« was used as an instrument of research. In the future the same research should be carried out in the whole area of the Republic of Croatia in order to obtain a complete picture of consumers of energy efficient household appliances, the level of awareness of Croatian citizens, their attitudes to energy efficiency, environment

TABLE 2
DESCRIPTION OF RESEARCH SAMPLE (N=200)

	n	%
GENDER		
Male	87	43.08
Female	113	56.92
Age group		
18–25	22	10.77
26–45	129	64.62
46–65	42	20.77
65+	7	3.85
Household		
Lives with parents	32	16.15
Lives alone	33	16.92
Lives with a partner	13	6.15
Family without children	15	7.69
Family with one child	50	24.62
Family with two child	48	23.85
Family with three or more children	9	4.62
Income		
< 3.000,00 kn	20	10.00
3.001,00 – 5.000,00 kn	21	10.77
5.001,00 – 8.000,00 kn	99	49.23
> 8.000,00 kn	60	30.00
Education		
No qualifications/education	0	0
Professional qualification	0	0
Secondary school	69	34.62
Associate degree	42	20.77
University degree	89	44.62
Size of living space		
Up to 30 m ²	3	1.54
From 30 to 40 m ²	14	6.92
From 40 to 55 m ²	51	25.38
From 55 to 65 m ²	20	10,00
From 65 to 80 m ²	42	20,77
From 80 to 95 m ²	27	13.85
Over 95 m ²	43	21.54

protection, the need to preserve natural resources as the basic requirements of sustainable development. The description of research sample is shown in Table 2.

Results

The research was carried out in the period from 13.02.2013 to 01.03.2013 and comprised 200 respondents. Some of the main research objectives were to gain insight into opinions and attitudes of consumers about priority

measures of energy efficiency, survey the willingness of potential consumers to invest in energy efficiency measures and discover the direction of the trend of demand for energy efficient products. The first six questions relating to socio-demographic factors such as age, gender, size of household and living space are presented in the Table 2. Therefore, the survey results begin with question seven. The way so fusing water during morning hygiene rituals is shown in Figure 2. A significant number of respondents said that they let the water run only at the beginning and the end of brushing teeth (55.38%). In the next category by numbers respondents said they leave the water running all the time they brush their teeth but in a light flow (18.46%). For 13.08% of respondents letting the water run »unnecessarily« depends on their mood (Figure 3). Most respondents think that the most important measure of energy efficiency is the overall reconstruction of living space, which involves installation of heat insulation, revitalization or replacement of heating system and similar measures (39.83%). A significant number of respondents think that the most important measure is switching on and using household appliances after 10 p.m.(42.46%) (Figure 4). According to their own opinion or knowledge 36.62% of respondents do not use

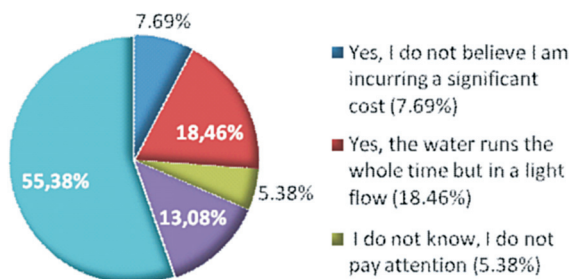


Fig. 2. Ways of using water during morning hygiene rituals.

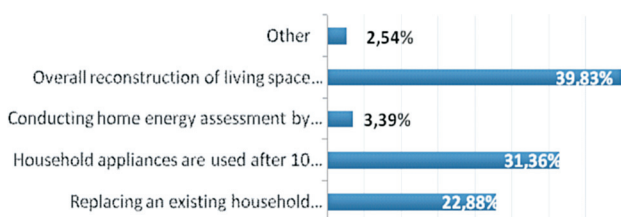


Fig. 3. The most important energy efficiency measures.

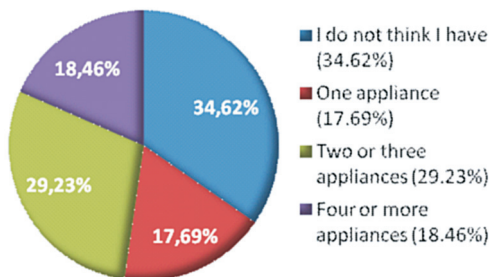


Fig. 4. Usage of energy efficient household appliances to date.

TABLE 3

HOUSEHOLD APPLIANCES ACCORDING TO AVERAGE ENERGY CONSUMPTION IN ONE HOUR OF ACTIVE USAGE

Fridge (volume 150 L)	2.67	7.
Washing machine (capacity 7 kg)	3.28	3.
Dish washer (7 programmes)	3.15	4.
TV LED LCD (screen 102 cm)	2.27	10.
Freezer (volume 300 L)	3.12	5.
Iron (power 2000 W)	3.32	2.
Food processor (volume 2 L)	2.45	9.
Light bulb (100 W)	2.46	8.
Air-conditioning system (cooling 40 m ²)	3.78	1.
Vacuum cleaner (1800 W)	3.05	6.

or think they do not use energy efficient appliances in their homes. The next category by numbers consists of respondents who use two or three appliances (29.23%) (Figure 5). The correct answer to this question is 1.5–2.0 kWh. 15.38% of respondents know how much energy consumes an average iron they use in their homes. 65.38% of them have admitted they do not know while 19.23% of respondents have given the wrong answer. Household appliances ranked according to the average energy consumption in one hour of active usage have been presented in Table 3 and Figure 6.

The respondents have given the highest rating (3.78) according to consumption in their homes to air-conditioning systems (cooling of 40 m² space). The next largest consumers of energy are irons (power 2000 W) with an

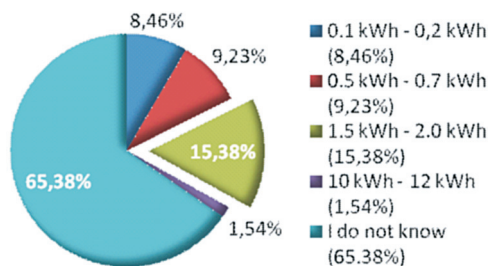


Fig. 5. Energy consumption of an iron one hour of active usage.

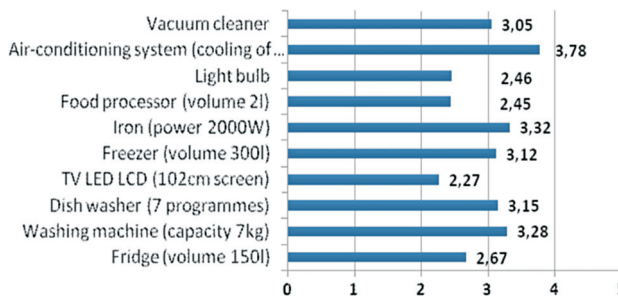


Fig. 6. Household appliances according to average energy consumption in one hour of active usage.

average rating 3.32. Respondents believe that the lowest energy consumer is TV LED LCD (screen 102 cm). An average rating for this appliance is 2.27, and food processors (volume 2 L) with an average rating 2.45. Figure 7 shows the condition relating to reduced electricity bills, under which the respondents would consider replacing an existing 10 year old refrigerator with a new energy efficient one costing 5000.00 HRK on the market. Most respondents (26.92%) believe they would replace a 10-year old fridge with a new one that costs 5000.00 HRK if their electricity bill decreased by over 300.00 HRK. However 26.15% of respondents said they would not be prepared to make that kind of investment.

Figure 8 shows the number of respondents who would make the decision to purchase an energy efficient refrigerator costing 5000.00 HRK on condition of receiving a government subsidy of 500.00 HRK towards the cost. In case the state co-financed the purchase of a more energy efficient fridge in the amount of 500.00 HRK towards the

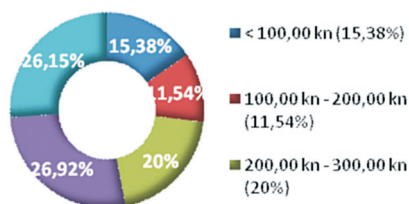


Fig. 7. Expected savings on a new energy efficient refrigerator.

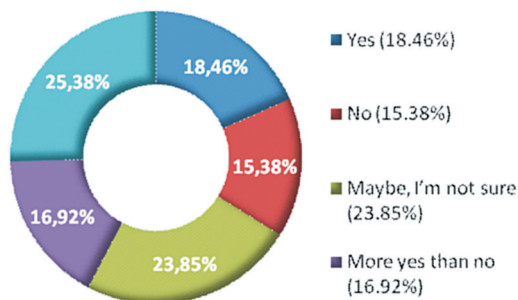


Fig. 8. Decision on buying energy efficient refrigerator with government subsidy of 500.00 HRK towards the cost.

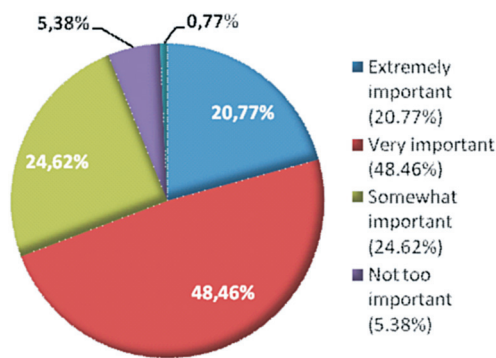


Fig. 9. The importance of the ecological approach and saving energy.

cost of 5000.00 HRK, 18.46% respondents would decide to make the purchase. Most of them (25.38%) would think about it and make the decision later. 23.85% respondents would possibly buy a co-financed appliance but they are not sure. The importance of the ecological approach and saving energy is represented by Figure 9. Out of the total number of respondents, 48.46% think that the ecological approach and energy saving are very important to them while 24.62% believe that these categories are somewhat important. Only 0.77% responded that they are not important at all.

The average rating of the importance of own criteria when purchasing electrical appliances is presented in Figure 10 and Table 4. When purchasing an electrical appliance, respondents consider the category of quality to be the most important (average rating 4.50). The next most important category to respondents is the warranty (average rating 4.11). The ecological awareness is positioned towards the bottom of the list at the 6th place (average rating 3.78) while the criteria of energy efficiency was rated with 4.03 and is in 4th place. The product brand is in the last place of the offered criteria and was rated by the respondents with 3.37. The willingness of respondents to pay a higher price for ecological household appliance is shown in Figure 11.

Out of the total number of respondents, 63.85% think they would rather buy an ecologically labelled product if its price wasn't significantly different, i.e. approximately the same as the price of an appliance with similar characteristics but without the ecological labelling. 18.46% of them think they would buy an ecological product but not always. Socially responsible behavior according to own criteria is depicted in Figure 12. According to their own criteria, 63.08% of respondents behave in a socially re-

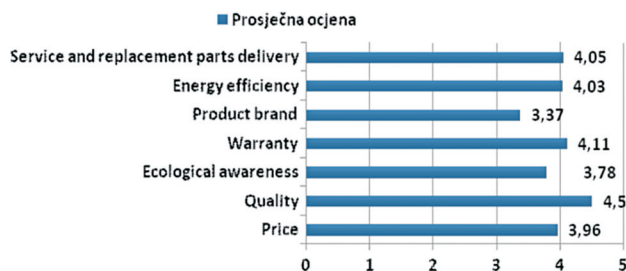


Fig. 10. Assessment of own criteria when purchasing electrical appliances.

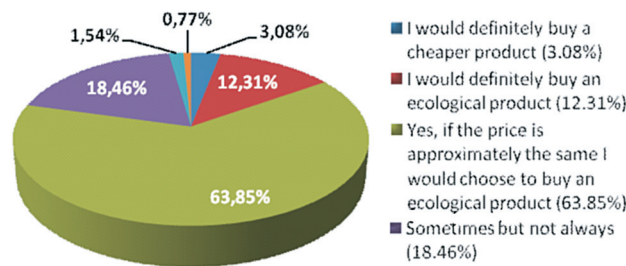


Fig. 11. Respondents willingness to pay higher price for an ecological household appliance.

TABLE 4
ASSESSMENT OF OWN CRITERIA WHEN PURCHASING ELECTRICAL APPLIANCES

Price	3.96	5.
Quality	4.50	1.
Ecological awareness	3.78	6.
Warranty	4.11	2.
Product brand	3.37	7.
Energy efficiency	4.03	4.
Service and replacemet parts delivery	4.05	3.

sponsible way. 19.23% sometimes behave socially responsibly but they are also aware that sometimes they do not. Only 1.54% respondents said they never pay attention whether they behave in a socially responsible way or not.

The negative impact of the economic situation on purchasing energy efficient and more advanced appliances is shown in Figure 13. 48.46% of respondents would agree that the unfavourable economic situation has a negative impact on purchasing energy efficient and more advanced appliances if we add to this the percentage of those who completely agree with the statement we can see that they account for 65.38% of respondents who believe the statement is true. The percentage of consumers who follow Croatian supermarkets special offers for purchasing household appliances is presented in Figure 14. The most common consumer behaviour of this survey's respondents regarding following special offers of supermarkets and their favourable offers when buying household appliances (34.62%) is that they show interest but

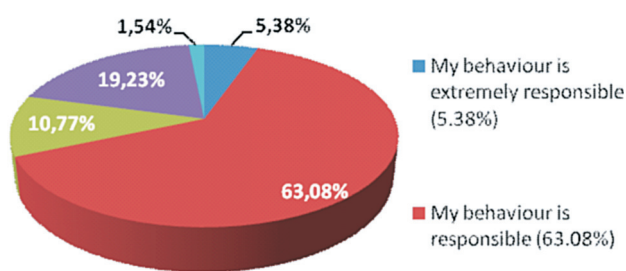


Fig. 12. Socially responsible behaviour according to own criteria.

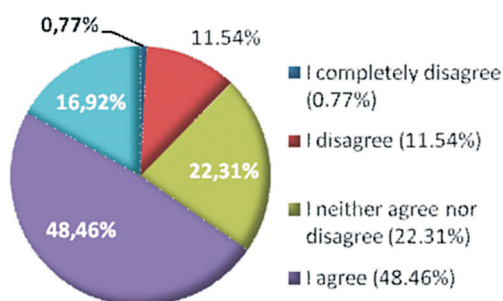


Fig. 13. Negative impact of economic situation on purchasing energy efficient and more advanced appliances.

also that they only occasionally respond to them. 22.31% of respondents never follow special offers and apply different criteria. The willingness of consumers to switch product brands if the competition offers a more energy efficient and more advanced appliance is shown in Figure 15. No less than 55.38% of respondents are willing to switch product brands if the competition offers a more energy efficient appliance on condition that its price is the same as the price of a brand they are used to or the price of their current brand. Further, 23.85% of them are not willing to try out other brands although they state that the category of product brand value is an important element. Figure 16 shows the purchase of products manufactured by a tested producer in case the competition offers products at a lower price. In case of a lower price offer, 38.46% of respondents would think about buying competitors' products while 33.85% of them believe that the competition should offer other benefits apart from a lower price. Only 5.38% of respondents would stick to their choice of producer regardless of the competition's offer. The reasons for purchasing household appliances are shown in Figure 17. For 58.46% of respondents, the reason for buying selected household appliances would definitely be the feature of energy efficiency, regardless of the price. Buying a less expensive appliance is the main criteria for 16.92% of them.

When replying to this open question most respondents have expressed similar views. The general idea in their replies: behaving rationally with all power sources. Some of them responded: turn off the lights when rooms are not in use, not heat the space when not in use, separate and recycle the waste, separate household waste, use energy efficient appliances, take care of the environ-



Fig. 14. Following of Croatian supermarkets special offers and their offers for purchasing household appliances.

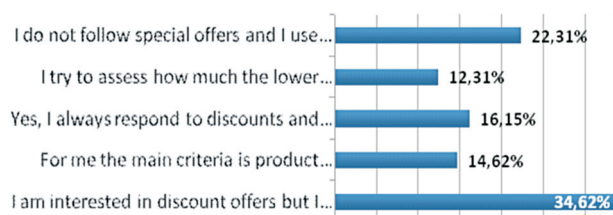


Fig. 15. Consumer willingness to switch product brands if the competition offers a more energy efficient and more advanced appliance.

TABLE 5
PRIORITIES WHEN BUYING ENERGY EFFICIENT HOUSEHOLD APPLIANCES

Continuous price increase of energy and other power sources	4.05	1.
Awareness of Croatian citizens of the negative impact on the environment as a result of excessive energy consumption	3.74	5.
New job openings in the field of production and installation of energy efficient equipment	3.58	6.
Availability of subsidies for investments in energy efficiency	3.78	4.
Property taxes decreased when energy efficiency measures are implemented	4.00	2.
Through energy efficiency life conditions are improved and other benefits are gained, e.g. higher property value	3.93	3.

ment, not buy disposable products, turn off appliances instead leaving them in stand-by mode, use energy saving light bulbs, do household chores in periods when energy is cheaper. The second category of selected responses and respondents' views refers to their attitude to »the green life« and views of the future: educate children, be aware of huge quantities of waste generated by people every day, use energy only when needed, use as little resources as possible, not spend money above one's means, act rationally even with things that are not their own, eat a healthy diet. The third category of responses could be summed up as the field of personal issues: consume rationally in order to be able to pay utility bills at the end of each month, be neighbourly, respect the rules of urban life, I am responsible to myself and if at the same time it benefits the society, all the better. We can conclude that most respondents view energy efficiency and ecological issues in a very positive way, and from their individual positions they are striving to contribute as much as possible. It can be seen that the respondents are aware of the world trends as well as that some of them give a huge importance to environmental care (Table 5, Figure 18).

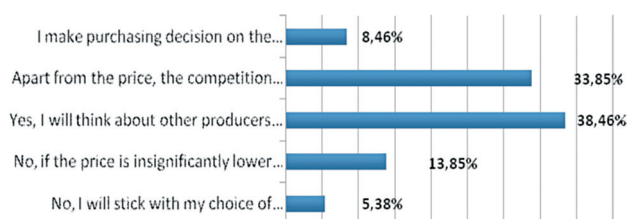


Fig. 16. Buying products a tested producer if the competition offers products at a lower price.

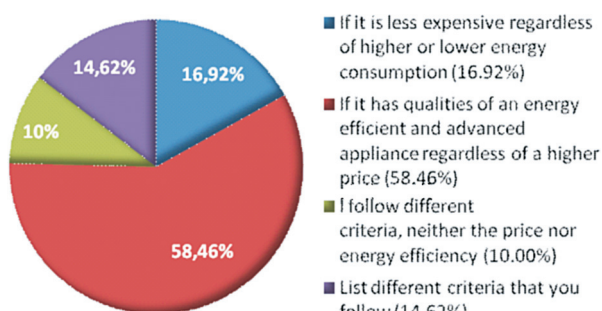


Fig. 17. Reasons for buying household appliances.

Referring to the factors as incentives for buying energy efficient household appliances the most important is the criterion of continuous price increase of energy and other power sources (average rating 4.05). The respondents found property tax decreases for implementing energy efficiency measures to be next most important category (average rating 4.00). Respondents listed new job openings in the field of production and installation of energy efficient equipment as the least important of the offered categories (average rating 3.58). The reasons for not implementing energy efficiency measures in respondents own homes are shown in Figure 19. As the main reason (50.00%) for not implementing energy efficiency measures in their homes respondents listed lack of funds (money) for implementing such measures. The next most important reason listed by respondents (38.98%) was insufficient information and knowledge about energy effi-

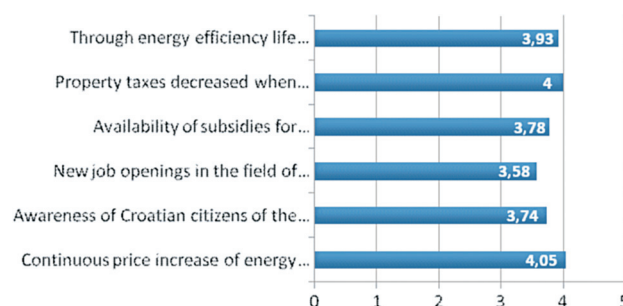


Fig. 18. Priorities when buying efficient household appliances.

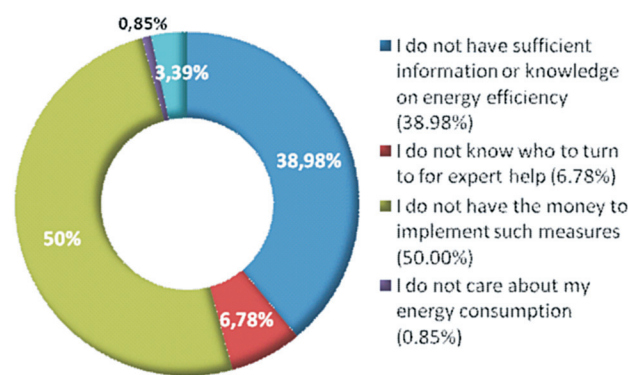


Fig. 19. Reasons for not implementing energy efficiency measures in my home.

ciency. As the main reason for implementing energy efficiency measures in their households, respondent mostly stated the awareness about excessive energy consumption, pollution, contributing to a better quality of life today and even more in the future, savings and the desire to contribute to protecting nature in general.

Discussion

This paper has established a correlation between the usage of energy efficient household appliances and the age of respondents, which leads to the most important and interesting social moment of energy efficient appliances market – the need and desire to preserve and protect the environment, save energy in the home and turns out to be the strongest driving force of consumers' desires. In other words, the survey results show that 58.46% of respondents would buy an energy efficient household appliance regardless of its price while 16.92% of respondents are motivated by a lower price of household appliances when making a purchase decision; the most important criterion that gives respondents incentive to buy energy efficient household appliances is the continuous price increases of energy and other power sources with an average rating of 4.05. The next criterion is the reduction of property taxes when energy efficiency measures are implemented, average rating 4.00. The carried out research has shown that there is an extremely strong impact of the crisis and recession on decisions when buying energy efficient household appliances. Consequently, 50% of respondents have stated that they cannot afford energy efficient household appliances and that they have postponed the decision to purchase one. As the most important purchase motivation when buying appliances respondents listed quality (4.50); warranty (4.11); service and replacement part delivery (4.05); and in the fourth place of the offered criteria, energy efficiency of household appliances (4.03). The limitations of this research are geographical since it was conducted mainly in the city of Zagreb. Further, this research covers just one segment of consumers' lives, i.e. the behaviour of consumers of energy efficient household appliances while the research does not cover the minimal requirements for energy performance of buildings or minimal requirements for energy efficiency of systems in buildings, or the equipment in heating, ventilation and air-conditioning systems. This research gives an insight in the behaviour of consumers of energy efficient household appliances and the opinions about and attitudes to energy efficient household appliances.

Research limitations and recommendations for further research

There is another way to observe motivation for purchasing, i.e. usage of energy efficient household appliances. It is based on an individual cost – benefit analysis embedded in a purchase decision-making process.

Since the choice to buy an energy efficient household appliance requires having certain information and in-

volves expenses but on the other hand brings benefits, the consumer of an energy efficient household appliance will behave in an ecologically acceptable way and his/her purchase decision will bring him/her sufficient benefit in order to balance the cost. Therefore, one of the more important directions of future research should be establishing individual perceived benefits as a consequence of ecological pattern of behaviour. It can also be added that consumers really feel individual benefits as a result of ecological and responsible behaviour, however these consequences are not necessarily connected to increased quality of life. Analysing research results it is necessary to establish the existing limitations of this research. The first limitation refers to the research sample. As it has already been stated, the research was carried out on respondents residing in the city of Zagreb together with online research with respondents mainly from Zagreb. The obtained results are merely indicators. In order to get the complete picture about attitudes, motivation for purchasing energy efficient household appliances, citizens' awareness about sustainable development, the research should be carried out in other Croatian cities as well.

The research limitations are also found in the methods of assessment of motivation, attitudes and knowledge about energy efficient household appliances based on respondents' own subjective assessment. Although these methods are commonly used in research and the Likert scale with five items is one of the most widely used the objectivity of indicators can be challenged. The influence of social desirability of responses, and therefore non-objectivity of respondents should not be disregarded taking into consideration that energy efficiency is a subject of debates on all levels. The future research into behaviour of consumers of energy efficient household appliances should involve a larger sample of subjects in the whole area of Croatia. The future research should give answers to questions about which segments of energy efficient household appliances on the domestic market are better accepted by consumers and what is the correlation between attitudes towards energy efficiency and consumer behaviour.

The limitations of this research are further connected to a lack of previous research conducted in the Republic of Croatia, to which the results could be compared. When designing the questionnaire numerous surveys were used, mostly carried out in the USA, the EU and other countries different from Croatia in terms of culture and development. Therefore, certain adjustments were necessary and the pre-testing of the survey questionnaire while the interpretation of research results was made difficult due to the impossibility of results comparison and making conclusions based on comparison.

Conclusion

Consumer behaviour has changed in the past ten years in all segments of life, in making purchase decisions when buying household appliances from the aspect of energy efficiency as well as when selecting any other

products. Nowadays, consumers of household appliances do not make purchase decisions based on price exclusively but purchase a household appliance taking into consideration saving energy and a whole range of other factors, expressing their personality in this way.

The process of purchasing household appliances from the aspect of energy consumption is influenced by a number of factors. Consumers of energy efficient household appliances include in the process their needs, desires, their attitudes and expectations regarding energy consumption, their comprehension of what is available as well as their financial resources in order to perceive different household appliance brands. Further, by buying an energy efficient household appliance they accept not only the brand of a purchased product but in the buying process they have also implemented their own awareness about the ecological product and the need of today's economy regarding preserving electrical energy.

By adding brands to household appliances, new dimensions were added to the product that satisfies the same consumer needs. The brand itself created in the eyes of consumers a realistic, tangible, symbolic and emotional difference, together with other product features. New features have been added to modern products, i.e. household appliances, which enable consumers to reduce energy consumption and carbon dioxide emissions without considerable changes to their lifestyle thanks to the simplicity and efficiency of today's technological advances, together with the development of awareness about the need for saving energy in their households, consequently putting the decision about the brand in the perception of consumers in the position after the factor of energy efficiency.

Since energy consumption is continuously growing, energy labelling of household appliances is an important tool in supporting energy efficiency in the household. Market research has shown that present-day consumers are willing to pay a higher price for higher energy efficiency products; they are prepared to replace the present brand with a brand that has energy labels. However, the research has also shown that most consumers are post-

poning the purchase due to the current crisis and recession. It can be concluded therefore, that most Croatian consumers are currently using energy inefficient household products over ten years old.

The new energy efficiency as a label on a product helps potential consumers bring a more sophisticated decision about buying energy efficient household appliances based on the following perceived values that determine the purchase:

- Clear and easy to understand categorization of products based on energy efficiency classes.
- A made easy comparison of energy and water consumption by product from the aspect of savings.
- Being more informed about other product parameters such as drying efficiency and product noise levels, which makes purchase decision easier to bring.

According to the authors and results of their own research, the largest disadvantage in achieving energy efficiency in the home is the lack of organized information and financial support to households in Croatia. Although the citizens', i.e. respondents' level of awareness and information is higher compared to previous years it is still not at the level necessary to achieve results regarding energy efficiency. Measures of producers, the government, NGOs etc. should be oriented towards those segments of energy consumption in households, namely household appliances with the largest share in the total energy consumption, but also the household appliances with the highest potential for savings in order to achieve satisfactory levels of energy efficiency.

Inefficient usage of energy as well as the usage of energy inefficient household appliances is a great burden for the Croatian economy and incur unnecessary expenses for the society. Therefore, incentives by the government, NGOs, as well as by other organisations and associations would increase the sales of energy efficient household appliances regardless of the economic crisis and recession in Croatia and it would contribute significantly to reduced energy consumption and a the rise in the standard of living of Croatian population.

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PONAŠANJE POTROŠAČA PRI KUPNJI KUĆANSKIH APARATA S ASPEKTA POTROŠNJE ENERGIJE U VRIJEME KRIZE

S A Ž E T A K

Ključ uspjeha proizvođača kućanskih aparata koji štede energije leži u uvažavanju promijenjenog razmišljanja i ponašanja potrošača te njihovih individualnih potreba nakon vremena krize i recesije. Potrošači danas imaju potpunu kontrolu nad kupnjom kućanskih aparata, a i puno više mogućnosti izbora pri kupnji istih. Potrošači kućanskih aparata, čija je potrošnja prije vremena krize i recesije predstavljala pokretačku snagu, danas pri donošenju odluke o kupnji kućanskih aparata uzimaju u obzir puno više čimbenika, te je njihova odluka složenija. Sa aspekta promjene vrijednosti i motiva potrošača kućanskih aparata ključni su trendovi: insistiranje na jednostavnosti, društvena odgovornost proizvođača kućanskih aparata, etičko poslovanje, potražnja za proizvodima koji štede energiju, lojalnost i sl. Sa plasmanom kućanskih aparata koji štede energiju i ne zagađuju okoliš potrošači preispituju svoje potrošačke navike i okreću se sve više »zelenom životu«. Klimatske promjene na zemlji dosegle su razinu kada svaki potrošač postaje svjestan korištenja manje štetnih izvora energije i kućanskih aparata koji štede izvore energije. Uz kratak osvrt na vrijeme krize i recesije, te potrošačke navike u vrijeme krize, cilj ovog rada je utvrditi motive i stavove potrošača kućanskih aparata, te utvrditi razinu svjesnosti ispitanika i njihove percepcije prema kućanskim proizvodima koji štede energiju i potiču brigu za okoliš.